Maternal and Child Health Journal (2024) 28:1822–1832
https://doi.org/10.1007/s10995-024-03982-8

Maternal Immunization Decision-Making Among Pregnant and Lactating People in Kenya: A Qualitative Exploration of Peer Influences on Vaccine Decision-Making for a Future RSV Vaccine

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Accepted: 30 July 2024 / Published online: 14 August 2024
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Abstract

Introduction Respiratory syncytial virus (RSV) is a leading cause of respiratory illness in infants globally, with new maternal RSV vaccines on the horizon. Vaccine decision-making during pregnancy is shaped by individual, interpersonal, community, and societal factors. This study explored key interpersonal influences on maternal vaccine decision-making among pregnant and lactating people (PLP) and community members in Kenya.

Methods This qualitative study conducted in-depth interviews with six pregnant people, 18 lactating people, and 10 community members in one rural and one urban county in Kenya. Data were analyzed using a grounded theory approach.

Results Participants identified the pregnant person themself, male partners, other family members, peers, and healthcare providers (HCPs) as key influences on the maternal immunization decision-making process. The majority of interviewed PLP believed that decision-making during pregnancy should be left to themselves due to autonomy and their role as the primary caregiver. Community members, including male partners, also identified pregnant people as the key decision-maker. While some PLP said they deferred to male partners to make vaccine decisions, more felt that men were not as informed on maternal and child issues as themselves or other female peers and relatives. HCPs emerged as important influences and information sources for PLP during decision-making.

Discussion Understanding who influences vaccine-decision making during pregnancy will help inform demand generation strategies, and in turn, uptake of future maternal vaccines, including RSV vaccines. Given the strong role HCPs and peers have in the decision-making process, targeting key potential influences is essential to improve vaccine acceptance.

Significance

What is Already Known Maternal immunization saves lives, but the presence of vaccines does not guarantee uptake. Decision-making for maternal vaccines does not occur in a vacuum and is influenced by multiple sources.

What this Study Adds Information on how peers influence future maternal vaccine acceptance is limited. Our findings show that pregnant and lactating people (PLP) believe the decision to vaccinate should be left to themselves due to autonomy and their caregiver role, even in rural Kenya. Additionally, our findings show that PLP are influenced not only by their partners and healthcare providers, but also female family members and peers. As RSV vaccine rollout begins, targeted demand generation strategies for PLP and their influences is paramount.

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Keywords Maternal immunization · Respiratory syncytial virus · Kenya · Peer influences

Introduction

Vaccine decision-making is a complex process influenced by numerous factors; decisions are not made in isolation (Lee et al., 2017). Vaccination decisions are shaped by societal, cultural, and personal factors, and understanding how these contextual factors shape decision-making is critical to inform strategies to promote immunization, especially during pregnancy (Larson Williams et al., 2019). One way to understand these contextual factors is to use a socio-ecological approach, which outlines four nested levels of influence on vaccination behavior—individual, interpersonal, community, and societal (Bronfenbrenner & Morris, 2007; Kilanowski, 2017; Limaye et al., 2022, 2023). This paper aims to focus on the dynamics between individual autonomy and interpersonal-level influences on vaccine decision-making during pregnancy.

Cultural norms and gender roles are important factors to consider while exploring interpersonal, or peer, influence on vaccine-specific and broad health decision-making. Many societies in Sub-Saharan Africa, such as Kenya, are patriarchal societies with male family members having influence on their spouse's access and utilization of health care (Andriano et al., 2021; Mochache et al., 2020). In some households, male family members single-handedly make decisions for their spouse; however, according to the Demographic and Health Survey (DHS), husbands' reported authority over decisions in Kenya has decreased over time (Andriano et al., 2021). Polygamy has also been legal in Kenya since 2014 and is another potential factor at play in the way cultural norms affect the decision-making process. In addition to male family members, older, experienced women have also been found as an important influence during pregnancy (Mochache et al., 2020).

Healthcare providers have also been shown to be influential to pregnant people's vaccine decision-making; a systematic review found that provider recommendation increased the likelihood of pregnant people accepting pertussis or influenza vaccines (Kilich et al., 2020). Additionally, healthcare providers are a highly trusted source for information about vaccination during pregnancy, both in Kenya and other settings (Bergenfeld et al., 2018; Godongwana et al., 2021; Marín-Cos et al., 2022). In Kenya, healthcare providers are seen as highly educated in health-related matters (Nganga et al., 2019). Pregnant people commonly express vaccine safety concerns and perceived risks and benefits (Geoghegan et al., 2022), including side effects and immunization-associated pain, as barriers to uptake (Lynch et al., 2012; Maisa et al., 2018; McQuaid et al., 2016; Smith et al., 2022). Partner involvement and community rumors also influence attitudes toward vaccination (Larson Williams et al., 2018; Siddiqui et al., 2017; Ymba & Perrey, 2003), as does vaccine knowledge (Mayet et al., 2017; Varan et al., 2014).

