Closing the 9-Month Immunization Gap

Barriers to late-infancy immunization and practical solutions to improve coverage at 9 months

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Executive Highlights

Why this matters now

In Malawi, the measles-rubella first dose (MR1), typhoid conjugate vaccine (TCV) and the second dose of inactivated polio vaccine (IPV2) are administered at 9 months of age. Although Malawi has historically sustained relatively high routine immunization coverage, including for early infancy vaccines administered through 14 weeks and measles vaccination administered at 9 and 15 months, measles incidence reached 44.2 cases per million population in 2024, following several years of low reported transmission.[1] This resurgence signals persistent immunity gaps, despite high coverage at the national level. Vaccination coverage rates mask delayed coverage, regional differences and inefficiencies in how 9-month vaccination is actually achieved, for both families and the health system.

Drivers of 9-month delay and dropout

Through participatory qualitative interviews with 107 participants from select health facilities in Zomba and Chikwawa districts, we found five themes that describe primary drivers of vaccination delay or dropout that were either unique to or more pronounced at the 9-month touchpoint:

- **Loss of routine cues and reminders** following the 14-week visit leads to caregivers unintentionally forgetting 9-month vaccinations
- **Reduced perceived importance of vaccines and competing demands** prompt families to reweigh the costs and benefits of 9-month vaccinations
- **Anticipated negative experiences** at the facility deter caregivers from seeking 9-month vaccination services
- Lack of information and encouragement around 9-month vaccines from trusted sources **creates knowledge gaps and allows rumors to spread**
- Stockouts and anti-wastage policies create **missed opportunities for vaccination**

[1] WHO/UNICEF Estimates of National Immunization Coverage. Immunization data. https://immunizationdata.who.int/ Accessed: Jan 29, 2026.

These drivers rarely occur in isolation and are further compounded by information gaps, poverty and food insecurity, gender norms shaping caregiving and decision-making, and geographic and financial constraints.

Community-identified solutions to improve 9-month coverage

Through human-centered design, participants co-designed and prioritized a package of four complementary solutions to strengthen the 9-month vaccination touchpoint:

- Empower **Model Mothers** to provide peer nudges and counter rumors
- Engage **Male Champions** to shift household norms and reduce the burden on mothers
- Improve on and expand an **Electronic Immunization Registry** to actively follow-up with missed children
- Deploy multichannel **reminder systems** that reach caregivers with low literacy or limited phone access

Together, these solutions address behavioral and health-system gaps that prevent early vaccination intent from translating into vaccination coverage at 9 months.

Priority policy actions

Findings also point to potential policy levers to improve 9-month vaccination, especially measles:

- Reduce missed opportunities by exploring **5-dose MR vials** and strengthening stock management
- Use routine **growth monitoring visits** and malaria vaccine visits as a platform for 9-month vaccination counseling
- Mixed perceptions on moving the MR1 vaccine from 9 months to 6 months merit further study

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Background

In Malawi, the measles-rubella first dose (MR1), typhoid conjugate vaccine (TCV), and the second dose of inactivated polio vaccine (IPV2) are administered at 9 months of age through routine immunization. These vaccinations provide critical protection against highly transmissible diseases that remain endemic or outbreak-prone in the region, particularly measles.

While Malawi has historically sustained relatively high routine immunization coverage, including for early infancy vaccines administered through 14 weeks and measles vaccination administered at 9 and 15 months, measles incidence reached 44.2 cases per million population in 2024, following several years of low reported transmission.[2] This resurgence signals persistent immunity gaps, despite high coverage at the national level. Vaccination coverage rates mask delayed coverage, regional differences and inefficiencies in how 9-month vaccination is actually achieved, for both families and the health system.

To better understand the factors driving delayed and missed 9-month immunization, VillageReach, in partnership with the Malawi Ministry of Health, conducted a mixed-methods participatory study in Zomba and Chikwawa districts, where 10% and 6% of children, respectively, dropout between the third dose of the diphtheria, pertussis, and tetanus (DPT3) vaccine at 14 weeks and the MR1 vaccine at 9 months. The team selected these districts partly because Chikwawa had introduced the malaria vaccine in 2021/22 while Zomba had not, allowing the study to assess whether adding a 7-month malaria vaccine affects adherence at the 9-month point. As part of a broader four-country study, the research aimed to identify drivers of delay and dropout and co-create potential solutions to improve coverage at the 9-month touchpoint.

Between December 2024 and May 2025, trained peer researchers collected interviews, observations and workshop inputs across four health facilities per district. Peer researchers interviewed 107 participants from four health facilities and their catchment areas in each district, including caregivers and heads of household of children with both on-time vaccination (at least one 9-month vaccine before 12 months) and delayed or missed vaccination (no 9-month vaccines by 12 months), healthcare workers, community influencers, and government officials. They also conducted eight health facility observations. Solutions to identified drivers of non-vaccination at 9 months were developed through two ideation workshops, followed by two prototyping workshops to further refine the identified solutions. Workshop participants were recruited from amongst interview participants, as well as additional EPI stakeholders.

[2] WHO/UNICEF Estimates of National Immunization Coverage. Immunization data. https://immunizationdata.who.int/ Accessed: Jan 29, 2026.

Table 1: Study Sample

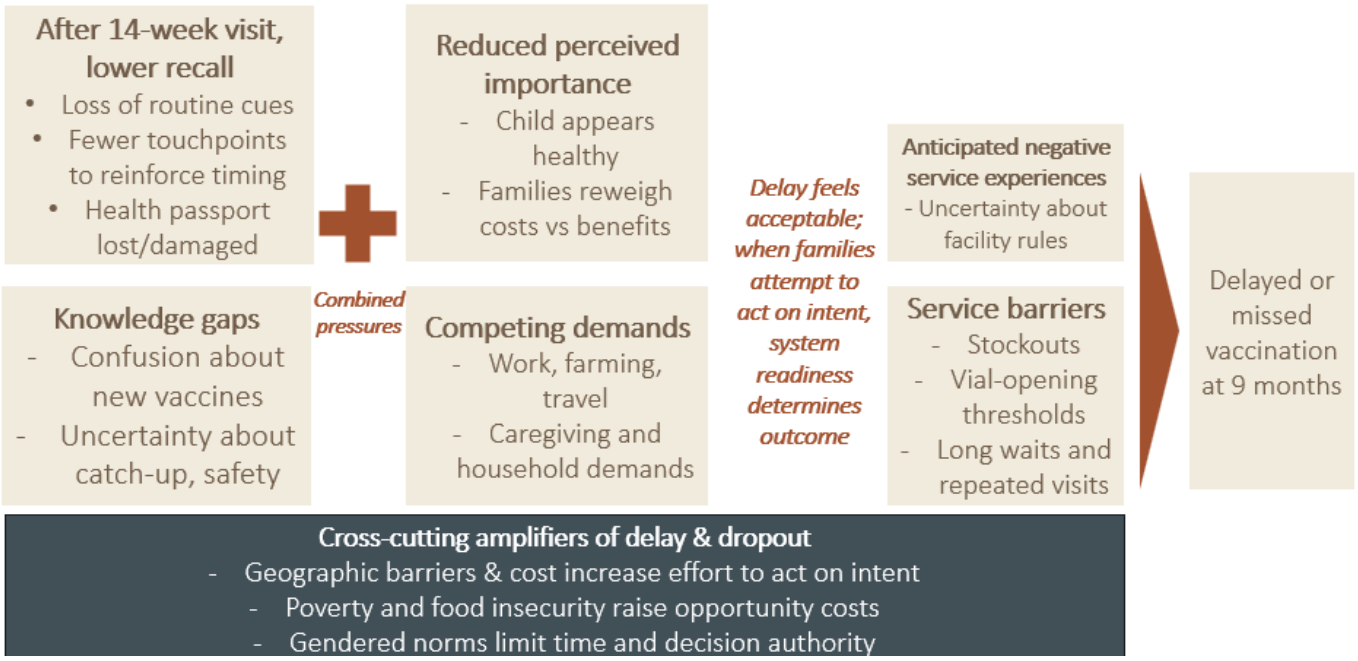
Participant type	Sample (n)		
	Participatory Data Collection	Ideation Workshops	Prototyping Workshops
Caregivers	48	13	10
Heads of household	24	11	8
Healthcare workers	16	7	8
Community influencers	16	9	6
Government officials	3	6	6
Total	107	46	38

