

# The Role of Health Education and Healthcare Providers in Promoting Infant Vaccination: Perspectives from New Mothers at the Cibiru Vaccine Home

Riza Arlinda<sup>1\*</sup>

<sup>1</sup> Universitas Islam Bandung, Indonesia

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## Abstract

Completeness of infant immunization remains a public health challenge in Indonesia, hindered by limited maternal knowledge, fear of side effects, and vaccine misconceptions. This qualitative study explored new mothers' perceptions, experiences, and decision-making regarding infant vaccination at the Cibiru Vaccine Home in Bandung. In-depth interviews were conducted with 10 mothers of infants aged 0–12 months, selected through purposive sampling, and analyzed thematically. Three themes emerged: (1) awareness of immunization benefits was shaped by child health knowledge, peer discussions, and counseling from healthcare staff; (2) barriers included fear of post-vaccination side effects, conflicting information from social networks, and logistical challenges; and (3) trust in healthcare workers fostered confidence to complete the immunization schedule. From a healthcare and immunology perspective, these findings underscore the importance of strengthening maternal understanding of vaccine-induced immunity, addressing misconceptions about immune responses, and ensuring reliable access to services. This study contributes actionable insights for culturally sensitive health promotion, two-way provider communication, and community-based strategies to reduce preventable infant morbidity and mortality.

**Keywords:** *Basic Immunization, Maternal Perception, Vaccine-Preventable Diseases, Immunology, Public Health*

## INTRODUCTION

Immunization is one of the most impactful biomedical interventions, preventing 3.5–5 million deaths annually and extending life expectancy worldwide (Rodrigues & Plotkin, 2020). Despite its success, disparities persist, particularly in LMICs. In Indonesia, complete immunization coverage fell from 93.0% in 2019 to 83.3% in 2020 and 84.2% in 2021, leaving children vulnerable to diphtheria, pertussis, measles, and polio. Barriers include limited maternal knowledge, safety concerns, misconceptions, logistical issues, and sociocultural influences. Evidence from West Java shows maternal knowledge strongly affects timeliness (Sulastris & Fadza, 2024), while national surveys highlight the role of credible health information (Machmud et al., 2022). Globally, vaccines provide not only health but also social and economic benefits, including herd immunity (Rodrigues & Plotkin, 2020). Safety concerns, often fueled by misinformation, are countered by evidence that adverse events are rare and mild (Lombardi et al., 2019). Timeliness challenges also persist in high-coverage settings such as Wales (Bailey et al., 2023). In Bandung, the Cibiru Vaccine Home aims to improve access, yet no qualitative research has examined mothers' perceptions, risk-benefit evaluations, or provider interactions. This study addresses that gap by exploring new mothers' perceptions, experiences, and decision-making at the Cibiru Vaccine Home. Practically, it informs culturally sensitive health promotion and service strategies, while theoretically it contributes to behavioral health models by showing how trust, communication, and service accessibility shape vaccine uptake. The study asks: (1) What are mothers' perceptions of immunization benefits, risks,



and protection? (2) What socio-behavioral, informational, and logistical factors influence coverage? (3) How do provider interactions shape trust, confidence, and adherence?

## RESEARCH METHOD

### Study Design

This study used a qualitative descriptive design to capture in-depth insights into new mothers' perceptions, experiences, and decision-making processes regarding infant immunization. A qualitative approach is well-suited to exploring the complex social and behavioral factors influencing vaccination acceptance, which cannot be fully understood through quantitative surveys alone (Creswell & Poth, 2018). This design also enabled the identification of context-specific barriers and facilitators, such as marketing strategies and pricing promotions, within the service delivery environment of the Cibiru Vaccine Home, which have been underexplored in existing immunization literature. This study was conducted at Cibiru Vaccine Home, a community-based vaccination facility in Bandung, West Java, Indonesia. The center provides a range of immunization services for infants and children, including basic immunizations under the national program and optional vaccines such as influenza vaccines.

### Participants and Sampling

Participants were new mothers (defined as mothers with a first child aged 0–12 months) who brought their infants for immunization at the Cibiru Vaccine Home during the study period. Inclusion criteria:

1. Mother aged  $\geq 18$  years
2. Babies aged between birth and 12 months
3. Willingness to participate and provide informed consent

#### *Sampling strategy*

Purposive sampling was applied to ensure diversity of participants' sociodemographic backgrounds (age, education, occupation, parity, and type of vaccine received). This method was chosen to obtain cases that are rich in information and can provide diverse perspectives (Guest et al., 2013).

