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Health care providers perspectives about maternal immunization in Latin America

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ABSTRACT

Background: Antenatal care providers have a key role in providing appropriate information and immunization recommendations to improve pregnant women's vaccine uptake. The objective of this study is to describe health care providers' perspectives and experience regarding the implementation of maternal immunization programs in Latin America.
Methods: We conducted 33 in-depth interviews of health care providers from Argentina, Brazil, Honduras, Mexico, and Peru (6–7 per country). Qualitative data analysis was conducted using a combination of both manual techniques and the computer software program NVivo. We identified and coded main themes related to maternal immunization.
Results: The main themes identified in this analysis were practices related to maternal immunization, knowledge and training, resource availability and interactions with pregnant women. Healthcare providers knew that recommendations exists but some did not know their content; they expressed concerns about insufficient training. Providers from all five countries expressed the need for additional human resources and supplies. They also expressed a desire for women to be more proactive and ask more questions during the health visits.
Conclusion: This is the first multi-country study assessing the perspectives of health care providers about maternal immunization practices at the facility level in Latin America. Recommendations based on the results from this study include implementing additional trainings around maternal immunization, especially targeting obstetricians and midwives. These trainings should be conducted in coordination with improvements to supply chain and other structural issues.

1. Introduction

Maternal vaccination is one of the best-known approaches to protect mothers and their babies from infectious diseases. The Region of the Americas has been a leader in vaccinating pregnant women. Currently, of the 51 countries and territories, maternal immunization policies are in place in 32 countries for tetanus toxoid-containing vaccines, of which 16 countries use tetanus toxoid, reduced diphtheria toxoid, and acellular pertussis vaccine (Tdap), and in 34 countries for seasonal influenza vaccine. In 2017, maternal and neonatal tetanus was eliminated in the region [1]. Although important achievements have been made, maternal vaccine uptake remains lower than childhood vaccination [2]. Some studies from other regions have attributed mother's hesitancy to concerns about maternal and child safety [3,4], however there is limited information on how to address other determinants impacting vaccine uptake among pregnant women [5].

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Physicians, obstetricians, nurses and midwives, as antenatal care providers have a key role in providing appropriate information and evidence-based recommendations to pregnant women in order to ensure they are making informed decisions. This includes not only raising awareness regarding recommended vaccines during pregnancy, but also reinforcing the importance of being protected against diseases, such as influenza for pregnant mothers, and pertussis and influenza for babies [3]. As with parental decision-making regarding childhood vaccinations, one of the trusted sources for maternal vaccine information are health care providers [4,6–9]. Studies reveal that pregnant women are more likely to be vaccinated when the vaccines are recommended and offered during a prenatal visit [3,8,10,11].

Though health care providers generally express their support for new vaccines [13], they often remain unaware of updated vaccine recommendations for pregnant women [3,10,12], as revealed in several studies where women report not having been advised regarding immunizations during their pregnancy [3,7,13,14]. Antenatal care providers describe the lack of appropriate immunization training and time for patient education as the main barriers in high-income countries [15–17], however limited evidence is available from low- and middle- income countries.

The objective of the paper is to describe health care providers' perspectives and their experience of implementing maternal immunization policies in countries in Latin America. We aim to identify factors that affect implementation practices at the facility level, in relation to providers' capacity and training, availability of human and material resources, and the interactions with pregnant women, among other dimensions. These will help identify opportunities for improving promotion and uptake of maternal vaccines. This approach is important in the context of not only currently recommended vaccines but as the maternal vaccination platform expands, particularly with Group B Streptococcus (GBS) and respiratory syncytial virus (RSV) vaccines in the pipeline.