Respiratory syncytial virus (RSV) is a leading cause of respiratory illness in infants and young children globally, with children under six months of age being most susceptible to severe disease (Shi et al., 2017; Verwey & Nunes, 2020). A systematic analysis estimated that 33.1 million episodes of RSV-associated acute lower respiratory infection occurred in children aged 0–60 months, resulting in 118,200 deaths worldwide (Li et al., 2022). Maternal immunization is an effective approach for providing protection to newborns from vaccine-preventable diseases such as RSV. By passing antibodies through the placenta to the fetus, maternal immunization harnesses the pregnant person's immune response to provide passive immunity to newborns, protecting infants at birth and when they are most susceptible to severe disease and not yet eligible for vaccination (Madhi et al., 2020).

There has been great progress related to the development of RSV vaccines (Kampmann et al., 2023). With the anticipated availability of a new maternal RSV vaccine as early as 2024, our study aimed to understand the dynamics of vaccine decision making, including key influences on maternal vaccine decision making processes among pregnant people, lactating people, and community members in Kenya.

Methods

This qualitative study conducted 34 in-depth interviews in Kenya with pregnant and lactating people (PLP) and community members (family members of PLP, community health volunteers, and community leaders). This study has followed the COREQ criteria for reporting qualitative research. Participants were recruited from 20 health facilities split evenly across two counties: Nakuru (rural) and Mombasa (urban). Semi-structured interview guides in both English and Kiswahili were pilot-tested with pregnant people in Kenya and included questions on RSV knowledge, awareness, and attitudes toward a new maternal RSV vaccine, as well as experiences related to maternal vaccination broadly.

Data were collected in July–September 2022. A 10-person, mixed-gender team of Kenyan data collectors experienced in qualitative interviewing participated in a three-day ethics and research training conducted by the study authors. Participants were recruited from the waiting areas at health facilities using simple random sampling; in smaller clinics, every single person was approached. We did not track refusals. Data collectors were not affiliated with the health facilities and were not known to participants prior to the

start of the study. Informed oral consent was obtained from participants and participants were only interviewed once. Interviews were conducted in a private setting in the health facilities with the participant and two members of the study team: one to conduct the interview and the other to take notes. Interviews took place in Kiswahili or English, lasted between 30 and 60 min, and were audio recorded. These recordings were transcribed and translated to English as needed by a team fluent in both languages. Transcripts were not returned to participants for feedback.

A six-member team applied a grounded theory approach to data analysis using Atlas.ti software. As such, we did not have a priori hypotheses about the findings; we aimed to allow the data to guide analysis. We followed a four-step process as described by Corbin and Strauss (2014): open coding, development of concepts, grouping concepts into categories, and theory formation. The team acknowledged their role in the research process and that their prior experiences and beliefs would affect how they interpreted the data. Data collectors and analysts had familiarity with maternal immunization but were not from the communities where they collected data.

A code list was generated, refined, and finalized through three rounds of open coding. The team coded approximately 25% of the transcripts, met to discuss emerging themes, then coded remaining transcripts. After coding, two researchers conducted interrater reliability with approximately 10% of the transcripts, with a reliability of 89%. After completion of coding, the team discussed emerging concepts and grouped concepts into categories over several discussions. We then identified influences and strengths of these influences on the decision-making process. Using Atlas.ti, a coding tree was developed and used to guide subcoding. Theoretical saturation was reached when we were not obtaining additional information related to maternal immunization influences. Emerging themes were presented and discussed with some participants at several workshops held in Kenya.

This study received ethical approval from the Johns Hopkins Bloomberg School of Public Health and the Kenya Medical Research Institute.

Results

Overall, 34 participants were interviewed, including 6 pregnant people, 18 lactating people, and 10 community members. While exact ages of all participants were not collected, all participants were 18 or older, all pregnant and lactating participants were under 50 years old, and some community members were above the age of 50. The community members included three male partners of PLP, three female relatives of PLP (aunt, mother-in-law, mother), three community health volunteers, and one community leader. Participants' occupations varied and are noted in the identifiers below.

Pregnant and lactating participants were asked which information sources they consulted to make decisions about maternal immunization, with the top two most frequently mentioned sources being healthcare providers and other community members, including family members (see Figs. 1, 2).

