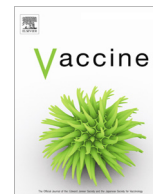




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Pregnant women's perspectives about maternal immunization in Latin America [☆]



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ABSTRACT

Background: Maternal immunization rates and vaccine uptake in Latin America vary from country to country. This variability stems from factors related to pregnant women, vaccine recommendations from healthcare providers and the health system. The aim of this paper is to describe women's knowledge and attitudes to maternal immunization, and barriers to access and vaccination related decision-making processes in Latin American countries.

Methods: We conducted focus group discussions (FGD) with pregnant women in five middle-income countries: Argentina, Brazil, Honduras, Mexico and Peru, between July 2016 and July 2018. The FGDs were conducted by trained qualitative researchers in diverse clinics located in the capital cities of these countries. **Results:** A total of 162 pregnant women participated in the FGDs. In general, participants were aware of the recommendation to receive vaccines during pregnancy but lacked knowledge regarding the diseases prevented by these vaccines. Pregnant women expressed a desire for clearer and more detailed communication on maternal vaccines by their healthcare professionals instead of relying on other sources of information such as the internet. Overall, participants had positive attitudes towards maternal immunization and were open to receiving vaccine in pregnancy based on general trust they have in recommendations made by their healthcare providers. The main obstacles pregnant women said they encounter were mainly centered around their clinical experience: long waiting times, vaccine shortages, and impolite behavior of healthcare providers or clinical staff.

Conclusion: Important advances have been made in Latin America to promote maternal immunization. Results from this study show that an important aspect that remains to be addressed, and is crucial in improving vaccine uptake in pregnancy, is women's clinical experience. We recommend pregnant women to be treated as a priority population for providing immunization and related healthcare education. It is imperative to train healthcare providers in health communication so they can effectively communicate with pregnant women regarding maternal vaccines and can fill knowledge gaps that otherwise might be covered by unreliable sources dispensing inaccurate information.

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1. Introduction

Pregnancy presents a critical opportunity to inform women about vaccines and protect both the mother and the baby through

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maternal immunization. Countries in Latin America have been ahead of the curve in terms of providing immunization throughout the life course [1] and achieving high infant vaccination coverage. The region's success in the elimination of maternal and neonatal tetanus, rubella endemic transmission, and congenital rubella syndrome are excellent examples of successful vaccination programs.

Vaccination against influenza, tetanus and pertussis has been recommended during pregnancy to protect the mother and the

newborn in several countries [2]. Since 2004, the Pan American Health Organization (PAHO) Technical Advisory Group (TAG) on vaccine-preventable diseases recommends routine immunization of pregnant women with an inactivated influenza vaccine and, in 2019, the PAHO TAG endorsed the recommendation to routinely administer a acellular pertussis-containing vaccine during pregnancy [3]. Currently, 34 of the 51 countries and territories in the Americas region recommend influenza vaccine for pregnant women and sixteen countries recommend tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap) for pregnant women [3]. Since more than 85% of pregnant women in Latin American countries attend at least four antenatal care (ANC) visits [4], this provides a unique opportunity to immunize pregnant women through the established antenatal care services and facilitates – especially with the potential introduction of new maternal vaccines on the horizon, such as Respiratory Syncytial virus (RSV) and Group B streptococcus (GBS).

Maternal vaccination coverage varies significantly in Latin American countries. In 2018, vaccination coverage of pregnant women ranged from 2% to 91% for influenza [5]. Vaccine uptake variability stems from factors related to community, healthcare providers recommending vaccines and the national health systems [6,7]. Based on understanding vaccine hesitancy as the delay in acceptance or refusal of vaccines despite availability of vaccines [8], some studies have attributed pregnant women's hesitancy to concerns regarding vaccine safety (both for the mother and the baby), and perceptions surrounding the risk and susceptibility of the vaccine-preventable disease [6,9,10]. Low vaccination coverage has also been attributed to a lack of awareness regarding vaccines recommended during pregnancy [7]. To design effective interventions that increase vaccination uptake among this group, a key aspect is to identify the information needs of pregnant women, understand a user's perspective in the context of clinical experience, and determine how vaccination practices can be improved [11–13].

The knowledge gaps mentioned above can be addressed by using different frameworks. There is limited work done with pregnant women's vaccine uptake. Most of the existing models, such as the 5Cs model [14], are primarily derived from childhood vaccination data. Similarly, 5As (access, affordability, awareness, acceptance, activation) were developed for adult, non-pregnant population in high- and middle-income countries. Other pregnant women-focused models, such as P3 model, had not been empirically evaluated at the time of data collection.

