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World Vision

Formative Research Report

Understanding Caregiver Decision-Making on Routine Immunization in Zero-Dose Communities in Cameroon

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Acknowledgements

This project was funded by The Pfizer Foundation implemented by World Vision in partnership with Christian Health Association of Cameroon (CHAC) and the African Christian Health Associations Platform (ACHAP).

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Contents

Abbreviations

BCG - Bacillus Calmette-Guérin (vaccine for tuberculosis)

BeSD - Behavioural and Social Drivers

CHAC - Christian Health Association of Cameroon

CHAI - Clinton Health Access Initiative

CHWs - Community Health Workers

COVID-19 - Coronavirus Disease 2019

DHS - Demographic and Health Survey

DTP1 - Diphtheria-Tetanus-Pertussis first dose

DTP3 - Diphtheria-Tetanus-Pertussis third dose

EPI - Expanded Program on Immunization

GNI - Gross National Income

GPT - Generative Pre-trained Transformer

MCV1 - Measles-Containing Vaccine first dose

OPV0 - Oral Polio Vaccine zero dose

PIRI - Periodic Intensification of Routine Immunization

RI - Routine Immunization

RR1 - Rougeole-Rubéole (Measles-Rubella) first dose

UNICEF - United Nations International Children's Emergency Fund

WHO - World Health Organization

Executive Summary

Overview

This report presents the findings of a formative research study conducted to understand caregiver decision-making on routine immunization in zero-dose communities in Cameroon. The study was funded by The Pfizer Foundation and implemented by the Christian Health Association of Cameroon (CHAC) with support from the African Christian Health Associations Platform, World Vision, and Osman Advisory Services. The research aimed to explore the barriers influencing caregivers' decisions regarding the vaccination of children aged 0-24 months, particularly children who have not completed the required routine immunizations (under-immunized) or children who have never received any of the routine immunizations (zero-dose).

Background

Cameroon faces significant challenges in fully immunizing all children under 12 months against vaccine preventable diseases. Despite efforts to increase vaccination rates, there are still 125,102 zero-dose children nationwide. The study focused on the Nkolndongo Health District in Yaoundé, which has the highest number of zero-dose children in the country. The research was guided by the UNICEF Journey to Health & Immunization and the WHO Behavioural and Social Drivers (BeSD) framework.

Methodology

The study employed a qualitative phenomenological approach to investigate the barriers affecting immunization uptake. Data were collected through in-depth interviews with 135 caregivers of zero-dose and under-immunized children. The analysis was conducted using a custom Generative Pre-trained Transformer (GPT) model to perform sentiment analysis across the BeSD domains: Thinking and Feeling, Social Processes, Motivation, and Practical Issues.

Key Findings

Demographic Characteristics

The study included a diverse group of caregivers, including younger and older mothers, fathers, grandmothers, grandfathers, and female extended family members.

Sentiment Analysis

- Younger Mothers (15-24 years): Showed mixed to positive sentiments in thinking and feeling, strong motivation, but faced significant practical barriers.
- Older Mothers (25+ years): Demonstrated more negative sentiments, particularly in social processes and practical issues, with mixed motivation levels.
- Fathers: Displayed uniformly negative sentiment across all domains, indicating comprehensive barriers to vaccination engagement.
- Grandmothers: Exhibited predominantly mixed sentiments across domains, with slightly more negative trends in social processes.
- Grandfathers: Showed uniformly negative sentiment across all domains, suggesting deep-rooted resistance to vaccination.
- Female Extended Family Members: Demonstrated mixed sentiments across domains, with moderate emotional engagement and practical challenges.

Decision-Making Processes

The study identified distinct decision-making pathways for each caregiver group, highlighting critical touchpoints that influence vaccination decisions. Key barriers included:

- Practical Issues: Accessibility, availability of vaccines and healthcare workers, affordability, and convenience were significant obstacles across all groups.
- Social Processes: Negative cultural beliefs and traditions, lack of community engagement, and peer pressure were prominent barriers, particularly among older caregivers and male caregivers.
- Trust in Health Systems: Predominantly negative trust levels among male caregivers and older mothers indicated a need for rebuilding trust through consistent, reliable, and empathetic interactions with healthcare providers.

Recommendations

Short Term

- Implement targeted communication campaigns for male caregivers.
- Support younger mothers through educational programs and community support groups.
- Leverage positive social norms and peer support networks.
- Reduce duplication of efforts by sharing and analyzing existing research.
- Apply a social and behavior change and human-centered design lens to interventions.

Medium Term

- Ensure consistent and empathetic communication from healthcare providers.
- Utilize community health workers to build relationships and provide ongoing support.

Long Term

- Develop integrated health programs addressing both vaccination and other healthcare needs.
- Improve the availability of vaccines and healthcare workers, particularly in underserved areas.
- Organize vaccination services to accommodate caregivers' schedules and needs.

Conclusion

The study provides valuable insights into the decision-making processes of caregivers regarding routine immunization in zero-dose communities in Cameroon. The findings highlight the need for targeted interventions that address both gender and generational differences while tackling universal practical barriers to vaccination access. By understanding and addressing these diverse pathways and critical touchpoints, vaccination programs can be more effectively designed to improve immunization uptake and reduce the number of zero-dose children in Cameroon.

Introduction

Background on Immunization Challenges in Cameroon

According to Gavi, Cameroon has a population of nearly 28 million and reported nearly one million live births and about 923,000 surviving infants to one year of age in 2022. Despite this high survival rate, infant and under-five mortality rates remained significant, at 47 per 1,000 live births and 70 per 1,000 children, respectively. The data also highlights low household economic capacity with a Gross National Income (GNI) per capita of $1,520 (USD) in 2020.

Immunization metrics reveal challenges in vaccination coverage and equity. According to the Cameroonian Expanded Program on Immunization (2024), there are 125,102 zero-dose children nationwide, defined as those who have not received the Penta 1 vaccine. As of December 2023, the coverage of key vaccines was[1]:

- DTP1 (diphtheria-tetanus-pertussis first dose): 90.1% coverage
- DTP3 (final dose in the series): 83.2% coverage
- MCV1 (measles-containing vaccine/ *vaccin combiné Rougeole-Rubéole* (RR 1)): 81.5% coverage

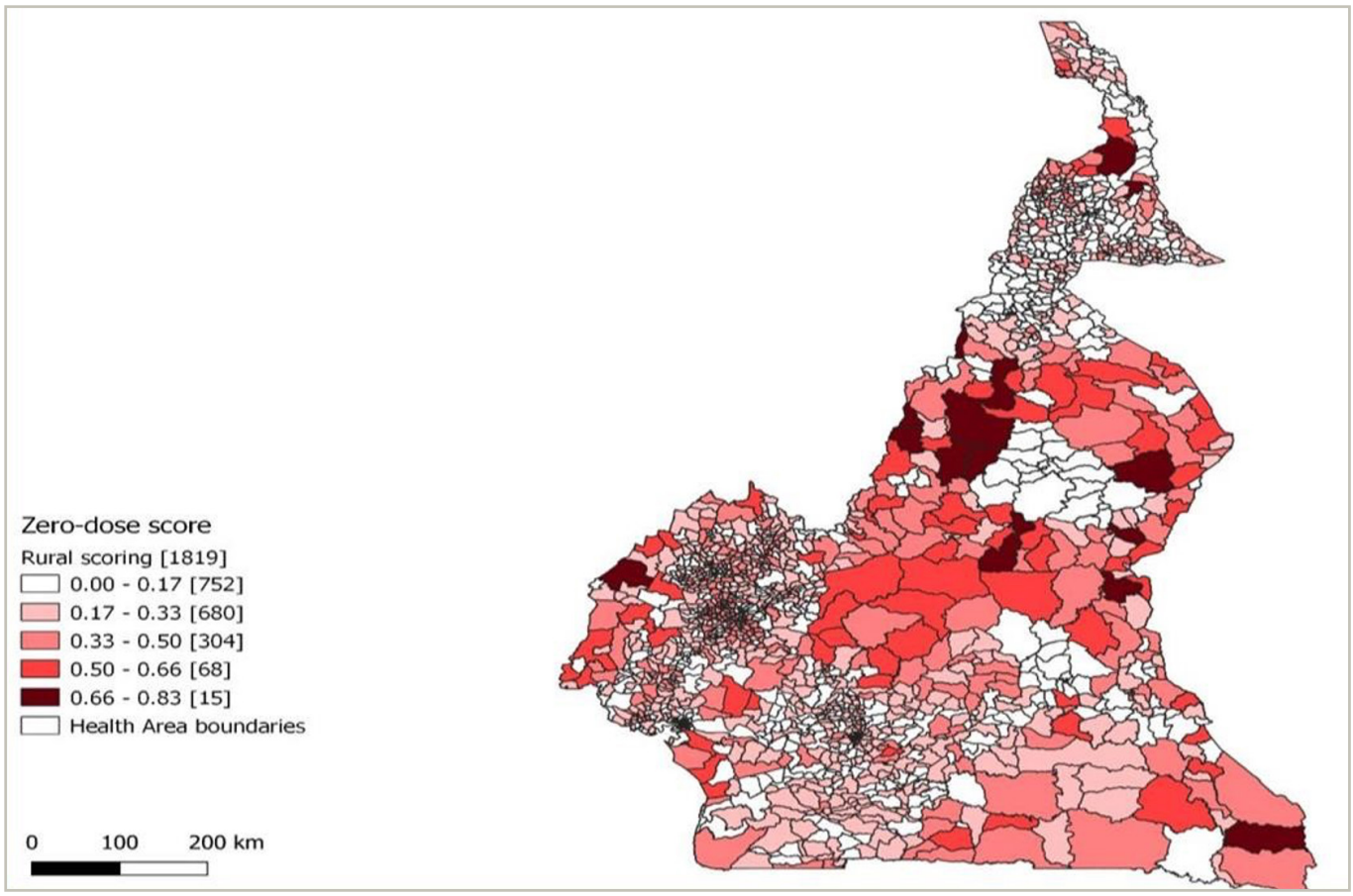

Figure 3: The Journey to Health & Immunization (UNICEF, 2018).

1 These figures were derived from Table 2 in the 2023 EPI annual report (***Tableau 2: Performances des indicateurs au 31 décembre 2023***).

- The dropout rate between DTP1 and DTP3 is 9%, while the rate between DTP1 and the last dose of MCV is 41%. Geographic disparities persist, with DTP3 coverage in the 20% of districts with the lowest vaccination rates reaching just 51%, reflecting notable inequities in access. This data highlights significant challenges in achieving equitable immunization across Cameroon, particularly for the zero-dose population and regions with limited access to healthcare services.

According to Clinton Health Access Initiative (CHAI) (2022), there are ongoing efforts to reduce the number of zero-dose children in Cameroon by 25% by 2025. In Cameroon, zero-dose children are identified as those who have not received the DPT 1 vaccine and are likely to miss out on other healthcare services as well. The traditional head counting approach to identify unvaccinated children is expensive and unsustainable, so a geospatial-based composite score approach was implemented to identify and map missed communities where zero-dose children are likely to be found (Figure 1).

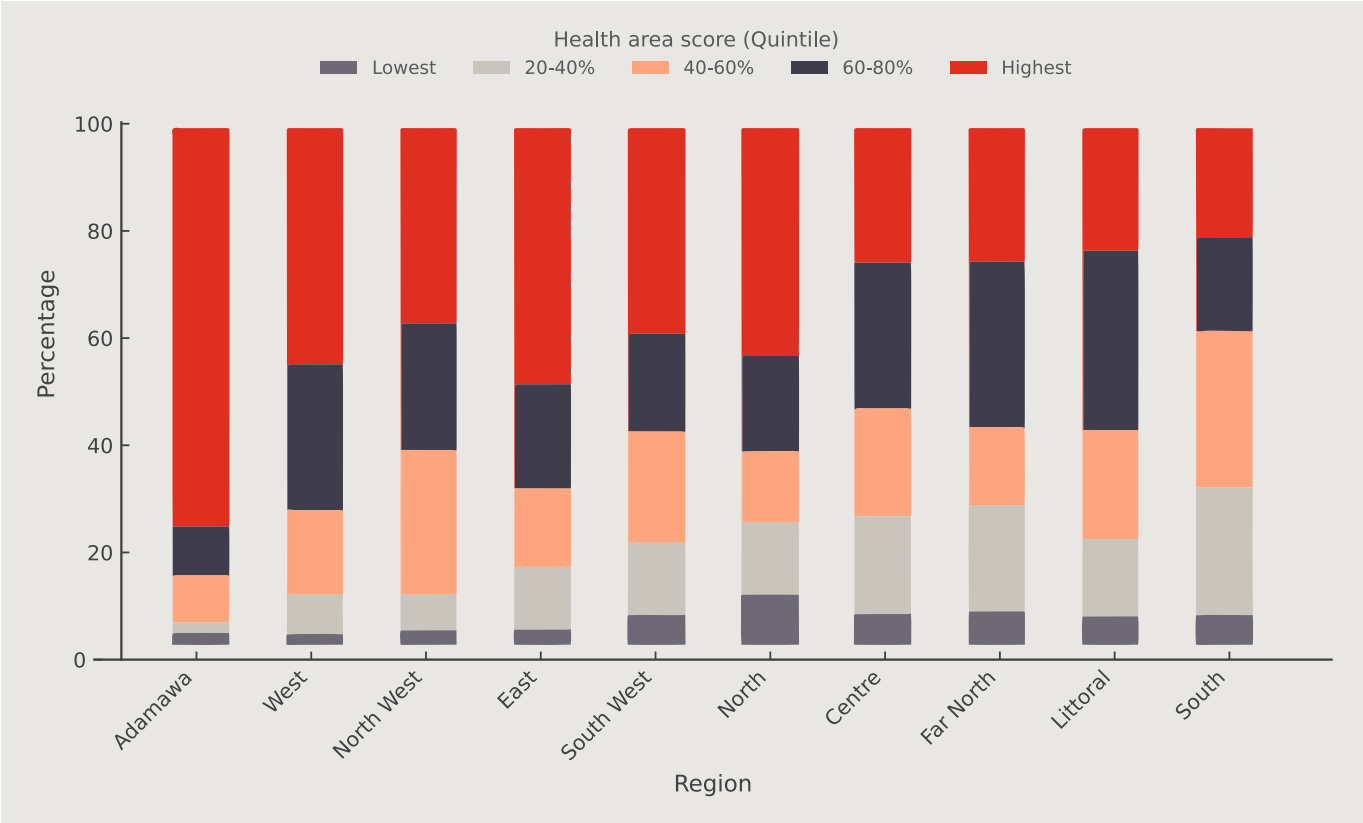

Figure 2: Concentration of zero-dose children in each of Cameroon's 10 regions (CHAI, 2022).

The results showed significant variations in the scores of both rural and urban health areas. Zero-dose children were found in most regions of the country, but priority health areas with a higher likelihood of containing zero-dose children were more concentrated in rural areas, particularly in the Far North, North, Adamawa, East, and Southwest regions (Figure 2). CHAI's preliminary findings of the characterization analysis revealed that a significant number of settlements/villages in the prioritized health areas were poorly covered by existing health facilities. Challenges such as lack of functional cold chain equipment, insufficient availability of health workforce, poor accessibility, lack of basic transportation, and limited electricity and mobile network signals were identified in these areas. Overall, there is a need for targeted interventions in rural areas and underserved communities.

Cameroon has a district health system structured across three tiers: the central level, represented by the Ministry of Public Health; the intermediate level, consisting of 10 regional delegations of public health; and the operational level, made up of 205 health districts. Each health district comprises multiple health areas,

which contain one or more public or private health facilities. Health facilities in Cameroon are categorized into seven distinct types, ranging from integrated health centers providing basic care services to general hospitals that offer more specialized healthcare (Yakum et al., 2023). Cameroon has three primary methods of routine immunization (Gavi, 2023):

- Routine service delivery at fixed health sites for those who live within 5 kilometers of a facility; Here, RI should be available everyday.
- Same-day outreach activities
- Multiday mobile activities for those who live more than 5 kilometers away, which takes place once per month

In addition, Periodic Intensification of Routine Immunization (PIRI), which includes Child Health Days, Child Health Weeks, and National Vaccination Weeks, is a short but intense effort used to deliver routine immunizations in Cameroon, particularly catch-up doses.

Cameroon has made some progress in reducing disease burden among children through vaccination, yet significant disparities in vaccine coverage persist. Demographic indicators like birth order, maternal characteristics, and cultural factors significantly influence immunization uptake (Deffo & Kamga, 2020; Ngandjon et al., 2020). The Expanded Program on Immunization (EPI) plays a pivotal role in the nation's vaccination efforts, supported by government and partner organizations. However, challenges persist in reaching zero-dose children, particularly in underserved regions. The Cameroon EPI program faces significant challenges due to conflicts in the Northwest and Southwest regions, which have resulted in the internal displacement of around one million people, health facility looting, targeted violence against health workers, and subsequent disruptions in healthcare services. Additionally, many remote areas lack cold chain equipment (Gavi, 2023). The COVID-19 pandemic further complicated immunization efforts. After the first COVID-19 case was reported in Yaoundé in March 2020, the government-imposed travel and gathering restrictions, prohibiting mass vaccination campaigns. The Centre region, which had one of the highest COVID-19 case counts, experienced a notable decline in vaccination access and utilization (Gavi, 2023). Moreover, COVID-19 prompted the EPI to expand its use of mass communication tools such as WhatsApp, Facebook, and other social networks due to the rapid spread of disinformation about COVID-19 vaccinations, which soon influenced public perceptions of routine immunizations (Gavi, 2023).