#### *Sample size justification*

Recruitment continued until data saturation was reached, the point at which no new themes emerged, achieved with a final total of 10 participants. This sample size aligns with similar qualitative vaccination studies in Indonesia and globally (Bailey et al., 2023; Harjaningrum et al., 2013), and the diversity of participants allowed for thematic depth across sociodemographic categories. The final number of participants will be reiterated in the Results section to confirm data saturation.

**Table 1.** Participant Characteristics for Purposeful Sampling

Category	Sub Category
Mother's age	18–25, 26–35, >35
Level of education	Primary, Secondary, and Higher Education
Work	Housewives, Formal sector, Informal sector
Baby's age	0–3 months, 4–6 months, 7–12 months
Type of vaccine received	Basic EPI vaccines, Optional vaccines (e.g., PCV, rotavirus)

### Data collection

Data were collected through semi-structured, in-depth face-to-face interviews conducted in a private room within the facility after the immunization session or at a location agreed upon by the participant.

#### *Instrument*

The interview guide was developed based on a literature review and adapted from previous qualitative studies on maternal immunization perceptions ([Bailey et al., 2023](#); [Lombardi et al., 2019](#)), which included:

1. Knowledge and beliefs about vaccine-preventable diseases
2. Perceived benefits and risks of infant immunization
3. Experience of vaccination services at the Cibiru Vaccine House
4. Influence from family, society, and media
5. Interaction with healthcare providers
6. Barriers and supporting factors for timely and complete immunization (including novel facilitators such as promotional bundling and flexible service hours)

The interview was conducted in Indonesian, lasting approximately 30–45 minutes, and audio recorded with prior participant consent. Field notes record non-verbal cues and contextual observations to support data triangulation.

#### **Data analysis**

All interviews were transcribed verbatim and analyzed using thematic analysis ([Braun & Clarke, 2006](#)), which was chosen for its flexibility in identifying and interpreting patterns in qualitative data. The analysis followed six steps:

1. Familiarization with data
2. Generating initial codes (inductive and deductive)
3. Searching for themes
4. Reviewing the theme
5. Defining and naming themes
6. Make a report

NVivo 12 facilitated data management, coding, and retrieval. The combination of inductive coding (emerging from the data) and deductive coding (guided by the research question and the WHO vaccine hesitancy framework) allowed for both theory-based and data-driven insights.

#### **Trustworthiness**

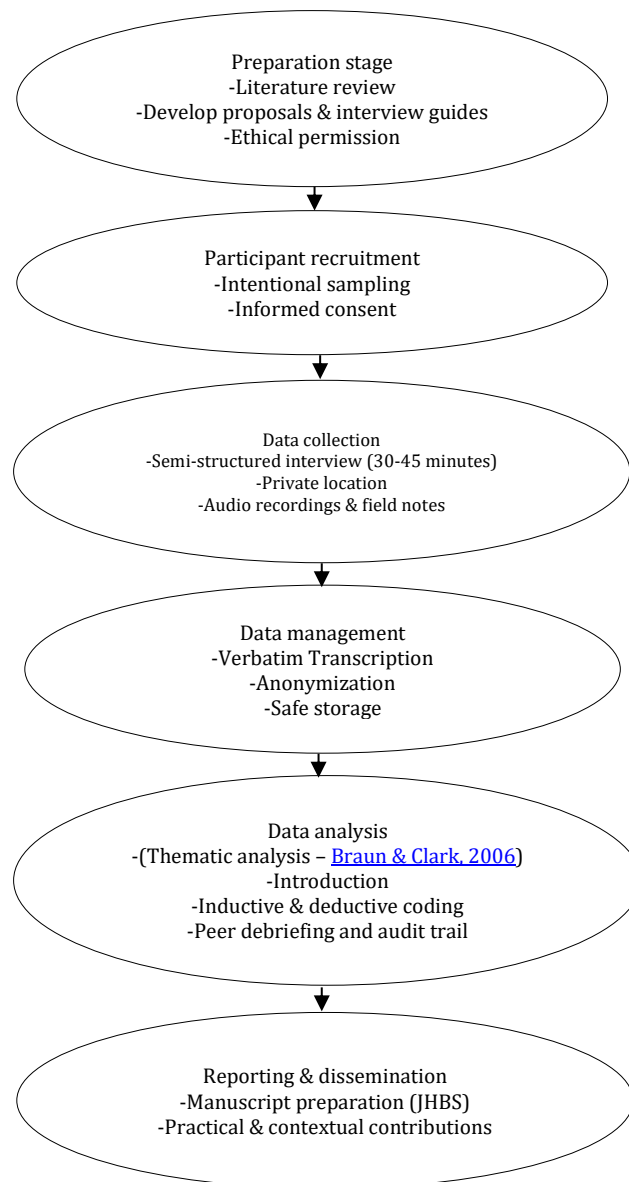
Credibility was ensured through member checking with participants, while triangulation combined interview data and field observations. An audit trail documented analytic decisions to support dependability, and peer discussions within the research team enhanced confirmability by minimizing bias.

