

Differences in Family Planning Services by Rural-Urban Geography: Survey of Title X–Supported Clinics In Great Plains and Midwestern States

CONTEXT: Understanding the nature of rural-urban variation in U.S. family planning services would help address disparities in unmet contraceptive need.

METHODS: In 2012, some 558 Title X–supported clinics in 16 Great Plains and Midwestern states were surveyed. Rural-urban commuting area (RUCA) codes were used to categorize clinic locations as urban, large rural city, small rural town or isolated small rural town. Bivariate analyses examined key domains of service provision by RUCA category and clinic type.

RESULTS: The proportion of clinics offering walk-in appointments was lower in isolated small rural towns (47%) than in the other RUCA categories (67–73%). Results were similar for sites that do not specialize in family planning or reproductive health, but no variation was seen among specialty clinics. Overall, availability of evening or weekend appointments varied in a linear fashion, falling from 73% in urban areas to 29% in isolated small rural towns. On-site provision of most hormonal methods was most common in urban areas and least common in isolated small rural towns, while provision of nonhormonal methods was similar across RUCA categories. Sixty percent of clinics provided IUDs or implants. For clinics that did not, the only barriers that varied geographically were low IUD demand and lack of trained IUD providers; these barriers were most common in isolated rural towns (42% and 70%, respectively).

CONCLUSIONS: While important characteristics, such as clinics' specialization (or lack thereof), are linked to the provision of family planning services, geographic disparities exist.

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Unintended pregnancy is a persistent public health problem in the United States, accounting for 51% of conceptions in 2008 and disproportionately affecting women who are poor, who have little education or who belong to racial or ethnic minorities.¹ Ninety-five percent of unintended pregnancies are attributable to misuse or nonuse of contraceptives.² Therefore, increasing women's access to methods that are highly effective and easy to use is essential to reducing the national level of unintended pregnancy. Access to long-acting reversible contraceptive (LARC) methods—the IUD and implant—is of particular interest to clinicians and researchers because of these methods' high effectiveness and underutilization by U.S. women.³

Numerous studies, including analyses of large, nationally representative data sets,^{4–6} have explored important aspects of service provision at U.S. family planning clinics—such as clinic policies and practices, and the breadth of services offered. One aspect of service provision that remains poorly understood, however, is the role of rural-urban geography. Some research suggests that rurality may be an important correlate of women's access to services. Residents in less populated areas of the United States often must drive long distances to health care facilities, and rural facilities may have few specialized providers.⁷ For example, rural counties have fewer obstetrician-gynecologists per 10,000 women than do nonrural counties.⁸ Obstetrician-gynecologists

who practice in rural areas are less likely than their urban counterparts to provide abortion services,⁹ and women living in rural areas travel farther than others to access abortion services.¹⁰ Finally, residents of rural areas are more likely than their urban counterparts to have sociodemographic characteristics that are associated with poor health care access and health outcomes—for example, poverty, unemployment or underemployment, lack of health insurance, low educational attainment and low wages.^{7,11}

The literature on family planning service provision is often limited by lack of rural-urban measures^{4–6} or use of suboptimal measures.^{3,12,13} The constructs “rural” and “urban” are complex and measurable in myriad ways, and there is no gold standard among the available taxonomies.¹⁴ Methodologists have raised concerns about measurement practices that fail to capture gradations on the rural end of the spectrum—for example, categorizing rural-urban geography into binary variables, assigning rural-urban status to large geographic units, such as counties, and defining “rural” as everything outside densely populated cities.^{7,14,15} Use of binary measures reduces the information available by collapsing a continuum into two categories, and county-level measures assume homogeneity among all subcounty geographies. These classification practices tend to define rurality “by exclusion”¹⁴ and hence fail to distinguish the differences among nonurban geographies. For example,

the U.S. Office of Management and Budget first classifies counties into urbanized areas on the basis of population size, adds surrounding counties to urbanized areas if enough residents work in the urbanized core and then classifies all other counties as rural. The U.S. census taxonomy has the advantage of classifying very small units (census blocks), but similarly creates a dichotomous definition of rural as everything not otherwise included in an urban area or cluster. This system also does not consider the economic relationships among geographies and as a result does not distinguish between isolated rural areas and rural areas that are strongly identified with an urban economic center. Lastly, studies limited to rural samples^{16–18} do not provide direct comparisons with urban environments.

The aim of our survey was to characterize rural-urban differences in U.S. family planning service provision using rural-urban commuting area (RUCA) codes. The RUCA coding system was developed by the University of Washington Rural Health Research Center and the U.S. Department of Agriculture's Economic Research Service in response to the limitations of existing measures. This taxonomy has many potential advantages: It classifies small, subcounty geographic units; it captures variation along the entire rural-urban spectrum, including within nonurban areas; and it reflects economic relationships between urban cores and outlying areas.