Justification for the Study

The existing research highlights a range of socio-economic, demographic, structural, and systems factors that contribute to the persisting existence of zero-dose children. However, there is no specific research on the decision-making steps that the various types of caregivers engage in regarding routine immunization in Cameroon. Apart from one study (Ames et al., 2017), we are not aware of in-depth qualitative research with caregivers of zero-dose children.

Research Questions and Objectives

General Research Objective: To increase the knowledge base of understanding why zero-dose children do not get vaccinated in Cameroon by looking in-depth at the decision-making process that caregivers engage in.

Specific Research Objectives:

- To identify and analyze the decision-making processes that affect caregivers' decisions regarding the routine immunization of children aged 0-24 months in Cameroon.
- To understand why those who start immunization do not complete the immunization schedule.

These specific objectives narrow the focus to pinpoint influences that have not been thoroughly explored in existing studies. The aim is to provide detailed insights into how these factors either facilitate or hinder vaccination uptake, directly addressing the research gap regarding the qualitative aspects of caregivers' decisions in the context of zero-dose children. The specific research objectives also emphasize the need for targeted interventions based on these insights to improve vaccination coverage effectively.

The main research question is:

How do caregivers make decisions regarding vaccinating children aged 0-24 months, particularly those who are under-immunized or who are considered zero-dose?

The research further aims to lead to the design of evidence-based, tailored social and behavior change interventions to improve routine immunization uptake in Cameroon.

Literature Review

Research by Rodrigue (2020) emphasizes the negative impact of birth order on the timely and complete vaccination of children in Cameroon. This impact intensifies with higher birth orders, highlighting a pattern where younger siblings often receive fewer vaccines. The study, based on Demographic and Health Survey (DHS) data across several years, identified cultural influences and logistical challenges as exacerbating factors.

A study by Ngandjon et al. (2020) that used the Health Belief Model (Rosenstock, 1990) to analyze sociocultural drivers influencing vaccination behaviors found that affiliation to Islam and limited knowledge of infectious diseases were associated with lower vaccination rates. Mothers' decision-making, particularly among single mothers, positively impacted the likelihood of completing the vaccination schedule. The EPI's vaccination card system improved completion rates, while maternal education and age were strong determinants of vaccine uptake. The study also found that starting vaccination at birth, e.g. BCG or OPV0 vaccines, significantly improved completion rates. This last finding in particular indicates the influence of the continuum and quality of care that new mothers receive.

Another study that focused on zero-dose children in Yaoundé found that the following factors were most strongly associated with whether a child will be zero-dose or not (Yakum et al., 2023):

- Uptake is lower for vaccines that require more than one dose.
- Mothers who had a lower education level were less likely to vaccinate their children.
- Children whose father did not live with them were less likely to be vaccinated.
- Children who did not reside with a biological parent were less likely to be vaccinated.
- Lower household income was also associated with the prevalence of zero-dose children, caused by some associated costs like transport fee to access health facility, purchase of vaccination card, access to information (through radio, TV, newspapers, etc.), and differences in the level of education.

While the social and structural facilitators and barriers are fairly well understood, there is an urgent need to understand how caregivers engage in their decision-making process when it comes to routine immunization (Mavundza et al., 2023). A recent systematic review concluded that there are five themes that drive vaccine uptake in Africa (Mavundza et al., 2023):

Theme 1: Ideas and Practices Surrounding Child Health and Illness. Parents in Africa hold various beliefs and practices regarding childhood vaccination. Some parents have religious beliefs that discourage vaccination, attributing diseases to God and relying on divine intervention for protection. However, many parents accept vaccination as they believe it is beneficial for their children's health, preventing diseases and deaths. On the other hand, some parents are hesitant due to concerns about the vaccine's effectiveness and potential side effects. Interestingly, some parents view side effects as a sign of the vaccine's effectiveness and continue vaccinating their children despite concerns. Overall, parents' beliefs about the benefits and risks of vaccines play a significant role in their acceptance or refusal of childhood vaccination.

Theme 2: Social Communities and Networks. Parents' acceptance of childhood vaccination is influenced by their social networks and community norms. The views and practices of other parents, relatives, peers, and community members shape their decision-making. Some parents are influenced by their spouses or family members to vaccinate their children, while others face resistance to vaccination from their family members. Community endorsement of vaccination also plays a role in parents' acceptance or refusal. Social practices and norms within the community can either encourage or discourage parents to vaccinate their children.

Theme 3: Political Events, Relations, and Processes. Parents' trust in authorities and expert systems, as well as socio-political factors, impact their acceptance of childhood vaccination. Some parents have a general decline in trust, which affects their trust in vaccination programs. Socio-political agendas or interests related to vaccination can influence parents' decision-making. Controversies

surrounding vaccines or health-related issues can contribute to vaccine hesitancy. Marginalization, inadequate public services, and priority misalignment also contribute to vaccine hesitancy. Trust in authorities and expert systems is a crucial factor in parents' acceptance or refusal of childhood vaccination.

Theme 4: Lack of Information or Knowledge. Parents' level of knowledge and understanding of vaccination significantly influences their acceptance. Some parents lack information about vaccines and their benefits, leading to hesitancy or refusal. Poor communication from healthcare workers and insufficient information about vaccines and diseases can contribute to vaccine hesitancy. Lack of knowledge, poor understanding of health education, and misperceptions of side effects can discourage parents from vaccinating their children. Providing sufficient information on vaccines and target diseases is essential to improve childhood vaccination uptake.

Theme 5: Access-Supply-Demand Interactions. Socioeconomic challenges and logistical issues can hinder parents' access to vaccination services.

Factors such as distance, lack of transport money, household work, and employment constraints can make it difficult for parents to reach vaccination centers. Undesirable aspects of vaccination services, such as long waiting times and vaccine stockouts, can contribute to vaccine hesitancy. Financial constraints and the cost of vaccination booklets can also prevent parents from vaccinating their children. Additionally, fear of being bullied or stigmatized during vaccination can lead to hesitancy. Interactions with healthcare workers, including mistreatment, poor communication, and denial of vaccination, can also influence parents' acceptance or refusal of childhood vaccination.

While existing research in Cameroon highlights various socio-economic, demographic, structural, and systemic factors that contribute to the presence of zero-dose children, there is a noticeable gap in understanding the decision-making processes of caregivers regarding routine immunization. Decision-making processes refer to the steps or actions that individuals or groups take to identify and evaluate different options, consider relevant information, and ultimately choose a course of action. In the context of healthcare, particularly immunization, it involves how caregivers gather information, assess risks and benefits, weigh personal, cultural, and social factors, and make a decision to vaccinate their children or not. This process is influenced by various external and internal factors, such as access to resources, social norms, and individual beliefs or attitudes.

Studies such as those by Rodrigue (2020) and Ngandjon et al. (2020) provide insights into factors like birth order, maternal education, and religious affiliation, but they do not explore the specific steps caregivers take in deciding whether to vaccinate their children. Apart from Ames et al. (2017), there is a lack of in-depth qualitative research focused on the decision-making of caregivers of zero-dose children. Despite identifying critical influences like socio-cultural drivers and logistical barriers, no studies have thoroughly examined how caregivers navigate these factors to arrive at decisions about immunization, leaving an important gap in the Cameroonian context. Our study aims to address this by investigating the decision-making processes of caregivers, particularly for under-immunized and zero-dose children aged 0-24 months.

In summary, the persistence of zero-dose children in Cameroon, despite efforts to increase immunization coverage, can be attributed to several factors: economic constraints, regional and internal conflict, immunization coverage disparities, vaccine misinformation, geographic inequities, and systemic healthcare challenges. However, there is little information available about the various types of caregivers of zero-dose children and how they make their decisions. Our study seeks to bridge this gap by focusing on these processes in order to design more tailored messages and message dissemination interventions to reduce the number of zero-dose children aged 0-24 months.

Methodology

We employed the UNICEF Journey to Health & Immunization and the WHO Behavioural and Social Drivers (BeSD) frameworks as theoretical foundations for this research to comprehensively address the social and behavioral determinants of vaccine uptake among infants in Cameroon. The UNICEF Journey to Health & Immunization framework emphasized the pathways and milestones that communities moved along towards achieving immunization goals, highlighting the interactions between healthcare systems, community dynamics, and individual behaviors. This framework was particularly useful for identifying critical touchpoints and barriers within the immunization process. On the other hand, the WHO Behavioural and Social Drivers (BeSD) framework offered a robust structure for understanding the underlying psychological, social, and environmental factors that influenced health-related behaviors. By integrating these frameworks, our research could systematically explore and address the various determinants influencing vaccine acceptance and coverage, ensuring that the strategies developed were culturally sensitive, context-specific, and evidence-based.

This was a qualitative phenomenological study that investigated the barriers affecting immunization uptake. Phenomenology focused on exploring and understanding the **lived experiences** of individuals regarding a particular phenomenon. The goal of this approach was to capture how participants perceived and made sense of their experiences.

Theoretical Framework

Our understanding of the steps that caregivers took in their journey towards immunizing their children was guided by UNICEF's Journey to Health and Immunization. The journey to health and immunization began with the critical stage of building knowledge, awareness, and belief in vaccines.

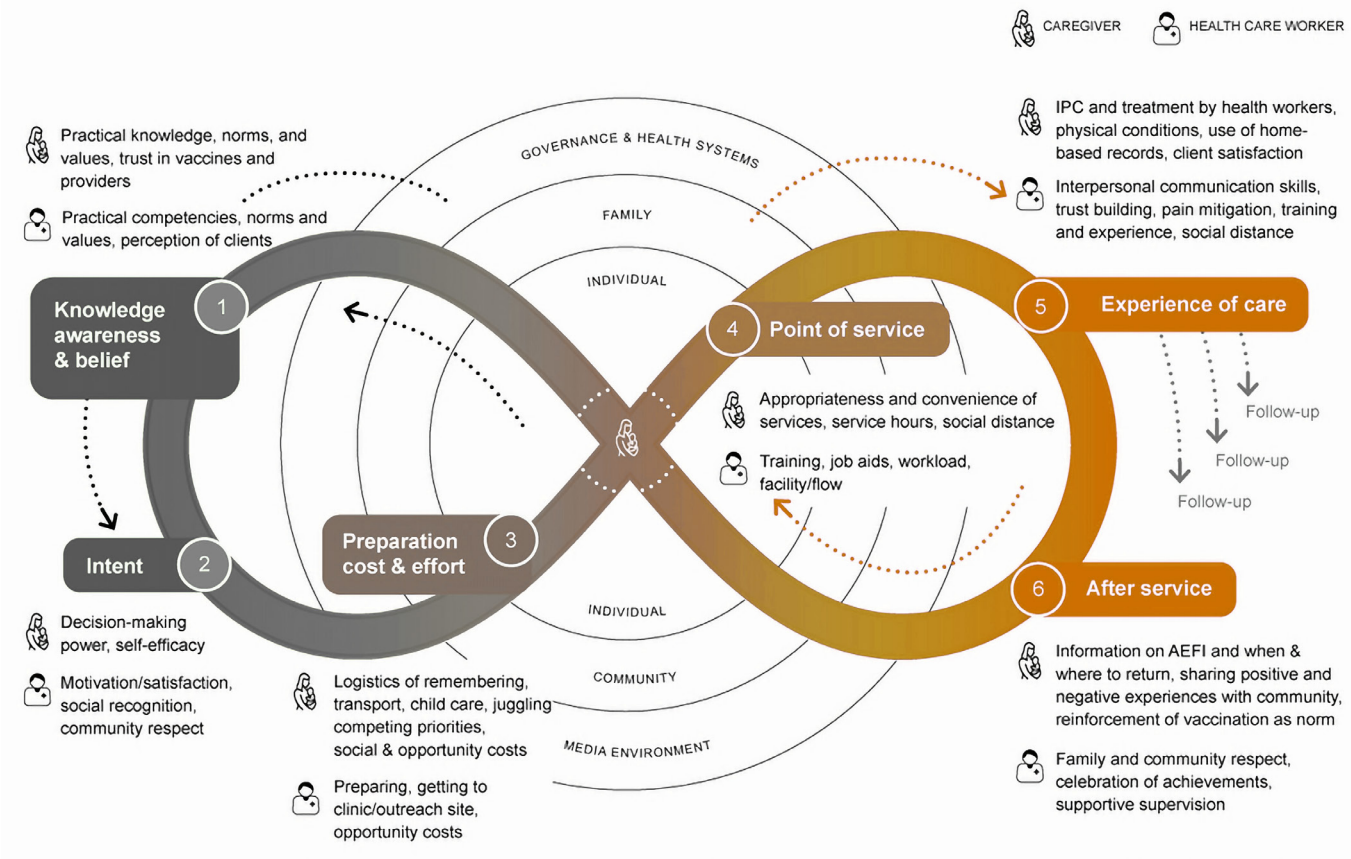

Figure 3: The Journey to Health & Immunization (UNICEF, 2018).

At the first stage, the focus was on educating individuals and communities about the importance, safety, and benefits of vaccines through clear and evidence-based communication. Trust in vaccines and healthcare providers was cultivated by ensuring consistent, reliable, and empathetic interactions. Understanding and respecting the perspectives and concerns of individuals receiving vaccines was also paramount, fostering confidence and trust in the immunization process.

Once awareness and belief were established, the journey progressed to the second stage of fostering the intent to seek immunization. This stage involved empowering individuals with the ability to make informed health decisions by providing comprehensive information and supporting their autonomy. Building self-efficacy was essential, as it enhanced individuals' confidence in their ability to navigate the healthcare system and get vaccinated. Motivation and satisfaction were nurtured through positive reinforcement, social recognition, and community respect. Influencing social norms and leveraging community leaders to advocate for immunization helped shape a supportive environment for decision-making.

The third stage focused on the practical aspects of preparing for immunization, addressing logistical and financial barriers that may have hindered access to vaccines. Ensuring easy access to immunization services included providing reminders and arranging transportation, especially for individuals with limited mobility or those in remote areas. Helping individuals manage responsibilities, such as childcare and work, allowed them to attend immunization appointments without significant disruption. Minimizing the opportunity costs associated with getting vaccinated, like time away from work or other essential activities, was crucial. Clear communication about what to expect and any necessary preparations ensured that individuals were well-prepared for their immunization appointments.

The focus of our work was on these first three stages. These initial stages set a strong foundation for the subsequent phases of the immunization journey. We therefore sought to understand the barriers and facilitators that caregivers of under immunized and zero-dose children experienced as they moved along these steps.

Behavioural and Social Drivers of Vaccination Framework

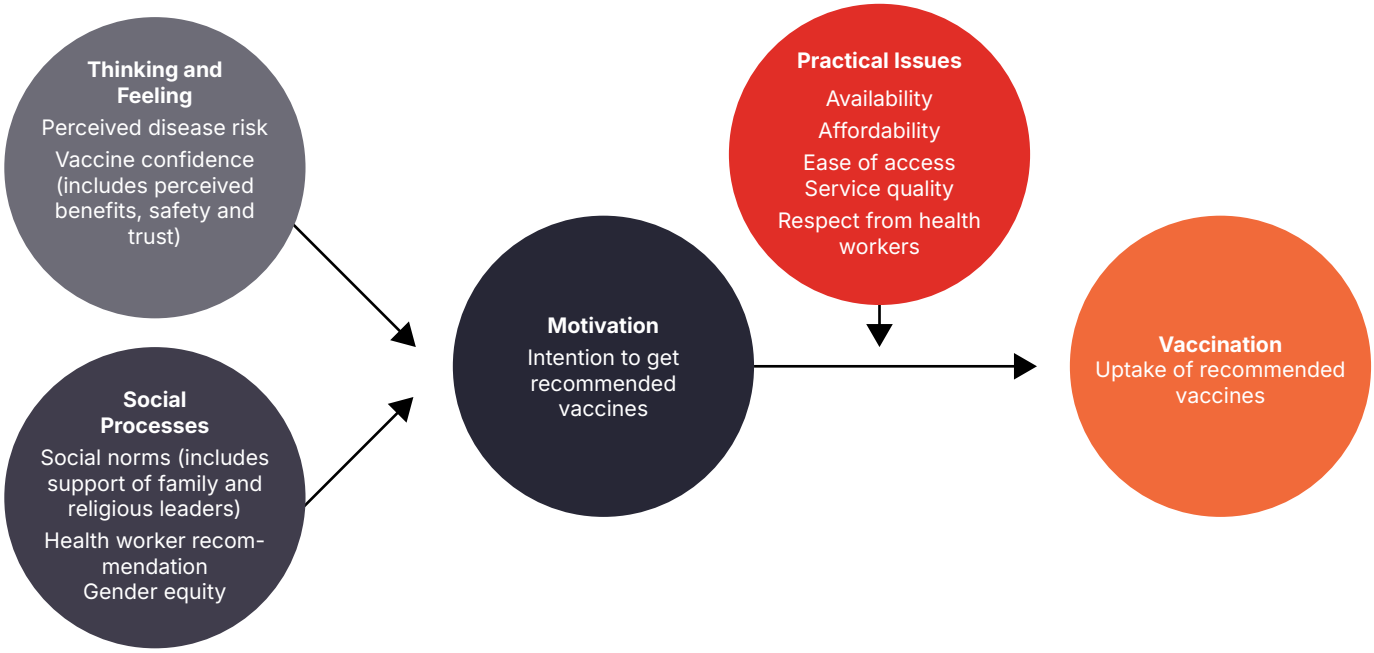

Figure 4: The Behavioral and Social Drivers of Vaccination Framework (WHO, 2022).

