Editor's Choice

Use of Highly Effective Reversible Contraception in Title X Clinics: Variation by Selected State Characteristics

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A B S T R A C T

Background: The use of long-acting reversible contraceptive (LARC) methods, such as intrauterine devices (IUDs) and implants has demonstrated high effectiveness in preventing pregnancy. While LARC use in Title X programs has increased over the past decade, little is know about the extent to which gains are occurring uniformly across states.
Methods: We examined state-level changes in LARC use among Title X clients between 2012 and 2016 using a repeated cross-sectional study design. States were characterized by the proportion of reproductive age women in need of publicly funded contraception. Variation in LARC use by level of need was examined using GEE models.
Results: Across all states, LARC use in Title X clinics increased from 9.1% to 16.2% during the study period. In 2012, LARC use in the states with the highest and lowest level of need differed by 2.3 percentage points (7.8% compared to 10.1%). By 2015 the gap in LARC use between high and low need states widened to reach 5.3 percentage points, more than double what was observed in 2012. However, by 2016 the margin of the gap narrowed.
Conclusions: Observed increases in LARC use among states with the highest level of need for publically funded services are much lower than what is observed among states with the lowest level of need. However, we did find this gap is narrowing. This finding is important given states with greater need are those with higher proportions of low-income and younger women who are at greater risk for experiencing unintended pregnancies.

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Unintended pregnancies, or those that are unwanted or mistimed, remain a significant public health issue that warrants attention (Finer & Zolna, 2016). The Title X program, administered by the Office of Population Affairs within the U.S. Department of Health and Human Services, is an important program for ensuring access to a wide range of family planning and preventive health services for those at greatest risk for experiencing unintended pregnancies. Through a network of public health departments, community health centers, and other nonprofit agencies, Title X program funds are used to support the delivery of contraceptive services, supplies, and information to anyone seeking services at a free or reduced cost to most clients (Frost, 2013; Frost, Frohwirth, & Zolna, 2016; Ranji, Salganicoff, Sobel, Rosenzweig, & Gomez, 2017).

Recent evidence suggest that Title X–funded clinics provided contraceptive services to 14% of all women of reproductive age, with higher proportions of poor (25%) and uninsured (36%) women seeking services from these clinics (Frost, 2013). Receipt of contraceptive services through this network of publicly funded clinics is estimated to have prevented 900,000 unintended pregnancies in 2014, of which 439,000 would have resulted in a live birth and 326,000 ending with induced abortions (Frost et al., 2016).

The provision of modern contraceptive methods through this network of clinics is a safe and effective clinical service important for reducing unintended pregnancy and improving birth spacing for women (American College of Obstetricians and Gynecologists, 2014; Peipert, Madden, Allsworth, & Secura, 2012; Stoddard, McNicholas, & Peipert, 2011; Winner et al., 2012). Although oral contraceptives and condoms remain the most commonly used methods for preventing pregnancy (Frost, Singh, & Finer, 2007; Peipert et al., 2012; Zolna, & Frost, 2016), non-use and inconsistent or incorrect use remains a salient issue undermining potential effectiveness of these methods (Harper et al., 2015; Peipert et al., 2012).

More recently, the use of long-acting reversible contraceptive (LARC) methods, such as intrauterine devices (IUDs) and implants, have demonstrated high effectiveness in preventing pregnancy (Frost, 2011; Harper et al., 2015; Stoddard et al., 2011; Thompson et al., 2016; Trussell, 2011). As such, the Centers for Disease Control and Prevention and other professional associations recommend increased access to the more effective LARC methods, as appropriate (American Academy of Family Physicians, 2012; "Contraception for Adolescents," 2014; Harper et al., 2015; American College of Obstetricians and Gynecologists Women's Health Care Physicians, Committee on Adolescent Health Care Long-Acting Reversible Contraception Working Group, & ACOG, 2012).