To analyze the qualitative data, VillageReach used a participatory team-based approach, employing regular debriefs, affinity mapping and in-depth thematic analysis using ATLAS.ti.

Drivers of MR1, TCV and IPV2 Delay and Dropout

Delay and dropout at the 9-month vaccination touchpoint rarely result from a single barrier. Instead, caregiver intent established during early infancy gradually erodes through a sequence of compounding behavioral, social and health-system pressures. Following the long gap after early infancy vaccination, the loss of routine cues and reminders reduces recall and immunization knowledge gaps further weaken motivation to act. As children appear healthy and the perceived importance of later vaccines declines, competing household and livelihood demands prompt families to reweigh the costs and benefits of vaccination, making delay feel acceptable. Anticipated negative service experiences can further discourage care-seeking. When caregivers eventually attempt to act on their intent, service readiness often determines the outcome, converting delay into missed vaccination. These dynamics are intensified by cross-cutting constraints, including poverty and food insecurity, gendered caregiving norms, and geographic and financial barriers. Each step along this pathway represents a distinct opportunity for targeted intervention to restore momentum, support follow-through and prevent dropout at the 9-month touchpoint.

Figure: Pathways to delay and dropout at the 9-month touchpoint



We identified **five themes that describe patterns of drivers** of vaccination delay or dropout that were either unique to or more pronounced at the 9-month vaccination touchpoint and **four general vaccination barriers** that, while not unique to the 9-month point, exacerbated the primary drivers and increased the likelihood of dropout. We found that often individuals whose children missed the 9-month vaccines rarely experienced one driver, but rather a combination of 9-month dropout drivers and general vaccination barriers that ultimately caused dropout.

1. Loss of routine cues and reminders following the 14-week visits leads to caregivers unintentionally forgetting 9-month vaccinations

The early infancy vaccinations take place over the course of several visits to the health facility, all made within the first 3-4 months of the child's life. These frequent visits provide consistent touchpoints between caregivers and the health system during which health workers can provide vaccine education and remind caregivers of their next vaccination due dates. These touchpoints become less consistent between the 14-week and the 9-month visits, creating gaps in the continuity of engagement between health workers and caregivers and putting more burden on parents to remember upcoming vaccinations on their own. As families shift their focus to other responsibilities, they may stop checking the vaccination card regularly, lose track of the schedule or think they still have more time before the next due date. This can result in families delaying vaccination until they receive a cue to remind them, such as a follow-up visit from a health volunteer.

> *"Maybe the dates were unclear, or we remembered late, so we missed the appointment… [We forgot the vaccination dates because] at that time, our farming work took priority, so we focused mostly on that." – 24-year-old father of delayed child in Chikwawa district*

This driver is exacerbated when the burden of vaccination falls solely on mothers, leaving them with the responsibility of remembering the 9-month vaccinations on their own. In contrast, participants whose children were vaccinated on-time consistently described that they and their spouses or other family members felt a shared responsibility for the child's vaccination. This increased the likelihood that at least one of the family members would remember the upcoming vaccines, supporting on-time vaccination despite the lack of reminders from the health system. This sense of shared responsibility was more pronounced in families that felt strongly about the importance of 9-month vaccines and about following health worker recommendations.

> *"The health workers remind us because they write [the next dates] on the card, so when [my husband and I] sit down, we look at the card to see if the vaccination date is not yet due… It helps because we all have a responsibility to look after the child. So when the card comes, I say this is the card, they tell me to go back next on this day. So that if I forget, he will remind me that the day is due it's time to vaccinate the child." – 29-year-old mother of on-time child in Chikwawa district*

Loss of routine cues and reminders following the 14-week visits was much more prominent in Zomba district than in Chikwawa district, where the malaria vaccine was introduced in 2021/22 and includes a dose delivered at 7 months, creating an additional touchpoint between caregivers and the health system. While only two caregivers specifically mentioned that getting the malaria vaccine at 7 months triggered a reminder about the 9-month vaccine, there were very few participants in Chikwawa who described forgetting the 9-month vaccines, indicating that the extra malaria vaccine touchpoints likely provide service continuity that helps parents remember the later vaccines.

> *"I knew [it was time for 9-month vaccines], because when she was 7 months old, I went to give the child a malaria vaccine, then when she was 8 months old, she was not vaccinated, when she was 9 months old, I knew that this month I had to get vaccinated because of the same card." – 38-year-old mother of on-time child in Chikwawa district*

2. Reduced perceived importance of vaccines and pressure of competing demands prompt families to reweigh the costs and benefits of 9-month vaccinations

Some caregivers and heads of household believed that older children were healthier and less susceptible to illness, making the 9-month vaccines feel less important compared to early childhood vaccinations. That reduced perceived urgency of vaccination resulted in some caregivers reweighing the perceived costs and benefits of vaccination and losing motivation to put aside their other responsibilities and spend time, money, and effort to access vaccination services or to care for children experiencing side-effects after vaccination. Community influencers also noted that parents' interest in vaccination tends to decline as the child ages.

> *"Ah, when it came to making the decision for the child not to [get the 9-month vaccines], we considered it, but what encouraged us most was the child's good health. The child was seen to be healthy, which reassured us that she could remain healthy without vaccinations, so we made that decision." – 23-year-old father of dropout child in Chikwawa district*

> *"When the child is 3-4 months old, the caregivers show interest in immunizing their children, but caregivers with 9-month old children start to lose interest in immunizing their children since they feel like their children received a lot of vaccines in the early months so if they miss the rest of the vaccines there won't be any problems and their body will still be protected from the vaccines they received in the early months." – Male community influencer in Zomba district*

The costs associated with vaccination were higher for caregivers who had trouble accessing health services due to distance or lack of transport, especially as children were heavier and harder to carry at the 9-month point. Further, the perceived costs of vaccination were especially pronounced for families experiencing poverty and food insecurity or who were facing other extenuating circumstances such as illness. Families facing poverty prioritized farming or earning income to meet basic needs over completing vaccination, especially if they had any uncertainty about how necessary the 9-month vaccines were. The reduced sense of vaccine urgency also meant that there was less family support to get vaccines on time if caregivers were ill themselves or caring for another ill family member around the 9-month point and couldn't bring the child to the facility themselves. These situations could lead to either delay or dropout depending on whether the family's circumstances improved, how important they felt the 9-month vaccines were, or whether they were presented with opportunities to conveniently access vaccination through outreach services.