Our study was guided by the WHO's Behavioral and Social Drivers (BeSD) of Vaccination Framework as the central theoretical framework (World Heath Organization, 2022). The rapid literature review showed that while there were some studies on the correlates of vaccine uptake in Cameroon, very few explored the drivers that the WHO had assessed as critical for vaccine uptake (Figure 4).

The BeSD framework is a comprehensive tool that examines vaccination behaviors across four domains:

- Thinking and Feeling
- Social Processes
- Motivation
- Practical Issues

These domains encompass the full range of factors influencing vaccination decisions, from individual beliefs and social pressures to logistical and practical barriers. To measure these influences, the framework provides specially designed tools, including surveys and interview guides, to collect both qualitative and quantitative data that accurately reflect local and broader population attitudes towards immunization.

The data collected using these tools were then utilized to identify gaps in current strategies, guiding the development of targeted interventions aimed at improving vaccination coverage. Furthermore, the framework included detailed guidelines for adapting these tools to local contexts, ensuring the data remained relevant and accurate. This adaptation process incorporated cultural sensitivity, translation needs, and alignment with existing local healthcare practices. By focusing on these areas, the BeSD framework provided practical guidance that supported immunization program managers and health officials in achieving high vaccination uptake.

Since we also found a knowledge gap in the understanding of the disability, gender, and spiritual drivers, our theoretical basis included two more sources that guided the data collection into this topic. The first was World Vision's Spiritual Landscape Assessment (World Vision, 2022) and the second was World Vision's Guidelines for Mainstreaming Gender Equality and Social Inclusion and Social and Behavior Change strategies to effectively reach and ensure access for zero-dose children and their families (World Vision, 2023).

Study Location and Population

The research took place in the Nkolndongo Health District, located in Yaoundé, Centre Region. Zero-dose children posed a significant challenge throughout Cameroon. According to the 2023 EPI annual report, there were 125,102 zero-dose children nationwide, defined as those who had not received the Penta 1 vaccine. The Centre Region, which included the capital Yaoundé, had several districts with high numbers of zero-dose children. Among them, Nkolndongo stood out with 5,918 zero-dose children, the highest in the country.

The Centre Region, particularly Yaoundé, offered an ideal environment because it encompassed both urban and peri-urban populations with diverse socioeconomic characteristics.

Several factors underpinned the selection of Nkolndongo Health District as the study area:

- It had the highest number of zero-dose children nationwide (5,918), highlighting an urgent need for intervention.
- Its location within Yaoundé facilitated easier study access and management by the CHAC team.

- The district included a variety of residential areas, ranging from affluent neighborhoods to disadvantaged communities and informal settlements, thus providing a representative urban sample.

To ensure geographic diversity in site selection within Nkolndongo, we collaborated closely with the district health team to identify:

- Slum areas and informal settlements
- Areas with challenging geographic access
- Middle and upper-income residential areas
- Disadvantaged communities

This approach enabled us to capture a broad spectrum of experiences and barriers faced by caregivers across different socioeconomic and geographic contexts within the district. Our goal was to select 3-4 distinct areas within Nkolndongo that reflected this diversity. Due to budget constraints, CHAC chose to prioritize a health district near their office in Yaoundé for this initial study. This decision optimized resource use while addressing a critical need.

Selection Criteria

The study population included two groups:

- Caregivers of zero-dose children aged 0-24 months
- Caregivers of under immunized children aged 0-24 months

In this study, a **caregiver of children aged 0-24 months** was an individual who assumed the primary responsibility for the daily care and well-being of a child within this age group. This role encompassed a wide range of activities including feeding, bathing, providing emotional support, ensuring the child received appropriate medical care, and facilitating early childhood development. Caregivers could be biological parents, extended family members, foster or adoptive parents, or legal guardians. They were responsible for the child's physical, emotional, and social needs, and played a critical role in their growth and development.

Category 1: Biological Parents

- Mothers: Women who had given birth to the child
- Fathers: Men who had fathered the child

Category 2: Extended Family Members

- Grandparents: Elderly family members who took on a caregiving role
- Aunts and Uncles: Siblings of the child's parents who assisted in caregiving
- Older Siblings: Brothers or sisters who helped in looking after the younger child

Category 3: Foster Parents

- Individuals who had taken on the responsibility of raising the child temporarily or permanently, though not biologically related

Category 4: Adoptive Parents

- Individuals who had legally adopted the child and were responsible for their upbringing

Category 5: Legal Guardians

- Individuals who had been granted legal custody of the child and were responsible for their care

Inclusion criteria: Caregivers as defined above of children aged 0-24 months who:

- Had missed the DPT1 vaccine (zero-dose)
- Had missed the DPT3 vaccine (under immunized)
- Caregivers who had consented to participate in the study. According to Cameroonian law, consent forms were for those over 21 years old. If including individuals aged 15 and above, assent forms and parental authorization were required.
- All participants must have lived in the area for the past 12 months.

Exclusion criteria: Individuals who were not caregivers and/or those that had children over the age of 24 months.

Sampling Criteria

This study used purposive sampling to recruit participants for in-depth interviews. Purposive sampling was ideal for our qualitative study as it allowed us to specifically target caregivers of unimmunized and under-immunized children. They in turn identified other caregivers with children of the same vaccination status (snowballing sampling). This method enabled us to select participants who could provide detailed and relevant insights into the decision-making processes surrounding childhood immunization in communities where children were either zero-dose or under-immunized.

The sample consisted of caregivers of children aged 0-24 months who were either unimmunized (zero-dose) or under-immunized. Recruitment and data collection took place during October 2024 within designated areas of the Nkolndongo Health District in Yaoundé, identified in collaboration with the district health team. This method ensured comprehensive coverage of experiences and perspectives related to immunization decision-making in our target population. In the end, 138 interviews were conducted, with 135 valid interviews.

Data Collection Methods

Participants were recruited through local health departments, community centers, religious institutions, and via direct outreach at health facilities. We also worked with a network of Community Health Workers (CHWs) and other caregivers to identify relevant participants. We used household identification to identify participants. For sample size, we focused on the concept of saturation as it was a qualitative study.

Participant Selection and Recruitment:

- Trained data collectors interviewed caregivers (parents, guardians, or primary caretakers) of children aged 0-24 months who were either unimmunized (zero-dose) or under-immunized. Identification was age-specific for each vaccine, as households were most familiar with these, such as at 3 months, 6 months, 9 months, etc.
- Data collection occurred during October 2024.

Data Analysis Approach

The data analysis process for understanding vaccination uptake among caregivers of children aged 0-24 months in Yaoundé, Cameroon followed a structured and systematic approach. First, a team of data collectors underwent specialized training to conduct qualitative interviews, ensuring consistency in data collection using the BeSD framework. This framework provided a structured lens to examine caregivers' knowledge, attitudes, motivations, and practical challenges regarding childhood vaccination.

A total of 138 respondents (of which 135 were valid for analysis) participated in recorded in-depth interviews, exploring various factors influencing their vaccination decisions. Once the interviews were completed, they were transcribed to preserve the narratives for analysis. These transcripts were then processed using a custom Generative Pre-trained Transformer (GPT) using ChatGPT model 4o, designed to conduct sentiment analysis across the four main BeSD domains: Thinking and Feeling, Social Processes, Motivation, and Practical Issues. The model classified responses into subcategories such as trust in health systems, accessibility of services, and social influences, allowing for a nuanced understanding of decision-making patterns. The instructions used for the GPT can be found in Annex 3.

The GPT's role in the analysis involved structuring the transcripts into a tabular format based on BeSD categories, assigning sentiment scores, and generating a summary of the trends. This method provided a data-driven approach to understanding caregiver decision-making, highlighting gaps and opportunities to improve vaccination uptake. The results allowed for an interactive exploration of the dataset, making it easier to identify trends and extract insights for policy recommendations.

Sentiment analysis is a method used to determine whether opinions expressed in text are positive, negative, or neutral. It employs natural language processing (NLP) and machine learning algorithms to analyze text data.

In this research, sentiment analysis was chosen to evaluate caregivers' attitudes and perceptions about routine immunization. Using a custom GP model, the study analyzed sentiments across the BeSD domains: Thinking and Feeling, Social Processes, Motivation, and Practical Issues.

The reasons for choosing sentiment analysis include:

- **Detailed Understanding**: It provides insights into caregivers' emotions and attitudes, identifying barriers and facilitators to vaccination.
- **Structured Data**: It categorizes and quantifies subjective data, making it easier to spot trends and patterns.
- **Targeted Interventions**: It helps design interventions that address specific needs and concerns of different caregiver groups.
- **Efficiency**: It processes large volumes of qualitative data quickly and accurately.

To facilitate interpretation, the sentiment analysis results were color-coded based on their classification. Negative sentiments were assigned a red score (0), indicating distrust in vaccines, lack of access, or misinformation. Mixed responses received a yellow score (1), reflecting ambivalence, partial trust, or persistent barriers. Positive responses were marked in green (2), representing strong support for vaccination, confidence in the health system, and ease of access. These scores were systematically assigned across all subcategories within the BeSD framework.

Ethical Considerations

We abided by the standards set forth by World Vision International's Adult and Child Safeguarding Policy (World Vision, 2011).

Risks and Benefits

- **Risks:** There were no physical risks involved in taking part in the study, as no blood sampling or clinical examinations were planned. However, in an in-depth interview, some questions could cause respondents discomfort or embarrassment. Respondents could refuse to answer questions they were not comfortable with.
- **Benefits:** All identified zero-dose or under-vaccinated children were sensitized and offered vaccines. Caregivers of unimmunized or under-immunized children were given information on the benefits of vaccines, that catch up on vaccination was possible, and where they could access services. Standard available information leaflets were provided.

Measures Taken to Ensure Data Confidentiality and Respect for Participants' Privacy

Data confidentiality was rigorously maintained; all collected data was securely stored with access restricted to research team members only. Identifiable information was promptly anonymized, with electronic data kept on password-protected computers and physical data stored in locked cabinets within secure facilities. Participants' privacy was protected by conducting interviews and discussions in private settings, and they were informed that they could withdraw from the study at any time without consequences. All information is presented anonymously in any publications or reports to ensure no individual participant could be identified. Transportation allowances were provided to all focus group participants.

The complete research protocol and ethical approval documents can be found in Annex 1 and Annex 2.

Study Findings

Demographic Characteristics of Participants

Tables 1 provides a summary of the demographic characteristics of the study participants. In total, 135 participants were interviewed, covering the entire range of caregivers that were of interest to the study.

Child Immunization Status	Demographic Group	Gender	Number of participants	Average Age	Age Range
Zero-dose	Older Mothers 25+	Female	26	32	25-46
Zero-dose	Younger Mothers 15-24	Female	17	20	16-24
Zero-dose	Fathers 25+	Male	10	33	25-50
Zero-dose	Grandmothers	Female	13	57	38-69
Zero-dose	Grandfathers	Male	3	62	53-77
Zero-dose	Extended family	Female	6	28	20-53
Under-immunized	Younger Mothers 15-24	Female	20	21	16-24
Under-immunized	Older Mothers 25+	Female	24	30	25-43
Under-immunized	Fathers 25+	Male	7	34	28-40
Under-immunized	Grandmothers	Female	8	55	38-81
Under-immunized	Extended family	Male	1	47	NA
Total			**135**		

Table 1: Demographics of the study participants.

Focus of the Data Analysis in this Report

In this report, we decided to focus the detailed data analysis on caregivers of zero-dose children. The reason for this is that the data reveals mostly mixed sentiment among caregivers of under-immunized children, predominantly showing mixed scores across most domains, in contrast to the more extreme variations between positive and negative scores seen among caregivers of zero-dose children. For caregivers of under-immunized children, barriers seemed to be concentrated around social processes and practical issues. Therefore, interventions designed for caregivers of zero-dose children may have the same desired impact on caregivers of under-immunized children.

The consistency in moderate sentiment among under-immunized children's caregivers suggests that barriers are more about practical access and social support rather than strong ideological opposition. This makes the barriers more tangible and potentially more addressable through targeted interventions.

Nonetheless, the sentiment analysis for caregivers of under-immunized children has still been provided under Annex 4 and is therefore available to be analyzed at a later stage.

Caregivers with Zero-Dose Children: Decision-Making Processes on Routine Immunization as per the BeSD Framework

We have used the BeSD Framework to understand the factors that influence vaccination decision-making amongst various caregivers. We have provided the detailed sentiment analysis in Annex 4. In this section, we provide the high-level findings based on averages per sub-domain. In the case of mothers, we have provided comparisons that we found useful, such as understanding differences between younger and older mothers. For other groups, we have not provided this side-by-side comparison because it does not follow the same logic, and instead we have provided an overview of the findings per group. Following the presentation of the sentiment analysis, we have also provided a narrative analysis.

The insights are color-coded as follows:

Positive sentiment Mixed sentiment Negative sentiment

Differences in Thinking & Feeling Between Younger and Older Mothers of Zero-dose Children

	Thinking & Feeling (Older Mothers 25+)	Thinking & Feeling (Younger Mothers 15-24)
Knowledge	Women in this group show a mix of solid understanding and some expertise of vaccines, leaning towards positive knowledge levels.	Young mothers predominantly show positive knowledge levels of vaccines with a strong foundation of understanding, though some gaps remain.
Attitude	Views on vaccines are predominantly balanced, with some inclination towards favorable attitudes.	Notably positive attitudes of vaccines prevail among younger mothers, representing the strongest sentiment across all sub-domains.
Perception of risks & benefits	Older mothers tend to have more negative perceptions about the balance of risks and benefits of vaccines.	Generally positive, indicating most young mothers can effectively weigh the advantages against potential concerns of vaccines.
Trust in health systems and providers	Mixed trust levels prevail, with a slight tendency toward positive trust in healthcare providers.	Trust of vaccines is mixed, suggesting some challenges in healthcare provider relationships among young mothers.
Emotional responses to vaccination	Emotional reactions tend toward the negative, suggesting discomfort or anxiety about side effects of vaccines.	Emotional responses are mixed to negative, indicating this is an area needing attention for young mothers.

Figure 5: Comparison of Thinking & Feeling domain between Older and Younger Mothers of zero-dose children.

"J'ai seulement dit que les vaccins sont importants. Quand l'enfant né, on doit seulement vacciner l'enfant."
"I only said that vaccines are important. When a child is born, we should simply vaccinate the child."
- Younger Mother (MIM2_028)

The comparison of Thinking & Feeling domains between younger and older mothers of zero-dose children reveals notable generational differences in their thoughts about routine immunization. Both age groups demonstrate positive knowledge levels, though **younger mothers show a more consistently positive foundation of understanding**, coupled with notably stronger positive attitudes toward

vaccination. A **clear generational divide emerges in risk perception, where older mothers tend to have more negative perceptions about the risk-benefit balance**, while younger mothers demonstrate a better ability to weigh advantages against potential concerns.

Trust in healthcare systems shows mixed levels across both groups, with older mothers displaying a slight tendency toward positive trust, while younger mothers face some specific challenges in their healthcare provider relationships. Perhaps most significantly, **emotional responses emerge as a concerning area for both age groups, with both younger and older mothers tending toward negative emotions or anxiety about vaccination.** This emotional aspect appears to be a significant challenge that transcends age differences.

> *"Elle a eu son inflammation à 9 mois , j'ai encore poursuivi avec que la suite là ce qui ne l'a pas dérangé mais vraiment ça m'a traumatisé."*
> *"She had her inflammation [from a vaccine] at 9 months, and I continued with the rest [of the vaccinations], which didn't bother her, but it really traumatized me."*
> *- Older Mother (MIM2_006)*

Differences in Social Processes Between Younger and Older Mothers of Zero-dose Children

Positive sentiment Mixed sentiment Negative sentiment	**Social Processes (Older Mothers 25+)**	**Social Processes (Younger Mothers 15-24)**
Influence of family and friends	Family and friend influence shows the strongest social impact with mixed to positive sentiment, though some still report negative influence.	Family and friend influence shows generally positive to mixed sentiment, indicating meaningful social support from close relationships.
Social norms regarding vaccination	Social norms have limited positive impact, with a majority showing negative sentiment and many showing mixed feelings, indicating vaccination may not be well-established as a social norm.	Social norms demonstrate the strongest positive influence within this group, with mixed to positive sentiment, suggesting vaccination is perceived as more normalised for this group.
Cultural beliefs and traditions	Cultural beliefs predominantly show negative sentiment, suggesting cultural factors may be creating barriers rather than support for vaccination.	Cultural beliefs show predominantly mixed sentiment, with no strongly positive responses, indicating cultural factors have a moderate but not fully supportive influence.
Community-level engagement and influence	Community engagement shows the lowest average score with predominantly negative sentiment, indicating a significant lack of community-level support and involvement.	Community engagement remains very low, suggesting a significant disconnect at the community level.
Peer pressure and shared experiences	Peer influence shows predominantly negative sentiment, suggesting peer networks aren't effectively supporting vaccination behaviors.	Peer influence shows predominantly negative sentiment, indicating peer networks aren't effectively supporting vaccination behaviors.