Although LARC use has increased over the past decade (Branum & Jones, 2015; Daniels, Daugherty, Jones, & Mosher, 2015), only about 11.6% of U.S. women report using these methods (Daniels et al., 2015; Finer, Jerman, & Kavanaugh, 2012), much lower than what is observed among other developed countries (Harper et al., 2015; Peipert et al., 2012; Thompson et al., 2016). LARC use in the United States is more common among women between 25 and 34 years of age (16.5%) and Hispanic women (15.1%), but little variation is noted by pay source (Daniels et al., 2015).

LARC use within Title X–funded clinics has also increased over the past decade from 2.5% in 2005 to 16% in 2016 (Title X Family Planning Annual Report, 2015 National Summary, 2016)—which is slightly higher than national averages for LARC use among all women of reproductive age (Daniels et al., 2015). Increases in LARC use, particularly in states with the greatest need for publicly funded family planning, may support larger population-based efforts to reduce unintended births and abortions and, thus, motivate policy interventions to expand family planning programs. However, the extent to which gains in LARC use have been realized in states with the greatest level of need for publicly funded family planning remains unclear.

This study addresses this issue by examining the extent to which increased LARC use within Title X programs is occurring uniformly across states' varying levels of underlying need for publicly funded family planning services. Given program standards and the role of Title X programs in ensuring access to a broad range of family planning and preventive services, we posit that LARC use has increased in all states; however, the extent to which these gains are equitable across states with varying levels of need remains a point of study.

Methods

Study Population and Data Sources

A state-level repeated cross-sectional study design was used to examine changes in LARC use among Title X clients between 2012 and 2016, the most recent year for which state-level data are available. These data were derived from publicly available reports published by the Office of Population Affairs, Title X Family Planning Program. Title X–funded programs report on the number of unduplicated clients and contraceptive use among Title X clients annually. Beginning in 2012, publicly available data also included state-level data on the use of highly effective LARC methods. These data were combined with additional state-level measures of health insurance coverage derived from census estimates and other reproductive health policy information characterizing important constructs relative to family planning services. Data used for this study were reviewed by the East

Tennessee State Institutional Review Board and deemed not human subjects research.

Variables

The proportion by state of women seeking services within Title X–funded clinics choosing highly effective LARC methods served as the dependent variable in the study. The denominator included all women seeking services at Title X clinics, excluding those who were pregnant, seeking pregnancy, or not using a contraceptive method for other specific reasons, such as sterility. The numerator reflects only those women choosing a LARC method at the last visit of record, which includes implants and IUDs. These data were used to derive the proportion of women within Title X using LARC methods for each year between 2012 and 2016.

We characterized the potential variation in LARC use by examining the proportion of reproductive age women in need of publicly funded contraceptive services and supplies within each state. Publicly funded services are those occurring in clinic sites that offer contraceptive services to the general public and uses public funds, such as Title X, Medicaid, or federally qualified health center programs, to provide services to at least some clients at a free or a reduced cost. These data were derived from updated estimates by Frost et al., (2016). Women in need of publicly funded contraceptive services and supplies were defined as those who are of reproductive age (13–44), under 250% of the federal poverty level, sexually active, able to conceive, and not intentionally trying to become pregnant. In addition to these criteria, all women under 20 years of age were considered as needing publicly funded contraception services and supplies. State estimates for the total number of women in need of publicly funded contraceptive services and supplies were divided by the total number of reproductive age women in each state to derive the proportion of reproductive age women in need of these services. State distributions were examined and divided into three groups based on the underlying level of need. Group one includes states with the lowest proportion of women in need of publicly funded contraceptive services and supplies, and includes those in the lowest 25th percentile of the overall state distribution (≤27.7% of women in need of publicly funded contraceptive services). Group two included states between the 25th and 75th percentiles of women in need of publicly funded contraceptive services and supplies (27.8%–30.8% of women in need of publicly funded contraceptive services). The third group reflects states with the highest level of need (>75th percentile), with 30.9% or more of all women in need of publicly funded contraceptive services and supplies.

