

Determinants of Parental Immunization Decisions in Africa: Poverty, Education, Healthcare Access, and Community Awareness – A Systematic Review

Kofi Acquah¹, Dr. Kobina Andoh Acquah²

¹Executive Director, Crystal Health Alliance International

Abstract

The rate of immunization in children remains very low in many countries in Africa. The reason for this is identified as poverty, lack of education among mothers, unavailability of healthcare, and lack of community education. However, until now, there does not exist any review in the literature that evaluates the combined effect of these four factors as determinants of childhood immunisation in Africa. Hence, the current systematic review undertaken herein aims to investigate the influence of the previously mentioned determinants of childhood immunisation. In order to accomplish this, a systematic search was carried out in the following databases: PubMed/MEDLINE, Scopus, Web of Science, Google Scholar, African Journals Online. The result of the search was the selection of articles mentioning any number of determinants presented and providing results on childhood immunization. Twenty-seven articles met the inclusion criteria. Poor children had 1.8-4.2 times lower immunization odds. Maternal education had the strongest effect (OR: 1.9-5.6). There were also other significant variables in terms of health care access (OR: 1.6-3.8) and community awareness (OR: 1.3-1.7). Interactions among determinants strengthened their impacts. Poverty, maternal education, healthcare access, and community awareness have an association between one another, whereby these factors act as determinants of immunization decisions in Africa. Hence, there is a need for different/intersectoral approaches based on various determinants to enhance immunization coverage.

Keywords: Childhood immunization; vaccination coverage; poverty; maternal education; healthcare accessibility; community awareness; parental immunization decisions.

1. Introduction

Childhood immunization is among the most important health interventions on a global level, which has led to saving millions of people every year from death due to diseases like measles, diphtheria, pertussis, and polio, among others, which cause about 3.5 to 5 million deaths annually (Dzinamarira et al., 2026). Even though the number of vaccinations has been increasing through the years, there has been stagnation and even a decline in the last decade of the 21st century (Gebeyehu et al., 2023). Recent statistics show that there are at least 25 million children who remain unvaccinated in 2023, with more than half of them being in certain parts of sub-Saharan Africa (Musuka et al., 2025). Thus, immunization coverage is not only a concern for children's health but also a concern because the immunization gap narrows the chances of achieving herd immunity, eradicating polio, and decreasing measles deaths in the region (Endalamaw et al., 2024).

Many factors influence childhood vaccination. They are ingrained in the economic, social, and healthcare structures of African countries (Bangura et al., 2020). While many determinants of vaccination decisions at the individual level have been analyzed through primary research, four determinants are frequently cited in the literature, such as poverty, maternal education, access to healthcare, and community awareness.

Poverty is typically defined using a household wealth index or income and creates problems for parents in vaccinating their children as a result of financial, transport, and other issues involved (Williams et al., 2024). Children from families in the poorest wealth quintile are much less likely to finish the vaccination process than children from families in higher quintiles (Dzinamarira et al., 2026; Musuka et al., 2025).

Maternal education is acknowledged as a critical factor in affecting health outcomes in society. The increase in the level of education is associated with health literacy, awareness of the advantages of being vaccinated, and health care-seeking behaviors (Gebreyesus & Tesfay, 2024). Other researchers found that the children of educated mothers were vaccinated more often than those with uneducated mothers (Gebeyehu et al., 2023; Taye et al., 2025). This is accounted for by the vaccination process, the extension of health service confidence, and the identification of improved family decision-making abilities (Gebreyesus & Tesfay, 2024).

Access to healthcare services plays a key role in making intentions turn to actions. Many factors affect healthcare accessibility, such as proximity to hospitals, availability of vaccines, quality of health services, and cost (George et al., 2025). In some African communities, the distance to health facilities and the lack of vaccines, along with waiting time and bad attitudes of healthcare providers, inhibit individuals from being vaccinated (Gammino et al., 2020; Bangura et al., 2020). Therefore, access to antenatal care and delivery in facilities is one of the most important factors for vaccination (Shah et al., 2024).

Community awareness of vaccine-preventable diseases is affected by such factors as media outreach, social and cultural norms, etc. (Ekhatior et al., 2025). In this regard, community engagement initiatives have been implemented with the participation of community health workers and NGOs to overcome the myths concerning vaccines and raise vaccine confidence among parents (Gadanya et al., 2021; Ekezie et al., 2024). Nevertheless, awareness would not be sufficient without considering other structural issues. The relationship between awareness and access to vaccines, taking into account socioeconomic factors, has become another research priority (Périeres et al., 2022; Kigongo et al., 2024).

While many studies have been conducted on the individual components, there is a noticeable lack of synthesis of the four determinants on the continent of Africa as a whole. Systematic reviews in the past have mostly focused on either analyzing the effect of individual determinants or analyzing the impact of two determinants at once, like the impact of maternal education or the interaction of access and education in a particular area, rather than analyzing the impact of all four determinants together (Gebeyehu et al., 2023; Bangura et al., 2020). More research work has been carried out on this topic in the last five years; however, no systematic review has been carried out on the impact of these determinants on vaccine confidence of parents. The need for such a review is especially important considering the variety of different social, economic, and cultural settings in African countries, where different roles of each of these factors and different mechanisms of their impact might exist (Williams et al., 2024; Fousseni et al., 2025). To address this gap, the current systematic review presents a holistic overview of the latest evidence on the role of poverty, maternal education, access to healthcare services, and community awareness in shaping the decisions of parents to immunize their children in Africa. This review contributes to the literature in three distinct ways, based on the synthesis of the current evidence. First of all, the study provides an updated analysis of four different determinants, including poverty, the level of education of mothers,

access to health services, and the impact of raising awareness. Secondly, by focusing only on African countries, the study reduces the scope and produces more relevant conclusions related to the African continent. Finally, the study reveals some contradictions in the existing empirical data, which can be a good basis for further research in this area.

