Leveraging Traditional and Religious Leaders in Vaccine Delivery Design and Demand Generation– Protocol for a living systematic review

Protocol information

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Introduction

Vaccination remains a successful health intervention against many diseases. Vaccines against 14 pathogens (diphtheria, Haemophilus influenzae type B, hepatitis B, Japanese encephalitis, measles, meningitis A, pertussis, invasive pneumococcal disease, poliomyelitis, rotavirus, rubella, tetanus, tuberculosis, and yellow fever) have averted 154 million deaths from 1974 to 2024, of whom nearly 95% are children under the age of five years (Shattock et al., 2024). This has led to a 40% decline in global infant deaths and a 52% decline in infant deaths in Africa since 1974, following the establishment of the Expanded Programme on Immunisation (Shattock et al., 2024). Moreover, vaccination against measles and hepatitis is predicted to avert 96 million deaths over the lifetime of birth cohorts born between 2000 and 2030 in 98 low- and middle-income countries (LMICs) (Li et al., 2021). The recently introduced RTS,S/AS01 malaria vaccine has been credited with averting one in eight child deaths, based on observational data from Ghana, Kenya, and Malawi (Mwapasa et al., 2026). Increased uptake and completion of all doses could yield greater health gains in areas of moderate to high malaria transmission.

The human papillomavirus (HPV) vaccine, recommended for pre-adolescents and adolescents, represents a similarly powerful opportunity to prevent cervical cancer, yet its uptake in many low- and middle-income countries remains far below target (Waheed et al., 2023). Like childhood vaccines, HPV vaccination faces barriers of access, awareness, and acceptance, but it also confronts distinct challenges related to adolescent health, gender dynamics, and cultural sensitivities around sexual and reproductive health and increased resistance with religious connotations.

Although recommended vaccines are effective, coverage remains low, especially in LMICs. According to the 2025 global estimates, 13.5 million eligible children did not receive their first dose of the diphtheria-tetanus-pertussis vaccine by their first birthday, operationally referred to as zero-dose children (ZDC) (WHO and UNICEF, 2026). Although there were 700,000 more ZDC in 2025 compared to the 2019 baseline, estimates over the past 25 years reflect a declining trend. The top 10 countries with ZDC are low- and middle-income countries, including Nigeria, the Democratic Republic of Congo, Yemen, India, Indonesia, Ethiopia, Afghanistan, Pakistan, Angola, and the Philippines, which account for 55% of global ZDC (WHO and UNICEF, 2026). Furthermore, LMICs have the highest number of children who did not receive a measles vaccine or were under-vaccinated against measles (WHO and UNICEF, 2026).

A systematic review in Africa found that mothers' knowledge of childhood immunisation, the objectives of immunisation, the immunisation schedule, fear of vaccine side effects, and safety concerns all contribute to low vaccine uptake (Galadima et al., 2021).

Although the overall vaccine acceptance of malaria vaccines was reported to be high (Bushi et al., 2024; Sahabi et al., 2025), awareness was only 32% (Sahabi et al., 2025). Participants' concerns about safety, efficacy, and multiple dosing were among the reasons some participants did not accept the malaria vaccine (Sahabi et al., 2025). Post-COVID-19, evidence shows mixed knowledge, awareness, and vaccine uptake in Africa. In a 2023 survey conducted in Nigeria, 67.8% of respondents believed that the COVID-19 pandemic and their knowledge of COVID-19 vaccines had changed their perception of other vaccines; 61.8% had high general trust in vaccines (D'Silva et al., 2024). In eight sub-Saharan African countries, vaccine confidence decreased between 2020 and 2022, except in Nigeria, where confidence increased (de Figueiredo et al., 2023). Perceived importance of childhood vaccines also declined in all countries, along with interruptions to immunisation.

Public trust in immunisation is a key factor that influences vaccine uptake. For example, in 2003, political and religious leaders in the Nigerian states of Kano, Zamfara and Kaduna contributed to a failure of the Kick Polio Out of Africa campaign by creating mistrust and fear in the public about the potential negative effects of the polio vaccine, including causing HIV, cancer and infertility (Ayodele Samuel Jegede, 2007). During the COVID-19 pandemic, LMICs had lower vaccination rates attributed primarily to limitations in access, logistics and acceptance (Dagovetz et al., 2025; Tupps et al., 2025). Clinical availability, therefore, does not necessarily translate into cultural accessibility. Traditional and religious institutions offer a proven yet underutilised solution to these barriers by serving as primary frameworks for community communication, governance, and social legitimacy**.** In Nigeria, a multicomponent intervention involving training traditional and religious leaders on vaccination increased childhood vaccination rates (Oyo-Ita et al., 2021). Conversely, religious leaders can also be significant barriers to vaccine uptake (Sirithammaphan et al., 2023). To understand the role of these organised social establishments in addressing vaccine inequity, hesitancy, and non-conformity, we must define them in terms of their dual capacity for administration and social influence (Logan, 2013).

In the most isolated and marginalised communities of low- and middle-income countries (LMICs), structural and social barriers often obstruct access to preventive measures. For example, a Cochrane review found that traditional and religious leaders can either increase or decrease acceptance of the human papillomavirus (HPV) vaccine (Cooper et al., 2025). However, the nature and intensity of these barriers vary significantly across different types of vaccines. For childhood vaccines like polio and measles, barriers are often logistical or informational, while vaccines like HPV (which targets adolescents and is linked to sexually transmitted infection) may face additional layers of moral, cultural, and religious resistance (Cooper et al., 2025; Sur, 2021). Similarly, the rapid development and politicisation of COVID-19 vaccines generated unique forms of

mistrust, some of which religious leaders and communities amplified (Dagovetz et al., 2025). This variation matters because traditional and religious leaders, as trusted intermediaries and moral authorities, are likely to be more critical of vaccines that carry social stigma or face religious opposition than of those perceived as routine or uncontroversial. Clinical availability, therefore, does not necessarily translate into cultural accessibility. Traditional and religious institutions offer a proven yet underutilised solution to these barriers by serving as primary frameworks for community communication, governance, and social legitimacy**.** To understand the role of these organised social establishments in addressing vaccine inequity, hesitancy, and non-conformity, we must define them by their dual capacity for administration and social influence (Logan, 2013).

In the African context, traditional leadership is a sophisticated system that is both symbolic and administrative. These authorities serve as an important administrative hub for rural communities, going beyond their ceremonial role. From managing communal resources to verifying residency for social grants and facilitating access to various social services, traditional institutions fill gaps where the formal state presence is thin (Delius, 2008; Comaroff & Comaroff, 2018). Customary institutions also serve as the legitimising authority for a dynamic ecosystem of community actors. Home-based caregivers who provide essential health services to those who cannot readily access clinics are not formal traditional authorities themselves, yet they frequently operate only through the sanctioned authority and cooperation of the traditional leader (Moshabela et al., 2016). These customary institutions typically (but not exclusively) centre men in their overt structures, with older male title-holders governing them and operating on power imbalances. Community health intermediaries, who are predominantly women, must negotiate access to adolescent female vaccine recipients through a governing layer of male elders who police local sexual and reproductive health norms (Chigbu et al., 2023).

In a number of West African customary systems, particularly among the Akan/Asante and Krobo communities in Ghana, female traditional leaders, commonly referred to as 'Queen Mothers', 'ohemaa/obahemaa' or 'manye', are not merely informal advisors but recognised office holders with their own stools, courts, constituencies and lines of authority. Scholarship on Asante chieftaincy describes queen mothers as female leaders who function in parallel with chiefs in dual-gender political systems, while work on Akan succession shows that the ohemaa can be central to nominating a royal for enrolment, though her role in destoolment varies by customary area and may be exercised with kingmakers rather than unilaterally (Stoeltje, 1997; Asaanful, 2019). This review recognises that customary governance is not entirely monolithic; these male-dominated structures are frequently mediated by covert female power networks, including institutional figures such as ‘Queen Mothers’ or paternal female advisors, i.e.

Rakgadi/Makhadzi (Oomen, 2005). Contemporary evidence shows that queen mothers are active in community development, women's and children's welfare, and health-related mobilisation. For instance, studies of Ghanaian queen mothers document their roles in children's education, women's rights, community planning and development, while the Manya Krobo Queen Mothers Association has been described as a credible community actor in HIV/AIDS awareness, mobilisation, partnership building and vulnerability reduction (Brown, 2011; Boateng, 2017). While these internal dynamics strongly influence community consensus, the review focuses primarily on formal institutional gatekeepers to maintain analytical manageability. The role of traditional leaders varies across Africa. Nonetheless, in other parts of the continent (such as in Uganda, Malawi and Nigeria), where traditional leaders may have less formal administrative responsibility, their role in influencing the behaviour and the social acceptance of rural populations remains the primary determinant of an intervention's success (Baldwin, 2016; Cammack et al., 2007; Englebert, 2000; Vaughan, 2006). The review will therefore not assume that engagement must always proceed first through male chiefs or elders. Instead, it will code the gender, title, level of authority, and customary functions of the leader engaged, including whether women traditional leaders hold formal decision-making, advisory, mobilisation, or gatekeeping roles within the intervention.