In addition to the primary independent variable (state level of need of publicly funded contraceptive services and supplies), other state and Title X program characteristics were included in the analysis. Select state-level policies specific to reproductive health services were examined and included in the analysis, largely as proxies for underlying policymaker attitudes toward reproductive health services. These include indicators for states with a required 24-hour wait period for abortions ("Counseling and Waiting Periods for Abortion," n.d.), states with a current Medicaid family planning waiver or state plan amendment to expand eligibility for coverage of family planning services ("Medicaid Family Planning Eligibility Expansions," n.d.), and states that did not expand Medicaid under the Patient Protection and Affordable Care Act by 2013 ("State Decisions on Health

Insurance Marketplaces and the Medicaid Expansion," n.d.). These variables were considered time invariant, coded as dichotomous variables, and included in the analysis. We also included the time-variant proportion of reproductive age women covered by private health insurance and Medicaid at the state level in each year of the study period. These estimates were derived from the U.S. Census Bureau, Current Population Survey, Annual Social and Economic Supplement.

Additional time-variant measures specific to Title X programs within states were also examined. These data were derived from Title X annual reports and include the proportion of users with public, private, or no insurance and the proportion of users who are less than 100%, 100% to 250%, and greater than 250% of the federal poverty level during the study period. Given the variability in states' reliance on Title X programs for providing contraception services to those in need of publicly funded services, a measure indicating the portion of the state's need for publicly funded contraception services and supplies that was met by Title X clinics in that state was included in the analysis (Frost et al., 2016). We are not positing that these covariates have causal influence on changes in LARC use; however, these covariates reflect broader policy and socioeconomic indicators that are likely to change over time in varied ways across the states, potentially contributing to the observed changes in LARC use.

Analysis

Characteristics of the study population by state level of need were described for both time-variant and time-invariant measures. Bivariate analyses describing the categorical variable for state level of need and selected time-invariant categorical variables of interest were conducted using χ^2 tests of independence. Continuous, time-variant measures by state level of need were examined for each year of the study period. Unadjusted generalized estimating equation (GEE) models were used to test for significant differences in population-averaged probabilities over time, by state level of need. Bivariate analysis examining differences in highly effective LARC use by selected outcomes was also conducted. Highly effective LARC use by categorical level of need was assessed using χ^2 tests of independence. Time-variant, continuous variables were assessed by examining mean values of highly effective LARC between the 25th and 75th percentiles for each year of the study period. Unadjusted GEE models were also used to test for significant differences in highly effective

LARC use over time for each time-variant, continuous variable included in the study.

Multivariable GEE models were fit to measure changes in population-averaged probabilities of highly effective LARC use over time, by level of need while adjusting for other important variables. GEE models are an extension of a generalized linear model and are used when analyzing correlated data. The primary independent variable, level of need for publicly funded contraception services and supplies, was interacted with year to test the hypothesis that highly effective LARC use varied systematically over time within each level of need. Additional time-invariant and time-variant covariates previously mentioned were included as covariates in the adjusted models. Time-variant measures significant in the bivariate analysis were interacted with the time variable in the full models. The Stata margins command was used to estimate the marginal effects of highly effective LARC use across state groups for women in need of publicly funded contraceptive services and supplies.

Results

Fifty states and Washington, DC, were included in the study population. Approximately 23.5% were categorized in the lowest level of need for publicly funded contraceptive services and supplies, 51% at the average, and 25.5% of states were categorized in the highest level of need. Differences in state characteristics for time-invariant measures by level of need for publicly funded contraceptive services and supplies were noted (Table 1). A greater proportion of states in the high need category (76.9%) also had state policies restricting abortion services to follow a 24-hour wait period, compared with states in the lowest need category (16.7%; $p < .008$). Expansion of Medicaid under the Patient Protection and Affordable Care Act was also much less common in states with the highest need (46.2%) compared with those at the lowest level of need (91.7%; $p < .039$). No statistical differences by level of need were noted for Medicaid family planning waiver or state plan amendment, or the proportion of state need for publicly funded contraception met by Title X programs at baseline.

