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Continuation of Reversible Contraception Following Enrollment in the Zika Contraception Access Network (Z-CAN) in Puerto Rico, 2016–2020

Lauren B. Zapata[1], **Katherine Kortsmit**[2], **Kathryn M. Curtis**[3], **Lisa Romero**[4], **Stacey Hurst**[5], **Eva Lathrop**[6], **Edna Acosta Perez**[7], **Marizaida Sánchez Cesáreo**[8], **Maura K. Whiteman**[9]

[1]Lauren B. Zapata, Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA 30341-3717, USA.

[2]Katherine Kortsmit, Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA 30341-3717, USA.

[3]Kathryn M. Curtis, Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA 30341-3717, USA.

[4]Lisa Romero, Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA 30341-3717, USA.

[5]Stacey Hurst, Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA 30341-3717, USA.

[6]Eva Lathrop, Department of Gynecology and Obstetrics, Emory University School of Medicine, Atlanta, GA 30303, USA.

[7]Edna Acosta Perez, Graduate School of Public Health, Medical Science Campus, University of Puerto Rico, PO Box 365067 San Juan, Puerto Rico 00936-5067, USA.

[8]Marizaida Sánchez Cesáreo, Graduate School of Public Health, Medical Science Campus, University of Puerto Rico, PO Box 365067 San Juan, Puerto Rico 00936-5067, USA.

[9]Maura K. Whiteman, Division of Reproductive Health, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA 30341-3717, USA.

Abstract

lzapata@cdc.gov .

The Zika Contraception Access Network (Z-CAN) provided access to high-quality client-centered contraceptive services across Puerto Rico during the 2016–2017 Zika virus outbreak. We sent online surveys during May 2017–August 2020 to a subset of Z-CAN patients at 6, 24, and 36 months after program enrollment (response rates: 55–60 percent). We described contraceptive method continuation, method satisfaction, and method switching, and we identified characteristics associated with discontinuation using multivariable logistic regression. Across all contraceptive methods, continuation was 82.5 percent, 64.2 percent, and 49.9 percent at 6, 24, and 36 months, respectively. Among continuing users, method satisfaction was approximately ≥90 percent. Characteristics associated with decreased likelihood of discontinuation included: using an intrauterine device or implant compared with a nonlong-acting reversible contraceptive method (shot, pills, ring, patch, or condoms alone); wanting to prevent pregnancy at follow-up; and receiving as their baseline method the same method primarily used before Z-CAN. Other associated characteristics included: receiving the method they were most interested in post-counseling (6 and 24 months) and being very satisfied with Z-CAN services at the initial visit (6 months). Among those wanting to prevent pregnancy at follow-up, about half reported switching to another method. Ongoing access to contraceptive services is essential for promoting reproductive autonomy, including supporting patients with continued use, method switching, or discontinuation.

BACKGROUND

Barriers to access to contraception in Puerto Rico before the 2016–2017 Zika virus outbreak included limited availability of the full range of reversible contraceptive methods, high out-of-pocket costs for patients, high up-front costs for health care providers, inadequate health care provider reimbursement, logistical barriers that limited same-day provision of methods, and a shortage of health care providers trained in the insertion, removal, and management of long-acting reversible contraception (LARC), which includes intrauterine devices (IUDs) and contraceptive implants (Tepper et al. 2016). The Zika Contraception Access Network (Z-CAN) was an emergency response intervention established by the National Foundation for the Centers for Disease Control and Prevention (CDC Foundation), with technical assistance from the Centers for Disease Control and Prevention (CDC), and in collaboration with a diverse group of partners and private corporations, domestic philanthropic organizations, and nonprofit organizations, to address gaps in contraception access and service provision in Puerto Rico during the 2016–2017 Zika virus outbreak (Lathrop et al. 2018, 2020).

Zika virus infection during pregnancy can cause microcephaly and other birth defects (Olson et al. 2019). Early in the 2016–2017 outbreak, Puerto Rico had the highest number of infections in the United States and its territories, and more than half (61 percent) of cases were in non-pregnant women (Lozier et al. 2016). Z-CAN provided access to contraception as a medical countermeasure to prevent unintended pregnancies and reduce adverse Zika-related reproductive outcomes (Romero et al. 2018). The Network provided patients who chose to delay or avoid pregnancy during the Zika virus outbreak access to high-quality client-centered contraceptive counseling and the full range of reversible contraceptive methods on the same day and at no cost through a network of trained providers. A total

of 153 physicians implemented Z-CAN at 139 clinics across Puerto Rico and served over 29,000 patients between May 2016 and September 2017 (Lathrop et al. 2018, 2020). Given the historical context of coerced sterilization and unethical testing of oral contraceptives in Puerto Rico and concerns about reproductive coercion (Boring, Rochat, and Becerra 1988; Briggs 1998), it was critical to incorporate program safeguards into the program. As part of Z-CAN, a safety net was developed to ensure that patients choosing LARC would have access to removal at no cost during and after the program's end. This included bundled LARC placement and removal reimbursement for Z-CAN physicians at the time of placement to cover future removal costs, communication channels to assist patients with finding a Z-CAN physician or clinic for removal, formal agreements with select Z-CAN champion physicians for consultation and services for any complicated LARC removals, and, if necessary, routine removals (Lathrop et al. 2020; Romero et al. 2020).

We previously described the Z-CAN program design, implementation activities, and characteristics of patients served by Z-CAN, including factors associated with the removal of a LARC method by a Z-CAN provider during the program's duration, using Z-CAN clinical encounter data (Lathrop et al. 2018, 2020). We have also previously described findings from a patient satisfaction survey administered to a subset of patients approximately two weeks after their initial visit that found Z-CAN was implemented with high fidelity to program strategies (i.e., providing high-quality client-centered contraceptive counseling, same-day access to contraceptive method of choice, and no-cost contraception) (Zapata et al. 2020). As part of the Z-CAN monitoring and evaluation plan, we implemented online follow-up surveys of patients aged ≥18 years receiving Z-CAN services approximately 6, 24, and 36 months after program enrollment to monitor program outcomes. The surveys assessed contraceptive use (current use and methods discontinued); satisfaction with contraceptive methods used since Z-CAN; access to no-cost LARC removal, if desired, among patients who chose and initiated LARC as part of the Z-CAN program; and unmet need for services after Z-CAN. The primary objectives of this analysis were to describe contraceptive method continuation of the baseline contraceptive method, contraceptive method satisfaction among continuing users, and characteristics associated with discontinuation of the baseline method, at 6, 24, and 36 months after program enrollment. We also sought to describe current contraceptive use after discontinuation of the baseline Z-CAN contraceptive method (i.e., method switching) among those who wanted to prevent pregnancy at the time of the follow-up survey.

METHODS

Study Participants

Patients aged ≥18 years who received Z-CAN services and completed an online patient satisfaction survey about two weeks after their initial Z-CAN visit (Zapata et al. 2020) were eligible to participate in follow-up surveys implemented 6, 24, and 36 months after Z-CAN program enrollment. We invited the first 3,278 patients who completed two-week satisfaction surveys to participate in the follow-up surveys. We based this number on power calculations estimating that at least 3,200 patients were needed to assess contraception

continuation rates 12 months postenrollment while allowing for 25–50 percent loss to follow-up.

