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"Those who do not vaccinate don't love themselves, or anyone else": a qualitative study of views and attitudes of urban pregnant women towards maternal immunisation in Panama

Clarissa Simas ,[1] Heidi J Larson,[1,2] Pauline Paterson[1,3]

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[1]Infectious Disease Epidemiology, London School of Hygiene and Tropical Medicine, London, UK
[2]Department of Health Metrics Sciences, University of Washington, Seattle, Washington, USA
[3]National Institute for Health Research Health Protection Research Unit (NIHR-HPRU) in Immunisation, London School of Hygiene and Tropical Medicine in partnership with Public Health England, London, UK

Correspondence to
Clarissa Simas;
clarissa.simas@lshtm.ac.uk

ABSTRACT

Objectives To identify pregnant women's views and attitudes towards maternal immunisation in Panama based on in-depth interviews and focus groups.

Setting Two main urban centres in Panama (San Miguelito and Panama City).

Participants Fifty-six pregnant women from Panama City (n=29) and San Miguelito (n=27).

Methods In-depth interviews and focus groups were conducted, audio-recorded, transcribed verbatim and analysed using a deductive-inductive approach.

Results Our findings suggest that this population perceives vaccination as a key component of maternal healthcare, not an elective part of it. The pregnant women interviewed disclosed a heightened perception of vulnerability to infectious diseases. For this reason, safety and effectiveness of maternal vaccines were closely associated for many participants (a vaccine was perceived as safe if it was effective against disease). Refusal of maternal vaccination was strongly associated with parental negligence. Participants reported the participation of husbands and partners in the decision-making around their health. Most participants reported high information-seeking behaviour, particularly online; many interviewees confirmed any information obtained online with their healthcare professionals (HCPs). Vaccine recommendations from HCPs appeared to be one of the main predictors of maternal immunisations among the sample interviewed. While acceptability of maternal vaccines was high in this sample, some pregnant women expressed concerns and doubts (e.g., that maternal vaccines could cause miscarriages) which require attention. Finally, many participants reported difficulties in accessing maternal vaccination, pointing to financial and physical barriers.

Conclusions The acceptability of maternal immunisation was high among the interviewed women. The pregnant women's receptiveness to maternal vaccinations, even when information provided was limited, is suggestive of high levels of trust in HCPs. Even so, HCPs and health officials should remain alert to apprehensions expressed by pregnant women. Many participants reported struggles in accessing maternal vaccination, pointing to issues that merit further examination.

Strengths and limitations of this study

- This is the first qualitative study to date to identify themes associated with maternal vaccine acceptance in Panama.
- We recruited a diverse sample of pregnant women in San Miguelito and Panama City.
- We analysed the data using a rigorous, deductive-inductive approach.
- The findings, however, may not be generalisable. Instead, the findings relay experiences of participants which may not be found in quantitative studies.
- Our sample was limited to urban populations; future studies should elicit the perspectives of rural and indigenous groups.

INTRODUCTION

Maternal immunisation is key to achieving the United Nations Sustainable Development Goal of reducing maternal and child mortality.[1] The Latin America and the Caribbean (LAC) region is a global leader in maternal and neonatal immunisation as evidenced by the elimination of congenital rubella syndrome and strong progress made towards neonatal tetanus elimination, both of which were achieved through successful vaccination programmes. Adding to these achievements in maternal health, 31 LAC countries currently target pregnant women for influenza vaccination and, as of 2015, aim to vaccinate over 90% of the region's newborns with hepatitis B vaccination.[2]

Panama, a high-income LAC country located in Central America, has been one of the fastest growing economies in the world, with a growth rate of 4.6% in the past 5 years.[3] The country has a population of approximately 4.4 million people as of 2021,[4] and indigenous people comprised 12.2% of

the population in 2010.[5] Adding to its large indigenous population, Panama is ethnically and culturally diverse, in large part due to its prominent role in international trade. Panama is one of the many Latin American nations with a sizeable West African diaspora, stemming from when slaves were forcefully brought in for the mining industry. Later, the construction of the Panamanian Railroad and eventually the Panama Canal, attracted workers from around the world, including Asia, Europe and the Caribbean—as well as US troops, who oversaw the use of the canal for over two decades.[6]