Therefore, the following research questions have been formulated for this study:

Primary research question:

(RQ1) What is the relationship between the four determinants, including poverty, maternal education, access to health services, and the impact of raising community awareness, on childhood immunization decisions made by parents in African countries?

Secondary research questions:

(RQ2) Which of the four determinants is the most consistent predictor of childhood immunization decisions?

(RQ3) How do the four different determinants interact with each other to impact parents' immunization decisions?

(RQ4) Do the effects of these determinants vary based on the region in African nations?

2. Methods

2.1 Study Design

The systematic review was conducted in compliance with PRISMA 2020 recommendations so as to ensure that the study is clear, repeatable, and rigorous. It should also be mentioned that the review protocol was registered beforehand in PROSPERO so as to provide transparency and reduce the possibility of research duplication.

2.2 PICO Framework

To perform the systematic review and determine inclusion/exclusion criteria, the PICO framework was used. The population consisted of parents or caregivers of children aged 0–23 months living in any country within Africa. The exposures assessed were categories such as poverty (measured by wealth vector, income or socio-economic status), maternal education (number of years of formal schooling), accessibility to healthcare (geographic proximity to a health facility, availability of health services in the area, number of antenatal visits, and institutional deliveries) and community awareness (awareness of vaccination, health information, access to media, and health beliefs).

The comparison among different types of exposures (e.g., those with poverty and those who were not poor; those with education and those who were uneducated; etc.) as well as outcomes concerning child immunization (complete immunization or absence of immunizations).

2.3 Inclusion and Exclusion Criteria

For this research, studies that fulfilled the inclusion and exclusion criteria specified in Table 1 were taken into account.

Table 1: Inclusion and Exclusion Criteria

Criterion	Inclusion	Exclusion
Population	Parents or caregivers of children 0–23 months in African countries	Outside Africa; other age groups

Exposure	One or more of the following: poverty, maternal education, healthcare access, community awareness	No clearly defined exposure
Outcome	Childhood immunization status (completed, partial, no doses administered, uptake, refusal)	No immunization outcome
Study Design	Peer-reviewed original research (either quantitative, qualitative, or mixed)	Non-peer-reviewed; editorials; commentaries; thesis
Publication Date	2015–2026	Before 2015
Language	English	Non-English
Full Text	Available	Not available

2.4 Search Strategy

The literature review was conducted in a comprehensive manner and was done systematically through the use of five electronic databases such as PubMed/MEDLINE, Scopus, Web of Science, Google Scholar and African Journals Online (AJOL). The literature search was done between January 2026 and February 2026. These databases were selected because they provide a wide range of international and African literature in order to avoid any publication bias.

In conducting the literature search, the following terms were used: MeSH terms and free text using Boolean operators:

("immunization" OR "vaccination" OR "vaccine uptake" OR "full immunization" OR "zero-dose" OR "immunisation")

AND

("poverty" OR "wealth" OR "socioeconomic status" OR "wealth index" OR "income" OR "poor")

AND

("maternal education" OR "mother's education" OR "parental education" OR "literacy" OR "schooling")

AND

("healthcare access" OR "health facility" OR "distance to clinic" OR "antenatal care" OR "ANC" OR "institutional delivery")

AND

("awareness" OR "knowledge" OR "health beliefs" OR "media exposure" OR "community awareness" OR "vaccine hesitancy")

AND

("Africa" OR "sub-Saharan Africa" OR "SSA" OR "Nigeria" OR "Kenya" OR "Ethiopia" OR "Ghana" OR "DRC" OR "Tanzania" OR "Uganda" OR "South Africa")

2.5 Study Selection Process

All the selected records were imported into Zotero software for organization and duplicate removal. This process was done according to the PRISMA 2020 flowchart for screening. The titles and abstracts of all records were screened against the set inclusion criteria. Then the full texts of the potentially eligible studies were obtained and assessed. Some of the reasons for exclusion of the full texts of the studies were: Studies

that were conducted outside Africa; studies that did not investigate the four determinants; studies that did not report immunization outcomes; not peer-reviewed; studies published before 2015; inaccessible full texts; and studies written in languages other than English. The 27 studies that met the inclusion criteria were selected for narrative synthesis and are cited in the Results. Other citations in this review served as methodological or background sources.

2.6 Data Extraction

To create a data extraction form, Microsoft Excel was employed. The data obtained from each selected research consists of: author's name, year of publication, country, type of research, number of respondents, age of the study population, variables being studied (poverty, mothers' education, availability of health care services, community knowledge), immunization outcome (fully immunized or partially immunized or not vaccinated or percentage of vaccination), and significant results (numerical effect size or qualitative result).

2.7 Quality Assessment

The methodological quality of the studies selected for review was evaluated using validated appraisal instruments depending on the type of study design. As far as cross-sectional studies are concerned, the JBI Critical Appraisal Checklist for Analytical Cross-Sectional Studies was employed (Moola et al., 2015). As for qualitative research, it was evaluated according to the CASP Qualitative Checklist (Long et al., 2020). For mixed-methods studies, MMAT was employed (Hong et al., 2018). AMSTAR-2 was used to examine the quality of systematic reviews included in the review for reference checking only and was not included in the analysis. The quality of the study selected was determined with the help of the quality grading system based on criteria percentage points achieved: High Quality ($\geq 80\%$), Moderate Quality (60 – 79%), or Low Quality ($<60\%$).

2.8 Data Synthesis

Due to the possible differences in study designs, populations studied, and measurements obtained, meta-analysis was not performed; therefore, the authors adopted the narrative synthesis approach (Popay et al., 2006). The synthesis was performed based on the four determinants: poverty, maternal education, healthcare access, and community awareness. Findings on each determinant were reported using effect sizes, directions of the relationship, themes, and geographic differences where applicable. Interactions between the determinants were also discussed.