> *"When he was 9 months old and when his date to receive the vaccine had arrived, I was sick, so it was hard for me to travel and go to receive the vaccine since it is very far. So I just decided to miss his vaccines and had planned to go and receive the vaccine once I feel better and then I just became lazy to go… I thought of the distance to travel, so I just decided to wait until I see a health worker passing by and stop him to administer the vaccine to my son here at home because it was very far." – 19-year-old mother of delayed child in Zomba district*

Travel away from home presented another conflict with the vaccination process that typically resulted in delayed vaccination. Community influencers noted that as children got older, mothers became more mobile and were more

likely to travel for long periods of time for family visits, weddings, funerals, or other occasions. Caregivers reported that it was difficult or inconvenient to access vaccination services while away from home, due to not knowing when or where to go for vaccination services or if they'd left the child's health card at home. The perception that later vaccines are less important reduced urgency, leading caregivers to postpone vaccinations until after returning home.

> *"We went away going somewhere that is why the child did not get the vaccine, we stayed there for weeks that's why the child did not get vaccinated on time because we had left the card here at home." – 26-year-old mother of delayed child in Chikwawa district*

This driver was exacerbated by gender roles that place the burden of vaccination on mothers; as infants grew older and vaccination was perceived as less important, men returned to work and provided less support and care for the child, leaving mothers with greater responsibilities and less assistance to remember vaccination due dates and seek services.

3. Anticipated negative experience at the facility deters caregivers from seeking 9-month vaccination services

Some caregivers were concerned that they would encounter bad service or other negative experiences at the health facility, which deterred them from seeking vaccination services. In some cases, this fear was the result of a prior negative vaccination experience. For instance, some caregivers reported either themselves or other mothers experiencing poor treatment from health workers (e.g. being yelled at for not having the vaccination card or for being off-schedule), being embarrassed in front of other mothers, cancelled sessions, or vaccines not being administered due to stockouts. When caregivers had encountered these kinds of experiences earlier in the schedule, they were less motivated to go back to the facility at 9 months out of concern that they would face similar situations.

> *"I was shouted at while I was there [for the 14-week vaccinations] … Just because we entered the vaccination room while breastfeeding our children, so she started shouting at us, but we didn't know that we weren't supposed to breastfeed them before vaccinations… I just stopped going with my child for vaccinations and I didn't go for some time and then it happened that I lost my child's vaccination card so I was afraid that they will shout at me again." – 19-year-old mother of dropout child in Zomba district*

Even caregivers who had previously had good vaccination visits were sometimes worried about encountering bad experiences, for instance if they had lost the vaccination card or fallen into poverty during the gap between the 14-week and 9-month points. Caregivers experiencing poverty or food insecurity were worried they would be judged or humiliated by health workers or other mothers if they showed up at the facility with a child who was hungry or dirty due to lack of money for food, soap or clean clothes.

> *"My heart also hurt that I stopped going to the scale because there is no soap at home, there is no food. My heart also hurts, when I told my friend, I told her that if I went to the scale, my friends would laugh at me… because if we wear dirty clothes, or the child is hungry because there is no food, if the dress is torn, they laugh at you at the clinic." – 20-year-old mother of dropout child in Chikwawa district*

Caregivers who had lost or damaged the child's health card during the long gap between the 14-week and 9-month vaccinations were also hesitant to return to the facility. If the vaccination card was lost or damaged, some caregivers

reported fearing they would be yelled at by health workers, refused vaccines or asked to restart the entire vaccination series, which was especially concerning at the 9-month point when many vaccines would need to be repeated. This fear and uncertainty around how their situation would be handled resulted in many caregivers opting to simply not seek additional vaccination services after losing the card. Health workers' descriptions of how they managed these situations varied by health facility and were dependent on the circumstances of each case, likely contributing to caregiver confusion.

> *"I raised a concern [to my friends] on how I lost my child's immunization card and they advised me to buy another card and when I go to the clinic I should explain why I bought another card, while other [friends] were saying no I shouldn't buy another because the health workers will give the vaccines all again starting from the first vaccine including the 9 months vaccines so such information made me not want to go back to the health facility." – 33-year-old mother of dropout child in Zomba district*

> *"If they don't bring the card, how can we know which vaccine the child has received or not? We might ask the age, but they may not know which vaccines the child has already had. That's why we emphasize having the card, even if they've replaced the old one with a new one—we need to see the old one for the register number to trace the records. It's a must that they come with the child's health passport… If it's someone who seems to know what they're talking about, we might assess and go ahead [with vaccination], but sometimes it's hard. If you can't confirm the vaccine history, you're unsure and might end up making a mistake. So, sometimes you send them back to avoid errors." – Male health worker in Chikwawa district*

4. Lack of information and encouragement around 9-month vaccines from trusted sources creates knowledge gaps and allows rumors to spread

Participants cited rumors and misinformation around 9-month vaccines, which were fueled in part by the recent additions of TCV and IPV2 doses to the 9-month touchpoint. Some caregivers and heads of household were concerned about how many new vaccines were introduced and cited rumors that they were added to the vaccination schedule as a population control method. This fear resulted in some participants deciding not to risk 9-month vaccination, especially if the child already seemed healthy without the vaccines, resulting in dropout.

> *"We fear when we heard stories on how they were vaccinating children in the past, they only get the vaccine on one leg. The vaccine ends there while waiting for 9 months, these days they get the vaccine on both legs, the second and third vaccine. The only fear that we have is why they are giving the children too much vaccine." – 30-year-old mother of dropout child in Chikwawa district*

> *"There's often a gap between the number of children receiving MR1 and those receiving TCV. TCV was only introduced in 2023, and some caregivers might not be fully informed about it. It's not surprising to find a child receiving MR1 but not TCV, even though they're scheduled together. We noticed in Dowa, for example, that many caregivers had no knowledge of TCV, indicating a gap in awareness. People tend to accept vaccines they're familiar with, but it takes time to adjust to new ones." – EPI stakeholder*

Though participants in both the vaccinated and nonvaccinated groups mentioned hearing these kinds of rumors and misconceptions, a key difference was that those in the vaccinated groups had information and encouragement from

trusted sources such as family members and health workers who helped to dispel those rumors and reinforce the importance of 9-month vaccination. Education from trusted sources was also important in helping shift likely dropouts to get delayed vaccines.