Health system configuration and Panama's National Immunization Programme

Panama's public health system is managed and provided by the Ministry of Health (*Ministerio de la Salud*) and Social Security Services (*Caja de Seguro Social*). It is estimated that 90% of the population have access to public health services: there are subsidies available for low-income populations, mostly concentrated in rural areas, who are not registered with Social Security Services. Despite efforts to tackle socioeconomic determinants of health,[7] marked health inequities remain, particularly between urban and rural populations. Weak health infrastructure, economic inequality and geographic barriers of economic and geographic nature all contribute to deficient access and lower health outcomes among indigenous and rural populations. In fact, while the maternal mortality ratio for Panama is moderate with 41.6 deaths per 100 000 live births, in some indigenous areas the death rate can be as high as 658 per 100 000.[7]

Panama has one of the best vaccination programmes in the LAC region.[3] The National Immunization Programme (*Programa Ampliado de Inmunizaciones*) was created in 1978, with an initial focus on childhood vaccinations before expanding to cover adult immunisation. Currently, Panama offers 23 different vaccines protecting against 30 diseases.[8] In line with Pan-American Health Organization recommendations, Panama offers all recommended maternal vaccines free of charge, including routine Tdap immunisation to pregnant women, which is only made available by a few other countries in the region. Alongside such countries, Panama has the potential to evaluate its impacts and contribute to informing decision-making in the region.[2]

LAC barriers to maternal immunisation and Panama

While there has been significant progress towards improving maternal immunisation coverage in Latin America, great discrepancies in vaccination uptake still exist. Across countries, coverage rates may vary drastically—and within countries, there can be persistent heterogeneity for coverage between regions, even in countries with high national coverage.[9] According to Guzman-Holst *et al*, in their comprehensive literature review of barriers to vaccination in LAC, only three studies (5% of total included in the review) looked at barriers to vaccination among pregnant women: Mendonza-Sassi *et al*[10] and Kfouri and Richtmann[11] investigated factors associated with influenza vaccine coverage among pregnant women in Brazil; Ozaki and Shimo[12] surveyed pregnant women about perceptions of a rubella vaccine.

While there have been some qualitative studies in Panama investigating overall vaccine acceptance,[5 13] little is known about perceptions of maternal immunisation among pregnant women in the country. The present study investigates views and attitudes towards maternal immunisation among pregnant women in Panama City and San Miguelito.

METHODS

Study site

This study is part of a larger global research project investigating attitudes to maternal vaccination worldwide. The study included participants from Panama City and the adjacent city of San Miguelito. The two cities were selected for several reasons. First, they are two of the most populous cities in the country, located in the centre of the country near the Panama Canal. Second, the two locations were chosen to allow comparisons of differences in interactions with the healthcare system, with a greater concentration of financial resources, hospitals and healthcare services in Panama City. Third, both cities have high urban demographic concentration which can facilitate virus contagion and outbreaks.

Recruitment

In total, 56 pregnant women from Panama City (n=29) and San Miguelito (n=27) participated in this qualitative study. The ages of the participants ranged from 18 to 39, with an average age of 26 years. Half of the participants (n=28) were first-time mothers. All recruiting was done face-to-face; in both Panama City and San Miguelito a trained recruiter was sent to hospitals, healthcare centres that provide antenatal care, private clinics and maternity hospitals to recruit participants. No chain or snowballing recruitment methodology was used. To be included in the study, participants had to be pregnant at time of participation and at least 18 years old.

To ensure a diverse sample of positive and negative attitudes towards vaccines, the screening process included one question about acceptance of maternal immunisation: 'On a scale of 1–10, could you tell me how strongly you agree or disagree with this statement, where 10 is agree completely and 1 is disagree completely: 'I would take any vaccine recommended to me by a doctor". The sample was selected to ensure a mix of responses to this question: 25% of participants (n=14) responded 1–3, 41% (n=23) responded 4–7 and 34% (n=19) responded 8 or more. All participants were compensated for travel, subsistence and participation in the research. Recruitment was continued until data reached saturation and no additional issues or insights emerged from the data.[14]

Data collection

Primary data were collected by staff at Worldwide Independent Network/Gallup International Association

(WIN/GIA), who conducted in-depth interviews and focus groups, in Spanish, under the supervision of CS. Data collectors were experienced local professionals briefed on the overall objectives of study. Data collection took place between April and May 2019 in Panama City. Two topic guides were developed, one for in-depth interviews (online supplemental file 1) and another for focus groups (online supplemental file 2). They were written in a way to encourage participants to discuss their views and opinions freely. In-depth interviews investigated individual perceptions and allowed exploration of sensitive topics. Focus groups explored shared representations and how different perceptions were negotiated among peers. Data generated from focus groups informed how shared values, social norms and group dynamics might impact maternal vaccine confidence; data from individual interviews provided in-depth understanding of reasons for attitudes towards maternal vaccination. Audio files of focus groups and interviews were translated and transcribed from Spanish directly into English by a professional translator at WIN/GIA.