Outside the African context, evidence shows that traditional leaders' roles have been formally incorporated into local governance structures. For example, in India, the 'Sarpanch' (known by different names in different parts of the country, such as 'Pradhan' and 'Mukhiya' is the elected leader of the *Gram Panchayat* (village council) as part of a village governance system based on a council of elders dating back thousands of years (Mathew, 2000; Palanithurai, 2008). One example from East Asia is the village assembly (Sangguniang Barangay) in the Philippines. The modern barangay system, in which a Barangay Captain (Punong Barangay) is elected, is based on the pre-colonial village governance system under a chief or 'Datu' (Bueno, 2013; Rojo, 2002). In China, village-level governance combines the Party's role with traditional leaders represented by elders of local clans or du lao (Tsai, 2007; Xu & Yao, 2015). Across all three contexts, the vast regional diversity introduces a critical linguistic and methodological consideration for this review: empirical literature often reports customary leaders by locally recognised titles rather than generic administrative terms. This specificity is increasingly prominent in contemporary co-produced or decolonial research, where investigators deliberately utilise indigenous appellations out of institutional respect and as a practice of epistemic justice.

Drawing on Baldwin's (2020) conceptualisation, this project defines traditional leadership as an institution in which authority derives from customary conventions and hereditary legitimacy. Traditional institutions are not undifferentiated systems of

governance. Instead, these institutions exist in a state of legal hybridity, with the extent of recognition and incorporation into formal governance structures varying by region and country. Internal institutional power dynamics frequently face contestation, national courts redefine them, or local government acts integrate them (Oomen, 2005). Across various LMIC contexts, this dynamism creates a complex political landscape in which traditional councils, often comprising both hereditary figures and community representatives, must navigate shifting legal recognition while maintaining their local symbolic authority. This dynamism does not diminish traditional leadership's capacity to mobilise collective action in ways that formal states cannot match.

Alongside traditional institutions, religious leadership serves as a foundational institution that shapes shared norms and ethics. Melillo et al. (2022) noted that religious leaders can influence vaccination uptake. For example, mechanisms such as facilitating communication, improving access to resources, and shaping followers' beliefs can influence uptake of Polio, HPV, and COVID-19 vaccines. Conversely, vaccine hesitancy also often arises from religious beliefs and the perceived spiritual safety of medical interventions. Religious and ideological doctrines that conflate vaccines with Western control further complicate the issue. This highlights a critical point: a vaccine may be physically available in a clinic but remain socially inaccessible if local governing structures have not legitimised its presence within the community's moral framework (Richard & Synthia, 2026).

Pfeiffer et al. (2002, 2011) suggest that while global definitions of religious leaders often focus on formal clergy: priests, imams, or bishops, they may overlook other important roles. However, in many African LMICs, this definition must be Africanised to include leaders of African Initiated Churches (AICs), such as the Zion Christian Church (ZCC), and practitioners of African spirituality, including traditional healers. These figures often serve as the primary point of medical and spiritual contact. Anderson (2018, 2023) observes that within AICs, healing theology holds that spiritual and physical well-being are inseparable. In this integrated approach, the church functions as a holistic health system in which spiritual practices, such as using blessed elements or adhering to physical disciplines, are considered active medical interventions. Consequently, religious institutions operate extensive non-state social safety nets and possess a unique faith-based legitimacy that can reshape how people access health care through sermons and community counselling (Olivier et al., 2015). For this review, religious leadership is defined not merely by ecclesiastical title but by the authority to mediate between the spiritual and the physical, thereby determining the cultural safety of vaccines.

The same logic of broadening definitions of religious leadership applies across Asian contexts, where Buddhist monastic orders (Sangha) operate as comprehensive parallel institutions that are not limited to 'traditional and religious affairs' but transcend these domains and extend into the state. In Thailand, the Sangha functions as a fully

developed administrative system with legislative, executive and judicial branches that mirror secular governance structures at every level: regional, provincial, district and village (Kyaw, 1984). This integration extends to public health: the Thai government has established a National Sangha Health Charter, issued monks national identification cards for universal healthcare access, and trained nursing monks through the Ministry of Public Health (National Health Commission Office, 2013; Yamada et al., 2025). In Bangladesh, the United Nations Population Fund (UNFPA) has formally partnered with thousands of imams as community health advocates, recognising their unique grassroots position to influence maternal and reproductive health outcomes (UNFPA, 2006).

In China, Traditional Chinese Medicine (TCM) remains widely practised and is often the preferred channel for health-seeking behaviour among many populations (Lau et al., 2001). Within the Chinese healthcare framework, TCM is institutionalised as complementary medicine alongside Western clinical practices, with both paradigms collaborating at all levels of the health system (Zhang et al., 2025). However, contrary to assumptions that institutional integration eliminates opposition, multiple studies have identified a robust association between TCM preference and vaccine hesitancy (Lan & Jin, 2024; Zhang et al., 2025). Because TCM practitioners nonetheless function as the primary, trusted point of medical and community contact for many populations (Lau et al., 2001), they occupy an influential gatekeeping role, making them crucial pathways for legitimising public health interventions and also potential sources of hesitancy (Lan & Jin, 2024).

What unites these religious figures across both continents is that they operate within deeply male-centred frameworks that ultimately govern clinical interventions aimed at women, determining whose voice is heard, whose body is accessed, and which interventions move forward or stall (Arguedas et al., 2025; Dube & Chirongoma, 2025). However, male authority often operates alongside authorised female actors. Traditional birth attendants (TBAs), for example, can play an important role because of their direct engagement in sexual and reproductive health and rights and simply because (unlike nearly all traditional and religious leaders) they are women. Research from Uganda confirms that men actively seek and trust TBA services, and TBAs, in turn, become allies with women in influencing male decision-makers to provide the resources needed for maternity care (Turinawe et al., 2016). The same caution applies to traditional leadership: while many village councils and religious hierarchies are male-dominated, some customary systems include formally recognised women leaders, such as queen mothers, whose authority may be central to community legitimacy and whose omission could weaken intervention design. Traditional leaders and village councils are typically male elders; religious leaders are usually male, and in most religions exclusively so (Dube & Chirongoma, 2025). Messaging via these channels therefore occurs within the broader context of the dominant ideology of sexual and reproductive health and rights

promoted by these leaders, which may affect how messages are conveyed and received.

In some contexts, this hesitancy is exacerbated by historical medical trauma; for instance, the legacy of coercive sterilisation programs in India has fostered deep-seated suspicion toward clinical reproductive health initiatives, creating a significant, long-term barrier to HPV vaccine acceptance (Sur, 2021). Traditional and religious leaders can play an important role in shaping trust, social norms, and community behaviour around vaccination. However, their effects likely vary across settings depending on the specific socio-cultural context and the health system's capacity to deliver the vaccine, especially in hard-to-reach populations. This protocol reviews evidence on whether, how, and under what conditions traditional and religious leaders can support vaccine delivery programs and demand generation in LMICs.

This living systematic review (LSR) is being produced for the HPV Living Evidence and Knowledge Partnership. Read more about the partnership here.

The partnership includes:

- The Alive team at the Future Evidence Foundation. Alive aims to build innovative evidence systems that empower decision-makers to solve society's most pressing challenges.
- Elevate Evidence Hub (EEH) was commissioned to produce this review. EEH is a non-profit company based in Johannesburg, South Africa, and a woman-led pan-African organisation that is strongly committed to addressing health issues affecting women and girls in the developing world. Our evidence synthesis team is among the most experienced in evidence synthesis for decision-making. Thus, we ensure that African evidence synthesis leadership remains firmly rooted on the continent and continues to drive equitable health outcomes globally.
- UCL EPPI Centre. The EPPI Centre aims for better evidence for better decision-making: robust and responsive reviews informing policy and practice
- The Research and Evaluation Centre is a global network of researchers with expertise in evidence synthesis across a wide range of subject areas
- Three structures represent the HPV vaccine delivery community: a Steering Group, a Tactical Group, and a Group of Advisors.

Why is it important to do this living systematic review?

In our previous review (final report in preparation), we noted very limited evidence on the role of traditional and religious leaders in co-designing and delivering HPV vaccination programs in LMICs. Given this evidence gap, the current protocol broadens the scope to examine the involvement of traditional and religious leaders in co-designing and delivering vaccination programs across all vaccines. Broadening the

scope may allow us to identify useful evidence from other vaccination programs that is transferable to the design and implementation of HPV vaccination programs. Given the rapidly evolving, context-dependent nature of the evidence on the role of traditional and religious leaders in vaccine delivery design and demand-generation activities, a static review would quickly become outdated. An LSR can continually incorporate new evidence, track emerging patterns, and support timely decision-making for countries introducing or scaling up vaccination. This approach matters because living systematic reviews preserve the rigour of systematic review methods while improving the currency and usefulness of evidence for decision-making in rapidly changing fields (Elliott et al., 2014; Akl et al., 2024). In vaccination, the evidence base is likely to evolve as countries introduce new vaccines against emerging diseases such as COVID-19, expand vaccination programmes, adjust delivery platforms, respond to misinformation, and refine strategies to reach out-of-school adolescents and marginalised communities. A living approach is therefore not only a technical updating mechanism, but also a way to ensure evidence remains responsive to changes in vaccine delivery systems, community trust, and implementation realities.