Therefore, we used a more inclusive approach to understanding knowledge, attitudes, barriers and access to vaccination. This perspective was also identified as a priority by the various program partners that were included in the development of this overall project. Hence, the aim of this paper is to explore pregnant women's perceptions about maternal immunization in Latin American countries. We describe women's knowledge of and their attitudes towards maternal immunization, as well as accessibility, barriers, and decision-making in the context of maternal immunization. As the global maternal immunization platform expands, programmatic lessons from middle-income countries will be useful in informing global health policies and decision-making processes.

2. Methods

2.1. Study design

We took a qualitative approach and conducted focus group discussions with pregnant women from Argentina, Brazil, Honduras, Mexico and Peru. The data was collected between July 2016 and July 2018. These focus groups were part of an overall exploratory

study that aimed to understand the state of maternal and neonatal immunization (MNI) policies, strategies, and implementation practices in middle-income countries in Latin America. Other methods included a desk review of MNI documents, key stakeholder interviews with healthcare professionals, and FGDs with pregnant women, and visits to healthcare facilities in each country. In this paper, we present the analysis from the focus group discussions with pregnant women.

The countries selected represent lower-middle and upper-middle income strata and those with maternal and neonatal immunization policies and practices in place. All of the countries have introduced tetanus-containing vaccine (TT, Td, or Tdap) and seasonal influenza immunization for pregnant women.

The health facilities in the five capital cities (Buenos Aires, Brasilia, Tegucigalpa, Mexico City and Lima) were selected using purposive sampling technique. The national health authorities in each country were contacted to approach three health facilities, including two health centers offering prenatal services (one urban and one in a marginal or *peri*-urban area); and one maternity hospital.

The study was reviewed and approved by the National Ethics Committees of each country, the Emory Institutional Review Board, and the PAHO Ethics Review Committee (PAHOERC).

2.2. Participants and data collection

A focus group discussion guide was developed, including questions on pregnant women's knowledge regarding vaccine recommendations during pregnancy, attitudes toward vaccines during pregnancy, vaccination-related information provided in antenatal care visits, information needs, and immunization barriers. Researchers from partner institutions with experience in qualitative research developed the data collection tools and conducted the FGDs during the in-country visits.

Fifteen FGDs were conducted (three in each country). Pregnant women from all three trimesters of gestation meeting the following criteria were included: 18 years of age or older; pregnant at the time of the focus group and having had at least one prenatal visit.

Researchers used convenience sampling approach. Healthcare providers invited their pregnant patients to participate in the study. Participants voluntarily accepted, signed a study consent form and agreed to be audio recorded. A small compensation was given to all participants as transport or supermarket vouchers.

Before each focus group discussion, a brief questionnaire was administered to each of the participants to gather information on demographics and clinic characteristics (age, gestational age, number of antenatal visit held, and number of previous pregnancies, among others). Vaccination status was not part of the inclusion criteria.

Focus group discussions were audio-recorded and conducted in Spanish or in Brazilian Portuguese. Participant responses were transcribed verbatim from digital recorders and translated from Spanish or Portuguese to English. Translations were reviewed by a second bilingual speaker for accuracy and by a native English speaker for clarity.

At the end of the focus group, a local health professional provided a brief explanation about maternal immunization and clarified participants questions and doubts.

2.3. Data analysis

Data compilation and analysis was conducted following the country visits. Qualitative data was analyzed using a combination of both manual techniques and the computer software program

NVivo (QSR International; Version 12). The development of the codebook and description of the resulting thematic observations used structural and content coding techniques. A constant - comparison strategy was applied to ensure internal consistency in the coding process. Matrices were developed to facilitate comparisons across themes and to retain the context of the data (i.e. sites, clinic, and type of informant). Finally, we interpreted and conceptualized the data. We selected and included direct quotations representative of participants' opinions.

3. Results

A total of 162 pregnant women participated in the focus groups. Table 1 presents the demographic characteristics of the participants. The median age of the participants was 27 years (ranging from 18 to 42 years), with a median gestational age of 28 weeks. For forty-three percent of the participants this was their first pregnancy, with some variations among countries (27% in Argentina and 57% in Peru).

The following section describes the main common themes found among the participants in the focus groups. The findings are organized into the following categories: knowledge, attitudes, access to vaccination, and vaccination decision-making.