Data Collection

We invited patients to participate in the surveys via email or text (per patient preference) on a rolling basis. Because patients were only notified at their initial Z-CAN visit about potential follow-up surveys through 12 months postenrollment, program staff sent a message to potential participants before sending the 24-month and 36-month surveys describing additional follow-up activities and how patients could opt out of being contacted. Patients who did not opt-out received subsequent surveys, regardless of their participation in previous follow-up surveys. The surveys, written in Spanish and sent via Survey Monkey online software, took approximately 7–10 minutes to complete. We collected no personal identifying information. We used unique identification numbers to track responses and to merge survey responses with Z-CAN clinical encounter data, routine programmatic data collected by Z-CAN staff during clinical encounters with patients to capture key information (e.g., Z-CAN clinic type, patient demographic characteristics, services provided at visits). We sent up to six reminder invitations and made up to six telephone calls to nonrespondents to encourage participation. Respondents received a U.S. $5 electronic gift card as a token of appreciation. Data collection for the six-month survey began in May 2017 and continued for approximately 14 months. Data collection for the 24-month and 36-month surveys began in October 2018 and October 2019, respectively, and continued for approximately 10 months.

Ethical Considerations

The study was reviewed and approved by the Institutional Review Boards of the University of Puerto Rico, Medical Science Campus, and the CDC. Participants provided electronic consent before beginning each survey.

Measures

We used Z-CAN clinical encounter data to examine the baseline contraceptive method received at or within 30 days of the initial Z-CAN visit (hormonal IUD, copper IUD, implant, shot, pills [progestin-only or combined], ring, patch, or condoms alone), patient demographic characteristics, Z-CAN clinic type (community health center, private, academic, or public), and patient reproductive health history including the primary contraceptive method used before the initial Z-CAN visit. If more than one contraceptive method was received within 30 days of the initial Z-CAN visit, the baseline contraceptive method was coded as the last contraceptive method received. We used data from the two-week patient satisfaction survey to assess whether patients received the contraceptive method they were most interested in after contraceptive counseling. All other variables were from the 6-month, 24-month, or 36-month surveys.

The surveys assessed current contraceptive use by asking: “Are you using any of these methods of birth control now?” We asked respondents to select only one of the following responses: hormonal IUD (Mirena, Skyla, Liletta); copper IUD (Paragard); implant (Nexplanon); contraceptive shot (Depo-Provera); birth control pills; contraceptive ring (NuvaRing); contraceptive patch (Xulane); or none of these. Separate questions asked about

use of condoms and other contraceptive methods (i.e., withdrawal, sterilization, and fertility awareness-based methods), although the time frames in the questions differed depending on the survey. For instance, questions included “in the past 6 months” for the six-month survey; “since your first visit to your Z-CAN provider” for the 24-month survey, and the 36-month survey for participants who did not respond to the 24-month survey; and “in the past 12 months” for the 36-month survey for those who did respond to the 24-month survey. Regarding condom use, the question asked: “[Insert time frame], how often do you and your partner(s) use condoms?” Response options were never, sometimes, most of the time, or always. Another question asked: “[Insert time frame], did you use any of these other birth control methods?” Respondents could select all that applied from the following list: withdrawal (pulling out); tubal sterilization (female); vasectomy (male sterilization); rhythm method or fertility awareness; and none of these methods.

We coded contraceptive method continuation by comparing current contraceptive use with the baseline contraceptive method received at or within 30 days of the initial Z-CAN visit. We coded patients who reported current use of their baseline Z-CAN method as continuing users. Among current users of specific contraceptive methods (hormonal IUD, copper IUD, implant, contraceptive shot, pills, ring, and patch), the survey also asked about the level of satisfaction with the method by asking: “[Insert time frame], how satisfied have you been with [your/the ‘insert method’]?” Response options were very satisfied, somewhat satisfied, or not satisfied. The time frames in these questions were: “in the past 6 months” for the six-month survey; “since your first visit to your Z-CAN provider” for the 24-month survey, and the 36-month survey for participants who did not respond to the 24-month survey; and “in the past 12 months” for the 36-month survey for participants who did respond to the 24-month survey.

Among patients who discontinued specific contraceptive methods (hormonal IUD, copper IUD, implant, contraceptive shot, pills, ring, and patch), the survey asked: “Why did you stop using [your/the ‘insert method’]?” Respondents could select all that applied from a list of responses that included side effects, pregnancy desire, partner influences, health care provider influences, and financial or other barriers (e.g., I experienced side effects, I experienced bleeding changes, it caused me pain; I wanted to get pregnant; my partner did not want me to use it; health care provider recommended I stop using it; it was too expensive.) As Puerto Rico experienced substantial population displacement following widespread damage by Hurricanes Irma and Maria in September 2017 (Kishore et al. 2018), the following response options were added to the 24-month and 36-month surveys that were administered afterward: difficulty finding a provider; I moved within Puerto Rico; and I moved out of Puerto Rico.

Data Analysis

Of 3,278 patients invited to participate in the six-month survey, 1,800 (54.9 percent) responded. Of 3,278 patients sent the 24-month presurvey notification, 117 opted out of further contact; of 3,161 patients invited to participate in the 24-month survey, 1,894 (59.9 percent) responded. Of 3,161 patients sent the 36-month presurvey notification, 94 opted out

of further contact; of 3,067 patients invited to participate in the 36-month survey, 1,809 (59.0 percent) responded.

We limited analyses to respondents who received a Z-CAN contraceptive method at or within 30 days of the initial Z-CAN visit because our primary outcome was contraceptive method continuation; this translated to 1,758 patients for the six-month survey, 1,851 patients for the 24-month survey, and 1,762 patients for the 36-month survey (2,430 patients responded to at least one survey and 750 patients who received a Z-CAN contraceptive method at or within 30 days of the initial Z-CAN visit did not respond to any survey). We described characteristics of survey respondents compared with nonrespondents and compared with the overall Z-CAN population. We examined contraceptive method continuation of the baseline Z-CAN method, and contraceptive method satisfaction among continuing users, at 6, 24, and 36 months after program enrollment. Due to small numbers, we combined ring and patch, but we examined all other contraceptive methods separately. Contraceptive methods were also collapsed into two groups: (1) LARC (comprising hormonal IUD, copper IUD, and implant) and (2) non-LARC (comprising shot, pills, ring, patch, and condoms alone). When examining satisfaction among non-LARC continuing users, we excluded patients whose baseline method was condoms alone because of survey limitations (i.e., satisfaction was not ascertained). Since prior experience with specific contraceptive methods has been shown to influence method choice (Whiteman et al. 2009) and may influence continuation rates, we conducted sensitivity analyses excluding patients whose baseline Z-CAN contraceptive method was the same as the primary contraceptive method used before the initial Z-CAN visit.