In many LMIC settings, the role of traditional and religious leaders in health programming is not fixed or straightforward; it is constantly shaped by negotiations over authority, legitimacy and trust as well as the nature of gender relations. Traditional and religious leaders may act as intermediaries between households, health workers, schools, local government, and national programmes. Their influence is not simply inherited or doctrinal; it may depend on whether communities perceive them as accountable, effective, gender-sensitive, and aligned with local priorities. These leadership structures do not exist in isolation; changing legal frameworks, shifting political realities, and evolving state policies shape them (Logan, 2013; Baldwin, 2016). In many rural contexts, authority itself is fluid, particularly where customary systems coexist uneasily with democratic governance structures and where national courts continue to redefine the powers of traditional leadership (Comaroff & Comaroff, 2018). For this reason, a once-off or static review would struggle to capture the ongoing adjustments required for effective vaccine delivery. An LSR approach matters because it lets the review follow these changing dynamics in real time, especially in contexts where community trust may already be shaped by local political tensions, resource conflicts, or competing forms of authority (Logan, 2013). Empirical research indicates that engagement with traditional and religious leaders can take various forms, including community mobilisation, message endorsement, involvement in planning, service monitoring, and collaboration with health workers. A cluster-randomised trial in Cross River State, Nigeria, examined an intervention that involved traditional and religious leaders in community decision-making and vaccination coverage efforts, showing that

these leaders can serve as both communicators and participants in planning and implementation (Oyo-Ita et al., 2021).

By continuously incorporating new evidence, the review is better positioned to observe how interventions adapt as the relationships between customary and elected structures shift over time, and to offer more grounded insights for programmes operating within these complex governance landscapes. The LSR design is particularly suitable for this subject as it can monitor not only the impact of traditional and religious leader engagement on vaccine uptake, completion, acceptance, and equity, but also how these effects fluctuate with changes in governance structures, gender dynamics, religious narratives, misinformation contexts, and delivery mechanisms. This is crucial for preventing oversimplified conceptions that traditional or religious leaders are invariably obstacles or consistently enablers. The evaluation will produce an ongoing account detailing when, how, for whom, and under what circumstances these leaders favourably or negatively influence vaccine distribution and demand development. In this protocol, we followed PRISMA guidance for living systematic reviews: Akl EA, Khabsa J, Iannizzi C, Piechotta V, Kahale LA, Barker JM, McKenzie JE, Page MJ, Skoetz N. Extension of the PRISMA 2020 statement for living systematic reviews (PRISMA-LSR): checklist and explanation. BMJ 2024;387:e079183. doi: 10.1136/bmj-2024-079183.

Research questions

Primary Research Question

To assess the effects of engaging traditional and religious leaders in designing vaccine delivery and demand-generation activities on uptake, completion, acceptance, and equity in LMICs.

Secondary Research Questions

1. To examine how effect estimates vary by intervention design, context, and substantive, methodological, and extrinsic study characteristics.
2. To assess the barriers and facilitators influencing the intervention's implementation and effects.

Definition of key concepts

a. Traditional leadership (customary institutions)

Definition: Local governance structures whose legitimacy derives from customary conventions, hereditary succession, and indigenous social systems.

Nominal variation: This review defines traditional leaders by what they do and not what they are called. Contemporary research increasingly avoids generic Western labels like 'traditional authority', and instead uses specific local titles out of respect and in adherence to what is epistemically just. In this case, if the institution functions as a custodian of local custom, a community asset, or an arbiter of indigenous resources, it will be included in the review, regardless of the name the original study uses.

Institutional structure: This review treats traditional leadership as an institutional entity (such as traditional councils) rather than as individual actors. This approach acknowledges that authority is typically distributed across a representative body rather than a single person, although the council or other body may have a recognised leader.

Hierarchical sensitivity: The review recognises diverse levels of customary authority, ranging from recognised kingships and queenships to senior traditional leaders and village headmen/headwomen. It acknowledges that while these leaders hold significant symbolic and customary authority, they exercise their formal powers within the constitutional frameworks of their respective nations, which reflect differing degrees of incorporation into formal governance structures.

Contested legitimacy: This review acknowledges that authority is often in flux. Legitimacy may fracture due to perceived mismanagement of communal resources (such as land or mining royalties) or tensions between hereditary members and democratically elected representatives. In such contexts, community trust may shift toward elected structures that represent the community gaze.

Sanctioned agents: Actors (i.e., community-based caregivers or village health committees) who do not hold formal titles but derive their operational license in the community from the approval and legitimising authority of traditional leadership.

b. Religious leadership and faith-based organisations (FBOs)

Definition: Individuals, groups, or organisations recognised as spiritual intermediaries or faith-based entities with the power to influence communal norms and health behaviours based on religious doctrine, spiritual authority or communal recognition

Scope: This definition includes three interconnected categories:

Formal denomination clergy: Priests, Imams, bishops, pastors, reverends, catechists, sheikhs, rabbis, deacons, ministers, chaplains and other recognised religious office-holders.

African Initiated Churches (AICs) and indigenous spiritual practitioners: Leaders of AICs (such as the Zion Christian Church), traditional healers, prophets and spiritualists whose authority derives from both Christian and indigenous cosmological

frameworks. As Anderson (2018, 2023) observes, within AICs the theology of healing posits that spiritual and physical wellbeing are inseparable, meaning that these leaders function as holistic health authorities.

Faith-Based Organisations (FBOs): Following Song et al. (2024), FBOs are entities whose organisational control, expression of religion and program implementation are tied to values and beliefs belonging to specific religious identities. This includes church-backed NGOs, faith-affiliated health networks, missionary health services, and religious charitable trusts.

Inclusive scope across formal and informal settings: For this review, religious and spiritual leadership is defined inclusively to encompass both formal, ordained religious authorities and informal or community-recognised spiritual practitioners. This includes mosque elders, scripture teachers, spirit mediums, prophetesses and syncretic ritual leaders whose authority derives from community recognition rather than formal ordination. The definition is not limited to any single religious tradition and applies across Buddhist, Hindu, Muslim, Christian, indigenous and syncretic contexts in low- and middle-income countries.

Integrated framework of health: Religious leaders and FBOs are defined by their role within an integrated framework in which physical well-being and spiritual health are inseparable. Religious institutions operate extensive non-state social safety nets and possess a unique faith-based legitimacy that can reshape how people access health care, through sermons, community counselling, and institutional health programming (Olivier et al., 2015). Endorsement by a religious or spiritual authority is often a prerequisite for perceived cultural safety in clinical interventions.

Description of the interventions

This protocol focuses exclusively on evidence related to the involvement of traditional and religious leaders in the design and delivery of any vaccine and demand-generation activities in low- and middle-income countries. This intervention can be categorised into two primary streams:

Stream 1: Administrative Integration (The Structural Component). This component addresses the logistical (or structural) barriers to vaccine delivery by utilising the organisational capacity and physical infrastructure of traditional and religious institutions. Examples include using traditional council offices, community meeting grounds, or religious halls as vaccination sites. This stream also includes integrating vaccine follow-up into existing administrative cycles, such as residency verification,

social service distribution meetings, or customary assemblies (traditional open gatherings for community consultation and information exchange).

Stream 2: Social Legitimisation (The Symbolic Component). This component leverages the institution's symbolic and moral authority to build community trust. Interventions include sermons, formal traditional proclamations, and the public vaccination of leaders or their family members. The objective is to establish the vaccine as a culturally and morally accepted community priority, thus addressing ingrained concerns regarding cultural safety and vaccine hesitancy. Activities under this component include those activities that build knowledge of and support for vaccination among traditional and religious leaders.

Engagement and reporting

The primary users of this LSR will be decision-makers and primarily their advisors in low- and middle-income countries (LMICs) involved in vaccine delivery, including but not limited to: representatives from National Immunisation Technical Advisory Groups (NITAGs), Federal Directorate for Immunisation (FDI) in Pakistan and some other countries, EPI teams, Ministries of Health, Ministries of Education, Ministries of Finance, technical partners, academia, researchers, implementing partners, and civil society organisations. However, this LSR also has application to policy, program design, and implementation decisions for normative and financing institutions, technical and learning partners, and evidence intermediaries at global and regional levels.

This review is not intended to replace national decision-making processes. Rather, it aims to strengthen evidence-informed deliberation by providing decision-makers at all levels with a continuously updated, contextually relevant synthesis of evidence on the effects of engaging traditional and religious leaders in vaccine delivery design and demand-generation activities across multiple outcomes.

Alive, the partnership secretariat will facilitate and convene a community of users to engage with, support the dissemination of, and directly use evidence that emerges from this LSR. This community and engagement process will focus on collectively refining a rigorous body of evidence to ensure that policy and practice questions receive timely, context-specific answers.

The community will be engaged through three structures.

- The Steering Group (SG) stewards the development of the living HPV vaccine delivery evidence base. It provides strategic direction and ensures that living evidence is continuously updated, shared with the broader research and delivery

community, and responsive to end users' needs. See here for the involved individuals.

- The Tactical Group (TG) provides expert guidance and technical oversight to the Elevate Evidence Hub synthesis team, UCL, and Alive, which develop the LSR. TG members will provide technical oversight to ensure the LSR is methodologically sound and meets decision-makers' needs. The TG will provide technical oversight to ensure the development of robust, high-quality living protocols, providing input on PICO frameworks, search strategies, and inclusion criteria. The Group of Advisors (AG) provides technical input and systems insight to inform the SG's strategic decisions.

Methods

This study is an LSR and will be updated continually. An LSR is a high-quality, up-to-date online synthesis of health research that is updated as new, relevant research data that meet the study inclusion criteria become available (Elliott et al., 2014). This means that, following an initial search from 2000 (Gavi Strategy 1.0), we will rerun searches monthly, incorporate any new studies into the review, and publish updates regularly. Based on current funding, we anticipate the last update will be in February 2027, but we are exploring options for sustainability beyond that.

We will register the protocol on PROSPERO before screening of studies commences. We will follow PROSPERO guidelines regarding minor or major amendments to the already registered protocol. In this protocol, we have followed the PRISMA guidance for LSRs (Akl et al., 2024). We will store all data and analyses compiled and generated by the project at data.evidence-repository.org.