> *"We wouldn't have vaccinated due to the reasons we heard that they wanted to reduce the population in Malawi, and they are introducing other diseases deliberately so that can they introduce [new] vaccines, and we said this is true. But because we heard information from health workers, that's when we thought it wise, "Ah, the government cannot reduce the population because people are still being born in this country," so it gave us the strength to vaccinate the child." – 29-year-old father of delayed child in Zomba district*

Knowledge gaps influencing 9-month delay or dropout extended beyond just rumors and myths. Lack of clear guidance from health facilities resulted in some caregivers not knowing if children could still receive 9-month vaccines after falling behind schedule (for instance due to illness or traveling at the 9-month due date) or if they'd lost the health card. When trusted sources could provide accurate information about catch-up practices or how to get a new vaccination card, it helped caregivers continue the vaccination process, even if delayed.

5. Stockouts and anti-wastage practices create missed vaccination opportunities

Stockouts can happen for any vaccine but seem to be somewhat more common for MR, in part due to the wastage associated with 10-dose measles vaccine vials, the need to reconstitute the measles vaccine with diluent, cold chain requirements, and reallocating routine immunization vaccine stock towards campaigns during outbreaks.

> *"The challenge we have is about the vaccine we need to reconstitute before administering, like the measles vaccine. It happens that in some circumstances, the diluent has been broken, which means that we have more bottles of vaccines than its diluent. I wonder sometimes why the manufacturers don't put an extra diluent just to cover up in case of emergency like this." – EPI stakeholder*

The measles vaccine comes in a 10-dose vial that expires 6 hours after being opened. Any doses that are not delivered to children within those hours get wasted. The official policy, in line with the Reach Every Child strategy, is that the vial should be opened even if only one child is present. In practice, however, this is not always followed, especially when health workers are worried about managing stock to prevent stockouts.

> *"To open a vial there are no rules, but sometimes the rules can be set on the ground, Maybe due to low supply of vaccines, they can follow such policies because the measles vaccine vial is for ten children so if you open it, within 6 hours or at the end of the clinic session we are supposed to discard the remains, even if you have injected one child. Or when there is shortage, we practice what we called Booking, so that we can avoid wastage of vaccine, but it is not what is supposed to be done." – EPI stakeholder*

Some health workers said they waited to open a vial until a minimum number of children were present, or that they might not open a new vial for caregivers who arrived at the vaccination session late, after the opened vial had expired.

> *"If they come late, say around 12 PM, we check if the vaccine is still available; if it is, we administer it. However, if the vaccine is finished, like the nine-month vaccine, which we usually open for ten children, we tell*

them that they need to come to the health center the following day to avoid vaccine wastage. But due to the Reach Every Child program, we sometimes feel pressured to open a bottle and give the vaccine to one child, even though it can be challenging." – Female health worker in Zomba district

Overall, caregiver and household head participants did not report having vaccination services denied due to anti-wastage practices, suggesting that in the selected health facilities, vaccinators mostly adhered to the official policy. However, many more participants cited stockouts as a reason for children not getting the vaccine on time or at all. Stockouts were a source of frustration for caregivers who had spent time and effort seeking services. Some caregivers found vaccines on their next trip back to the facility, some returned multiple times before vaccines were available, and others gave up before ever finding vaccines. The lack of clear communication around when vaccines would be available again was an additional deterrent, leading caregivers to lose trust and confidence in the health system. This finding highlights the tradeoffs when balancing wastage, coverage and stockouts.

"I was interested in vaccinating my child unfortunately the vaccine wasn't available, and I spent a lot of time there. I went back home around 12 noon after spending a lot of time without any benefit… I felt disappointed because I sat at the health clinic for a long time without any benefit so I felt very sad and if they had mentioned that didn't carry enough vaccines then we wouldn't have spent a lot of time waiting." – 33-year-old mother of dropout child in Zomba district

Cross-cutting barriers that exacerbate drivers

We identified four cross-cutting barriers that are present throughout the vaccination schedule but that exacerbate the primary 9-month delay and dropout drivers described above.

Information Gaps

Information gaps that cut across drivers related to caregivers' limited understanding of the schedule and importance of 9-month vaccines, lack of knowledge of how to get children back on schedule after falling behind, confusion about policies related to handling of lost health cards, poor knowledge of how and where to access vaccination services while traveling, and lack of awareness of vaccine availability following stockouts. These knowledge gaps contributed to reduced motivation and confusion that hindered caregivers from following the vaccination process.

Poverty / Food Insecurity

Caregivers facing poverty and food security found it difficult to prioritize vaccination when they were struggling to meet basic needs. Those dire situations forced parents to focus on their farming or piece meal work, which made them more likely to forget about the 9-month vaccines and also resulted in a high opportunity cost associated with the vaccination process. Even caregivers who felt that vaccination was important were embarrassed to go to the facility if they didn't have soap or clean clothes.

Gender Roles

Gender roles place the burden of vaccination largely on mothers, the primary caregivers. Health workers and community influencers reported that male involvement in children's health is highest in early infancy and then decreases as the child gets older and is perceived to be stronger. By the 9-month point, caregivers may have less

support from husbands or other family members to remember vaccination appointments, to travel to the facility, or to care for children after vaccination.

> *"Men are not particularly interested in the 9-month vaccine, they are more interested in the vaccine that is given to the child when he is young, while women can also be interested in the 9-month vaccine… If the vaccine is given to a child at one month old, [men] have the impression that the child is young and should be vaccinated more often. However, when the child is 9 months old, I see that many men are not interested in their child receiving the measles vaccine that is given at 9 months." – Male community influencer in Chikwawa district*

Limited family support is especially crippling for caregivers who are ill and unable to travel to the facility themselves or who are responsible for watching other young children and are unable to leave them to go to the facility.

Access Challenges

Many caregivers experienced challenges accessing vaccination services due to long distances and limited or expensive transportation to reach health facilities or inconvenient vaccination service hours. Caregivers and health workers reported that access challenges were especially present during the rainy season, when poor road conditions and swollen rivers make it difficult both for caregivers to get to the health facility and for health workers to conduct outreach services. While these barriers were present across the vaccination schedule, they exacerbated several of the drivers of 9-month dropout. For instance, access challenges contributed to the high perceived cost of vaccination for parents who questioned the importance of later vaccines. They also resulted in caregivers having less motivation to make repeated trips back to the facility after encountering stockouts.

> *"When we went to get the [9-month] vaccine, we were told that it had finished. They told us that we should go to Matawale to receive that vaccine, but it was difficult for us to find transport to take the child to Matawale health centre." – 38-year-old father of dropout child in Zomba district*

Facilitators of 9-month Vaccination and Catch-up

Factors that facilitate a delayed individual catching up

Despite encountering similar drivers, some caregivers successfully caught their child up on delayed 9-month vaccinations. We identified four factors that facilitated catch-up and linked them to specific drivers that contributed to non-vaccination at 9-months (Table 2).