We next examined characteristics associated with discontinuation of the baseline Z-CAN contraceptive method (coded as yes or no) at 6, 24, and 36 months using multivariable logistic regression. The main characteristic of interest was the baseline Z-CAN method (for modeling, coded as hormonal IUD, copper IUD, implant, or non-LARC method). As discontinuation was not a rare outcome (i.e., prevalence exceeded 10 percent), we calculated adjusted prevalence ratios (aPRs) and 95 percent confidence intervals (CIs). We chose to report PRs rather than odds ratios (ORs) because ORs overestimate associations when interpreted as PRs when the outcome is common (Tamhane et al. 2016). In addition, we determined potential confounders by examining characteristics associated with baseline Z-CAN method choice and discontinuation at 6, 24, or 36 months (to adjust for a single set of confounders across models). We used chi-squared tests to compare distributions in outcomes by characteristics to determine potential confounders and selected: age at the initial visit, insurance status (at the initial visit for the six-month survey and at the time of survey for the 24-month and 36-month surveys), type of clinic where Z-CAN services were received, trouble paying for basic needs in the past six months, received contraceptive method most interested in after counseling, contraceptive method received was the same as the method used before the initial Z-CAN visit, want to prevent pregnancy at the time of survey, and satisfaction with Z-CAN services at initial visit. Multivariable models also adjusted for breastfeeding at the initial visit and relationship status at the time of the survey, selected a priori, as we hypothesized that these factors may influence contraceptive method choice and use. We examined collinearity between covariates using pairwise correlations, and all were low ($r < 0.15$). Among patients discontinuing their baseline Z-CAN contraceptive method

(excluding those who received condoms alone), we reported reasons for discontinuation. Last, among patients discontinuing their baseline Z-CAN contraceptive method and who reported wanting to prevent pregnancy at the time of the survey, we reported current contraceptive use. We used SAS-callable SUDAAN version 11.0.0 to conduct all analyses to account for clustering of patients within clinic-provider dyads.

RESULTS

Respondents to at least one survey (n = 2,430) differed significantly ($p < 0.05$) from nonrespondents to any survey by age, education, insurance status, and baseline Z-CAN contraceptive method received. Compared with nonrespondents, a higher percentage of respondents overall had these characteristics: were aged ≥25 years (57 percent of respondents vs. 46 percent of nonrespondents); were more educated (52 percent of respondents had a college degree or higher vs. 40 percent of nonrespondents); and had private or other insurance (49 percent of respondents vs. 39 percent of nonrespondents) (Table 1). In addition, more respondents received a LARC method as their baseline Z-CAN method (78 percent) compared with nonrespondents (71 percent).

In general, patients who participated in the follow-up surveys were similar to the overall Z-CAN population of patients aged ≥18 years who received a contraceptive method at or within 30 days of the initial visit, with a few notable differences (Table 1). Whereas about half of the overall Z-CAN population was aged 18–24 years (49 percent) and had public insurance (51 percent), fewer survey respondents (those who responded to at least one survey) were in this age group (43 percent) or had this type of health insurance (45 percent). More than one-third of the Z-CAN population had ≤12 years of education (36 percent), whereas roughly one-fourth of survey respondents did (28 percent). A higher proportion of the overall Z-CAN population reported not using contraception before the initial Z-CAN visit (45 percent) compared with survey respondents (36 percent). Last, about one-third of the Z-CAN population received a hormonal IUD as their baseline Z-CAN method (34 percent), compared with a higher proportion of survey respondents (42 percent). Approximately 9 percent of both survey respondents and the overall Z-CAN population received, as their baseline Z-CAN method, the same contraceptive method as the primary method they used before their initial Z-CAN visit. Among survey respondents who received the same method, 50 percent received pills, 11 percent a hormonal IUD, 10 percent rings, 9 percent a contraceptive shot, 7 percent condoms alone, 6 percent a copper IUD, 6 percent an implant, and 1 percent received patches (data not shown).

Continuation and Satisfaction

Across all contraceptive methods, continuation was 83 percent at six months, 64 percent at 24 months, and 50 percent at 36 months (Table 2). By baseline Z-CAN method, continuation was highest for the hormonal IUD at each time point (92 percent at six months, 77 percent at 24 months, and 70 percent at 36 months) and was lowest for the shot at each time point (41 percent at six months, 11 percent at 24 months, and 2 percent at 36 months). By baseline contraceptive method group, continuation was highest for LARC methods compared with non-LARC methods (91 percent vs. 51 percent at six months; 73 percent vs. 32 percent at

24 months; and 59 percent vs. 23 percent at 36 months). In sensitivity analyses excluding patients whose baseline Z-CAN contraceptive method was the same as the contraceptive method used before the initial Z-CAN visit, findings were generally consistent with the main analysis for LARC methods, but continuation was lower for non-LARC methods (44 percent at six months, 27 percent at 24 months, and 17 percent at 36 months; Online Appendix 1).

Among patients continuing to use their baseline Z-CAN method, most reported being "very satisfied" with their contraceptive method; few (< 11 percent) reported being "not satisfied." A higher percentage of LARC users compared with non-LARC users reported being "not satisfied" at all time periods (six and 24 months: 4 percent vs. 3 percent; 36 months: 3 percent vs. 2 percent). At six months, a higher percentage of shot users (10 percent) and implant users (7 percent) reported being "not satisfied" compared with those using a hormonal IUD, copper IUD, pills, ring or patch, or condoms alone. At 24 and 36 months, implant users reported the highest percentage of being "not satisfied" (8 percent and 5 percent, respectively) compared with those using other methods.

Characteristics Associated with Discontinuation of the Baseline Z-CAN Method

After adjustment for covariates, compared with patients whose baseline Z-CAN method was a non-LARC method, those using a LARC method were significantly less likely to discontinue their method at 6 months, 24 months, and 36 months (Table 3). Patients who wanted to prevent pregnancy at the time of the survey were significantly less likely to discontinue their baseline method at 6 months, 24 months, and 36 months compared with those who did not. Similarly, patients who received the contraceptive method they were most interested in after contraceptive counseling at the initial visit were significantly less likely to discontinue their baseline Z-CAN method at 6 months and 24 months, but not at 36 months. Patients who received as their baseline Z-CAN method the same method they were primarily using before the initial Z-CAN visit were significantly less likely to discontinue their baseline method at 6 months, 24 months, and 36 months. Patients who reported being very satisfied with Z-CAN services at the initial visit two weeks following the visit were significantly less likely to discontinue their method at six months, but not at 24 months or 36 months, compared with patients who were somewhat or not at all satisfied.

Reasons for Discontinuation of the Baseline Z-CAN Method

Among patients discontinuing their baseline Z-CAN contraceptive method (excluding those who received condoms alone), the most frequently reported reason for discontinuation was experiencing side effects, bleeding changes, or pain; this applies to all contraceptive methods except the patch (Table 4). This reason was reported by a wide range of patients at each follow-up: 33 percent discontinuing the patch to 92 percent discontinuing the implant at six months, 31 percent discontinuing pills to 85 percent discontinuing the implant at 24 months, and 24 percent discontinuing the ring to 84 percent discontinuing the copper IUD at 36 months. Those who discontinued patch use frequently reported discontinuation because the patch was not convenient or too hard to get, reported by 33 percent of discontinuers at six months, 46 percent at 24 months, and 60 percent at 36 months. Discontinuation because the method was not convenient or too hard to get was also frequently reported at 6 and 24 months by patients discontinuing the shot (23 percent and 17 percent, respectively), the

pill (27 percent and 26 percent, respectively), and the ring (25 percent and 25 percent, respectively). At 36 months, patients often reported desire for pregnancy as the reason for method discontinuation, reported by approximately one in five patients who no longer used the hormonal IUD, pill, and patch. At 36 months, cost was also frequently reported as the reason for method discontinuation, reported by 24 percent of ring discontinuers and 20 percent of patch discontinuers.