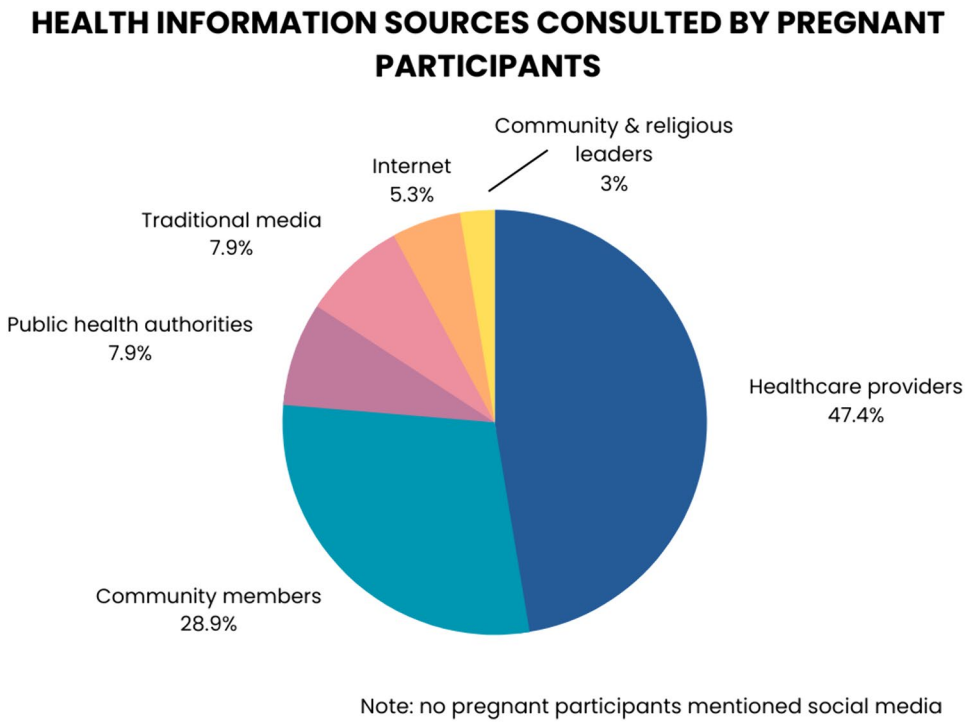

Fig. 1 Health information sources consulted by pregnant participants. Figure is a pie chart showing the health information sources consulted by pregnant participants. 47.4% of pregnant participants consult healthcare providers, followed by community members (28.9%), public health authorities (7.9%), traditional media (7.9%), the internet (5.3%), and community and religious leaders (3%). No pregnant participants mentioned social media

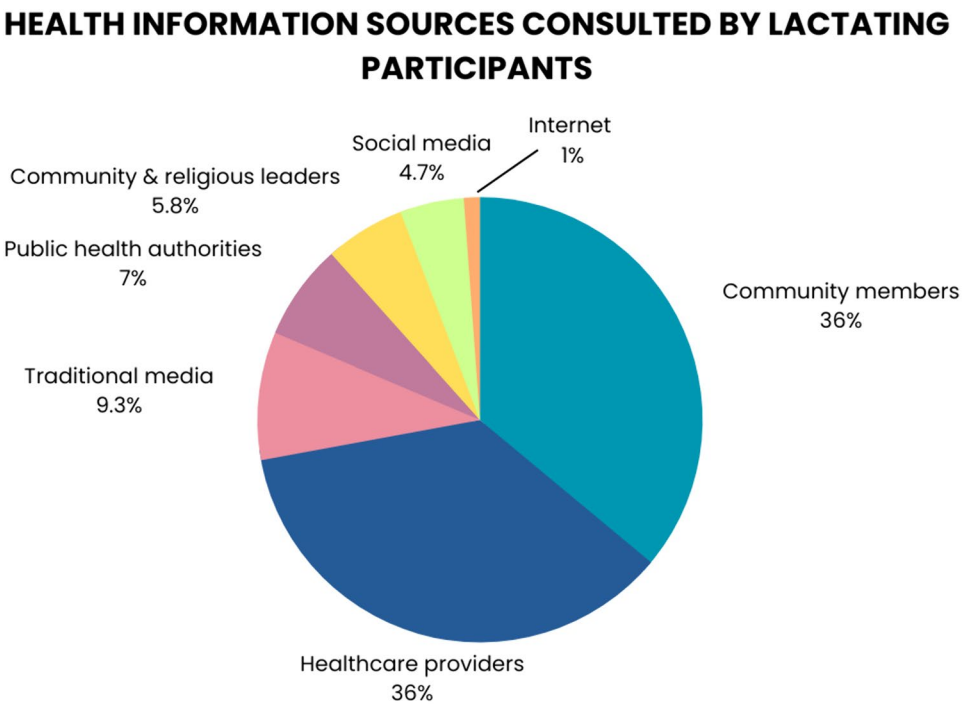

Fig. 2 Health information sources consulted by lactating participants. Figure is a pie chart showing the health information sources consulted by lactating participants. 36% of lactating participants consult healthcare providers and another 36% consult their community members. Lactating participants also consult traditional media (9.3%), public health authorities (7%), community and religious leaders (5.8%), social media (4.7%), and the internet (1%)

As the primary purpose of this paper is to characterize interpersonal influences on the vaccine decision-making process for maternal immunization, the following sections summarize key influences that emerged, including the pregnant person themself, their male partner, other family members, peers, and healthcare providers (see Fig. 3). Within each of these sections, we have organized results by target audience perspectives. These results contribute to the body of knowledge about vaccine decision-making during pregnancy but introduce a novel lens of influences for a future maternal RSV vaccine specifically. Given that a maternal RSV vaccine has yet to be introduced in most settings, including Kenya, exploring which influences to target during demand generation can help with acceptance and uptake at the onset of vaccination.

Pregnant Person Themself

Of the 34 participants interviewed, 27 (79%) stated that the pregnant person themself should be the primary decision-maker about maternal vaccination. Sub-themes that emerged focused on the autonomy of the pregnant person, the belief that the pregnant person knows what is best for their body, the role of the mother as the primary caregiver responsible for an infant's wellbeing, and the effects of an infant's illness on the mother.