2. Methods

2.1. Study design

We conducted an exploratory qualitative research study in one lower-middle (Honduras) and four upper-middle income (Argentina, Peru, Brazil and Mexico) Latin American countries that had maternal immunization policies and practices already in place. These countries had already introduced a tetanus- and diphtheria toxoids (Td) vaccine during pregnancy at the time of the study (with Argentina, Peru, and Brazil already recommending the pertussis-containing vaccine (Tdap), and seasonal influenza inactivated vaccine for pregnant women. Health care facilities visited in each country were part of a larger study that aimed to understand the state of maternal and neonatal immunization policies, strategies and implementation practices in Latin America.

The national health authorities in each country were contacted to obtain an intentional sample of three public health facilities in the capital cities of the participants countries (Buenos Aires, Brasilia, Tegucigalpa, Mexico City and Lima), including two primary health centers (one urban and one in a marginal or peri-urban area) where prenatal controls are usually held; and one maternity hospital (a facility with a second level of complexity).

2.2. Data collection

We conducted 33 semi-structured interviews in the selected countries (6–7 per country). Health care providers interviewed included obstetricians /gynecologists, general practitioners (physicians) and nurses, which were responsible for antenatal care prenatal visits, as well as nurses responsible for vaccinating pregnant women.

Interview guide questions were open-ended and included the following topics: a) Health center/ hospital standards and clinical protocols about antenatal care and immunizations, b) Maternal immunization training and knowledge of health care providers, c) Vaccination policy for pregnant women in the health center/hospital, d) Social communication about maternal immunization, and, e) Maternal immunization barriers from the perspective of health care providers.

Country visits were made between July 2016 and July 2018. At the moment of data collection Peru and Honduras were carrying out their influenza vaccination campaign. Interviews were conducted in Spanish or in Brazilian Portuguese and were audio-recorded. Responses from participants were translated into English and transcribed. Participants accepted to be interviewed by signing an informed consent form.

2.3. Data analysis

Qualitative data analysis was conducted using a combination of both manual techniques and the computer software program NVivo. The codebook was developed iteratively and revised as needed using structural and content coding techniques for each country. A constant comparison strategy was applied to ensure internal consistency in the coding process and to describe the resulting thematic findings. Our target Inter Coder Reliability (ICR) test score was 0.8. Electronic memos, linking different pieces of data on each informant group - examining perspectives and experiences within each group and across groups based on their coded responses – were manually examined to determine how they thematically linked together. Matrices developed facilitated comparisons across themes, while retaining data context (i.e. sites, clinic, and type of informant). Finally, the data was abstracted and interpreted. As part of the analysis, direct quotations representative of participants' opinions were compiled and used in the article to support reported findings.

2.4. Ethics approval

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

3. Results

The characteristics of the health care providers interviewed are detailed in Table 1.

3.1. Implementation practices about maternal immunization

Though the majority of health care providers are aware of the national recommendations regarding maternal immunization and country specific Ministry of Health (MoH) guidelines and protocols, some of them did not mention the influenza vaccine as one recommended during pregnancy. Also, others suggested that some health care workers have yet to incorporate the influenza vaccine into their routine antenatal care practice.

> It's as if influenza is still mainly associated with the elderly, right? They ask the elderly patients, "Have you received the vaccine against influenza?" It's as if the idea that a pregnant woman also needs to get vaccinated is harder to accept. (Obstetrician, Peru)

Table 1
Characteristics of health care providers interviewed.

	Argentina	Brazil	Honduras	Mexico	Peru
Type of health care provider	4 nurses 3 obstetricians	3 nurses 3 physicians (all of them trained as obstetricians)	3 nurses 2 obstetricians 2 physicians	4 nurses 3 physicians	3 nurses 3 obstetricians
Gender	7 women	5 women 1 man	5 women 2 men	6 women 1 man	6 women
Age (mean and range)	50 years 32–64	38 years 27–46	43 years 28–52	48 years 29–64	48 years 33–60
Years of experience (mean and range)	22 years 14–33	12 years 3–23	12 years 1–29	25 years 5–45	19 years 5–30

Some of those interviewed appeared to doubt the effectiveness of influenza vaccines (not only during pregnancy), which likely affects their approach in recommending the vaccine.