Current Contraceptive Use after Discontinuation of the Baseline Z-CAN Method

Among patients who discontinued their baseline Z-CAN contraceptive method at six months and who reported wanting to prevent pregnancy at the time of the survey, 55 percent reported current use of a LARC method, short-acting nonbarrier reversible contraceptive method (defined as shot, pills, ring, or patch), or sterilization (female or male); 45 percent reported none of these methods or no method (Table 5). In later surveys, the proportion of patients who discontinued their baseline Z-CAN method reporting current use of one of these methods was lower: 47 percent at 24 months and 46 percent at 36 months. At six months, 33 percent of LARC discontinuers were currently using a different LARC method: 13 percent switched to a hormonal IUD, 11 percent to a copper IUD, and 10 percent to an implant. In later surveys, the proportion of LARC discontinuers switching to a different LARC method was lower: 16 percent at both 24 and 36 months.

For non-LARC discontinuers, more than one-third reported switching to a LARC method in all three surveys. The percentage was 39 percent at six months: 15 percent switched to a hormonal IUD, 5 percent to a copper IUD, and 20 percent to an implant. The percentage was 34 percent at 24 months: 17 percent switched to a hormonal IUD, 3 percent to a copper IUD, and 14 percent to an implant. The percentage was 36 percent at 36 months: 18 percent switched to a hormonal IUD, 4 percent to a copper IUD, and 14 percent to an implant).

DISCUSSION

The findings on contraceptive method continuation observed in the Z-CAN monitoring and evaluation follow-up surveys in Puerto Rico are generally consistent with prior studies with longer (≥30 months) longitudinal data (Chiles, Roberts, and Klein 2016; Cohen, Sheeder, and Teal 2019; Diedrich et al. 2015; Phillips et al. 2017). Compared with findings from the Contraceptive CHOICE Project (CHOICE), a prospective cohort study in St. Louis, Missouri, that sought to reduce unintended pregnancy rates by promoting the most effective methods of contraception and eliminating cost barriers to all forms of contraception that followed participants for three years, continuation across all methods was similar at 24 months (64 percent in Z-CAN and 64 percent in CHOICE) and was slightly lower in the Z-CAN program at 36 months (50 percent in Z-CAN and 56 percent in CHOICE) (Diedrich et al. 2015). As found in other reports (Chiles, Roberts, and Klein 2016; Cohen, Sheeder, and Teal 2019; Diedrich et al. 2015; Hubacher et al. 2018; Usinger et al. 2016), continuation was higher for LARC methods compared with non-LARC methods, and among LARC users continuation was higher for IUDs compared with the implant. For non-LARC methods, continuation at 36 months in the Z-CAN program compared with CHOICE was about the same for pills (29 percent vs. 32 percent), but lower for shots (2 percent vs. 33 percent)

and ring or patch (23 percent in Z-CAN vs. 30 percent for ring and 28 percent for patch in CHOICE).

Before the Z-CAN program, the implant was not available in Puerto Rico. Our data about implant continuation at 36 months was lower than findings from other studies (Cohen, Sheeder, and Teal 2019; Diedrich et al. 2015). This finding may be due to the method's recommended duration of use before expiration (i.e., three years) and the timing of the last follow-up survey (i.e., 36 months), especially since the 24-month implant continuation rate in our analysis was similar to that in other studies (Cohen, Sheeder, and Teal 2019; Diedrich et al. 2015). One retrospective cohort study of LARC use in the U.S. military health care system reported implant continuation at 36 months (32 percent) and 33 months (i.e., three months before the recommended expiration date; 46 percent), and findings suggested that a large portion of discontinuations were due to method expiration (Chiles, Roberts, and Klein 2016). In our analysis, at 36 months, nearly one in four patients reported discontinuation due to method expiration.

For patients wishing to discontinue contraception, barriers may exist, such as inability to see a provider to obtain a different contraceptive method or for device removal (for LARC). Patient-reported unwillingness or resistance of providers to remove LARC has also been reported (Amico et al. 2016; Higgins, Kramer, and Ryder 2016). As such, use of patient-centered outcomes in family planning research (e.g., longitudinal measures of satisfaction with contraceptive methods) has been recommended to enhance reproductive autonomy (Dehlendorf et al. 2018). In our analysis, we also examined method satisfaction among continuing users at 6, 24, and 36 months and found that for each contraceptive method approximately nine in 10 continuing users were satisfied. Our findings of high method satisfaction are like those of other studies with longitudinal assessments of method satisfaction (Ela et al. 2022; Hubacher et al. 2018; Peipert et al. 2011; Kramer et al. 2022; Costescu et al. 2022).

The Z-CAN program offered the full range of reversible contraceptive methods approved by the U.S. Food and Drug Administration and at no cost to ensure that patients had a choice among all methods. We found that patients who received the contraceptive method they were most interested in after contraceptive counseling were less likely to discontinue their Z-CAN method at 6 months and 24 months, but not 36 months. Access to a wide range of contraceptive methods is important because patients prefer different contraceptive features when choosing a contraceptive method (e.g., effectiveness, safety, few or no side effects, protection against sexually transmitted infections, easy to use, easy to obtain) (Madden et al. 2015; Lessard et al. 2012). Such choice gives patients the reproductive autonomy to choose the method (or methods) that best meets their needs and preferences (Gomez, Fuentes, and Allina 2014). As patient contraceptive needs and preferences change over time due to dynamic life circumstances and other factors (e.g., relationship status and level of commitment), (Downey et al. 2017), one might expect the association between receiving one's method of choice and continuation to wane over time, which is what we observed; receiving one's method of choice was associated with continuation through 24 months, but not 36 months. Other studies have found that patients who received the contraceptive

method they wanted were less likely to discontinue use before at least 24 months of follow-up (Cohen, Sheeder, and Teal 2019; Ela et al. 2022).

We also found that patients who received the same contraceptive method as the primary method they used before their initial Z-CAN visit were less likely to discontinue their Z-CAN contraceptive method at each follow-up survey. Past contraceptive experiences are an integral part of the contraception decision-making process, (Downey et al. 2017), and participation in Z-CAN did not require noncontraceptive use at baseline or willingness to switch to a different method. Similar to our findings, another 12-month study (with a U.S. inner-city patient population) retrospectively reviewed medical charts of patients desiring LARC placement and found fewer discontinuations among patients who received LARC replacements compared with new insertions (29 vs. 71 percent) (Runyan et al. 2021).

Patients who wanted to prevent pregnancy at follow-up were also less likely to discontinue their Z-CAN contraceptive method at 6, 24, and 36 months. Desire to avoid pregnancy has previously been associated with increased contraceptive use and consistency of contraceptive use (Rocca et al. 2022; Samari et al. 2020), and future pregnancy plans (even if years out) have been associated with method discontinuation by six months (Simmons et al. 2019). It is important to note that our analysis showed no association between method discontinuation and age or relationship status. Some providers may believe young, single patients to be more likely to discontinue contraception (Kavanaugh et al. 2013), and such biases may negatively affect providing patient-centered care.