Two-thirds (4/6) of pregnant people interviewed believed they would be the primary decision makers for a future maternal RSV vaccine. One stated reason was due to the belief that the mother knows what is best not only for herself, but also for her infants, per this pregnant person: *"I think the decision is for the pregnant mother. Because at the end of the day, she is the one who knows what is best for herself and what is best for her child"* (pregnant office worker, multigravida, Kizingo, Mombasa). Another pregnant person stated, "*Because I need to be safe, it is my decision. I will take [the RSV vaccine] so that later on it will help me and help [my baby]"* (pregnant farmer, multigravida, Molo, Nakuru).

Similarly, 89% (16/18) of lactating participants explicitly stated they would be the primary decision makers for maternal vaccination. Several believed the pregnant person should not include other family members in decision-making because she would be the one most affected by either her or her child falling sick with the vaccine preventable disease, such as this participant: *"There is no part where I should involve parents or my family, because this is my child and his life I am protecting. It is I who should know that my child needs this. Yes, I may ask my mother, and if she tells me 'no' and…then, I do not take [my child to get vaccinated], I am the one who will lose. I will be hurting my baby. So, I should be the one who should decide by myself"* (Lactating grocery worker, multipara, Molo, Nakuru). Another lactating person said, *"Even if you inquire [your family members] at home, you are not protecting a body which is at home. You are protecting your body, and if you do not get those services, it will be your problem and not the family's problem…So it is better you go and access that service to protect yourself"* (Lactating garment factory worker, multipara, Port Reitz, Mombasa).

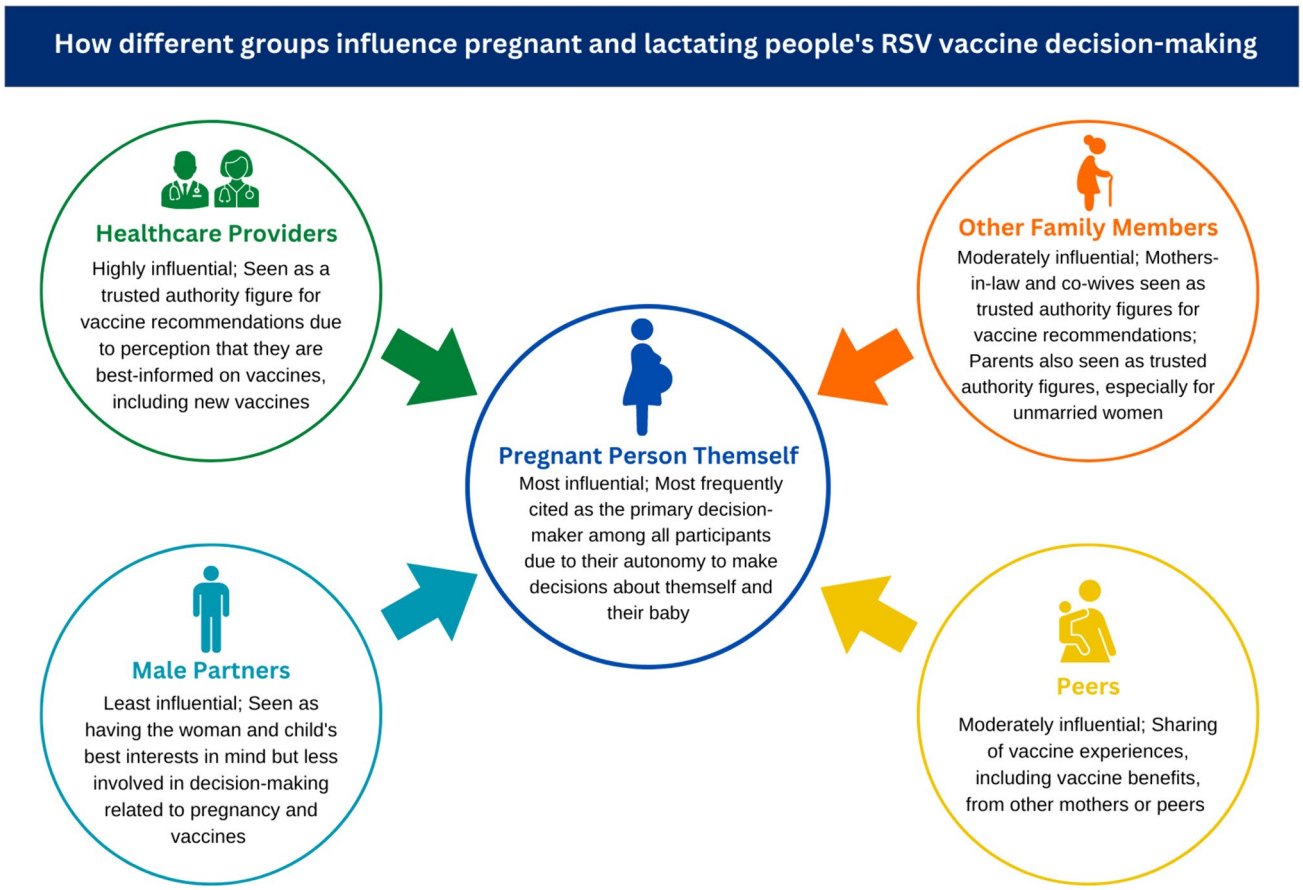

Fig. 3 Peer influences on maternal immunization decision-making. Figure shows how different groups influence pregnant and lactating people's RSV vaccine decision-making. The most influential person in decision-making, located in a circle at the center of the figure, is the pregnant person themself. Healthcare providers (HCPs), peers, other family members, and male partners are in circles around the pregnant person, with arrows pointed toward the pregnant person to demonstrate their influence on the pregnant person. HCPs are highly influential; peers and other family members are moderately influential; male partners are least influential