Figure 6: Comparison of Social Processes domain between Older and Younger Mothers of zero-dose children.

The comparison of social processes between younger and older mothers of zero-dose children reveals significant generational differences in how social factors influence vaccination decisions. In terms of family and friend influence, younger mothers demonstrate more consistently positive responses and generally supportive immediate social networks, while older mothers show greater variability in their experiences, ranging from negative to positive influence. **A notable generational contrast emerges in social norms, where younger mothers perceive vaccination as more normalized within their peer group**, while older mothers report limited positive impact and often express negative or mixed feelings about vaccination as a social norm, suggesting a gradual generational shift in vaccination acceptance.

"Mes sœurs disent que c'est bien de vacciner les enfants, ils seront épargnés de certaines maladies."
"My sisters say it's good to vaccinate children, they will be protected from certain diseases."
- Younger Mother (ESS_029)

"Mon mari, lui, il a sa part de conception. Bon, il ne m'a jamais encouragé dans ce domaine... Donc lui-même, il n'a pas la tête à ça... Je ne peux pas accepter. Je ne peux pas accepter... Même les voisins, je ne suis pas en contact."
"My husband has his own way of thinking. Well, he's never encouraged me in this area... So he's not really interested in it... I can't accept that. I just can't accept it... Even with the neighbors, I'm not in contact."
- Older Mother (EMO_027)

Cultural beliefs present challenges for both groups, though with different manifestations. Older mothers report predominantly negative sentiment, with cultural beliefs actively creating barriers to vaccination, while younger mothers show more mixed responses, indicating that while cultural factors aren't fully supportive, they may be less inhibiting for the younger generation. **Community engagement emerges as a shared concern, with both age groups showing troublingly low levels of community involvement.** Both younger and older mothers demonstrate predominantly negative sentiment regarding community-level support, suggesting this is a broader cultural issue that transcends age differences.

Peer pressure and shared experiences present challenges across both groups, with **neither younger nor older mothers reporting effective peer support systems for vaccination behaviors**. These findings carry important implications for intervention strategies, suggesting the **need for targeted approaches that can build on the more positive social norms** present among younger mothers while addressing cultural barriers more intensively with older mothers. Additionally, there appears to be a clear need for strengthened community engagement mechanisms and more effective peer support systems for both age groups.

"Est-ce que vous parlez souvent de la vaccination avec des personnes, des gens ? Non. Que ce soit à la maison, que ce soit avec vos frères, les camarades, les collègues, les oncles, les amis. Est-ce que vous parlez souvent avec eux ? Non."
"Do you often talk about vaccination with people, with others? No. Whether at home, with your siblings, classmates, colleagues, uncles, or friends, do you often talk with them? No."
- Younger Mother (MIM1_007)

Differences in Motivation Between Younger and Older Mothers of Zero-dose Children

Positive sentiment Mixed sentiment Negative sentiment	Motivation (Older Mothers 25+)	Motivation (Younger Mothers 15-24)
Intrinsic motivation	Strong internal drive, suggesting personal conviction plays a significant role in vaccination decisions.	Consistently strong internal drive with the majority showing positive sentiment, indicating high personal conviction towards vaccination.
Extrinsic motivation	External motivators show limited effectiveness with predominantly negative sentiment, indicating that external rewards or pressures aren't significantly influencing vaccination choices.	Generally positive response to external motivators with the majority showing mixed to positive sentiment, suggesting external factors have meaningful influence.
Personal priorities and competing demands	Personal priorities show a moderate influence with mixed sentiment, suggesting competing demands have a notable but not determining impact on vaccination decisions.	Predominantly mixed sentiment regarding personal priorities, indicating competing demands remain a consideration but not a major barrier.
Perceived importance of vaccination	The perceived importance of vaccination shows generally positive trends with most expressing mixed to positive sentiment, indicating growing recognition of vaccination's value.	Very strong recognition of vaccination's importance, demonstrating high value placed on vaccination.
Influence of authority figures or trusted sources	Authority figures maintain substantial influence with most showing mixed to positive sentiment, suggesting healthcare providers and community leaders play a meaningful role in vaccination decisions.	Strong positive influence from authority figures, indicating healthcare providers and trusted sources have significant impact on vaccination decisions.

Figure 7: Comparison of Motivation domain between Older and Younger Mothers of zero-dose children.

"Parce que je vois que le vaccin est important. C'est tout ce que moi je connais... C'est venu de moi-même d'aller vacciner mon enfant."
"Because I see that vaccination is important. That's all I know... It was my own decision to go and vaccinate my child."
- Younger Mother (EMO_028)

The comparison of motivational factors between younger and older mothers of zero-dose children reveals interesting generational differences in what drives vaccination decisions. For intrinsic motivation, both age groups show strong internal drive, though it manifests differently. Younger mothers demonstrate consistently positive sentiment with high personal conviction, while older mothers' internal drive, though strong, appears to be more variable in its influence on vaccination decisions.

A notable contrast emerges in extrinsic motivation patterns, for example from family members and siblings. **Younger mothers show a generally positive response to external motivators, with the majority demonstrating receptiveness to external factors**. In contrast, older mothers display predominantly negative sentiment toward external motivators, suggesting that rewards or external pressures aren't significantly influencing their vaccination

"Mon frère bien sûr, vu qu'il est infirmier... Il insiste sur la vaccination, il est vraiment inquiet... Il joue un grand rôle... Le vaccin est bien pour les enfants car sa protège leurs corps et ça leurs évite plusieurs maladies tels que la polio, méningites..."
"My brother, of course (since he's a nurse) he insists on vaccination. He's really concerned... He plays a big role. Vaccines are good for children because they protect their bodies and prevent many diseases like polio and meningitis."
- Younger Mother (ESS_033)

> *"C'était toujours par les conseils des médecins qu'on comprenait que le vaccin est bien pour l'enfant... Mais l'enfant là, c'est comme si ça m'a découragée... chaque fois que je la vaccinais, la semaine, on se retrouvait pour l'hospitaliser. Jusqu'à ce qu'elle est partie."*
> *"It was always through doctors' advice that we understood vaccines are good for children... But that child, it's as if she discouraged me... Every time I vaccinated her, within the week, we ended up in the hospital. Until she passed away."*
> *- Older Mother (MIM2_011)*

choices. This generational difference might indicate a shift in how external influences are perceived and processed between age groups.

Personal priorities and perceived importance show interesting variations between the groups. **Younger mothers express predominantly mixed sentiment regarding personal priorities, though these competing demands such as working aren't major barriers.** Older mothers similarly show moderate influence from personal priorities, but with more variation in how these priorities impact their decisions. Regarding perceived importance, both groups demonstrate positive trends, though **younger mothers show particularly strong recognition of vaccination's value**, suggesting a potentially stronger educational impact on the younger generation.

The influence of authority figures such as nurses presents as significant for both groups but manifests differently. Younger mothers show strong positive influence from healthcare providers and trusted sources, indicating these relationships significantly impact their vaccination decisions**. Older mothers also acknowledge the substantial influence of authority figures, but with more mixed sentiment, suggesting a more complex relationship with healthcare providers and community leaders.** These findings suggest that while both age groups are influenced by authority figures, the nature and extent of this influence varies by generation, potentially requiring different approaches to healthcare communication and support for each group.

Differences in Practical Issues Between Younger and Older Mothers of Zero-dose Children

Positive sentiment Mixed sentiment Negative sentiment	Practical Issues (Older Mothers 25+)	Practical Issues (Younger Mothers 15-24)
Accessibility of vaccination services	Mixed accessibility experiences, suggesting varied access challenges across different communities.	Strong positive sentiment toward accessibility, indicating generally good access to vaccination services.
Availability of vaccines and health workers	Predominantly negative sentiment about availability, indicating significant challenges with vaccine and healthcare worker supply.	Generally positive availability, suggesting relatively good perception of supply of vaccines and healthcare workers.
Affordability	Mostly mixed sentiment regarding cost of travel, with some negative experiences requesting payment for things like vaccine books, suggesting affordability is a moderate but not insurmountable barrier.	Predominantly mixed to positive views on affordability, though with some notable negative experiences, indicating cost is manageable for most but remains a barrier for some.
Convenience	Generally favorable convenience ratings, indicating vaccination services are reasonably well-organized for most.	Strong tendency toward mixed experiences with convenience, suggesting vaccination services are adequately organized but with room for improvement.
Structural Barriers	Predominantly mixed experiences with structural barriers, suggesting systemic challenges exist but aren't completely inhibiting access.	Mixed experiences with structural challenges, with a notable portion reporting negative experiences, indicating systemic obstacles remain a significant consideration.

Figure 8: Comparison of Practical Issues domain between Older and Younger Mothers of zero-dose children.

"Mon temps est souvent surchargé... Je ne peux pas faire le marché, la cuisine, tout ça... Je n'ai pas le temps de me balader."
"My time is often overloaded... I can't manage the market, cooking, all of that... I don't have time to go out."
Older Mother (MIM2_026)

The comparison of practical issues between younger and older mothers of zero-dose children reveals notable generational differences in how they experience vaccination services. Accessibility shows a clear contrast, with younger mothers reporting strong positive sentiment and generally good access to vaccination services, while older mothers experience mixed accessibility challenges that vary across different communities. This generational gap is particularly evident in the availability of vaccines and health workers, where younger mothers report generally positive availability and good perception of supply, while **older mothers face predominantly negative experiences with significant challenges in accessing both vaccines and healthcare workers.**

Affordability presents challenges for both groups but manifests differently. Younger mothers show mixed to positive views on affordability, though cost remains a barrier for some, while older mothers report mostly mixed sentiment with some negative experiences, suggesting cost is a moderate but not insurmountable barrier across both age groups. Convenience ratings also show interesting variations, with younger mothers indicating strong tendency toward mixed experiences but with adequate organization, while older mothers report generally favorable convenience ratings, suggesting vaccination services are reasonably well-organized for most but with room for improvement.

Structural barriers appear to be a persistent challenge across both age groups but with different manifestations. Younger mothers report mixed experiences with structural challenges and a notable portion

reporting negative experiences, while older mothers face predominantly mixed experiences with systemic challenges that exist but aren't completely inhibiting access. These findings suggest that while both age groups face practical challenges in accessing vaccination services, **younger mothers generally report more positive experiences across most dimensions, particularly in accessibility and availability. This could indicate either improved service delivery for younger mothers or potentially different expectations and resources between the age groups.** The findings highlight the need for targeted interventions that address the specific practical challenges faced by each age group, with particular attention to improving vaccine and healthcare worker availability for older mothers and addressing structural barriers for both groups.

Thinking & Feeling Amongst Fathers of Zero-dose Children

Positive sentiment Mixed sentiment Negative sentiment	**Thinking & Feeling (Fathers)**
Knowledge	Knowledge levels show an even split between negative and mixed sentiment, with only a small portion showing positive knowledge levels, suggesting significant gaps in vaccination understanding.
Attitude	Vaccination attitudes mirror the knowledge pattern, indicating potential correlation between knowledge and attitude formation.
Perception of risks & benefits	Overwhelmingly negative perception of risks and benefits, suggesting a critical need to address risk communication and benefit understanding.
Trust in health systems and providers	Similarly low trust levels with negative sentiment indicates a fundamental breakdown in healthcare provider relationships.
Emotional responses to vaccination	Emotional responses are mixed, with few positive emotional responses, suggesting widespread emotional barriers to vaccination.

Figure 9: Thinking & Feeling amongst Fathers of zero-dose children.

"Les vaccins qu'il y a eu, c'est des vaccins qui vont juste paralyser les enfants... j'ai vu au moins deux cas... un enfant qui n'a même plus les vaccins... les boutons sortaient sur lui."
"The vaccines that were given, they only end up paralyzing children... I've seen at least two cases... one child doesn't even get vaccinated anymore... he had rashes all over his body."
Father (MIM2_033)

The analysis of Thinking & Feeling among fathers of zero-dose children reveals concerning patterns across all dimensions of vaccination attitudes and understanding. **Knowledge and attitudes appear to be closely interlinked**, with both showing an even split between negative and mixed sentiment, and notably few fathers demonstrating positive knowledge levels or attitudes. This correlation suggests that fathers' attitudes toward vaccination may be fundamentally shaped by their level of understanding, highlighting a critical need for better educational engagement.

A particularly troubling finding emerges in the perception of risks and benefits, where fathers show overwhelmingly negative sentiment. This suggests a fundamental misunderstanding or miscommunication of vaccination's risk-benefit profile, which likely serves as a significant barrier to vaccination uptake. Similarly concerning is the **extremely low trust in health systems and providers**, indicating a breakdown in relationships between fathers and healthcare providers that could be undermining vaccination efforts.

The emotional dimension adds another layer of complexity, with **emotional responses showing predominantly mixed sentiment and very few positive emotional associations** with vaccination. This widespread presence of emotional barriers, combined with the knowledge gaps and trust issues, creates a challenging environment for promoting vaccination. The findings suggest that fathers' resistance to vaccination isn't simply a matter of lack of information, but rather a complex interplay of insufficient knowledge, negative risk perceptions, broken trust relationships, and emotional barriers.

Social Processes Amongst Fathers of Zero-dose Children

Positive sentiment Mixed sentiment Negative sentiment	**Social Processes (Fathers)**
Influence of family and friends	Family and friend influence shows overwhelmingly negative sentiment, indicating minimal social support from close relationships for vaccination decisions.
Social norms regarding vaccination	Social norms show predominantly negative sentiment, suggesting vaccination isn't well-established as a social norm among fathers.
Cultural beliefs and traditions	Cultural beliefs show universally negative sentiment, indicating cultural factors may be creating significant barriers to vaccination acceptance.
Community-level engagement	Community engagement shows very low levels, suggesting a critical lack of community involvement in vaccination support.
Peer pressure and shared experiences	Peer influence demonstrates predominantly negative sentiment, indicating peer networks aren't providing support for vaccination behaviors.

Figure 10: Social Processes amongst Fathers of zero-dose children.

"Comme j'avais pris l'exemple avec le corona... les blancs sont en train de développer des choses qu'on ne comprend pas... C'est la raison pour laquelle je ne veux pas vacciner mes enfants."
"Like I said with the example of COVID... white people are developing things we don't understand... That's why I don't want to vaccinate my children."
Father (MIM2_041)

The analysis of social processes among fathers of zero-dose children reveals a concerning pattern of comprehensive social disconnection and negative sentiment across all dimensions. **Family and friend influence shows overwhelmingly negative sentiment**, indicating that fathers are receiving minimal support from their closest relationships in making vaccination decisions. This isolation extends to broader social contexts, where **social norms demonstrate predominantly negative sentiment**, suggesting that vaccination hasn't been established as a normalized behavior among fathers in these communities.

The findings become even more troubling when examining cultural and community aspects. **Cultural beliefs show universally negative sentiment**, indicating that cultural factors may be actively creating barriers to vaccination acceptance rather than supporting it. This cultural resistance is compounded by **critically low levels of community engagement**, pointing to a fundamental disconnect between vaccination programs and community involvement of fathers. The peer influence dimension reinforces this pattern of isolation.

These findings paint a picture of fathers who are essentially operating in a **social vacuum regarding vaccination decisions**, with negative influences or absence of support across all social dimensions. **The**

universal presence of negative sentiment across different social processes suggests a systemic failure to engage fathers in vaccination programs through social channels. This comprehensive lack of social support likely creates a reinforcing cycle where the absence of positive social influences further entrenches negative attitudes and behaviors toward vaccination.

Motivation Amongst Fathers of Zero-dose Children

Positive sentiment Mixed sentiment Negative sentiment	**Motivation (Fathers)**
Intrinsic motivation	Fathers have very low internal drive toward vaccination decisions.
Extrinsic motivation	External motivators appear to have almost no positive influence on fathers' vaccination decisions.
Personal priorities	Mostly negative, and there is little recognition of vaccination's importance within personal priorities.
Perceived importance	There is little recognition of vaccination's importance with predominantly negative sentiment.
Authority influence	The strong negative sentiment suggests fathers are largely unresponsive to or distrustful of authority figures regarding vaccination.

Figure 11: Motivation amongst Fathers of zero-dose children.

> *"L'homme blanc qui se cache derrière les vaccins cherche le moyen de réduire les africaines sur terre."*
> *"The white man behind the vaccines is looking for a way to reduce the African population on Earth."*
> *- Father (ESS_036)*

The analysis of motivational factors among fathers of zero-dose children reveals a deeply concerning pattern of disengagement and negative sentiment across all motivational dimensions. **Fathers demonstrate very low internal drive toward vaccination decisions**, indicating a fundamental lack of personal investment in vaccination outcomes. This is compounded by the finding that **external motivators appear to have almost no positive influence** on their vaccination decisions.