#### **Ethical Considerations**

Ethical approval for this study was granted by the owner and medical director of the Cibiru Vaccine Home. Participants were informed about the study's purpose, procedures, potential risks, and their right to withdraw at any time, after which written consent was obtained. Confidentiality was ensured through anonymized participant codes (e.g., P01, P02), removal of identifiers from transcripts, and secure, restricted-access data storage.

### Expected Contribution and Novelty

This study provides context-specific qualitative insights into mothers' experiences in community vaccination facilities, highlighting underreported facilitators such as promotional pricing and bundled offers. The findings inform tailored health education, enhance mother-provider communication, and build public trust. Practically, they guide culturally sensitive service innovations, while theoretically they enrich behavioral health and vaccine acceptance models by integrating service delivery innovations as determinants of uptake.



**Figure 1.** Research flow diagram of the study process at the Cibiru Vaccine Home

## FINDINGS AND DISCUSSION

### Participant Demographics

A total of 10 new mothers participated in the study, all of whom had babies aged 0–12 months. Participants ranged in age from 19 to 36 years, with diverse educational and occupational backgrounds. This sample size was sufficient to achieve data saturation, as no new themes emerged

after the eighth interview, and the last two interviews confirmed and reinforced existing themes. Table 2 summarizes the demographic characteristics of the participants.

**Table 2.** Demographic characteristics of participants

Code	Age (years)	Education	Work	Baby's age (months)	Vaccine Received
P01	25	S1	Housewife	2	DPT – Hib – Hep B – Polio PCV Rotavirus
P02	30	S1	Private sector employee	5	PCV Rotavirus
P03	31	S1	Housewife	9	MR
P04	34	S2	State-Owned Enterprise Employees	4	DPT – Hib – Hep B – Polio PCV Rotavirus
P05	25	S1	Private sector employee	6	Influenza PCV
P06	27	S1	civil servant	2	DPT – Hib – Hep B – Polio PCV Rotavirus
P07	29	S1	Private sector employee	9	MR Influenza
P08	31	S2	State-Owned Enterprise Employees	6	Influenza PCV Rotavirus
P09	35	S1	Businessman	3	PCV Rotavirus
P10	33	S1	civil servant	3	DPT – Hib – Hep B – Polio PCV Rotavirus

### **Mother's Knowledge and Awareness**

#### *Resources*

Mothers reported obtaining information about vaccines primarily from healthcare providers, social media, and family members. Some cited midwives or obstetricians as the first sources to introduce the importance of immunization during prenatal checkups. Social media, particularly the official Cibiru Vaccine Home account and pediatrician accounts, became popular channels for learning about various mandatory and supplemental vaccines. Support from family, such as information from relatives who had used immunization services, also strengthened their motivation to take their children for immunizations.