In-depth interviews

Twenty in-depth interviews were conducted in Spanish with pregnant women, either face-to-face or over the phone. Due to mobility limitations from advanced pregnancy, the option of participating over the phone was given to participants. When face-to-face interviews were possible, data collection took place at the offices of WIN/GIA subsidiaries in Panama City and participants from San Miguelito travelled to participate. Most interviews conducted in person were observed and supervised by CS.

Focus groups

Four focus groups were conducted (two per location). Each group was composed of 8–10 women of different ages and stages of pregnancy. Groups were split into first-time pregnancies and non-first-time pregnancies. All focus groups required participants to attend in person and were conducted in Spanish at the country offices of WIN/GIA subsidiaries in Panama City. The focus groups were observed and supervised by CS. Participants were compensated for travel, subsistence and participation in the research.

Data management and analyses

To ensure confidentiality, all data were anonymised. Quotations from participants were used in this study and confidentiality was maintained by using city acronyms as sole identifiers (PC for Panama City and SM to San Miguelito); we ensured participants cannot be identified through contextual information.

Data were stored anonymously within a secure server on password-protected computers. Only co-investigators cited in the ethics approval had access to the files. As per the London School of Hygiene & Tropical Medicine Records Retention and Disposal Schedule guidance, research data will be stored for ten years, and the records documenting the management of the project will be stored for 6 years following the completion of the research study.

A deductive approach was used to develop an initial coding scheme based on research goals and interviews guides. The initial coding framework was piloted in a few transcripts and through an inductive process, additional codes were derived from deeper interpretation of data and analytical notes. Transcripts were analysed using NVivo V.11 software (QSR International, Melbourne, Australia). The results were organised under themes derived from the literature and which emerged when pregnant women were surveyed about different aspects of maternal immunisation. This study adheres to the Standards for Reporting Qualitative Research reporting guideline[15] (online supplemental file 3).

Patient and public involvement

This research was done without public involvement.

RESULTS

Maternal immunisation as a social norm

Most participants of this study were positive about maternal immunisation. They perceived vaccines as something normal or routine to their lives. As one mother states, 'Vaccinating is part of our culture, you just do it' (PC). Another mother discusses this idea of normalcy associated with vaccines through a metaphor, 'To me, taking my children to get their shots is like giving them a bath—it's just something that needs to be done" (PC). One mother boasted proudly, "I have never refused a shot!" (SM). Other participants, when asked why they chose to vaccinate, simply answered, "You have to do it (get vaccinated)" (PC); or "It is the right thing to do" (SM). Another mother echoed her peers, "(I got vaccinated because) everyone did it" (PC). Some talked about the "culture" of vaccination, "I haven't heard anything bad about vaccinations after someone got a vaccine, and really when many people get the vaccination, it's like a culture" (PC).

When probed about their decisions to take maternal vaccines, most of the women expressed there appears to be an overall sentiment that there is no decision to be made. To have vaccines, including maternal immunisation, is the normal, expected behaviour. "We feel it is a requirement, it's not an option. You're due for a shot, you get the shot" (PC). Both general immunisation and maternal immunisation were perceived by most women as an important part of their healthcare routine, one that was not optional, "Getting vaccinated was not a decision (…), I believe it is part of the routine of being pregnant" (PC).

Influencers in health decision-making

When asked about their overall health decision-making, many of the women noted that their husbands, mothers and HCPs were involved in decision-making. In particular,

husbands and partners played a key role for many participants. Several women interviewed discussed seeking support from partners, "My husband helps me make a decision" (PC); "My husband—he's the one who takes the decisions for my pregnancy" (PC); "Since the beginning it has been the two of us (husband and I). Him and I have always taken any decision together" (PC).

