## Title

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## Journal

The Journal of adolescent health : official publication of the Society for Adolescent Medicine, 60(4)

## ISSN

1054-139X

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## Publication Date

2017-04-01

## DOI

10.1016/j.jadohealth.2016.10.016

Peer reviewed

Journal of Adolescent Health 60 (2017) 395–401

ELSEVIER

JOURNAL OF ADOLESCENT HEALTH

www.jahonline.org

Original article

# Rural–Urban Differences in Awareness and Use of Family Planning Services Among Adolescent Women in California

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*Article history:* Received August 12, 2016; Accepted October 25, 2016
*Keywords:* Adolescent; Awareness; Family planning services; Rural; Urban

A B S T R A C T

**Purpose:** The purpose of this study was to compare awareness and use of family planning services by rural and urban program site among a sample of adolescent women before participation in the federal Personal Responsibility Education Program in California.
**Methods:** We conducted a secondary analysis of survey data collected from youth before participation in California's Personal Responsibility Education Program. Bivariate and multivariate analyses were conducted for a sample of 4,614 females ages 14–18 years to compare awareness and use of family planning services between participants at rural and urban program sites, controlling for the program setting and participant demographic, sexual, and reproductive characteristics.
**Results:** Overall, 61% of participants had heard of a family planning provider in their community, and 24% had visited a family planning provider. Awareness and use of family planning services were lower among rural participants than urban participants. After adjusting for the program setting and participant characteristics, rural participants were less likely to know about a family planning provider in their community (odds ratio, .64; 95% confidence interval, .50–.81) or receive family planning services (odds ratio, .76; 95% confidence interval, .58–.99) than urban participants.
**Conclusions:** Findings suggest that adolescents in rural areas face greater barriers to accessing family planning services than adolescents in urban areas. Targeted efforts to increase awareness and use of family planning services among adolescents in rural areas and among other underserved populations are needed.



**IMPLICATIONS AND CONTRIBUTION**

Given evidence of higher adolescent birth rates in rural areas, this study sought to examine rural–urban differences in adolescents' awareness and use of family planning services. Rural participants reported less awareness and lower use of family planning services than those in urban areas.

In the United States, youth in rural areas are more likely to give birth during adolescence than youth in metropolitan areas. In 2010, the adolescent birth rate was 43.3 in rural counties, compared to 32.7 in metropolitan counties [1]. Declines in adolescent birth rates have also been slower in rural areas. Between 1990 and 2010, the birth rate among adolescents living in rural counties declined by 31%, compared to a 50% decline among adolescents in the most urbanized counties [1].

Rural–urban disparities in adolescent childbearing reflect similar disparities in associated sexual and contraceptive behavior. Several studies found that rates of sexual activity were higher among rural adolescents [1–4], which may be driven by a range of factors from community-level poverty to a lack of

**Conflicts of Interest:** The authors have no known conflicts of interest to declare.
**Disclaimer:** All analyses, interpretations, and conclusions are those of the authors and not of the State of California or the Family and Youth Services Bureau (FYSB).

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1054-139X/
http://dx.doi.org/10.1016/j.jadohealth.2016.10.016

recreational options in rural communities [5]. In addition, an analysis of the 2006–2010 National Survey of Family Growth found that adolescent women in rural areas were less likely to use contraception the first time they had sex than their peers in metropolitan areas, although there were no statistically significant differences in their likelihood of using contraception the most recent time they had sex [1]. However, a study of African-American high school students found that male and female students in rural areas were less likely to report using a condom the most recent time they had sex than students in nonrural areas [2].

Another factor that may contribute to the rural–urban disparity in adolescent childbearing is access to sexual health education. Between 2006–2010 and 2011–2013, declines in receipt of formal sex education were concentrated among adolescents living in nonmetropolitan areas [6]. Although most rural parents express support for the role of schools in sexual health education [7], research has found significant challenges in implementing sexuality education in rural areas, such as opposition from rural churches and lack of buy-in and resources in rural school districts [8,9]. At the time this study was conducted, sexual health education was not legally required in California, and some school districts that offered sexual health education failed to provide evidence-based, medically accurate information [10].