In the Z-CAN program, experiencing side effects, bleeding changes or pain was frequently reported as the reason for method discontinuation, and these findings are consistent with prior studies (Hendrick et al. 2020; Costescu et al. 2022; Simmons et al. 2019). The CDC's U.S. Selected Practice Recommendations for Contraceptive Use includes recommendations for health care providers that address a select group of common, yet complex, issues regarding the initiation and use of specific contraceptive methods and includes guidance on management of women with bleeding irregularities while using contraception (Curtis et al. 2016). Improved counseling with more discussion about potential side effects and ongoing provider support to help patients manage side effects or choose a different contraceptive method (or no method), may enhance the quality and patient- centeredness of care.

Cost was another frequently reported reason for discontinuation of some short-acting methods at 24 and 36 months. While the Z-CAN program offered contraceptive methods at no cost while operational during May 2016–September 2017 (and potentially beyond, until Z-CAN supplies were depleted), it is unknown whether Z-CAN clinics sustained no-cost policies after the program ended. Since our data suggested that cost was a barrier to method continuation, at least for some contraceptive methods, addressing system financial barriers will support patients using their preferred method of choice.

For patients discontinuing contraception, switching to a different contraceptive method was common, also consistent with prior studies (Ali, Park, and Ngo 2014; Simmons et al. 2019). About half of patients who discontinued their baseline Z-CAN method and who wanted to prevent pregnancy switched to another method. This highlights the need for ongoing

access to the full range of contraceptive methods and services, as patients' circumstances and contraceptive desires change over time.

Strengths of our analysis are the large sample size, high response rates (55–60 percent) at each data collection survey over the 36 months of follow-up, use of an online mode of data collection reducing data entry errors, and assessment of patient-centered outcomes and contextual factors measured during multiple longitudinal surveys. Also, patients participated in the surveys after leaving the clinical encounter, to decrease the potential for social desirability error.

Our analysis also has limitations. Respondents differed from nonrespondents (and program participants overall) by several characteristics, one of which was associated with decreased likelihood of discontinuation (i.e., receiving LARC as their baseline Z-CAN method). As such, we may have overestimated contraceptive method continuation in our findings. Data were self-reported and may be subject to social desirability and recall error, particularly for reporting more sensitive questions (e.g., trouble paying for basic needs in the past six months) and questions ascertained at later survey time periods (e.g., 24 and 36 months) that required recall since the initial Z-CAN visit. Contraceptive method continuation was coded by comparing current contraceptive use at the time of the survey with the baseline Z-CAN contraceptive method received. This approach assumes continuous use, though there may have been periods of nonuse followed by resumed use (and switching to another method before resumed use). In such instances, which may be more likely to occur for non-LARC compared with LARC methods, we may have overestimated method continuation. Due to survey limitations, no data on method satisfaction among continuing users were available for patients who chose condoms alone at baseline. Similarly, due to survey limitations, we were unable to report current use of condoms, other barrier methods, withdrawal, or fertility awareness-based methods among patients who discontinued their baseline Z-CAN contraceptive method. We know from 2016 population-based survey data that these methods were used by approximately one in five Puerto Rican women of reproductive age (Ellington et al. 2020). Not having this information diminishes our understanding of current contraceptive use and need because we cannot distinguish patients not using contraception from patients using one of these other methods.

In Z-CAN, contraceptive method continuation was 83 percent across all methods at six months and declined thereafter (64 percent at 24 months and 50 percent at 36 months), and method satisfaction among continuing users was ≥90 percent at all time periods. Characteristics associated with decreased likelihood of discontinuation at 6, 24, and 36 months included using a LARC method, wanting to prevent pregnancy at follow-up, and receiving as their baseline method the same method they primarily used before the initial Z-CAN visit. About half of patients who discontinued their baseline Z-CAN method and who wanted to prevent pregnancy switched to another method.

CONCLUSIONS

Access to contraception is essential for promoting patient reproductive autonomy. Ongoing care after contraception initiation is also critical to support patients with continued use,

management of side effects, switching to another method, if desired, or discontinuation. Understanding patient experiences and reasons for method discontinuation may improve contraceptive counseling and quality of care, but the aim of contraception care is to meet the individual needs of patients, which may be dynamic, and help patients achieve their reproductive goals. Researchers have proposed frameworks for providing patient-centered, high-quality, and equitable contraception care (Holt et al. 2020; Ross 2017), and such care is important both during and after public health emergencies that impact pregnancy and pregnancy outcomes.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are not shared.

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TABLE 1

Characteristics of patients aged ≥18 years who received a Zika Contraception Access Network (Z-CAN) contraceptive method,[a] Puerto Rico, 2016–2020

Characteristic	Nonrespondents *N* = 750	Survey respondents[b] *N* = 2,430 (%)	Six-month survey respondents *N* = 1,758 (%)	24-month survey respondents *N* = 1,851 (%)	36-month survey respondents *N* = 1,762 (%)	Z-CAN population[c] *N* = 26,514 (%)
Age at initial visit (years)*						
18–24	53.7	43.2	42.8	41.0	41.4	49.1
25–34	35.7	42.8	44.0	44.1	44.0	38.3
35+	10.7	14.0	13.2	14.8	14.6	12.6
Education at initial visit*						
≥12 years	41.0	28.2	27.7	25.8	25.8	35.9
Associate degree	19.2	19.5	18.9	18.6	18.1	20.5
College degree	31.0	40.1	40.1	40.8	41.8	33.3
Graduate degree	8.9	12.3	12.4	13.8	13.3	9.3
Relationship status at the initial visit						
Single	42.0	38.8	37.5	38.0	38.0	42.2
Partnered	12.0	13.3	12.9	13.6	13.2	11.5
Married/ cohabiting	46.0	47.9	48.7	47.3	47.6	45.4
Insurance status at the initial visit*						
Private or other	39.2	48.5	46.9	50.1	50.2	41.6
Public	54.6	45.8	45.2	42.6	42.6	51.2
None	6.2	5.6	5.6	5.5	5.0	5.6
Type of clinic where Z-CAN services received						
Community Health Center	17.7	15.6	15.6	14.8	14.9	19.3
Private	75.3	76.9	77.1	78.0	77.6	75.4
Academic	5.6	6.0	5.7	5.8	6.1	3.9
Public health	1.3	1.5	1.7	1.5	1.45	1.4
Previous live birth at initial visit						
0	39.5	43.0	42.7	43.3	43.6	38.6
1+	60.5	57.0	56.1	55.3	55.3	59.5
Breastfeeding at initial visit						
Yes	14.7	16.6	16.2	16.3	16.3	16.3
No	85.3	83.4	82.9	83.2	82.9	82.0
Want to prevent pregnancy at the time of survey						
No	–	–	5.0	10.4	15.6	–
Yes	–	–	93.5	87.7	81.2	–
Level of effectiveness of contraceptive method used before initial Z-CAN visit[d]						
Most	2.4	4.6	4.6	5.0	4.7	3.8
Moderately	22.8	27.6	28.0	27.8	28.4	21.0