Several lactating participants believed so strongly in their autonomy and being the key decision makers that they stated they would override any objections to vaccines raised by their husbands and get vaccinated. When asked what she would do if her husband refused to allow her to get a future RSV vaccine, one lactating parent said, *"You just leave home to go about your business and pass by the hospital [to get vaccinated]. He can't know…He can't come to ask, 'Let me see your arm. What does it look like?'"* (Lactating school speaker, primipara, Rongai, Nakuru). Another lactating woman commented, *"Even if your spouse asks you not to go, it is a must that you decide for yourself. There are some husbands who tell their wives not to go, but the woman decides to go. Even for family planning injections, you are told 'don't do it,' but if you go behind his back and do it, he doesn't know. So, it is to you to decide…because you know it will help you"* (Lactating garment factory worker, multipara, Jomvu, Mombasa).

The autonomy of women to make decisions about vaccinations during pregnancy was reinforced not only by pregnant and lactating participants, but also by 70% (7/10) of the interviewed community members. For example, the male partner of a pregnant woman stated, *"You cannot decide what she needs. Like my wife—she decided herself to be vaccinated…I cannot decide for her"* (male partner, hotel worker, Naivasha, Nakuru). Additionally, one community leader said, "*To inform [pregnant women] is our responsibility. But she herself has to decide…You can only advise the person on what to do, but the decision remains for them to make"* (female assistant chief, Jomvu, Mombasa). In addition to believing in women's autonomy in decision-making, several community members echoed PLP's belief that the mother is best-informed to make vaccine decisions, such as this male partner to a lactating woman: *"[My wife] is the one who knows when the baby should be [vaccinated], or even herself when she is pregnant…I cannot question it. I*

cannot question her" (male partner, school office assistant, Karagita, Nakuru).

Healthcare Providers

Approximately 56% (19/34) of all interviewees believed that healthcare providers (HCPs) were or should be involved in the maternal vaccination decision. Sub-themes that emerged included the role of HCPs as advisors in the decision-making process, trust in and deference to the opinion of HCPs due to the perception that they are best informed about vaccines due to their education and training, and beliefs that HCPs could mandate vaccines.

Two thirds (4/6) of the pregnant participants believed that HCPs played a major role in maternal vaccine decision-making. Some believed that HCPs should be the primary deciders, such as this pregnant woman: "*The doctor should decide for a pregnant woman to be vaccinated. The government can also decide"* (pregnant housewife, multigravida, Mlaleo, Mombasa). Participants indicated a high degree of trust in HCP recommendations, especially related to new vaccines, because health care workers were well-educated and professionally trained. For example, this pregnant person noted: *"With a new vaccine, you normally get scared…because you do not know it. I am not a doctor, so you will have to just trust what the doctor is telling you,…since they are the professionals*" (pregnant farmer, multigravida, Bahati, Nakuru). Another pregnant woman felt that HCPs could mandate vaccines in pregnant people because they are best informed: *"The final decision is normally the doctor's. I cannot say I do not want [a vaccine], because they have already done the research and know it can help me. I can refuse, but they can force me to use it because they know its benefits"* (pregnant housewife, multigravida, Bahati, Nakuru).

Several participants mentioned that HCPs not only influence pregnant people, but also their male partners, who often defer to HCP recommendations because they perceive HCPs as better informed than themselves on vaccination. One pregnant person compared her husband's knowledge and involvement in vaccination to her HCP's: *"Some people are not literate and do not know about vaccinations. If you tell them, they will say, 'I do not understand that.' Like my husband will tell you 'I am not the doctor'"* (pregnant vegetable vendor, multigravida, Port Reitz, Mombasa). Another pregnant person said, *"[My husband] will not keep on following up about [vaccines with me] because everyone trusts doctors…If I tell him I am not going to take this medicine, he will say, 'You were given this medicine by the doctor to take.' So, you see, he trusts what the doctor is telling him"* (pregnant housewife, multigravida, Bahati, Nakuru).

Approximately 55% (10/18) of lactating people interviewed believed that HCPs should be consulted for maternal vaccination decisions. This trust in HCPs and their recommendations was frequently coupled with trust in the government, as referenced by this lactating person: *"It is the government who has put these [doctors] here, and it trusts them, so who am I to start doubting them? And I know they are doing their work faithfully. They check those vaccines—if they are fine, if they have expired…We trust these doctors"* (Lactating small business owner, multipara, Junda, Mombasa).