Nationally, between 2012 and 2016, significant increases in the proportion of women with Medicaid or private insurance were noted (Table 2; $p < .05$), with greater proportional increases among those with private insurance. Within Title X clinics, sociodemographic shifts were also noted with a lesser

Table 1
State-level Characteristics for Time-Invariant Measures

	Lowest Need ($n = 12$; 23.5%), n (%)	Average Need ($n = 26$; 51%), n (%)	Highest Need ($n = 13$; 25.5%), n (%)	Total ($n = 51$; 100%), n (%)	p Value
State-level characteristics					
Wait period for abortion					.008
No wait period	10 (83.3)	11 (42.3)	3 (23.1)	24 (47.1)	
24-hour waiting period	2 (16.7)	15 (57.7)	10 (76.9)	27 (52.9)	
Medicaid expansion					.039
Expansion states	11 (91.7)	14 (53.9)	6 (46.2)	31 (60.8)	
Non-expansion states	1 (8.33)	12 (46.2)	7 (53.8)	20 (39.2)	
State family planning waiver/amendment					.605
No	7 (58.3)	12 (46.2)	5 (38.5)	24 (47.1)	
Yes	5 (41.7)	14 (53.9)	8 (61.5)	27 (52.9)	
Proportion of state need met by Title X clinics					.790
Tertile 1 (<18% of need)	5 (41.67)	7 (26.92%)	3 (23.08)	15 (29.40)	
Tertile 2 (19%–31% of need)	3 (25.00)	11 (42.31)	6 (46.15)	20 (39.22)	
Tertile 3 (>31% of need)	4 (33.33)	8 (30.77)	4 (30.77)	16 (31.37)	

Table 2
State-Level Characteristics for Time-Variant Measures, 2012–2016

	Year (%)				
	2012	2013	2014	2015	2016
State-level characteristics					
Change in reproductive age women covered by Medicaid*					
All (n = 51)	12.3	13.3	15.7*	16.1*	16.9*
Lowest need (n = 12)	13.3	14.6	15.7	16.2	16.3
Average need (n = 26)	12.5	13.2	15.9	16.2	16.7
Highest need (n = 13)	10.8	12.2	15.2	15.7	17.7
Change in reproductive age women covered by private insurance*,†					
All (n = 51)	69.3	69.8	72.6*	73.6*	73.4*
Lowest need (n = 12)	73.7	73.5	75.6	76.1	74.9
Average need (n = 26)	68.6	69.5	72.5	73.9	74.1
Highest need (n = 13)†	66.6	67.2	70.1	70.6	70.6
Title X program characteristics					
Poverty level of Title X clients					
<100% of FPL*					
All (n = 51)	67.4	66.9	65.5	62.6*	61.7*
Lowest need (n = 12)	60.3	60.5	61.3	59.9	58.8
Average Need (n = 26)	68.0	67.3	64.4	61.3	60.9
Highest need (n = 13)	72.6	71.8	71.6	67.8	66.1
100%–250% of FPL					
All (n = 51)	23.0	23.7	23.6	24.5*	25.3*
Lowest need (n = 12)	26.9	28.0	26.9	26.5	27.6
Average need (n = 26)	22.4	23.2	23.8	24.8	24.4
Highest need (n = 13)	20.6	20.6	20.3	22.1	25.0
>250% of FPL					
All (n = 51)	5.7	5.5	6.3	6.6*	7.8*
Lowest need (n = 12)	5.3	5.4	6.0	6.2	7.6
Average need (n = 26)	5.9	5.4	6.2	7.2	8.4
Highest need (n = 13)	5.7	5.8	6.9	5.8	6.7
Source of insurance among Title X clients					
Public insurance*					
All (n = 51)	23.6	24.5	27*	30.6*	32.1*
Lowest need (n = 12)	32.3	30.8	35.1	38.1	38.0
Average need (n = 26)	20.6	23.1	27.2	32.2	32.0
Highest need (n = 13)	21.7	21.2	19.1	20.4	26.5
Private insurance					
All (n = 51)	14.5	15.4	20.5*	22.6*	24.9*
Lowest need (n = 12)	17.1	18.5	22.3	24.0	26.4
Average need (n = 26)	13.3	13.6	18.0	20.3	23.1
Highest need (n = 13)	14.6	16.2	24.0	26.1	27.2
Uninsured*					
All (n = 51)	59.3	58.0	49.7*	45*	41.6*
Lowest need (n = 12)	47.1	48.0	40.4	35.1	33.6
Average need (n = 26)†	63.5	61.4	51.8	45.9	43.4
Highest need (n = 13)†	62.1	60.6	54.1	52.0	45.5