3. Results

3.1 Study Selection

A total of 847 records were obtained from the five database searches. This search generated 236 articles on the PubMed/MEDLINE database, 213 articles on Scopus, and 161 articles on Web of Science. The search on Google Scholar generated 127 articles, whereas the search on African Journals Online generated 110 articles. After duplicates were removed, 625 articles remained for further screening. As a result of title and abstract screening, 523 articles were excluded. The full texts of 102 articles were evaluated for their eligibility, and 75 of them were excluded for different reasons. In particular, 25 articles were excluded as the studies were not performed in Africa, 18 did not investigate any of the four determinants of interest, 11 did not present results regarding immunization outcomes, 6 were not peer-reviewed, 5 were published before 2015, 4 did not have full texts accessible, 3 were in other languages rather than English, and 3 were duplicate articles that had been left unnoticed during the first stage of the deduplication process. A total

of 27 studies satisfied the inclusion criteria and were included in the narrative synthesis. The process of study selection is shown in Figure 1 below.

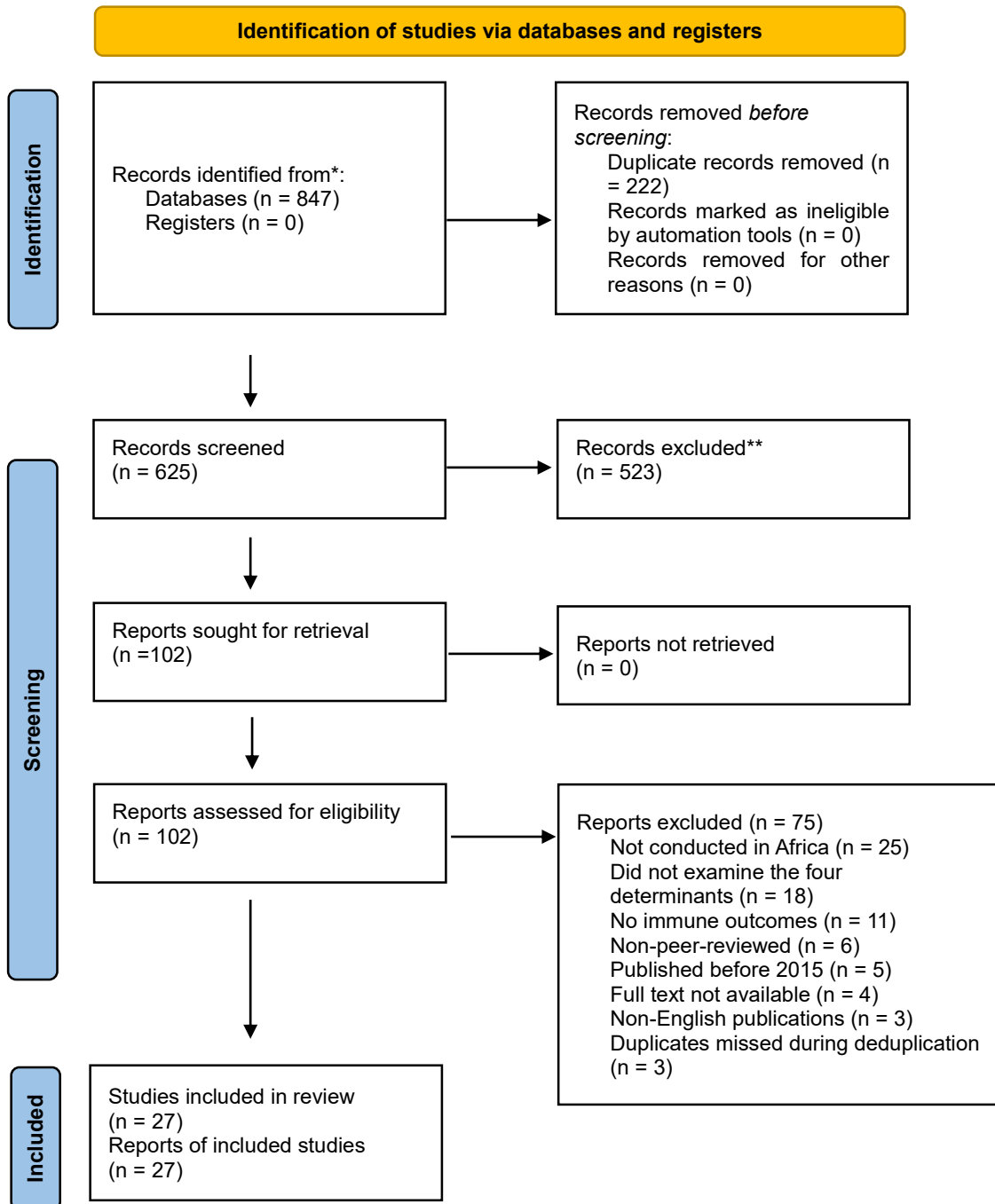


Figure 1. PRISMA 2020 Flow Diagram

Source: Page et al. (2021)

3.2 Characteristics of the Included Studies

Among the total 27 studies, 19 were classified as systematic reviews or meta-analyses (70.4%), while 4 were cross-sectional studies (14.8%), 2 were critical literature reviews (7.4%), 1 was an umbrella review (3.7%), and 1 was a systematic review protocol (3.7%). All 27 studies were conducted in over 20 countries

in Africa, including Nigeria, Ethiopia, Kenya, South Africa, and Somalia. The sample size used in studies with primary data varied from 1,200 to 28,000 individuals, whereas the sample size used in systematic review studies comprised 9 to 42 individual primary data studies. More than 88% of the total 27 studies included (n=24) involved the age range of 12-23 months, which was similar to the standard defined by WHO for measuring full immunization coverage. All 27 studies focused on full immunization or zero-dose prevalence as the primary outcome.

