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Perceptions of Zika Virus, Family Planning Accessibility, and Motivations to Participate in the Z-CAN Program: Qualitative Analysis of Focus Groups with Puerto Rican Women

By: Hailey S. Bednar

MPH Candidate 2021

Global Health

Eva Lathrop, MD, MPH, Adjust Associate Professor at Emory University

Rollins School of Public Health & Emory University School of Medicine

Committee Chair

Lisa Romero, DrPH, MPH

Health Scientist, Division of Reproductive Health

National Center for Chronic Disease Prevention and Health Promotion

U.S. Centers for Disease Control and Prevention

Committee Member

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By: Hailey S. Bednar

B.S Psychology

Clemson University

2019

Thesis Committee Chair: Eva Lathrop, MD, MPH, Adjust Associate Professor at Emory University, Rollins School of Public Health & Emory University School of Medicine

Lisa Romero, DrPH, MPH, Health Scientist, Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, U.S. Centers for Disease Control and Prevention, Committee Member

An abstract of a thesis submitted to the Faculty at Rollins School of Public Health at Emory University in partial fulfillment of the requirements for the degree of Master of Public Health in Global Health, 2021

Abstract

Perceptions of Zika Virus, Family Planning Accessibility, and Motivations to Participate in the Z-CAN Program: Qualitative Analysis of Focus Groups with Puerto Rican Women

By: Hailey Bednar

Background: During the 2016-2017 Zika virus outbreak in Puerto Rico, CDC Foundation with technical assistance from the CDC established the Zika Contraception Access Network (Z-CAN) as a short-term emergency response using contraception as a medical countermeasure to prevent unintended pregnancy to reduce Zika-related adverse birth outcomes. Z-CAN provided women in Puerto Rico access to client-centered contraceptive counseling and the full range of reversible contractive methods same-day and at no cost through a network of trained providers.

Objective: The purpose of this study was to explore how Puerto Rican women's knowledge and beliefs of Zika virus affected their family planning behaviors, perceived accessibility to contraceptive services, and to evaluate motivations for participation in the Z-CAN program.

Methods: A qualitative analysis methodology was used to analyze 24 focus group discussions of women that did and did not participate in the Z-CAN program.

Results: Increasing access to affordable family planning services yielded higher motivation to access contraceptive services. Distance of clinics, complicated processes, and long wait times prevented women from accessing family planning services outside of the context of Zika. Women expressed their satisfaction in easily finding a Z-CAN clinic due to increased number and use of online physician locator. Participants valued the program's same-day provision of contraceptives without unnecessary medical tests. Participants who received Z-CAN counseling reported their negative impressions of the family planning process shifted towards positive interactions, encouraging further participation. Rate-limiting steps in contraceptive distribution affected provision of all methods at all times; when the supply of full range of methods was not readily available, women were discouraged from accessing the program.

Conclusions: Future emergency response efforts that focus on preventing unintended pregnancy should consider providing the full range of contraceptive methods on the same-day and at no cost. Patient-centered counseling and culturally-appropriate communication materials can build trust in reproductive healthcare and reinforce women's ability to make autonomous decisions about their reproductive health care. Women's perceptions of reproductive healthcare can influence participation in contraceptive access programs; the use of formative research is important to understand barriers and facilitators to contraception access, which can be used to inform future contraceptive access programs.

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Acknowledgements

I would like to extend my sincere thanks to my thesis team, Dr. Lisa Romero and Dr. Eva Lathrop, for their invaluable advice, their continuous support, and for their overall assistance at every stage of the research process. Their knowledge and experience not only enabled me to pursue such a rich project, but also provided me great encouragement for both during and beyond my academic endeavors. I additionally would like to thank my teams at the CDC and the CDC Foundation for providing me an outlet to pursue my passions and further my experiences in global public health. My appreciation also goes out to my parents and my brother for their unwavering support and belief in me.

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I. Background and Context

Zika virus is a mosquito-borne flavivirus resulting in fever, rash, conjunctivitis, joint pain and malaise; infection during pregnancy is a cause of microcephaly and other adverse birth defects (1). It was first discovered in Africa in 1947, and later detected in Asia in 1966; its public health implications were not known until it became the source of outbreaks in the Pacific from 2007 to 2015. Fewer than 20 cases of Zika Virus were reported before 2007, but a change in its epidemiology led to the outbreaks in Micronesia in 2007, French Polynesia in 2013 and 2014, then the pandemic spread to the Americas, Caribbean and Africa in 2015. Zika virus was first identified in the Americas in March 2015 in Brazil (2); by March 2016, the virus had spread to at least 33 countries and territories in the Americas (3). The epidemiologic changes with the pandemic led to the emergence of severe complications, including higher incidence of adverse birth outcomes (4,5).

The U.S. Zika Pregnancy and Infant Registry, a surveillance network that monitors pregnancies with laboratory-confirmed Zika, showed that 10% of pregnancies with laboratory-confirmed Zika infections resulted in a Zika-associated birth defect (6). By January 2018, more than 3700 cases of Zika-associated adverse birth outcomes had been reported in the Americas (7). In 2015 and 2016, large outbreaks of Zika virus occurred in the Americas, including widespread transmission in Puerto Rico and the U.S. Virgin Islands (8).

The 2015-2017 Zika Virus outbreak disproportionately affected the Commonwealth of Puerto Rico. During the Zika virus outbreak, Puerto Rico had the highest number of symptomatic Zika virus infections in the U.S. and U. S. territories; between November of 2015 and October of 2016, 62,500 suspected cases of Zika virus were reported to the Puerto Rico Department of Health (PRDOH) (9). For pregnant women, the risk of Zika virus is severe; Zika infection during

pregnancy can cause microcephaly and other severe fetal brain defects. This posed a problem for Puerto Rico, for at the onset of the Zika Virus outbreak, 138,000 of the 715,000 women of reproductive age in Puerto Rico were estimated to be at risk for unintended pregnancy (10). The term unintended pregnancy refers to women of reproductive age who are sexually active, do not want to get pregnant, yet are not utilizing a most-effective form of contraception. Overall, 65.5% of pregnancies in Puerto Rico are unintended based on the National Survey of Family Growth (2011-2013) (11). The Zika outbreak created a sense of urgency to reduce the risk of unintended pregnancy in the Puerto Rican population.

The Centers for Disease Control and Prevention (CDC) developed prevention strategies to prevent birth defects due to Zika virus infection, which included eliminating mosquitos in the environment and preventing mosquito bites, protecting pregnant women from sexual transmission of Zika virus, and preventing pregnancy among women who choose to delay or avoid pregnancy (12). Alongside the CDC's strategies, the World Health Organization (WHO) recommended that all patients with Zika virus and their sexual partners should receive information about sexual transmission of Zika, information about contraceptive measures, and be provided contraceptive methods to reduce the spread of the disease (1). In response to the Zika virus outbreak in Puerto Rico, the National Foundation for the Centers for Disease Control and Prevention (CDC Foundation), with technical assistance from the CDC, established the Zika Contraception Access Network (Z-CAN), a short-term emergency response intervention that used contraception as a medical countermeasure to prevent unintended pregnancy as a primary strategy to reduce Zika-related adverse birth outcomes (13). Z-CAN was a network of 153-trained physicians that provided client-centered contraceptive counseling and same-day access to the full range of the FDA-approved reversible contraceptive methods at no cost for women who

chose to prevent pregnancy. From May 2016 to September 2017, a total of 29,221 women received Z-CAN services (14,15).

From January 2016 to June 2017, Puerto Rico and the U.S. Virgin Islands had 129 cases of potential Zika-related birth defects out of 42,358 live births (16). Eliminating barriers to family planning services during an outbreak with potential effects on reproductive health was necessary for reducing the incidence of Zika-related birth defects. Puerto Rico has a long history of coerced sterilization and contraceptive testing, therefore the implementation of a contraception access program needed to take into careful consideration the perspectives and desires of women of reproductive age. By emphasizing autonomous decision-making and by providing the full range of contraceptive methods free of cost, Z-CAN was able to reduce the morbidity of Zika virus birth defects among Puerto Ricans. Understanding what encouraged women to participate in such a program, as well as what discouraged them, will be important to understand for future emergency response programs that necessitate rapid procurement and distribution of family planning services.

Focus groups were conducted with Puerto Rican women to gain insight into the perception and experiences of contraception access during the Zika virus outbreak among Z-CAN participants and non-participants. The purpose of this study was to explore the knowledge of and perceived accessibility to contraceptive services in Puerto Rico in the context of Zika and to evaluate reasons for participation in the Z-CAN program. This study explores women's perceptions of the program's accessibility and logistics as barriers preventing them from participating. It also looks into how knowledge levels and information sources potentially contributed to participation in the program. By examining the awareness and response to the Z-CAN program, in tandem with perceptions of facilitators and barriers to contraception access, we

can better understand the impact of this large-scale contraceptive access network program. This study evaluates how women perceived accessibility to contraception in Puerto Rico, how the Zika virus factored into contraceptive decision-making, and how the Z-CAN program's outreach led to their decision to participate or not participate in the Z-CAN program.