3.1. Knowledge

The pregnant women participating in the focus groups were aware of recommendations to receive vaccines during pregnancy. However, they had little knowledge regarding the diseases that prevent, the complications associated with these diseases and the type of protection immunization provides. At least one participant in each of the focus groups mentioned the name of the vaccines recommended during pregnancy in their countries but most were unsure regarding the diseases they prevented or any other benefits related to vaccine on their own or their baby's health.

Most women were more concerned about other pregnancy-related health issues, such as high blood pressure and diet requirements, and not regarding the need for vaccination during pregnancy. Therefore, they rarely sought or requested information regarding immunization during pregnancy and for their newborns.

In terms of immunization-related protection, many participants mentioned that it promotes strong fetal development and a healthy birth, while only a few more women mentioned the specific diseases and the possible impact on newborns if the mother is not vaccinated and becomes ill.

In Argentina, a participant mentioned vaccination as a mean to prevent illness, especially during pregnancy when most medications are not recommended.

'It is a concern because when you are pregnant you cannot take certain medicines, so it is better to prevent with the vaccine than self-medicate... I think it is to prevent influenza, the flu during pregnancy.' (Argentina)

We found some differences between countries regarding women's knowledge about the Influenza vaccine during pregnancy. In Argentina and, to a lesser extent, in Mexico, women were better informed about the importance of seasonal influenza vaccination due to televised communication campaigns in their respective countries.

'... I think that with the vaccines that come out for the flu and all that, when you watch that information on TV, you have to get vaccinated for the flu and for other new diseases that come out' (Argentina).

Pregnant women generally acknowledged that if healthcare providers routinely recommend the vaccines, they will get vaccinated. They also stressed that they were not offered enough information about the reasons for vaccination. For example, in an Argentine focus group, participants described lack of information received by the healthcare provider.

'No, for example when you come to your [visit] they do not say "you're going to get this vaccine for this thing", they simply issue the prescription and you leave, you get it ... for example if there is a vaccine that says the triple acellular, I do not know what it is about, but they give it to me ...' (Argentina)

In one of the Peruvian focus groups, a participant was much more clear on what kind of specific information she would like to get about each vaccine.

'I would like to know about its benefits and also about its risks, right? Because also every vaccine or any medication has its pros and cons.' (Peru)

Table 1
Characteristics of pregnant women who participated in focus groups.

	Argentina	Brazil	Honduras	Mexico	Peru
Number of participants	37	27	35	19	44
Type of health facility where participant was recruited					
• Hospital					
• Urban clinic	40,5%	33,3%	25,7%	26,3%	34,1%
• Peri-urban clinic	224,4%	33,3%	40,0%	36,8%	31,8%
Median age in years	35,1%	33,3%	34,3%	36,8% ³⁶	34,1%
m (range)	26 (18–40)	31 (20–41)	25 (18–39)	28 (20–41)	27 (18–39)
Educational level					
• Primary or less					
• Secondary	18,9%	14,9%	37,2%	15,8%	11,4%
• Tertiary	78,4%	44,4%	42,8%	42,1%	56,8%
Median gestational age in weeks (range)	2,7% 27 weeks (7–38)	40,7% 23 weeks (6–36)	20% 26 weeks (12–39)	42,1% 27 weeks (12–37)	31,8% 33 weeks (18–40)
Proportion of primiparous women	27%	41%	42%	36%	57%

The focus group participants generally said that they did not initiate conversation to seek immunization information from their healthcare providers. However, some women reported utilizing social media, pregnancy tracking apps, and internet websites as important resources for researching pregnancy and vaccine-related information on their own.

'I, for example, use social networks frequently. I participate in many groups of mothers. These groups upload a lot of information and they answer questions. There is where I get information. If someone asks "Where can I get the Hepatitis vaccine close to my place?", this is how I am realizing that there are many activities that we forget. (...) Then I start researching through social networks, logging on and finding out what each vaccine is for...' (Mexico)

Participants expressed the importance of using credible online sources.

'Well, but you also have to know which websites to trust, because not all of the information there is true' (Brazil)

In all countries, female friends and relatives were recognized as important sources of information especially if they had firsthand experiences with pregnancy and newborn babies.

Women in Mexican focus groups acknowledged that their lack of vaccine knowledge was also due to not asking more questions from their healthcare providers.

'... It is also partly our fault, because many of us do not ask, that is, we just take what they (health providers) tell us. If they indicate an injection, we go and get the injection and it's over' (Mexico)

3.2. Attitudes towards vaccination

Pregnant women generally had a positive outlook towards vaccination across all five countries. They acknowledged the health benefits of maternal vaccination and its contribution toward their and their newborn's wellbeing.