> There is... anyways, a discussion about the efficacy, even of the effectiveness of the vaccine, considering the circulating serotypes and possible side effects. (Physician, Brazil)

Access barriers to prenatal care were also mentioned as a determinant for vaccine uptake, since countries established that maternal immunization vaccination is carried out within these visits. In Brazil and Mexico, health care providers stated that access to prenatal care is challenging for women living in rural or marginalized areas. Participants also mentioned the lack of funding to conduct outreach activities as a barrier.

> Sometimes they live far away and have difficulty to get to health centers because of the distance, because of the same place of residence, sometimes even for the risk of leaving their homes (Physician, Brazil)

Providers expressed concern about getting all the health care providers (from both public and private sector and informal caregivers such as traditional birth attendants involved in antenatal care) "on the same page" in terms of vaccine recommendations during pregnancy follow-up visits. Mexican and Peruvian providers mentioned that the use of traditional birth attendants at the community level for prenatal care in their countries leaves some pregnant women out of the formal health care provider network, which are those trained on current maternal vaccine recommendations. The discrepancy regarding immunization recommendations between formal and informal prenatal care providers generates inconsistencies in the vaccination approach to pregnant women. Providers from Brazil also mentioned the lack of adherence of physicians from the private sector to the national recommendations regarding maternal immunization.

> Let's say that of the patients in our area only 40% attend prenatal checkups in the health services, the others do it privately, because they work, or in a pharmacy. Often in those types of places there is no culture to telling them "go to the health center to get vaccinated", they just follow their check-up and when they arrive at the hospital, they give them the Td, because they did not have any vaccine. (Physician, Mexico)
>
> Many women have their prenatal control at private facilities, and they come late (to the vaccination room), when they already missed the deadline to Tdap, and then sometimes they are not protected against tetanus. They did not get the influenza vaccine. The hepatitis scheme is not appropriate. (...) Every ten pregnant women who are coming to us from the private sector, eight do not have the proper vaccine scheme, because they were not referred here at the right time to get these vaccines in a timely manner. (Nurse, Brazil)

3.2. Providers' knowledge and training about maternal immunization

Most health care providers mentioned a lack of vaccination training, including about childhood vaccines, and the interest and need for more information and training opportunities about maternal immunization.

> I would have like more, in fact today we were talking with my colleagues about the issue of saying for example where we could do a course, a course, in which they give us a certificate that we did the course about vaccines. (Nurse, Argentina)

Study participants reported that the nurses get more on-the-job training opportunities including training on vaccines which is generally designed for nurses. However, they also expressed a strong need for similar trainings on variety of related vaccines for medical personnel across the board. Physicians (obstetricians/ gynecologists and general practitioners) were particularly cited as they have the opportunity to directly speak to their patients and are considered most trusted source of information, [10]*. In order to follow the recommendations or policies related to vaccines, a desire and need was expressed to have more knowledge about vaccines that extends beyond Tetanus.*

> The only training that there is more than everything is for the nursing staff, because they are those who go outside the walls, they go out of the health center to get patients to their place of residency. Doctors, because we do not receive that constant training, as I say, we only follow the rules (recommendations/ policies) or any article on the Internet (Gynecologist, Honduras)

3.3. Availability of human and material resources

A common feedback received in all five countries was the need for additional human and material resources at healthcare facilities to support effective vaccine delivery, in particular for pregnant women. Participants also mentioned a lack of human resources to respond to high vaccination demand and competing priorities. In some health facilities, hospitals in particular, pregnant women experience long wait times to get vaccinated. Most of the visited health centers lacked separate immunization areas from childhood vaccination activities or specific vaccine-related appointments for adults and pregnant women.