Table 2: Facilitators of catch-up mapped to delay/dropout drivers

Catch-up facilitators	Related dropout drivers
Education or encouragement from a trusted source such as family members or health workers addressed rumors and concerns and reminded parents of 9-month vaccine importance	• Reduced perceived importance of later vaccines • Knowledge gaps
Visits from community volunteers reminded caregivers of missed vaccines and informed them about options to continue vaccination, even if off schedule	• Loss of routine cues and reminders • Knowledge gaps
Community and/or door-to-door vaccination provided needed opportunities and convenience for caregivers to catch up on missed vaccines	• Reduced perceived importance of later vaccines • Anticipated negative experiences
News or observations that reinforced the importance of 9-month vaccines, such as examples of child illness after 9 months or news of outbreaks, remotivated caregivers	• Reduced perceived importance of later vaccines

Factors that facilitate on-time vaccination at 9 months

Caregivers and heads of household that completed 9-month vaccines on-time felt strongly about the importance of the 9-month vaccines, proactively checked due dates and made plans for vaccination and perceived that vaccination was the responsibility of both parents. They received timely information and encouragement from health workers and some also felt that there was a community norm or "law" about completing the vaccination sequence. Notably, caregivers who completed vaccination on time didn't encounter systemic challenges and noted that the process was easy. Table 3 presents factors that were present among caregivers and heads of household whose child was vaccinated on-time at 9 months that weren't present for caregivers and heads of household of delayed or non-vaccinated children.

Table 3: Comparison of factors present for on-time and delay/dropout caregivers and heads of household

Factor	On-time vaccinated groups	9-month delay/dropout groups
Strong perceived benefit of 9-month vaccines	Yes	Rarely
Proactive planning/checking	Yes	No
Family/couple shared responsibility	Yes	No
Health worker info/encouragement	Yes	Sometimes, but less proactive
Social/community norm adherence	Sometimes	Not evident
General vaccination barriers	No	Yes

CASE STUDY

How Delay Becomes Acceptable

Mary* is a 33-year-old mother of five who runs a small charcoal business with her husband. Her youngest child, Charity, received her 9-month vaccines four months late, at 13-months.

At 3-months, Charity's vaccines were administered on time. Mary knew the vaccines were due because of health talks at the clinic and the schedule written on Charity's immunization card. She also received encouragement from her husband and family. Her husband stayed home to care for their other children while she took Charity to the clinic. Mary felt motivated to prevent polio, experienced a positive vaccination visit and was treated well.

By the time Charity was 9-months old, Mary's circumstances had changed. With Charity getting older, her husband returned to his normal work schedule. This left Mary alone, caring for her two youngest children and managing business responsibilities. Vaccination was no longer a priority, and Mary wasn't too concerned when the 9-month vaccination date passed. After the due date passed, she wasn't sure how to get Charity the missed 9-month vaccines and felt that taking both children to the clinic without support would be too difficult.

Charity was eventually vaccinated with MR1, TCV and IPV2 at home when health workers visited. Mary was glad to see them; noting that they were familiar, friendly and clearly explained the purpose of the visit. Though she was not very concerned about Charity having gotten the vaccines late, Mary was grateful for the outreach, as it provided an opportunity for Charity to get vaccinated without impeding her other responsibilities.

> *"Well, I decided that she was not going to get vaccinated anymore. I thought time had passed. I took it that the month during which this child had to receive the vaccine had passed, so I just left it." – Mary*

"This picture shows that … I had two young children, and they both needed my attention, and I was taking care of them alone. How was I going to carry them to the clinic? Also, if I had decided to take this one to the clinic, who would I have left the other one with? So, it was difficult for [child's name] to follow the vaccination schedule."

**Names were changed to maintain anonymity. Photo was taken by participant as part of the photovoice data collection process. Consent to share was obtained*

Comparing drivers of vaccination at 3 months and 9 months for Mary and Charity			
Exemplars in Global Health Vaccine Delivery Framework		3-month vaccines	9-month vaccines
Intent	Awareness	High	Low
	Attitude	Strongly favorable	Indifferent
	Prior experience	Unknown	Good
Access	Support	High	Low
Readiness	Supply	Available	-
	Health worker availability	Available	-
Service Delivery	Modality	Health facility	-

Health workers and the village chief validated this as a fairly common experience. The chief noted that awareness efforts in the community usually focuses on early infant vaccines as they assume once the child starts immunizations, they will finish. He also emphasized that caregivers often perceive later vaccines as less important and that men rarely participate beyond the initial visits, leaving women to manage vaccination alone. Health workers confirmed that busy schedules, forgetfulness and low awareness contribute to delayed or missed doses, despite their efforts to remind caregivers about upcoming vaccines at each visit.

> *Through my observation I have noticed that most caregivers feel like the 3-4 months vaccine is more important rather than 9 months vaccines because we see that the child is okay and is not getting sick and they are healthy so we just think that the rest of the vaccines is not necessary and when the child is 9 months they are probably crawling or walking so there wouldn't be any risk not to receive the vaccine rather than when the child is younger and they are just a new born baby. Most caregivers also forget to continue to get their child vaccinated for the 9 months vaccine because after getting the first vaccines they stay for some months without receiving vaccinations, so they feel the vaccines the child received is enough. – Chief*

Community-Identified Solutions to Improve Coverage at 9 Months

To improve coverage of MR1, TCV and IPV2 at 9 months of age, participants identified and prioritized four solutions:

- Model Mothers: Mothers within a select community would be equipped to motivate their peers, counter misinformation and provide social support for completing the 9-month vaccines
- Electronic Immunization Registry (EIR): Expand and enhance the current piloted EIR system to enable reminders, support proactive defaulter tracing and maintain vaccine record continuity
- Male Champions: Influential men within a select community would be equipped to encourage fellow heads of household to take responsibility for ensuring their children get their 9-month vaccines on time
- Reminders: Through multiple channels (posters, video, SMS etc.), deliver clear, timely reminders for caregivers to get their children vaccinated with MR1, TCV and IPV2 at 9 months

Although each intervention is described separately, these solutions work best when combined, as they target different contributors to missed or delayed 9-month vaccinations. Notably, three of the four focus on strengthening intent, reflecting our findings that most caregivers are not resistant to vaccination but simply lose visibility of the 9-month schedule due to limited messaging and follow-up from the health system. Our data show that when motivated caregivers receive reminders and can overcome access barriers, they follow through with getting their children vaccinated with MR1, TCV and IPV, even if late.

1. Model Mothers

This solution would build off the well-trodden community-based volunteer models that have been used in Malawi to promote immunization and broader maternal and child health initiatives. These models have demonstrated measurable improvements in infant care practices and breastfeeding rates, and reductions in infant mortality. For instance, the Mai Mwana project in Mchinji district, which combined women's groups with home visits by trained volunteer peer counsellors showed statistically significant reductions in infant mortality in rural Malawi.[3]

This proposed solution would build on this evidence-based model to address the specific barriers that caregivers face at the 9-month vaccination point such as forgetting the vaccines are due, competing priorities, lack of active support and misinformation (Table 4). Unlike broader volunteer programs, this solution would focus on trusted peer influence, personalized support and context-specific behavior change techniques, ensuring it aligns closely with hyper-local challenges to completing the 9-month vaccines.

This approach would also ensure that mothers receive needed information through their peers, as prior research in Malawi has shown that women have lower literacy rates, phone ownership, and media access compared to men.[4]

[3] Lewycka S, Mwansambo C, Kazembe P, et al. Effect of women's groups and volunteer peer counselling on rates of mortality, morbidity, and health behaviours in mothers and children in rural Malawi (MaiMwana): a factorial, cluster-randomised controlled trial. *Lancet*. 2013 May 18;381(9879):1721-35.

