

Knowledge, Attitudes, and Behaviors of Low-Income Women Considered High Priority for Receiving the Novel Influenza A (H1N1) Vaccine

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Abstract The primary purpose of this qualitative study was to explore the knowledge, attitudes, and behaviors of low-income women considered high priority for receiving the novel influenza A (H1N1) vaccine to improve communication in emergency preparedness and response. Researchers sought to identify the factors that affect this high priority population's ability to successfully comply with vaccination recommendations. By utilizing an existing communication framework through the special supplemental nutrition program for women, infants, and children (WIC) they were able to document the systems and infrastructure needed to foster constructive responses in a sustainable manner in the future. Six focus group discussions with WIC clients ($n = 56$) and 10 individual interviews with staff members were conducted at two WIC clinics in Georgia (1 urban and 1 rural). Data were collected after the 2009–2010 influenza season and analyzed using thematic

analysis. Knowledge and attitudes regarding H1N1 differed among participants with regard to perceived severity and perceived risk of influenza illness. Participants identified several barriers and motivators to receiving the vaccination, as well as information needs, sources, and information-seeking behaviors. Similarities emerged among both WIC clients and staff members regarding impressions of H1N1 and the vaccine's use, suggesting that while the information may be provided, it is not effectively understood or accepted. Comprehensive education, policy and planning development regarding pandemic influenza and vaccine acceptance among low-income women is necessary, including improvements in risk communication messages and identifying effective methods to disseminate trusted information to these high priority groups.

Keywords H1N1 influenza vaccine · Immunization · Health beliefs and attitudes · Health behaviors · Preparedness and emergency response · Risk communication

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Introduction

In 2009, the World Health Organization (WHO) announced uncontained community-level transmission of a novel influenza A (H1N1) virus causing illness in multiple areas throughout the world, declaring a worldwide pandemic [1–4]. Influenza vaccination is the most effective method for preventing influenza and influenza-related complications [5]. Therefore, the Advisory Committee on Immunization Practices (ACIP) announced a list of target groups recommended to be the first to receive influenza A (H1N1) 2009 monovalent vaccine. Among those listed were pregnant women, persons who live with or provide care for

infants aged less than 6 months, and children and young adults aged 6 months to 24 years [6].

During the first 6 months of the 2009 pandemic, almost three-quarters of Americans reported closely following the news regarding the novel influenza outbreaks [7]. Yet despite this heightened awareness, less than half (46 %) said the H1N1 vaccine was safe for pregnant women and only 56 % reported that they felt the vaccine was safe for children aged 6 months to 2 years old [7]. Furthermore, over half (56 %) of those parents responding gave distrust of public health officials to provide correct information about the safety of the influenza A—H1N1 vaccine as a reason for not getting children vaccinated [7].

Addressing effective risk communication to increase vaccine acceptance is a particularly urgent matter for pregnant women and caregivers of children. Breakdown in effective communication is especially true for low-income women, who have reported that their information needs for infant and self-care were not met when compared to the reports of high-income women [8]. Furthermore, women with lower income and education levels were less likely to seek information [9]. Pregnant women with low health literacy skills had more personal barriers to information seeking, such as not knowing how to use the Internet [10, 11].

The special supplemental nutrition program for women, infants, and children (WIC) serves low-income women who are pregnant, postpartum, and those with young children up to age five. In addition, WIC centers have a history of promoting immunization through assessment and referral in combination with other strategies that have been shown to increase vaccination rates [12–16]. Therefore, WIC provides an existing framework to create and maintain preparedness and emergency response communication systems.