In addition, adolescents in rural areas have less access to sexual and reproductive health services than those in urban areas. Past research found that rural counties have significantly fewer publicly funded clinics that offer contraception than urban counties [1]. People living in rural and remote areas also may be disadvantaged by limited access to sources of health information [11]; thus, rural adolescents may not be aware of family planning service providers located near them. Lack of transportation and excessive distances to clinics pose additional barriers to accessing family planning services for rural youth [12,13]. Concerns about confidentiality and privacy also can be exacerbated in rural communities. Youth in rural areas may avoid seeking family planning services out of fear that a friend, relative, or acquaintance will see them and scrutinize and share their actions [12,14]. Although previous research suggests that the association between religiosity and adolescent sexual activity and related behaviors is complex, religiosity is slightly higher in rural counties than urban counties, which may contribute to rural–urban disparities in use of family planning services as well [1,15–17].

The purpose of this study was to examine rural–urban differences in awareness and use of family planning services among female youth before participation in the federally funded State Personal Responsibility Education Program in California (CA PREP). We also examined social and demographic characteristics that may be associated with awareness and use of family planning services, including age, race/ethnicity, and prior sexual and reproductive experiences. We hypothesized that rural participants would have less knowledge about and experience using family planning services than urban participants.

## Methods

### Setting

CA PREP is an adolescent sexual health and pregnancy prevention program overseen by the State of California's Maternal, Child, and Adolescent Health Division. Federally funded through the U.S. Department of Health and Human Services, Administration for Children and Families, Family and Youth Services Bureau, CA PREP is designed to replicate evidence-based program models that have been shown to delay sexual activity, increase condom or contraceptive use for sexually experienced youth, or reduce pregnancy among youth [18,19]. The program provides education on abstinence and contraception to prevent pregnancy and sexually transmitted infections, including HIV. A key component of CA PREP is the dissemination of information about family planning services that are available to youth in their local communities [20]. In 2012, 21 agencies were selected to implement CA PREP in 19 counties with above state-average adolescent birth rates in 2007–2009. During the 2012–2015 program cycle, agencies administered the program in a range of settings, including mainstream middle schools and high schools, alternative or continuation schools, foster care, shelter or transitional housing, juvenile justice facilities, community-based organizations, and clinics.

### Data and sample

An entry survey was administered to all participating youth up to 7 days before or on the first day of the program (or on joining the program after the first day). The anonymous paper-and-pencil survey consisted of 28 questions, including questions about demographic characteristics and sexual behaviors, and took participants about 10 minutes to complete. The survey was offered in both English and Spanish, and passive parental consent was required. The study was approved by the State of California's Committee for the Protection of Human Subjects; the Committee on Human Research at the University of California, San Francisco deemed this study exempt from review.

In total, 14,823 youth attended at least one session of CA PREP between September 1, 2013, and June 30, 2014. Entry survey data were available for 13,174 participants. Although males have an important role in adolescent sexual and reproductive health, the sample was restricted to females as they comprise most family planning clients [21]. Of the 5,914 respondents who identified as female, 1,152 were excluded because they were aged $<14$ years or $>18$ years. The sample was restricted to the 14–18 age group because $<10\%$ of participants aged 10–13 years were sexually active and $<3\%$ of all participants were aged $>18$ years. We excluded an additional 127 respondents who had missing data for sexual experience and another 21 respondents who had missing data on pregnancy history. The final sample included 4,614 adolescent females who participated in 567 cohorts (i.e., groups of youth) across 121 CA PREP sites. The number of participants per cohort ranged from 1 to 32, and the average number of participants per cohort was 8. The number of participants per site ranged from 1 to 494, and the average number of participants per site was 38.

### Measures

*Dependent variables.* To assess awareness of family planning providers, participants were asked, "Have you heard of a clinic or doctor in your community where teens can get family planning services (such as going to a doctor or clinic to get condoms, birth control pills, pregnancy tests, and STD/HIV tests or information about these)?" (yes/no/not sure). To assess prior use of family planning services, participants were asked, "Have you ever been

**Table 1**
Characteristics of female California Personal Responsibility Education Program participants ages 14–18 years, by rural or urban program site