II. Literature Review

February 1, 2016, the WHO declared Zika virus a Public Health Emergency of International Concern (PHEIC). August 12, 2016, the United States Health and Human Services Secretary declared a public health emergency in Puerto Rico, signaling that the Zika virus posed a significant threat to pregnant women and children born to pregnant women in the Commonwealth (3). During the 2015-2017 Zika virus outbreak in the Americas, 86% of all cases of laboratory-confirmed Zika virus disease in the U.S. were reported from Puerto Rico (8). Women made up the majority (61%) of the 28,219 nonpregnant confirmed or presumptive Zika cases from Puerto Rico (9).

Puerto Rico became a part of the United States in 1898 following the Spanish-American War. As an unincorporated territory of the USA, it lacks self-determination and representation in Congress (17). Their territorial status, alongside a foundation built on colonialism, has led to Puerto Rico becoming a case study on human rights, reproductive rights, and reproductive freedoms. High levels of sexuality-related stigma, poor quality sex education, limited access to contraception, and limited participation in the allocation of resources are major issues influencing sexual transmission of Zika in Puerto Rico (17), all of which permeate through the island's history of reproductive services. The historical context of coerced sterilization, unethical testing of oral contraceptives, and issues of reproductive coercion in Puerto Rico must be

discussed to understand sociocultural barriers that the development of the Z-CAN program was likely to face.

Since Puerto Rico's establishment in 1898, the island has been known for prevailing overpopulation, policies of emigration, and population control efforts. The unique relationship that the United States has with Puerto Rico creates power dynamics that are problematic regarding health and human rights. U.S. officials blamed Puerto Rico's poverty and underdevelopment on overpopulation, which led to projects emphasizing migration and sterilization as solutions inevitably tied to racism (18,19). By 1946, 6.5% of Puerto Rican women had been sterilized, and by 1953 this jumped to 17%. The project's success in reducing overpopulation led to an intensification of sterilization programs to reduce the island's birth rate. In 1974, government statistics say that 200,000 (35%) of Puerto Rican women had been sterilized. By 1982, 39% of Puerto Rican women aged 15 to 45 had been sterilized, and the average age of these women was 26 (20).

The link between sterilization and population control, lack of access to viable birth control and healthcare, and increasing use of surgical fertility control has been acknowledged as major contributors to sexual stigma and oppression among Puerto Rican women since the early 1900s (20,21). Puerto Rico's case of sterilization is of particular interest; for at least the past 20 years, it has had the highest rate of contraceptive sterilization in the world (22). In Puerto Rico's case, the line between population control as a state policy and birth control as a human right has been blurred.

Coerced sterilization of women in Puerto Rico became an issue of concern in 1937. In May of that year, Puerto Rico enacted Law 136 allowing birth control services and information to be disseminated. Law 136 legalized the teaching and practice of birth control in Puerto Rico as

a means to improve health. This had unprecedented results in terms of sterilization support; a 1930's study of Puerto Rican physicians showed that 80% of them favored sterilization as a medical solution to malnourishment and poor health (23). A shift occurred in 1946 when family planning services were limited to those in which pregnancy was a serious risk, decreasing women's access to any family planning services (23).

In the 1970s, sterilization campaigns intensified in Puerto Rico, especially in rural areas (23). A 1973 document "Opportunities for Employment, Education and Training" became known as a population control blueprint. The document led birth-control campaigns to specifically reach into occupations of low-income (e.g. factories, unions, schools, and social services) to reach a goal of cutting island-wide fertility by two-thirds by 1985. Sterilizations were often carried out post-partum, and consent for the operation was obtained during labor to try to ensure that new mothers were inclined to comply (23). Women were not informed that sterilization was permanent during this time, which led to high rates of regret among women who opted into the procedure (24–26).

In addition to sterilization programs, from 1961 through 1976, Puerto Rican women were subjugated to long-term testing of oral contraceptives as the test population. Puerto Rico was chosen for the site of oral contraceptive testing because of its dense and continuously growing population, lack of anti-birth control laws, and already existing birth control clinics. The scientists also believed that if they could teach 'poor, uneducated women' to follow birth control pill regimens, then they could refute the idea that oral contraceptives are 'complicated.' While the pill was found to be 100% effective for the Puerto Rican women when used correctly, 17% experienced negative side effects such as nausea, dizziness, headaches, stomach pain, and vomiting. Negative reactions were reported by researchers as psychosomatic symptoms not

related to the pill and that such side-effects were minor compared to the pill's benefits. This pill was later determined to have too many side reactions to be generally acceptable, and the experimental team was accused of deceit, colonialism and exploitation of poor women of color (25).

The Zika virus outbreak in Puerto Rico exposed failures in socioeconomic policies and protections of sexual and reproductive health rights (27). Given the historical context of coerced sterilization, and unethical testing of oral contraceptive pills in Puerto Rico, CDCs Public Health Ethics Committee recommended that the Z-CAN program offer the full range of reversible contraceptive methods, train Z-CAN physicians to offer client-centered contraceptive counseling, and proctor Z-CAN physicians post-training to ensure competency in delivering client-centered contraceptive counseling and high-quality care. Further, for women who chose a long-acting reversible contraception method (LARC), women needed to have the ability to discontinue their LARC method at any time. To ensure access to no-cost LARC removal, Z-CAN established a safety net that will operate for 10 years after the program ended (28). A history of coerced sterilization and concern for unethical testing of oral contraceptives in Puerto Rico were important to consider in program design (15). Z-CAN needed to consider these historical and social determinants in the creation of program strategies, which could have affected the reach and value of the program and the eventual success of the emergency response effort.

The CDC Foundation, in partnership with CDC and a diverse group of stakeholders, established Z-CAN as a short-term emergency response for rapid implementation of reversible contraceptive services in Puerto Rico. The CDC Foundation is an independent nonprofit and is the sole entity created by Congress to mobilize philanthropic and private-sector resources to

support CDC's health protection work. While the government has unique capacities for providing health protection funding, there are also limitations on federal funding; by aligning interests and resources to create public-private collaborations, the CDC Foundation works in lock-step with the CDC to respond to health emergencies (29). To support CDC's critical work on the Zika virus outbreak, the CDC Foundation leveraged philanthropic and private-sector partnerships to support Z-CAN. The program was developed through public-private partnerships between federal agencies, territorial health agencies, private corporations, and domestic organizations in the U.S. and Puerto Rico (30). The response lasted from May 2016 to September 2017 (15).

The objective of Z-CAN was to increase contraceptive access and use of contraception as a medical countermeasure to reduce unintended pregnancies and therefore reduce the number of cases of Zika virus-associated microcephaly (13). The prevention of unintended pregnancies in the context of a Zika virus outbreak was necessary to reduce the likelihood of adverse birth outcomes. Removing barriers to contraception and increasing the use of most-effective methods of contraception (intrauterine devices, implants, etc.) would result in fewer adverse pregnancy and birth outcomes associated with the Zika virus (10).

The Z-CAN intervention cost a total of $26.1 million, including costs for the full range of reversible contraceptive methods, contraception-related services, and programmatic activities. The program is estimated to have prevented 34 cases of Zika virus-associated microcephaly among unintended pregnancies avoided. The intervention cost is offset by $88.4 million in avoided Zika virus-associated costs and $148.4 million from avoided unintended pregnancies, with a net savings of $236.9 million (31).

Findings suggest that when barriers to contraception access are removed (i.e. cost, service points, trained providers), women who want to prevent pregnancy were more likely to choose a more effective method of contraception (15). Contraceptive CHOICE project in St. Louis, Missouri provided FDA-approved contraceptive methods at no cost and counseling to promote the use of LARCs, and 75% of the study population and 72% of adolescents (age 15-19) chose to receive a LARC method. Similar projects have also been done in Iowa and Colorado to increase LARC method usage (10). Z-CAN is the first contraception access program developed as a primary prevention strategy to mitigate a mosquito-borne virus outbreak, and it is the first contraception access program as a primary intervention to prevent adverse pregnancy and birth outcomes in the context of a public health emergency (15).