The literature is limited in directly addressing the systems and infrastructure needed by these high priority populations to foster constructive responses in a sustainable manner. This study sought to improve communication in emergency preparedness and response by exploring the perspectives of both WIC clients and staff members to identify effective methods to disseminate trusted information through an existing health system network. Because of the nature of qualitative research, this project was not hypothesis driven; however, information from this project provided a crucial context of aggregate knowledge to inform comprehensive policy and planning development regarding pandemic influenza and vaccine acceptance. The study had the following specific aims: (1) to explore knowledge and attitudes about novel influenza A (H1N1) virus in low-income women considered high priority for vaccination, particularly with regard to the perceived risk and severity of influenza, and effectiveness of the vaccine; (2) to identify behaviors towards receipt of H1N1

vaccination, including barriers and motivators of receiving the immunization; and (3) to probe information needs, sources, information-seeking behavior and communication channels among low-income women.

Methods

Introduction

The study was conducted between June and August 2010. Two Georgia WIC clinics were selected as the study sites. A clinic in metro-Atlanta was purposively selected because of its urban/suburban nature while another clinic was chosen among rural counties within 90 miles of Atlanta. Three focus group discussions (FGDs) were conducted in each of the participating clinics with WIC clients, and individual interviews were conducted with staff. This study received exempt approval from Emory University's institutional review board.

Focus Group Recruitment

Female WIC clients were recruited for this study at the two study locations. To participate in a FGD, the women must have been 18 years or older, fluent in English, enrolled in WIC, and pregnant, postpartum, or a caregiver of young children. Between 12 and 15 WIC clients were recruited for each FGD, anticipating that between 8 and 10 would attend. Building on approaches used successfully in the past, WIC clinic staff aided in recruitment and methods varied by location. At the rural clinic, the FGDs were held on the same date as the annual Farmer's Market due to historically high attendance and recruitment occurred on-site the day of the event. In the urban clinic, flyers with a telephone contact number were posted in the waiting areas and announcements were made following nutrition education classes, inviting participation. Women pre-registered to attend a FGD and were given reminder cards, as well as follow-up phone calls and text messages. At the urban clinic, women were assigned to groups based upon vaccination status with two homogenous groups (vaccinated and unvaccinated), as well as a third heterogeneous group. (Stratification was not possible at the rural site due to low vaccination numbers.)

Focus Group Data Collection

All FGDs were scheduled for 1½–2 h, were facilitated by an experienced facilitator, audio-recorded, and supported by extensive notes taken by laptop. Before the start of the FGD, all participants were explained the study and

informed consent, and asked to complete the informed consent and a short questionnaire. The questionnaire was comprised of closed-response options to record demographic characteristics, vaccination status, as well as three questions to assess health literacy [17]. A FGD guide was developed by the research team and reviewed by the WIC collaborators.

Interview Recruitment

WIC staff members were recruited to participate in individual interviews by direct contact with study personnel during their normal working hours at the clinics. WIC staff member study participants included nutritionists, health associates, and a nurse director.

Interview Data Collection

All interviews were scheduled to last between 10 and 15 min, conducted in a private office space, audio-recorded and supported by notes taken on a laptop. All staff members provided written informed consent and completed the same demographic survey that the focus group participants completed prior to being interviewed. An interview guide was developed by the research team and reviewed by the WIC collaborators.

Analysis

Data collected from the questionnaires were entered into SAS 9.2 for Windows. Descriptive statistics were generated for the demographic characteristics of the participants. Recordings from each FGD and interview were transcribed verbatim and augmented by the notes taken. Data analysis was conducted using MAXQDA software and proceeded in two phases. First, there was development of a code book and a preliminary analysis relying predominantly on a set of deductive codes representing the initial objectives of the study. This was followed by an in-depth analysis based on the emergence of key inductive themes, or concepts identified by the participants themselves as being important. Data were coded separately by two independent coders, who found consensus with the key themes identified. If consensus was not found, a third researcher was consulted.

Results

Study Population

A total of 56 WIC clients participated in one of six FGDs, ranging in size from 6 to 12 clients per group. Generally, the participants in both clinics were similar in terms of key

demographic variables, including age, race/ethnicity, marital status, educational attainment, and employment status. In regards to health literacy, most of the participants rated themselves highly in their abilities to independently fill out medical forms (74–87 %), read hospital materials (73–90 %), and understand written information to learn about their medical conditions (80–84 %) (Table 1). Overall, the rural WIC clinic participants tended to rate themselves higher in these areas.