Table 2. Summary of Included Studies

Characteristic	Number	Percentage
Total references	33	100%
Included studies	27	81.8%
Supporting references	6	18.2%
Study type (included studies)		
Systematic reviews and meta-analyses	19	70.4%
Cross-sectional studies	4	14.8%
Critical literature reviews	2	7.4%
Umbrella review	1	3.7%
Systematic review protocol	1	3.7%
Countries covered	More than 20 African countries	–
Most represented	Nigeria, Ethiopia, Kenya	–
Age group	12–23 months	88.9%
Determinants examined		
Poverty/Wealth	23	85.2%
Maternal Education	27	100%
Healthcare Access	21	77.8%
Community Awareness	17	63.0%

Detailed characteristics of each included study are presented in Appendix Table A1.

3.3 Quality Assessment Summary

In the case of the 27 included studies, as many as 17 (63.0%) were identified to be of high quality, 7 (25.9%) of moderate quality, and 3 (11.1%) of low quality. Some of the reasons explaining these low-quality ratings include no control for confounding (n=5), poor description of sampling (n=4), low level of response rates (n=3), and poor explanation of search strategy/data abstraction (n=3). Studies that had low quality were used in the analysis but were considered limitations.

Table 3: Methodological Quality Ratings of the Included Studies

Quality Rating	Studies	Percentage
High quality (≥80% of criteria met)	17	63.0%
Moderate quality (60–79% of criteria met)	7	25.9%
Low quality (<60% of criteria met)	3	11.1%

3.4 Synthesis of Findings by Theme

3.4.1 *The Role of Poverty in Shaping Immunization Choices*

The odds ratio shows that there is a minimum value of 1.8 and a maximum value of 4.2, where the most common odds ratio was actually in the range of 2.0 to 3.5 (Dzinamarira et al., 2026, Musuka et al., 2025, Williams et al., 2024, Fenta et al., 2021, Wiysonge et al., 2025). Budu et al. (2023) finds wealth is an important factor that influences childhood vaccination in Benin. As reported by Halane et al. (2025), the prevalence of zero dose is 53.0% for the poorest cohort and only 29.0% for the richest cohort. In total, 23 studies focused on the interplay between poverty (wealth index, income, socioeconomic status) and childhood vaccination. All the studies found that children from the poorest quintile of wealth had significantly fewer chances to be vaccinated compared to children from the wealthiest quintile of wealth. The conducted qualitative and critical review showed that the costs of transport, loss of daily wages, as well as conflicting family obligations could contribute to the identified correlation between poverty and non-vaccination (Bangura et al., 2020; Périères et al., 2022). There may be geographical distinctions since the relationship between poverty and immunization seems to be apparent in West Africa rather than in East Africa (Gebeyehu et al., 2023; Taye et al., 2025).

3.4.2 *Maternal Education as a Driver of Immunization Coverage*

In the case of children whose mothers had secondary or higher education, the likelihood of receiving full vaccination was significantly greater compared to the children whose mothers had no education at all; the range of odds ratios varied between 1.9 and 5.6, although the most frequent range was between 2.5 and 4.0 (Gebreyesus & Tesfay, 2024; Gebeyehu et al., 2023; Taye et al., 2025; Fenta et al., 2021). The evidence suggests that maternal education is associated with better health status of children. Thus, for example, in Southern Africa it was shown that for each additional year of maternal education the likelihood of vaccination increases by about 8–12% (Williams et al., 2024; Wiysonge et al., 2025). Moreover, based on the research findings, completion of secondary education by a mother is one of the factors predicting BCG vaccination in Somaliland (Ibraahim et al., 2026; AOR = 2.15). Studies conducted in several regions of Eastern Africa, such as Ethiopia, Kenya, and Nigeria, show the trend of increased immunization in children born/raised by educated mothers (Alemu et al., 2024; Endalamaw et al., 2024; Mengistie et al., 2025). Qualitative studies identified such mediating factors as enhanced health literacy, trust in health facilities, and autonomy (Gebreyesus & Tesfay, 2024; Périères et al., 2022).

3.4.3 *Healthcare Access and Immunization Decisions*

Access to healthcare has been assessed in some studies (21 publications). The distance from the health facility appears to be the key barrier, and it was determined that the probabilities of vaccination for children living more than 5 kilometers from the health facility drop by 40–60% (George et al., 2025; Gammino et al., 2020; Bangura et al., 2020; Shah et al., 2024). The use of antenatal care of at least four visits and delivery in health facilities showed a significant correlation with complete immunization in the study, with an odds ratio between 1.6 and 3.8 (Shah et al., 2024; Fousseni et al., 2025; Khan et al., 2024). The limitations on funds and access to health services were important determinants of zero dose status in Wiysonge et al. (2025). Research on nomadic pastoralists (Gammino et al., 2020) and refugee/displaced persons (George et al., 2025) pointed out some distinctive barriers to access. Another study by Shah et al. (2024) and Fousseni et al. (2025) showed that such things as vaccine supply, long waiting times, poor attitudes of health providers, and absence of integration of immunization services with maternal and child health services were significant barriers. Halane et al. (2025) found geographic differences in the prevalence of zero-dose in the Somali regions.

3.4.4 Community Awareness and Its Influence on Immunization Decisions

Community awareness was assessed using seventeen articles. Community media exposure (radio, television, or print) was associated with a 30–70% increased likelihood of achieving complete immunization (Ekhatior et al., 2025; Ekezie et al., 2024; Wiysonge et al., 2025). According to Gadanya et al. (2021), community-based immunization strategies such as outreach services by community health workers and NGO mobilization efforts increased vaccination acceptance by counteracting myths, misinformation, and hesitancy. The reasons for non-vaccination cited by Périères et al. (2022) were fears about adverse events, religious beliefs, doubts about the vaccines' efficacy, and misconceptions about vaccine safety.

The study by Kigongo et al. (2024) found that community readiness and acceptance for malaria vaccine rollout depended on the level of awareness (8.8–82%) in sub-Saharan Africa. The most efficient channels for immunization communication were community engagement and use of local languages according to Ekezie et al. (2024). Community awareness alone could not overcome structural immunization barriers (Périères et al., 2022; Kigongo et al., 2024).