Early in the outbreak, contraceptive access in Puerto Rico was limited by reduced availability of the full range of reversible methods, high out-of-pocket costs, insufficient provider reimbursement, logistical barriers that limited same-day provision, lack of patient education, and shortage of providers trained in insertion, removal, and management of long-acting reversible contraception (10). Before Z-CAN, the number of providers who offered contraception was limited, especially LARC methods (13); less than 1% of women in Puerto Rico were using LARC methods before this project (10). Coverage for all contraceptive methods by insurance is not universal in Puerto Rico, and the high cost of certain methods makes them unavailable and unaffordable. Puerto Rican women with public insurance are referred to contracted Medicaid clinics for contraceptive services, and women often do not pursue such clinics because they are limited in number, require unnecessary medical tests, and require multiple visits (10,13).

To increase awareness and uptake of Z-CAN services, a multi-strategy social marketing communication campaign, "Ante La Duda, Pregunta" (ALDP), translated to "When in Doubt,

Ask," was developed and implemented to increase knowledge about the full range of reversible contraceptive methods, increase information-seeking behaviors related to contraception use, and increase awareness of Z-CAN services; Z-CAN services include the availability of same-day access to the full range of reversible contraceptive options at no cost to women who chose to delay or avoid pregnancy (32). Before the development of the Z-CAN program, formative research was conducted to understand what Puerto Rican women perceived as barriers and facilitators to accessing contraceptive services (33); the results informed the development of the ALDP communication campaign. The Z-CAN program framed the ALDP communication campaign in the Theory of Planned Behavior to guide the development of campaign messaging and the selection of dissemination channels and used social marketing principles for the planning, development, and implementation of the campaign, including the campaign messaging, materials, and strategies to reach the target audience of Puerto Rican women of reproductive age 18-49 (13,32).

The structural development of Z-CAN included several strategies to rapidly reduce barriers to contraceptive access across Puerto Rico's health system, strengthen healthcare infrastructure, and work towards the sustainability of reversible contraceptive services beyond program implementation. Successful development of Z-CAN required establishing a chain of supply for contraception acquisition and distribution and improving the capacity of care provided by the public health system (13). Program staff consulted with a wide range of agencies and organizations such as the PRDOH to recruit health care providers for Z-CAN. In establishing a network of clinics and providers, the implementation team conducted evidence-based training, proctoring of knowledge and procedures, clinic infrastructure assessments, and eventually certified clinics for readiness to participate (34). A product ordering and distribution plan was

created with the help of the CDC Foundation and pharmaceutical distributors to ensure product procurement, tracking and tracing of products, and management of inventory levels (34).

A primary goal of Z-CAN was to encourage the autonomy of women in family planning decision-making by training physicians in client-centered counseling. A total of 177 physicians and 311 staff were trained to participate in the Z-CAN program. Providers completed a one-day training to cover topics in contraception, counseling, initiation and management, and insertion and removal of LARCs. Training included Zika education, client-centered contraceptive counseling, IUD and implant insertion practicum and Z-CAN program policies and procedures (15). To ensure the delivery of high-quality care, each provider was offered ongoing support and mentorship. Safeguards were also incorporated into the Z-CAN design to ensure no-cost LARC removal after the program's end (13).

The Z-CAN safety net for LARC removal was developed to maintain the sustainability of the program beyond the emergency response and to ensure that women were provided all options to make a personal decision about contraceptives. This safety net included a memorandum of understanding with participating physicians, appropriate physician reimbursement for services, standard operating procedures for patient complaints, and established communication channels for such cases. Provider champions were also established for LARC removals in the case that other participating physicians left the program (28). It is important that client-centered counseling at the time of LARC placement include information on how and when the women should seek removal services, which led to the creation of program safeguards.

The first Z-CAN services were offered on May 4, 2016 (15). The program served women who chose to prevent pregnancies through the provision of the full range of reversible contraceptive methods on the same-day and at no cost (13,15,27,40). To improve contraceptive

access in Puerto Rico during the Zika outbreak, Z-CAN was implemented across all five public health regions and in 69% of municipalities (54 of 78), through 153 physicians at 139 clinics between May 2016 and September 2017. The reach of the Z-CAN network throughout the island (among the 139 Z-CAN clinics) included: 89 private practices, 40 community health centers, 5 government health clinics and 5 academic clinics (13).

The program was successful in increasing access to contraceptives and promoting patient-centered counseling across most municipalities of Puerto Rico. A total of 29,221 women received an initial visit from the Z-CAN program, and 96% of these women received same-day contraception at their initial Z-CAN visit. These women had a mean age of 26 years. The majority of women (56%) were married or were in a partnered relationship and 43% were single. 40% of women served by the program had private insurance, 52% had public insurance, and 5% had no insurance. Most women (58%) had one or more previous live births, and nearly all women (95%) reported that they did not want to conceive within the next year. Further, 51% of Z-CAN participants had a college degree; 38% had a high school degree or less; and 9% had a graduate degree (13,14).

Before a woman's initial Z-CAN visits, most women reported that they used either no method (45%) or one of the least effective contraceptive methods (i.e., condoms or withdrawal) (30%). A small number of women (4%) had previously used one of the most effective methods of contraception (i.e., intrauterine devices, implants). At their visit, 70% of women chose a most-effective method, 23% chose a moderately effective method (i.e., injectables, pills, patch, ring, and diaphragm), 3% chose a least effective method, and 4% left without contraception (15,27). According to patient satisfaction surveys, Z-CAN participants were satisfied with the program and the patient-centered contraceptive counseling they received. A majority (85.2%) of

respondents reported receiving high-quality client-centered contraceptive counseling, and most that opted to receive contraception reported same-day access to their preferred method (86.8%) and at no cost (87.4%) (27).

It should be noted that the Z-CAN program was not able to provide services in areas without healthcare infrastructure. While it was able to reach 54 of the 78 municipalities, barriers to access could not be eliminated for women that had to travel to different municipalities (15). Additionally, contraceptive availability even within the Z-CAN program was often slowed by rate-limiting steps. This included the set-up of the procurement and distribution system, which slowed the delivery of some contraceptive methods in the early phases of the program (15,27).

III. Methods

In summary, focus group discussions with women in Puerto Rico that participated in Z-CAN and did not participate in Z-CAN were recorded, transcribed, and translated. For this project, focus group discussions were coded with a pre-existing codebook that was created through a rigorous process immediately following the completion of focus group discussions. Codes included previously identified themes and key objectives, plus codes created during the thematic analysis of the focus group discussions. This project utilized MaxQDA qualitative data analysis software to code each transcript line by line. Following initial coding, each code branch was reviewed for consistency within code definition, identifying biases, noting overall impressions, and searching for patterns and interconnectedness. From this, themes were mapped and utilized in drawing conclusions.

The CDC recruited focus group participants via a screener form. Screening criteria for participation in focus groups included females of reproductive age (18-44) that were not currently pregnant or planning pregnancy, but at risk for unintended pregnancy (currently

sexually active [has had sexual intercourse in last 3 months] but neither she nor her sexual partner have been sterilized (capable of becoming pregnant). Participants also needed to be residents of Puerto Rico and fluent in Spanish. Focus groups were conducted across two strata, those that participated in the Z-CAN program and those that did not participate in Z-CAN program.

Recruitment strategies included flyers posted at specific Z-CAN clinics to specifically recruit women who received Z-CAN services. The same flyer was also posted in community settings and businesses frequented by women of reproductive age (e.g., grocery stores, shopping areas) to recruit women who had not accessed Z-CAN services. Advertisements were also posted through media outlets (e.g., radio, newspaper, and internet) to ensure a diverse sample of participants. Participants were then screened using an online survey platform or in-person and were accepted based on participant eligibility criteria. As the eligibility was determined, participants were organized by place of residence. During this process, meeting places were identified to carry out the focus groups and invitations were made (through email and phone calls) to registered women to participate. If participants agreed to participate, reminders were carried out and all participants received a $50 gift card as an appreciation for time spent in the focus group. Before starting focus groups, the consent form was discussed with each participant and they signed the form. The duration of each focus group was between 2 and 2.5 hours.

August 7th, 2017 marked the end of the focus group discussions. Twenty-four focus group discussions were completed around the island: 12 with participants of Z-CAN and 12 with women of reproductive age not participating in Z-CAN (referred to as non-participants). A total of 205 women participated in these focus groups: 98 Z-CAN participants and 107 non-participants. The distribution of the focus groups conducted in each PRDOH Region can be seen

in Figure 1 (35). The distribution of age for participants was 61% between 18 and 24 years old, and 29% were 25 years old or older. These differed between the two strata: Z-CAN participants had 48% and 52% in each age group respectively, and non-participants had 30.8% and 69.2% in each age group respectively.