| | Total (N = 4,614) | Rural (n = 1,531, 33%) | Urban (n = 3,083, 67%) | *p* value |
|---|---|---|---|---|
| Site characteristics | | | | |
| Program setting, n (%) | | | | <.001 |
| Mainstream school | 3,285 (71) | 1,302 (85) | 1,983 (64) | |
| Alternative or continuation school | 716 (16) | 138 (9) | 578 (19) | |
| Foster care, shelter or transitional housing, juvenile justice | 351 (8) | 42 (3) | 309 (10) | |
| Community-based organization, clinic, or other | 262 (6) | 49 (3) | 213 (7) | |
| Respondent characteristics | | | | |
| Age, n (mean ± SD) | 4,614 (15.5 ± 1.23) | 1,531 (15.5 ± 1.12) | 3,083 (15.5 ± 1.28) | .852 |
| Race/ethnicity, n (%) | | | | <.001 |
| Hispanic | 3,268 (71) | 1,157 (76) | 2,111 (68) | |
| Non-Hispanic white | 418 (9) | 132 (9) | 286 (9) | |
| Non-Hispanic black | 410 (9) | 101 (7) | 309 (10) | |
| Non-Hispanic other/multiple/unknown | 518 (11) | 141 (9) | 377 (12) | |
| Ever had sexual intercourse, n (%) | | | | <.001 |
| No | 3,058 (66) | 1,086 (71) | 1,972 (64) | |
| Yes | 1,556 (34) | 445 (29) | 1,111 (36) | |
| Ever been pregnant, n (%) | | | | <.001 |
| No | 4,228 (92) | 1,443 (94) | 2,785 (90) | |
| Yes | 386 (8) | 88 (6) | 298 (10) | |

Results are unweighted percentages; *p* values are from unadjusted bivariate tests (*t* test or chi-square test as appropriate).

to a clinic for family planning services (such as going to a doctor or clinic to get condoms, birth control pills, pregnancy tests, and STD/HIV tests or information about these)?" (yes/no/not sure). For purposes of this analysis, responses of "not sure" were coded as "no."

*Independent variable.* The primary independent variable was rural/urban program site. Agencies provided the address of each program site, which we geocoded to a state-defined Medical Service Study Area (MSSA). MSSAs are geographic areas created by aggregating Census tracts and approved by the federal government for identifying health care workforce shortage areas. Based on state definitions, MSSAs are considered rural if they contained <250 residents per square mile and have no population centers exceeding 50,000 residents. Urban MSSAs have populations between 75,000 and 125,000 residents [22]. We created a variable indicating whether the youth participated in CA PREP at a rural or urban site by using program records to link participants to the geocoded service sites.

*Control variables.* Participants provided information about their age (in years), race/ethnicity, whether they had ever had sexual intercourse, and whether they had ever been pregnant. We also included a measure of the type of setting in which participants received CA PREP services, which included four categories: mainstream middle or high school; alternative or continuation school; foster care, shelter or transitional housing, or juvenile justice facility; and community-based organization, clinic, or other.

### *Data analysis*

We first examined the study variables using descriptive statistics. We conducted bivariate analyses to compare program setting and participant characteristics by rural–urban program site using the chi-square test for categorical variables and the *t* test for age. Subsequently, we conducted bivariate analyses to compare awareness and use of family planning services by rural–urban program site and participant characteristics using the chi-square test. Finally, we conducted multivariate analyses using multilevel, mixed-effects logistic regression (*melogit* command in Stata 13.1; StataCorp, College Station, TX). These models examined rural–urban differences in awareness and use of family planning services, independent of other site and participant characteristics. Models account for the three-level structure of the data with participants nested within cohorts and cohorts within sites.

## Results

### *Descriptive characteristics*

Two thirds (67%) of the sample were participants at urban sites, whereas one third (33%) were participants at rural sites (Table 1). Nearly three fourths (71%) of the sample were participants in mainstream school settings, but a sizeable percentage participated in alternative or continuation schools (16%) and foster care, shelter or transitional housing, or juvenile justice facilities (8%).

The average age in the sample was 15.5 years. Overall, 71% of participants self-identified as Hispanic, 9% as non-Hispanic white, and 9% for urban participants as non-Hispanic black. Eleven percent of the sample identified as Asian, Native Hawaiian, or other Pacific Islander, American-Indian or Alaska Native, or selected multiple racial groups or did not provide information about race/ethnicity. Thirty-four percent of the sample had experienced sexual intercourse, and 8% had a prior pregnancy.

A larger percentage of the rural participants were receiving the program in mainstream school settings than the urban participants (85% vs. 64% for urban participants, $p < .001$). There were no significant differences between rural and urban participants in age, but rural participants were more likely to be Hispanic (76% vs. 68% for urban participants, $p < .001$). Rural participants were less likely to have had sexual intercourse (29% vs. 36% for urban participants, $p < .001$), and they were less likely to have had a prior pregnancy (6% vs. 10% for urban participants, $p < .001$). However, in additional analysis among the participants in mainstream school settings only, we found that rural

participants were more likely to have had sexual intercourse (23% vs. 20% for urban participants, $p < .05$), and they were slightly more likely to have had a prior pregnancy (3% vs. 2% for urban participants, $p < .05$) (data not shown).