[4] National Statistical Office. Malawi Multiple Indicator Cluster Survey 2019-20, *Survey Findings Report*; 2021.

Home-based follow-up, tailored reminders, and supportive counseling would strengthen caregivers' knowledge and motivation, leading to timely vaccination and reduced 9-month delay or dropout.

Table 4: Solution design components mapped to 9-month delay and dropout drivers (Model Mothers)

Drivers	Design components to address identified drivers
Loss of routine cues and reminders	• Conduct regular check-ins and follow-up on caregivers in their communities.
Reduced perceived importance	• Share relatable stories to normalize challenges and motivate caregivers to prioritize 9-month vaccines. • Conduct home-visits to help caregivers plan around busy schedules and encourage making time for vaccination.
Anticipated negative experiences	• *Not directly addressed*
Knowledge gaps	• Share personal stories that reinforce the value/importance of 9-month vaccines. • Provide accurate vaccine information.
Stockouts and waste management	• *Not directly addressed*

MODEL MOTHER: KEY COMPONENTS

Model Mother Selection Process: Community voting

Model Mother Profile: Literate, approachable, respected, persistent, have a fully immunized child aged 9 months-3 years

Model Mother Training: Minimum of 3-days delivered by a qualified Community Health Worker (HSA); focus on clear messaging

Volunteer Model: Volunteer motivation reinforced through recognition, practical tools and non-monetary incentives like bicycles

Model Mother Engagement Approach:

- Engagement should be with all caregivers, not just mothers
- Meet caregivers where they are at (church, water points, village banks, home); do not engage at the caregiver's workplace
- Key messages told through focused, clear, benefit oriented storytelling (e.g. *dramas*)
- Model Mothers should use motivational, empathetic language
- To ensure trust, all Model Mothers should have identification *(badges, T-shirts, branded chitenje*)

EXAMPLE OF MODEL MOTHER DRAMA SCRIPT

"Completing all vaccinations, including the 9-month one, is the key to the health of our children."

Plot Summary

- Many caregivers miss the 9-month measles vaccine, even though it provides critical protection.
- Model Mothers show that completing all vaccines keeps children healthier and that side effects are usually mild and temporary.
- Health workers clear up misconceptions and explain why the 9-month vaccine is essential for strong, lasting protection.

2. Electronic Immunization Registry (EIR)

This solution would build off the EIR current under development as part of the Digital Innovation in Pandemic Control (DIPC) initiative. This initiative is led by Digital Square in partnership with the Ministry of Health Malawi and as of late 2023, an EIR module is being piloted in 21 facilities in Mchinji District, and in selected sites in Ntcheu District and Salima District.[5]

An EIR addresses systemic weaknesses of Malawi's largely paper-based immunization record system, including fragmented immunization data, missed vaccinations due to a missing or lost vaccination card and poor inter-facility immunization record continuity. By digitizing immunization registers within the national health information system, the EIR enables real-time access to child vaccination histories, supports accurate scheduling and reduces dependency on physical health passports.

Early results from pilot EIR implementation are promising; according to recent DIPC data, across the 46 facilities in pilot districts recordkeeping errors have decreased and immunization workflows have become more efficient. However, the pilot also surfaced challenges: limited internet connectivity at some sites, lack of health-worker digital literacy and incomplete interoperability with some legacy systems. [6]

Participants prioritized expanding and improving on this piloted EIR system to Zomba and Chikwawa to improve coverage of the 9-month vaccines as its automated reminders would help caregivers remember vaccination appointments, its digital records would ensure access to services even when health cards are lost and ability for health workers to manage a child's vaccination schedule across facilities.

Table 5: Solution design components mapped to 9-month delay and dropout drivers (EIR)

Drivers	Design components to address identified drivers
Loss of routine cues and reminders	• Timely messages sent to caregivers and volunteers before scheduled vaccinations • Caregivers receive notifications regardless of location, helping mitigate missed appointments
Reduced perceived importance	• Health workers at any facility can access a child's vaccination history, ensuring continuity of care for mobile families
Anticipated negative experiences	• Health workers can retrieve child's vaccination history even if the caregiver loses the card
Knowledge gaps	• *Not directly addressed*
Stockouts and waste management	• *Not directly addressed*

[5] Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. *Scaling the use of digital tools for vaccination planning, deployment, and monitoring: Health data ecosystem mapping.* Digital Innovation in Pandemic Control (DIPC), on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ); October 2023. Bonn, Germany.

[6] PATH. *Digital Innovation in Pandemic Control - Malawi.* PATH; August 2025. Resource page on the Digital Innovation in Pandemic Control (DIPC) project strengthening Malawi's digital immunization ecosystem. Available at: https://www.path.org/our-impact/resources/digital-innovation-in-pandemic-control-malawi/

EIR: KEY COMPONENTS

EIR Purpose: A digital platform that stores accurate child vaccination histories, reducing reliance on paper vaccine cards and ensuring continuity of care across facilities and adherence to 9-month vaccinations

Core Features:

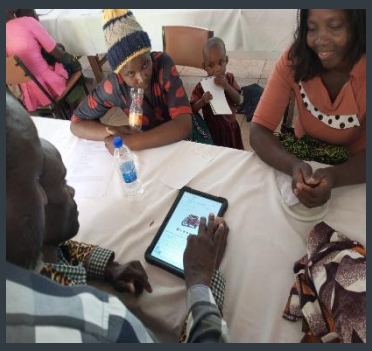
- Real-time record access and updates across facilities
- Offline functionality to avoid service disruptions
- Duplicate record prevention with guidance for resolving discrepancies
- Automatic due-lists for children needing vaccination

SMS Reminder system:

- Timely, actionable reminders to caregivers with child name, due date and facility
- Multiple messages leading up to the 9-month vaccine
- SMS alerts to volunteers for children in their catchment areas
- Standardized message templates tested with communities

Community Health Worker (HSA) and Volunteer Support:

- Simple follow-up tools for volunteers without smartphones
- Clear procedures when system data conflicts with caregiver information
- Training focused on usability, accuracy, and troubleshooting



Prototyping workshop participants testing entering a child's information into the EIR

3. Male Champions

Previous and ongoing efforts in Malawi show that engaging men and community champions can shift knowledge, attitudes and service uptake. For example UNICEF-supported "Male Champion" initiatives and other male-engagement strategies have been used in maternal and child health and show that men can be mobilized to support maternal and child health care, particularly in male peer-to-peer interventions.[7] Civil society organizations, such as the Malawi Health Equity Network, have also engaged community advocates to increase male support for immunization and some districts have reported improvements in coverage following intensified community mobilization.[8]

[7] Kululanga LI, Sundby J, Malata A. *Striving to promote male involvement in maternal health care: A qualitative study of women and men's perspectives on male involvement in maternal health care in Malawi. Reproductive Health.* 2011; 8:36.