The focus group discussions were conducted by one or two facilitators using a semi-structured format to gather information on contraceptive access, choice, and use; perceptions about Zika transmission, pregnancy, and pregnancy planning; and awareness and/or experiences with the Z-CAN program. Questions were also included about perceptions about Zika transmission, pregnancy and pregnancy planning, impact, awareness and/or experiences with the Z-CAN program. Two versions of the focus group guide were developed: one for the participants of the Z-CAN program and one for non-participants. The guides consisted of between 33 to 44 questions with 7 (non-participants) and 8 (Z-CAN) thematic areas. The thematic areas of these interview guides were: pregnancy, access and contraceptive methods, implant, IUD, Z-CAN program reflections, patient focus contraceptives counseling (only for Z-CAN participants), Zika Virus, and closure.

Focus group discussions were digitally recorded and a notetaker documented information about the process. Recordings were transcribed into Microsoft Word in Spanish, translated into English, and a combination of word processing (Microsoft Word) and qualitative data (MaxQDA) software was used. In the creation of the codebook, an a priori preliminary codebook was created based on the key objectives of the study. Qualitative thematic analysis was used to identify emerging topics. During the program, translated transcripts were coded using NVivo qualitative analysis software by reading data line-by-line to assist in identifying concepts. The final codebook was developed based on key objectives of the study, as well as any relevant

theoretical/scientific findings. Ten major topics were identified for discussion and organized into the following: pre-implementation of Z-CAN program (training and participants' characteristics), Z-CAN program implementation (promotion, same-day access, reimbursement) and post-implementation of Z-CAN program (satisfaction, sustainability, impact, effect on women's life, why Z-CAN worked).

Following the program close in September 2017, all qualitative analysis and focus group materials were handed off to the CDC per emergency response deactivation procedure. For this project, the previously developed codebook was used, as it was created and justified through a rigorous process. Each translated transcript was loaded into MaxQDA qualitative data software, as were the codes per the previously developed codebook. For this analysis, transcripts were coded through a line-by-line reading to identify concepts and themes. Following initial coding, each code branch was reviewed for consistency within code definition, identifying biases, noting overall impressions, and searching for patterns and interconnectedness. From this, themes were mapped and utilized in drawing conclusions.

After reading through each transcript and reviewing relevant coded segments, patterns were identified in relation to each of the study's aims. Thematic analysis was then conducted to examine similarities and differences across groups to understand the perceptions of the Zika Virus, facilitators and barriers of family planning services, and accessibility of the Z-CAN programmatic response.

IV. Results

Knowledge, Perception, and Influence of Zika Virus on Family Planning

Participants of Z-CAN had a basic knowledge of the Zika virus (Table 1). While mechanisms of learning about Zika were not discussed, most reported that they knew Zika could

be transmitted via both sexual activity and mosquitoes. The majority of participants understood that Zika was dangerous for pregnant women and their unborn babies, as it could result in microcephaly. Its asymptomatic nature was also known. Many Z-CAN participants reflected that the epidemic was over, and that media sources had decreased promotions about the virus.

Z-CAN participants reported that there was limited worry about being infected with Zika during the epidemic (Table 1). Decreased media reporting post-epidemic, and comparisons to the well-known Dengue and Chikungunya decreased women's concerns about the potential for serious illness. Women felt that during the epidemic, the methods by which the media reported about Zika exaggerated its severity; the media campaign promoted by the PRDOH was said to instigate aggravation. Women additionally expressed knowledge of spreading theories that the PRDOH campaign had a goal of slowing the reproductive rate of the island and that it had an underlying birth control agenda, relating this situation to Puerto Rico's past of contraceptive testing and coerced sterilization. There was also a theory mentioned that the PRDOH campaign was promoted as an economic strategy to encourage the purchase of certain products and medicines. The way that these women understood the PRDOH campaign contributed to a low perceived risk of being infected by the virus.

Overall, non-participants also had basic knowledge about the Zika virus (Table 1). These women reported similar knowledge to participants regarding transmission and manifestation, as well as its potential severity for pregnant women and their unborn children. Non-participants also noted that this was not an epidemic anymore and that media campaigns had decreased. There was similar skepticism from non-participants about the government's educational campaign and worried the virus was created to "prevent people from continuing to conceive" (non-participant

group 1); this sentiment was shared across multiple non-participants. Focus group responses from non-participants also reflected the belief Zika was exaggerated as an economic strategy.

Among Z-CAN participants, women were not worried about Zika unless they were pregnant (Table 2). As the epidemic slowed, media reports followed, and awareness decreased, simultaneously decreasing worry among the population. Doubts existed about Zika's credibility because of the government's actions in the past and present. Zika's similarity to other mosquito-borne illnesses also created confusion about its severity.

The proximity that one had to Zika cases and Zika-related information was a factor in how one proceeded during the epidemic (Table 2). Across Z-CAN participant groups, it was understood that the concern was mainly with pregnant women or women trying to get pregnant. When one was pregnant, there was more initiative taken to protect oneself from Zika infection. On the other hand, Z-CAN participants reported that even when one was pregnant, overall worry about the virus was low. Microcephaly influenced fear during the epidemic, yet there were reservations among a few participants of microcephaly's relation to Zika. There were also doubts about the ability to prevent transmission via mosquito, decreasing the action one may take.

Similar to Z-CAN participants, non-participants had a low perceived risk of Zika for reasons including skepticism of the government, similarity to other illnesses, and lack of proximity to cases (Table 2). Personal experiences with and proximity to Zika virus cases affected perceived risk; if one did not know anybody with Zika, then it was less likely that precautions would be taken against the virus. Zika was understood as something distant. Participants talked about how this perceived distance from potential infection decreased their desire to engage in care-seeking behaviors. High perceived risk and actions taken against Zika

were reported from those that were pregnant or planning pregnancy, providing insight into Zika's effect on family planning and contraceptive use.

Zika was not a major factor in planning or postponing pregnancies and was not a reason for contraceptive use, both for participants and non-participants. Most Z-CAN participants reported that seeking contraceptive services through Z-CAN was done to prevent pregnancy, but not necessarily because of concern for Zika infection during pregnancy. One potential reason for this was feelings of 'distance' from the virus (Table 2). For example, if one was not pregnant, there was no urgency to be concerned or take precautions. Even in pregnancy, the worry was minimal. Additionally, as the epidemic slowed down, there was less talk about using contraceptives as a means to prevent complications from Zika infection, leading to less awareness about contraception as a barrier against the virus.

Some participants expressed that Zika had some effect on planning pregnancies. Women were worried about the effects Zika had on babies and feared microcephaly (Table 2). Women said they did not want to have a sick child, so the epidemic was an added motivator for seeking contraceptives. Focus group participants said that because of the virus, more women sought out abortions because of the fear; it was reported that Zika led to an increased number of women that terminated pregnancies. Those in Z-CAN focus groups mentioned how contraceptives became more accessible due to Zika prevention programs, but these sentiments were not found in non-participants.

Among non-participants of Z-CAN, there were varying responses about whether Zika influenced seeking family planning. Similar to participants, most non-participants said Zika was not a factor in planning or postponing pregnancies. Non-participants reported that individuals may have made the decision to engage in family planning during the outbreak, but it may not

have been because of Zika. Economic factors and preventing pregnancies were cited as more important reasons for engaging in family planning by non-participants. If Zika was a reason that family planning was accessed, non-participants said it was most likely due to fear of microcephaly. Both Z-CAN participants and non-participants reported that Zika was not a reason to postpone pregnancy, but it was a motivator for some because they feared potential birth defects.

Knowledge and Access of Family Planning Services beyond Context of Zika

Among women, how they receive information about family planning and contraceptives, barriers to information and accessing services, and facilitators to accessing services are important factors for engaging family planning services. A Z-CAN participant reported, “Here… in Puerto Rico [it] is a serious problem because first, not everyone has access to information systems; and second, not everyone has access to health”. Given this context, barriers to both information and health services have different effects on reproductive healthcare-seeking behaviors.

Z-CAN and non-participants received information about family planning and contraceptives from the same sources; these sources included physicians and gynecologists, pharmacies, family planning clinics, and nonprofit organizations (Table 3). Word of mouth via friends and other women was also valued. The most cited source of this information was the internet, where reviews of services were mentioned as highly valuable. Television was mentioned as a potential source, as was school and parental advice. Non- participants mentioned that they received this information from all of the same sources.

Outside of the context of Zika, women reported barriers to receiving information about family planning and contraception (Table 4). Participants of Z-CAN mentioned that family

planning was a topic of taboo in Puerto Rico and that it was not spoken about within households or by parents. Discussions about family planning were restricted to abstinence; parents felt that if they taught their children about family planning, they were permitting adolescents to be sexually active. These taboos may lead adolescents to fear approaching this topic with parents. Additionally, preconceived notions about specific contraceptives influenced the information shared by gynecologists. For example, it was a false preconceived notion that a woman must have had a child before they can have an IUD; this prevented gynecologists from sharing information about LARCs with patients without children.