One third (6/18) of lactating participants specifically believed that only the pregnant person and their healthcare provider should be involved in the decision-making process. Unlike some pregnant participants who believed that HCPs should be able to make the final decision, these lactating people saw the decision as a collaborative one, with the provider as a knowledgeable advisor and the pregnant person deciding after consultation. This lactating woman said, *"The mother on her own is the one with the decision…And maybe a doctor, because if a doctor informs her how [the vaccine] will benefit her, it will be like holding the mother's hand and directing her"* (lactating office worker, primipara, Tudor, Mombasa). Another woman reinforced this thinking: *"It will be good if [HCPs] give [a pregnant woman] the information she needs. After they advise her, it is on her to decide"* (lactating housewife, primipara, Mlaleo, Mombasa). The doctor as an important and trustworthy source of knowledge was also emphasized by this lactating woman, who indicated she would allow her doctor to influence her decision, but not her husband or other family members because "*the doctor is the one who knows a lot of things [about vaccines]"* (lactating flower farm worker, multipara, Naivasha, Nakuru).

Similar to PLP, 70% (7/10) of interviewed community members believed that HCPs were crucial to the vaccine decision-making process, due to their knowledge, as illustrated by this mentor mother: "*It is just the doctor themselves [who can decide] because they have that education. They can explain the vaccine and educate [people] on the reasons for giving the vaccine"* (mentor mother to HIV-positive pregnant people, Rongai, Nakuru). This aunt of a lactating woman felt that pregnant people could not refuse vaccines offered by HCPs, saying, "*When you go to the hospital, the doctor will decide [about vaccination]. Once the doctor says, then the mother can't start giving excuses"* (aunt of lactating woman, street food vendor, Likoni, Mombasa).

Male Partners

In contrast to the influence of HCPs, only 35% (12/34) of all interviewed participants highlighted the importance of male partners being involved in the process and providing their approval before making a decision, while 41% (14/34) explicitly stated that male partners would not influence the process.

Half (3/6) of the pregnant participants mentioned they would consult their male partners about the decision. Some felt that male partners may know more about vaccination than the pregnant person and should be trusted to want what is best for them, such as this pregnant person: *"If [my partner] wants me to get the vaccine…it would be because I know he wants good things for me. Maybe I don't know much concerning the vaccine, and if he insists that it's good…I would not doubt him"* (pregnant housewife, multigravida, Nakuru Town, Nakuru). Another pregnant participant who discussed consulting her male partner described how he would question her decision if he felt she was not adequately informed: *"If I will not tell [my husband] information [about the vaccine], then he will tell me, 'I do not see its use, because you yourself do not know [how it] works, so why are you being vaccinated with it?'"* (pregnant vegetable vendor, multigravida, Port Reitz, Mombasa). However, other pregnant participants discussed how their male partners are uninvolved in the processes of pregnancy, such as this person: *"Men normally are not involved in things like [vaccination]. They leave it to the women to choose for themselves"* (pregnant farmer, multigravida, Bahati, Nakuru). The perceived contrast between a male partner's and HCP's knowledge on, interest in, and involvement with immunization and pregnancy may help explain why many interviewed PLP felt HCPs were highly influential to vaccine decision-making while also feeling that male partners should have minimal to no involvement.

Among lactating participants, 61% (11/18) explicitly stated that their male partners would not be allowed to make decisions about maternal immunization. While part of this was due to the perceived lack of men's knowledge and/or interest in maternal issues, several participants deprioritized male partners' opinions because fathers were perceived as shouldering fewer childcare responsibilities compared to mothers, especially during illness. For example, this lactating woman said, *"There is no influence [from my husband] because I am the one who is protecting myself and my baby…and when the baby is infected with diseases, it is me who will have troubles"* (lactating garment factory worker, multipara, Port Reitz, Mombasa). However, 17% (3/18) of lactating participants said they would consult male partners first and follow their partner's recommendation. Related to a new RSV vaccine, one lactating woman stated, *"I will first discuss with my husband, and…whatever he decides is what I will do"* (lactating school speaker, multipara, Rongai, Nakuru). Another felt that she could not act contrary to her partners' wishes, specifically highlighting the impact of a partner's refusal to vaccinate on her own decision-making: *"I must first start with my husband. If he refuses, I must listen to him"* (lactating housewife, primipara, Magongo, Mombasa).

Half (5/10) of the community members believed that male partners played a key role in vaccine decision-making, including all three male partners interviewed. One pregnant woman's husband discussed his feelings of responsibility, saying, *"I have said my wife must get all vaccines and also [vaccinate] the baby to avoid blaming myself, to avoid saying 'If I would have done it…' Let us just do it, so that in case the disease strikes, it would just be bad luck"* (male partner of pregnant woman, sales assistant, Tudor, Mombasa). Another husband, when asked to discuss who he believed should be involved in vaccine decision-making said, *"Because the baby is mine, even if anyone else like my sister has some weight, it is me who has the most weight. So nobody else can say, apart from me and my wife"* (male partner of lactating woman, school office assistant, Karagita, Nakuru). While the sample of male partners is small, it is notable that all felt they should have a say in vaccine decision-making during pregnancy, citing a sense of responsibility for the infant. This is in stark contrast to many of the sampled PLP, who perceived themselves as much more responsible for the infant, and their male partners as either entirely uninfluential to their decision-making process, or less influential than healthcare providers and female family members and peers.