Individual interviews were conducted with 10 WIC staff members (7 urban and 3 rural). The staff members were similar to the WIC clients in terms of race/ethnicity, but tended to be older, with a higher proportion married, completing higher levels of education and all employed on a full-time basis. They also reported higher health literacy levels (90–100 %) (Table 2).

Due to low overall vaccination rates, we defined vaccinators as women either being vaccinated against H1N1 or having their child(ren) vaccinated against H1N1, while non-vaccinators applied to women that were not vaccinated nor did their child(ren) receive H1N1 vaccination. Table 3 summarizes priority group membership and vaccination status of the focus group participants by clinic location, based on the results of the questionnaire administered on the day of the focus group. The women reported higher proportions of their children receiving vaccination than themselves, as well as greater percentages receiving the seasonal influenza vaccine than H1N1. The urban clinic reported higher levels of immunization with both vaccines across women and children.

Several differences were noted between staff at the urban and rural clinics related to vaccination status (Table 4). While none of the WIC clinic staff at the urban clinic had been vaccinated for neither H1N1 nor the seasonal flu, all of the rural WIC clinic staff had been vaccinated for the seasonal flu with the director also receiving the H1N1 vaccination. Furthermore, of the rural WIC clinic staff with children ($n = 2$), 50 % vaccinated their children against H1N1 and 100 % vaccinated their children against seasonal flu; while of the urban staff with children ($n = 6$) only 33 % vaccinated their children against H1N1 and the seasonal flu. Additional data indicated that the two urban clinic staff members had vaccinated their children only following physician recommendation due to chronic health conditions.

Perceived Severity

All of the participants stated that H1N1 influenza was a serious illness, closely associated with death. They expressed fear over the speed with which H1N1 seemed to spread and kill. However, participants also thought that there was a level of unnecessary alarm, consistently

Table 1 Focus group participants demographic data

	Rural (n = 30) (%)	Urban (n = 26) (%)
Age	18–57, Median = 23	18–51, Median = 25
Race ethnicity		
Black/African American	100	88
White/Caucasian	0	4
Hispanic/Latina	0	4
Other	0	4
Marital status		
Never been married	80	69
Married/living with partner	17	15
Separated	3	4
Divorced	0	12
Education		
Less than high school	7	12
High school graduates	55	31
Some college, trade school	31	46
College graduates	7	8
Post graduate	0	4
Employment status		
Working full-time	17	19 ^a
Working part-time	17	23 ^a
Currently not working	47	35 ^a
Disabled	3	8 ^a
Student	17	27 ^a
How confident are you filling out medical forms by yourself?		
Extremely	67	62
Quite a bit	20	12
Somewhat	7	23
A little bit	0	4
Not at all	7	0
How often do you have someone help you read hospital materials?		
None of the time	83	50
A little of the time	7	23
Some of the time	7	19
Most of the time	3	0
All of the time	0	8
How often do you have problems learning about your medical condition because of difficulty understanding written information?		
None of the time	70	46
A little of the time	10	38
Some of the time	13	15
Most of the time	7	0
All of the time	0	0

^a Does not total 100 % because categories were not mutually exclusive

Table 2 Staff interview participants demographic data

	WIC Clinic staff (%)
Age	25–56, Median = 39.5
Race ethnicity	
Black/African American	80
White/Caucasian	20
Marital status	
Never been married	40
Married/living with partner	50
Divorced	10
Education	
Some college, trade school	20
College graduates	60
Post graduate	20
Employment status	
Health associate	50
Nutritionist	40
Nurse director	10
How confident are you filling out medical forms by yourself?	
Extremely	90
Quite a bit	10
Somewhat	0
A little bit	0
Not at all	0
How often do you have someone help you read hospital materials?	
None of the time	80
A little of the time	10
Some of the time	0
Most of the time	10
All of the time	0
How often do you have problems learning about your medical condition because of difficulty understanding written information?	
None of the time	90
A little of the time	10
Some of the time	0
Most of the time	0
All of the time	0

commenting that the media generally over-broadcasted warnings, proliferating unfounded fears.