Participants of Z-CAN explained the influence that 'machismo' has on the spread of information (Table 4). Machismo defines the role of women as reproducing and mothering. The pressure this role places on women creates shame, judgment, and fear around seeking contraceptives. Contraceptives prevent women from having children and therefore prevents them from falling into the role that they were meant to play. Many participants indicated that people avoided going to public places, such as pharmacies and drug stores, to purchase contraceptives to avoid judgment and shame. Yet at the same time, the responsibility of protecting oneself from pregnancy falls on women; men were praised for purchasing condoms while women were judged. Religion builds upon these stigmas and biases; religious institutions reportedly reinforced the role of women as mothers. These views prevented the sharing of information to young girls that were not supposed to be sexually active from a religious viewpoint.

Many non-participants mentioned similar barriers in obtaining information about family planning and contraception. Both participants and non-participants reported that taboos against family planning and contraceptives prevent information sharing (Table 4). Stigma against certain contraceptives may cause gynecologists to limit the information they provide. Both groups

reported that topics around sexuality were not talked about in the households and that generational differences placed pressure on parents to not share differences.

Non-participants also reported that 'machismo' influenced the information shared regarding family planning (Table 4). Machismo was reported to affect what information was provided to women and how open one was to receive that information. Like Z-CAN participants, non-participants mentioned that women were meant to be mothers and to remain abstinent until marriage, and this idea was reinforced by religion. Both groups also mentioned that differing gender expectations affect the information that one receives on the topic.

Outside of the context of the Zika epidemic, many barriers to accessing family planning services were identified (Table 5). Participants explained how there was a lack of accessible services throughout Puerto Rico. If there were resources proximal to participants, there were reflections that the process was complicated, discouraging engagement. The cost of contraceptives was also a major barrier. Participants discussed that contraceptives were generally expensive, especially LARC, and health insurance coverage was limited in the provision of these services. Time was also a barrier; due to other responsibilities, participants were unable to take the time to receive an appointment, travel to a clinic, sit in a waiting room, and wait for the doctor.

Non-participants reported similar barriers in access (Table 5). Availability of reproductive services was a barrier that Puerto Rican women faced in accessing family planning and contraceptives, both for participants and non-participants. Even if there were resources nearby, there were reflections that the process was very complicated, costly, and time-consuming. Non-participants emphasized that the time it took to obtain an appointment time,

travel to a clinic, sit in a waiting room, and wait for the doctor affected the ability to access services and the quality of services one received.

While limited, participants of Z-CAN did mention facilitators to accessing family planning services (Table 5). Many talked about being able to find contraceptives at lower costs; condoms were named as a cheap and accessible option. Community pharmacies and family planning clinics, such as Profamilia, provided contraceptives at lower cost, and some participants mentioned that some health insurance policies did cover the cost of contraceptives. Non-participants mentioned similar facilitators, including some health insurance coverage, the lower cost and availability of condoms and pills, and the ability to get some prescriptions at lower costs at community pharmacies.

Outside of the context of Zika, women engaged with family planning services for a multitude of reasons (Table 5). Participants of Z-CAN mentioned that they initially accessed family planning services for pregnancy, for routine tests, or for managing other health conditions such as hormone imbalances and period regulation. A few participants mentioned accessing family planning specifically because they desired contraceptives. For some participants, the desire to avoid pregnancy and childbearing was a major contributor to the decision to access contraceptives outside of the context of Zika. Some were more specific about this and said that they wanted to avoid pregnancy because of the cost of children; they felt their economic stability was not where it needed to be to support a child. Another important factor for participants in accessing family planning services was the goals and responsibilities that they hold outside of being a mother.

Non-participants mentioned similar motivators for accessing family planning services (Table 5). For non-participants, major motivators were avoiding pregnancy, treatment of other

health conditions, and to get contraceptives. Responsibilities and goals, such as economic stability, were mentioned by both groups as a reason to prevent pregnancies.

Accessing the Zika Contraceptive Action Network (Z-CAN)

Women that participated in these focus groups reported motivators for accessing the Z-CAN program, as well as what may have kept women from initially participating. Women that participated in the Z-CAN program mentioned that while they wanted to avoid children and potential Zika-related birth defects, they were particularly drawn to the ability to try different contraceptive methods at no cost (Table 6). The provision of the full range of contraceptives at a low cost allowed these women to feel empowered in their choice of contraceptives and allowed them to try different methods without fear of costly or complicated switch. The smooth and efficient process and the knowledge of accessibility via the physician locator website encouraged participation, especially when a woman discovered that their gynecologist was within the network.

In some cases, non-participants sought out more information about the program through their network (Table 6). While these individuals were a part of the non-participant focus groups because they did not participate in the program, a few of these women visited the program's providers for consults or to get more information. Similar to Z-CAN participants, non-participants were interested in having the ability to select different contraceptive methods and receive them at a low cost. It was also reported how accessible the program was, especially with the ability to search for the provider that was closest to them. One non-participant said that "we did not know that it was SO accessible".

Participants in Z-CAN mentioned that for some reason, they were wary about participating in Z-CAN (Table 6). The most mentioned reason for delaying participation was hearing negative stories about the side effects that others experienced after using a new method of contraception from the program. Some women feared adding something foreign to their body, whether referencing hormones or an object like the IUD. Additionally, many women mentioned how methods promoted within the program were not always available. Some participants experienced Z-CAN providers with no immediate supply of implants and IUDs at their respective Z-CAN clinics, preventing access to the desired contraceptive of choice. Many Z-CAN clinics had wait-lists; participants in some cases had to wait months before being able to be seen in one of the program's clinics. Participants were doubtful that this program was truly free; in fact, many mentioned that they were unaware of the tests and procedures that were not covered by the program and had to unexpectedly pay for them.

Many non-participants of Z-CAN had not heard of the program, restricting their motivation to access it (Table 6). For those that had heard of it, they agreed that this program seemed too good to be true. Negative stories about side effects from the program's contraceptives kept them from participating, as did the potential of paying additional costs. Many non-participants also mentioned that they did not have time to go through the process and protocols; some non-participants were currently on a waiting list to participate, and they had been for many months. A few non-participants mentioned seeing the information flyers, but it did not interest them enough to check it out. Non-participants reported that those that did not participate were likely not motivated enough to prevent pregnancy at the time and that participation rates were unrelated to Zika.

V. Discussion

The use of focus groups by the Z-CAN program was important to evaluate how women perceived accessibility to contraception in Puerto Rico, how the Zika virus factored into contraceptive decision-making, and how the reach and response of Z-CAN's campaign materials led to a woman's decision to participate or not participate in the Z-CAN program. Understanding women's perceptions of accessing contraception during an outbreak when identified barriers to contraception access were eliminated could be used to help guide other future emergency responses. Findings from multiple programs that increased contraception access through the provision of patient-centered contraceptive counseling, offering the full range of contraceptive methods, and removing access barriers reported increased contraceptive use (14,15,36–38) and higher satisfaction of family planning services (39,40). The purpose of this study was to explore the knowledge of and perceived accessibility to contraceptive services in Puerto Rico in the context of Zika, and to evaluate reasons for participation in the Z-CAN program. The findings highlight women's perceptions of the program's accessibility and logistics as barriers preventing them from participating. The findings also explore how knowledge levels and information sources contributed to participation in the program.

Increasing Access to Affordable Family Planning Services

Access to affordable family planning services is an important consideration in health program implementation. Before Z-CAN, Puerto Rican women with public insurance were referred to a Medicaid managed care organization (MCO) contracted clinic for contraceptive services (41). Puerto Rican women with public insurance such as Medicaid (approximately 56% of women of reproductive age were Medicaid recipients) faced logistical barriers to obtaining

contraceptives, including unnecessary medical tests and the need for multiple visits. There were also a limited number of Medicaid access points; 13 Medicaid MCO clinics were representing 12 of the 78 municipalities (13,42). Outside of the context of Zika, lack of family planning services was a major barrier to accessing contraceptives for both participants and non-participants of Z-CAN.

Z-CAN increased contraceptive access points from these 13 publicly funded sites to 139 public and private sites, and efforts to sustain contraceptive services are in process (15). Within the context of Zika, family planning clinics were seen as easy to find due to their increased number, location in both public and private sites, and Z-CAN's online physician locator facilitated awareness of where to access family planning services. In a study where an online locator was provided for HIV care clinics, it was found that while the online clinic locator did not directly correlate with increased rates of appointments, it was perceived by patients as a means of reducing barriers to care for potentially stigmatized conditions (43). Women in half of the Z-CAN participant groups mentioned how the physician locator on the website made finding a local provider easy. Findings of this study support other evidence that online clinic locator tools are another way of reducing barriers for those seeking out healthcare resources (43); the usefulness of the Z-CAN online clinic locator is therefore noteworthy for future emergency healthcare programming or in non-emergency settings to increase access.