Abbreviation: FPL, federal poverty level.

　* Significant difference by year (p < .05).
　† Significant within group differences (p < .05).

proportion of women below 100% of the federal poverty level among the patient mix. Between 2012 and 2016, the proportion of Title X patients with Medicaid as a source of payment increased, whereas the proportion of women with no insurance source decreased significantly. Although these trends were consistent across levels of need, differences in the payer mix between higher and lower need states remain persistent. On average, Title X clinics in high-need states provide services to a greater proportion of uninsured women than their lower need counterparts.

Results from the bivariate analysis are shown in Table 3. Across all states, between 2012 and 2016, LARC use within Title X clinics increased from 9.1% to 16.2%. Although increases in LARC use were noted across all levels of need, observed increases were not proportional. In 2012, LARC use in the states with the highest and lowest level of need differed by 2.3 percentage points (7.8% compared with 10.1%). By 2015, the gap in LARC use between high- and low-need states had widened to reach 5.3 percentage points, more than double what was observed in 2012. However, by 2016, the margin of the gap narrowed. LARC use among the lowest need states increased from 10.1% to 18.5%, compared with an increase from 7.8% to 14.10 % in states with the highest need. The marked increase in LARC use among high-need states during the last year of the study period (2015 to 2016) was greater than what was observed during the previous 4 years combined (2012 to 2015).

Increases in highly effective LARC use over time are also noted among other state and Title X program characteristics. In states with no 24-hour wait period for abortion services, LARC use increased from 11.00% to 20.20% between 2012 and 2016. However, in states with a 24-hour wait period for these services, LARC use increased from 7.40% to 12.6% during this same time period.

Table 3
Highly Effective Reversible Contraception Use by Year (2012–2016) and Variable of Interest

	Year (%)				
	2012	2013	2014	2015	2016
Variables of Interest					
Need for publicly funded contraception services[*]					
All	9.10	10.3[*]	11.9[*]	13.6[*]	16.2[*]
Lowest need	10.10	12.40	14.10	16.20	18.50
Average need	9.30	10.50	12.30	13.70	16.10
Highest need[†]	7.80	7.90	8.90	10.90	14.10
State characteristics					
Abortion wait period[*]					
No wait period	11.00	13.10	15.10	17.40	20.20
24-hour waiting period	7.40	7.90	9.00	10.30	12.60
Medicaid expansion[*]					
Expansion states	10.00	11.50	13.30	15.30	17.90
Non-expansion states	7.70	8.60	9.70	10.90	13.60
State family planning waiver/amendment					
No	9.30	10.60	12.10	14.00	16.30
Yes	8.90	10.10	11.70	13.20	16.10
Women (18–64) covered by Medicaid[*]	9.60	10.00	13.20	13.30	16.10
Women (18–64) covered by private insurance[*]	9.40	11.20	12.20	14.50	16.10
Characteristics of State Title X programs					
Poverty level of Title X users					
<100% of FPL[*]	10.10	11.10	12.30	13.10	15.90
100%–250% of FPL	9.70	10.30	12.90	14.60	16.30
>250% of FPL	8.80	10.60	12.00	14.60	16.70
Source of insurance among Title X users					
Public insurance[*]	9.80	10.50	12.00	14.20	18.00
Private insurance	9.30	10.30	11.70	13.40	15.70
Uninsured[*]	9.00	10.40	11.00	12.70	16.30

Abbreviation: FPL, federal poverty level.