Eligibility criteria

Study types

Inclusion

- Randomised controlled trials
- Case studies
- Cross-sectional studies
- Surveys

- Qualitative studies
- Mixed-methods studies
- Controlled before-and-after studies
- Difference-in-differences
- Regression discontinuity
- Natural experiment
- Propensity score matching

Exclusion

- Opinion pieces
- Framework/conceptual
- Commentaries
- Editorials
- Policy analyses
- Methodological studies and guidelines
- Protocols

Publication status

Inclusion

- Peer-reviewed journal articles
- Preprints
- Working papers
- Government reports
- NGO or donor reports
- Technical briefs

- Theses/dissertations
- Unpublished data/evaluations

Exclusion

- Press releases
- Abstracts
- On-going studies

Concepts

Inclusion

- Co-design of vaccine delivery programs involving traditional and religious leaders
- Community sensitisation and mobilisation involving traditional and religious leaders
- Communication through messaging, sermons, and mass media
- Outreach campaign strategies, such as community meetings
- Collaborative delivery of vaccine programs
- Advocacy and endorsement of vaccine programs
- Addressing misinformation
- Addressing vaccine hesitancy
- Partnerships with health departments or local NGOs
- Interventions in which healthcare workers collaborate with, are supported by, or operate through traditional or religious leaders, faith-based organisations, customary institutions or community authority structures in vaccine delivery design or demand-generation activities

Exclusion

- Studies that do not include traditional or religious leader interventions
- Studies that focus on non-vaccine programs
- Studies on vaccine efficacy, safety, or immunogenicity, such as pre-clinical or clinical trials

- Studies on reproductive health that don't include vaccination
- Health-worker-only interventions, including studies focused solely on provider recommendation, provider knowledge, clinical counselling, health-worker training or service delivery, unless these are explicitly linked to traditional or religious leader engagement

Participants

Inclusion

- Individuals eligible for vaccination, including children and adults
- Traditional leaders such as Kings, village chiefs, clan heads, and traditional healers
- Religious leaders such as priests, pastors, catechists, Reverends, and Bishops, Imams, and sheikhs
- Parents and caregivers
- Healthcare stakeholders such as healthcare leaders, nurses, doctors, and immunisation officers who work with traditional and religious leaders

Exclusion

- Individuals not involved in vaccination programs

Geographical context

Inclusion

- Low- and middle-income countries based on the World Bank's fiscal year 2026 (base data for calendar year 2024), World Bank Country and Lending Groups – World Bank Data Help Desk

Exclusion

- High-income countries only

Language

Inclusion

- English

Exclusion

- Languages other than English

Year

Inclusion

- Studies published from 2000 (GAVI strategy 1.0)

Exclusion

- Studies published before 2000

Search and screening

Search strategy

A comprehensive search strategy will be developed in collaboration with an information specialist. The search strategy will aim to locate both published and unpublished studies from 2000 onwards. Searches will be performed in the following electronic databases: [Medline via PubMed, Embase, CINAHL, CABI, Scopus, Web of Science; Social Sciences, PsycINFO, Global Index Medicus and ERIC]. The search will combine MeSH terms (controlled vocabulary) with free-text keywords to account for evolving terminology in research on how traditional and religious leaders shape vaccination. The strategy will incorporate truncation, wildcards, and proximity operators where supported and will be adapted for each database. The search strategy will include terms for all recommended vaccines, traditional and religious leaders, faith communities, and LMICs. This strategy is presented in Appendix 1, and Table A3 provides a comprehensive list of academic and grey literature sources for this review.

We will conduct a grey literature search of umbrella organisations with broad knowledge repositories. These organisations include the World Bank Knowledge Hub, World Bank Documents and Reports, UNICEF, and UNESCO; evidence repositories such as the International Initiative for Impact Evaluation (3ie) Development Evidence Portal (DEP) and the Cochrane and Campbell Collaboration Libraries; as well as specialised organisations focused on sub-areas relevant to the review question, for example, Gavi - the Vaccine Alliance, WHO IRIS, PATH, MSI Reproductive Choices (formerly Marie Stopes), Girl Effect, and UNFPA. The snowballing search will include backward citation searches (i.e., searching the reference lists of included studies and seminal papers) and

forward citation searches (i.e., using Google Scholar to identify papers that cite the included studies).

Title and abstract screening

After the search, we will collate all identified citations and upload them to EPPI Reviewer, a web application that enables researchers to manage the entire lifecycle of a review in a single location (Thomas et al., 2023), and remove duplicates. We will pilot-test titles and abstracts, which two independent reviewers will screen to assess compliance with the review's inclusion criteria. Any disagreements will be resolved by a third reviewer or through team discussions. After achieving high agreement (80% or above), a further subset of references will be single-screened, with a 10% check-in by the team lead.

The double-screened references will be divided into 10% subsets. These subsets will be used to iteratively develop and test Large Language Model (LLM) screening. The team will develop prompts using the review's inclusion and exclusion criteria and run them in EPPI Reviewer using the integrated OpenAI GPT-4.1 model on the first 10%. The team will evaluate the LLM's performance by comparing it against gold-standard human reviewer judgements to determine the model's accuracy in correctly including and excluding citations. Once the prompt has been refined and evaluated to achieve a recall above 0.95, it will be deployed to all remaining unscreened citations. The team lead will then screen a random 10% sample of records to assess agreement with the LLM. Further prompt iteration and re-piloting, or reverting to full double human screening/extraction for that batch, if a pilot round does not target recall.

Full text screening

Reviewers will independently assess the full text of studies retained after title and abstract screening. A third reviewer or team discussions will resolve discrepancies. Reasons for exclusion will be documented. The search results and selection process will be illustrated in a PRISMA flow diagram.

Data extraction

Data will be extracted using a standardised form (see Appendix 2). For each study retained after full-text screening, one reviewer will extract the data, and a second reviewer will verify its accuracy and completeness.

Using a subset of studies with data extraction verified by two reviewers, we will iteratively develop and test LLM prompts for all items on the data extraction form using

the integrated OpenAI GPT-4.1 model within EPPI Reviewer. We will apply the prompts to all studies included in the full text, with a 10% random subset double-screened by a human reviewer. If agreement is above 95%, the LLM will extract the remaining studies, which a human reviewer will then verify for accuracy and completeness.

The extraction form will include details on the following areas, as described in Appendix 2.

- General characteristics: author and year of publication, study type.
- Study characteristics: start and end dates of the study, follow-up period, funding sources, and contextual information, including country or regional focus, continent, World Bank region, and World Bank income group;
- Intervention description: engaging traditional and religious leaders in the delivery design, mobilisation, messaging or delivery of vaccination, target audience and activities;
- Comparison where applicable: standard of care, no intervention, alternative intervention, historical/administrative control;
- Target population information: age, gender, income;
- Outcomes: Uptake, completion, acceptance, equity, trust, knowledge, misinformation reduction, cost, and sustainability;
- Delivery location of the intervention: school, community;
- Outcome data: means and standard deviations, sample size in each intervention group, test statistics (e.g. t-test, F-test, p-values, 95% confidence intervals).
- Barriers and facilitators to programme participation for (i) traditional and religious leaders, (ii) healthcare workers, and (iiI) target women for vaccination
- Barriers and facilitators to successful programme implementation
- Barriers and facilitators to achieving outcomes
- Gender relations, the extent to which intervention design or implementation explicitly adopts a gender-informed perspective.

For studies involving healthcare workers, we will extract whether their role was linked to traditional or religious leader engagement; the type of health worker involved; the nature of collaboration with traditional or religious leaders; whether health workers provided training, counselling, technical information, vaccination services, referral or follow-up; and whether the study reports how this interaction influenced trust, acceptance, uptake, completion, equity or implementation.

Risk of bias (RoB) assessment

We will use the Cochrane risk of bias tool (RoB 2) to assess the risk of bias for included randomised studies and the ROBINS-I tool for included non-randomised studies of interventions (Sterne et al., 2019), adapted to our context, drawing on Waddington et al.

(2021). Two reviewers will independently conduct the appraisal and resolve any disagreements through discussion or consultation with a third reviewer. For this LSR, we will update RoB assessments as we incorporate new studies. We will present the results in summary tables to inform the interpretation of findings and the overall confidence placed in the body of evidence. The domain-based risk of bias tool covers the following six indications of trustworthiness:

- Selection bias
- Confounding bias
- Bias due to departures from applied interventions
- Bias due to missing data
- Bias due to the measurement of outcomes
- Bias due to the selection of reported results.

For each study, each domain of bias will be given a low, moderate, high, or critical risk-of-bias rating, enabling a transparent calculation of the overall risk-of-bias score. Studies with a critical risk of bias will be included in the review but excluded from the synthesis.

Qualitative studies will be appraised using an adapted version of the CASP tool. The appraisal will assess six areas: clarity of the methodology, appropriateness of recruitment and sampling, consideration of researcher reflexivity, ethical standards, transparency of data collection methods, and rigour of data analysis. We will rate each domain as 'Yes', 'No', or 'Can't tell', and record supporting page references or quotations for transparency. We will then assign an overall judgement to each study using a "weakest link" approach, and present results in summary tables or figures. We will not exclude studies solely on the basis of appraisal, but findings will inform interpretation and confidence in the evidence.