In Puerto Rico, the limited number of family planning clinics supported by Medicaid was a barrier that needed to be considered in the development of the Z-CAN program (41). Through public-private partnerships and stakeholder engagement, the program was able to increase the number of clinics in Puerto Rico that accepted Medicaid patients, which increased the number of accessible family planning clinics island-wide (41,44). The broad coverage of Z-CAN was

notably successful in program implementation, but the program was not able to be implemented in municipalities without healthcare infrastructure, so some women had to travel outside their municipality to access care (15). Fortunately, the women in focus groups did not cite clinic number and distance as a barrier to accessing the program, but this finding may not be generalizable to the entire population of Puerto Rico without further research. By working with the Puerto Rico Health Insurance Administration, the agency that oversees Medicaid, and with established healthcare entities, Z-CAN was able to successfully extend access to family planning across the island and decrease barriers to contraceptive access in most of Puerto Rico's municipalities.

Importance of Same-day Contraceptive Access

Same-day provision of initiating contraceptive use is known to improve contraception access (45,46). CDC's evidence-based contraceptive guidance recommends providing immediate access to contraceptive methods at the same visit if a woman is not pregnant and there is no medical reason to require patients to return for a follow-up visit (47–49). When patients are required to return for a second visit for LARC insertion, the likelihood that they receive their method of choice decreases; up to 50% of patients will not return for the LARC insertion visit (46). Outside of the context of Zika, a majority of non-participant focus groups said the time it took to visit family planning clinics was a reason that they did not access family planning. This included the time it took to sit in the waiting room, engage in multiple unnecessary tests, the requirement of multiple visits, and waitlists for appointment scheduling. A goal of Z-CAN was to implement same-day contraception service protocols (45,46,50) to provide same-day contraception without unnecessary medical tests and exams. Such tests may deter women from

having visits with their providers that can encourage the use of a contraceptive method (51). To facilitate this, the Puerto Rico Department of Health issued waivers to Z-CAN physicians to allow on-site stocking of contraceptives for same-day service provision (13). Women in focus groups valued the ability to receive contraceptives in a streamlined manner and felt that the easy process and same-day provision of contraceptives was a positive aspect of the Z-CAN program.

Successful development of Z-CAN required establishing a supply chain for contraception acquisition, method distribution, and healthcare capacity. Program establishment included readiness audits to ensure that supplies, space, and equipment in each clinic were sufficient for Z-CAN participation (15). While the Z-CAN program worked to address appointment times and contraceptive availability barriers by advertising provision of the full range of contraceptive methods at no cost and on same-day (15), the availability of contraceptive methods within the program was often slowed by rate-limiting steps such as the set-up of procurement and distribution of the contraceptives (13,15,27). Despite the goals of Z-CAN, many of the Z-CAN participant groups had women who experienced wait-lists to access the program, which discouraged some women from participating. Often, these waitlists were a product of limited or no availability of desired contraceptive methods. Women in half of the Z-CAN participation groups explained that their local clinics did not have the desired contraceptive available, or that they had to wait an extended period for them to become available. One woman in the non-participant group reflected that the lack of her desired contraceptive method at her local Z-CAN clinic was the reason that she had not yet participated. Women valued the program's ability to provide same-day provision of the full range of contraceptives, and when supply was not available it prevented women from accessing the program.

It is important to note that out of the 29221 women that participated in Z-CAN, 27985 (96%) were able to receive a method same-day; 20,381 (70%) of these women chose a LARC method. Out of the 959 women that were not able to get a method the same day, 97 (10%) of them said it was because their desired method was out of stock (15). In future program implementation, it is important to consider that building clinic capacity takes time, introducing methods that were previously unavailable requires a shift in clinical practice, same-day provision of methods requires a shift in protocols (34). Additionally, future programs should consider ways to manage patient expectations for clinic wait times and wait times for first appointments. Clarifying with patients any expectations for the time taken and cost-sharing for services will improve potential complication management.

Creation of Safety Net to Ensure Reproductive Autonomy

Women in focus groups reported that they were worried about the continuity of the Z-CAN program beyond Zika, especially when considering their potential access to free removal of LARC contraceptives implanted during the program. While the program was appealing to Puerto Rican women, some were wary of accessing it because they knew it was not permanent. From Z-CAN participants, a majority of the concerns about program participation were about continuity of services and eventual contraceptive removal. For non-participants, concerns were mostly centered around program specifications as well as permanence of the program beyond Zika. Reproductive autonomy, or the ability to decide and control contraceptive use, pregnancy, and childbearing, was a fundamental component of developing Z-CAN (52). Allowing women to maintain autonomy in decision-making through patient-centered counseling is particularly important for women whose racial, ethnic, and class identities have made them targets of forced

sterilization (53). A history of coerced sterilization and concerns for unethical testing of oral contraceptives in Puerto Rico were important considerations for Z-CAN program design. Overall, focus group participants' concerns about the Z-CAN program can be traced back to ethical considerations in reproductive health programs, reproductive autonomy in decision-making, and the provision of contraceptive methods by government entities.

Knowledge of Puerto Rico's history of forced sterilization prevailed through worries regarding Z-CAN; some women that did not participate in the program often reflected beliefs that the Puerto Rican Government's Zika campaign had a birth control agenda and history was repeating itself through a new contraceptive program. While these concerns existed among Puerto Rican women, efforts were made to ensure that women had autonomy in their contraceptive decision by engaging in client-centered care and education on the full range of methods available and ensuring patients understood the ability to have prompt removal of methods when desired (28). The Z-CAN Program offered women the full range of reversible contraceptive methods and provided client-centered contraceptive counseling to ensure autonomous decision-making. Building a women's autonomy in family planning decision-making included the creation of a multi-component safety net to ensure a women's ability to access safe and free LARC removal through the Z-CAN Program (14,28).

Women in focus groups were concerned that if they chose a LARC method and the Z-CAN program ended, they would not be able to access removal as part of the program. This discouraged some women from participating in the program, or from choosing LARC methods during their appointment. Data shows that the Z-CAN program's efforts to provide patient-centered counseling and ensure prompt LARC removal when desired appear to have been successful for encouraging women that accessed the program, as almost 70% of women that

received a method same-day chose a LARC method (15). Having access to all necessary information about LARC removal, and concerns surrounding this component of the program shared by both participants and non-participants highlights the importance of client-centered counseling at the time of placement of a LARC, including providing information about how to access removal services (28). Puerto Rico's history of unethical contraceptive testing and coerced sterilizations have placed women in a wary state around family planning services, and client-centered counseling can help give women confidence that they are making autonomous decisions in their reproductive care plans. While barriers still exist due to preexisting concerns about contraceptive provision in Puerto Rico, safeguards used by the Z-CAN program to ensure reproductive autonomy can inform contraceptive access programs beyond epidemiological threats (28).

Trust in Information and Communication Sources

Before the onset of the Z-CAN program's communication campaign, ALDP, a qualitative assessment was conducted to inform the development of culturally appropriate communications for women in Puerto Rico to raise awareness of the full range of reversible contraceptive methods through Z-CAN (33). This formative research found that physicians were most frequently referenced for contraception information, but that women in Puerto Rico also get family planning information from the internet, friends, family, and physicians. Women in formative research relayed that physicians were the most trusted source (33). Focus group participants had similar opinions on source trustworthiness. Interestingly, women who heard about Z-CAN from physicians were more often participants of the program; women who heard about Z-CAN from other sources were more often in non-participant focus groups. The results of

this study highlight the importance of providing information through trustworthy sources and spokespersons, including physicians. Previous research indicates that consumers generally seek health-related information through digital sources including the internet, but physicians remain a highly trusted information source (54–57). Women in focus groups seemed more likely to pursue program participation if they heard about it from a more trustworthy source, such as physicians, but this cannot be generalized across the entire population without further research.

A wide array of communication methods were used to spread Z-CAN information – this included media sources such as the ALDP Facebook page, radio influencers, and engagement with the community at events in various settings in Puerto Rico (34). Outside of the context of Zika, women in half of the Z-CAN participant groups reported getting information about family planning and contraceptives directly from family planning clinics. Interestingly, there were no groups of non-participants that referenced family planning clinics as a source of information about this topic. Within the context of Zika, women that did not participate most often heard about the Z-CAN program from Facebook, friends, and radio spokespersons. Women who participated more often heard about it from internet sources, gynecologists and physicians (Table 7).