Across all participants, about 3 in 5 (61%) had heard of a clinic or doctor in their community where teens can get family planning services (Table 2). Among sexually experienced participants, 81% were aware of a source of family planning in their community, compared to 50% of participants who had not had sexual intercourse ($p < .001$). Rural participants were significantly less likely than urban participants to know of a local family planning provider (52% vs. 65%, $p < .001$).

Overall, participants in mainstream school settings had the lowest level of awareness of a family planning provider (53%), compared to 84% for alternative or continuation school participants, 77% for participants in foster care, shelter or transitional housing, or juvenile justice facilities, and 70% for participants at community-based organization, clinic, or other settings ($p < .001$). Awareness of a source of family planning increased with age, ranging from 46% for 14-year-olds to 80% for 18-year-olds ($p < .001$). Hispanic participants were significantly less likely to know of a family planning provider than other racial/ethnic groups (58% vs. 72% for non-Hispanic white and 67% for non-Hispanic black, $p < .001$). Nearly all previously pregnant participants (91%) could identify a family planning provider, compared to 58% of those who had never been pregnant ($p < .001$).

Less than one quarter (24%) of participants reported visiting a clinic for family planning services. Among sexually experienced participants, about half (51%) reported using family planning services, compared to 10% of those who were not sexually experienced ($p < .001$). Rural participants were less likely to report family planning service utilization than urban participants (18% vs. 27%, $p < .001$). Across all youth, reported use of family planning services was highest among non-Hispanic black participants (33% vs. 22% for Hispanic vs. 26% for non-Hispanic white, $p < .001$). More than three fourths (76%) of previously pregnant participants reported using family planning services, compared to 19% of those who had never been pregnant ($p < .001$).

### *Multilevel regression analysis*

Participants at rural program sites were significantly less likely to know of a local family planning provider than those at urban sites after controlling for program setting and participant characteristics (odds ratio [OR], .64; 95% confidence interval [CI], .50–.81) (Table 3). Among all youth, the odds of knowing a source of family planning services were twice as large for participants in alternative or continuation schools than in mainstream school settings (OR, 2.05; 95% CI, 1.45–2.90). Awareness of a family planning provider increased with age (OR, 1.24; 95% CI, 1.15–1.33). Compared to Hispanic participants, the odds of knowing a source of family planning were 1.90 times larger for non-Hispanic white participants (95% CI, 1.47–2.45) and 1.32 times larger for non-Hispanic black participants (95% CI, 1.01–1.71). As expected, the odds of knowing a source of family planning were more than twice as large for youth who had experienced sexual intercourse (OR, 2.53; 95% CI, 2.12–3.03) or a prior pregnancy (OR, 2.26; 95% CI, 1.51–3.37) than those who had not.

Results for use of family planning services were similar to those for knowledge of a family planning provider. Controlling

**Table 2**
Factors associated with awareness and use of family planning services among female California Personal Responsibility Education Program participants ages 14–18 years (N = 4,614)

| | Heard of source of family planning services (n = 2,705, 61%) | *p* value | Received family planning services (n = 1,063, 24%) | *p* value |
|---|---|---|---|---|
| | n (%) | | n (%) | |
| Site characteristics | | | | |
| Location | | <.001 | | <.001 |
| Urban | 1,936 (65) | | 801 (27) | |
| Rural | 769 (52) | | 262 (18) | |
| Program setting | | <.001 | | <.001 |
| Mainstream school | 1,685 (53) | | 425 (13) | |
| Alternative or continuation school | 584 (84) | | 375 (54) | |
| Foster care, shelter or transitional housing, juvenile justice | 258 (77) | | 172 (52) | |
| Community-based organization, clinic, or other | 178 (70) | | 91 (36) | |
| Respondent characteristics | | | | |
| Age | | <.001 | | <.001 |
| 14 | 572 (46) | | 122 (10) | |
| 15 | 648 (56) | | 184 (16) | |
| 16 | 692 (66) | | 289 (28) | |
| 17 | 561 (76) | | 307 (41) | |
| 18 | 232 (80) | | 161 (56) | |
| Race/ethnicity | | <.001 | | <.001 |
| Hispanic | 1,840 (58) | | 707 (22) | |
| Non-Hispanic white | 288 (72) | | 106 (26) | |
| Non-Hispanic black | 269 (67) | | 134 (33) | |
| Non-Hispanic other/multiple/unknown | 308 (61) | | 116 (23) | |
| Ever had sexual intercourse | | <.001 | | <.001 |
| No | 1,477 (50) | | 295 (10) | |
| Yes | 1,228 (81) | | 768 (51) | |
| Ever been pregnant | | <.001 | | <.001 |
| No | 2,364 (58) | | 778 (19) | |
| Yes | 341 (91) | | 285 (76) | |

Results are presented as unweighted percentages of use and awareness of family planning services for each group; *p* values are from chi-square tests.