Other Family Members and Peers

Overall, 41% (14/34) of participants discussed the impact that other family members and peers could have on the decision-making process, primarily focusing on the influence of pregnant people's parents, other female family members, and pregnant peers.

One of the six pregnant people interviewed believed that peers were influential, saying, *"Peers can influence me, because she would tell me about that vaccine and its importance, her reaction when she was injected, and how she felt like it has helped her"* (pregnant vegetable vendor, multigravida, Port Reitz, Mombasa). 44% (8/18) of lactating participants mentioned the influence of peers and other family members when deciding to get a maternal vaccine. Participants often highlighted the influence of other women in their family and community who had likely already experienced pregnancy, such as this lactating woman: *"A good woman would influence you to get vaccinated. Some co-wives can help, not all co-wives are bad…Your mother-in-law and mother have the strongest influence*" (lactating secondhand clothes seller, primipara, Likoni, Mombasa). Another lactating woman mentioned that she would be motivated to get the RSV vaccine if her pregnant friends received it, saying, *"That would force me to because I would have learned the benefit of that vaccine from them. Even me, if I met a pregnant person, I would tell them about its benefits"* (lactating housewife, primipara, Karagita, Nakuru). The fact that many

PLP in our study felt that female peers and family members were more influential in the maternal vaccine decision-making process than their male partners suggests the advice and experiences of those who had physically experienced pregnancy before were more highly valued.

Half (5/10) of the community members cited other family members or peers as key influences. For example, parents were identified as important influences for unmarried women by this community health volunteer: *"When it comes to…a lady who has not been married—single mothers—then you have to approach their parents [about vaccination to convince them]"* (male community health volunteer, farmer, Kamara, Nakuru). A lactating woman's mother said, *"Even for your married daughter, as a parent, it is important to advise her to get the [RSV] vaccine. This is the expectation"* (mother of lactating woman, housewife, Mrima, Mombasa). A pregnant woman's husband reinforced the influence of older women in the family: *"The person who can contribute a lot is my mother. When she hears there is a vaccine [my wife] has not received, my mother usually contributes; she makes sure my wife has gone for vaccination"* (male partner of pregnant woman, sales assistant, Tudor, Mombasa).

Discussion

In Kenya, the highest burden of RSV is concentrated among infants 6 months and younger (Nyawanda et al., 2023), meaning that maternal immunization has the potential to reduce severe pneumonia in this group. However, the presence of an effective and promising vaccine does not guarantee a decrease in disease burden; vaccine acceptance and uptake does. As maternal RSV vaccines are on the horizon, we aimed to understand the vaccine decision-making influences of pregnant and lactating people in Kenya. We found that most pregnant and lactating participants believe the decision to receive a vaccine should be left to pregnant people given their bodily autonomy and child caregiver role. Community members, including male partners, also identified pregnant people as the central vaccine decision-maker during pregnancy. Additionally, healthcare providers arose as an important influence, and participants also noted community members, such peers, family members, and male partners, as important influences, with greater weight being given to those who had experienced pregnancy before.

Previous research has shown that many women feel a sense of authority over their health decision-making, but male partners and healthcare providers have been identified as key influences (Larson Williams et al., 2018). A study of Zambian women found that many indicated that their personal opinions took precedence when making healthcare decisions, including vaccinating their child, given their personal authority when caring for their child (Larson Williams et al., 2018). Another study conducted in Uganda found that pregnant people believed they should be responsible for making maternal vaccination decisions, without the influences of family and community members (Nalubega et al., 2021), which reflects the perspectives of many of the PLP in our study. Additionally, Shibeshi et al. (2023) found that most women in a rural region of Ethiopia felt empowered to make decisions on maternal health without men's involvement because they perceived men to be less knowledgeable about pregnancy, an attitude present among participants in our sample.

Shifting to data from Kenya, a study of married Kenyans found that 46% of the sampled wives supported an "egalitarian" view on household decision-making, believing that decisions should be made jointly between couples (Musalia, 2018). The same study found that 29% of the sampled wives supported an "independent" view, with themselves being the primary decision-maker, while 26% of the sampled wives supported a "conservative" view that leaves most decisions to the husband (Musalia, 2018). Focusing on health, a sample of married women aged 15–49 in the 2022 Kenya Demographic Health Survey found that 42% of women were the main decision-maker regarding their health, 44% of women made decisions jointly with their male partners, and 14% of women had their health decisions directed by their husband (Kenya DHS, 2022). The difference in our results and the DHS data may be due to our focus on vaccine-specific decisions rather than general health decisions. Additionally, given that we focused on decisions made during pregnancy, the primary caregiver role that PLP noted for their children likely increases the autonomy felt over their vaccine decisions. While the proportion of our sample of pregnant individuals claiming responsibility for vaccine decision-making is higher than that of other research done in the region, the presence of autonomy along with influence of male partners is consistent, with a low proportion of women believing that they should defer entirely to their male partner and not be involved in health decision-making. There is an inherent tension between a pregnant woman's autonomy and adhering to the wishes of her spouse. Given the significant portion of women making decisions with their male partners, and that supportive partners can act as facilitators to healthcare access while hesitant partners can act barriers (Larson Williams et al., 2018), it is imperative to also target men in demand generation.