3.4.5 Interactions Between Determinants

Some studies analyzed the relationship between determinants. The most common result was that the impact of poverty was countered by maternal education since educated mothers from poor families had immunization rates similar to uneducated mothers from rich families (Williams et al., 2024; Fenta et al., 2021; Dzinamarira et al., 2026). The extent to which community awareness affected vaccination was greater in communities that had more readily available healthcare (Ekezie et al., 2024; Kigongo et al., 2024). The presence of synergy occurs when all four determinants favorably coincide, leading to vaccination rates of more than 80%, but below 30% in cases where none of the determinants are in favor (Gebeyehu et al., 2023; Wiysonge et al., 2025). The gender-related factors, as well as poverty and lack of awareness, were responsible for zero-dose status, as noted by Musuka et al. (2025). As pointed out by Fousseni et al. (2025), issues concerning healthcare systems interact with socio-economic and awareness barriers to produce double disadvantages for groups at risk.

Table 4: Summary of Findings by Determinant

Determinant	Studies	Key Findings	Effect (OR)	Range
Poverty	23	Children from poorer families were less likely to be fully immunized	1.8 - 4.2	
Maternal education	27	High levels of education had an impact on vaccinations	1.9 - 5.6	
Healthcare access	21	Distance, antenatal care, and institutional deliveries affected coverage	1.6 - 3.8	
Community awareness	17	Media influence and community programs helped in vaccinations	1.3 - 1.7	
Interactions	12	Education offset the impact of poverty; access allowed awareness to work	Not applicable	

4. Discussion

4.1 Summary of Findings

Collectively, the evidence from the 27 studies conducted on the determinants of vaccination practices by parents in Africa resulted in the identification of four major determinants that include poverty, maternal education, access and availability of healthcare, as well as community awareness. The findings revealed that children from the poorest wealth quintile group were less likely to be vaccinated as compared to other individuals. In terms of maternal education, children whose mothers had been educated exhibited higher vaccination status. Access to healthcare became another important enabling determinant of immunization. Community awareness, which included media exposure and community-based programs, had a positive impact on immunization. Most importantly, these four determinants were never working alone but in synergy with each other. For example, maternal education reduced the impact of poverty on immunization, and community awareness worked effectively where there was access to healthcare services.

4.2 Interpretation of Results

4.2.1 *The Influence of Poverty on Immunization Decisions*

The study results on the link between poverty and low levels of immunization have taken into account and matched the findings from previous studies in the literature regarding social and economic determinants of health (Dzinamarira et al., 2026; Musuka et al., 2025). There are many mechanisms through which poverty influences immunization levels, such as direct and indirect costs of vaccination, opportunity cost in time, etc. Though the vaccination may be free of charge, there are indirect costs (travel expenses and co-payments for other services) and opportunity cost of the absence of a parent from work (Bangura et al., 2020; Périères et al., 2022). In addition, competing priorities within the household reduce the ability to care for the child and invest in health. Finally, there is a likely explanation for the observed difference in the magnitude of the association between West and East Africa (Gebeyehu et al., 2023; Taye et al., 2025). The difference could be related to health system financing, poverty levels, social safety nets, and health facility density in the two regions. The fact that the number of children not receiving any dose was almost double in the poorest families (Halane et al., 2025). This observation underscores the need to think creatively about means of addressing financial hardship for poor families, such as conditional cash transfers, free vaccines, and free transportation.

4.2.2 *Maternal Education as a Key Driver of Coverage*

According to the results of the conducted research and 27 studies, maternal education is considered to be the most significant and reliable factor, with odds ratios fluctuating from 1.9 to 5.6. Finding out about the dose-response effect that shows an increase in the probability of vaccination by 8%-12% for each extra year of maternal education further substantiates the idea about the accumulated effect of education (Williams et al., 2024; Wiysonge et al., 2025). Considering the process of mediation described above, which included health literacy, confidence in the health system, and ability to make decisions, it should be noted that education allows mothers to use the proper means of handling the health care system, adhering to the schedule of vaccinations, opposing false information and making the necessary decisions regarding the health of their children (Gebreyesus & Tesfay, 2024; Périères et al., 2022). It should be stressed that educated mothers from poor households managed to vaccinate their children in the same way as uneducated women from rich households did (Williams et al., 2024; Fenta et al., 2021). Thus, the education of girls is one of the strongest methods of increasing vaccination rates because it helps to overcome the

effects of poverty. Thus, from the perspective of public policy, it is necessary to ensure that girls continue attending school not only for their own benefit but also for the health of future generations.

4.2.3 Healthcare Accessibility as a Determinant

Access to healthcare has become an enabling factor without which other factors would not be able to be implemented. Distance to health facilities, which is the most common barrier, lowers the immunization rates to between 40 and 60 percent (George et al. 2025; Gammino et al. 2020; Bangura et al. 2020). The finding corresponds with the application of the “three delays model” to immunization, where additional challenges in access are taken into account along with cost-related, awareness-related, and service-related obstacles (Wiysonge et al. 2025). The findings from the research conducted on the relationship between vaccination, antenatal clinic visits, and institutional delivery (Shah et al., 2024; Fousseni et al., 2025; Khan et al., 2024) confirm the importance of integrating the vaccination-related services within the framework of maternal health care services. Therefore, it can be concluded that medical contacts are important for immunizations since increased availability of maternal health care services can affect the immunization outcomes positively. The obstacles faced by nomadic pastoralists (Gammino et al. 2020) and refugees/displaced people (George et al. 2025) point to the necessity of developing service models that provide opportunities for treatment and access to vulnerable populations. The unequal distribution of zero-dose cases in Somalia (Halane et al. 2025) stresses that access should not be generalized but should be addressed on a smaller scale with regard to the context.