We hypothesized that rural clinics would offer less access to family planning services—specifically, that they would have less availability of walk-in, evening and weekend appointments; less on-site provision of contraceptive methods; and greater perceived barriers to providing LARC methods. We sampled Title X–supported clinics because of their prominent role as family planning providers, their coverage along the rural-urban continuum and their focus on patient populations at high risk of unintended pregnancy. We restricted our sample to clinics in 16 Great Plains and Midwestern states—U.S. Department of Health and Human Services Regions V, VII and VIII*—which have clinically underserved areas,¹⁹ both urban and rural, that are not frequently studied. Analyzing rural-urban differences related to family planning services in the understudied center of the country could highlight areas for clinical improvement and contribute to the literature on rural reproductive health care and disparities.

METHODS

Participants and Procedures

• **Survey development.** Key informant telephone interviews were conducted with five Title X regional program consultants and clinic managers, from both rural and urban service areas across Regions V, VII and VIII. Interviews probed for barriers to and facilitators of providing reproductive

health care in Title X–supported clinic settings. We developed a draft survey based on participants' feedback and important elements of service provision as represented in the literature.^{4,13,16,20,21} To confirm the survey's validity, we circulated it among an expert panel of family planning clinicians, researchers, clinic managers and a clinic medical director. The survey was then refined in collaboration with the University of Chicago Survey Lab, which ensured that the wording, ordering and response options for each question conformed to best practices in survey design. The final 10-page survey contained 38 items pertaining to clinic characteristics, services offered, clinic policies, patient eligibility criteria and perceived barriers to providing family planning care.

• **Survey administration.** From June to September 2012, all 811 clinics in Regions V, VII and VIII receiving Title X funding were surveyed using a list provided by the Office of Population Affairs, which administers the federal program. Surveys were initially mailed to the attention of clinic managers and directors; a cover letter instructed them to collaborate with other staff, if necessary, to answer the questions. To optimize the response rate, multiple prompts to complete the survey were made in the following sequence: a postcard, a letter inviting respondents to complete the survey online, an e-mail, a phone call and a final e-mail. As an incentive, each respondent was given the option of entering his or her clinic in a raffle to win one of five \$500 Amazon.com gift cards. To capture clinics that had closed or changed their Title X status after the sampling frame was generated, the first survey questions asked respondents to confirm that their clinic was operational and using Title X funds. All research activities were approved by the University of Chicago institutional review board.

Measures

• **Dependent variables.** Three outcome variables were examined: availability of flexible appointments, on-site provision of contraceptive methods and perceived barriers to on-site provision of LARC methods. Availability of flexible appointments—specifically, appointments on a walk-in basis and during evening and weekend hours—was measured with binary (yes or no) questions. Provision of non-LARC methods—pill, patch, vaginal ring, injectable, male condom, female condom, diaphragm and spermicides, as well as the copper IUD for emergency contraception—was assessed by asking respondents to select one of the following options that best described each: “stocked and provided on site,” “prescribed but not routinely stocked” or “not provided or prescribed.” For each method, selection of the first option was classified as representing on-site provision. Respondents were also asked whether natural family planning instruction was provided upon request; if they answered yes, these clinics were categorized as on-site providers. Additional questions assessed whether the IUD and implant were inserted at clinics. If respondents answered yes, clinics were considered on-site providers; if

*Health and Human Services has 10 regional offices that serve state and local organizations. Regions V, VII and VIII comprise Colorado, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Montana, Nebraska, North Dakota, Ohio, South Dakota, Utah, Wisconsin and Wyoming.

no, respondents were asked if they referred clients to other providers for these methods.

On the basis of feedback from our key informants, we included measures about perceived barriers to providing LARC methods, using the following prompt: “Which are barriers to providing [IUDs/implants] at this site?” For each method, respondents were given a checklist of possible barriers (e.g., the method is too costly to stock, demand is too high and so supplies run out) and an open-ended option. Responses from the latter that matched a checklist item were recoded accordingly. This survey item was directed to all clinics, regardless of whether they offered on-site LARC provision, as our key informants indicated that these methods may involve challenges even for clinics that provide services.

•Independent variable. The rural-urban status of surveyed clinics was classified using RUCA codes.²² In the most recent version, the developers combined 2000 U.S. census data on population size with data on primary and secondary commuting flows to classify all census tracts into 33 categories. Primary and secondary commuting flows refer to the largest and second-largest patterns, respectively, in residents’ travel from home to work. The consideration of commuting patterns is one key advantage of RUCA coding.¹⁴ For example, it distinguishes nonurban tracts that are highly integrated with urban economies from similar-size tracts that are less connected to urban areas. The flexible system of 33 codes was designed to be restricted or aggregated according to users’ needs and goals. Because many research data sets contain zip codes rather than census tracts, the developers constructed a zip code approximation of the RUCA scheme using the 2004 residential and commercial zip code file.²³ RUCA zip code files for each of our survey states were downloaded and merged with survey clinics’ zip codes. The RUCA codes were then collapsed into a four-level variable: urban, large rural city, small rural town and isolated small rural town. This grouping is one of several recommended by the RUCA developers and is described under their categorization A.²⁴ Of note, less populated areas that might be classified as rural under traditional taxonomies are considered urban under this schema if 30–49% of residents commute to urbanized areas.