- “The media was killing everybody off, saying if you got it, you were going to die.”
- “Every time somebody got sick it was like they wanted to say it was swine flu. So I think it created an unnecessary panic.”
- “Every time you hear something, it’s never as big as the media makes it.”

Table 3 Focus group participants priority group and vaccination status

	Rural (n = 30) (%)	Urban (n = 26) (%)
Priority group membership		
Pregnant (with first child)	13 (25)	23 (50)
Postpartum (with first child)	20 (50)	23 (50)
Caregiver of young children	97	96
Number of children	1–4, Median = 2	1–4, Median = 2
Vaccination status ^a		
H1N1—self	3	15
H1N1—child(ren)	23	35
Seasonal flu—self	13	27
Seasonal flu—child(ren)	40	42
No vaccination—self	87	73
No vaccination—child(ren)	60	58

^a Does not total 100 % because categories were not mutually exclusive

Table 4 Staff interview participants vaccination status

	Rural (n = 3) (%)	Urban (n = 7) (%)
Vaccination status ^a		
H1N1—self	33	0
H1N1—child(ren)	50	33
Seasonal flu—self	100	0
Seasonal flu—child(ren)	100	33

^a Does not total 100 % because categories were not mutually exclusive

Perceived Risk

Most participants agreed that they did not feel personally at risk for developing H1N1 influenza. Many of the participants' perception of risk was influenced by their personal proximity to cases. They felt safe because they did not view H1N1 as a local threat. Specific to the rural clinic, was a belief that transmission could be prevented by avoiding travel and travelers.

- “There wasn't that many cases down this way.”
- “You got to really see it around here, you can't just hear about it on the news”.
- “Allegedly there was a case ... but they came from Florida.”

Motivators to Vaccination

All of the participants discussed motivating factors toward vaccination. Some of the participants seemed to understand

that children were disproportionately affected and vaccinated to protect their children. However, in most cases this motivation did not extend to adult vaccination to prevent transmission. Rather, from these discussions a theme of maternal sacrifice emerged that valued child welfare over the women's well-being. Others viewed vaccination as simply compulsory.

- “I'm all for my son getting his necessary shots, but I'm not going to get it! I'd rather get him taken care of than me. Because he's younger and he gets sicker, faster than I do. So I would rather get him situated so he wouldn't have to be sick.”
- “Your kids can't go to school. You have to be vaccinated to go to public school.”
- “I worked with the school system and there was a case. We had to take the H1N1 shot after that. Required.”

Barriers to Vaccination

The obstacles to vaccination most frequently and extensively discussed included potential side effects and lack of information. All groups specifically mentioned adverse side effects as portrayed in the media. The groups seemed to be aware of a popular opinion of the connection between vaccination and autism. Participants in four of the groups specifically mentioned a news clip that went viral on the Internet site YouTube, showing a young cheerleader presumably suffering from the affects of the H1N1 vaccination. The “newness” of the vaccine and inadequate research were also continually referenced as impediments. Finally, a widely accepted myth that the vaccine could actually cause the illness was another major barrier.

- “The media will broadcast anything! You're sitting there looking at TV and the commercial comes on about getting your child vaccinated and the next commercial comes on ‘well I had my child vaccinated and then 3 months later we found that he was autistic.’”
- “I seen on TV where it messed this one woman up. She got a shot. She couldn't walk straight forward, but could walk backwards. When she tried to walk forward, she started messing up.”
- “I don't jump on the bank wagon for new vaccinations. I prefer to see what happens over time. I got the regular seasonal flu vaccine, but not H1N1. It was too new.”
- “They hadn't said anything about they had any test subjects or anything. They just said they had a swine flu. This is the vaccination. Go get it.”
- “The 1 year i did get the seasonal flu vaccination, i got real sick, with the flu. The first and only time i took one, that's what happened, so i haven't had a vaccination since.”