Characteristic	Nonrespondents *N* = 750	Survey respondents[b] *N* = 2,430 (%)	Six-month survey respondents *N* = 1,758 (%)	24-month survey respondents *N* = 1,851 (%)	36-month survey respondents *N* = 1,762 (%)	Z-CAN population[c] *N* = 26,514 (%)
Least	30.6	31.4	30.8	31.7	32.1	29.8
None	44.2	36.4	36.0	35.1	34.5	44.8
Received contraceptive method most interested in after counseling at initial visit[e]						
Yes	92.7	93.3	91.8	91.4	91.2	–
No	7.3	6.7	6.4	6.3	6.0	–
Z-CAN contraceptive method received[a]						
Hormonal IUD	34.0	42.0	42.3	42.4	43.4	33.9
Copper IUD	11.0	11.7	11.4	12.1	11.9	10.8
Implant	26.4	24.5	25.0	25.2	24.7	28.6
Shot	4.5	3.7	4.0	3.1	3.5	4.3
Pills	15.1	11.8	11.3	11.0	10.1	15.2
Ring	4.4	3.5	3.1	3.5	3.5	3.4
Patch	1.3	0.9	1.0	1.0	0.9	0.9
Condoms alone	3.2	1.9	1.8	1.9	1.9	2.9
Z-CAN contraceptive method received[a] same as the primary method used before the initial Z-CAN visit						
Yes	9.4	9.3	9.2	9.1	8.6	9.0
No	90.6	90.7	90.3	90.4	91.0	90.5

NOTE: Percentages may not sum to 100 due to rounding or missing data.

Abbreviations: IUD, intrauterine device; Z-CAN, Zika Contraception Access Network.

[a] At or within 30 days of the initial Z-CAN visit.

[b] To at least one survey (6-month survey, 24-month survey, or 36-month survey).

[c] Data shown are restricted to patients aged ≥18 years who received a contraceptive method at or within 30 days of the initial Z-CAN visit. In total (not restricted by age or by receipt of a contraceptive method at or within 30 days of the initial Z-CAN visit), 29,221 patients received Z-CAN services.

[d] Most effective contraceptive methods included IUDs, implants, and partner sterilization. Moderately effective contraceptive methods included injectables, pills, patch, ring, and diaphragm. The least effective contraceptive methods included male and female condoms, withdrawal, sponge, fertility awareness-based methods, and spermicides.

[e] Assessed using the patient two-week follow-up survey.

$p < 0.05$ based on a chi-squared test comparing the distribution of the characteristic by survey respondent type (non-respondent or respondent).

TABLE 2

Contraceptive method continuation of baseline Zika Contraception Access Network (Z-CAN) contraceptive method at 6, 24, and 36 months and method satisfaction among continuing users, Puerto Rico, 2016–2020

	All users		Continuing users		
Baseline Z-CAN method[a]	***N*[b]**	**Continuation (%)**	**Very satisfied (%)**	**Somewhat satisfied (%)**	**Not satisfied (%)**
			6 months		
All methods		*82.5*	–	–	–
Hormonal IUD	726	92.0	70.2	27.0	2.8
Copper IUD	195	86.2	69.6	27.4	3.0
Implant	434	91.5	65.7	27.0	7.3
Shot	70	41.4	75.9	13.8	10.3
Pills	193	57.0	77.1	21.1	1.8
Ring or patch	69	46.4	93.8	6.3	0.0
Condoms alone	31	41.9	_[c]	_[c]	_[c]
LARC	1355	91.0	68.7	27.0	4.3
Non-LARC[d]	363	50.7	80.0	17.1	2.9
			24 months		
All methods		*64.2*	–	–	–
Hormonal IUD	764	76.7	79.9	17.7	2.4
Copper IUD	216	70.4	74.5	23.5	2.0
Implant	454	66.3	63.9	28.1	8.0
Shot	56	10.7	100.0	0.0	0.0
Pills	198	37.9	79.7	16.2	4.1
Ring or patch	81	29.6	100.0	0.0	0.0
Condoms alone	33	36.4	_[c]	_[c]	_[c]
LARC	1434	72.5	74.4	21.6	4.0
Non-LARC[d]	368	31.8	85.6	11.5	2.9
			36 months		
All methods		*49.9*			
Hormonal IUD	733	69.9	82.8	13.9	3.3
Copper IUD	204	64.7	73.5	25.8	0.1
Implant	419	37.9	74.1	20.9	5.1
Shot	58	1.7	100.0	0.0	0.0
Pills	167	29.3	68.8	29.2	2.1
Ring or patch	74	23.0	93.8	6.3	0.0
Condoms alone	30	30.0	_[c]	_[c]	_[c]
LARC	1356	59.2	79.5	17.2	3.3
Non-LARC[d]	329	23.1	75.4	23.1	1.5

NOTE: Percentages calculated excluding missing data. Percentages may not sum to 100 due to rounding.

Abbreviations: IUD, intrauterine device; LARC, long-acting reversible contraception (includes IUDs and implants); Z-CAN, Zika Contraception Access Network.

[a] Defined as the contraceptive method received at or within 30 days of the initial Z-CAN visit.

[b] The Number of participants who responded to question assessing contraceptive method continuation.

[c] No data on satisfaction of current users of condoms alone because of survey limitations (i.e., satisfaction was not ascertained).

[d] Satisfaction among non-LARC continuing users excludes patients whose baseline method was condoms alone because of survey limitations (i.e., satisfaction was not ascertained).

TABLE 3

Characteristics associated with discontinuation of baseline Zika Contraception Access Network (Z-CAN) contraceptive method,[a] Puerto Rico, 2016–2020

Characteristic	6 months		24 months		36 months	
	(%)	aPR[b]	(%)	aPR[b]	(%)	aPR[b]
Baseline Z-CAN method						
Hormonal IUD	8.0*	**0.15 (0.11, 0.20)**	23.3*	**0.32 (0.28, 0.37)**	30.2*	**0.38 (0.34, 0.43)**
Copper IUD	13.8	**0.28 (0.19, 0.41)**	29.6	**0.41 (0.33, 0.50)**	35.3	**0.46 (0.38, 0.56)**
Implant	8.5	**0.18 (0.13, 0.25)**	33.7	**0.46 (0.40, 0.54)**	62.1	**0.72 (0.65, 0.80)**
Non-LARC	48.5	Referent	68.7	Referent	77.6	Referent
Age at initial visit (years)						
18–24	17.5	1.03 (0.83, 1.27)	33.7	0.88 (0.78, 1.01)	50.8*	1.03 (0.93, 1.14)
25–34	16.4	Referent	37.7	Referent	48.7	Referent
35+	15.8	1.18 (0.82, 1.69)	32.8	0.98 (0.82, 1.17)	33.5	0.88 (0.76, 1.03)
Relationship status at time of survey						
Single	20.2	1.15 (0.91, 1.46)	37.7	1.09 (0.95, 1.25)	47.4	1.03 (0.93, 1.15)
Married or partnered	15.8	Referent	34.7	Referent	47.4	Referent
Insurance status[c]						
Private or other	14.3*	Referent	33.7	Referent	44.0*	Referent
Public or none	19.1	1.24 (0.99, 1.53)	37.4	1.11 (0.98, 1.25)	51.5	1.09 (0.99, 1.20)
Type of clinic where Z-CAN services received						
Community Health Center	20.5	Referent	40.7	Referent	55.2*	Referent
Private, academic, or public health	16.1	1.13 (0.85, 1.50)	34.4	1.02 (0.86, 1.21)	46.1	0.96 (0.84, 1.09)
Trouble paying for basic needs[d] in past 6 months						
Yes	18.8*	1.12 (0.91, 1.36)	34.4	1.00 (0.89, 1.13)	46.2	0.96 (0.87, 1.06)
No	15.1	Referent	36.0	Referent	48.2	Referent
Breastfeeding at initial visit						
Yes	14.4	1.07 (0.83, 1.38)	36.6	1.13 (0.97, 1.30)	49.8	1.11 (0.99, 1.25)
No	16.9	Referent	35.2	Referent	46.9	Referent
Want to prevent pregnancy at time of survey						
No	51.9*	Referent	76.0*	Referent	79.4*	Referent
Yes	15.0	**0.39 (0.28, 0.55)**	30.6	**0.44 (0.39, 0.50)**	41.4	**0.56 (0.51, 0.62)**
Received contraceptive method most interested in after counseling at initial visit[e]						
Yes	15.5*	**0.69 (0.52, 0.92)**	34.5*	**0.80 (0.65, 0.97)**	47.0*	0.90 (0.75, 1.08)
No	30.3	Referent	50.0	Referent	59.3	Referent
Contraceptive method received[f] same as the primary method used before initial Z-CAN visit						
Yes	29.2*	**0.60 (0.43, 0.84)**	43.4*	**0.59 (0.46, 0.75)**	48.4	**0.55 (0.42, 0.70)**
No	15.7	Referent	34.6	Referent	47.3	Referent
Satisfaction with Z-CAN services at initial visit[e]						
Very satisfied	15.8*	**0.66 (0.48, 0.90)**	35.0*	0.85 (0.67, 1.07)	47.2	0.93 (0.78, 1.10)