Similar to our findings, multiple studies have identified healthcare providers as an important influence on maternal immunization uptake, with trust in healthcare providers being central to the decision-making process (Godongwana et al., 2021; Kilich et al., 2020; Marín-Cos et al., 2022). Perceptions of healthcare provider knowledge are a crucial influence on this trust, as in many settings, including Kenya, healthcare providers are seen as authority figures

(Bergenfeld et al., 2018). Furthermore, healthcare providers' negative attitudes about vaccination can hinder maternal vaccine acceptance (Nalubega et al., 2021), pointing to the necessity of ensuring healthcare providers are knowledgeable and confident in their recommendations.

While many studies have examined the role of male partners and HCPs in decision-making during pregnancy, fewer studies exist on the role of female peers and family members in Kenya. One study in Kwale noted that older women who had previously experienced pregnancy played a critical role in pregnant people's decision-making process about place of delivery, creating a strong matriarchal influence within the overarching patriarchal structure of that community (Mochache et al., 2020). This echoes how some participants in our study valued the input of other women in the maternal vaccine decision-making process over that of their male partners. Given the complex gender dynamics involved in decision-making during pregnancy within individual communities and households, demand generation and community sensitization efforts for future maternal vaccines should aim to target not only pregnant people and their partners, but also female peers and family members.

While peers and interpersonal influences are a key driver of maternal vaccine uptake, research has shown that there are many aspects of vaccination uptake for other routine vaccines which should also be considered for maternal vaccines. For example, in Kenya, insufficient knowledge and religious beliefs have contributed to decreased acceptance of routine childhood vaccines, while misinformation and poor understanding of disease have affected HPV vaccine uptake (Essoh et al., 2023; Njuguna et al., 2021). Another study in Kenya focused on influenza vaccination during pregnancy found that awareness of influenza was associated with increased willingness to accept the vaccine (Otieno et al., 2020). Particularly high levels of vaccine hesitancy were seen with COVID-19 vaccination in Kenya with a low perceived risk of COVID-19 and concerns about vaccine effectiveness and side effects (Limaye et al., 2022; Orangi et al., 2021; Paul et al., 2022). Along with these drivers of vaccine uptake, it is crucial to consider structural barriers that exist in these settings, including vaccine supply and distance to clinics (Limaye et al., 2022; Orangi et al., 2021).

This study is not without limitations. Results may not be generalizable to other settings given the qualitative nature, and the study sample does not include or reflect the views of those who would not seek care at a health facility. While we sought to include a diverse sample from the two counties that participated in the study, we were particularly interested in better understanding and elucidating experiences illustrative of the targeted population. Response bias is likely present. Immunization is a norm, particularly in health facilities where we were recruited; participants may have felt that they had to express positive feelings towards vaccines. Despite these limitations, an exploration of influential peer groups for maternal vaccine uptake can inform future demand generation strategies, and in turn, uptake of future maternal vaccines, including RSV vaccines. Given that decision-making does not occur in a vacuum (Nalubega et al., 2021), targeting all potential influences in demand generation strategies is essential for vaccine acceptance.

Conclusion

This study provides insight into the maternal vaccine decision-making influences valued by pregnant and lactating persons in Kenya. As a maternal RSV vaccine has not yet been introduced in most settings, we aimed to characterize important influences to inform future demand generation strategies. It is important to recognize the autonomy of pregnant people within the context of the decision-making process, while ensuring that male partners perceive that they are included in the process. Ensuring that male partners are part of community sensitization efforts for new vaccines is also key to not alienate those pregnant people who would prefer—or are required—to consult with or obtain permission from their male partners prior to receiving a vaccine during pregnancy. Additionally, while pregnant people perceive themselves to be autonomous in decision-making even during pregnancy, they still seek to obtain information and guidance from their healthcare providers and female peers. Therefore, demand generation and community sensitization efforts for any maternal vaccines should involve not just the pregnant person and their healthcare provider, but also their family members, partners, and peers.

Acknowledgements We thank Mombasa and Nakuru Counties and their participating health facilities for their collaboration. We also thank Jhpiego Headquarters and their team in Kenya for their partnership and role in conducting this research. This work was supported by the Bill & Melinda Gates Foundation (INV-016977).

Author Contributions Authors RJL and RAK conceptualized and designed the study. Authors RJL, PS, RNN participated in data collector training and helped conduct interviews. Authors RJL, PS, BF, and CL contributed to data analysis. RJL conducted interrater reliability. Authors RJL, PS, BF, and CL contributed to drafting the manuscript. RJL, RAK, and RNN contributed to a critical review of the manuscript. All authors read and approved the final version of the manuscript.

Funding This study was funded by the Bill & Melinda Gates Foundation (grant INV-016977) to R. Limaye/R.A. Karron at the Johns Hopkins Bloomberg School of Public Health.

Data Availability Data will be made available upon reasonable request.

Code Availability Not Applicable.

Declarations

Conflict of interest The authors report there are no competing interests to declare.

Ethical Approval This study received ethical approval from the Johns Hopkins Bloomberg School of Public Health and the Kenya Medical Research Institute.

Consent to Participate Informed oral consent was obtained from all participants in this study.

Consent for Publication Not Applicable.

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