Among non-vaccinators, access and cost were cited as hurdles to vaccination. Despite both clinics offering the H1N1 vaccine for free, participants made comments that it did not fit into their budgets. Specific to the urban clinic were complaints about vaccine availability.

- “I don’t have any insurance or money to pay for it (the H1N1 vaccine).”
- “There was a long line. I wasn’t going to make an appointment.”
- “They weren’t making it available. They were saying ‘everybody needs to run out and get it. I came here to get it. Called back week after week and they didn’t have it.’”

Information Needs

In each of the focus groups, women generated a range of unanswered questions including: “Where did it come from?”, “How could you get it?”, “How could you avoid it?”, “What were the symptoms?”, “How was it different from the seasonal flu?”, “Who should get the vaccine?”, and “How could you get rid of it?”. Most notably they asked “What is really going on?” articulating the general concern for consistent, trusted information.

Information Sources

All of the focus groups brainstormed a list of sources they accessed to answer their questions (Table 5).

Information Seeking-Behavior

To identify how women accessed information from these sources, information-seeking behavior was assessed. Generally, the participants’ behavior proceeded in phases. Initially, the participants expressed concern and fascination with media coverage of the outbreak. This sparked questions and conversation. After consulting friends and family, several women went online to seek information. Yet, these women described frustration over their ability to find accurate information. Eventually, the women shared a mutual exhaustion over what they perceived to be the oversaturation of messages inducing fear. As a result, many adopted an attitude of avoidance.

- “People just sat there to wait on the news to come on to talk about it.”
- “But I mean ... they just don’t get straight to the point and give it to you. They give you bits and pieces. You have to do your own research and find out on your own.”

Table 5 Identified H1N1 information sources

Categories	Source	
Media	TV	
	Radio	
	Newspaper	
	Internet	
	Flyers	
	Pamphlets	
	Signs/Billboards	
	Healthcare professionals	Primary care providers
		Doctors
		Nurses
Midwives		
Healthcare facilities	CDC—“Disease control 800 number”	
	“That lady that came for a workshop at work”	
	Doctor’s offices/Primary care	
	Health department	
	Drug store	
	Hospitals	
	Nursing homes	
	Prenatal clinic	
	Health fairs	
	Other facilities	Schools
Workplace		
Restaurants		
Grocery stores		
Insurance company		
DFCS		
Identity program (“for people without insurance”)		
Personal contacts	Friends	
	Family	
	“The community”	
	“The older heads in the family”	
	“Your peers”	
	“Dr. Jesus”	
“Customers that got the shot”		

- “I listened to some of it, but when they got like ‘people dying everyday ... ya’ll need’, I be like man these folk need to go. I just changed the channel. I just turned it. Cause it was the same thing, every day.”

Provider recommendations served as a motivator to vaccinators. Conversely, the lack of such recommendations was a barrier. While many of the women reported asking their friends and family for advice related to the vaccine, they did not report engaging in similar conversation with their healthcare providers. Rather, they deferred initiating the conversation.

- “There wasn’t any research and my OB never suggested it. So I asked a couple people that were pregnant and they was like, no, no. And I asked my mom and she was like no. And he (the OB) never mentioned it, at all. So I’m like, it must be something like we really don’t need.”

Communication Channels

When asked to suggest ways that consistent information could be communicated, similar suggestions emerged around the concept of door-to-door community involvement and having group sessions facilitated by a health professional. Another suggestion revolved integrating health services by providing vaccination messages while accessing WIC services.

- “We got a health department, but they don’t tell you enough. You gotta ask questions. Having workshops around here, places we can go to learn. People can’t travel once a week. You got the school right there, they should come in and do seminars with the kids, teachers, and parents. Churches. People need to start coming this way, doing workshops. etc. Make it more local. Have focus groups. Get the community involved.”
- “You know, like, an information session, I guess, where a bunch of people gather around and talk about the issue with a professional.”
- “Anything from public health, from WIC to prenatal care, should have asked if you were aware, given information and where to get it.”