Analysis

Measurement of the effect of treatment

We will calculate the standardised treatment effect using the quantitative outcome data extracted from the relevant included study. A standardised mean difference (SMD) or Cohen's *d* will be calculated for continuous outcomes (where group means are being compared), using formulae reported in Borestein et al., 2009 or the Campbell Collaboration's effect size calculator, Effect Size Calculator – Campbell Collaboration. Because Cohen's d can be biased in small-sample studies, we will adjust it to Hedge's g using the formula provided by Ellis (2010). We will use appropriate formulae depending on the study's effect size. We will calculate a Cox-transformed log-odds ratio effect size for outcomes reported as proportions (Sánchez- Meca et al., 2003). We will calculate

effect sizes in Excel spreadsheets, and if we use Campbell Collaboration's effect size calculator, we will copy the output into Excel.

Unit of analysis issues

The main unit of analysis will usually be individuals eligible for vaccination, regardless of vaccine type, but we will also include studies that report outcomes at the levels of parents or caregivers, households, schools, health facilities, religious congregations, traditional authority areas, villages, or wider communities. Because interventions involving traditional and religious leaders are often delivered at the cluster level while outcomes such as uptake, completion, acceptance, trust, or misinformation are measured at the individual level, we will use study estimates that appropriately account for clustering where available. If a cluster-randomised or cluster-assigned study treats individuals as independent observations, we will correct the unit-of-analysis error by adjusting the effective sample size or inflating the variance using an intra-cluster correlation coefficient, using reported ICCs where available or plausible external values tested through sensitivity analysis (Higgins et al., 2023). We will not apply this adjustment when the outcome is genuinely measured at the cluster level. For studies with multiple eligible intervention arms, such as separate engagement of traditional leaders, religious leaders, or combined leader engagement, we will include only relevant comparisons and avoid double-counting by combining conceptually similar arms where appropriate or splitting shared control groups across comparisons (Borenstein et al., 2009). We will link multiple reports from the same intervention or dataset before analysis, using one primary report for effect-size extraction and companion reports for supplementary information. Where studies report multiple outcomes or time points, we will retain distinct outcome constructs separately, such as initiation, completion, acceptance and equity, while avoiding duplicate inclusion of the same participants for the same outcome in the same meta-analysis.

As part of the analysis, we will document lessons from traditional and religious leader engagement across different vaccines that may be applicable to HPV vaccination programs. We will synthesise findings by the mechanism through which traditional and religious leaders influence uptake, completion, trust, and other outcomes across different vaccines. We will then assess the relevance and applicability of these mechanisms to HPV vaccination programs while considering HPV vaccination-specific characteristics such as its primary target of adolescents, school delivery system, parental consent and perceptions linking to sexual and reproductive health. We will examine whether leader engagement varies according to vaccine type, target population, delivery platform, and context.

If any included study has missing data, we will contact the study's first author. If we cannot reach the author, we will report those outcomes as missing. For continuous outcomes in which standard deviations are not reported, we will use standard errors, confidence intervals, or probability values to calculate them using appropriate formulae.

Synthesis and reporting

This review will adopt a mixed-methods evidence synthesis approach to answer both the effectiveness question of what works and the implementation-related question of how, why, for whom, and under what conditions interventions work. To answer the first question, where possible, we will conduct a meta-analysis of studies that are sufficiently comparable in terms of interventions and outcomes. We will conduct separate meta-analyses for each intervention and outcome type, using standardised effect sizes where appropriate. We will present meta-analysis results as forest plots. We aim to use Stata packages for meta-analysis and meta-regression and will consider alternative software and machine learning (ML) languages, such as R and Python. Where meta-analysis is not possible due to heterogeneity, limited numbers of studies, or insufficient reporting of effect estimates, we will conduct a structured narrative synthesis to summarise the direction, strength, and consistency of findings across studies. Where effect estimates are reported, we will present them in summary tables and discuss their direction, magnitude, precision, and risk of bias, rather than relying on simple vote-counting based on statistical significance. We will also explore whether variation in findings can be explained by differences in intervention design, implementation intensity, population characteristics, comparator conditions, follow-up duration, or contextual factors.

This approach is consistent with guidance on the conduct of systematic reviews where statistical pooling is inappropriate, which recommends transparent, structured synthesis of findings and careful attention to heterogeneity, effect direction, effect size, and study quality (Popay et al., 2006; Campbell et al., 2020; Higgins et al., 2023)

To complement the quantitative synthesis, we will also synthesise qualitative and mixed-methods evidence on barriers, facilitators, acceptability, trust, implementation processes, and socio-cultural context. We will code qualitative studies, mixed-methods studies with extractable qualitative components, process evaluations, and relevant descriptive material reported alongside quantitative studies thematically. Coding will follow an abductive framework that classifies evidence according to whether factors operate as barriers or facilitators, whether they relate to implementation, diffusion, or effectiveness, and whether they are primarily individual, institutional, or contextual. The

authors or participants will mostly report these data as commentaries. Within this structure, we will use an inductive approach to allow the evidence to reveal more specific themes. This review will capture how factors such as trust, legitimacy, local authority structures, gender norms, religious influence, misinformation, service access, and delivery context shape intervention success or failure across LMIC settings. The qualitative synthesis findings will be combined with the quantitative results to better understand what is likely to work, for whom, and in what contexts.

Where relevant, the synthesis will examine health-worker involvement as an implementation feature rather than a standalone intervention category. We will explore whether and how interactions between health workers and traditional or religious leaders shape intervention effects, acceptability, feasibility, and implementation. This will allow the review to distinguish between the social legitimisation functions of traditional and religious leaders and the technical, counselling and service-delivery functions of health workers, while recognising that these functions may reinforce or undermine each other in practice.

Assessment of heterogeneity and subgroup analyses

We will assess statistical heterogeneity separately for each meta-analysis using appropriate heterogeneity statistics, including Cochran's Q-test, Tau (τ^2), and I^2, and visually examine it through forest plots. Where sufficient data are available, we will explore potential sources of heterogeneity through subgroup analyses and meta-regression, considering substantive, methodological, and extrinsic study characteristics. In this review, likely sources of heterogeneity will include the type of traditional or religious leader engaged, the role they are assigned within the intervention, the delivery platform through which vaccination is provided, the main demand-side barriers being addressed, the socio-cultural and geographic setting, and the institutional arrangements through which the intervention is implemented. This will help identify whether variation in effects is associated with differences in intervention type, population group, setting, study design, or other contextual factors relevant to vaccine delivery and demand generation. For example, effects may differ depending on whether leaders are engaged primarily as trusted messengers or involved in mobilisation, consent processes, or follow-up for dose completion and whether interventions target school-going girls or out-of-school adolescents.

Certainty assessment

We will assess the certainty of the evidence for intervention effects using the Grading of Recommendations Assessment, Development and Evaluation (GRADE) approach. GRADE provides a transparent and structured framework for rating the certainty of a body of evidence for each outcome, rather than assessing individual studies in isolation

(Guyatt et al., 2011; Schünemann et al., 2024). It is distinct from risk-of-bias assessment: while risk of bias focuses on the internal validity of individual studies, GRADE considers the overall trustworthiness of the evidence across studies, including risk of bias, inconsistency, indirectness, imprecision and publication or dissemination bias (Guyatt et al., 2011; GRADE Working Group, 2024).

We will rate certainty as high, moderate, low, or very low for each priority outcome and, where appropriate, by intervention type or comparison. Where meta-analysis is possible, GRADE assessments will be informed by pooled effect estimates, confidence intervals and heterogeneity. Where meta-analysis is not possible, and findings are synthesised narratively, GRADE will still be applied to the body of quantitative evidence, with judgements based on the direction and magnitude of effects across studies, consistency of findings, precision of reported estimates, applicability to the review question and the risk of selective reporting (Murad et al., 2017; Campbell et al., 2020). The rationale for all downgrading or upgrading decisions will be documented transparently and presented in evidence profile tables and Summary of Findings tables, following GRADE guidance (Schünemann et al., 2024).

Limitations

The proposed review will consider references published in English because translating non-English-language publications is resource-intensive. Therefore, potentially relevant evidence published in languages other than English will be missed, introducing the risk of language bias and limiting the generalizability of findings.