The findings become more troubling when examining personal priorities and perceived importance. **There is little recognition of vaccination's importance within fathers' personal priorities**, with predominantly negative sentiment suggesting that vaccination is **not being integrated into their parental responsibilities**. This lack of prioritization aligns with the broader pattern of **little recognition of vaccination's overall importance**, indicating a fundamental disconnect between vaccination programs and fathers' perception of child health needs.

Perhaps most significantly, the data shows that **fathers are largely unresponsive to or distrustful of authority figures regarding vaccination**. This strong negative sentiment toward authority influence suggests a breakdown in trust between fathers and healthcare providers or community leaders. **When viewed collectively, these findings paint a picture of fathers who are fundamentally disconnected from vaccination programs across all motivational dimensions - internally, externally, personally, and institutionally**. If there are approaches to engaging fathers in vaccination decisions, they are failing at multiple levels and indicate a need for comprehensive reimagining of how vaccination programs approach and engage fathers in their children's immunization decisions.

Practical Issues Amongst Fathers of Zero-dose Children

Positive sentiment Mixed sentiment Negative sentiment	**Practical Issues (Fathers)**
Accessibility of vaccination services	Mixed picture with split between negative and positive sentiment, suggesting variable access across different locations or communities.
Availability of vaccines and health workers	Predominantly negative sentiment indicates significant challenges with vaccine and healthcare worker supply.
Affordability	Mostly mixed sentiment with some negative experiences suggesting cost is a moderate concern but not the primary barrier.
Convenience	Predominantly negative to mixed experiences, indicating significant challenges with service convenience.
Structural barriers	Strong negative sentiment with some mixed experiences suggesting persistent systemic obstacles to vaccination access.

Figure 12: Practical Issues amongst Fathers of zero-dose children.

"Je n'ai pas voulu qu'on continue qu'il prenne les vaccins... Parce qu'il y a eu des mauvaises choses."
"I didn't want them to continue giving him vaccines... Because there were bad things."
- Father (MIM2_033)

The analysis of practical issues among fathers of zero-dose children reveals a complex landscape of barriers and challenges across multiple dimensions. **Accessibility of vaccination services shows a notable division**, with experiences split between negative and positive sentiment, suggesting significant disparities in access depending on location or community. This variability is contrasted by the **predominantly negative sentiment regarding vaccine and healthcare worker availability**, indicating substantial systemic challenges in service delivery and staffing.

The financial aspect, represented by affordability, presents a more nuanced picture, with **mostly mixed sentiment suggesting that while cost is a concern, it's not the primary barrier** preventing vaccination. However, the practical challenges become more pronounced when examining convenience factors, where **predominantly negative to mixed experiences indicate significant issues with service delivery arrangements**. This suggests that even when services are affordable, the way they are organized may not accommodate fathers' needs or schedules.

Perhaps most concerning is the presence of significant trust barriers, with **strong negative sentiment indicating persistent systemic obstacles** to vaccination access. When viewed collectively, these findings suggest a multi-layered problem where even when one barrier (such as affordability) is manageable, others (like availability and convenience) create cumulative challenges that make vaccination access difficult. The variable nature of these barriers across different locations suggests that solutions need to be locally tailored while addressing fundamental systemic issues regarding trust.

Thinking & Feeling Amongst Grandmothers of Zero-dose Children

Positive sentiment Mixed sentiment Negative sentiment	**Thinking & Feeling (Grandmothers)**
Knowledge about vaccination	Grandmothers show primarily mixed to positive knowledge levels, though many show negative knowledge suggesting variable understanding across the age group.
Attitudes towards vaccination	Attitudes are predominantly mixed with some negative sentiment, indicating varied but generally cautious perspectives toward vaccination.
Perceived risks and benefits	Risk perception shows a concerning pattern with more than half expressing negative views and no positive perceptions, suggesting significant concerns about vaccination safety and benefits.
Trust in health systems and providers	Trust levels mirror attitudes with predominantly mixed sentiment, indicating variable relationships with healthcare providers.
Emotional responses to vaccination	Emotional responses show the most positive trend with many showing mixed to positive responses, suggesting better emotional engagement compared to other domains.

Figure 13: Thinking & Feeling amongst Grandmothers of zero-dose children.

"Que c'est les blancs qui ont créé les vaccins pour tuer les enfants... injecter la maladie aux enfants»
"The white people who created the vaccines are trying to kill children... injecting disease into them."
- Grandmother (ESS_007)

The analysis of Thinking & Feeling among grandmothers of zero-dose children reveals a complex mix of perspectives and concerns across different domains. **Knowledge levels show encouraging signs**, with grandmothers demonstrating primarily mixed to positive understanding, though the variable comprehension across the age group suggests uneven access to or uptake of vaccination information. This variability extends to their attitudes, where predominantly mixed sentiment with some negative views **indicates a generally cautious approach to vaccination rather than outright rejection.**

A particularly concerning finding emerges in the perception of risks and benefits, where **more than half of grandmothers express negative views with no positive perceptions** recorded. This suggests deep-seated concerns about vaccination safety and benefits that could significantly influence family vaccination decisions. **These concerns were most pronounced for vaccinations that took place in the community and outside of public health facilities.** Trust in health systems mirrors the pattern seen in attitudes, with **predominantly mixed sentiment indicating variable relationships** with healthcare providers, suggesting inconsistent experiences with health services.

However, a more promising aspect emerges in the emotional domain, where responses **show the most positive trend among all dimensions**, with many grandmothers demonstrating mixed to positive emotional engagement. This better emotional engagement compared to other domains suggests a potential pathway for intervention. **Anecdotal evidence also suggests that grandmothers have a better understanding of the benefits of vaccination given their knowledge of times when vaccines were scarce.**

Social Processes Amongst Grandmothers of Zero-dose Children

Positive sentiment Mixed sentiment Negative sentiment	**Social Processes (Grandmothers)**
Influence of family and friends	Family influence shows a nearly even split between negative and mixed sentiment, suggesting variable social support from close relationships.
Social norms regarding vaccination	Social norms show the strongest positive trend with predominantly mixed sentiment, indicating vaccination may be becoming more socially accepted among grandmothers.
Cultural beliefs and traditions	Cultural beliefs show predominantly negative sentiment, suggesting cultural factors may create significant barriers to vaccination acceptance.
Community-level engagement	Very low community engagement with negative sentiment indicates a critical lack of community-level support for vaccination.
Peer pressure and shared experiences	Peer influence shows predominantly negative sentiment, suggesting peer networks aren't effectively supporting vaccination behaviors.

Figure 14: Social Processes amongst Grandmothers of zero-dose children.

"On parle dans notre association au quartier. Certaines personnes acceptent de vacciner leurs enfants mais d'autres sont catégoriques... la vaccination ne nous apporte rien."
"We talk about it in our neighborhood association. Some people agree to vaccinate their children, but others are very firm... they say vaccination brings us nothing."
- Grandmother (ESS_004)

The analysis of social processes among grandmothers of zero-dose children reveals a complex pattern of social influences with varying levels of impact. **Family influence demonstrates a notable division**, with an almost even split between negative and mixed sentiment, suggesting that close family relationships provide inconsistent support for vaccination decisions. However, a more promising trend emerges in social norms, where **predominantly mixed sentiment indicates that vaccination may be gradually gaining social acceptance** among grandmothers, potentially creating a foundation for positive change.

The findings become more concerning when examining cultural and community dimensions. Cultural beliefs show predominantly negative sentiment, suggesting that traditional beliefs and practices may be actively creating barriers to vaccination acceptance. This cultural resistance is compounded by very low community engagement with negative sentiment, indicating a critical lack of community-level support systems for vaccination. The peer influence dimension further reinforces this pattern of social disconnection, with predominantly negative sentiment suggesting that peer networks aren't effectively supporting vaccination behaviors. These findings paint a picture of grandmothers operating in a socially complex environment where emerging positive social norms are counterbalanced by strong cultural barriers and weak community support. The contrast between the gradually improving social acceptance and the persistent cultural and community barriers suggests a transition period in vaccination attitudes among grandmothers. Special attention should be paid to strengthening peer networks and community engagement, as these appear to be particularly weak points in the social support structure for vaccination among grandmothers.

Motivation Amongst Grandmothers of Zero-dose Children

Positive sentiment Mixed sentiment Negative sentiment	**Motivation (Grandmothers)**
Intrinsic motivation	Strong showing of mixed to positive internal drive, indicating grandmothers have relatively good personal conviction about vaccination.
Extrinsic motivation	Almost even split between negative and mixed responses with minimal positive sentiment, suggesting external motivators have limited effectiveness.
Personal priorities	Predominantly negative sentiment with no positive responses, indicating vaccination isn't well-integrated into grandmothers' personal priority frameworks.
Perceived importance	Strong tendency toward mixed to positive views, suggesting generally good recognition of vaccination's value.
Authority influence	Most positive average among all domains with balanced distribution across all sentiments, indicating authority figures maintain meaningful influence with grandmothers.

Figure 15: Motivation amongst Grandmothers of zero-dose children.

«Moi même... je refuse les vaccins donnent au quartier.»
"I myself refuse the vaccines given in the neighborhood."
- Grandmother (ESS_003)

The analysis of motivational factors among grandmothers of zero-dose children reveals an interesting mix of positive potential and significant challenges. **Strong internal motivation emerges as a strength**, with grandmothers demonstrating good personal conviction about vaccination through mixed to positive internal drive. This internal motivation is particularly noteworthy when contrasted with **external motivators, which show limited effectiveness** with an almost even split between negative and mixed responses and minimal positive sentiment.

A significant challenge appears in the area of personal priorities, where predominantly negative sentiment with no positive responses indicates that vaccination hasn't been effectively integrated into grandmothers' priority frameworks. However, this is balanced by more promising findings regarding perceived importance, where there is a strong tendency **toward mixed to positive views**, suggesting that grandmothers generally recognize vaccination's value even if they haven't prioritized it in their personal decision-making.

Perhaps most significantly, **authority figures maintain meaningful influence with grandmothers**, showing the most positive average among all domains with a balanced distribution across sentiments. This finding, combined with the strong internal motivation and recognition of vaccination's importance, suggests potential pathways for intervention. The data indicates that while grandmothers have some foundational positive elements in their motivation (internal drive, perceived importance, and responsiveness to authority), there's a disconnect in translating this into personal priorities and actions.

Practical Issues Amongst Grandmothers of Zero-dose Children

Positive sentiment Mixed sentiment Negative sentiment	**Practical Issues (Grandmothers)**
Accessibility of vaccination services	Strong positive trend, suggesting generally good access to vaccination services.
Availability of vaccines and health workers	Mixed to positive responses, indicating relatively reliable vaccine and healthcare worker supply.
Affordability	Predominantly negative sentiment with no positive responses, suggesting cost is a significant barrier for grandmothers.
Convenience	Even split between negative and mixed experiences, indicating variable challenges with service convenience.
Structural barriers	Strong negative sentiment, suggesting persistent systemic obstacles to vaccination access.

Figure 16: Practical Issues amongst Grandmothers of zero-dose children.

"Parce que quand tu amènes un bébé, on peut peut-être t'exiger qu'il fasse trois pévisions... le montant... tu as fini par rentrer ton bébé à la maison... on doit ramener le coût des bébés au plus bas prix..."
"Because when you bring a baby, they might require you to make three payments... the amount... you end up taking your baby back home... we need to reduce the cost of care for babies to the lowest possible price."
- Grandmother (ESS_017)

The analysis of practical issues among grandmothers of zero-dose children reveals a complex mix of enabling and inhibiting factors affecting vaccination access. **Accessibility and availability show notably positive trends**, with grandmothers reporting generally good access to vaccination services and relatively reliable vaccine and healthcare worker supply. This suggests that the basic infrastructure for vaccination delivery is functioning reasonably well in their communities.

However, significant barriers emerge in other practical dimensions. **Affordability emerges as a major concern**, with predominantly negative sentiment and no positive responses, indicating that cost represents a substantial barrier for grandmothers in accessing vaccination services. The convenience factor shows a mixed picture, with **an even split between negative and mixed experiences**, suggesting that while some grandmothers find services manageable, others face significant challenges with service arrangements and timing.

Perhaps most concerning is the presence of **strong negative sentiment regarding structural barriers**, indicating persistent systemic obstacles to vaccination access. This creates an interesting paradox where, despite relatively good physical access and availability of services, other practical barriers – particularly cost and structural issues – may be preventing effective utilization of these services. The findings suggest that while the fundamental service infrastructure exists, **secondary barriers are creating significant obstacles** to actually accessing these services. This points to the need for interventions that address affordability concerns and structural barriers while maintaining the positive aspects of accessibility and availability, perhaps through targeted financial support mechanisms and systemic reforms to address structural challenges.

Thinking & Feeling Amongst Grandfathers of Zero-dose Children

Positive sentiment Mixed sentiment Negative sentiment	**Thinking & Feeling (Grandfathers)**
Knowledge about vaccination	Knowledge shows predominantly mixed sentiment, suggesting moderate but limited understanding of vaccination.
Attitudes towards vaccination	Predominantly negative attitudes, indicating generally unfavorable views toward vaccination.
Perceived risks and benefits	Universally negative perception of risks and benefits, suggesting significant concerns about vaccination safety and efficacy.
Trust in health systems	Predominantly negative trust levels, indicating significant challenges in healthcare provider relationships.
Emotional responses	Similar to trust levels, emotional responses show predominantly negative sentiment, suggesting significant emotional barriers to vaccination.

Figure 17: Thinking & Feeling amongst Grandfathers of zero-dose children.

«Ils ne m'ont pas dit ce qu'il faut faire quand un enfant tombe malade après le vaccin... Non, ils ne m'ont rien dit."
"They didn't tell me what to do if a child gets sick after the vaccine... No, they didn't tell me anything."
- Grandfather (MIM2_020)

The analysis of Thinking & Feeling among grandfathers of zero-dose children reveals a concerning pattern of negative sentiments and limited engagement across all dimensions. **While knowledge levels show predominantly mixed sentiment**, suggesting moderate understanding, this is qualified by clear limitations in vaccination comprehension. This limited knowledge base appears to contribute to **predominantly negative attitudes**, indicating generally unfavorable views toward vaccination.

The findings become particularly concerning when examining risk perception, where there is **universally negative perception of risks and benefits**, suggesting significant and widespread concerns about vaccination safety and efficacy. This negative risk perception is compounded by **predominantly negative trust levels** in health systems, indicating fundamental challenges in relationships with healthcare providers. The emotional dimension mirrors these trust issues, with **predominantly negative emotional responses** suggesting significant psychological barriers to vaccination acceptance.

This comprehensive pattern of negative sentiments across all dimensions suggests a deeply rooted resistance to vaccination among grandfathers. The combination of limited knowledge, negative attitudes, universal concerns about risks, low trust in health systems, and negative emotional responses creates a mutually reinforcing cycle of vaccination hesitancy.

Social Processes Amongst Grandfathers of Zero-dose Children

Positive sentiment Mixed sentiment Negative sentiment	Social Processes (Grandfathers)
Influence of family and friends	Universal negative sentiment indicates complete absence of positive family and social support for vaccination.
Social norms regarding vaccination	Uniformly negative response suggests vaccination is not at all established as a social norm among grandfathers.
Cultural beliefs and traditions	Universal negative sentiment indicates cultural factors are consistently creating barriers to vaccination acceptance.
Community-level engagement	Complete negative sentiment shows total lack of community involvement or support for vaccination.
Peer pressure and shared experiences	Universally negative peer influence suggests complete absence of positive peer support for vaccination behaviors.

Figure 18: Social Processes amongst Grandfathers of zero-dose children.

"Je pense que c'est ce qui se passait à l'époque de nos ancêtres, puisqu'il n'y avait pas de vaccin."
"I think that's how it was in the time of our ancestors, since there were no vaccines back then."
- Grandfather (MIM2_037)

The analysis of social processes among grandfathers of zero-dose children reveals a strikingly uniform pattern of negative sentiment across all social dimensions. **The complete absence of positive family and social support** is particularly concerning, with universal negative sentiment indicating grandfathers are operating in an environment devoid of supportive family influences regarding vaccination. This isolation is further reinforced by **uniformly negative social norms**, suggesting that vaccination has completely failed to establish itself as an accepted practice among grandfathers.

The findings become even more troubling when examining cultural and community aspects. **Universal negative sentiment in cultural beliefs** indicates that cultural factors are consistently creating barriers rather than support for vaccination acceptance. This cultural resistance is matched by **complete negative sentiment in community-level engagement**, demonstrating a total lack of community involvement or support structures. The social isolation is further compounded by **universally negative peer influence**, indicating a complete absence of positive peer support for vaccination behaviors.

"Moi, je ne peux pas m'engager à perdre le temps chaque jour à aller vacciner les enfants. Il y a leur maman, il y a leur grand-mère..."
"I personally can't commit to spending time every day going to vaccinate the children. Their mother is there, their grandmother is there..."
- Grandfather (MIM2_020)

This comprehensive pattern of negative social influences creates a particularly challenging environment for vaccination promotion. The uniform negativity across all social dimensions suggests that grandfathers are operating in a complete social vacuum regarding vaccination support, with no positive influences from any social source.