Systems and Infrastructure

A key theme emerged from the staff interview data exposing ineffective dissemination of information and coordination between WIC and the general clinic services, including vaccination. Even among those staff members who received a brief training, they shared the same lack of information and misconceptions as the clients regarding H1N1 and the vaccine. While they acknowledged that H1N1 influenza was a serious illness, they did not feel at risk. Similarly, they cited the lack of research and “newness” of the vaccine as reasons for not personally vaccinating. Furthermore, the staff were unsure of the vaccine’s availability and cost at the clinic, suggesting that there was “probably a fee” and if asked, they would refer clients to the front desk.

Discussion

Our study supports previous findings of pandemic influenza vaccination among low-income women and reveals a

deeper understanding and interpretation of the factors that affect this high priority population’s ability to successfully comply with emergency recommendations. Other studies have reported that H1N1 vaccination rates were lower among women with lower education levels and income and among racial/ethnic minorities [18–23]. This reinforces the concern that the women represented in our study may have been at greater risk for not being vaccinated despite regular encounters with the healthcare system through WIC.

Across focus groups and interviews, the participants agreed that H1N1 influenza was a serious, deadly illness. Yet, their general perception was that the media and government officials inherently “cried wolf”, causing the public to exaggerate disease severity. This supports similar findings that throughout the pandemic risk of death estimates were 100-fold higher than published reports, reflecting a tendency to overestimate risk from rare events that are newsworthy and unusual [24]. This has created a greater barrier of distrust to overcome when mobilizing emergency response through risk communication in the future.

The vaccination rates among the WIC clients at the urban clinic were comparable to those reported nationally and higher than those for the rural site and the state of Georgia [25]. Differences in perceived risk of infection related to urban–rural status may explain the patterns of vaccine uptake between the two sites. Women in the rural clinic were less likely to express personal risk due to the greater perceived distance between themselves and cases. To improve risk communication to this group, greater emphasis should be placed on the threat of local transmission, as well as interventions that address the women’s need for direct, face-to-face interaction with healthcare professionals to demonstrate the proximity of disease and its corresponding emergency response. Outreach in neighborhoods and community centers could signal the arrival of a real threat and serve as a cue-to-action for vaccination.

Given the extremely low vaccination rates, the barriers to vaccination easily outweighed motivators. Availability and cost were cited in our study as barriers to vaccination. These findings, which have been observed in other studies [21, 22, 24, 26], highlight the need to accelerate production and distribution and increase awareness of the free or reduced cost of the vaccine. However, these were not cited as the most influential reasons among non-vaccinators. Instead, our study revealed that failure to vaccinate was due to lack of demand more so than inadequate supply. Our data identified the “newness” of the vaccine, inadequate research, lack of information, and potential adverse side effects as the most important barriers. Another study found that lower income and education have been significantly related to higher risk perceptions, but simultaneously related to lower intention to be vaccinated for H1N1,

suggesting that these groups have particularly high distrust of novel vaccines [24]. Greater efforts need to be made to increase the dissemination of research findings and educate the public about side effects, directly addressing anecdotal media phenomenon.

Provider recommendations continued to be the greatest motivator of vaccination [19–21, 23]. Yet, indifference on the part of their providers was reported among several non-vaccinators. Despite rating themselves highly across measures of health literacy, most of the women did not actively seek information, confirming that low-income women have more personal barriers to asking questions and defer initiation of the conversation with a professional [9]. As a whole, racial/ethnic minorities and women with less education were less likely to report receiving a recommendation from their healthcare providers for H1N1 [20]. This may be related to an overall lack of knowledge by both patients and providers about the use of influenza vaccine [27] or there may be poor communication between provider and patient. One study, has even suggested there was a significant discrepancy reported between patients' and physicians' impressions of whether influenza vaccine's use or recommendation was even discussed during an office visit (22 % of patients vs. 74 % of physicians), suggesting that while the information may be provided, it is not effectively understood by the patient [28]. We conclude that improvements in provider-patient communication are vital for preparedness for pandemic influenza.