•Other variables. Clinic type was assessed by asking respondents which category best described their site: health department (local, county or state), hospital-based clinic, comprehensive reproductive health center or clinic, federally qualified health center (FQHC) or community health center, or other (with a write-in option). Write-in responses that resembled an existing category were recoded accordingly. Sixteen sites were hospital-based clinics, and these were classified as other; the third category was expanded to “family planning or reproductive health” to include clinics primarily focused on family planning. After clinics were sorted on the basis of write-in responses, the “other” category included school-based, tribal, women’s health, adolescent health and family health clinics, as well as clinics described too generically to be otherwise classified (e.g., private, nonprofit, satellite, Title X).

Additional clinic-level measures were the number of female clients served in the most recent fiscal year, the proportion of female clients who were aged 11–24 and the number of days per week (or month) that a clinician is available on-site. A variable to reflect the nesting of clinics under the same umbrella agency was created. Clinics were categorized by agency using the Title X clinic list of the Office of Population Affairs, agency websites and e-mail communication with Title X–supported grantees.

Analysis

After we excluded 39 clinics that were closed or no longer funded by Title X, the response rate was 75% (579 of 772 clinics). An additional 21 clinics were excluded: six whose surveys were returned in a bundle without unique responses for each clinic, one that did not confirm Title X funding and 14 that lacked complete data on which contraceptive methods were provided. Hence, the analytic sample comprised 558 clinics (72% of those eligible).

We conducted cross-tabulations of clinic characteristics by RUCA category and tested the independence of each association with a design-based F statistic (Pearson chi-square statistic correcting for clinic clustering).²⁵ We then examined bivariate relationships between the four-category RUCA variable and each binary dependent variable within our three outcome categories. Next, we conducted pairwise comparisons of percentages between RUCA categories for each binary dependent variable using the F statistic described above. Linear trends across categories were assessed using linear regression and corresponding model F statistics. Analyses yielding statistically significant results were repeated after stratifying by clinic type—family planning or reproductive health versus all others—to assess whether rural-urban differences persisted. For stratified analyses with cell sizes of five or less, overall F tests were conducted in lieu of pairwise RUCA comparisons. Statistical significance was determined at $p=.05$. All analyses were performed in Stata version 14 using the `svy` commands to account for clustering of clinics within agencies.

RESULTS

Sample Characteristics

There were no statistically significant differences in clinic characteristics between survey respondents and nonrespondents by region or RUCA category. Sixty-two percent of respondents were clinic managers or directors, 24% were clinicians or nurses, and 14% occupied administrative roles. Fifty-two percent of clinics were operated by local, county or state health departments; 29% were dedicated family planning or reproductive health clinics; 7% were FQHCs or community health centers; and 12% were categorized as other (Table 1). Clinic type varied significantly by RUCA category: Health department clinics represented the majority of sites (63–79%) in small rural towns and isolated small rural towns; they made up smaller proportions of facilities (33–47%) in urban areas and large rural cities, where they were about as common as family planning and

TABLE 1. Percentage distribution of Title X–supported clinics in 16 Great Plains and Midwestern states, by selected characteristics, according to rural-urban commuting area category, 2012

Characteristic	Total (N=558)	Urban (N=199)	Large rural city (N=116)	Small rural town (N=140)	Isolated small rural town (N=103)
Clinic type***					
Health department	51.8	32.7	47.4	62.9	78.6
Family planning/reproductive health	29.2	36.2	39.7	21.4	14.6
FQHC/community health center	7.2	15.6	6.0	0.7	1.0
Other	11.8	15.6	6.9	15.0	5.8
No. of female clients served in prior fiscal year***					
1–99	17.5	2.7	4.4	15.7	63.0
100–499	37.0	19.1	29.8	69.3	34.0
500–1,999	28.4	35.5	56.1	14.3	3.0
≥2,000	17.1	42.9	9.7	0.7	0.0
% of female clients aged 11–24					
1–24	14.4	9.2	18.0	10.5	25.3
25–49	29.4	37.8	25.2	24.1	25.3
50–74	43.4	39.5	43.2	55.6	34.3
75–100	12.9	13.5	13.5	9.8	15.2
On-site availability of family planning clinician***					
≤1 day/month	15.7	1.6	6.4	18.3	51.0
1.5–3.5 days/month	17.1	3.7	12.8	37.4	20.8
1–2 days/week	25.0	18.2	39.5	30.5	14.6
2.5–4 days/week	17.2	27.6	22.9	5.3	6.3
>4 days/week	25.0	49.0	18.4	8.4	7.3
Total	100.0	100.0	100.0	100.0	100.0