> We have a vaccine problem, which I already understand that has repercussions in the follow-up of our pregnant women, that is the fact of the vaccines room need to be closed because missing professionals (...) Already happened that the pregnant comes to the appointment, and she was overdue for the vaccine and she said that the day she came was closed or the day she came she had a lot of queue and she cannot wait.. (Physician, Brazil)
>
> In the area of immunizations we are five nurses. But we not only do immunizations, but we also do what is the healthy children care, then they are rotating schedules. And the nurse not only

enters to vaccinate newborns, but also has to comply with the requests of the vaccination office. (...) We try to comply, but in any case the demand is high, both in immunizations and for the care of healthy children. (Nurse, Perú)

In some centers, staff employed specific practices to facilitate access for pregnant women; for example vaccination in the waiting room of prenatal visits.

The nurse takes the strategy that takes a thermos with the vaccine to the obstetrics office. Then the patient who is there, she comes over and says "Ma'am, I'm going to vaccinate you" so the patient does not have to move, right? and not lose the opportunity for the patient to be vaccinated. (Obstetrician, Perú)

Health providers in charge of prenatal care (obstetricians/gynecologists and physicians) mentioned that despite having access to the vaccine, they are had limited time to provide in depth information regarding vaccines to pregnant women.

I think we indicate it, but we in general do not inform the patient specifically of what it is for, how does it protect and which are going to be the benefits. (Gynecologist, Argentina)

Health care providers from all the countries in the study mentioned the lack of brochures and posters with maternal immunization information for pregnant women and their families. The prebirth classes were identified as spaces that could provide greater information regarding maternal vaccination as well as vaccines recommended for the neonate. Currently they generally focus on birthing preparation and breastfeeding advice.

Mexican and Peruvian professionals mentioned vaccine shortages during the last year. As a result, health care providers were unable to meet the vaccine recommendations made to their pregnant women, which generates distrust and apathy towards medical personnel.

Sure, it does generate a little distrust because to tell you that, for example, we started prenatal check-ups and we said all this is what you have to do, right? are all these activities that we are going to fulfill, but suddenly the patient arrived at five months there are no vaccines, six months there are no vaccines, seven months ... then like the patient will say "Well, why did you tell me?" 10 days, 15 days without giving the vaccine because we do not have tetanus. (Obstetric, Peru)

In Peru, some mentioned that the vaccines were occasionally only available in hospitals and not in health centers where women receive prenatal care, causing women to have to travel to both places.

But in this case, for example, with the influenza vaccine, we only count here in the hospital. Not yet ... the health centers still do not have the vaccine, so they are referred to the direct immunization area. (Nurse, Peru)

3.4. Interactions of health care providers with pregnant women

Health care providers cited the need for women to take a proactive role in their own health by seeking information from their providers during prenatal visits. They expressed that women do not ask questions during the visits and end up relying on inaccurate or incomplete information received from other sources. Health care providers suspect this may prevent women from seeking out prenatal and immunization services.

In fact, they do not ask, it is very rare to be asked what it is for or ... when it is a suggestion from us, they accept it and put it on, they are not incredulous at the moment they say "well, and what is it going to do for me or what does it have or what is it made", no, I have never had anyone who has that curiosity to ask what things are being put or what has it. (Physician, Mexico)

I tell pregnant women, "Do you know what we are giving you? Why don't you ask? Whether it's a nurse or a doctor, you have to know everything you are going to put in your body." (Nurse, Argentina)

4. Discussion

This is the first multi-country study assessing the perspectives of health care providers about maternal immunization practices at the facility level in Latin America [10,18]. The study provides insights about current practices and offers recommendations as the maternal vaccination platform expands globally and more vaccines become available for pregnant women.

Health care providers are aware and follow Ministry of Health recommendations for vaccinations during pregnancy. However, there is an unmet need and demand for professional development that would enable them to better recommend and administer vaccines to pregnant women in accordance with national immunization guidelines [16,18]. Trainings tend to target those that administer the vaccines, however as obstetricians and midwives generally have close relationships with their pregnant patients, they should be more involved with vaccine promotion and should also benefit from trainings. This would allow to better integrate vaccination into their routine antenatal care practices [19]. Areas identified for training relate to aspects of maternal vaccine delivery and include vaccine purpose, disease prevention, number of doses and schedule.