Motivation Amongst Grandfathers of Zero-dose Children

Positive sentiment Mixed sentiment Negative sentiment	**Motivation (Grandfathers)**
Intrinsic motivation	Predominantly negative internal drive with some mixed responses, suggesting low personal conviction about vaccination.
Extrinsic motivation	Universal negative sentiment indicates complete ineffectiveness of external motivators for vaccination decisions.
Personal priorities	Predominantly negative sentiment suggests vaccination is not well-integrated into grandfathers' priority frameworks.
Perceived importance	Similar to personal priorities, showing predominantly negative recognition of vaccination's value.
Authority influence	Shows the highest average with predominantly mixed sentiment, suggesting authority figures maintain some influence despite overall negative trends.

Figure 19: Motivation amongst Grandfathers of zero-dose children.

The analysis of motivational factors among grandfathers of zero-dose children reveals a predominantly negative pattern across most dimensions, with one notable exception. **Internal drive shows predominantly negative sentiment with some mixed responses**, suggesting low personal conviction about vaccination, while **external motivators demonstrate complete ineffectiveness** with universal negative sentiment, indicating that traditional incentives or pressure tactics have no positive impact on grandfathers' vaccination decisions.

The findings regarding personal priorities and perceived importance are particularly concerning. **Predominantly negative sentiment in personal priorities** suggests that vaccination is not well-integrated into grandfathers' decision-making frameworks, and this is mirrored in their **predominantly negative recognition of vaccination's importance**, indicating a fundamental disconnect from vaccination's value. These parallel negative patterns in personal priorities and perceived importance suggest that grandfathers don't see vaccination as relevant to their family's health decisions.

However, a potentially promising finding emerges in the area of authority influence, which **shows the highest average with predominantly mixed sentiment**. This suggests that authority figures maintain some level of influence despite the overall negative trends across other motivational dimensions. This relative responsiveness to authority figures could provide a crucial pathway for intervention, offering perhaps the only viable channel for engaging grandfathers in vaccination decisions.

Practical Issues Amongst Grandfathers of Zero-dose Children

Positive sentiment Mixed sentiment Negative sentiment	**Practical Issues (Grandfathers)**
Accessibility of vaccination services	Predominantly negative accessibility experiences, suggesting significant challenges in accessing vaccination services.
Availability of vaccines and health workers	Universal negative sentiment indicates consistent problems with vaccine and healthcare worker supply.
Affordability	Predominantly negative views on affordability, suggesting cost is a significant barrier for grandfathers.
Convenience	Similar to accessibility and affordability, showing predominantly negative sentiment, indicating services are not conveniently arranged.
Structural barriers	Shows highest average with predominantly mixed experiences, suggesting variable but persistent systemic challenges.

Figure 20: Practical Issues amongst Grandfathers of zero-dose children.

"Je n'ai pas voulu qu'on continue qu'il prenne les vaccins... Parce qu'il y a eu des mauvaises choses."
"I didn't want them to continue giving him vaccines... Because there were bad things."
- Grandfather (MIM2_033)

The analysis of practical issues among grandfathers of zero-dose children reveals significant barriers across multiple dimensions, with only one area showing slightly more nuanced results. **Accessibility shows predominantly negative experiences**, suggesting substantial challenges in reaching vaccination services, while **availability demonstrates universal negative sentiment**, indicating consistent problems with vaccine and healthcare worker supply. These fundamental access issues create a significant first barrier to vaccination engagement.

The situation is further complicated by financial and convenience factors. **Predominantly negative views on affordability** suggest that cost represents a significant barrier for grandfathers, while **convenience shows similarly negative sentiment**, indicating that even when services are technically available, they are not arranged in ways that accommodate grandfathers' needs or schedules. This combination of financial and logistical barriers compounds the basic access challenges.

However, a slightly different pattern emerges in structural barriers, which **shows the highest average with predominantly mixed experiences**. This suggests that while systemic challenges persist, they may be more variable or context-dependent than other practical issues. The overall picture suggests a multi-layered problem where basic access issues (accessibility and availability) are compounded by financial barriers and inconvenient service arrangements, while structural challenges add another layer of complexity. This points to the need for comprehensive interventions that address not only the fundamental issues of access and availability but also consider affordability and convenience factors, while acknowledging the variable nature of structural barriers across different contexts.

Thinking & Feeling Amongst Female Extended Family Members of Zero-dose Children

Positive sentiment Mixed sentiment Negative sentiment	**Thinking & Feeling (Female Extended Family Members)**
Knowledge about vaccination	Generally positive trend, indicating good understanding of vaccination among female extended family members.
Attitudes towards vaccination	Predominantly mixed attitudes with some negative sentiment, suggesting generally cautious but not opposed views toward vaccination.
Perceived risks and benefits	Even split between negative and mixed perceptions, indicating significant uncertainty about vaccination's risk-benefit balance.
Trust in health systems	Predominantly negative trust levels, suggesting significant challenges in relationships with healthcare providers.
Emotional responses	Strong tendency toward mixed responses with minimal negative sentiment, indicating moderate emotional engagement with vaccination.

Figure 21: Thinking & Feeling amongst Female Extended Family Members of zero-dose children.

"Moi quand tu arrives à l'hôpital la réception n'est pas vraiment courtoise... certains infirmiers peuvent créer ce que moi je me dis que ça a un impact..."
"When I arrive at the hospital, the reception isn't really courteous... some nurses behave in ways that, to me, have an impact..."
- Aunt (MIM2_013)

The analysis of Thinking & Feeling among female extended family members of zero-dose children reveals a complex mix of understanding and hesitancy. **Knowledge levels show a generally positive trend**, with good understanding of vaccination demonstrated across this group, suggesting that basic health education has been relatively effective. This is balanced by **predominantly mixed attitudes with some negative sentiment**, indicating that while these family members aren't opposed to vaccination, they maintain cautious views.

A significant area of concern emerges in the perception of risks and benefits, where there is **an even split between negative and mixed perceptions**, suggesting considerable uncertainty about vaccination's risk-benefit balance. This uncertainty is compounded by **predominantly negative trust levels** in health systems, indicating significant challenges in relationships with healthcare providers. However, a more promising finding appears in emotional responses, where there is a **strong tendency toward mixed responses with minimal negative sentiment**, suggesting moderate emotional engagement with vaccination without strong negative reactions.

These findings suggest that female extended family members occupy a potentially influential middle ground in vaccination decisions. While they possess good knowledge and show moderate emotional engagement, their cautious attitudes, uncertain risk perceptions, and low trust in health systems may limit their ability or willingness to actively support vaccination.

Motivation Amongst Female Extended Family Members of Zero-dose Children

Positive sentiment Mixed sentiment Negative sentiment	**Motivation (Female Extended Family Members)**
Intrinsic motivation	Strong showing of mixed sentiment with minimal negative responses, indicating generally good internal drive toward vaccination decisions.
Extrinsic motivation	Universal mixed sentiment, suggesting external motivators have consistent but moderate influence.
Personal priorities	Even split between negative and mixed responses, indicating variable integration of vaccination into personal priority frameworks.
Perceived importance	Strong tendency toward mixed sentiment, suggesting general recognition of vaccination's value.
Authority influence	Universal mixed sentiment, indicating authority figures maintain consistent moderate influence.

Figure 22: Motivation Amongst Female Extended Family Members of zero-dose children.

"Parce que, je prends l'exemple de la rougeole, ce que j'ai constaté... celui qui a été vacciné ne devient pas grave."
"Because, I take the example of measles—what I've observed is that the child who was vaccinated doesn't get seriously ill."
- Aunt (EMO_019)

The analysis of motivation among female extended family members reveals a generally moderate pattern of engagement across all dimensions. **Strong internal drive is evident with predominantly mixed sentiment and minimal negative responses**, suggesting these family members have a basic positive orientation toward vaccination decisions. This is complemented by **universal mixed sentiment regarding external motivators**, indicating that while external factors have consistent influence, their impact remains moderate rather than strongly positive or negative.

The findings become more variable when examining personal priorities, where there is an even split between negative and mixed responses, suggesting inconsistent integration of vaccination into personal priority frameworks. However, there is a strong tendency toward mixed sentiment regarding vaccination's perceived importance, indicating that while these family members generally recognize vaccination's value, this recognition hasn't translated into strong positive conviction. The role of authority figures shows a similar pattern, with universal mixed sentiment suggesting consistent but moderate influence from healthcare providers and other authority figures.

This overall pattern suggests that female extended family members occupy a potentially valuable middle ground in vaccination decision-making.

Social Processes Amongst Female Extended Family Members of Zero-dose Children

Positive sentiment Mixed sentiment Negative sentiment	**Social Processes (Female Extended Family Members)**
Influence of family and friends	Predominantly mixed influence with some negative experiences, suggesting variable but present family support for vaccination.
Social norms regarding vaccination	Strong showing of mixed sentiment, indicating vaccination may be perceived as socially accepted within this group.
Cultural beliefs and traditions	Even split between negative and mixed responses, suggesting cultural factors have variable impact on vaccination decisions.
Community-level engagement	Predominantly negative community engagement indicating limited community-level support for vaccination.
Peer pressure and shared experiences	Strongly negative peer influence, suggesting peer networks aren't effectively supporting vaccination behaviors.

Figure 23: Social Processes amongst Female Extended Family Members of zero-dose children.

"Heh c'est tout le monde qui doute même déjà de ça eh, beaucoup de gens doutent de la vaccination..."
"Heh, everyone is already doubting this, many people are skeptical about vaccination..."
- Aunt (ESS_005)

The analysis of social processes among female extended family members reveals a nuanced pattern of social influences with both supportive and challenging elements. **Family and friend influence shows predominantly mixed sentiment** with some negative experiences, suggesting that while family support for vaccination exists, it's not consistently positive. This is complemented by a **strong showing of mixed sentiment in social norms**, indicating that vaccination may be becoming more socially accepted within this group, though not yet firmly established.

The findings become more complex when examining cultural and community dimensions. **Cultural beliefs show an even split between negative and mixed responses**, suggesting that cultural factors have variable impact on vaccination decisions, without any clearly positive influence. This variability contrasts with the more consistently negative findings in community engagement, where **predominantly negative sentiment indicates limited community-level support** for vaccination. Perhaps most concerning is the **strongly negative peer influence**, suggesting that peer networks aren't effectively supporting vaccination behaviors.

These findings paint a picture of female extended family members operating in a social environment where immediate family support and social norms show some promise, but broader community and peer support are largely absent.

Practical Issues Amongst Female Extended Family Members of Zero-dose Children

Positive sentiment Mixed sentiment Negative sentiment	**Practical Issues (Female Extended Family Members)**
Accessibility of vaccination services	Strong tendency toward mixed experiences with minimal negative responses, suggesting generally manageable access to vaccination services.
Availability of vaccines and health workers	Even split between negative and mixed responses, indicating inconsistent availability of vaccines and healthcare workers.
Affordability	Predominantly mixed sentiment with some negative experiences, suggesting cost is a moderate but not insurmountable barrier.
Convenience	Similar to affordability, showing predominantly mixed experiences, indicating vaccination services are moderately convenient for most.
Structural barriers	Strong showing of mixed responses with minimal negative experiences, suggesting systemic challenges exist but are generally manageable.

Figure 24: Practical Issues amongst Female Extended Family Members of zero-dose children.

"C'etait trop long, donc l'attente..."
"It was too long, so the waiting..."
- Aunt (EMO_013)

The analysis of practical issues among female extended family members reveals a generally moderate pattern of barriers with some areas of variability. **Accessibility shows a strong tendency toward mixed experiences with minimal negative responses**, suggesting that while access challenges exist, they are generally manageable. However, **availability of vaccines and healthcare workers shows an even split between negative and mixed responses**, indicating inconsistent and potentially problematic supply situations.

The financial and logistical aspects present similar patterns of moderate challenges. **Affordability demonstrates predominantly mixed sentiment with some negative experiences**, suggesting that while cost creates barriers, they aren't insurmountable for most. This moderate trend continues with convenience, where **predominantly mixed experiences indicate that vaccination services are adequately arranged** for most family members, though not optimally convenient. Notably, **structural barriers show a strong tendency toward mixed responses with minimal negative experiences**, suggesting that while systemic challenges exist, they are generally manageable.

This overall pattern suggests that female extended family members face a range of practical challenges that, while present, aren't severely inhibiting.

Summary of Sentiment Across Domains and Caregiver Type

Table 2 below summarizes the overall patterns across caregiver groups.

Table 2: Summary of Sentiment Across Caregiver Groups.

Caregiver Group	Thinking & Feeling	Social Processes	Motivation	Practical Issues
Younger Mothers	Mixed/Positive	Mixed	Positive	Negative
Older Mothers	Mixed/Negative	Negative	Mixed	Negative
Fathers	Negative	Negative	Negative	Negative
Grandmothers	Mixed	Mixed/Negative	Mixed	Mixed
Grandfathers	Negative	Negative	Negative	Negative
Female Extended Family	Mixed	Mixed/Negative	Mixed	Mixed

The analysis of sentiment across domains and caregiver types revealed distinct patterns of vaccine hesitancy and barriers. Younger mothers showed the most promising profile, with mixed to positive thinking and feeling, and strong motivation, though they faced significant practical barriers. In contrast, older mothers demonstrated more negative sentiments, particularly in social processes and practical issues, with mixed motivation levels.

Male caregivers (fathers and grandfathers) displayed uniformly negative sentiment across all domains, suggesting comprehensive barriers to vaccination engagement. This stark gender divide was notable, as female caregivers generally showed more mixed sentiments.

Grandmothers and female extended family members exhibited predominantly mixed sentiments across domains, with slightly more negative trends in social processes. This pattern suggested potential for engagement, particularly as these groups showed mixed rather than negative responses to practical issues.

The analysis highlighted three key findings:

1. A clear gender divide in vaccination attitudes
2. Generational differences in sentiment, with younger caregivers showing more positive responses
3. Universal challenges with practical issues across all groups, though experienced differently by each caregiver type

These patterns suggest the need for targeted interventions that account for both gender and generational differences while addressing universal practical barriers to vaccination access.

Discussion

The Decision-Making Process Per Caregiver

Younger Mothers

A caregiver's journey to vaccination is not linear. There are many moments at which a caregiver can proceed or drop off in their decision-making process. Please use the **Miro board** to view the journey maps in a larger size.

For younger mothers, the immunization journey starts with basic vaccine information interpretation. A successful path emerges when they feel reassured by thorough research, leading them to discuss vaccination with family and friends. When peers share positive experiences, this reinforces their decision. Their motivation strengthens when they overcome scheduling conflicts and competing demands. Finding practical solutions like nearby immunization sites or affordable transport options moves them forward. Finally, positive healthcare interactions culminate in successful vaccination.

However, the journey can derail at any point. Initial anxiety about side effects might cause immediate withdrawal. Even if they progress, negative stories from others can plant doubts that halt momentum. Practical challenges often prove decisive - scheduling difficulties lead to indefinite postponement, while transportation barriers or distant clinics create seemingly insurmountable obstacles. Even if they overcome these hurdles, poor experiences with healthcare providers can end their journey, as unresponsive or unfriendly service erodes their commitment to vaccination.

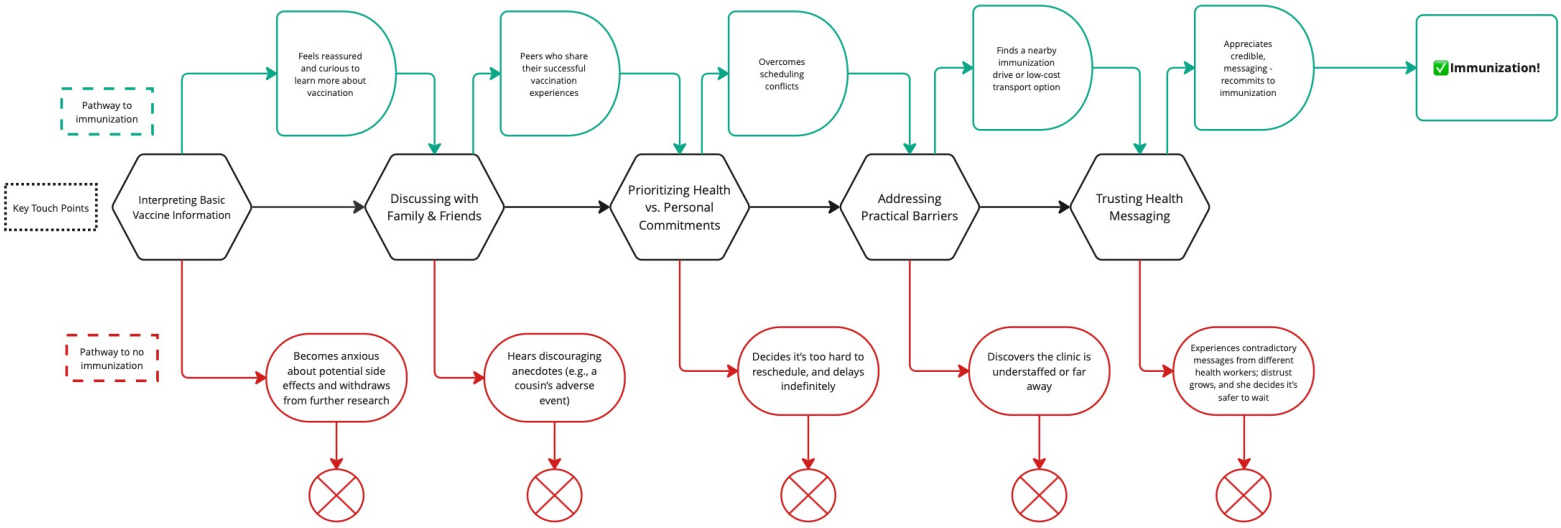

Figure 25: The Decision-making Journey of a Young Mother.