*** $p < .001$ in F test comparing distributions across categories while accounting for clinic clustering. Notes: The following 16 states make up Health and Human Services Regions V, VII and VIII: Colorado, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Montana, Nebraska, North Dakota, Ohio, South Dakota, Utah, Wisconsin and Wyoming. Percentages may not total 100.0 because of rounding. FQHC=federally qualified health center.

reproductive health clinics (36–40%). Fifty-five percent of clinics had served fewer than 500 women in the prior year. Clinic volumes varied significantly across RUCA categories, decreasing from urban areas to isolated small rural towns. Fifty-six percent of clinics reported that at least half of their female clients were aged 11–24; this proportion did not vary significantly across RUCA categories. Differences were seen in clinician availability: For example, 49% of urban facilities had clinicians on-site more than four days per week, while 51% of those in isolated small rural towns had clinicians on-site no more than one day per month.

Flexible Appointments

The proportion of clinics offering walk-in appointments was significantly lower in isolated small rural towns (47%) than in the other RUCA categories (67–73%; Table 2). In analyses stratified by clinic type, the proportion did not differ among family planning and reproductive health clinics (72–83%); for all other clinic types, however, those in the most rural areas remained the least likely to offer walk-in appointments (45% vs. 64–70%). Overall, availability of

*Nearly all clinics that did not provide on-site IUD insertion referred clients elsewhere for this procedure (97–100% across RUCA categories). However, among clinics that did not offer implant services, referrals for this method varied significantly: 95% in urban areas, 91% in large rural cities, 80% in small rural towns and 85% in isolated small rural towns ($p < .05$ in F test comparing distributions across categories).

evening or weekend appointments varied significantly in a linear fashion, falling from 73% in urban areas to 29% in isolated small rural towns, and most pairwise comparisons between RUCA categories were statistically significant. Contrary to our findings for walk-in visits, however, rural-urban disparities in offering evening or weekend appointments remained when we considered only family planning and reproductive health clinics: Some 92% of such clinics in urban areas, but only 20% of those in isolated small rural towns, offered services at these hours.

Method Provision

Rural-urban patterns in on-site provision of contraceptives varied by method; in general, the level of provision was highest in urban clinics and lowest in isolated small rural town clinics, and did not differ between large rural city and small rural town facilities (Table 3). Overall, 60% of clinics offered either implant or IUD insertions on-site, and 41% provided both (not shown). On-site availability of each LARC method ranged widely in a significant linear fashion from urban areas to isolated small rural towns (from 63% to 20% for the implant, and from 83% to 20% for the IUD). For both methods, all comparisons between RUCA categories were statistically significant except for that between the two middle groups.* These same rural-urban patterns were noted for provision of the copper IUD for emergency contraception, but in all RUCA categories, this method was provided less frequently than IUDs used for regular contraception. Nearly all clinics (at least 97% for all categories) dispensed the injectable. The proportion offering on-site distribution of the pill also was high, but was significantly lower among clinics in isolated small rural towns (86%) than among others (97–99%). Patterns in the provision of the patch and vaginal ring were similar to those of LARC methods: Linear trends from urban areas (highest) to isolated small rural towns (lowest) were statistically significant, as were most pairwise comparisons between RUCA categories. For the remaining methods, no significant differences were seen in on-site availability.

The six contraceptive methods with significant overall findings were further evaluated in analyses stratified by clinic type (Table 4). For most methods, rates of on-site provision at family planning and reproductive health clinics were higher and showed less variation than rates at all other clinics. Differences among the first group of clinics were statistically significant for only two methods: the IUD (provided at 94% of clinics in urban areas and 40% in isolated small rural towns) and the copper IUD for emergency contraception (70% and 20%, respectively). All family planning and reproductive health clinics dispensed the pill. Among all other clinics, variation in the provision of all six methods remained statistically significant.

Perceived Barriers to LARC Provision

Perceived barriers to providing LARC methods were generally not associated with rural-urban status (Table 5). Twenty-six percent of clinics that provided IUDs,

and 20% of those that provided implants, reported at least one barrier. The high cost of stocking devices was the most frequently cited barrier for both methods (19% and 14%, respectively), and other barriers were infrequently endorsed. For clinics that did not offer IUDs on-site, the most commonly cited challenges were lack of trained clinicians (61%), high cost of stocking the devices (50%) and low patient demand (35%). The proportion of these clinics that identified clinician training as a barrier varied among RUCA categories, but not in a linear fashion (44% in large rural cities, compared with 70% in isolated small rural towns). However, we noted a significant linear trend in the proportion of clinics reporting low patient demand as an impediment to providing IUD services (rising from 18% in urban areas to 42% in isolated small rural towns). Clinic policies were cited as a barrier by 16% of clinics that did not provide IUDs. The same barriers were reported by respondents from clinics that did not provide implants, but the proportions were higher and were similar across RUCA categories: lack of clinician training (70%), high cost of stocking (54%), low patient demand (41%) and clinic policies (21%). There were no significant differences in service barriers by clinic type.