*"I first heard about immunization from my midwife during my prenatal checkup." – P03*

*"I first heard about immunization from my obstetrician during my prenatal checkup." – P04*

*"I first heard about immunization from my friend who already had children." – P09*

*"I first learned about the various types of mandatory and additional vaccines from the Cibiru Vaccine Home Instagram account." – P08*

*"I learned about vaccines from pediatrician accounts that discussed childhood immunizations." – P10*

*"I learned about the vaccine and the vaccination center from my brother who is also a patient here." – P01*

These findings align with [Machmud et al. \(2022\)](#), who reported that maternal awareness is significantly influenced by communication from health workers and exposure to health promotion media. [Harjaningrum et al. \(2013\)](#) also found that direct interactions between mothers and health workers play a crucial role in shaping positive perceptions of new vaccines, such as the pneumococcal conjugate vaccine (PCV). While information from mass media helps broaden knowledge, but is not always sufficient to drive decision-making without clarification from health workers. Furthermore, [Rodrigues and Plotkin \(2020\)](#) emphasized that an effective vaccine communication strategy requires a combination of evidence-based messages from health workers with consistent media campaigns to build public trust. Findings from [Bailey et al. \(2023\)](#) in Wales also showed that active involvement of health care providers in providing direct education was positively correlated with the completeness of children's immunization status, particularly in vulnerable populations.

#### *Understanding the Benefits of Vaccines*

Although most mothers understand the important role vaccines play in protecting children from vaccine-preventable diseases, not all understand the complete immunization schedule in detail. Some mothers reported general knowledge of vaccine benefits but struggled to remember vaccine names or the recommended order of administration.

*"I know vaccines protect against diseases, but I don't really remember the names of all the vaccines.." – P07*

*"I know vaccines protect against diseases, but I don't really remember the names of all the vaccines.." – Page 15*

*"As far as I know, mandatory vaccinations are required for up to 9 months, but it turns out there are still vaccination schedules for up to 2 years or even longer" – P02*

*"I want to give my child all the vaccines, but I don't really understand the schedule" – P04*

*"I know this vaccine is a child's right and will be very beneficial for them, but I have difficulty memorizing the schedule" – P05*

These findings are consistent with [Harjaningrum et al. \(2013\)](#) in Bandung, who reported that despite mothers' relatively high awareness of vaccine benefits, knowledge gaps persisted regarding schedules and types, especially for additional vaccines like PCV and rotavirus. [Machmud et al. \(2022\)](#) further noted that such gaps often stem from limited access to systematic and

comprehensible information. While [Rodrigues and Plotkin \(2020\)](#) highlighted that global awareness of vaccine benefits is generally strong, they stressed the need for repeated and consistent health communication to ensure proper understanding of schedules. Similarly, [Ozawa et al. \(2017\)](#) showed that accurate maternal knowledge of schedules increases timely vaccination and thus enhances protection. Visual aids and immunization calendars in community health settings can help parents remember complete schedules. Taken together, these studies suggest the importance of structured educational strategies at the Cibiru Vaccine Home, including visual media, booklets, and digital reminders to support mothers in completing their children's immunization schedules.

#### *Confidence in Vaccine Effectiveness*

Most mothers at the Cibiru Vaccine House expressed strong belief that immunization is effective in preventing dangerous diseases. This belief is often based on personal experiences, such as children who are less likely to get sick after receiving vaccines, or feeling safe when taking their children to environments with a higher risk of disease exposure. Although some mothers are aware of the potential side effects, they still believe the benefits of vaccines far outweigh the risks.

*"After my child was vaccinated, I felt more confident that he would not contract any dangerous diseases.."- P01*

*"I strongly believe that vaccines will be useful in preventing serious diseases" – P03*

*"After my child was vaccinated, my child is less likely to catch illnesses at daycare" – P07*

*"There are risks to vaccines, but I think the benefits outweigh the risks." – P10*

*"After my child was vaccinated, I feel more at ease when taking my child to crowded places" – P08*

These findings are supported by global studies ([Rodrigues & Plotkin, 2020](#); [Ozawa et al., 2017](#)). In Rwanda, it was reported that more than 90% of parents with strong trust and knowledge about vaccines were more likely to vaccinate their children, with beliefs shaped largely by health workers and mass media. In Indonesia, it was found during the COVID-19 pandemic that mothers with moderate knowledge were 2.65 times more likely to complete vaccinations than those with low knowledge. Similarly, another study demonstrated through the Health Belief Model that perceived benefits were the dominant factor influencing vaccination intentions. Together, these studies reinforce the importance of strengthening parental confidence in vaccine effectiveness.

#### *Concerns About Side Effects*

Some mothers at the Cibiru Vaccine Home expressed concerns about side effects after immunization, particularly fever, fussiness, or pain at the injection site. These concerns often stem from other people's stories or previous experiences, but they can be alleviated after receiving explanations from healthcare professionals. Clear, practical, and reassuring education has proven to be a crucial factor in transforming doubt into acceptance.