Many times, women described their own husband's trust in medical advice, "He (my husband) doesn't want me to take anything not prescribed by my doctor" (PC). Another shared that "(When making decisions) I ask him (husband), but I always go with what the doctor recommends" (PC). One participant discussed a situation in which her husband refused for her to get vaccinated because he was uncomfortable with the man vaccinating her, "A friend of mine (did not get vaccinated because her) husband wouldn't let another man touch her—culture, and education levels (influence vaccination)" (SM).

Perceptions of disease risk versus perceptions of vaccine safety and effectiveness

A reason repeatedly cited for maternal immunisation was the high prevalence of infectious diseases in Panama. Participants had heightened perceptions of disease risk and felt vulnerable—and recognised that vaccines can mitigate such risk. Several of the interviewed mothers-to-be stressed the importance of vaccines, "because they protect children from viruses" (PC) and "because they are effective in protecting viruses" (SM). When asked about the benefits of immunisation and why she had been vaccinated, one mother stated, "(Vaccines) avoid diseases that could cause unfortunate consequences later. Better safe than sorry" (PC). Some women interviewed talked about the power of maternal vaccines, not only for themselves, but also for their unborn babies, "I'd say the benefit (of maternal vaccination) is that the baby gets vaccinated through the mother" (PC).

Some women associated safety with the effectiveness of vaccines. They reported perceiving vaccines as unsafe in instances when they are not effective, "Effectiveness and safety (of a vaccine) are the same thing. Will it protect me or will it not (against diseases)" (PC).

Other participants felt vaccines were even more important now that they are pregnant, "When I wasn't pregnant, I'd also had my shots, but not with the same frequency and it wasn't as important to me as it is now. Before, I'd get vaccinated and that was it, but now I know that it keeps the baby from getting sick" (SM). Reports from peers, or positive experiences of other pregnant women who were vaccinated, were also important influences on their perception of the effectiveness and safety of maternal immunisation.

Refusal of maternal vaccines as negligence

Most of the women did not report refusing maternal immunisation. They were asked to think of reasons why pregnant women might refuse vaccination during pregnancy. Participants of this study commonly associated vaccine refusal with negligence, "There are women who say it's pointless to get vaccinated, but they don't think about their baby. Many children are born with illnesses, and it's not known if it's because of something else (…) or because of the negligence (of not vaccinating)" (PC). To many of the participants, to have maternal vaccinations was to be responsible for preventing their new-borns from getting hurt: 'The main reason to get vaccinated during pregnancy is to prevent some diseases that can hurt the baby in the future" (PC); "(To vaccinate) is the best prevention and I don't want to be held responsible (for not vaccinating if the child were to get ill)" (PC).

To vaccinate during pregnancy was also perceived by participants as a mother's act of love towards her baby and the community. When asked why a mother, having access to immunisation, would refuse to vaccinate during pregnancy, one participant said, "Those who do not vaccinate don't love themselves, or anyone else" (PC).

Vaccine refusal as negligence was not only associated with maternal vaccination, but also with childhood vaccination, "I've seen cases of negligence. There are mothers who don't get their children vaccinated. My sister-in-law's children weren't vaccinated, and her daughter fell ill because of a virus and in the hospital, they realized she wasn't getting her shots and they scolded her … They nearly called social services because this is penalized here in Panama" (PC).

Sources of information and influences on decision-making

Most participants reported intense information seeking behaviour regarding their overall health, particularly using the internet. As one said, "I search everything, I am a detective online" (PC). Interviewees reported using apps such as *mi embarazo* (my pregnancy), but not group chat technologies (e.g., WhatsApp or Facebook groups), to connect with peers or participate in online discussions.

Even with a high internet usage, most of the pregnant women reported consulting with HCPs before making health-related decisions. HCPs were identified as the most trustworthy source of information by several participants, and many reported fact-checking information harvested online. While the internet is mostly used for overall health questions, any vaccine-related questions tend to be directly asked to their HCPs. Whenever getting information online or from non-medical sources (e.g., family, husband), many participants again reported seeking advice from their HCPs over the matter. Participants reported that husbands, when asked about these issues, usually advised them to revert to their HCP for guidance. Even though the HCP remained a focal point for information about maternal vaccination for many of the participants, a few women mentioned concerns and misconceptions that arose from information they came across online, particularly from YouTube.

Importance of HCP recommendations of maternal immunisation

Among most of the women, HCP recommendations were cited as one of the main drivers of maternal vaccination.