4.2.4 Community Awareness and Immunization Coverage

Several studies have demonstrated the positive impact of community awareness on vaccine decision-making processes in that media influence results in 30-70% increase in the likelihood of vaccination (Ekhatior et al., 2025; Ekezie et al., 2024; Wiysonge et al., 2025). Community awareness is important in terms of vaccine perception and contributes to eliminating possible fears related to vaccination. The example of community workers implementing awareness campaigns as well as the mobilization of NGOs (Gadanya et al., 2021) shows how effective community agents can be in making progress in overcoming vaccine hesitancy as an obstacle in reaching those groups of people who are hard to reach. Reasons for not getting vaccinated may include fear of possible adverse reactions; religious views; skepticism over how well vaccines work, as well as the belief that immunization is harmless (Périeres et al., 2022). The above discussion emphasizes the significance of sociocultural influence in this decision-making process. Nevertheless, these results prove that understanding alone is not enough if there are structural barriers (Périeres et al., 2022; Kigongo et al., 2024). Thus, any efforts being done on the demand side must be complemented with improvement activities on the supply side to achieve long-lasting outcomes. Awareness activities coupled with improvement work are likely to be more efficient than activities based on only one type of intervention.

4.2.5 Significance and Interactions

The interaction between determinants is the most insightful implication for policy arising from the research. Maternal education has been shown to counter the effect of poverty (Williams et al., 2024; Fenta et al., 2021; Dzinamarira et al., 2026), which indicates that education may allow mothers to support themselves and benefit from it in times of economic crisis. This indicates that promoting education is believed to be one of the most efficient methods of solving the issue of different rates of vaccination in different population groups, particularly poor ones. It was shown that the effectiveness of community awareness campaigns required adequate access to health care services (Ekezie et al., 2024; Kigongo et al., 2024), which points to the fact that awareness is of little value if there are no opportunities to take

advantage of the health care offered. It is frustrating to be aware of something when the health care is inaccessible. Considering that the four factors are simultaneously favorable, with ratios of positive outcomes above 80%, while ratios below 30% are observed in the absence of the factors, it is evident that approaches tackling many factors together are more efficient than those that tackle one factor alone (Gebeyehu et al., 2023; Wiysonge et al., 2025). The respective weaknesses of these factors as highlighted in the literature by Fousseni et al. (2025) and Musuka et al. (2025) underscore the necessity of taking an equity-based multisectorial approach to deal with immunization inequalities.

4.3 Practical implications

There are several practical implications of the results found. First, investment in education for girls is expected to give good returns on immunization, based on the positive and consistent correlation between the two variables. Education of women should become a public health concern. Secondly, financial constraints can be addressed by offering free vaccination, transport support, and cash transfer programs. Thirdly, improvement of health system capacity in relation to increasing availability of health services, shortening waiting periods, and integration of vaccination and antenatal services can increase accessibility. Fourthly, community-based interventions aimed at involving intermediary agents and dealing with misconceptions can supplement structural approaches. Fifthly, interventions addressing a number of determinants together will be more effective than focusing on a single determinant at a time.

4.4 Limitations

There are many strengths in this review, which include its comprehensive synthesis of four key determinants in one review and it is entirely focused on African countries. There are, however, several limitations in this review. Firstly, there might be language bias because this review contains only studies conducted in English. Secondly, there is publication bias as studies with no effect size might be less likely to be published. Thirdly, it must be emphasized that as the research designs, samples, and outcome measures differ greatly, a meta-analysis was not carried out because the narrative synthesis might not reflect the quantitative ties properly. Fourthly, the majority of studies reviewed were either cross-sectional or systematic reviews, which means that the cause-and-effect ties cannot be established. Fifthly, some limitations of this review are low-quality studies which indicate bias. Finally, single-author screening could have resulted in selection bias.

4.5 Recommendations for Future Studies

A few recommendations can be applied in future studies. First, one can utilize longitudinal studies to determine causal relationships between certain variables and vaccination rates. Second, qualitative studies are important to analyze the link between poverty, education, accessibility, and awareness. Thirdly, research on multicomponent interventions can also be applied. Fourth, research on regional differences within Africa can be conducted to develop specific policies. Fifth, studies of zero-dose children and the effects of various disadvantages can aid in targeting the most disadvantaged populations. Lastly, cost-effectiveness research on the various methods of addressing these determinants can help allocate resources.

5. Conclusion

This review systematically analyzed evidence from 27 studies about determinants of immunization decisions by parents in Africa. The main elements that appeared to be significant were poverty, maternal education, accessibility to healthcare services, and community awareness. It was noted that children

belonging to the lowest income quintile had significantly lower possibilities to get vaccinated, whereas maternal education was considered to be the most influential factor. Accessibility to health care, especially distance and frequency of antenatal visits, was an important enabling factor, whereas community awareness positively affected immunization decisions through media involvement and community interventions.

The results indicate that these determinants do not act in isolation. For example, maternal education compensated for the negative influence of poverty, while the effect of community awareness proved to be more effective in communities where people had good access to health care services. In the case where all four determinants were positive, more than 80% of children were vaccinated; in contrast, only less than 30% of children received the necessary vaccinations if no determinant was positive.

From the point of view of policies on vaccination, investments in girls' education, reduction of financial barriers, improvement of health care systems, and community-based programs should be viewed as critical measures. The directions of future research should include longitudinal research to define cause-and-effect relationships, qualitative research, and intervention studies focused on multicomponent interventions.