Older Mothers

The decision-making journey of older mothers (25+) involves five critical touchpoints that can either lead to or prevent vaccination.

Starting with risk assessment, success comes when mothers see positive examples, like a neighbor's healthy vaccinated child. However, negative family stories about side effects can derail this stage.

In family dynamics, encouragement from close friends with similar decisions strengthens resolve, while spouse or in-law opposition can halt progress. The effort-reward calculation is particularly crucial - mothers who prioritize child health despite missing work proceed, while those who can't justify leaving their market stall drop off.

Community engagement presents another pivotal moment. Attending women's group meetings about vaccines builds confidence, but unchallenged local myths maintain skepticism. Finally, trust in the health system determines follow-through - those who develop enough confidence bring their children, while others remain hesitant and perpetually delay.

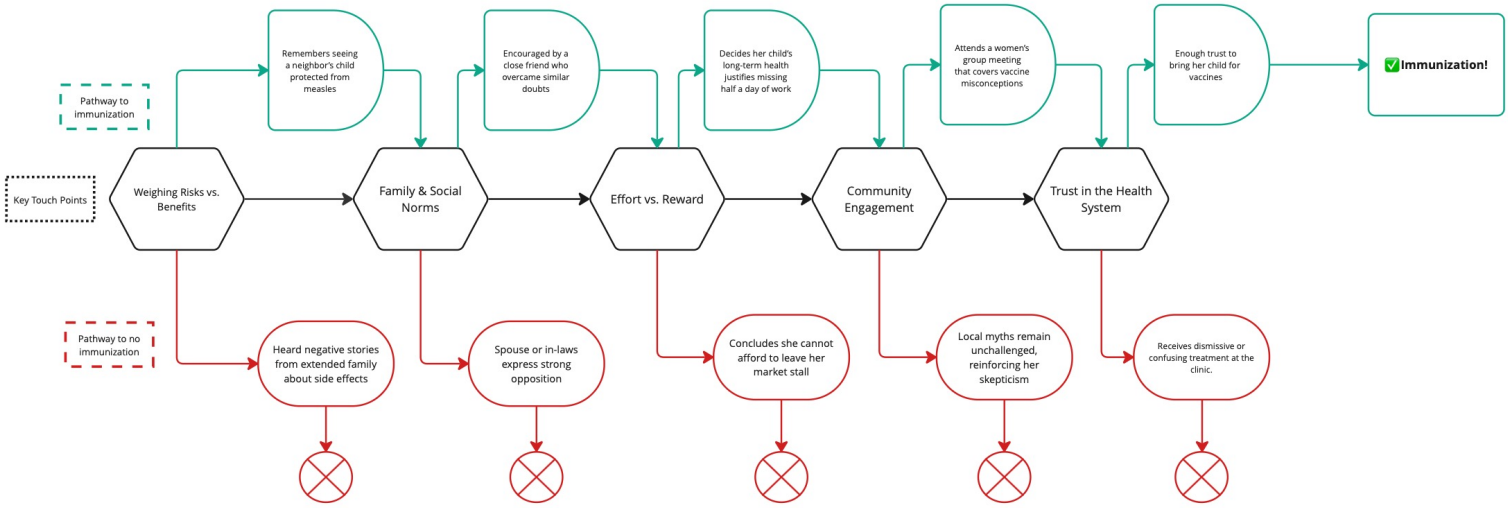

Figure 26: The Decision-making Journey of an Older Mother.

Fathers

Fathers' vaccination decision-making follows a distinct pathway marked by key influence points. When positive, a father hears respected peers praising vaccines for preventing illness, responds to his wife's advocacy for child immunization, and recognizes that a sick child could impact family finances more than preventive care. He becomes receptive to factual information from trusted religious leaders and ultimately agrees to support vaccination.

However, the negative pathway shows multiple exit points. Long-time peers reinforcing vaccine risk myths can cement early negative attitudes. Even if initially open, he may warn his wife against "wasting money" on vaccines. Financial concerns often trigger withdrawal, as immediate work losses outweigh potential future health benefits. Sensational stories about vaccine complications from media can override earlier positive inclinations. Finally, even if somewhat convinced, he may avoid direct engagement by maintaining distance from the decision.

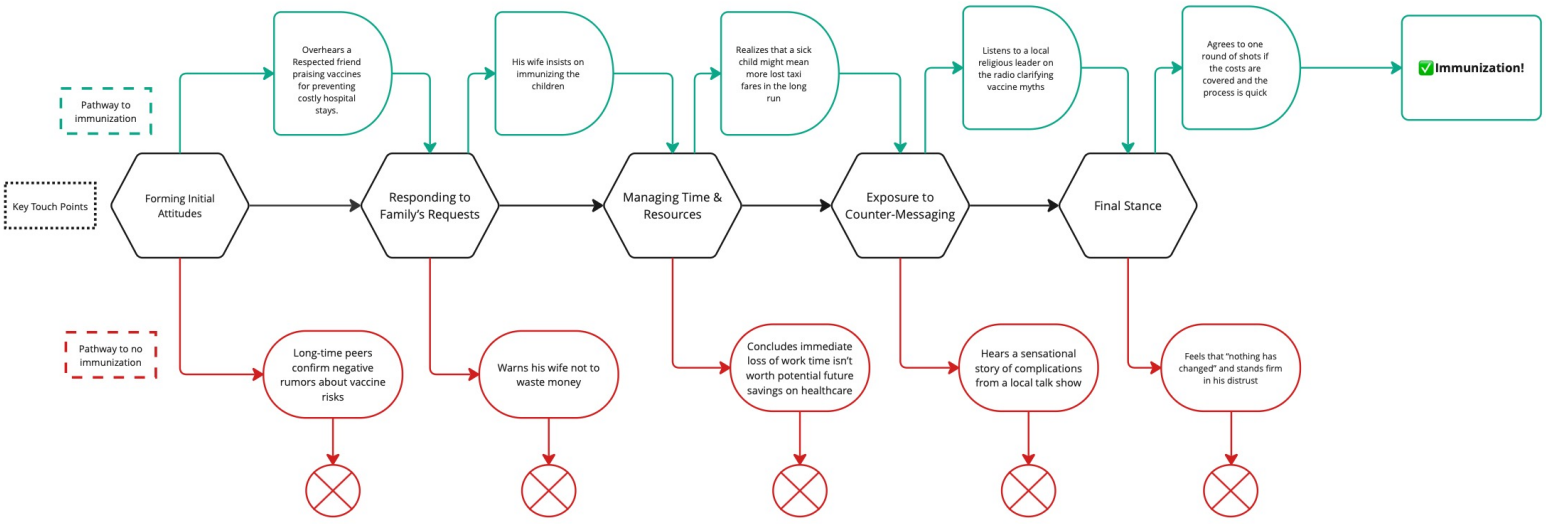

Figure 27: The Decision-making Journey of a Father.

Grandmothers

Grandmothers' vaccination decision-making pathway reflects a complex negotiation between traditional knowledge and modern healthcare. The positive journey begins when they attend educational sessions at health centers, learning how vaccines prevented childhood diseases like the outbreaks they witnessed in their youth. Seeing their grandchild's health improve compared to past generations builds confidence, and respectful interactions with healthcare workers reinforce trust.

However, several critical points can derail this journey. Negative influences begin when older friends share beliefs about injections causing more harm than good. Past negative clinic experiences resurface, weakening confidence. Family dynamics play a crucial role - visiting relatives questioning "Western medicine" can reignite doubts. Poor interactions with dismissive health workers can permanently damage trust. Even if partially convinced, lingering doubts may lead them to quietly discourage vaccination within the family.

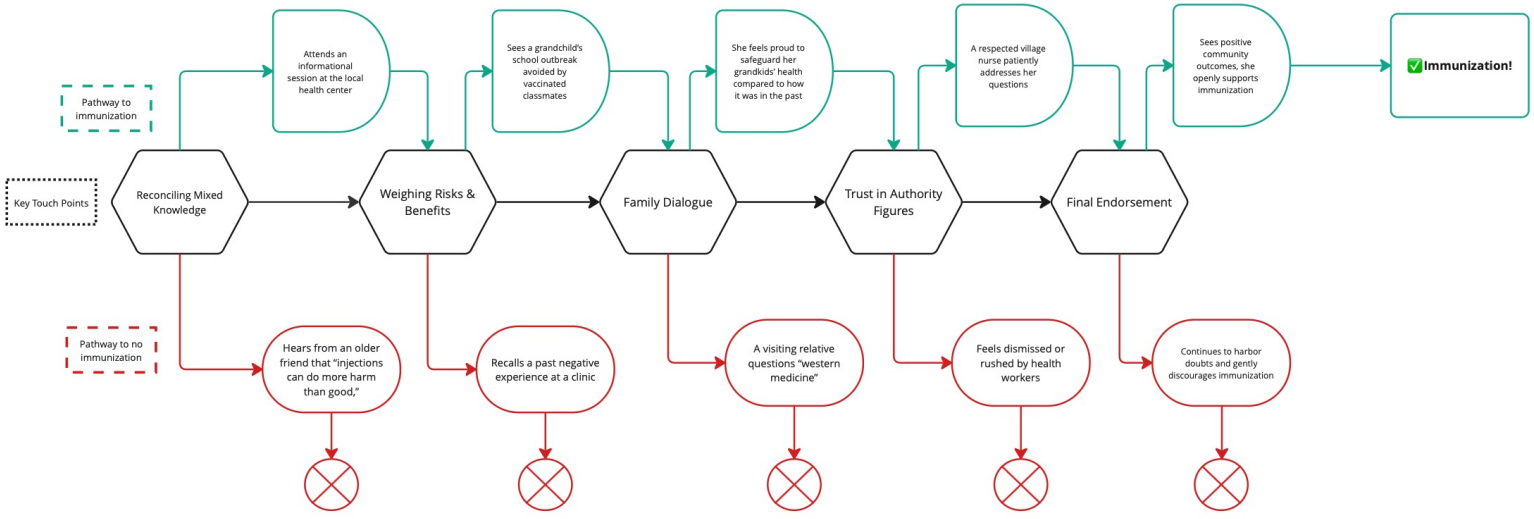

Figure 28: The Decision-making Journey of a Grandmother.

Grandfathers

The grandfather's vaccination decision pathway reflects traditional authority and community influence. When positive, endorsement from a respected local chief opens the door to consideration. Direct appeals from grandchildren's parents carry weight, especially when supported by trusted health workers who take time to address concerns. Seeing peers' grandchildren thriving post-vaccination and hearing spiritual leaders advocate for immunization can lead to acceptance.

The negative pathway shows multiple barriers rooted in traditional beliefs. Long-held skepticism about "foreign medicine" creates initial resistance. Family tradition becomes a justification to forbid vaccination. Health campaigns failing to reach him in culturally appropriate ways reinforce distance. Rumors of complications in nearby villages validate concerns. Ultimately, fundamental distrust in modern healthcare systems may cement opposition.

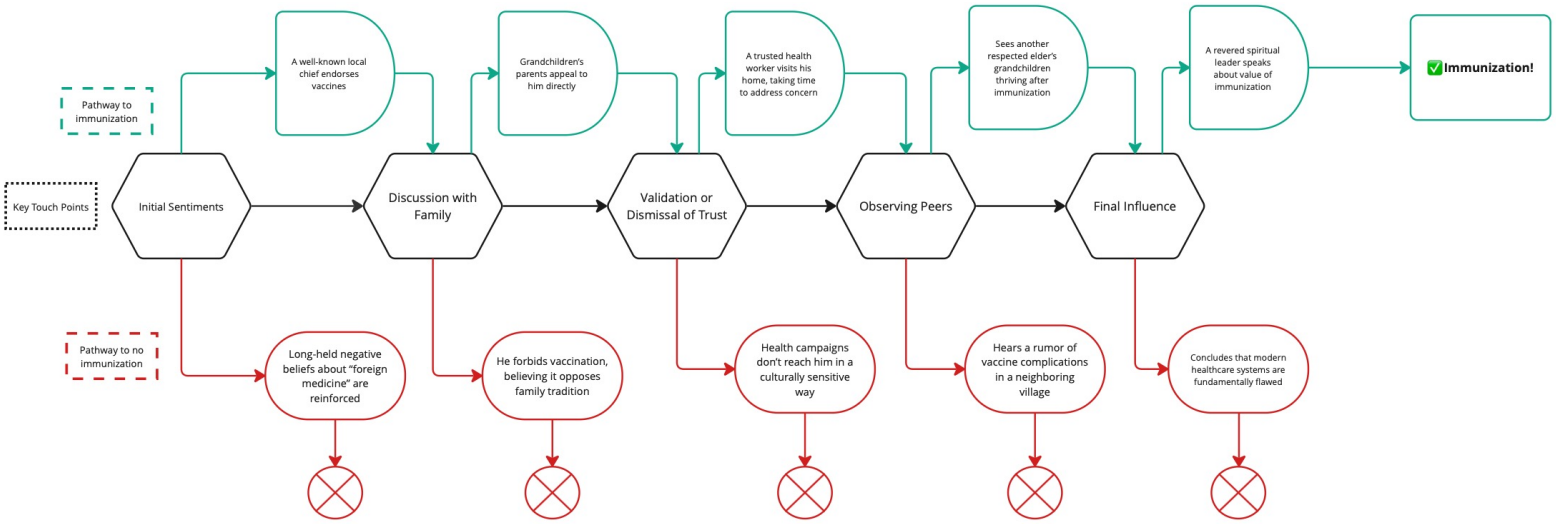

Figure 29: The Decision-making Journey of a Grandfather.

Female Extended Family Members

The female extended family member's vaccination decision journey reflects a balance between information-seeking and practical constraints. The positive path begins when she takes initiative to read government brochures, strengthened by family members sharing successful vaccination experiences. Her sense of responsibility for the child's care drives prioritization, while mobile notifications about vaccine availability and clear schedules facilitate action.

However, several barriers can derail this progress. Conflicting online information creates early doubt. Cousin's claims about vaccine side effects reinforce hesitancy. Competing household duties and work demands make vaccination seem less urgent. Practical challenges like clinics being out of stock create frustration. Even when partially convinced, concerns about medical complications may lead to indefinite postponement.

The success of vaccination programs depends on recognizing these diverse pathways and designing targeted interventions that address critical decision points for each caregiver type. Most notably, barriers manifest differently across groups, suggesting the need for tailored support systems that acknowledge both common challenges and group-specific concerns.

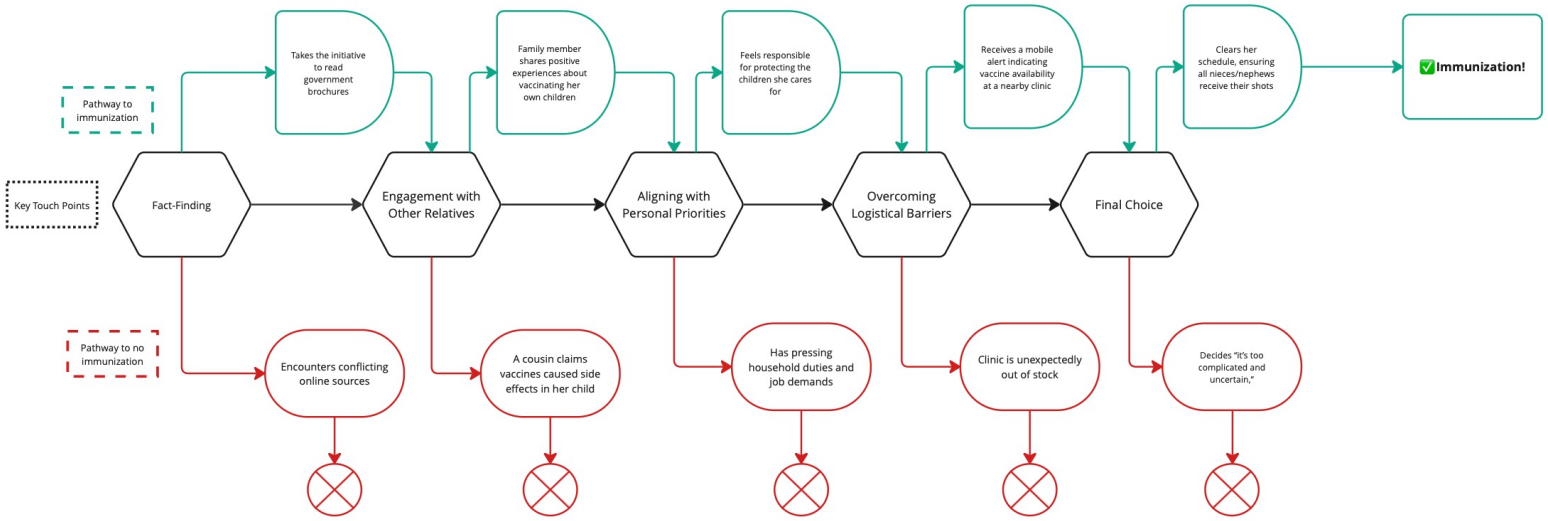

Figure 30: The Decision-making Journey of a Female Extended Family Member.