When asked about vaccine regulations, participants in the Peru focus group suggested that maternal vaccines should be made mandatory because of its health benefits.

'Mandatory more than anything... it's something for your health.' (Peru)

Participants believed in the importance of vaccination for them and their children, but they also expressed concerns over perceived adverse side effects following immunization. The main motivation for vaccination for pregnant women was their unborn child's health above all and then mother's health – as in 'healthy mother, healthy baby'. In an Argentine focus group, a woman referred to pregnant women as "containers".

'You get vaccinated for the sake of the baby, so the container is okay' (Argentina)

In the Peruvian and the Honduran focus groups, women recalled what they had heard from others about having negative experiences with vaccines. This information was often obtained through social media platforms.

'We see on the news that the vaccine given to a child damaged his arm, an accident has already happened.' (Peru)
'I have read, not only on WhatsApp but on other social networks, that the HPV vaccine, there are a lot of people that recommend not to get it because it leaves you, paralytic. It has a lot of adverse effects and then you think ... 'oh, that happened to her, it can happen to me...' (Honduras)

Only one woman, in Argentina, expressed outright vaccine hesitancy, where she was clear that she has major doubts about vaccines. She explained that her views were based on a relative's experience, her mistrust in the dominant medical model, and her support of traditional alternative medicines. In the other countries, some women were aware of the anti-vaccine "movement", but they did not personally know anyone who was strongly against vaccination.

Vaccine acceptance was largely the result of confidence in medical advice. Participants believe that if the health care provider recommends a vaccine it is necessary.

3.3. Access to vaccination

Although, many women reported that they had no access to vaccination-related problems, some barriers were mentioned. The main obstacles women encountered were associated with their clinical experience: long waiting times, vaccine shortages, and impolite healthcare providers.

Understaffing at clinics caused long waiting lines and short one-on-one times with healthcare providers for pregnant women.

'It happened to me that there were about two hundred patients in a line in front of me and there was only one-person vaccinating.' (Argentina)

Similarly, vaccine shortages were mentioned as another accessibility barrier for pregnant women. Sometimes clinics would be out of certain recommended vaccines and refer patients to another clinic which might have them. Having to travel from one clinic to another to find all the required or desired pregnancy vaccines was an issue for the pregnant women.

'The issue is whether they give you the tetanus (vaccine) in a clinic ... because here I am seeking care (in one clinic) and they did not have it. ... I went to two other health centers and they did not have them either.' (Peru)

Focus group participants also recalled encountering impolite healthcare providers who discouraged their decision to get further information or get vaccinated during pre-natal care clinic visits.

'I had a very bad experience with [name of clinic], no, it's the worst, there's no information, they don't pay attention to you and everything is bad ...'

'Nurses are strict, that is, you ask them (something) and they are rude to you.' (Argentina)

Focus group participants felt strongly that pregnant women should be given a priority as compared to regular patients when waiting to receive vaccines in healthcare facilities. They expressed that it is important to reduce the time pregnant women spend waiting to receive a vaccine– they considered pregnancy a special condition that should be given better care.

'Here there is a whole line of all types of patients mixed together and you are waiting there with your pregnant belly. I think there should be a line ... if they say that the pregnant women are given priority, there has to be a (separate) line for pregnant women, so we are seen first.' (Argentina)

3.4. Vaccination decision-making

Although the focus group participants wanted more information, they also said they would accept to be vaccinated if their health provider recommended it as they trusted their knowledge and expertise. Many women said they received vaccines without

consulting their relatives or friends, revealing that their vaccination related decision-making during pregnancy is mainly influenced by health workers (in particular antenatal care nurses and OB/GYNs), and to a lesser extent, family members (partners or parents).

However, a few women in Peru, Brazil and Honduras elaborated on the involvement and influence of the immediate and extended family members on their vaccine related decision-making. They said it is important to consider opinions and suggestions of their family members on their health and well-being. Especially, other pregnant female family members who share maternal immunization experiences and can support by re-enforcing healthcare provider's advice.

'In my case they asked me to get vaccinated. I went to ask my sister "did you get vaccinated?" and she said "yes, of course", "ah, because the doctor asked me to get vaccinated."' (Peru)

'Yes, my grandmother would always say "you give all the vaccines to your child, because it is very important", and well, they have all the vaccines, she told the same thing to my mom, and well, my mom later (did the same) ... everything is from generation to generation.' (Argentina)

A few also identified their male partners as trusted advisors heavily involved in the process of vaccine decision-making and as reminders of their pre-natal appointments.