[*] Significant differences by year ($p < .05$).

[†] Significant differences by level of need ($p < .05$).

LARC use in Medicaid expansion states increased from 10.0% in 2012 to 17.9% in 2016, while the rate among non-expansion states increased from 7.70% to 13.6%. LARC use increased among women with Medicaid as a pay source and those with private insurance during the study period. Increases during the study period were also noted across select characteristics of the state Title X programs; however, no within-group differences were noted.

Findings from the fully adjusted GEE models are shown in Table 4. After adjusting for time-invariant state characteristics, time-varying state and Title X program–specific measures and their subsequent interactions, observed relationships between state level of need and changes in LARC use remained significant. The interaction suggests that for 2 of the 5 years examined, significant differences in the probability of LARC use by underlying level of need were noted. Marginal probability plots from the interaction of time and underlying level of need derived from the fully adjusted model are shown in Figure 1. Although increases occurred across all three categories of need, most gains were realized in states with the lowest level of need for publicly funded contraceptive services and supplies. States with the highest need did not experience gains in highly effective LARC use at the same rate as states with the lowest level of need. However, the gap has narrowed over time.

Among other variables also included in the model, highly effective LARC use was considerably lower in states with a 24-hour wait period for abortion services. Also of note, the interaction between time and Medicaid coverage at the state population level was significant. Highly effective LARC use was positively associated with the proportion of reproductive age women covered by Medicaid. No effects on LARC use were noted when examining changes in socio-demographic measures specific to Title X users over time.

Discussion

This study examined changes in LARC use over time within Title X clinics among states with varying levels of need for publicly funded contraceptive services and supplies for reproductive age women. We found that, although the use of highly effective LARC methods has increased over time, these gains have not been experienced uniformly across states. Observed increases in LARC use among states with the highest level of need for publicly funded services are much lower than what is observed among states with the lowest level of need. However, we did find this gap is narrowing. This finding is particularly relevant given that states with greater need are those with higher proportions of low-income and younger women who are at greater risk for experiencing unintended pregnancies. Given the efficacy of LARC use in preventing pregnancy, these findings suggest that increased LARC use in high need states could have a substantial impact on reducing unintended pregnancies, births, and abortions. However, this potential is not being fully realized.

Our study also found that increased state Medicaid coverage for reproductive age women during the study period was also associated with increases in the use of highly effective LARC methods within Title X clinics. Our analysis found that increased Medicaid coverage occurred primarily in states with the lowest or average need for publicly funded contraceptive services, which is intuitive, given that only 1 of the 12 states in this category did not expand Medicaid under the Affordable Care Act. Previous studies have noted on-site provision of LARC methods is

Table 4
Results From Adjusted GEE Model of Highly Effective Contraception Use by Select Variables

Variables of Interest*	Risk Ratio (95% CI)	SE	p Value
Year			
1 (2012)	Reference		
2 (2013)	1.105 (0.823–1.483)	0.166	.506
3 (2014)	1.285 (1.008–1.638)	0.159	.043
4 (2015)	0.894 (0.638–1.235)	0.150	.480
5 (2016)	0.843 (0.583–1.219)	0.159	.365
Need for publicly funded contraception services			
Lowest need	Reference		
Average need	1.021 (0.989–1.054)	0.017	.196
Highest need	1.018 (0.979–1.057)	0.019	.371
Need for publicly funded services × time			
Year 2/lowest need	Reference		
Year 2/average need	0.986 (0.967–1.006)	0.010	.169
Year 2/highest need	0.972 (0.949–0.996)	0.012	.022
Year 3/lowest need	Reference		
Year 3/average need	0.993 (0.974–1.014)	0.010	.500
Year 3/highest need	0.977 (0.953–1.001)	0.012	.063
Year 4/lowest need	Reference		
Year 4/average need	0.985 (0.965–1.005)	0.010	.129
Year 4/highest need	0.979 (0.955–1.004)	0.012	.100
Year 5/lowest need	Reference		
Year 5/average need	0.983 (0.963–1.002)	0.010	.082
Year 5/highest need	0.973 (0.949–0.997)	0.012	.027
24-hour waiting period for abortion	0.941 (0.916–0.966)	0.013	.000
State % of women (18–44) with Medicaid coverage	0.850 (0.712–1.015)	0.077	.072
Year 1/% of women with Medicaid coverage	Reference		
Year 2/% of women with Medicaid coverage	1.033 (0.838–1.273)	0.110	.763
Year 3/% of women with Medicaid coverage	1.130 (0.925–1.382)	0.116	.232
Year 4/% of women with Medicaid coverage	1.262 (1.019–1.563)	0.138	.033
Year 5/% of women with Medicaid coverage	1.479 (1.175–1.862)	0.174	.001
Percent of public need met by Title X (baseline)			
Tertile 1 (<18%)	Reference		
Tertile 2 (19%–31%)	0.991 (0.967–1.107)	0.013	.502
Tertile 3 (>32%)	0.968 (0.942–0.995)	0.014	.019