One particularly notable communication channel used by the Z-CAN program was the providers themselves; Z-CAN providers were given programmatic information kits. This included talking points for providers to go through with patients to ensure they were prepared to deliver urgent Zika messages to patients. This was a unique part of provider communications that the widespread public campaign itself did not include in its messaging (34). Women who participated in Z-CAN more often heard about the program from their providers; a majority of groups that participated in Z-CAN reported receiving information about the program from their

gynecologists or physicians, while this was only true for individuals in a few non-participant groups. Women interviewed in the formative research process said that Zika was not sufficient motivation for accessing contraceptive services; reducing the messaging about the virus could have led to a lack of urgency and agency in accessing reproductive care in the context of Zika. Those that were accessing reproductive healthcare outside of the context of the program were provided with more urgent messaging based on the toolkits given to providers, possibly leading these women to have more agency in participating.

Formative research in communications is imperative in creating a widespread campaign. The research itself should inform the communication pathway by keeping the target population at the forefront of all materials. Measurement and evaluation also contribute to long-term program success by allowing opportunities to alter and strengthen messages as needed to positively influence behavior change. Providing a message of urgency for providers to relay to their patients was one way in which trusted sources were used during the Z-CAN program to assist in the emergency response. Yet while women in Z-CAN focus groups valued being informed about contraceptives, they did not always engage their doctors in a discussion about desired contraceptives. In fact many women felt uncomfortable asking their provider questions about contraception or Zika. Instead, women were known to engage with their social network for advice about their experiences, which became a blueprint for the women's own decisions" (34). There is value in utilizing social media messaging during an emergency response to encourage urgency in accessing health programs. The ALDP Facebook page was an example of how there was potential in encouraging written reviews on social media pages, allowing the sharing of stories and the spread of information between trusted social networks. Women often felt distanced from the virus's effects, which decreased their agency in accessing preventative

services; encouraging the spread of information by women who were accessing the program within the communities could increase this agency and therefore increase utilization of contraceptive programs.

Client-Centered Counseling Rebuilding Trust in Healthcare

Decision-making around the selection and use of contraceptive methods is influenced by a multitude of factors, including the patient-provider interaction. Patient-centered contraceptive counseling through a shared decision-making approach can facilitate women finding a contraceptive method aligned with their needs and preferences (58) and increase patient satisfaction with their contraceptive method (27,59) and when to return to remove or replace their contraceptive method and how and where to access removal services (48). Research shows that patient-centered communication has a positive correlation with patients' trust in healthcare providers and their evaluation of healthcare quality (60,61).

A women-centered approach to family planning that promotes reproductive autonomy and agency should be taken rather than approaches focused on effectiveness; informing with a lens of providing reproductive autonomy helps to increase access to all women rather than increasing use among target populations (62). However, issues of perceived or actual provider coercion of women to choose LARC methods (or refuse LARC removals), particularly based on age, race, and class, have been reported (63,64). Women in both groups, when asked about contraceptive counseling, reported a wide range of experiences with their family planning providers outside of the Z-CAN program. Many explained how gynecologists external to Z-CAN did not often take the time with them to explain all of the options for methods. Many women reported that their gynecologists suggested only pills during their visit and that they did not

explain the full range of contraceptive methods. Negative experiences in reproductive counseling, including suggested preferred contraceptives by the provider and minimized explanation of methods, were found to lead women to halt care and contraception use (65).

An important element of the Z-CAN training and proctoring for all providers and clinic staff was to develop competency in delivering high-quality, patient-centered contraceptive counseling that facilitated autonomous decision-making (15). A qualitative study with Latina and Black women in the United States provided evidence that when it was suggested that providers favor a certain contraceptive, they felt implicit pressure based on an imbalanced provision of information and minimizing explanations of method side effects; these women who felt this pressure took these experiences as a reason to halt relations with these providers, and often stopped accessing reproductive healthcare and contraceptive use (65). Few women in Z-CAN focus groups reported physician prejudice for specific methods, such as not allowing women without children to consider IUD insertion. In a majority of participant focus groups, women who received Z-CAN counseling mentioned that after their experience their impressions of the family planning process changed. Women in Z-CAN participant groups reflected on receiving patient-centered counseling, how it improved their experience, and how it served its purpose of increasing knowledge before making the contraceptive decision. It made participants feel empowered in making this decision and helped them to feel confident in a vulnerable situation.

Findings of this study support that contraception access programs expand and not restrict contraceptive options for all women. Patient-centered approaches are particularly important and highly valued in reproductive care, therefore providers in family planning programs should be taught how to take a patient-centered approach to provide contraceptive information, incorporating the women's questions and concerns, and preferences into counseling (62). This is

of particular concern for women whose racial, ethnic, and class identities have made them targets of forced sterilization (53). By educating a woman on 'most effective' reproductive options based on the statistical risk of unintended pregnancy neglects a women's situation (62), which is critical to counseling her to make her own autonomous decision making about family planning.

VI. Limitations

The Z-CAN program and this study have several limitations. Given the rapid design and implementation of the program and the specific viral threat, these findings are not readily generalizable to the non-emergency provision of contraceptives. Qualitative approaches additionally limit the generalizability of the data. Much of the concerns of focus group participants surrounding supply and procurement of methods were influenced by the delivery of services likely in the early phases of program implementation; rapid procurement of LARC contraceptive methods in a context such as Puerto Rico was challenging and therefore delivery of such services in early phases of response may be slowed by a program's contextual surroundings (14,28). Z-CAN was designed to be a short-term emergency response, and despite its limitations data, analytics, and post-program evaluations show that the Z-CAN program is a model program that could be replicated or adapted in similar settings as part of emergency preparedness and response. Its design and implementation could be refined for non-emergency settings for increasing access to contraceptives and family planning and improving health outcomes (15).

VII. Conclusion

The Z-CAN program was designed to increase access to family planning and contraceptives to reduce the number of unintended pregnancies in Puerto Rico during the Zika outbreak. Focus groups with Puerto Rican women were conducted during the program to understand women's knowledge of the Zika virus, general accessibility to family planning

services outside of the context of Zika, and motivations for participation in the Z-CAN program. Women that participated in the Z-CAN program most often heard about it from their trusted health providers; these women often expressed satisfaction with the services and the provision of contraceptives and spoke about the influence that patient-centered communication had on their decision. Women that did not participate in Z-CAN often heard about the program from less trustworthy sources such as radio or social media and often expressed a lack of trust in government campaigns and healthcare providers. The findings of this study highlight that women's personal experiences and understandings of reproductive healthcare influence participation in contraceptive access programs, as it influences the trust one has in providers and services. Patient-centered communication was successful in positively influencing one's trust in reproductive healthcare provision; additionally, clear communication about program logistics and potential safety nets for post-program follow-up increased the possibility that women would engage in programs of contraceptive provision. Findings demonstrated that a patient-centered direction of care and emphasis on reproductive autonomy by eliminating barriers to care can improve the implementation of reproductive health programs in complex emergency responses.

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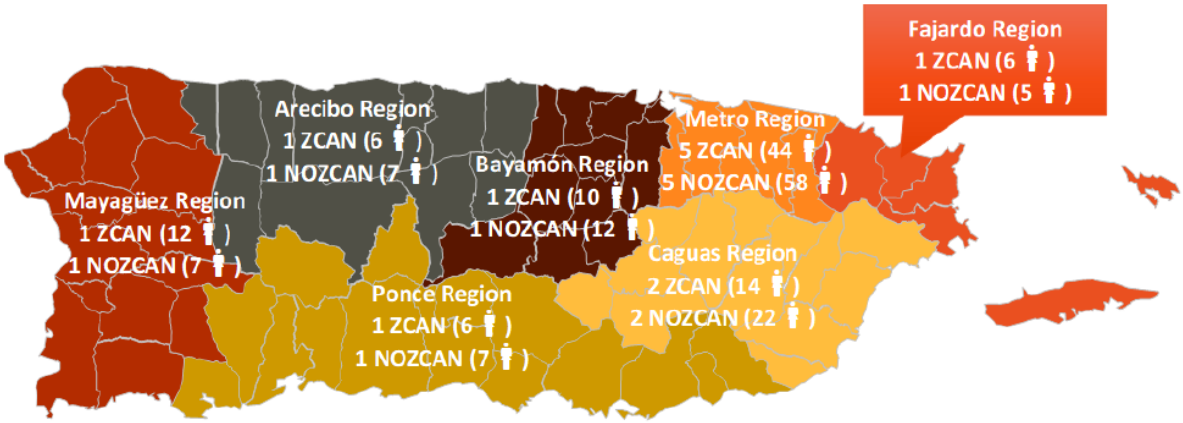
IX. Figures and Tables

Figure 1: Distribution of Focus Group Participants by Puerto Rican Health Department Region(35)



The map above shows the number of Z-CAN participant (ZCAN) and non-participant (NOZCAN) focus groups conducted from each region in Puerto Rico.