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Appendices

Appendix 1. Search Strategy

Table A1: MeSH Terms

Category	**MeSH Terms**
Vaccines	"Vaccines"[Mesh]
Traditional and religious leaders	"Religious personnel"[Mesh]; "Traditional medicine practitioners"[Mesh]

Keywords

Vaccines terms

vaccin*, shot*, injection*, jab*, booster*, immunization*, immuniz*, immunis*

Traditional and religious leaders terms

(traditional, village*, trib*, clan*, religious, church, spiritual, faith) adj2 (leader*, chief*, head, heads, healer*, headman, headmen, headwoman, headwomen, headperson, elder, elders), "faith leader*", "faith-based leader*", king, kings, queen*, priest*, imam*, bishop*, pastor, pastors, catechist*, reverend*, sheikh*, clergy, cleric, rabbi, rabbis, deacon*, minister*, chaplain*, "council of elders", "gram pradhan", "gram panchayat", sarpanch, mukhiya, "village assembly", "sangguiniang barangay", "barangay council", shaman*, sangoma*, inyanga*, babalawo, dibia, marabout*, mullah*, mufti*, ayatollah*, ulema, ulama, qadi, archbishop*, cantor*, monk, monks, nun, nuns, guru*, swami*, pandit*, pujari*, granthi*, lama*, rinpoche*, bonze*, sultan*, oba, emir*, "medicine man", matai, sadhu, mahant)

Language-specific terms
Ikosi, Kumkani, "Inkosi Enkhulu", Morena, "Morena e Moholo", "Kgosi Kgolo", "Hosi Nkhulu", Ngwenyama, "Hosi Enkulu", Inkosi, Inkosi, Kgoshi, Morena , Kgosi, Hosi, Sikhulu, Hosi, Umnumzana, Induna, Morenana, "Monga-motse", Kgosana, Vhothovhele, Vhamusanda, Umnumzane, Ndhuna, Inyanga, Isangoma, Igqirha, Ixwele, Isangoma, Ngaka, Matwetwe, Nanga, Maine, Indaba, Lekgotla, Mambo, Mfumu, Omukwaniilwa, Ishe, Mfumu, Omusamane, "N'anga", "Sing'anga", Ombapala, Mambo, Oba, Eze, Igwe, Obi, Asantehene, Nana, Ishe, Oloye, Ichie, "N'anga", Babalawo, Dibia, Okomfo, Kabaka, Sultan, Mfalme, Mokonzi, Katikkiro, Mwenyekiti, Mokinzi, Omusawo, Mganga, Nganga, Amghar, Ameqran, Amenokal, Malik,

Amghar Ameqran, Amghar, Shaykh, Qaid, Tajmaat, Ameni, Ameney, "Majlis al-Hukama", "Jama'a", Amessan, Amessan, "Tabib taqlidi", Mrabt

Faith community terms

church*, mosque, temple, (religion*, religious, faith*, spiritual, spirituality) adj2 (communit*, organization*, organisation*, group*, network*, association*, institution*, actor*, representative*), congregation*, parish*, parishioner*, masjid*, synagogue*, gurdwara*)

LMICs terms

afghanistan, albania, algeria, angola, argentina, armenia, armenian, azerbaijan, bahrain, bangladesh, republic of belarus, belarus, byelarus, belorussia, byelorussian, belize, british honduras, benin, dahomey, bhutan, bolivia, "bosnia and herzegovina", bosnia, herzegovina, botswana, bechuanaland, brazil, brasil, burkina faso, burkina fasso, upper volta, burundi, urundi, cabo verde, cape verde, cambodia, kampuchea, khmer republic, cameroon, cameron or cameroun, central african republic, ubangi shari, chad, china, colombia, comoros, comoro islands or iles comores, mayotte, democratic republic of the congo, democratic republic congo or congo, zaire, "cote d'ivoire", "cote d' ivoire", cote divoire, cote d ivoire, ivory coast, cuba, cyprus or djibouti, french somaliland, dominica, dominican republic, ecuador, egypt, united arab republic, el salvador, equatorial guinea, spanish guinea, eritrea or eswatini, swaziland, ethiopia, fiji, gabon, gabonese republic, gambia, "georgia (republic)", georgian, ghana, gold coastr grenada, guatemala, guinea, guinea bissau, british guiana, haiti, hispaniola, honduras or india, indonesia, timor, iran, iraq, isle of man, jamaica, jordan, kazakhstan, kazakh, kenya. north korea, south korea, korea, kosovo, kyrgyzstan, kirghizia, kirgizstan, kyrgyz republic, kirghiz, laos, lao pdr, "lao people's democratic republic", lebanon, lebanese republic, lesotho, basutoland, liberia, libya, libyan arab jamahiriya, republic of north macedonia, macedonia, madagascar, malagasy republic, malawi, nyasaland, malaysia, malay federation, malaya federation, maldives, indian ocean islands, indian ocean, mali, micronesia, federated states of micronesia, kiribati, marshall islands, northern mariana islands, palau, tuvalu, mauritania, mauritius, mexico, moldova, moldovian, mongolia, montenegro, morocco, ifni, mozambique, portuguese east africa, myanmar, burma, namibia, nepal, netherlands antilles, nicaragua, niger, nigeria, muscat, pakistan, papua new guinea, new guinea, paraguay, peru, philippines, philipines, phillipines, phillippines, rwanda, ruanda, samoa, pacific islands, polynesia, samoan islands, navigator island, navigator islands, "sao tome and principe", saudi arabia, senegal, serbia, seychelles, sierra leone, melanesia, solomon island, solomon islands, norfolk island, norfolk islands, somalia, south africa, south sudan, sri lanka, ceylon, saint lucia, "st. lucia", "saint vincent and the grenadines", saint vincent, "st. vincent", grenadines, sudan, suriname, surinam, dutch guiana, netherlands guiana, syria, syrian arab republic, tajikistan, tadjikistan, tadzhikistan, tadzhik, tanzania, tanganyika, thailand, siam, timor leste, east timor, togo, togolese republic, tonga, tunisia, turkey, turkmenistan, turkmen, uganda, ukraine, uzbekistan, uzbek, vanuatu, new hebrides or venezuela, vietnam, viet nam, middle east, west bank, gaza, palestine, yemen, zambia, zimbabwe, northern rhodesia, global south, africa, magreb, maghrib, sahara, west indies, indian ocean islands, caribbean, central america, latin america, "south and central america", south america, asia, central or central asia, asia, northern, north asia, northern asia,

asia, southeastern, southeastern asia, south eastern asia, southeast asia, south east asia, asia, western, western asia, europe, eastern, east europe, eastern europe, developing country, developing countries, developing nation?, developing population?, developing world, less developed countr*, less developed nation?, less developed population?, less developed world, lesser developed countr*, lesser developed nation?, lesser developed population?, lesser developed world, under developed countr*, under developed nation?, under developed population?, under developed world, underdeveloped countr*, underdeveloped nation?, underdeveloped population?, underdeveloped world, middle, income countr*, middle income nation?, middle income population?, low income countr*, low income nation?, low income population?, lower income countr*, lower income nation?, lower income population?, underserved countr*, underserved nation?, underserved population?, underserved world, under served countr*, under served nation?, under served population?, under served world, deprived countr*, deprived nation?, deprived population?, deprived world, poor countr*, poor nation?, poor population?, poor world, poorer countr*, poorer nation?, poorer population?, poorer world, developing econom*, less developed econom*, lesser developed econom*, under developed econom*, underdeveloped econom*, middle income econom*, low income econom*, lower income econom*, low gdp, low gnp, low gross domestic, low gross national, lower gdp, lower gnp, lower gross domestic, lower gross national, lmic, lmics, third world, lami countr*, transitional countr*, emerging economies, emerging nation?

LMICs terms

afghan, afghans, afghani, albanian?, algerian?, american samoan?, angolan?, antiguan?, barbudan?, argentine?, argentinian?, argentinean?, armenian?, azerbaijani?, bahraini?, bangladeshi?, bangalees, bajan?, belarusian?, byelorussian?, belizean?, beninese?, bhutanese, bolivian?, bosnian?, botswana, batswana, brazilian?, brasilian?, bulgarian?, burkinabe, burkinese, burundian?, cape verdean?, cabo verdean?, cambodian?, khmer, cameroonian?, central african?, chadian?, chilean?, chinese, colombian?, comorian?, congolese, costa rican?, ivorian?, croatian?, cuban?, cypriot?, czech?, djiboutian?, dominican?, ecuadorian?, egyptian?, salvadoran?, equatorial guinean?, equatoguinean?, eritrean?, estonian?, swazi?, swati?,ethiopian?, fijian, gabonese, gabonaise, gambian?, georgian?. Ghanaian?, gibraltarian?, greek?, grenadian?, guamanian?, guatemalan?, guinean?, bissau guinean?, guyanese, haitian?, honduran?, indian?, indonesian?, iranian?, iraqian?, iraqi?, manx, jamaican?, jordanian?, kazakhstani?, kenyan?, kirabati, kirabatian?, north korean?, kosovar?, kosovan?, kyrgyz*, lao, laotian?, latvian?, lebanese, lesothan?, lesothonian?, mosotho, basotho, liberian?, libyan?, lithuanian?, macanese, macedonian?, malagasy ,madagascan?, malawian?, malaysian?, maldivian?, malian?, maltese, marshallese?, mauritanian?, mauritian?, mexican?, micronesian?, moldovan?, mongolian?, mongol, montenegrin?, moroccan?, mozambican?, burmese, myanma, namibian?, nauruan? or nepali or nepalese, netherlands antillean?, nicaraguan?, nigerien?, nigerian?, northern mariana islander?, mariana?, omani?, pakistani?, palauan?, papua new guinean?, paraguayan?, peruvian?, philippine?, philipine?, phillipine?, phillippine?, filipino?, filipina?, rwandan?, rwandese, ruandan?, ruandese, samoan?, sao tomean?, santomean?, saudi arabian?, saudi?,

senegalese, serbian?, montenegrin?, seychellois, seychelloise?, sierra leonean?, slovak?, slovene?, solomon islander?, somali?, south african?, south sudanese, sri lankan?, ceylonese, saint lucian?, vincentian?, sudanese, surinamese?, syrian?, tajik?, tajikistani?, tanzanian?, tanganyikan?, thai, timorese?, togolese, tongan?, trinidadian?, tobagonian?, tunisian?, turk?, turkish, turkmen?, tuvaluan?, ugandan?, ukrainian?, uruguayan?, uzbek?, vanuatu*, venezuelan?, vietnamese, yemeni?, yemenite?, yemenese, zambian?, zimbabwean?, african?, asian?, pacific islander?, latin american?, central american?, south american?, caribbean?, west indian?, iberoamerican?,middle eastern?

Search string

Table A2: Search results (Medline/Ovid).