*"I was worried about having a fever after the vaccination, but the nurse explained that it was normal.and I became calmer"- P05*

*"Every time I get vaccinated, I always ask about possible side effects and how to deal with them. The doctor explains them in detail, so I feel more at ease at home." - P02*

*"I heard a lot of stories about fever after vaccination, but after the doctor explained that it was okay, I became more confident about getting vaccinated." -P04*

*"I was hesitant to get vaccinated because I was afraid of the side effects, but after reading a lot on educational accounts, I became brave enough to get vaccinated" - P06*

The findings of this study are consistent with earlier research, which showed that mild side effects such as fever or pain can undermine parental confidence if not accompanied by proper explanation, whereas proactive communication helps reduce anxiety. Similar evidence from Bangladesh revealed that although 41.7% of parents were concerned about side effects, vaccination continued when clear guidance on prevention and management was provided, underscoring the importance of structured pre-vaccination counseling. In Italy, excessive worry was linked to misinformation on social media, and health literacy interventions were recommended, while in Indonesia, interactive visual education effectively reduced side-effect concerns contributing to hesitancy. Overall, concerns about side effects are a global phenomenon, but their impact depends heavily on healthcare workers' communication quality. At the Cibiru Vaccine Home, direct and personal interaction was crucial in building trust and transforming hesitation into confidence, filling a research gap on communication processes in community-based facilities.

#### *Mother-Healthcare Provider Interaction*

At the Cibiru Vaccine Home, positive interactions between mothers and healthcare providers have proven to be a key factor in encouraging continued immunization. Clear, friendly, and empathetic communication creates a sense of comfort and increases mothers' confidence in completing their child's vaccination schedule.

*"The staff here are friendly and explain things clearly, so I'm not afraid to come again." – P08*

*"The doctor explained in detail the vaccine I would receive, including its side effects, so I felt calmer and more confident." – P01*

*"The doctor explained the vaccination schedule in detail, so I understood and wanted to come back here again." – P05*

*"The doctor explained the difference between the initial dose and the follow-up dose, so I understand better and will continue with the vaccination until it is complete." – P07*

*"The doctor explained in detail which vaccines should be taken next, and the admin also explained the prices in detail, so I am more confident about completing my child's vaccinations." -P05*

These findings are consistent with [Bailey et al. \(2023\)](#), who showed that trust-based relationships with healthcare providers improve immunization adherence, while [Yufika et al. \(2020\)](#) in Indonesia confirmed that two-way communication is more effective than one-way approaches in reducing hesitancy. Overall, the success of the Cibiru Vaccine Home lies not only in physical access but also in the quality of interpersonal relationships, offering contextual evidence



that community-based facilities can serve as models for effective health communication.

#### *Barriers and Facilitators*

The study results showed that although mothers at the Cibiru Vaccine Home generally had a strong intention to complete their children's immunizations, they faced a number of practical barriers. The most frequently cited factors were work schedule conflicts, limited transportation, and the cost of additional vaccines outside the national program.

*"I have to ask permission from the office; sometimes it's hard to find time." – P04*

*"Transportation is sometimes a problem, because I can't drive my own vehicle, so I have to wait for my husband to take the day off work on Sundays" – P01*

*"The additional vaccine turned out to be quite expensive for me, so I had to think about it first" – P03*

*"The price of additional vaccines is quite expensive. If there were a bundled package or promotion, it would certainly be very helpful for me." - P09*

*"I can only get vaccinated on Sundays due to scheduling issues. Luckily, the Cibiru vaccination center is also open on weekends." - P07*

Interestingly, several mothers highlighted the potential of marketing strategies such as bundled packages or promotional pricing as a driver of their decision to receive additional vaccines. This factor is rarely explored in the vaccination literature but has relevant practical implications, particularly for private vaccination services. On the other hand, adequate service facilities act as powerful facilitators. Strategic location, short waiting times, and flexible service hours were the main reasons mothers chose the Cibiru Vaccine Home.