Training must also focus on the improvement of health providers' communication skills in order to successfully inform pregnant women regarding the importance of maternal immunization. It is important that health providers remain trusted information sources, since they are the most accessible and important resource influencing pregnant women's immunization decisions. Despite limited studies evaluating interventions to improve patient/provider dialogue, nudge-based interventions that build on favorable vaccination intentions, such as provider prompts and standing orders, have demonstrated significant success in improving influenza vaccine uptake [6]. There is room for national programs to develop better communication trainings. However, trainings for health workers cannot be done in isolation from improvements to supply chain and public perceptions.

The lack of human and material resources can negatively impact the clinical experience of pregnant women. The behavioral and social determinants of maternal vaccination interface actively with supply side factors. For example, there is an expressed need for more resources, especially as more vaccines are introduced. This analysis highlights how supply-side deficiencies impact demand-side factors and how interventions must address both sides. An important factor in global health vaccine decision-making is that the supply and demand sides are not separate. Supply shortages breed mistrust in pregnant women seeking access to immunization. Supply hurdles might be short-lived, but they leave long-term damage regarding society's trust in vaccines.

Access-related barriers to antenatal care services and the lack of time during the visits were also mentioned as a determinant to higher vaccine uptake. Health care providers understand that access remains an issue for mothers living in rural or marginalized areas. Access issues impact equity and likely exacerbate inequities in maternal immunization coverage, in particular due to the introduction of new vaccines that may require multiple visits or whose first dose begins earlier. Similary, adherence can suffer if health care providers are not convinced regarding the effectiveness of some vaccines (for example the influenza vaccine). Providers in

some countries, like Mexico and Peru, also expressed the need to standardize prenatal care including vaccination recommendations during pregnancy between public and private health facilities.

Given the influence of health care providers, in particular those that work with pregnant women to increase vaccine confidence, acceptance and uptake, systematic trainings and updates on maternal immunization, jointly with a communication strategy is critical.

Our study has some limitations. Only visits to capital cities were conducted, so the findings may not be relevant for other urban regions or rural areas of each country. The relatively small sample size of health care facilities and health care providers for each country may not be generalizable to the larger population of health care providers. Country visits were made at different times of the year, and the overlap of the visits with the influenza vaccine campaign in some countries may have influenced participants' perceptions. Though the data is limited and sourced from few countries, the findings were quite consistent between the 5 countries and provide useful information regarding maternal vaccination.

This study provides unique insights into health care providers' perceptions regarding maternal vaccination. In order to sustain the success of maternal immunization in Latin America and introduce robust and sustainable maternal immunization programs in other parts of the world we need to provide systematic and scalable communication trainings and standardized protocols and practices while dealing with access, resource and supply side issues. This comprehensive approach to maternal immunization programs would ensure access to hard-to-reach populations and that inequities are not exacerbated.

5. Data statement

Data from the focus groups are not fully available online due to privacy concerns. Some data may be available by request.

CRediT authorship contribution statement

Fauzia A. Malik: Conceptualization, Methodology, Validation, Investigation, Supervision, Writing - original draft. **Juan Pedro Alonso:** Methodology, Resources, Investigation, Data curation, Project administration, Writing - review & editing. **Lauren N. Sanclemente:** Data curation, Formal analysis, Investigation, Writing - review & editing. **Alba Vilajeliu:** Project administration, Resources, Methodology, Investigation, Supervision, Writing - review & editing. **Mariana Gutierrez:** 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 Ropero:** Conceptualization, Resources, Methodology, Validation, Investigation, Supervision, Funding acquisition, Writing - review & editing. **María Belizán:** Supervision, Resources, Validation, 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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