DISCUSSION

Variation in the provision of family planning services by rural-urban status has received little attention in the literature. A number of conceptual and methodological challenges contribute to this problem, including the breadth of available rural-urban taxonomies, restrictions on use of geocoded data because of confidentiality concerns and exclusion of geography from study measures. Individual-level surveys of women provide important insight on the correlates of use of family planning services, but typically feature suboptimal rural-urban measures and lack adjustment for sociodemographic characteristics that vary across the rural-urban spectrum.^{3,26} A better understanding of how rural and urban environments shape women's access to reproductive health services and, ultimately, health outcomes such as unintended pregnancy would have significant implications for public health programs and the distribution of federal funds.

We found that rural-urban status was an important correlate of the appointment types and contraceptives offered by Title X-supported clinics. Consistent with our hypotheses, rural clinics offered a smaller range of services and perceived more barriers to providing such services. While decreased availability of flexible appointments and provision of contraceptives at rural clinics may be construed as suboptimal care, they may also reflect the constraints of balancing supply and demand when serving smaller patient populations. Adjusting staffing according to scheduled appointments and referring patients for more expensive and resource-intensive contraceptives, such as LARC methods, may allow clinics to make the best use of their limited funds. However, rates of referrals for the implant were lower in rural clinics than in urban ones,

TABLE 2. Percentage of clinics offering selected types of appointments, by clinic type, according to rural-urban commuting area category

Appointment and clinic types	Urban	Large rural city	Small rural town	Isolated small rural town
WALK-IN				
All	66.7	73.0	71.7	47.1†,‡,§
Family planning/reproductive health	71.8	82.6	76.7	74.7
All others	63.8	66.7	70.4	44.8†,‡,§
EVENING/WEEKEND				
All***	73.4	50.4†	43.6†	29.1†,‡,§
Family planning/reproductive health***	91.7	45.7†	43.3†	20.0†,‡
All others***	63.0	53.6	43.6†	30.7†,‡

***p<.001 in test of trend from linear regression models that account for clinic clustering. †Different from the percentage for urban at p<.05. ‡Different from the percentage for large rural city at p<.05. §Different from the percentage for small rural town at p<.05.

TABLE 3. Percentage of clinics offering on-site contraceptive provision, by method, according to rural-urban commuting area category

Method	Urban	Large rural city	Small rural town	Isolated small rural town
Implant***	62.8	38.8†	41.1†	20.4†,‡,§
Any IUD for regular contraception***	82.9	51.7†	50.7†	20.4†,‡,§
Copper IUD for emergency contraception***	54.6	29.3†	31.4†	9.7†,‡,§
Injectable	97.5	99.1	97.1	98.1
Pill	97.5	99.1	97.1	86.4†,‡,§
Patch**	67.8	56.0	51.4†	37.9†,‡
Vaginal ring***	83.9	72.4†	72.9†	48.5†,‡,§
Diaphragm	27.1	25.0	25.4	20.4
Male condom	96.5	98.3	98.6	99.0
Female condom	55.8	50.0	47.5	38.8
Natural family planning	92.9	95.7	97.8	92.2
Spermicide	45.2	37.9	40.3	34.0

p<.01 in test of trend from linear regression models that account for clinic clustering. *p<.001 in test of trend from linear regression models that account for clinic clustering. †Different from the percentage for urban at p<.05. ‡Different from the percentage for large rural city at p<.05. §Different from the percentage for small rural town at p<.05.

TABLE 4. Percentage of clinics offering on-site contraceptive provision, by method and clinic type, according to rural-urban commuting area category

Method and clinic type	Urban	Large rural city	Small rural town	Isolated small rural town
Family planning/reproductive health clinics (N=72)				
Implant	81.9	58.7	80.0	66.7
Any IUD for regular contraception***	94.4	76.1	80.0	40.0
Copper IUD for emergency contraception*	70.4	56.5	50.0	20.0
Pill	100.0	100.0	100.0	100.0
Patch	81.9	69.6	70.0	66.7
Vaginal ring	94.4	89.1	93.3	100.0
All other clinics (N=127)				
Implant***	52.0	25.7	30.0	12.5
Any IUD for regular contraception***	76.4	35.7	42.7	17.1
Copper IUD for emergency contraception***	45.7	11.4	26.4	8.0
Pill***	96.1	98.6	96.4	84.1
Patch*	59.8	47.1	46.4	33.0
Vaginal ring***	78.0	61.4	67.3	39.8

*p<.05 in F test accounting for clinic clustering. ***p<.001 in F test accounting for clinic clustering.