References

1. Alemu, T. G., Tamir, T. T., Workneh, B. S., Mekonen, E. G., Ali, M. S., Zegeye, A. F., Wassie, M., Kassie, A. T., Tekeba, B., & Gonete, A. T. (2024). Coverage and determinants of second-dose measles vaccination among under-five children in East Africa countries: a systematic review and meta-analysis. *Frontiers in Public Health*, 12, 1359572. <https://doi.org/10.3389/fpubh.2024.1359572>
2. Aslam, F., Ali, I., Babar, Z., & Yang, Y. (2022). Building evidence for improving vaccine adoption and uptake of childhood vaccinations in low- and middle-income countries: a systematic review. *Drugs & Therapy Perspectives*, 38(3), 133–145. <https://doi.org/10.1007/s40267-021-00890-7>
3. Bangura, J. B., Xiao, S., Qiu, D., Ouyang, F., & Chen, L. (2020). Barriers to childhood immunization in sub-Saharan Africa: A systematic review. *BMC Public Health*, 20(1), 1108. <https://doi.org/10.1186/s12889-020-09169-4>
4. Budu, E., Ahinkorah, B. O., Guets, W., Ameyaw, E. K., Essuman, M. A., & Yaya, S. (2023). Socioeconomic and residence-based related inequality in childhood vaccination in Sub-Saharan Africa: Evidence from Benin. *Health Science Reports*, 6(4), e1198. <https://doi.org/10.1002/hsr2.1198>
5. Dzinamarira, T., Mano, O., Musuka, G., Madziva, R., Mataruse, N., Mbunge, E., Nkambule, S. J., & Moyo, E. (2026). Prevalence and determinants of full immunization among children under five in sub-Saharan Africa: A systematic review and meta-analysis (2013–2025). *Vaccine*, 75, 128228. <https://doi.org/10.1016/j.vaccine.2026.128228>
6. Ekezie, W., Igein, B., Varughese, J., Butt, A., Ukoha-Kalu, B. O., Ikhile, I., & Bosah, G. (2024). Vaccination Communication Strategies and Uptake in Africa: A Systematic review. *Vaccines*, 12(12), 1333. <https://doi.org/10.3390/vaccines12121333>
7. Ekhtor, E., Essien, V. G., Afolabi, O. E., Okundaye, M. I., & Adewonbi, T. (2025). Public awareness and acceptance of malaria vaccine in Sub-Saharan Africa: a systematic review. *BMC Public Health*, 25(1), 3890. <https://doi.org/10.1186/s12889-025-25196-5>
8. Endalamaw, D., Nibret, E., Munsha, A., Mekonnen, F., Tadesse, S., Zeru, T., Tefera, M., & Yismaw, G. (2024). Measles vaccine effectiveness in African children: a systematic review and meta-analysis. *BMC Infectious Diseases*, 24(1), 1330. <https://doi.org/10.1186/s12879-024-10239-w>

9. Fenta, S. M., Biresaw, H. B., Fentaw, K. D., & Gebremichael, S. G. (2021). Determinants of full childhood immunization among children aged 12–23 months in sub-Saharan Africa: a multilevel analysis using Demographic and Health Survey Data. *Tropical Medicine and Health*, 49(1), 29. <https://doi.org/10.1186/s41182-021-00319-x>
10. Fousseni, S., Ngangue, P., Barro, A., Ramde, S. W., Bihina, L. T., Ngoufack, M. N., Bayoulou, S., Kiki, G. M., & Salfo, O. (2025). Navigating the Road to Immunization Equity: Systematic Review of Challenges in Introducing New Vaccines into Sub-Saharan Africa's Health Systems. *Vaccines*, 13(3), 269. <https://doi.org/10.3390/vaccines13030269>
11. Gadanya, M. A., Alo, C., Umar, A. A., Ahmad, K. A., Afolaranmi, T., Adeloye, D., Garba, R. M., & Dabo, B. (2021). Evaluating nongovernmental organization–led community mobilizers in health promotion, immunization campaigns, and acute flaccid paralysis surveillance. *International Journal of Medicine and Health Development*, 27(1), 1–13. https://doi.org/10.4103/ijmh.ijmh_5_21
12. Gammino, V. M., Diaz, M. R., Pallas, S. W., Greenleaf, A. R., & Kurnit, M. R. (2020). Health services uptake among nomadic pastoralist populations in Africa: A systematic review of the literature. *PLoS Neglected Tropical Diseases*, 14(7), e0008474. <https://doi.org/10.1371/journal.pntd.0008474>
13. Gebeyehu, N. A., Gelaw, K. A., Adella, G. A., Tegegne, K. D., Admass, B. A., & Gesese, M. M. (2023). Incomplete immunization and its determinants among children in Africa: Systematic review and meta-analysis. *Human Vaccines & Immunotherapeutics*, 19(1), 2202125. <https://doi.org/10.1080/21645515.2023.2202125>
14. Gebreyesus, A., & Tesfay, K. (2024). Effect of maternal education on completing childhood vaccination in Ethiopia: systematic review and meta-analysis. *Scientific Reports*, 14(1), 17453. <https://doi.org/10.1038/s41598-024-68182-4>
15. George, N. S., Bassey, A. E., Cruz, J. a. A., & Tambor, M. (2025). Access to vaccination among refugees, asylum seekers and internally displaced persons in Sub-Saharan Africa: a systematic review. *Discover Public Health*, 22(1). <https://doi.org/10.1186/s12982-025-00584-9>
16. Gilano, G., Sako, S., Molla, B., Dekker, A., & Fijten, R. (2024). The effect of mHealth on childhood vaccination in Africa: A systematic review and meta-analysis. *PLoS ONE*, 19(2), e0294442. <https://doi.org/10.1371/journal.pone.0294442>
17. Halane, S., Ahmed, A., Ahmed, M. M., Hersi, M. D., & Sani, J. (2025). Assessing prevalence and regional disparities in Zero-Dose immunization among children aged 12–23 months in Somalia. *Journal of Epidemiology and Global Health*, 15(1), 59. <https://doi.org/10.1007/s44197-025-00395-w>
18. Hong, Q. N., Fàbregues, S., Bartlett, G., Boardman, F., Cargo, M., Dagenais, P., Gagnon, M. P., Griffiths, F., Nicolau, B., O'Cathain, A., Rousseau, M. C., Vedel, I., & Pluye, P. (2018). The Mixed Methods Appraisal Tool (MMAT) version 2018 for information professionals and researchers. *Education for Information*, 34(4), 285–291. <https://doi.org/10.3233/EFI-180221>
19. Ibraahim, S. M., Moumin, M. M., Elmi, M. M., Husein, H. A., Roble, S. D., Ahmed, S. M., Muhumed, U. H., & Hassan, M. S. (2026). Determinants of Zero-Dose Bacillus Calmette–Guérin vaccination in Somaliland: A Cross-Sectional Study. *Health Science Reports*, 9(5), e72522. <https://doi.org/10.1002/hsr2.72522>
20. Khan, T., Malik, S., Rafeekh, L., Halder, S., Desai, S., & Bhattacharya, S. D. (2024). Facilitators and barriers to maternal immunization and strategies to improve uptake in low-income and lower-middle income countries: A systematic review. *Human Vaccines & Immunotherapeutics*, 20(1), 2411823. <https://doi.org/10.1080/21645515.2024.2411823>