*"I chose the vaccine place closest to home, so it was easier"- P02*

*"The clinic is close to my workplace, so I can spare some time" -P07*

*"The service is fast, the queue is not long, so my child doesn't get bored waiting" – P05*

*"Usually, you can register and be served right away upon arrival, so you don't have to wait too long. This keeps me vaccinated here." -P10*

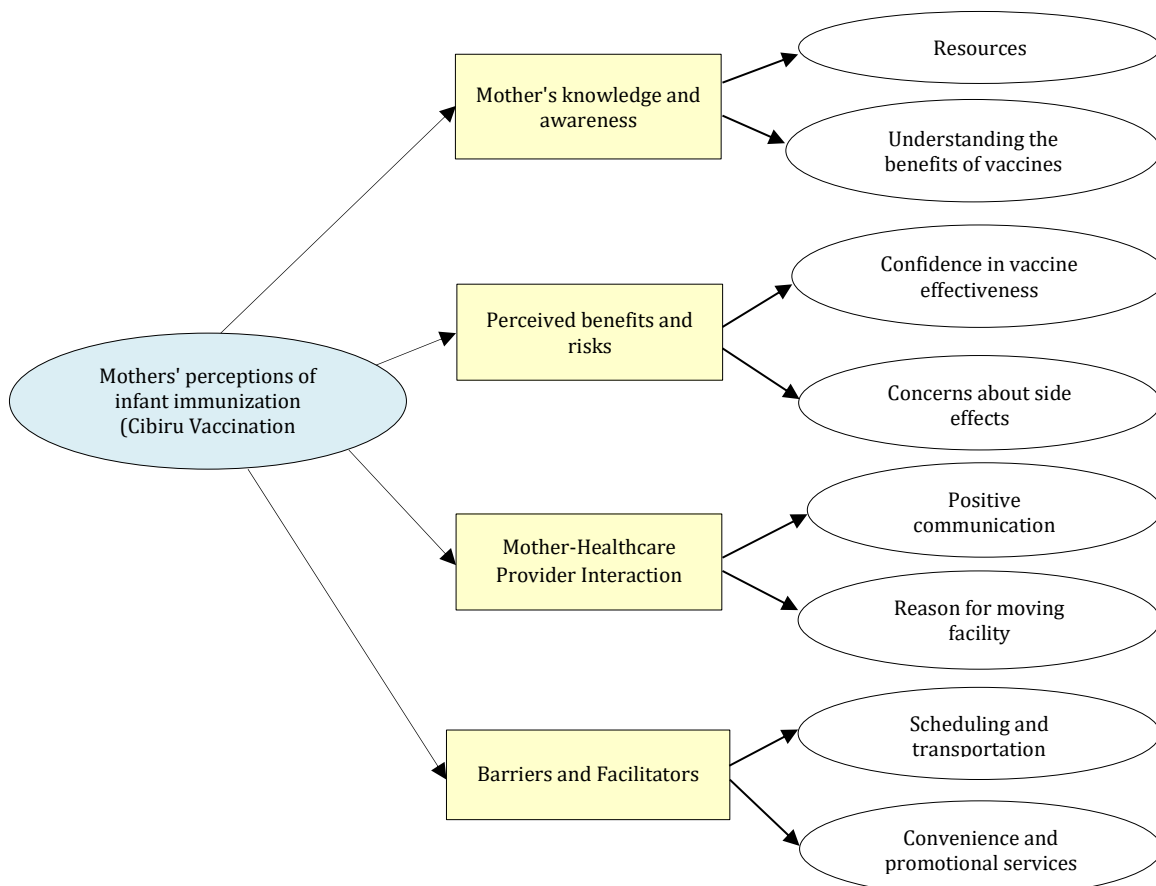
*"The clinic is still open on weekends, making it easier for me who has to be driven by my husband" – P01*

These findings are in line with [Mutua et al. \(2022\)](#), who found that flexible service hours and proximity improved vaccine retention, especially for working parents. [Ozawa et al. \(2019\)](#) also confirmed that economic barriers, particularly vaccine costs, were major reasons for delaying optional immunizations. Similarly, [De Leon et al. \(2023\)](#) showed that financial incentives or bundled pricing increased uptake by 18% in the Philippines, while [Yufika et al. \(2020\)](#) emphasized that physical, social, and economic factors jointly shape adherence in Indonesia. Notably, the role of pricing and healthcare marketing as facilitators remains underexplored, making this study a

novel contribution.

### Thematic Map of Findings

The relationship between the four main themes and their subthemes is summarized in Figure 2.