TABLE 5. Percentage of clinics reporting barriers to on-site provision of any IUD for regular contraception and of the implant, by whether they provide the method, according to rural-urban commuting area category

Method, provision status and barrier	Total	Urban	Large rural city	Small rural town	Isolated small rural town
IUD					
Provide	(N=315)	(N=165)	(N=59)	(N=70)	(N=21)
Too costly to stock	18.7	20.0	18.6	14.3	23.8
Demand too high	2.9	1.8	3.4	2.9	9.5
Demand too low	3.5	1.8	5.1	4.3	9.5
Policies/regulations	3.2	3.6	5.1	0.0	4.8
Any of the above	25.7	26.1	27.1	21.4	33.3
Do not provide	(N=238)	(N=34)	(N=54)	(N=69)	(N=81)
Too costly to stock	49.6	50.0	51.9	50.7	46.9
Demand too high	0.4	0.0	0.0	1.5	0.0
Demand too low	34.9	17.7	29.6	39.1†	42.0†
No clinician trained in insertion	60.5	58.8	44.4	62.3	70.4‡
Policies/regulations	16.4	20.6	13.0	13.0	19.8
Any of the above	89.1	91.2	81.5	91.2	91.4
IMPLANT					
Provide	(N=247)	(N=124)	(N=44)	(N=58)	(N=21)
Too costly to stock	13.8	13.7	13.6	10.3	23.8
Demand too high	1.2	1.6	0.0	1.7	0.0
Demand too low	6.5	6.5	4.6	6.9	9.5
Policies/regulations	2.4	2.4	2.3	1.7	4.8
Any of the above	20.2	21.0	18.2	15.5	33.3
Do not provide	(N=303)	(N=74)	(N=69)	(N=81)	(N=79)
Too costly to stock	53.5	52.7	59.4	49.4	53.2
Demand too high	0.0	0.0	0.0	0.0	0.0
Demand too low	41.3	37.8	37.7	42.0	46.8
No clinician trained in insertion	70.3	64.9	65.2	75.3	74.7
Policies/regulations	20.8	25.7	17.4	14.8	25.3
Any of the above	98.7	100.0	95.7	98.8	100.0

†Different from the percentage for urban at $p < .05$. ‡Different from the percentage for large rural city at $p < .05$.

as were rates of on-site provision of methods that do not require specialized clinical training, such as the patch and vaginal ring. Provision of the full range of contraceptive methods for which women are medically eligible is both recommended by the Centers for Disease Control and Prevention²⁷ and required by the Title X program. While prescriptions constitute provision and thus achieve this goal, they require women to take the additional steps of traveling to a pharmacy and paying for the method. Future studies should investigate whether rural women perceive separate trips to a pharmacy (to fill a prescription) or clinic (for LARC insertion) as barriers. In a clinic-based survey of 2,094 women conducted in 2011–2012,²⁸ respondents' reasons for attending reproductive health-focused family planning clinics instead of primary care providers included getting a prescription for the method they wanted (77%) and being able to obtain the method (74%), not just a prescription.

Title X supports a diverse range of clinics, whose resources and protocols may lead to differences in service provision.⁵ Indeed, 16–21% of clinics not offering LARC methods on-site cited clinic policies or regulations as barriers to provision. Our stratified analyses allowed us to assess rural-urban variation in family planning services by clinic type. Most of our overall findings were confirmed among clinics without a family planning or reproductive health focus, suggesting an independent relationship between rurality and family planning service provision in this clinic category. At the same time, this stratified assessment showed that family planning and reproductive health

clinics moderated or eliminated the rural-urban differences we observed in the overall sample, except those for IUD provision. Thus, disparities in LARC provision by rural-urban status even among the most specialized reproductive health clinics warrant further attention.

Our findings of such disparities in LARC provision are consistent with the scarce literature on this topic. A 2008–2009 survey among family planning providers in Texas found significantly higher rates of LARC provision and, in particular, greater willingness to recommend implants among clinics in urban than in rural counties; it also revealed that 75% of urban providers had adequate LARC training, while only 57% of rural ones did, but this difference was not statistically significant (likely because of the small sample size).¹³ However, the survey had a 43% response rate, used county-level measures of rural-urban status and defaulted to the most urban county for agencies serving multiple counties. A 2011 survey that examined accessibility of LARC methods at 423 FQHCs nationwide asked respondents to identify their largest primary care site as urban, suburban or rural.^{12,29} Rural facilities had significantly lower rates of on-site implant provision than did urban ones, but FQHCs supported by Title X were more likely to provide both IUDs and implants than were clinics without such funding. Although the survey's response rate (44%) limits the generalizability of the results, the findings suggest that rural-urban disparities may exist for FQHCs, a topic that the present study could not explore because of limited sample size. Other studies limited to rural samples echo our findings regarding service barriers. A 2011–2012

survey of 599 rural primary care providers in Wisconsin and Illinois cited lack of training and low patient demand as challenges to LARC provision.¹⁷ A study of 31 family planning clinics in Washington surveyed in 1995 found cost and provider training to be the most common barriers to service provision in general.¹⁶