1 Vaccines	exp Vaccines/ OR (vaccin* OR shot* OR injection* OR jab* OR booster* OR immunization* OR immuniz* OR immunis*).ti,ab,kf,ot,oa.
2 Traditional and religious leaders	exp Religious personnel/ OR Traditional Medicine Practitioners/ OR (((traditional OR village* OR trib* OR clan* OR religious OR church OR spiritual OR faith) adj2 (leader* OR chief* OR head OR heads OR healer* OR headman OR headmen OR headwoman OR headwomen OR headperson OR elder OR elders)) OR "faith leader*" OR "faith-based leader*" OR king OR kings OR queen* OR priest* OR imam* OR bishop* OR pastor OR pastors OR catechist* OR reverend* OR sheikh* OR clergy OR cleric OR rabbi OR rabbis OR deacon* OR minister* OR chaplain* OR "council of elders" OR "gram pradhan" OR "gram panchayat" OR sarpanch OR mukhiya OR "village assembly" OR "sangguiniang barangay" OR "barangay council" OR shaman* OR sangoma* OR inyanga* OR babalawo OR dibia OR marabout* OR mullah* OR mufti* OR ayatollah* OR ulema OR ulama OR qadi OR archbishop* OR cantor* OR monk OR monks OR nun OR nun OR guru* OR swami* OR pandit* OR pujari* OR granthi* OR lama* OR rinpoche* OR bonze* OR sultan* OR oba OR emir* OR "medicine man" OR matai OR sadhu OR mahant).ti,ab,kf,ot,oa.
3 Language-specific terms	(Ikosi OR Kumkani OR "Inkosi Enkhulu" OR Morena OR "Morena e Moholo" OR "Kgosi Kgolo" OR "Hosi Nkhulu" OR Ngwenyama OR "Hosi Enkulu" OR Inkosi OR Inkosi OR Kgoshi OR Morena OR Kgosi OR Hosi OR Sikhulu OR Hosi OR Umnumzana OR Induna OR Morenana OR "Monga-motse" OR Kgosana OR Vhothovhele

	OR Vhamusanda OR Umnumzane OR Ndhuna OR Inyanga OR Isangoma OR Igqirha OR Ixwele OR Isangoma OR Ngaka OR Matwetwe OR Nanga OR Maine OR Indaba OR Lekgotla OR Mambo OR Mfumu OR Omukwaniilwa OR Ishe OR Mfumu OR Omusamane OR "N'anga" OR "Sing'anga" OR Ombapala OR Mambo OR Oba OR Eze OR Igwe OR Obi OR Asantehene OR Nana OR Ishe OR Oloye OR Ichie OR "N'anga" OR Babalawo OR Dibia OR Okomfo OR Kabaka OR Sultan OR Mfalme OR Mokonzi OR Katikkiro OR Mwenyekiti OR Mokinzi OR Omusawo OR Mganga OR Nganga OR Amghar OR Ameqran OR Amenokal OR Malik OR Amghar OR Ameqran OR Amghar OR Shaykh OR Qaid OR Tajmaat OR Ameni OR Ameney OR "Majlis al-Hukama" OR "Jama'a" OR Amessan OR Amessan OR "Tabib taqlidi" OR Mrabt).ti,ab,kf,ot,oa.
4 Faith community	(church* OR mosque OR temple OR ((religion* OR religious OR faith* OR spiritual OR spirituality) adj2 (communit* OR organization* OR organisation* OR group* OR network* OR association* OR institution* OR actor* OR representative*)) OR congregation* OR parish* OR parishioner* OR masjid* OR synagogue* OR gurdwara*).ti,ab,kf,ot,oa.
6	2 OR 3 OR 4
8 LMICs	(afghanistan or albania or algeria or angola or argentina or armenia or armenian or azerbaijan or bahrain or bangladesh or republic of belarus or belarus or byelarus or belorussia or byelorussian or belize or british honduras or benin or dahomey or bhutan or bolivia or "bosnia and herzegovina" or bosnia or herzegovina or botswana or bechuanaland or brazil or brasil or burkina faso or burkina fasso or upper volta or burundi or urundi or cabo verde or cape verde or cambodia or kampuchea or khmer republic or cameroon or cameron or cameroun or central african republic or ubangi shari or chad or china or colombia or comoros or comoro islands or iles comores or mayotte or democratic republic of the congo or democratic republic congo or congo or zaire or "cote d'ivoire" or "cote d' ivoire" or cote divoire or cote d ivoire or ivory coast or cuba or cyprus or djibouti or french somaliland or dominica or dominican republic or ecuador or egypt or united arab republic or el salvador or equatorial guinea or spanish guinea or eritrea or eswatini or swaziland or ethiopia or fiji or gabon or gabonese republic or gambia or "georgia (republic)" or georgian or ghana or gold coast or grenada or guatemala or guinea or guinea bissau or british guiana or haiti or hispaniola or honduras or india or indonesia or timor or iran or iraq or isle of man or jamaica or jordan or kazakhstan or kazakh or kenya or north korea or south korea or korea or kosovo or kyrgyzstan or kirghizia or kirgizstan or

	kyrgyz republic or kirghiz or laos or lao pdr or "lao people's democratic republic" or lebanon or lebanese republic or lesotho or basutoland or liberia or libya or libyan arab jamahiriya or republic of north macedonia or macedonia or madagascar or malagasy republic or malawi or nyasaland or malaysia or malay federation or malaya federation or maldives or indian ocean islands or indian ocean or mali or micronesia or federated states of micronesia or kiribati or marshall islands or northern mariana islands or palau or tuvalu or mauritania or mauritius or mexico or moldova or moldovian or mongolia or montenegro or morocco or ifni or mozambique or portuguese east africa or myanmar or burma or namibia or nepal or netherlands antilles or nicaragua or niger or nigeria or muscat or pakistan or papua new guinea or new guinea or paraguay or peru or philippines or philipines or phillipines or phillippines or rwanda or ruanda or samoa or pacific islands or polynesia or samoan islands or navigator island or navigator islands or "sao tome and principe" or saudi arabia or senegal or serbia or seychelles or sierra leone or melanesia or solomon island or solomon islands or norfolk island or norfolk islands or somalia or south africa or south sudan or sri lanka or ceylon or saint lucia or "st. lucia" or "saint vincent and the grenadines" or saint vincent or "st. vincent" or grenadines or sudan or suriname or surinam or dutch guiana or netherlands guiana or syria or syrian arab republic or tajikistan or tadjikistan or tadzhikistan or tadzhik or tanzania or tanganyika or thailand or siam or timor leste or east timor or togo or togolese republic or tonga or tunisia or turkey or turkmenistan or turkmen or uganda or ukraine or uzbekistan or uzbek or vanuatu or new hebrides or venezuela or vietnam or viet nam or middle east or west bank or gaza or palestine or yemen or zambia or zimbabwe or northern rhodesia or global south or africa or magreb or maghrib or sahara or west indies or indian ocean islands or caribbean or central america or latin america or "south and central america" or south america or asia, central or central asia or asia, northern or north asia or northern asia or asia, southeastern or southeastern asia or south eastern asia or southeast asia or south east asia or asia, western or western asia or europe, eastern or east europe or eastern europe or developing country or developing countries or developing nation? or developing population? or developing world or less developed countr* or less developed nation? or less developed population? or less developed world or lesser developed countr* or lesser developed nation? or lesser developed population? or lesser developed world or under developed countr* or under developed nation? or under developed population? or under developed world or underdeveloped countr* or underdeveloped nation? or underdeveloped population? or underdeveloped world or middle income countr* or middle income nation? or middle income population? or low income countr* or low income nation? or low income population? or lower income countr* or lower income nation? or lower income population? or underserved countr* or underserved nation? or underserved population? or underserved world or under served countr* or under served nation?

	or under served population? or under served world or deprived countr* or deprived nation? or deprived population? or deprived world or poor countr* or poor nation? or poor population? or poor world or poorer countr* or poorer nation? or poorer population? or poorer world or developing econom* or less developed econom* or lesser developed econom* or under developed econom* or underdeveloped econom* or middle income econom* or low income econom* or lower income econom* or low gdp or low gnp or low gross domestic or low gross national or lower gdp or lower gnp or lower gross domestic or lower gross national or lmic or lmics or third world or lami countr* or transitional countr* or emerging economies or emerging nation?).ti,ab,hw
9 LMICs	(afghan or afghans or afghani or albanian? or algerian? or american samoan? or angolan? or antiguan? or barbudan? or argentine? or argentinian? or argentinean? or armenian? or azerbaijani? or bahraini? or bangladeshi? or bangalees or bajan? or belarusian? or byelorussian? or belizean? or beninese? or bhutanese or bolivian? or bosnian? or botswana or batswana or brazilian? or brasilian? or bulgarian? or burkinabe or burkinese or burundian? or cape verdean? or cabo verdean? or cambodian? or khmer or cameroonian? or central african? or chadian? or chilean? or chinese or colombian? or comorian? or congolese or costa rican? or ivorian? or croatian? or cuban? or cypriot? or czech? or djiboutian? or dominican? or ecuadorian? or egyptian? or salvadoran? or equatorial guinean? or equatoguinean? or eritrean? or estonian? or swazi? or swati? or ethiopian? or fijian or gabonese or gabonaise or gambian? or georgian? or ghanaian? or gibraltarian? or greek? or grenadian? or guamanian? or guatemalan? or guinean? or bissau guinean? or guyanese or haitian? or honduran? or indian? or indonesian? or iranian? or iraqian? or iraqi? or manx or jamaican? or jordanian? or kazakhstani? or kenyan? or kirabati or kirabatian? or north korean? or kosovar? or kosovan? or kyrgyz* or lao or laotian? or latvian? or lebanese or lesothan? or lesothonian? or mosotho or basotho or liberian? or libyan? or lithuanian? or macanese or macedonian? or malagasy or madagascan? or malawian? or malaysian? or maldivian? or malian? or maltese or marshallese? or mauritanian? or mauritian? or mexican? or micronesian? or moldovan? or mongolian? or mongol or montenegrin? or moroccan? or mozambican? or burmese or myanma or namibian? or nauruan? or nepali or nepalese or netherlands antillean? or nicaraguan? or nigerien? or nigerian? or northern mariana islander? or mariana? or omani? or pakistani? or palauan? or papua new guinean? or paraguayan? or peruvian? or philippine? or philipine? or phillipine? or phillippine? or filipino? or filipina? or rwandan? or rwandese or ruandan? or ruandese or samoan? or sao tomean? or santomean? or saudi arabian? or saudi? or senegalese or serbian? or montenegrin? or seychellois or seychelloise? or sierra leonean? or slovak? or slovene? or solomon islander? or somali? or south african? or south sudanese or sri lankan? or ceylonese or saint