**Figure 2.** Thematic map showing the relationship between maternal knowledge, perceived benefits/risks, provider interactions, and barriers/facilitators at the Cibiru Vaccine House.

### Service Context and Visual Illustration

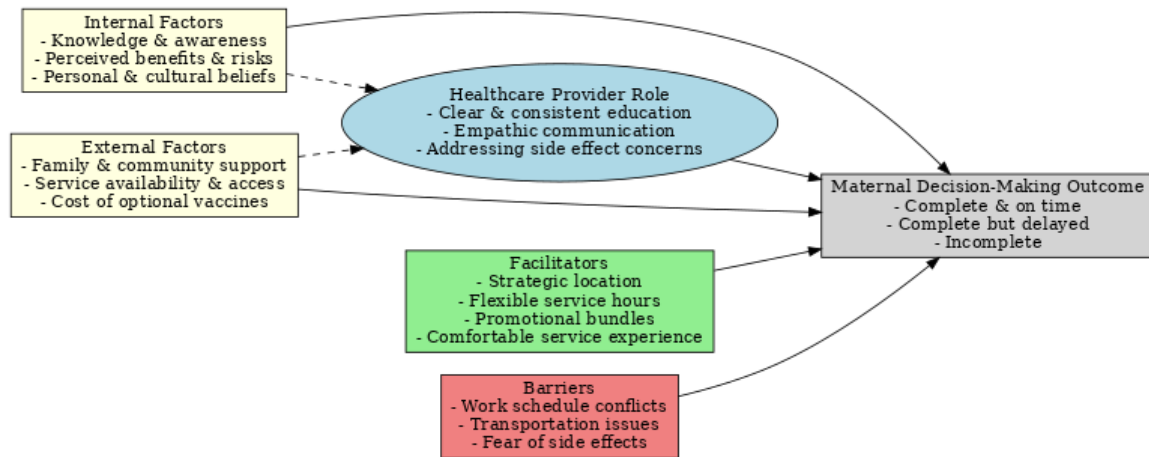
Figure 3 provides visual documentation of the service environment at the Cibiru Vaccine Home, including the waiting area, vaccination room, and counseling room. These facilities contribute to a comfortable and accessible immunization experience for mothers.



**Figure 3.**Service facilities and vaccination process at the Cibiru Vaccine House.

### **Conceptual Framework of Factors Influencing Immunization Decisions**

Based on the thematic analysis, a conceptual framework was developed to describe the interactions between barriers, facilitators, and healthcare provider influence on maternal decision-making. This is illustrated in Figure 4.



**Figure 4.** A conceptual framework summarizing the determinants of maternal decision-making for infant immunization at the Cibiru Vaccine House.

## Discussion

This study supports [Machmud et al. \(2022\)](#), who emphasized the role of health worker communication and credible media in shaping maternal knowledge, consistent with evidence that provider recommendations and on-site services significantly boost vaccine uptake ([Opel, 2023](#); [Provider Communication and HPV Vaccine Uptake, 2021](#)). Mass media also builds trust during crises ([Frontiers in Communication, 2023](#)), while framing benefits reduces risk perception ([Tan et al., 2024](#)). Uniquely, this study highlights marketing-related facilitators, such as bundled pricing, promotions, and weekend services, as novel drivers of uptake, suggesting that economic and service innovations should be incorporated into existing frameworks like the WHO Vaccine Hesitancy Matrix.

## Implication Practice

Improve targeted health education that aligns with mothers' literacy levels. Strengthen providers' communication skills to build vaccine confidence.  
Explore flexible service models to accommodate working mothers.

## Limitations

Conducted at a single private facility, limiting generalizability. Future research could include multiple facilities and integrate quantitative measures for triangulation.

## CONCLUSIONS

This qualitative study found that while mothers recognized vaccine benefits, adherence was influenced by schedule uncertainty, side-effect concerns, work and transport barriers, and the cost of optional vaccines. Facilitators included location, short wait times, flexible hours, and promotional pricing, a novel factor rarely noted in vaccination literature. Theoretically, the study extends the WHO Vaccine Hesitancy Framework and Health Belief Model by highlighting service design and economic incentives as key determinants. Practically, it recommends tailored health education, two-way provider communication, flexible service hours, and bundled pricing to improve maternal confidence and immunization completeness, offering a replicable model for community-based settings.

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