'My husband stays on my tail... [to remind me he says] "today you have a vaccine".' (Brazil)

In my case, my partner wants everything to be up to date with my (pre-natal) check-ups.' (Peru)

4. Discussion

This is one of the first studies to examine women's knowledge and attitudes toward maternal vaccination in Latin America. We found that, overall, there is a positive attitude about vaccines in pregnancy in these countries. However, pregnant women expressed a desire for clear and detailed communication from providers on the reasons for maternal immunization. This knowledge gap is often filled by other sources with variable quality information such as family and social contacts, websites, social media, and online apps. However, women realize that not all of these online or other sources of information are credible. The ubiquity of these sources suggest that they might be spreading information that may cause more confusion and may eventually adversely influence maternal vaccination uptake. Immediate or extended family members are rarely involved in the vaccination decision-making, but their male partners often play an important and positive influence by supporting vaccination and other prenatal care requirements.

It is noteworthy that women prioritize their baby's health over their own health. Therefore, any vaccine that has the purpose to protect the baby rather than just the pregnant woman would be considered more important. Other studies support this notion by describing how influenza vaccine is considered to protect the mother against complications while pertussis vaccination during pregnancy focuses on protecting the newborn's health [15]. This could be one of the factors that fosters pertussis vaccine coverage rather than influenza vaccine in Latin America.

Obstacles that negatively influence accessibility include vaccine shortages, clinic flow where understaffing leads to long lines and extended waiting times, and perceived healthcare provider mistreatment of patients. Our findings are consistent with the recent knowledge, attitude and practice studies from El Salvador [16] and Nicaragua [17], which identified similar factors limiting

access to healthcare services and maternal immunization programs implementation.

In our research, the biggest modifiable factor beyond improving healthcare provider's health communication is the improvement of the quality of the clinical experience. We recommend pregnant women to be treated as a priority population for providing immunization and healthcare services. Communication interventions with pregnant women may have a long lasting impact on their later decisions about vaccines for their children. Some studies have established this correlation between vaccine concerns, intentions, and maternal vaccination with subsequent childhood vaccination uptake [18].

Our study has some limitations. First, the study was conducted in the capital cities of five Latin American countries and therefore only examines the attitudes and knowledge of a sub-set of urban population, potentially limiting its generalisability to rural or regional areas. Furthermore, our findings are insightful but future larger quantitative studies need to be conducted to clearly establish a correlation between mother's knowledge, their attitudes and any changes in practices related to vaccination decision-making processes. Second, we only included five Latin American countries and while the findings were remarkably consistent across the board, there may be some nuances that we are missing in other populations that can be reached with more extensive qualitative research. Third, women's experiences are based on current vaccines, and may differ if RSV or GBS vaccines are introduced with better information available for pregnant women. Finally, the study was conducted in some countries closer to the time when influenza vaccine campaigns were being commenced. Therefore, community knowledge may have been affected by these campaigns in some ways.

This paper is part of an emerging body of knowledge in the area of maternal immunization. While current evidence is limited, it is likely to grow, and immunization programs should be crafted in line with these emerging data. As countries expand their maternal immunization platform, it is important to learn from experiences like Latin America.

CRediT authorship contribution statement

A. Fauzia Malik: Conceptualization, Methodology, Validation, Investigation, Supervision, Writing - original draft. **María Belizan:** Supervision, Resources, Validation, Methodology, Resources, Investigation, Data curation, Project administration, Writing - review & editing. **Mariana Gutierrez:** Data curation, Formal analysis, Investigation, Writing - review & editing. **Alba Vilajeliu:** Project administration, Resources, Methodology, Investigation, Supervision, Writing - review & editing. **Lauren N. Sanclemente:** Data curation, Formal analysis, Investigation, Writing - review & editing. **Ines Gonzalez Casanova:** Methodology, Project administration, Resources, Methodology, Investigation, Supervision, Writing - review & editing. **Daniel Jones:** Data curation, Investigation, Writing - review & editing. **Saad Omer:** Conceptualization, Resources, Methodology, Validation, Investigation, Supervision, Funding acquisition, Writing - review & editing. **Alba Maria Roperro:** Conceptualization, Resources, Methodology, Validation, Investigation, Supervision, Funding acquisition, Writing - review & editing. **Juan Pedro Alonso:** Methodology, Resources, Investigation, Data curation, Project administration, Writing - review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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