Some women reported that they received limited information from their HCPS about specific vaccines, but that the HCP recommendation was still enough to convince them to vaccinate. As one explained, "No, I didn't (get a detailed explanation about the vaccine). Of course (I would have liked more information). But I got the vaccine because those were the doctor's orders" (PC). Another commented, "If the nurse says I should get vaccinations I get them, I don't have to talk to anyone else" (PC).

Sometimes the high reliance on the HCP recommendation, or lack thereof, was reported by several women as occasionally driving them away from maternal vaccination: "(I have not been vaccinated while pregnant) because the doctor hasn't told me to" (SM); "I'm not going to get vaccinated if I'm not told to (by my HPCs)" (PC); "I suspected I was going to get vaccinated, but I was just going to wait and see what the doctor says. (…) I haven't asked" (PC); "I know they (vaccines) are essential during pregnancy, but (my doctor) hasn't ordered that yet" (SM).

The recommendations of HCPs were also cited as reasons to trust that it is safe to vaccinate during pregnancy: "I'm sure the doctor will not give you a shot that is not safe for us" (PC); "The doctors offer it to me and that's why I feel safe" (SM); "Most of them are safe, I'm sure the doctor isn't going to give you a shot that will harm your baby. 99% of them are safe" (SM) and "If the doctor says vaccines are safe, then I see no problem" (PC).

Religious compatibility with vaccination and implication for indigenous communities

Most participants did not see their religious beliefs as an impediment to maternal vaccination or immunisation in general. In fact, most did not believe science and religion should be mixed. As one commented, "Religion and vaccines have nothing to do with the other" (PC). Others noted: "I'm not religious, but I do believe in God, and I don't think it affects my trust in vaccination" (SM); "As science makes progress, doctors have discovered medicines and injections to help prevent diseases, but that has nothing to do with religion" (PC) and "My religion and culture have nothing to do with vaccines. Nothing at all" (PC).

On occasion, participants frame their own religious beliefs in a way that encourages vaccination. One woman explained, "(The Bible) says God has put doctors and nurses (to care for us). That's biblical because if you feel ill, you must pray, and the Bible says that through the wounds of Christ we are healed, but the Bible also says that there are doctors and nurses, and God has put them there" (PC).

Although participants themselves did not see their own religious beliefs as incompatible with maternal immunisation, many women surveyed mentioned other traditional cultural and religious practices that view vaccination differently. Such practices would be predominant mostly in rural settings, particular within indigenous territories, or *comarcas*. One mother-to-be discusses this issue, "(What stops some women getting vaccinated) are myths … for example, religion. There are people who believe vaccines go against their religious beliefs. (…) many women said that their religion taught them to go to a healer and not to a healthcare centre and that's why many children died" (PC). Another commented, "There are many illnesses that affect adults and children in rural areas (…) and some indigenous people's religion does not allow vaccination" (PC).

Fragmentation in access to maternal vaccination

Women's reports of their experiences pursuing vaccination pointed to access barriers (e.g., cost and availability) to maternal immunisation in Panama City and San Miguelito. Study participants reported mixed use of private and public services for both maternal health services and immunisation.

Among participants, there were discrepant reports about the quality and availability of maternal health public services and different reasons for using private versus public health services. There were reports of good access in public services, "I chose the (public) healthcare centre because my mother told me they're good and (…) I stayed there. (…) they're reliable" (PC). Still, at times public services were described as insufficient or difficult to access. One mother discussed her difficulties in accessing public healthcare, "It's a rather tiresome process (…) first they give you an appointment for a gynaecologist to see you and another appointment for an ultrasound. It's not like a private clinic (…), It's a bit complicated. I go to both places for my tests" (PC). In cases where mothers have economic access to private clinics, it was not uncommon for participants to switch to private services to get better provision or choose their doctor, "(I changed doctors because) I felt she wasn't involved, and I was worried about my family's medical history, and she didn't seem concerned (…). So I decided to switch to a doctor that meet my needs. I feel more at ease (now that I go to) a private clinic" (PC). Or "The female doctor I went to was not too involved with me (…) I wanted someone who was more serious or took more interest. I am now using private (health services)" (PC).