Characteristic	6 months		24 months		36 months	
	(%)	aPR[b]	(%)	aPR[b]	(%)	aPR[b]
Somewhat or not at all satisfied	25.5	Referent	43.5	Referent	56.8	Referent

Abbreviations: IUD, intrauterine device; LARC, long-acting reversible contraception (includes IUDs and implants); PR, prevalence ratio; Z-CAN, Zika Contraception Access Network.

Note: Boldface indicates statistical signficance ($p < 0.05$).

[a]Defined as the contraceptive method received at or within 30 days of the initial Z-CAN visit. Excludes patients whose baseline method was condoms alone.

[b]Multivariable model included baseline Z-CAN method, age, relationship status at time of survey, insurance status, type of clinic where Z-CAN services were received, trouble paying for basic needs in the past six months, breastfeeding at initial visit, received contraceptive method most interested in after counseling, contraceptive method received was the same as the method used before the initial Z-CAN visit, want to prevent pregnancy at time of survey, and satisfaction with Z-CAN services.

[c]At time of the initial Z-CAN visit (six months) or at time of the survey (24 and 36 months).

[d]Food, housing, transportation, or medical care.

[e]Assessed using the patient two-week follow-up survey.

[f]At or within 30 days of the initial Z-CAN visit.

$p < 0.05$ based on the chi-squared test comparing the distribution of discontinuation by characteristic.

TABLE 4

Reasons for discontinuation of baseline Zika Contraception Access Network (Z-CAN) contraceptive method,[a] Puerto Rico, 2016–2020

	Hormonal IUD (%)	Copper IUD (%)	Implant (%)	Shot (%)	Pill (%)	Ring (%)	Patch (%)
Discontinuation at 6 months	$N^{b,c}$ = 24	$N^{b,c}$ = 10	$N^{b,c}$ = 25	$N^{b,c}$ = 26	$N^{b,c}$ = 59	$N^{b,c}$ = 20	$N^{b,c}$ = 9
It was in the wrong place or falling out	8.3	40.0	— *e*	— *e*	— *e*	— *e*	— *e*
I had an infectiond	0.0	10.0	— *e*	— *e*	— *e*	— *e*	— *e*
I experienced side effects, bleeding changes, or pain	79.2	70.0	92.0	61.5	40.7	35.0	33.3
My partner did not want me to use it	4.2	0.0	0.0	3.9	0.0	5.0	0.0
I wanted to get pregnant	8.3	0.0	4.0	3.9	1.2	15.0	11.1
I do not believe it is effective for birth control	0.0	0.0	4.0	11.5	3.4	10.0	22.2
Health care provider recommended I stop using it	4.2	30.0	8.0	11.5	11.9	0.0	11.1
It was too expensive	— *e*	— *e*	— *e*	7.7	6.8	15.0	22.2
It was not convenient or too hard to get	— *e*	— *e*	— *e*	23.1	27.0	25.0	33.3
Too hard to remember to take (for pills) or difficult to use (for ring and patch)	— *e*	— *e*	— *e*	— *e*	25.4	15.0	11.1
Discontinuation at 24 months	$N^{b,f}$ = 114	$N^{b,f}$ = 34	$N^{b,f}$ = 125	$N^{b,f}$ = 36	$N^{b,f}$ = 87	$N^{b,f}$ = 36	$N^{b,f}$ = 11
It was in the wrong place or falling out	6.1	35.3	— *e*	— *e*	— *e*	— *e*	— *e*
I had an infection[d]	5.3	11.8	— *e*	— *e*	— *e*	— *e*	— *e*
I experienced side effects, bleeding changes, or pain	78.1	70.6	84.8	58.3	31.0	33.3	36.4
My partner did not want me to use it	6.1	2.9	1.6	2.8	4.6	8.3	0.0
I wanted to get pregnant	14.9	5.9	6.4	0.0	11.5	8.3	9.1
I do not believe it is effective for birth control	3.5	5.9	10.4	11.1	4.6	11.1	18.2
Health care provider recommended I stop using it	11.4	14.7	12.0	19.4	5.8	2.8	0.0
It was too expensive	— *e*	— *e*	— *e*	16.7	11.5	25.0	9.1
It was not convenient or too hard to get	— *e*	— *e*	— *e*	16.7	26.4	25.0	45.5
Too hard to remember to take (for pills) or difficult to use (for ring and patch)	— *e*	— *e*	— *e*	— *e*	25.3	8.3	0.0
Difficultly finding a provider	— *e*	— *e*	— *e*	2.8	18.4	5.6	9.1
I moved within Puerto Rico	— *e*	— *e*	— *e*	0.0	1.2	0.0	0.0
I moved out of Puerto Rico	— *e*	— *e*	— *e*	13.9	6.9	2.8	9.1
Discontinuation at 36 months	$N^{b,g}$ = 113	$N^{b,g}$ = 25	$N^{b,g}$ = 168	$N^{b,g}$ = 20	$N^{b,g}$ = 53	$N^{b,g}$ = 17	$N^{b,g}$ = 5