**Table 3**
Multivariate logistic regression models predicting awareness and use of family planning services among female California Personal Responsibility Education Program participants ages 14–18 years

| | Heard of source of family planning services (n = 4,463) | *p* value | Received family planning service (n = 4,462) | *p* value |
|---|---|---|---|---|
| | OR (95% CI) | | OR (95% CI) | |
| Site characteristics | | | | |
| Location | | | | |
| Urban (ref) | | | | |
| Rural | .64 (.50–.81) | <.001 | .76 (.58–.99) | .043 |
| Program setting | | | | |
| Mainstream school (ref) | | | | |
| Alternative or continuation school | 2.05 (1.45–2.90) | <.001 | 2.71 (1.95–3.77) | <.001 |
| Foster care, shelter or transitional housing, juvenile justice | 1.42 (.93–2.17) | .104 | 2.90 (1.93–4.35) | <.001 |
| Community-based organization, clinic, or other | 1.32 (.88–1.97) | .184 | 1.76 (1.16–2.69) | .008 |
| Respondent characteristics | | | | |
| Age | 1.24 (1.15–1.33) | <.001 | 1.37 (1.27–1.50) | <.001 |
| Race/ethnicity | | | | |
| Hispanic (ref) | | | | |
| Non-Hispanic white | 1.90 (1.47–2.45) | <.001 | 1.28 (.95–1.72) | .101 |
| Non-Hispanic black | 1.32 (1.01–1.71) | .039 | 1.41 (1.06–1.89) | .020 |
| Non-Hispanic other/multiple/unknown | 1.13 (.90–1.41) | .288 | 1.02 (.78–1.34) | .882 |
| Ever had sexual intercourse | | | | |
| No (ref) | | | | |
| Yes | 2.53 (2.12–3.03) | <.001 | 4.01 (3.31–4.86) | <.001 |
| Ever been pregnant | | | | |
| No (ref) | | | | |
| Yes | 2.26 (1.51–3.37) | <.001 | 3.23 (2.41–4.33) | <.001 |

CI = confidence interval; OR = odds ratio; Ref = reference category.

for program setting and participant characteristics, rural participants were less likely than urban participants to have used family planning services (OR, .76; 95% CI, .58–.99). Across all youth, those in alternative or continuation schools (OR, 2.71; 95% CI, 1.95–3.77) and foster care, shelter or transitional housing, or juvenile justice facilities (OR, 2.90; 95% CI, 1.93–4.35) were more likely to report using family planning services than participants in mainstream schools. Non-Hispanic black participants had significantly higher odds of using family planning services than Hispanic participants (OR, 1.41; 95% CI, 1.06–1.89), as did older participants (OR, 1.37; 95% CI, 1.27–1.50). The odds of using family planning were markedly higher for participants who had experienced sexual intercourse (OR, 4.01; 95% CI, 3.31–4.86) or a prior pregnancy (OR, 3.23; 95% CI, 2.41–4.33) than those who had not.

We also tested for interactions between rural–urban location and site and participant characteristics. We found no consistent evidence for interactions between these variables in predicting awareness or use of family planning services (data not shown).

## Discussion

In a sample of adolescent women targeted to receive sexual health education in California, we found that participants in rural settings were less aware of locations to access family planning services than those in urban settings. Moreover, after adjusting for demographic, sexual, and reproductive characteristics, young women in rural areas were less likely to report using family planning services than their urban counterparts. Gaps in the knowledge about and use of family planning services place adolescents in rural areas at greater risk of unintended pregnancy. Our results are consistent with a study that analyzed MSSA-level birth data from 2010 to 2012 in California and found that, although most adolescent births occurred in urban areas, the adolescent birth rate was significantly higher in rural areas than urban areas, particularly for white adolescents [23]. Our study identified additional groups of participants who were less likely to report knowledge or use of family planning services, particularly younger adolescents, Hispanic youth, and those in mainstream school settings.