Caregiver Personas

Based on the findings of this study, we were able to create a set of personas based on what we learned about caregivers. The caregiver personas were created to bring to life the diverse experiences, beliefs, and motivations that shape childhood vaccination decisions in Nkolndongo, Yaoundé. By transforming the research findings into relatable narratives, we aim to provide a clear, human-centered lens on each group's challenges and thought processes. These personas highlight not only ***what*** factors contribute to immunization uptake or avoidance, but also ***why*** those factors matter in everyday life—whether it's a mother juggling work schedules, a father influenced by peers, or a grandparent guided by cultural norms.

Going forward, these personas can be used as practical tools to:

1. **Guide Intervention Design:** Tailor communication strategies, outreach activities, and health service improvements to each persona's specific barriers and motivators.
2. **Enhance Stakeholder Understanding:** Help policymakers, healthcare workers, and community leaders empathize with real-life situations, ensuring more nuanced and inclusive decision-making.
3. **Improve Program Messaging:** Develop targeted messaging and creative campaigns that resonate with each persona's concerns and values, building trust and engagement.
4. **Facilitate Team Alignment:** Serve as a reference point for interdisciplinary teams—ensuring consistent, persona-focused strategies across design, implementation, and evaluation phases.
5. **Inform Ongoing Adaptations:** Provide a structured framework for gathering feedback and refining programs, as each persona's journey can evolve with changing social and practical realities.

Bintou

Bintou is a **22-year-old mother** who believes in the importance of **vaccination** but struggles with **practical challenges** such as clinic accessibility and limited finances. She **reads leaflets** and browses online resources to understand potential **side effects** yet sometimes **forgets appointments** or cannot attend due to **transport and scheduling conflicts**.

Despite these barriers, Bintou draws motivation from **supportive peers** and the **positive social norms** around her, especially when reinforced by **social media campaigns** aimed at young mothers. She ultimately benefits most from **vaccine reminders** and **flexible clinic hours** that accommodate her busy routine, helping her feel more confident and capable of keeping her baby up-to-date on immunizations.

Meet Bintou (22)

"When we arrive, the people who vaccinate are often not there. We wait for hours in the room."

Bintou is a 22-year-old mother. She is well-informed about vaccination but faces practical challenges.

Key points in the journey

- Gets information
- Seeks reassurance
- Balances priorities
- Faces scheduling challenges & forgetfullness
- Limited budget

Goals

- She wants to ensure her baby gets all recommended vaccines and wants to improve her child's overall nealtn and well-being.

Needs

- She needs rellable information about vaccination schedules, and accessible and affordable vaccination services.

Opportunities

- She can draw motivation from positive social norms and family support, as well as from social media campaigns targeting young mothers.

Observations

- She has a generally positive view of vace nation but experiences anxiety about side effects. She faces practical issues, particularly related to accessibility and affordability.

Tasks

- She reads informational leaflets and checks online resources to understand the benefits and risks of vaccines.

Barriers & Frustrations

- She struggles with the affordability and availability of services, often missing appointments due to transport or time management.
- Unsupportive spouse.

Experience solutions

- She benefits from vaccine reminders, supportive peers, and flexible clinic schedules that accommodate her busy routine.

Cécile

Cécile is a **35-year-old market vendor** in Yaoundé, juggling care for her children and the demands of running a small business. She feels **uncertain** about vaccine safety and effectiveness, largely due to **negative past experiences** with healthcare workers. Despite **conflicting stories** she hears from relatives—some encouraging, others discouraging—she strives to protect her family and seeks **trustworthy information** to guide her decisions.

Cécile struggles to **fit vaccine appointments** around her busy market hours and faces **financial hurdles** when clinics are far or fees add up. Ultimately, she responds well to **relatable success stories**, **peer endorsements**, and **health services** that minimize her time away from work, helping her build enough trust and convenience to **follow through** with immunizations.

"No, I'm not even afraid, I just don't often have the time. Every time I get dressed, laziness takes over."

Meet Cécile (35)

A 35-year-old market vendor in Yaoundé who juggles caring for multiple children while managing a small business. She's generally tired.

Key points in the journey

- Encounters conflicting stories about vaccine side effects
- Hears discouraging remarks from in-laws
- Struggles to rank vaccination over immediate daily needs
- Hesitates because past clinic experiences left her with concern

Goals

- She wants her children protected from illness but feels uncertain about the true safety and effectiveness of vaccines.

Needs

- She needs accessible, trustworthy information to counter mixed perceptions and build confidence in vaccination.

Opportunities

- She could be reached by local women's groups or community-based initiatives aimed at dispelling myths.

Observations

- She has lower trust in health systems, influenced by prior negative experience with healthcare workers.

Tasks

- She tries to organize vaccination visits between market hours, relying on help from neighbors for childcare.

Barriers & Frustrations

- She finds traveling to distant clinics costly, with limited support from family who question the benefits of vaccines.

Experience solutions

- She reacts well to relatable success stories, peer endorsements, and integrated health services that reduce time away from work.

Jean-Paul

Jean-Paul is a **36-year-old taxi driver** who **questions vaccine safety** and doubts the sincerity of the health system. Although he wants the best for his family, he doesn't see **vaccination** as a **high priority**, often viewing any clinic trip as **lost income**. His skepticism is reinforced by **conversations with fellow taxi drivers** who share distrustful attitudes toward government health campaigns.

Jean-Paul occasionally **collects clinic flyers** for his wife but **rarely engages** with the content himself. Because **official reminders** or announcements tend to **fall on deaf ears**, he might only reconsider his stance if **highly respected figures**—such as community or religious leaders—provide **clear, factual information** through channels he trusts, like local taxi associations.

Meet Jean-Paul (36)

A 36-year-old taxi driver who holds skeptical views about the health system and vaccine efficacy.

"Before, there were vaccines that were often given to children. Later, they caused deformities... Other people came and said they were there to vaccinate. We were told they were there to spread diseases."

Key points in the journey

- Starts off with negative beliefs about vaccine safety
- Talks with fellow taxi drivers who reinforce distrust in government health campaigns
- Feels no personal urgency to support vaccination appointments
- Views any clinic trip as lost income
- Ignores official reminders unless a highly respected figure personally convinces him.
- Typically concludes there's no real benefit

Goals

- He wants his family's well-being but doesn't see vaccination as a high priority.

Needs

- He needs strong evidence and trusted voices to reshape his predominantly negative perceptions.

Opportunities

- He might be influenced by respected community or religious leaders who vouch for vaccination.

Observations

- He perceives vaccines as risky, reinforced by friends and peers who share distrustful attitudes.

Tasks

- He occasionally collects clinic flyers for his wife but seldom engages with the content himself.

Barriers & Frustrations

- He faces cost and time constraints, plus he doubts the sincerity of health workers.

Experience solutions

- He might respond if a well-known and trusted figure promotes clear, factual vaccine information.

Marie

Marie is a **60-year-old grandmother** who helps care for her grandchildren and feels **conflicted** about modern healthcare. While she deeply desires to **protect her grandchildren** from serious illnesses, she also worries about **potential side effects** of vaccines. Marie's **trust in the health system** shifts based on both **negative peer influences** and positive examples within her extended family, making her open to new information but still cautious.

She often **mixes traditional remedies** with modern advice and struggles with **affordability issues** when clinic fees or travel costs rise. However, Marie becomes more confident in vaccination when **a trusted nurse or local authority** provides **clear, relatable explanations** and respects her cultural beliefs. **Home visits** and **community gatherings** that address her questions directly can transform her from a hesitant observer into a powerful advocate among her peers.

Meet Marie (60)

A 60-year-old grandmother who helps care for her grandchildren and has mixed feelings about modern healthcare.

"It's only the vaccines that come... People no longer think about doing anything else. (.../ They only come with the vaccines. And that's what they eat."

Key points in the journey

- Harbors concerns about unknown risks due to partial or outdated information
- Sees other community members' success stories
- Gets conflicting advice
- Often moves forward when a trusted nurse or authority figure validates her questions
- Deeply wants her grandchildren protected

Goals

- She wants her grandchildren to avoid serious illnesses but worries about possible vaccine side effects.

Needs

- She needs approachable health workers who address her concerns and explain risks and benefits in relatable terms.

Opportunities

- She can be a powerful advocate among her peers if her worries are respectfully addressed by trusted authorities.

Observations

- She has varying levels of trust in the health system, shaped by both negative peer influences and positive family norms.

Tasks

- She encourages the family to stay informed but sometimes blends traditional remedies with modern advice.

Barriers & Frustrations

- She struggles with affordability issues, as well as cultural beliefs that sometimes conflict with vaccination.

Experience solutions

- She responds well to home visits from community health workers and social gatherings where accurate information is shared.

François

François is a **65-year-old retiree** who questions whether modern healthcare practices, including vaccinations, align with his **traditional family values**. He **routinely hears negative opinions** from neighbors and relatives, reinforcing his view that "foreign medicine" is untrustworthy. Although he wants to **preserve family traditions** and protect his grandchildren, he doubts that vaccines are the right way to do it.

He rarely takes an **active role** in scheduling immunizations, believing such "modern medicine" matters fall to others. Structural barriers—such as **poor clinic infrastructure** or vaccine shortages—further **confirm his skepticism** about the system's reliability. François may *occasionally* engage if **respected local elders** or **spiritual leaders** who share his cultural background **endorse immunization** in a way that honors tradition. In such settings, **clear, evidence-based facts** presented with **cultural sensitivity** can gradually shift his stance.

Meet François (65)

A 65-year-old retiree whose deeply held doubts about vaccinations reflect broader social and cultural skepticism.

"If it were up to me, I wouldn't even understand what people mean by 'vaccine'."

Key points in the journey

- Starts with a strong distrust of "new medicine"
- Converses with other elders who reinforce the idea that vaccines aren't necessary or safe.
- Sees poor clinic infrastructure and occasional vaccine shortages as proof that the system doesn't work.
- Even community leaders have difficulty shifting his stance unless they're deeply respected or share his cultural values.

Goals

- He wants to preserve family traditions, uncertain that vaccines align with them.

Needs

- He needs culturally respectful assurances and simplified information to address his negative views about healthcare.

Opportunities

- He might soften his stance if local elders or spiritual leaders who share his background endorse immunization.

Observations

- He consistently hears negative opinions from neighbors and relatives, reinforcing his distrust of vaccines.

Tasks

- He rarely takes an active role in scheduling immunizations, believing others should handle "modern medicine" matters.

Barriers & Frustrations

- Structural hurdles confirm his belief that the system is unreliable.

Experience solutions

- He occasionally engages with community dialogues when they honor traditional viewpoints and provide clear, evidence-based facts.

Josiane

Josiane is a **40-year-old aunt** who cares for her nieces and nephews, working hard to balance **extended family expectations** with her own day-to-day responsibilities. She believes **vaccines are generally beneficial** but often hears **conflicting opinions**—some relatives encourage vaccination, while others voice skepticism about possible side effects.

Josiane coordinates **household budgets** and errands, aiming to include vaccine visits in the family schedule, yet **unpredictable clinic hours** and **negative peer pressure** can derail her plans. She remains motivated by the desire to see her nieces and nephews **thrive**, finding reassurance in **reliable SMS updates** about vaccine availability and **women's group discussions** that clarify common misconceptions.

Meet Josiane (40)

"You leave the house in the morning. You spend the whole day over there. You don't even have water to drink. You come back exhausted."

A 40-year-old aunt who helps raise her nieces and nephews, balancing family expectations with her own household duties.

Key points in the journey

- Knows vaccines are beneficial but is uncertain about the level of risk for side effects.
- Receives both supportive and negative remarks from relatives and friends.
- Strongly wants to ensure nieces and nephews receive good care.
- Struggles with inconsistent vaccine availability and unpredictable service hours.

Goals

- She wants to see her extended family's children thrive while maintaining family harmony.

Needs

- She needs consistent information and better clinic logistics to keep track of vaccination schedules for multiple children.

Opportunities

- She can use women's association meetings to share and gather insights on the benefits of vaccines.

Observations

- She knows vaccines are generally good but hears occasional rumors that stir mixed attitudes.

Tasks

- She coordinates household budgets and errands, aiming to include vaccination trips in the family routine.

Barriers & Frustrations

- She faces unpredictable clinic availability and sometimes negative peer pressure, which complicates planning.

Experience solutions

- She responds to reliable SMS alerts about vaccine stock and benefits from group discussions that clarify misconceptions.

Recommendations

In this section we are presenting recommendations that can be implemented by the various partners who are working on increasing routine immunization in Cameroon. We present the recommendations as those that can be implemented in the short term, medium term and long term.

Recommendations for Implementation in the Short Term

For Male Caregivers: Implement targeted communication campaigns that address the specific concerns and barriers faced by fathers and grandfathers. Engage male community leaders and influencers to advocate for vaccination and build trust in health systems.

For Female Caregivers: Continue to support and enhance the positive trends seen among younger mothers through educational programs and community support groups. Address the specific practical barriers faced by older mothers through tailored interventions.

Leverage Younger Mothers: Leverage younger mothers' positive attitudes and strong motivation as vaccination advocates to create peer support networks that address social process gaps while modeling successful navigation of practical barriers for other caregivers.

Leverage Positive Social Norms: Promote vaccination as a socially accepted and valued practice within communities. Use media to promote these new norms.

Strengthen Peer Support Networks: Develop peer support groups and networks to provide encouragement and shared experiences among caregivers, particularly targeting those with negative peer influences.

Reduce Duplication of Efforts: Ensure that existing research by the various actors is shared and analyzed and used to inform intervention design.

Apply a Social and Behavior Change and Human-Centered Design Lens: Use the learnings from the approach of this research to understand various populations in Cameroon and to apply a nuanced understanding of barriers and facilitators to routine immunization uptake.

Recommendations for Implementation in the Medium Term

Consistent and Empathetic Communication: Ensure that healthcare providers engage with caregivers in a consistent, reliable, and empathetic manner. Provide clear and evidence-based information about the safety and benefits of vaccines.

Community Health Workers: Utilize community health workers to build relationships with caregivers and provide ongoing support and education about vaccination.

Recommendations for Implementation in the Long Term

Integrated Health Programs: Develop integrated health programs that address both vaccination and other healthcare needs of children and caregivers, ensuring a holistic approach to health and well-being.

Accessibility and Availability: Improve the availability of vaccines and healthcare workers, particularly in underserved areas. Ensure that vaccination services are conveniently located and accessible to all caregivers.

Convenience: Organize vaccination services in a way that accommodates the schedules and needs of caregivers, such as offering flexible hours and mobile vaccination units.

Conclusion

The findings from this study reveal significant insights into the decision-making processes of caregivers regarding routine immunization in zero-dose communities in Cameroon. The analysis highlights distinct patterns of vaccine hesitancy and barriers across different caregiver groups, emphasizing the need for targeted interventions.

Gender Divide in Vaccination Attitudes: Male caregivers (fathers and grandfathers) displayed uniformly negative sentiment across all domains, indicating comprehensive barriers to vaccination engagement. This stark contrast with female caregivers, who generally showed more mixed sentiments, suggests that male caregivers are significantly less engaged in the vaccination process. This gender divide underscores the importance of developing gender-specific strategies to address the unique barriers faced by male caregivers.

Generational Differences in Sentiment: Younger mothers exhibited more positive responses in terms of thinking and feeling, and strong motivation towards vaccination, despite facing significant practical barriers. In contrast, older mothers demonstrated more negative sentiments, particularly in social processes and practical issues, with mixed motivation levels. These generational differences suggest that younger caregivers may be more receptive to vaccination messages and interventions, while older caregivers may require more intensive support to overcome their hesitancy.

Universal Challenges with Practical Issues: Practical barriers to vaccination access were a common theme across all caregiver groups, though experienced differently by each type. Issues such as accessibility, availability of vaccines and healthcare workers, affordability, and convenience were significant obstacles. Addressing these practical barriers is crucial for improving vaccination uptake across all demographics.

Social Support Systems: Social processes, including the influence of family, friends, and community norms, played a significant role in vaccination decisions. Negative cultural beliefs and traditions were particularly prominent among older caregivers and male caregivers, creating substantial barriers to vaccination acceptance. Enhancing community engagement and leveraging positive social norms could help mitigate these cultural barriers.

Trust in Health Systems: Trust in health systems and healthcare providers was a critical factor influencing vaccination decisions. Predominantly negative trust levels among male caregivers and older mothers indicate a need for rebuilding trust through consistent, reliable, and empathetic interactions with healthcare providers.

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Appendices

- Formative Research Protocol and Approval
- GPT instructions
- Sentiment analysis

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