21. Kigongo, E., Kabunga, A., Opollo, M. S., Tumwesigye, R., Musinguzi, M., Akello, A. R., Nabaziwa, J., Hardido, T. G., & Puleh, S. S. (2024). Community readiness and acceptance for the implementation of a novel malaria vaccine among at-risk children in sub-saharan Africa: a systematic review protocol. *Malaria Journal*, 23(1), 182. <https://doi.org/10.1186/s12936-024-04995-y>
22. Long, H. A., French, D. P., & Brooks, J. M. (2020). Optimising the value of the critical appraisal skills programme (CASP) tool for quality appraisal in qualitative evidence synthesis. *Research Methods in Medicine & Health Sciences*, 1(1), 31–42. <https://doi.org/10.1177/2632084320947559>
23. Mengistie, B. A., Yirsaw, A. N., Lakew, G., Mekonnen, G. B., Shibabaw, A. A., Chereka, A. A., Kitil, G. W., Wondie, W. T., Abuhay, A. E., & Getachew, E. (2025). Human papillomavirus vaccine uptake and its determinants among women in Africa: an umbrella review. *Frontiers in Public Health*, 13, 1537250. <https://doi.org/10.3389/fpubh.2025.1537250>
24. Moola, S., Munn, Z., Sears, K., Sfetcu, R., Currie, M., Lisy, K., Tufanaru, C., Qureshi, R., Mattis, P., & Mu, P. (2015). Conducting systematic reviews of association (etiology). *International Journal of Evidence-Based Healthcare*, 13(3), 163–169. <https://doi.org/10.1097/xeb.0000000000000064>
25. Musuka, G., Moyo, E., Iradukunda, P. G., Gashema, P., Madziva, R., Herrera, H., Dhliwayo, T., Mutata, C., Mataruse, N., Mano, O., Mbunge, E., & Dzinamarira, T. (2025). Gender-Associated Factors on the Occurrence and Prevalence of Zero-Dose Children in Sub-Saharan Africa: a critical literature review. *Tropical Medicine and Infectious Disease*, 10(10), 286. <https://doi.org/10.3390/tropicalmed10100286>
26. Page, M. J., McKenzie, J. E., Bossuyt, P. M., Boutron, I., Hoffmann, T. C., Mulrow, C. D., Shamseer, L., Tetzlaff, J. M., Akl, E. A., Brennan, S. E., Chou, R., Glanville, J., Grimshaw, J. M., Hróbjartsson, A., Lalu, M. M., Li, T., Loder, E. W., Mayo-Wilson, E., McDonald, S., . . . Moher, D. (2021). The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. *BMJ*, 372, n71. <https://doi.org/10.1136/bmj.n71>
27. Périères, L., Séror, V., Boyer, S., Sokhna, C., & Peretti-Watel, P. (2022). Reasons given for non-vaccination and under-vaccination of children and adolescents in sub-Saharan Africa: A systematic review. *Human Vaccines & Immunotherapeutics*, 18(5), 2076524. <https://doi.org/10.1080/21645515.2022.2076524>
28. Popay, J., Roberts, H., Sowden, A., Petticrew, M., Arai, L., Rodgers, M., Britten, N., Roen, K., & Duffy, S. (2006). Guidance on the conduct of narrative synthesis in systematic reviews: A product from the ESRC Methods Programme. In *Lancaster University eBooks*. <https://doi.org/10.13140/2.1.1018.4643>
29. Shah, M. P., Morgan, C. J., Beeson, J. G., Peach, E., Davis, J., McPake, B., & Wallace, A. S. (2024). Integrated Approaches for the Delivery of Maternal and Child Health Services with Childhood Immunization Programs in Low- and Middle-Income Countries: Systematic Review Update 2011–2020. *Vaccines*, 12(12), 1313. <https://doi.org/10.3390/vaccines12121313>
30. Taye, B. A., Weldearegay, B. Y., Yirsaw, B. G., & Belete, A. K. (2025). Tetanus toxoid vaccination coverage and associated factors among pregnant women in East Africa: systematic review and meta-analysis. *BMC Public Health*, 25(1), 3319. <https://doi.org/10.1186/s12889-025-24687-9>
31. Williams, S. V., Akande, T., & Abbas, K. (2024). Systematic review of social determinants of childhood immunisation in low- and middle-income countries and equity impact analysis of childhood vaccination coverage in Nigeria. *PLoS ONE*, 19(3), e0297326. <https://doi.org/10.1371/journal.pone.0297326>

32. Wiysonge, C. S., Uthman, M. M. B., Ndwandwe, D., & Uthman, O. A. (2025). Multilevel Analysis of Zero-Dose Children in Sub-Saharan Africa: a three delays model study. *Vaccines*, 13(9), 987. <https://doi.org/10.3390/vaccines13090987>
33. Zarekar, M., Al-Shehabi, H., Dörner, R., Weishaar, H., Lennemann, T., Bcheraoui, C. E., & Bernasconi, A. (2024). The impact of information and communication technology on immunisation and immunisation programmes in low-income and middle-income countries: a systematic review and meta-analysis. *EBioMedicine*, 111, 105520. <https://doi.org/10.1016/j.ebiom.2024.105520>