	lucian? or vincentian? or sudanese or surinamese? or syrian? or tajik? or tajikistani? or tanzanian? or tanganyikan? or thai or timorese? or togolese or tongan? or trinidadian? or tobagonian? or tunisian? or turk? or turkish or turkmen? or tuvaluan? or ugandan? or ukrainian? or uruguayan? or uzbek? or vanuatu* or venezuelan? or vietnamese or yemeni? or yemenite? or yemenese or zambian? or zimbabwean? or african? or asian? or pacific islander? or latin american? or central american? or south american? or caribbean? or west indian? or iberoamerican? or middle eastern?).ti,ab,hw
10 LMICs	7 OR 8
11	1 AND 6 AND 10
12	Publication date: 2000-present

Table A3: List of targeted databases and grey literature sources

Database Type	**Name of Database**
Academic	1. Medline via PubMed
	2. Embase
	3. CINAHL
	4. Centre for Agricultural Bioscience International (CABI)
	5. Scopus
	6. Web of Science (Social Science Citation Index, Science Citation Index Expanded, Emerging Sources Citation Index)
	7. PsycINFO
	8. Global Index Medicus
	9. ERIC
Grey Literature	1. World Bank Knowledge Hub
	2. World Bank Documents and Reports
	3. UNICEF
	4. UNESCO
	5. International Initiative for Impact Evaluation (3ie)

	6. Development Evidence Portal (DEP)
	7. Cochrane and Campbell Collaboration Libraries
	8. Gavi, the Vaccine Alliance
	9. WHO IRIS
	10. PATH
	11. MSI Reproductive Choices (formerly Marie Stopes)
	12. Girl Effect
	13. UNFPA
	14. Google Scholar
	15. HPV Living Evidence Repository by Alive (Alliance for Living Evidence)
	16. Google

Appendix 2. Data Extraction Form

Description	**Question**
Publication author	*Surname of the first author*
Publication date	*Year when the study was published*
Publication type	*What type of publication is it?*
Funding agency	*Who funded the intervention/study?*
Country	*Select*
Detailed location	*Describe the location where the study took place*
World Bank region	*Select region(s) in which the study was conducted according to the World Bank.*
World Bank income category	*Select the World Bank income classification of the country at the time of the study*
Study design	*Choose the type of study design*
Program name	*Name of the program as reported by the author/s*
Vaccine characteristics	*Specify the type of vaccine the study addressed* ☐ *Measles* ☐ *Polio* ☐ *Malaria* ☐ *DPT* ☐ *MMR* ☐ *Covid* ☐ *Rotavirus* ☐ *Meningococcal* ☐ *BCG* ☐ *Others*
Vaccine dose	*Specify the number of vaccine doses*
Vaccination schedule	*Specify the schedule of vaccination*
Program description	*Short description of the program*
Description of the intervention	*Describe the intervention*
Number of intervention components	*Select the number of components of the intervention*
Description of the intervention components	*Brief description of intervention components*

Type of leader/institution/organisation involved in the intervention	☐ *Traditional* ☐ *Religious* ☐ *Faith-based organisation/NGO* ☐ *Healthcare worker* ☐ *Other*
Gender	☐ *Male* ☐ *Female* ☐ *Male and Female*
Type of traditional leader engaged	*Specify the type of traditional leader engaged*
Level of leadership	☐ *Village* ☐ *Community* ☐ *District* ☐ *National* ☐ *Institution*
Religious leader selection	*How were traditional leaders identified/recruited?*
Type of religious leader engaged	*Specify the type of religious leader engaged*
Level of leadership	☐ *Village* ☐ *Community* ☐ *District* ☐ *National* ☐ *Institution*
Religious leader selection	*How were religious leaders identified/recruited?*
Type of Faith-based organisation/NGO involved	*Specify the type of faith-based organisation/NGO involved/engaged*
Traditional, religious leader or faith-based organisation/NGO nature of engagement	*Leader engagement role/Level of authority within the intervention.* ☐ *Vaccine delivery program co-design* ☐ *Mobilisation* ☐ *Formal decision-making* ☐ *Messaging/communication* ☐ *Consultation* ☐ *Training* ☐ *Vaccination delivery* ☐ *Endorsement* ☐ *Health education* ☐ *Other*
Health-worker linkage to traditional or religious leader engagement	*Record whether the health worker role was explicitly linked to traditional or religious leader engagement, and describe the nature of this linkage.*

Nature of collaboration with traditional or religious leaders	*Describe how health workers collaborated with traditional or religious leaders, faith-based organisations, customary institutions or other community authority structures.*
Health-worker functions within the intervention	*Select and describe any health-worker functions reported: training, counselling, technical information, vaccination services, referral, follow-up, misinformation response, or other relevant activities.*
Influence of health-worker and leader interaction on outcomes or implementation	*Extract whether and how the interaction between health workers and traditional or religious leaders influenced trust, acceptance, uptake, completion, equity or implementation.*
Intervention target group	*Describe the group that received the intervention* ☐ *Children under the age of 5 years* ☐ *Adolescents* ☐ *Caregivers* ☐ *Healthcare workers* ☐ *Others*
Target population's living environment	*Select the target population's living environment* ☐ *Rural* ☐ *Urban* ☐ *Mixed*
Target population gender	*Select the gender-targeted population* ☐ *Male* ☐ *Female* ☐ *Both*
Target population age	*Indicate the age*
Target population school attendance status	☐ *Attend school* ☐ *Out of school*
Income of the target population	*Indicate the target population income*
Delivery location of the intervention	*Select the delivery location of the intervention* ☐ *School* ☐ *Community* ☐ *Health facility* ☐ *Mobile/outreach* ☐ *Other*
Intervention start and end date	*When did the intervention start and end*
Period of follow-up	*From the start of the intervention, how long was the follow-up period?*

Comparison	*What was the comparison group?*
Consideration of equity	*Has the study considered equity?*
Equity dimension	*What dimension does the study consider?*
Cost	*Report any cost data provided or comments on the intervention's cost-effectiveness; include the authors' comments on cost data even if quantifications are not provided.*
Outcome type	*Define the outcome(s)* ☐ *Uptake* ☐ *Completion* ☐ *Acceptance* ☐ *Equity* ☐ *Trust* ☐ *Misinformation reduction* ☐ *Intention to vaccinate* ☐ *Other*
Methods	*Description of how the outcome was estimated*
Were there any differences in the measurement of this outcome between the treatment group participants and the comparison group?	☐ *Yes* ☐ *No*
Was the effect significant?	☐ *Yes* ☐ *No*
Treatment sample size	*Input a numerical value*
Control sample size	*Input a numerical value*
Type of outcome measure	☐ *Continuous* ☐ *Dichotomous*
The questions below are applicable to continuous outcomes	
Treatment group mean	*Input a numerical value*
Comparison group mean	*Input a numerical value*
Treatment group standard deviation	*Input a numerical value*
Comparison group standard deviation	*Input a numerical value*
Treatment group standard error	*Input a numerical value*

Comparison group standard error	*Input a numerical value*
T-value from the independent t-test	*Input a numerical value*
The questions below are applicable to dichotomous outcomes	
Number of participants in the treatment group who experienced a change	*Input a numerical value*
Number of participants in the comparison group who experienced a change	*Input a numerical value*
Proportion of the treatment group who experienced a change	*Input a numerical value*
Proportion of the comparison group who experienced a change	*Input a numerical value*
Adjustment of proportions	☐ *Yes* ☐ *No*
Standard error of odds ratio	*Input a numerical value*
Log odds ratio	*Input a numerical value*
Standard error of the log odds ratio	*Input a numerical value*
Log odds ratio adjusted?	☐ *Yes* ☐ *No*
The questions below are applicable to regression data	
Regression coefficient (beta)	*Input a numerical value*
Standard error of beta	*Input a numerical value*
CI (lower bound) of beta	*Input a numerical value*
CI (upper bound) of beta	*Input a numerical value*
T stat	*Input a numerical value*
P value	*Input a numerical value*
Summary of effect	*What is the effect of the intervention for each outcome?*
Source of the data	*Include source of the data: Table, row, column and page number*

Barriers and facilitators	
Facilitators	*a) Short copied passage from text with page number* *b) Summarised in own words*
Barriers	*a) Short copied passage from text with page number* *b) Summarised in own words*