[8] Mkandawire P. *MEHN encourages men to participate in ensuring wider vaccine coverage.* Malawi News Agency; 11 September 2024. Blantyre, Malawi. Available at: https://www.manaonline.gov.mw/index.php?Itemid=219&id=5359%3Amehn-encourages-men-to-participate-in-ensuring-wider-vaccine-coverage&option=com_k2&view=item

Table 6: Solution design components mapped to 9-month delay and dropout drivers (Male Champions)

Drivers	Design components to address identified drivers
Loss of routine cues and reminders	• Champions provide timely prompts and household follow-ups to reinforce vaccination schedules and reduce missed appointments due to forgetfulness. • Champions check in with fathers and heads of household to encourage shared responsibility and support caregivers in planning and attending vaccination sessions.
Reduced perceived importance	• Champions remind and motivate heads of household to accompany children for vaccination even when traveling or when the caregiver has travelled, ensuring continuity.
Anticipated negative experiences	• *Not directly addressed*
Knowledge gaps	• Champions deliver culturally resonant, brief, and actionable messages emphasizing the importance of 9-month vaccines, correcting misconceptions, and addressing rumors.
Stockouts & waste management	• *Not directly addressed*

This solution would build off these initiatives and evidence to improve shared responsibility for the child's vaccination and reduce the burden of vaccination on mothers as well as improve remembering the 9-month vaccines and ensuring understanding of their equal importance in the vaccination schedule. This solution would engage men as 'Male Champions" to deliver brief, relatable messages emphasizing a father's role in protecting his children, clarifying the purpose of vaccines and encouraging shared responsibility in taking children for their 9-month vaccination visits. Male Champions would also conduct household follow-ups with peers and encourage them to check vaccination cards and accompany mothers/caregivers to health facilities. This solution would also address challenges that the design and nature of health education tend to make men feel uncomfortable participating during antenatal care and

MALE CHAMPIONS: KEY COMPONENTS

Male Champion Selection Process: Combination of self-volunteering, nomination and community voting

Male Champion Profile: Respected, trustworthy, humble, dedicated male heads of household who have vaccinated their own children

Male Champion Training: Short, practical and focused on essential vaccination facts, clear messaging and techniques for engaging men

Engagement Approach:

- Deliver brief, relatable, culturally grounded messages in male-dominated spaces that emphasize a father's role in vaccination
- Conduct household follow-ups to encourage peers to check vaccination cards and support the 9-month measles visit.

Male Champion Model

- Non-financial, performance-based, refresher trainings, protective gear and recognition from community leaders.
- Ongoing oversight by community influencers and health workers
- Two male champions per village

EXAMPLE OF MALE CHAMPION DRAMA SCRIPT

"Fathers, check your child's card. If the 9-month vaccine is due, plan together and make sure your child gets it on time."

Plot Summary

- A Male Champion shares his personal testimony, highlights fathers' responsibility, and encourages men to actively support completing all vaccines—especially the 9-month measles dose.
- He urges fathers to check child health cards, plan ahead, and accompany or take children to the clinic, reinforcing that healthy children strengthen families and the whole community.

children's healthcare visits and evidence that shows general men's disinterest in vaccination.[9] By increasing male engagement in child vaccination, particularly around the 9-month touchpoint, the solution has the potential to shift social norms and create a more supportive environment for 9-month vaccination uptake.

4. Reminders

This solution would leverage evidence on effectiveness of reminder systems for vaccinations. Data from a meta-analysis of the use of SMS reminders for routine immunization in low and middle-income countries suggests that SMS reminders can contribute to achieving high and timely routine immunization coverage.[10] Other studies in Africa have documented positive effects of SMS or mobile based reminders on reducing dropouts and increasing completion rates of vaccination schedules.[11] In Malawi, through the My Village My Home (MVMH) reminder program, community volunteers and village heads monitored each infant's vaccination status on a poster-sized tool, tracked eligible children, and conducted home visits and community meetings to follow up on immunization. In the districts where MVMH was implemented, this led to markedly improved coverage and timeliness and high levels of community ownership and motivation. A VillageReach solution using improved posters for the immunization schedule and dramas to address immunization dropouts had similar results.[12,13]

This solution would aim to strengthen immunization communication to caregivers about vaccination dates (specifically the 9-month vaccines) by combining posters, SMS reminders and volunteer engagement. Posters would serve as visual reminders in high-traffic community spaces, while SMS messages would deliver direct, action-oriented prompts. Health volunteers would reinforce these messages through household visits and community engagement, building rapport with caregivers and fathers and supporting adherence to vaccination schedules. This approach would prioritize multichannel communication to account for variability in female caregivers' phone access and literacy levels.

Table 7: Solution design components mapped to 9-month delay and dropout drivers (Reminders)

Drivers	Design components to address identified drivers
Loss of routine cues and reminders	• Weekly SMS prompts during the child's 8th month to reduce missed appointments. Posters provide ongoing visual cues in the community.
Reduced perceived importance	• SMS reminders deliver messages regardless of location to ensure caregivers are aware of upcoming vaccinations

[9] Kululanga LI, Sundby J, Malata A. Striving to promote male involvement in maternal health care: a qualitative study of women's and men's perspectives on male involvement in maternal health care in Malawi. *Reproductive Health*. 2011; 8:36.

[10] Miller NP, Weisser M, Yoshida S, et al. Implementation of community health worker programs in rural Malawi: a qualitative study of stakeholder perspectives on challenges and facilitators. *BMC Health Services Research*. 2022;22(1):1234. P

[11] Manakongtreecheep K. *SMS-reminder for vaccination in Africa: research from published, unpublished and grey literature. Pan African Medical Journal*. 2017;27(Suppl 3):23.

[12] Olayinka F. *Community Monitoring of Individual Children's Vaccinations: Six Country Experiences.* Media Development/Communication Initiative (Comminit); published 1 December 2018. Summary of community monitoring strategies used to engage communities in tracking and promoting individual children's vaccination status across six countries. Available at: https://media-development.comminit.com/content/community-monitoring-individual-childrens-vaccinations-six-country-experiences

[13] VillageReach. *Endline evaluation of the Malawi Let's Talk About Vaccines project*. VillageReach; March 2025. Available at: https://www.villagereach.org/wp-content/uploads/2025/03/Endline-Evaluation-of-the-Malawi-Lets-Talk-About-Vaccines-Project-March-2025.pdf

	• Volunteers follow up with caregivers, providing support and reminders to plan around busy schedules.
Knowledge gaps	• Posters and volunteer messaging to reinforce the importance of 9-month vaccines, clarify misconceptions, and motivate action.
Anticipated negative experiences	• *Not directly addressed*
Missed opportunity for vaccination	• *Not directly addressed*

REMINDERS: KEY COMPONENTS

Reminder Channels

- Posters placed in high-traffic community areas
- SMS reminders sent during the child's 8th month
- Volunteers reinforcing reminders through household visits

Reminder Content

- Short, simple, culturally relevant messages emphasizing the importance of the 9-month measles vaccine
- Trusted sender identity for SMS (e.g., Ministry of Health)
- Posters showing local families, including fathers in caregiving roles

Targeting & Reach

- Identify households with children approaching 9 months
- Updated contact lists gathered through health workers, promoters and cluster leaders

Volunteer Role

- Conduct brief home visits using simple scripts and reminders
- Answer basic questions and encourage checking child's health card.

Training & Support

- Short training for volunteers on communication, targeted reminders, and follow-up.
- Light supervision from health workers to ensure consistent messaging.
- Non-financial incentives (visibility materials, recognition).