Strengths and Limitations

The use of RUCA codes proved to be a valuable tool for discerning rural-urban patterns in family planning services. Sometimes we observed a gradient across RUCA categories, while at other times the data clustered into two or three groups. These patterns would not have been elucidated through a more conventional binary measure. Similarly, by coding geographies below the county level, RUCA allows for a wider exploration of geographic variability. We used a four-level categorization that is recommended by RUCA developers, has been frequently used in other published analyses^{30–32} and was efficient for our sample size. RUCA is a robust and flexible system for the investigation of rural-urban effects. Researchers have illustrated the advantages of richer measures, including RUCA, over traditional ones that mask variation on the rural end of the spectrum.^{14,33,34}

This study provides a focused profile of family planning service provision in an understudied region of the United States. We were able to analyze 72% of all eligible clinics in our sampling frame. Our inclusion of Title X–supported clinics in three Health and Human Services regions (covering 16 states) enhances the generalizability of our findings, although we cannot be certain that our conclusions apply to other regions of the country. Another limitation is that the data on perceptions of barriers to provision of LARC services reflect the perspective of clinic personnel—directors, managers and clinicians—and not patients themselves. Therefore, responses may not be indicative of patients' experiences at these clinics or of their demand for specific services. Moreover, perceptions of barriers may depend on whether respondents occupy a clinical versus an administrative role; however, we found no significant differences in the distribution of respondent roles across RUCA categories. Our survey also did not probe for details on clinic policies, so we were unable to describe which policy aspects were considered problematic in providing LARC methods. Furthermore, we present only bivariate analyses. Our clinic-level data set lacked information on potential confounders such as policies, community norms and patient preferences that may be associated with both rural and urban geography and the services offered by the surveyed clinics. Additionally, this survey was conducted in 2012 and may not reflect current practices at Title X–supported clinics. In particular, provision of LARC methods may have increased since then, as family planning clinicians and professional medical groups have undertaken efforts in recent years to increase rates of LARC use.^{35–37} Finally, although this study focuses on important clinic-level practices, it does not address the impact of

these practices on patient outcomes such as contraceptive uptake and unintended pregnancy.

Conclusions

Our study focused on Title X–supported clinics, which form the backbone of family planning care for low-income women across the United States.³⁸ Overall, we found significant disparities in family planning service provision on the basis of clinics' rural-urban status. While important clinic characteristics, such as their specialization (or lack thereof), are linked to the provision of family planning services, geographic disparities exist. Our findings suggest an opportunity for improving access to care among rural women. Potential improvements include offering flexible appointments, dispensing the patch and vaginal ring on-site and, for clinics that are not able to provide implants, referring women to the nearest provider. Such efforts will require additional research that elucidates the preferences of rural women in need of family planning care, as well as the challenges faced by the clinics that serve them.

REFERENCES

1. Finer LB and Zolna MR, Shifts in intended and unintended pregnancies in the United States, 2001–2008, *American Journal of Public Health*, 2014, 104(Suppl. 1):S43–S48.
2. Gold RB et al., *Next Steps for America's Family Planning Program: Leveraging the Potential of Medicaid and Title X in an Evolving Health Care System*, New York: Guttmacher Institute, 2009.
3. Jones J, Mosher W and Daniels K, Current contraceptive use in the United States, 2006–2010, and changes in patterns of use since 1995, *National Health Statistics Reports*, 2012, No. 60.
4. Centers for Disease Control and Prevention, Contraceptive methods available to patients of office-based physicians and Title X clinics—United States, 2009–2010, *Morbidity and Mortality Weekly Report*, 2011, Vol. 60, No. 1.
5. Frost JJ et al., *Variation in Service Delivery Practices Among Clinics Providing Publicly Funded Family Planning Services in 2010*, New York: Guttmacher Institute, 2012, www.guttmacher.org/pubs/clinic-survey-2010.pdf.
6. Kavanaugh ML et al., Meeting the contraceptive needs of teens and young adults: youth-friendly and long-acting reversible contraceptive services in U.S. family planning facilities, *Journal of Adolescent Health*, 2013, 52(3):284–292.
7. Hart LG, Larson EH and Lishner DM, Rural definitions for health policy and research, *American Journal of Public Health*, 2005, 95(7):1149–1155.
8. Rayburn WF et al., Distribution of American Congress of Obstetricians and Gynecologists fellows and junior fellows in practice in the United States, *Obstetrics & Gynecology*, 2012, 119(5):1017–1022.
9. Stulberg DB et al., Abortion provision among practicing obstetrician-gynecologists, *Obstetrics & Gynecology*, 2011, 118(3):609–614.
10. Jones RK and Jerman J, How far did US women travel for abortion services in 2008? *Journal of Women's Health*, 2013, 22(8):706–713.
11. Larson S and Correa-de-Araujo R, Preventive health examinations: a comparison along the rural-urban continuum, *Women's Health Issues*, 2006, 16(2):80–88.
12. Beeson T et al., Accessibility of long-acting reversible contraceptives (LARCs) in federally qualified health centers (FQHCs), *Contraception*, 2014, 89(2):91–96.