Reports of access to maternal vaccination followed a similar pattern, with a mixed use of private and public health services. A few women reported being directed from private clinics towards public health services to get vaccinated, to avoid paying vaccines out-of-pocket, "The doctor tells me at private clinic that I need vaccine. She tells me to go to (the public) health centre so I don't have to pay" (PC). In contrast, others mention having to pay for immunisation in private clinics and reported difficulties of access due to costs, "Some vaccines you have to pay for and people can't afford" (PC). Another participant cited physical access as a reason for not vaccinating during pregnancy, "(Some women don't vaccinate) because of access. They can't get there to the appointments" (SM).

Concerns, misconceptions and rumours about maternal vaccination

While most participants reported a positive regard for maternal immunisation, some presented concerns with recurring themes related to vaccine safety. These concerns were particularly prominent in focus groups discussions, where women were encouraged to freely associate words that came to mind when presented with images of women getting vaccinated while pregnant.

A repeated concern was that vaccines could lead to miscarriages: "Will it harm the baby? Not the mother, but the baby because there are vaccines that result in miscarriage" (PC); "I am scared because vaccines can lead to miscarriage" (PC); "Especially during my first pregnancy. I saw people who said they were four months pregnant or that they felt sick and got a shot and miscarried. … or they didn't know they were pregnant and got a vaccine and had a miscarriage" (PC). Another recurrent concern was that vaccines could lead to allergic reactions which might be harmful for the fetus: "I might think is this vaccine going to be harmful for my baby? Am I allergic" (SM); "It might not be safe because for a specific reason and you might be allergic" (SM).

In stark contrast to overall confidence in maternal immunisation, one mother discussed her suspicions around maternal immunisation, "We are the guinea pigs, they test vaccines on us before sending to South America" (SM). And another participant reported mistrust due to information gathered online, "I investigate a lot. I've seen on YouTube that many vaccines are made of animal organs and there are vaccines, such as the polio vaccine, that's responsible for HIV in humans … I'm a bit doubtful when it comes to that one, but if made of other components, then children need to get vaccinated" (PC).

DISCUSSION

This study identified themes associated with maternal vaccine confidence in Panama. The results suggest an overall positive sentiment towards maternal immunisation in Panama City and San Miguelito. Due to a heightened sense of vulnerability to infectious diseases when pregnant, perceptions of vaccine safety and effectiveness appeared to be closely linked. Among some of the interviewees, a vaccine was considered safe when it effectively protects pregnant women against infectious diseases.

There was an overall perception of maternal immunisation as a social norm, one that is expected of them. When asked about their decision-making process, most pregnant women reported believing that there is no decision to be made. Getting all the vaccines recommended for pregnancy is part of their routine healthcare. Yet, the pregnant women interviewed in this study reported a high involvement of their husbands and partners in their overall health decision-making. To that end, future health policy and communications for maternal immunisation should consider targeting both pregnant women and their partners in official strategies.

In this study, participants reported high levels of information-seeking behaviour, particularly online. This is not unique to this sample and has been identified as occurring in different settings among pregnant women.[16 17] Still, despite looking online for information about their pregnancy, most of the pregnant women in the present study cited their HCPs as their most trusted source of information and repeatedly reported cross-checking online information with them. Moreover, when looking for information on maternal immunisation, most participants stated they generally relied on their HCPs for advice.

The importance of HCP recommendations has been previously identified as one of the main drivers of vaccination in pregnant women.[9 18–21] While trust in the HCPs is positive and desirable, participants did not report any other public health efforts, such as government communication campaigns, that could inform them of the need of a maternal vaccination. Consequently, many participants of this study said they would consider maternal vaccination only if directly prescribed by their HCPs. This is of concern as many participants in this study reported not having received this recommendation, raising concerns about consistency of recommendation from HCPs in the two cities included in this study. High levels of dependency on HCP recommendations, alongside a patchy health system, mean that other policy strategies (such as targeted communication campaigns) may be needed to ensure that the majority of pregnant women are reached.