Policy Considerations to Improve Coverage at 9 Months

Changing the MR vial from 10 doses to 5 doses

According to our analysis, some health workers and caregivers reported missed opportunities for vaccination due to fear of opening a 10-dose MR vial when there weren't enough children for each dose. This tension between minimizing wastage and vaccinating eligible children reflects a gap between official guidance and frontline practice. This dynamic is particularly problematic at the 9-month touchpoint, where session sizes are often small and irregular. In these settings, informal rationing practices can lead to repeated caregiver visits, delayed vaccination or complete dropout, especially for families facing distance, time or resource constraints.

Smaller 5-dose vials could potentially better match typical 9-month session attendance patterns, reducing instances where a child is turned away or asked to return because staff avoid opening a 10-dose vial for only a few children. However, health worker and EPI participants flagged that this change would have to address important implementation considerations like cold-chain capacity, diluent handling, stock management and procurement processes. There were also expressed concerns about potential increases in unit costs of the MR vaccine.

Moving the MR1 vaccine from administration at 9 months to 6 months

Participants across all groups expressed mixed views on moving MR1 from 9 to 6 months. While caregivers and health workers saw potential convenience and coverage benefits, EPI staff cautioned that there would be reduced strength of immunity if delivered at 6 months and emphasized the need for extensive community sensitization before any schedule change.

Caregivers and heads of household shared varied perspectives. Some felt that giving the vaccine at 6 months would be more convenient and easier to remember, reducing the chance of forgetting and providing earlier protection. They also noted that younger infants are easier to manage during immunization, crying less and experiencing fewer side effects. However, others preferred keeping the vaccine at 9 months, saying they trust the current schedule and believe the older infants are stronger and better able to tolerate vaccines. Some caregivers also expressed concern about how moving the MR1 vaccine to 6 months would be too close to the 7-month malaria vaccine, fearing it could be "too much for the child" or cause side effects such as swelling or fever. Overall, most caregivers and heads of household noted that regardless of their own preferences, they would follow health worker recommendations with respect to the best timing for the MR1 vaccine.

Health workers similarly held mixed views. Some believed moving MR1 to 6 months could improve coverage, as caregivers are more consistent with clinic visits during early infancy. They also noted potential benefits of linking vaccination with growth monitoring and nutrition counseling at 6 months. Others cautioned that the change could increase workload, create confusion among caregivers, and require extensive sensitization efforts to avoid resistance or misunderstanding.

In contrast, EPI representatives clearly favored keeping the MR1 vaccine at 9 months. They explained that vaccine effectiveness is higher at 9 months (about 85%) compared to approximately 50% at 6 months, due to the child's developing immune system. While they acknowledged that moving MR1 to 6 months might slightly improve coverage,

they emphasized that the scientific rationale and immune response associated with administering it at 9 months outweigh the logistical benefits of moving the vaccine to 6 months. They also noted that altering the schedule would require major community education efforts and could lead to confusion or mistrust.

Table 8: Advantages and disadvantages about moving the MR1 vaccine to 6-months

Advantages	Disadvantages
• Perception that younger infants are easier to manage during immunization • Opportunity to combine with other 6-month services like growth monitoring, contraception and nutritional counseling • Earlier protection may prevent measles infection in children prior to 9 months • Could improve overall coverage since caregivers are more consistent with early vaccination visits. • Builds habit of timely vaccination early in the schedule, potentially strengthening adherence to later vaccines	• Increased workload for health workers at the 6-month visit due to more services delivered at once. • Reported lower immune response, estimated vaccine effectiveness approximately 50% at 6 months compared to approximately 85% at 9 months. • Increased risk of confusion or mistrust if the schedule changes without strong sensitization and clear rationale. • Belief that older children are stronger and can "better handle" vaccines, reinforcing preference to keep at 9 months.

Enhance vaccine communication alongside growth monitoring visits

Our findings indicate that there may be missed opportunities for reminders and follow-up within the broader primary health care provision. Although the interval between the 14-week and 9-month vaccinations is relatively long, caregivers are expected to visit the health facility monthly for growth monitoring and health education for their children. These visits provide opportunities for health workers to remind caregivers of upcoming vaccination dates and reinforce the importance of timely completion of the immunization schedule. Ideally, caregivers who adhere to monthly visits should receive adequate reminders of the upcoming 9-month vaccinations. In practice, however, some caregivers may choose to attend only when a vaccination is due, thereby missing periodic reminders and increasing the likelihood of forgetting subsequent doses. The fact that so many caregivers reported forgetting about the 9-month vaccinations points to gaps in continuity of engagement between health workers and caregivers, particularly among those who do not attend growth monitoring sessions. It also points to gaps between the overall policy expectations of monthly contact translating into consistent caregiver engagement and adherence to the full immunization schedule versus what happens in practice. This inconsistency in practice may be due to reported poor treatment by health workers in this study as well as others[14], as well as the burden of managing household responsibilities, which may take priority over health-seeking activities.

[14] Fleming JA, Munthali A, Ngwira B, et al. Maternal immunization in Malawi: A mixed methods study of community perceptions, programmatic considerations, and recommendations for future planning. Vaccine. 2019;37(32):4568-4575.

Conclusion

Dropout at Malawi's 9-month touchpoint is driven by a unique convergence of factors: the long five-month gap since the last vaccine, which increases forgetfulness and card loss; a perceived decline in risk as children grow; fear of repeating negative experiences from earlier vaccine visits; confusion and misinformation following recent vaccine introductions; and missed opportunities for vaccination linked to stockouts and anti-wastage practices. Importantly, caregivers rarely face a single barrier; instead, non-vaccination or late vaccination of MR1, TCV and IPV2 reflects multiple compounding drivers, intensified by underlying access challenges, gender inequities and poverty-related constraints. These barriers are consistent with broader literature, which highlights how structural factors, such as women carrying nearly all household, childcare, and economic duties, directly shape behavioral drivers like forgetting appointments.

VillageReach previously conducted a similar study in Lilongwe and Mzimba North that focused on drivers of dropout of any vaccine in the routine childhood vaccine schedule. When comparing results from that study against this one some similarities emerged as well as some distinct barriers specific to the 9-month touchpoint.[15] While both studies identified dropout drivers such as forgetfulness, weak communication from health workers, opportunity costs, practical access barriers and vaccination being viewed primarily as a mother's responsibility, this specific focus on 9-month vaccine reveals that the unusually long interval between visits causes these vaccines to fall off families' radars and reduces opportunities for Community Health Workers (HSAs) to reinforce the schedule. Additionally, for the 9-month vaccines dropout appears driven less by hesitancy and more by structural and informational gaps, including limited awareness of the existence and importance of the 9-month vaccines.

FOR MORE INFORMATION, PLEASE CONTACT

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[15] Powelson J, Kalepa J, Kachule H, Nkhonjera K, Matemba C, Chisema M, Chumachapera T, Lawrence E. Using community-based, participatory qualitative research to identify determinants of routine vaccination drop-out for children under 2 in Lilongwe and Mzimba North Districts, Malawi. *BMJ Open*. 2024;14(2):e080797