Abbreviations: CI, confidence interval; GEE, generalized estimating equation; SE, standard error.
  * Additional nonsignificant variables included in the model and not shown include Medicaid Expansion states, states with a family planning waiver or state plan amendment, change in % of women (18–44) covered by private insurance, change in poverty level of Title X clients over time, and change in pay source of Title X clients over time.

more common in publicly funded Title X programs operating in Medicaid expansion states (Zolna & Frost, 2016). Although this study is not attempting to explain why these differences occurred, this finding may suggest that expanding access to publicly funded health insurance played a significant role in the differential increase in LARC use observed between high- and low- to average-need states.
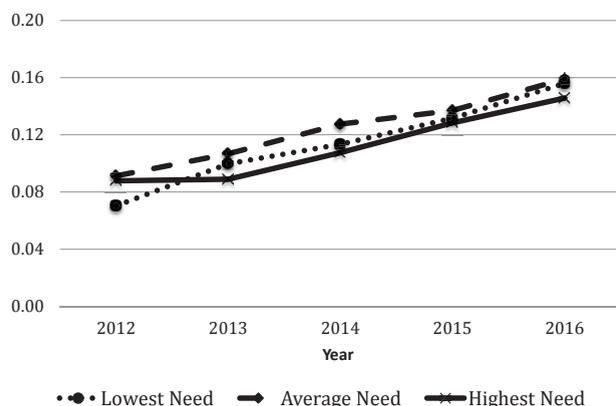

Figure 1. Change in highly effective reversible contraception in Title X clinics by level of need (2012–2016).

Another important finding relates to the observed association between level of need for publicly funded services and state policies. Our findings indicate that states with the greatest need for publicly funded services are more likely to have 24-hour waiting period abortion policies, and less likely to have expanded Medicaid under the Affordable Care Act, than states with the lowest need. This indicates that women in states with the highest need may face greater barriers to access to care, including reproductive and other services.

More restrictive state policies specific to abortion may be a proxy reflecting underlying cultural attitudes toward reproductive health services within respective states. Differences in the use of highly effective LARC methods could be reflective of limited availability/accessibility of those methods in certain states, or alternatively, of women's preferences in contraception choice—which is particularly relevant to the discussion. Although LARC use has demonstrated high effectiveness in preventing unintended pregnancy, exclusive focus on these methods may lead to or be perceived as coercive and counter to patient-centered choice in contraceptive use (Gomez, Fuentes, & Allina, 2014). Although efforts aimed at increasing LARC use and reducing barriers to access are certainly warranted, efforts should not come at the expense of women-centered care and principles of reproductive health justice for women (Gomez et al., 2014; Higgins, 2014). Rather, efforts are needed that focus on increasing women's awareness of their contraceptive

benefits and options, helping women to make contraceptive decisions consistent with their needs and preferences (Chuang, Mitchell, et al., 2015; Weisman and Chuang, 2014), and effectively engaging women in reproductive life planning (Chuang, Velott, et al., 2015).