In this study, participants reported a mixed use of public and private maternal health services, including for immunisation. Pregnant women discussed difficulties in access, either due to availability of vaccines in public services, physical barriers (i.e., not managing to reach services) or financial impediments. In situations where access was possible, the route to maternal immunisation was, at times, unclear. Considering women in this sample were living in urban regions, Panama City and San Miguelito, this raises concerns for maternal immunisation access in rural and indigenous areas which are reported to have an even patchier and more precarious access to the healthcare system.[22 23]

Indigenous populations were not interviewed, but the offer of healthcare services to this population is known to be inadequate. Many of these regions are geographically isolated by mountainous dirt roads and powerful rivers, making the delivery of medical care and routine vaccinations difficult. For some of these indigenous groups, up to 90% live in rural areas in reservations (or *comarcas*), while the majority of individuals in other groups live in urban areas within the provinces.[22] Prior studies have shown that high rates of extreme poverty and illiteracy are common among indigenous populations in Panama, and disparities in maternal mortality rates and access to healthcare persist despite efforts to improve healthcare access in these remote regions,[5 7] particularly when minority groups are extensively reported to have lower levels of trust in HCPs and the healthcare system, this

picture of maternal immunisation confidence is likely to be different in other regions in Panama, particularly in the *comarcas*.

While there is an overall positive sentiment towards maternal immunisation, some participants mentioned concerns and misconceptions. These concerns were mostly shared during free association exercises in the focus groups among their peers. The most common concerns raised were related to a fear of miscarriage, cited by many, but some also reported being generally suspicious of maternal immunisations (e.g., fear that women are being experimented on). Women have also reported that not much information was given to them prior to maternal immunisation—it only informed them that vaccination was necessary. HCPs should aim to provide more information and stimulate women to openly discuss with them any concerns they might have regarding immunisation and remain alert for any rumours, misinformation or other concerns expressed by women considering vaccination during pregnancy. Future studies should investigate the association between economic, educational, marital or professional status and maternal vaccine confidence.

Limitations

This study has limitations. First, despite a large sample of participants, the research was conducted in two main urban centres in Panama and did not include participants of indigenous and rural settings. Second, there is a marked gap in public health services between urban, rural and indigenous regions in Panama; indigenous and rural regions experience weaker access to maternal immunisation, as well as lower levels of both vaccine literacy and trust in health services. Third, qualitative study findings are not essentially generalisable but instead investigate practices and experiences which may not be captured in quantitative studies.

CONCLUSION

The government of Panama has promoted maternal immunisation as an important strategy to increase maternal health in the country. Continued success of a maternal immunisation programme depends on high coverage, which is linked to attitudes and acceptance among target populations. Data from this qualitative study suggest that there is a high level of positive attitudes towards maternal vaccines among pregnant women in Panama. The acceptability of maternal immunisation was high in the sample studied. Pregnant women's willingness to receive maternal immunisations even when information provided was scarce was suggestive of high levels of trust in HCPs. Even so, HCPs and health officials should remain alert to any rumours, misinformation and concerns expressed by pregnant women. Many participants reported difficulties in accessing maternal vaccination, pointing to financial and physical issues which merit further investigation. Finally, future studies of maternal immunisation acceptance in Panama should aim to generate evidence which can help build policies that cater to rural and indigenous populations.

Twitter Heidi J Larson @ProfHeidiLarson

Contributors CS, HJL and PP conceived and designed the study. CS, HJL and PP designed the coding scheme. CS identified the thematic framework and interpreted the data. CS, HJL and PP reviewed and refined the data. CS drafted the main manuscript text and all authors revised it. All authors contributed to data interpretation, and finalised and approved the manuscript.

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Patient consent for publication Not required.

Ethics approval We received approval to conduct secondary data analysis from the London School of Hygiene & Tropical Medicine observational research ethics committee in May 2019 (LSHTM ethics ref: 17100). For primary data collection, standard industry verbal and written consent were obtained by WIN/Gallup International Association (WIN/GIA). Participants were informed that their contribution was voluntary, and they could refuse to answer any question or terminate the interview at any time. All participants provided authorisation of the use of data for research purposes only. During data collection, researchers emphasised that any questions about immunisation should be discussed with a healthcare professional.