13. Vaaler ML et al., Urban-rural differences in attitudes and practices toward long-acting reversible contraceptives among family planning providers in Texas, *Women's Health Issues*, 2012, 22(2):e157–e162, doi:10.1016/j.whi.2011.11.004.
14. Hall SA, Kaufman JS and Ricketts TC, Defining urban and rural areas in U.S. epidemiologic studies, *Journal of Urban Health*, 2006, 83(2):162–175.
15. Vanderboom CP and Madigan EA, Federal definitions of rural-ity and the impact on nursing research, *Research in Nursing & Health*, 2007, 30(2):175–184.
16. Dobie SA, Gober L and Rosenblatt RA, Family planning service provision in rural areas: a survey in Washington State, *Family Planning Perspectives*, 1998, 30(3):139–142 & 147.
17. Lunde B et al., Long acting contraception provision by rural primary care physicians, *Journal of Women's Health*, 2014, 23(6):519–524.
18. Chuang CH et al., Primary care physicians' perceptions of barriers to preventive reproductive health care in rural communities, *Perspectives on Sexual and Reproductive Health*, 2012, 44(2):78–83.
19. Meyer PA et al., CDC health disparities and inequalities report—United States, 2013, *Morbidity and Mortality Weekly Report*, 2013, Vol. 62, No. 3, Suppl.
20. Lindberg LD et al., Provision of contraceptive and related services by publicly funded family planning clinics, 2003, *Perspectives on Sexual and Reproductive Health*, 2006, 38(3):139–147.
21. Jones RK and Kooistra K, Abortion incidence and access to services in the United States, 2008, *Perspectives on Sexual and Reproductive Health*, 2011, 43(1):41–50.
22. Rural Health Research Center, RUCA data: general methods, no date, <http://depts.washington.edu/uwruca/ruca-methodology.php>.
23. Rural Health Research Center, RUCA data: instructions for downloading 2004 zip data, no date, <http://depts.washington.edu/uwruca/ruca-download.php>.
24. Rural Health Research Center, RUCA data: using RUCA data, no date, <http://depts.washington.edu/uwruca/ruca-uses.php>.
25. Rao JNK and Scott AJ, On chi-squared tests for multiway contingency tables with cell proportions estimated from survey data, *Annals of Statistics*, 1984, 12(1):46–60.
26. Hall KS, Moreau C and Trussell J, Determinants of and disparities in reproductive health service use among adolescent and young adult women in the United States, 2002–2008, *American Journal of Public Health*, 2012, 102(2):359–367.
27. Centers for Disease Control and Prevention, U.S. selected practice recommendations for contraceptive use, 2013: adapted from the World Health Organization Selected Practice Recommendations for Contraceptive Use, second ed., *Morbidity and Mortality Weekly Report*, 2013, Vol. 62, No. RR-05.
28. Frost JJ, Gold RB and Bucek A, Specialized family planning clinics in the United States: why women choose them and their role in meeting women's health care needs, *Women's Health Issues*, 2012, 22(6):e519–e525, doi:10.1016/j.whi.2012.09.002.
29. Wood S et al., Scope of family planning services available in federally qualified health centers, *Contraception*, 2014, 89(2):85–90.
30. Hillemeier MM et al., Individual and community predictors of preterm birth and low birthweight along the rural-urban continuum in central Pennsylvania, *Journal of Rural Health*, 2007, 23(1):42–48.
31. Strutz KL et al., Birth outcomes across three rural-urban typologies in the Finger Lakes region of New York, *Journal of Rural Health*, 2012, 28(2):162–173.
32. Baldwin L-M et al., Quality of care for myocardial infarction in rural and urban hospitals, *Journal of Rural Health*, 2010, 26(1):51–57.
33. Epstein B et al., Does rural residence affect access to prenatal care in Oregon? *Journal of Rural Health*, 2009, 25(2):150–157.
34. Langlois PH et al., Occurrence of conotruncal heart birth defects in Texas: a comparison of urban/rural classifications, *Journal of Rural Health*, 2010, 26(2):164–174.
35. American College of Obstetricians and Gynecologists (ACOG), Practice bulletin no. 121: long-acting reversible contraception—implants and intrauterine devices, *Obstetrics & Gynecology*, 2011, 118(1):184–196.
36. ACOG, Committee on Adolescent Health Care/Long-Acting Reversible Contraception Working Group, Committee opinion no. 539: adolescents and long-acting reversible contraception—implants and intrauterine devices, *Obstetrics & Gynecology*, 2012, 120(4):983–988.
37. Committee on Adolescence, Contraception for adolescents, *Pediatrics*, 2014, 134(4):e1244–e1256, doi:<http://dx.doi.org/10.1542/peds.2014-2299>.
38. Frost J, Zolna M and Frohwirth L, *Contraceptive Needs and Services*, 2010, New York: Guttmacher Institute, 2013, <http://www.guttmacher.org/pubs/win/contraceptive-needs-2010.pdf>.

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