Table 1: Knowledge about Zika Virus

What do you know about Zika Virus?	**Participant Groups (N=12)**	**Non-Participant Groups (N=12)**
Pregnant women at the population at risk for Zika virus	7	2
Zika virus causes microcephaly	4	8
Zika virus causes Guillain-Barre Syndrome	2	0
Zika virus is transmitted via mosquito	4	4
Zika virus is transmitted via sexual intercourse	5	3
Zika virus can be asymptomatic	2	2

Table 2: Reasons for Perceived Risk of Zika Virus Infection and Impact of Zika

What knowledge and perceptions do Puerto Rican women have about Zika-related education campaigns?	**Participant Groups**		**Non-Participant Groups**	
Theme	**Notable Quotes**	**# of groups referenced (N=12)**	**Notable Quotes**	**# of groups referenced (N=12)**
PRDOH* Zika Virus campaign has an agenda to control population growth	"But, then [the PRDOH campaign] is not so much [about] the Zika virus…that has to do with the birth rate of Puerto Ricans, yes."	1	"I have even read that this is the government creating ideas to prevent people from continuing to conceive. I have read in the networks that this is putting fear in the people so that they do not have children, a birth control …"	4
Zika was exaggerated in the media	"It is that they abused the subject...And the people then had a lot of respect for it, but suddenly this this was just to aggravate ..."	2	"I think promotion or advertising, I think... it was exaggerated…"	4
Zika virus is not reported, therefore there is no worry about it	"Now it is summer and beach and no one is thinking about [Zika]...since you do not hear so much in the news..."	5	"At the beginning, when Zika started, it was very strong. Now it is not so strong."	2
Lack of personal connection to Zika virus cases makes it feel distant	"Here the Puerto Rican does not create awareness until it happens to him. Then the public as in general it is not aware of the consequences or that I can contract it."	2	"It is not being heard that it is something alarming…because I'm not going to avoid getting pregnant by Zika if I do not know almost anyone who has [had] Zika."	5
Microcephaly is a reason to fear Zika virus	"Having a child with some condition must be difficult…maybe it is the fear that my baby is not born with any problem."	4	"I work in a hospital and I started receiving babies with microcephaly… I did not understand the severity of the matter and the reality until I could see it in my hands."	4

*PRDOH: Puerto Rican Department of Health

Table 3: Information Source for Family Planning and Contraception Beyond Zika Context

Information Source	**Participant Groups (N=12)**	**Non-Participant Groups (N=12)**
Physicians/Gynecologists	11	9
Family Planning Clinics	6	0
Word of mouth	8	5
Internet	12	11
Reviews of services	4	2
TV	2	1
School	3	4
Parents	2	1

Table 4: Barriers to Family Planning Information

What barriers to women in Puerto Rico face in getting information on family planning?	**Participant Groups**		**Non-Participant Groups**	
Theme	**Notable Quotes**	**# of groups referenced (N=12)**	**Notable Quotes**	**# of groups referenced (N=12)**
Family planning is not spoken about among family members	"I was never told about protection, I was never told about all the methods, at least to me, from my family, never, I have my mother seat with me and tell me: 'These things can happen. You have this option, protect yourself.' Never, never, her method is abstinence."	9	"There is no talk of family planning if you are not married so everyone in the family who is not in a marriage for the rest of the family is supposed to be abstinent…"	7
Family Planning information is not taught in school	"In places such as in the [education system] they do have it as taboo, because if they did not have it as taboo, they would offer a little more workshops, guidance, and they are not doing it."	3	"When I got sex education, it was not sex education, it was anatomy... They give you the dolls, they teach you that, but they do not teach you anything else, it is not worthwhile."	3
Physician prejudice against certain methods prevents information sharing	"As for what you mention about the IUD…that is a false myth that you cannot put the IUD to women who have not been pregnant... some doctors still have that idea…"	3	"I mean, unless you do not search the internet or something, maybe you will not know about everything [Referring to information the gynecologist provides]."	3
A women's role as a mother prevents teachings on avoiding children	"It is the stigma of society, that after a certain age you need to have a child. If you do not have a child, you are not complete as a woman..."	5	"The taboo that this is the role of women. That you are there, and you can do it, so, you should do it, and many women make the decision to have children very quickly."	5

Table 5: Barriers to Accessing Family Planning Services outside of Zika Context

What are the barriers to accessing family planning and contraceptive services?	**Participant Groups**		**Non-Participant Groups**	
Theme	**Notable Quotes**	**# of groups referenced (N=12)**	**Notable Quotes**	**# of groups referenced (N=12)**
There is a lack of accessible services	"Where I live there are only two gynecologists who took care of ALL the population there, and of the nearby towns…."	7	"The reality is that Pro-Familia is not everywhere, Preven is not everywhere either. We are in the metro area, but there are areas in Puerto Rico that do not have these clinics or distance from cars or walking distance. That for us maybe, or those of us who have the opportunity to be in the university, is much easier, but not everything is … [it] is not always accessible to everyone, or at the time that one determines."	4
The process is difficult and wait lists are long	"[The process is] difficult…I went to a clinic and they gave me an appointment for February…I called in November or in December."	4	"Each has a different system [referring to physicians, labs, etc. that have to all be visited to obtain contraceptives]"	4
The cost of contraceptives is too high and insurance coverage is slim	"If you go to the family planning clinic, they have a cost… 'it is an accessible cost,' but according to whose parameter is that? If I do not have any kind of income, accessible to whom?"	11	"Depending on your health insurance it may be contraceptive pills, but they come with a cost…they are very expensive for me" (NO Z-CAN 1); "there was a point when health insurance no longer paid for them"	9
The time it takes to go to the gynecologist is long and exceeds availability	"…my wait at the gynecologist has always been more than three hours…already when I enter, I am hungry, tired, cold…when I enter, I am already too anxious and half of the questions of what I was going to ask…I have forgotten"	2	"That these are things that also crowd many people: One, for the time. Sometimes going to a clinic is being in the clinic all day. For example, I have no one to take care of my son."	7

Table 6: Reasons to participate or not participate in the Zika Contraception Access Network (Z-CAN) Program

What encourages (+) or discourages (-) women to participate in Z-CAN?	**Participant Groups**		**Non-Participant Groups**	
	Notable Quotes	**# of groups referenced (N=12)**	**Notable Quotes**	**# of groups referenced (N=12)**
Opportunity to test different methods (+)	"And in the worst case, you take it off and go back to your pills. But at least you are not investing hundreds of dollars..."	8	"[It] at least gave me the peace of mind that [I can leave it for five years] and I do not have to think about anything else, nobody has to worry about anything [referring to using new method (IUD)]	4
Free provision of contraceptives (+)	"I said to myself: 'Look, I have the opportunity to receive this excellent product for free, if worse comes to worst, it does not suit me and I have it removed, but I did not pay hundreds of dollars for it.'"	10	"I mean they give you everything…you get it for free."	3
The process is easy to navigate (+)	"I was not, exactly, they tested me for pregnancy, and I understand they have to do it, but the fact that not only was it free, but everything was so easy and accessible, and so fast. [And fast but in a good] way, fast in terms of giving a quick appointment and being attended to quickly, but during the appointment they took their time with me."	11	"I only had the consultation with the doctor, they explained to me the different options I had, and I chose the option that I wanted, but they explained that they were all free of charge."	2
Had to pay additional costs for extra tests (-)	"I refuted I say 'look, but it's supposed to be a free service' and she said "no, not what you decide you're going to place is free what has the cost are $ 30 per visit by the consultation "	9	"Yes, but that person may have Reforma [government health insurance]. And it is the same thing she says, paying a hundred dollars in a test, it's the same as, you know, it's super difficult for her too…"	2
There was a waitlist and it takes time to go to the clinic (-)	"Because when I called for Z-CAN, she told me that the implant list was quite long, that I had to wait a lot... I wanted the implant, but I had to wait a long time, she told me."	9	"When I went to look for information about the implant, I had been told that there was a waiting list."	4
Desired contraceptives were not available (-)	"I was looking for suppliers who put the implant and I had to call several gynecologists. And they said no, they do not insert the implant...I wanted to put the implant and it was, there were like three physicians in all of Puerto Rico."	6	"What happened to me, at least when I went to look for information about the implant, I had been told that there was a waiting list. That is the only thing, but I imagine it is normal because there are many people, many women who are looking for contraceptive methods."	1

Table 7: Information Source about the Zika Contraception Access Network (Z-CAN) Program

Where did you hear about Z-CAN?	Participant groups (N=12)	Non-Participant groups (N=12)
Internet	11	11
Facebook	11	11
Gynecologist	8	3
Physicians	6	4
YouTube	3	0
ALDP* Website	3	2
Radio	4	8
TV	3	2
Newspapers/Magazines	3	1
Flyers	6	3
Friends	7	5
Other People	7	2

*ALDP: Ante La Duda, Pregunta