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ORCID iD

Clarissa Simas http://orcid.org/0000-0003-0035-8419

REFERENCES

1 Meulen AS-T, Bergquist S, Klugman KP. Global perspectives on maternal immunisation. *Lancet Infect Dis* 2017;17:685–6. doi:10.1016/S1473-3099(17)30230-X
2 Ropero Alvarez AM, Jauregui B, El Omeiri N. Progress towards a comprehensive approach to maternal and neonatal immunization in the Americas. *Rev Panam Salud Publica* 2017;41:e159:1.
3 United Nations Population Fund [Internet]. World population dashboard, Panama, 2021. Available: https://www.unfpa.org/data/world-population/PA [Accessed 23 Jun 2021].
4 Fantom N. The World Bank's classification of countries by income, 2016. Available: https://openknowledge.worldbank.org/handle/10986/23628 [Accessed 23 Jun 2021].
5 Gantz L, Calvo A, Hess-Holtz M, *et al*. Predictors of HPV knowledge and HPV vaccine awareness among women in Panama City, Panama. *World Medical & Health Policy* 2019;11:95–118.
6 Schlemmer JJ. International migration in the geographical middle of the Americas, 2016. Available: http://library.fes.de/pdf-files/bueros/fesamcentral/13023.pdf [Accessed 23 Jun 2021].
7 Perez AL, Locklear TD, Perez A. Women's health in central America : the complexity of issues and the need to focus on indigenous

healthcare. *Current Womens Health Reviews* 2013;9 https://www.researchgate.net/publication/255909874_Women's_health_in_Central_America_The_complexity_of_issues_and_the_need_to_focus_on_indigenous_healthcare
8 Organización Panamericana de la Salud. Vacunas E inmunización: boletín de inmunización, 2020. Available: https://www3.paho.org/hq/index.php?option=com_topics&view=rdmore&cid=960&Itemid=40903&lang=es [Accessed 23 Jun 2021].
9 Guzman-Holst A, DeAntonio R, Prado-Cohrs D, *et al*. Barriers to vaccination in Latin America: a systematic literature review. *Vaccine* 2020;38:470–81.
10 Mendoza-Sassi RA, Cesar JA, Cagol JM, *et al*. 2010 A(H1N1) vaccination in pregnant women in Brazil: identifying coverage and associated factors. *Cad. Saúde Pública* 2015;31:1247–56.
11 Kfouri Renato de Ávila, Richtmann R. Influenza vaccine in pregnant women: immunization coverage and associated factors. *Einstein* 2013;11:53–7.
12 Ozaki LMTR, Shimo AKK. The meaning of the rubella vaccine for pregnant women. *Rev Lat Am Enfermagem* 2007;15:529–35.
13 Vamos CA, Calvo AE, Daley EM, *et al*. Knowledge, behavioral, and sociocultural factors related to human papillomavirus infection and cervical cancer screening among inner-city women in Panama. *J Community Health* 2015;40:1047–56.
14 Glaser BG, Strauss AL. *The discovery of ground theory: strategies for qualitative research*. Chicago: Aldine Publishing, 1967.
15 O'Brien BC, Harris IB, Beckman TJ, *et al*. Standards for reporting qualitative research: a synthesis of recommendations. *Acad Med* 2014;89:1245-51 https://journals.lww.com/academicmedicine/Fulltext/2014/09000/Standards_for_Reporting_Qualitative_Research__A.21.aspx
16 Sayakhot P, Carolan-Olah M. Internet use by pregnant women seeking pregnancy-related information: a systematic review. *BMC Pregnancy Childbirth* 2016;16.
17 Clarke RM, Paterson P, Sirota M. Determinants of satisfaction with information and additional information-seeking behaviour for the pertussis vaccination given during pregnancy. *Vaccine* 2019;37:2712–20.
18 Wilson RJ, Paterson P, Jarrett C, *et al*. Understanding factors influencing vaccination acceptance during pregnancy globally: a literature review. *Vaccine* 2015;33:6420–9.
19 Lutz CS, Carr W, Cohn A, *et al*. Understanding barriers and predictors of maternal immunization: identifying gaps through an exploratory literature review. *Vaccine* 2018;36:7445–55.
20 Varan AK, Esteves-Jaramillo A, Richardson V, *et al*. Intention to accept Bordetella pertussis booster vaccine during pregnancy in Mexico City. *Vaccine* 2014;32:785–92.
21 Fabry P, Gagneur A, Pasquier J-C. 621: understanding pregnant womens intentions to have the A/H1N1 vaccine. *Am J Obstet Gynecol* 2011;204:S247.
22 Vakis R, Lindert K. Poverty in Indigenous populations in Panama: a study using LSMS data, 2000. Available: http://www.binal.ac.pa/panal/downloads/vakis-pananaindigenous.pdf [Accessed 23 Jun 2021].
23 Castro F, Zúñiga J, Higuera G, *et al*. Indigenous ethnicity and low maternal education are associated with delayed diagnosis and mortality in infants with congenital heart defects in Panama. *PLoS One* 2016;11:1–12.