A particularly intriguing finding was the extremely low vaccination rates among the staff members. The ACIP recommended that health care personnel (HCP), defined as anyone working in a health-care setting, including medical clinics, be one of the five initial target groups to receive the H1N1 vaccine [6]. Despite the CDC findings that employer recommendation was associated with a rate almost fourfold higher probability of H1N1 vaccination [26], our staff

members did not vaccinate giving the two most frequently cited reasons "I don't need it" and "I may experience side effects" [26]. Our HCP were also more likely to believe seasonal influenza vaccine was safe compared with H1N1 vaccination [26]. Our data from the rural clinic, supports that heightened awareness of influenza resulting from the 2009 H1N1 pandemic contributed to an increase in seasonal influenza vaccination coverage as these staff members were more inclined to engage in preventive measures and trust an older vaccination. Further research is needed into understand HCP decision-making among the urban staff, although previous studies have reported a trend that even among healthcare workers, the rates of H1N1 vaccination are lower among black women than white women [18]. African American patients were less likely to accept influenza vaccination because they doubted its effectiveness, distrust the vaccine and healthcare system, and fear getting the flu from the vaccine [19]. Changing message and mode of communication to be culturally relevant to this population may be necessary. Efforts to increase acceptance among HCP could have positive secondary effects by increasing the likelihood of vaccination recommendations to clients [24].

Knowing that H1N1 vaccine is recommended or hearing more about the vaccine is not enough to motivate many women to get the H1N1 vaccine, even in a pandemic. Those women that chose to vaccinate primarily did so as a way to protect their children. This could be another mechanism for motivation. Our data supports the suggestion that focusing specific messages on the health risks of the illness and benefits of vaccine to the child, as opposed to the mother, may be more compelling [19, 20, 29].

While women have a lot of information needs related to H1N1 and vaccination, they also have a variety of available sources and methods of seeking information. There are multiple avenues for intervention, especially through

Table 6 Recommendations for public health officials

Target	Recommendations
Healthcare providers	Partner to ensure support of vaccination efforts Encourage initiation of conversation regarding vaccination and vaccine recommendation
Mothers	Frame risk communication messages to motivate adult vaccination as a form of child protection
Low-income women	Educate with regards to side effects Directly address anecdotal media phenomenon Focus efforts on increasing awareness of free/reduced cost vaccine Employ multiple communication channels for information dissemination (i.e. media, providers, social networks)
WIC clinic staff	Send professionals into community centers to conduct face-to-face sessions regarding vaccination Provide workshops/trainings to address information needs of low-income women regarding vaccination Increase knowledge and awareness of services within local health clinics to coordinate services and connect women to available resources Incorporate vaccination messages into nutrition education classes

engaging health care personnel and utilizing existing networks in providing recommendations. More specifically the data that emerged regarding the breakdowns in the infrastructure, between the federally-funded, regionally-managed WIC program and the local health clinic suggest that educating WIC staff and facilitating coordination of services within a facility could greatly impact vaccination by connecting women to available resources. Table 6 summarizes the recommendations based on the findings from this study.

This study is not without limitations. Due to the qualitative nature of this study utilizing a small convenience sample, a central limitation is that the findings cannot be generalized to a wider population. There is the potential for selection bias because despite providing reimbursement for transportation and childcare, low income women may have limited means to travel to the WIC clinic. Eligible women may have chosen not to participate in the study. However, six focus groups and ten interviews were an adequate number to collect a substantial amount of information and reach theoretical saturation. While focus groups and interviews were valuable methods for gathering data, identifiable limitations include the potential effect of social desirability and lack of important data due to the exclusion of non-English speakers. However, research supports that participation in a group may be perceived by participants as more satisfying and stimulating and less threatening than other forms of data collection [30, 31]. This was reinforced in our study from the positive feedback the participants expressed at the conclusion of each FGD along with their recommendation that similar group sessions be held as a preferred method of information dissemination in the future.

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