	Hormonal IUD (%)	Copper IUD (%)	Implant (%)	Shot (%)	Pill (%)	Ring (%)	Patch (%)
It was in the wrong place or falling out	10.6	20.0	— *e*	— *e*	— *e*	— *e*	— *e*
I had an infection[d]	5.3	8.0	— *e*	— *e*	— *e*	— *e*	— *e*
I experienced side effects, bleeding changes, or pain	58.4	84.0	79.2	60.0	45.3	23.5	0.0
My partner did not want me to use it	4.4	0.0	3.0	0.0	0.0	5.9	0.0
I wanted to get pregnant	18.6	12.0	11.9	10.0	18.9	5.9	20.0
I do not believe it is effective for birth control	2.7	0.0	2.4	0.0	1.9	0.0	20.0
Health care provider recommended I stop using it	13.3	20.0	8.9	20.0	3.8	11.8	0.0
It was too expensive	— *e*	— *e*	— *e*	5.0	13.2	23.5	20.0
It was not convenient or too hard to get	— *e*	— *e*	— *e*	5.0	11.3	0.0	60.0
Too hard to remember to take (for pills) or difficult to use (for ring and patch)	— *e*	— *e*	— *e*	— *e*	17.0	5.9	0.0
Difficultly finding a provider	— *e*	— *e*	— *e*	5.0	13.2	5.9	0.0
I moved within Puerto Rico	— *e*	— *e*	— *e*	0.0	3.8	0.0	0.0
I moved out of Puerto Rico	— *e*	— *e*	— *e*	0.0	1.9	0.0	0.0
Method expired	13.3	0.0	23.2	— *e*	— *e*	— *e*	— *e*

Abbreviations: IUD, intrauterine device; Z-CAN, Zika Contraception Access Network.

[a]Excludes patients whose baseline method was condoms alone. Data shown are numerators and percentages.

[b]Denominator represents a number of respondents who indicated ≥1 specified reasons for discontinuation; may be less than the number of discontinuers if participants did not answer the survey question about reasons for discontinuation.

[c]The number of discontinuers at six months was 58 for hormonal IUD, 27 for copper IUD, 37 for implant, 41 for shot, 83 for pill, 27 for ring, and 10 for patch.

[e]Reason not asked.

[d]For example, chlamydia, gonorrhea, pelvic inflammatory disease.

[f]The number of discontinuers at 24 months was 178 for hormonal IUD, 64 for copper IUD, 153 for implant, 50 for shot, 123 for pill, 43 for ring, and 14 for patch.

[g]The number of discontinuers at 36 months was 221 for hormonal IUD, 72 for copper IUD, 260 for implant, 57 for shot, 118 for pill, 43 for ring, and 14 for patch.

TABLE 5

Current contraceptive use among patients who discontinued their baseline Zika Contraception Access Network (Z-CAN) contraceptive method and wanted to prevent pregnancy at time of follow-up survey,[a] Puerto Rico, 2016–2020

Baseline Z-CAN method[d]	Hormonal IUD (%)	Copper IUD (%)	Implant (%)	Shot (%)	Pill (%)	Ring or patch (%)	Sterilization[b] (%)	None of these methods[c] or no method (%)
					6 months			
All Methods (*N* = 258)	*14.3*	*7.0*	*15.5*	*2.0*	*12.0*	*1.6*	*2.3*	*45.4*
Hormonal IUD (*N* = 48)	–	16.7	16.7	2.1	25.0	2.1)	0.0	37.5
Copper IUD (*N* = 26)	42.3	–	7.7	0.0	7.7	3.	7.7	30.8
Implant (*N* = 31)	9.7	9.7	–	3.2	9.7	3.2)	3.2	61.3
Shot (*N* = 34)	17.7	5.9	29.4	–	14.7	0.	5.9	26.5
Pill (*N* = 71)	15.5	1.4	19.7	1.4	–	1.4	1.4	59.2
Ring or patch (*N* = 31)	12.9	6.5	12.9	3.2	22.6	–	0.0	41.9
Condoms alone (*N* = 17)	11.8	11.8	11.8	5.9	11.8	0.0	0.0	47.1
LARC (*N* = 105)	13.3	10.5	9.5	1.9	16.2	2.9	2.9	42.9
Non-LARC (*N* = 153)	15.0	4.6	19.6	2.0	9.2	0.7	2.0	47.1
					24 months			
All Methods (*N* = 503)	*10.5*	*4.4*	*8.2*	*1.2*	*11.9*	*3.4*	7.4	53.1
Hormonal IUD (*N* = 132)	–	7.6	7.6	0.8	17.4	3.0	8.3	55.3
Copper IUD (*N* = 53)	20.8	–	5.7	0.0	11.3	5.7	5.7	50.9
Implant (*N* = 118)	6.8	5.1	–	2.5	15.3	5.9	9.3	55.1
Shot (*N* = 35)	8.6	2.9	20.0	–	22.9	5.7	8.6	31.4
Pill (*N* = 99)	18.2	1.0	13.1	2.0	–	1.0	7.1	57.6
Ring or patch (*N* = 49)	20.4	4.1	10.2	0.0	4.1	–	4.1	57.1
Condoms alone (*N* = 17)	17.7	11.8	17.7	0.0	17.7	0.0	0.0	35.3
LARC (*N* = 303)	6.3	5.3	4.3	1.3	15.5	4.6	8.3	54.5
Non-LARC (*N* = 200)	17.0	3.0	14.0	1.0	6.5	1.5	6.0	51.0
					36 months			
All Methods (*N* = 592)	*10.1*	*5.7*	*5.9*	*1.4*	*13.2*	*3.6*	*6.4*	53.7
Hormonal IUD (*N* = 158)	–	11.4	4.4	1.3	14.6	3.8	5.1	59.5
Copper IUD (*N* = 58)	12.1	–	5.2	1.7	15.5	1.7	6.9	56.9

Baseline Z-CAN method[d]	Hormonal IUD (%)	Copper IUD (%)	Implant (%)	Shot (%)	Pill (%)	Ring or patch (%)	Sterilization[b] (%)	None of these methods[c] or no method (%)
Implant (*N* = 195)	10.3	4.6	–[e]	1.5	16.9	5.7	7.7	53.3
Shot (*N* = 40)	12.5	5.0	20.0	–	10.0	7.5	7.5	37.5
Pill (*N* = 84)	19.1	1.2	13.1	1.2	–	0.0	3.6	61.9
Ring or patch (*N* = 42)	21.4	7.1	9.5	2.4	21.4	–	7.1	31.0
Condoms alone (*N* = 15)	20.0	6.7	13.3	0.0	0.0	0.0	13.3	46.7
LARC (*N*=411)	6.6	6.6	2.4	1.5	15.8	4.4	6.6	56.2
Non-LARC (*N* = 181)	18.2	3.9	13.8	1.1	7.2	1.7	6.1	48.1

NOTE: Percentages estimated include missing data.

Abbreviations: IUD, intrauterine device; LARC, long-acting reversible contraception (includes IUDs and implants); Z-CAN, Zika Contraception Access Network.

[a] Female or male.

[b] Of 301 patients who discontinued their baseline method at six months, 258 (85.7 percent) wanted to prevent pregnancy at time of survey. Of 646 patients who discontinued their baseline method at 24 months, 503 (77.9 percent) wanted to prevent pregnancy at time of survey. Of 806 patients who discontinued their baseline method at 36 months, 592 (73.5 percent) wanted to prevent pregnancy at time of survey.

[c] Unable to report current use of other contraceptive methods (i.e., condoms, other barrier methods, withdrawal, fertility awareness-based methods) because of survey limitations.

[d] Defined as the contraceptive method received at or within 30 days of the initial Z-CAN visit.

[e] Patients who received implant re-insertion after implant expiration were not considered as patients who discontinued their baseline Z-CAN contraceptive method.