Key strengths of our study included a rare measure of awareness of local family planning providers and a large sample of young women in both urban and rural program settings. We also used robust estimation techniques that account for the multilevel structure of the data. However, there were limitations. First, we relied on self-report of sexual behaviors and awareness and use of family planning services, which may be prone to response bias due to recall error or social desirability, particularly in the setting of sexual health education. Second, the survey did not collect personal addresses of participants, so the rural/urban designation was based on the program location. The program does not provide transportation, and, except for youth in a county juvenile detention center, few participants would be expected to travel between rural or urban locations for the program. In addition, our sample is not representative of the population of adolescent women as a whole but rather a convenience sample of participants in CA PREP, a program that targets high-need youth populations. Compared to the general population of adolescents in California, our sample is disproportionately Hispanic and located in areas with elevated adolescent birth rates. Although our results cannot be generalized to all adolescent women in California, the study provides an opportunity to learn about youth in high-risk groups or settings, such as those in shelters and foster care. Furthermore, given prior research demonstrating urban–rural differences in sexual health behaviors and outcomes among a broad cross section of youth, we would expect to find a similar relationship in the general population between rural–urban location and the outcomes studied here.

Further research is needed to elucidate the mechanisms underlying the rural–urban disparities in awareness and use of family planning services and, in turn, identify appropriate strategies for reducing them. One component may be the relative lack of providers of family planning services near youth in rural areas [1,24]. A second component may be that youth in rural areas may have less access to sources of information about the family planning services available near them or they may face additional challenges to seeking family planning information [11]. In addition, even when youth in rural areas are aware of local providers of family planning services, they may have a harder time reaching the clinics because of transportation difficulties, difficulty paying for services because of a lack of health insurance, or heightened concerns about confidentiality [1]. In our study, among the sexually active adolescent women who know of a local provider of family planning services, less than half (49%) of rural participants had ever used family planning services, compared to 63% of urban participants. This suggests that increasing youth awareness of family planning services is a necessary but not sufficient condition for reducing rural–urban disparities in family planning service use. Continued efforts are needed to identify and address socioeconomic and cultural barriers to utilization that may be more prevalent in rural areas, including the role of the ethnic, cultural, political, and religious environment.

Our study did not examine potential rural–urban differences in the quality of family planning services that adolescents receive. Research is also needed to explore differences in access to youth-friendly family planning providers (i.e., providers offering walk-in or same-day appointments, evening or weekend hours, and staff training to meet adolescents' special contraceptive needs) [25]. Among youth receiving sexual and reproductive health services, there may be important rural–urban disparities in access to preventive health services, costs, or timeliness of care and specific contraceptive methods, particularly highly effective long-acting, reversible contraceptives.

Given the importance of family planning for preventing unintended pregnancies, the results of this study provide support for improving youth access to family planning services in rural areas. A new state law in California that allows pharmacists to prescribe hormonal contraception directly to patients may help alleviate unmet need for contraception in rural areas [26]. Additional research will be needed to determine if this benefit is realized, however, as factors such as embarrassment, which has been shown to affect condom purchasing behavior [27], may be more prevalent in rural areas where the clerk or other shoppers are more likely to be in the youth's personal network. In addition to expanding the availability of family planning providers in rural areas, schools, and programs such as CA PREP can help educate and empower youth in rural areas to learn about and access family planning services before and after they become sexually active. In 2015, California enacted a state law mandating comprehensive sexual education, including instruction about local resources for sexual and reproductive health care and how to access them [28]. Beyond simply giving students a list of family planning providers, schools should be encouraged to build partnerships with youth-friendly providers and dedicate sufficient resources to referring and linking students to services. These new state laws, along with CA PREP and other adolescent sexual health programs, offer great potential for reducing the persistent rural–urban disparity in adolescent birth rates.

## Acknowledgments

The authors are grateful to Abigail Gutmann-Gonzalez, M.P.H., Amanda Mazur, M.Sc., and Lana Tilley, M.P.H., for their thoughtful comments on an earlier version of the article. The authors also acknowledge Margaret Tufts, M.P.H., for assistance preparing the project data set and Stephanie Arteaga, M.P.H., for assistance with a review of the literature.

## Funding Sources

This study was supported by grant number 93.092 from the U.S. Department of Health and Human Services (DHHS), Administration for Children and Families (ACF), Family and Youth Services Bureau (FYSB), through the State of California, Maternal, Child and Adolescent Health Division, contract number 15-10047.

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