Overall, although LARC rates have been increasing in the United States, many barriers continue to affect access and use. These barriers exist at multiple levels (individual, provider, community, policy) and include issues related to cost (Trussell, 2012), limited awareness and misinformation (Frost, Lindberg, & Finer, 2012; Stanwood & Bradley, 2006), and fewer providers offering LARC methods to patients (American College of Obstetricians & Gynecologists, 2009). National studies estimate that only 38% of providers offered IUDs to adolescents, 53% to nulliparous women, and 25% immediately after abortion (Harper et al., 2012; 2013; Tyler et al., 2012), despite the fact that these women may safely use IUDs and implants (Curtis et al., 2016; Tocce, Sheeder, & Teal, 2012). These findings suggest that providers may be less likely to offer LARC methods to women at greatest risk for unintended pregnancy, and indicate a need for provider training aimed at addressing gaps in knowledge and building confidence and skill in contraceptive counseling and provision.

Within Title X clinics, more than one-half (59%) offer the full range of contraceptive methods approved by the U.S. Food and Drug Administration. Estimates from 2015 suggest that at least three of every four Title X clinics offer any LARC method. However, approximately one-half of these clinics require a follow-up appointment for the insertion of implants and IUDs, which may pose a barrier for some women (Zolna & Frost, 2016). Previous research suggests same-day LARC insertion may be less costly and burdensome for women, improving uptake (Parks & Peipert, 2016; Wang et al., 2014). Local Health Departments and Federally Qualified Health Centers continue to lag behind other Title X–funded clinics with respect to key metrics of access. These sites are often less likely to offer same-day appointments and extended hours in the evening or weekends. They are also more likely to have longer appointment wait times and more difficulty developing revenue sources and modern technology (Zolna & Frost, 2016). Together with findings from our study, these findings suggest that initiatives focused on expanding the capacity of local health department and FQHC clinics, including staffing resources, process improvement, and revenue cycle management, are essential to support safety net clinics as they seek to respond to on-going policy, programmatic, and demographic shifts.

This study is not without weakness. Although the analytical methods used are appropriate for these data, the study is a repeated cross-sectional design. The intent of the study is not implying causal inference as to why observed changes occurred, rather documenting existing variation in LARC use by underlying level of need for publicly funded contraceptive services. In addition, this study uses secondary Title X program data that were not collected for research purposes. Variation in reporting definitions contributing to state and national estimates could affect observed proportions used in the analysis. The strength of conclusions drawn from the study was contingent on the quality of the data, how well the models fit the data, and how well the specified models were able to explain observed changes over time. Furthermore, this study only examined LARC use within Title X programs. Findings from this study are not generalizable to the population as a whole.

Despite its limitations, this study makes important programmatic and policy contributions to the field of reproductive health. Primarily, we documented that increases in LARC use are smaller in states with a greater need for publicly funded family planning services—states at the greatest risk for experiencing high rates of unintended pregnancy. Although the study is cross-sectional, the methods used were rigorous given the nature of the study.

Implications for Policy and/or Practice

Title X programs are an important component of larger efforts to reduce rates of unintended pregnancy and subsequent abortions. Lower use of highly effective LARC methods among high-need states, or those with higher proportions of low-income and younger women who are at risk for experiencing unintended pregnancies, has important implications for policy, practice, and the long-term health and well-being of women and families. Although LARC methods may not be the preference for some women (Gomez et al., 2014), continued efforts to expand access to these methods while reducing barriers to uptake is certainly warranted. Specific factors contributing to observed differences remains a salient issue in need of further investigation.

Conclusions

Unintended pregnancy remains an important public health issue. Although LARC use is not the only strategy for reducing unintended pregnancies, it remains a strategy of significant importance. Future research should focus on developing a deeper understanding of the nexus between women's decision making in selecting contraception, efficacy of contraceptive methods, and policy barriers affecting LARC use among women.

Acknowledgments

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