



Original article

## Access to contraception in local health departments, four Midwest states, 2017–2018<sup>☆</sup>



Catherine Lindsey Satterwhite<sup>a,b,\*</sup>, Valerie French<sup>b</sup>, Molly Allison<sup>a</sup>, Tanya Honderick<sup>a</sup>, Megha Ramaswamy<sup>a</sup>

<sup>a</sup> University of Kansas School of Medicine, Department of Preventive Medicine and Public Health, 3901 Rainbow Blvd, MS: 1008, Kansas City, KS 66160

<sup>b</sup> University of Kansas School of Medicine, Department of Obstetrics and Gynecology, 3901 Rainbow Blvd, MS: 2028, Kansas City, KS 66160

### ARTICLE INFO

#### Article history:

Received 1 December 2018

Received in revised form 19 February 2019

Accepted 20 February 2019

#### Keywords:

Local health departments

Contraception

IUD

Implant

Family planning

Title X

### ABSTRACT

**Objective:** Describe contraception availability at local health departments (LHDs) serving largely rural populations. **Study design:** We invited administrators at LHDs located in four Midwest states to participate in an online survey conducted from September 2017–April 2018. We collected data on clinic staffing, patient population, receipt of Title X funds, and services provided to assess the proportion of LHDs providing any prescription method of contraception; secondary outcomes included healthcare staff training level and other reproductive health services provided.

**Results:** Of 344 LHDs invited, 237 administrators completed the survey (68.9%). Three-quarters served rural populations. One-third (34.6%) provided short-acting hormonal contraception; however, availability varied by state (Kansas: 58.0%, 40/69; Missouri: 37.5%, 33/88; Nebraska: 16.7%, 3/18; Iowa: 9.7%, 6/62;  $p < .01$ ). Only 8.4% of LHDs provided IUDs; 7.6% provided implants, and 5.9% provided both methods. LHDs in Nebraska and Kansas provided any long-acting method more frequently (Kansas: 17.4%, Nebraska: 16.7%, Iowa: 8.1%, Missouri: 4.6%;  $p = .04$ ). LHDs receiving Title X funds (27.0%) were much more likely to provide any prescription contraception (85.1% vs. 14.2%,  $p < .01$ ). Most LHDs relied on registered nurses (RNs) to provide medical care; 81.0% reported that RNs provided care  $\geq 20$  days per month. Pregnancy testing was widely available in Missouri and Kansas ( $>87\%$ ) and less commonly available in Iowa and Nebraska ( $<18\%$ ) ( $p < .01$ ).

**Conclusion:** LHDs in these states are currently ill-equipped to offer comprehensive contraceptive services. Women seeking care at LHDs have limited, if any, contraceptive options.

**Implications:** Local health departments in the Midwest, serving a largely rural population, rarely offer prescription contraception, especially long-acting reversible methods. Women residing in settings without broad access to publicly-funded healthcare providers may have limited access to comprehensive contraceptive services. Efforts to ensure rural access are needed.

© 2019 Elsevier Inc. All rights reserved.

## 1. Introduction

Well-established barriers to contraception use center around education, cost, and access [1]. Advances in health insurance provision, such as the Patient Protection and Affordable Care Act, have addressed some of these concerns by reducing out-of-pocket patient costs [2]. Successful efforts to expand access to a broad range of contraceptive methods, focusing on intrauterine devices (IUDs) and implants, have been described, including a statewide project in Colorado that effectively

facilitated availability through agencies receiving Title X funds (federal funding directed towards the provision of reproductive health services) [3]. This initiative successfully halved the teen pregnancy rate and avoided nearly \$70 million in public assistance funds [4]. The HER Salt Lake community-based initiative also successfully engaged health centers receiving Title X funding to remove cost and access barriers to all effective contraceptive methods, demonstrating an increase in IUD and implant uptake [5].

While some local health departments (LHDs) receive Title X funding, many do not. LHDs, particularly in rural settings or areas with limited healthcare access, might be important providers able to address the healthcare needs of populations at risk for unintended pregnancy, particularly women with low income or low educational attainment. To better understand the role of LHDs in contraception provision, we surveyed LHDs in four Midwest states about their contraceptive services.

<sup>☆</sup> Declarations of interest: none.

\* Corresponding author. Tel.: +1 913 945 7892 (Office); fax: +1 913 588 2780.

E-mail addresses: [csatterwhite@kumc.edu](mailto:csatterwhite@kumc.edu) (C.L. Satterwhite), [vfrench@kumc.edu](mailto:vfrench@kumc.edu) (V. French), [mallison2@kumc.edu](mailto:mallison2@kumc.edu) (M. Allison), [thonderick@kumc.edu](mailto:thonderick@kumc.edu) (T. Honderick), [mramaswamy@kumc.edu](mailto:mramaswamy@kumc.edu) (M. Ramaswamy).

## 2. Materials and methods

We invited administrators from every LHD in Health and Human Services Region VII (Iowa, Kansas, Missouri, and Nebraska) to participate in a survey that included questions on staffing, patient population, and healthcare services provided. The survey was conducted as part of a larger project aimed at increasing HPV vaccination of age-eligible inmates in county jails through a partnership with county health departments [6]. Thus, only LHDs proximate to geographically-linked correctional facilities were eligible to participate. Two LHDs in Kansas and four in Missouri were ineligible based on these criteria. All remaining LHDs in the four Region VII states were eligible.

In Kansas, Missouri, and Iowa, almost all LHDs serve single-county or city-county jurisdictions [7–9]. In Nebraska, LHDs serve larger geographic areas of two or more counties and are classified as county health departments, city-county health departments, or district health departments [10]. After identifying contact information for all eligible LHDs, we sent an email invitation to administrators about our online survey. A week later, we followed up by phone with each LHD that had not yet responded to the survey to encourage participation. We made up to two additional reminder phone calls and sent one additional email request. If a response to the online survey had not been received before the second phone call and second email invitation, administrators could elect to complete the survey by phone. During each point of contact, we used a scripted introduction to the study. We stopped our contact efforts after we made a total of three phone calls and sent two email invitations. We collected data from September 2017 to April 2018. We used REDCap, a secure web-based application, hosted at the University of Kansas Medical Center for data collection and management [11].

All states in Region VII have a decentralized LHD model; control is held at the local level rather than the state [12]. Thus, decisions about LHD services and funding are made independently of the state health department. Each Region VII state has one primary Title X grantee (Iowa has two); these grantees receive state-level Title X funding and distribute funds to family planning providers across the state. We identified LHDs receiving Title X funding as of September 2017 using the Office of Population Affairs (OPA) Title X Directory, available by month on their website [13]. Most policies around LHDs address who qualifies for services rather than what services are offered. The LHDs in the four Region VII states vary substantially in size, staffing, and available facilities, ranging from LHDs without any clinical capabilities (small offices) to larger “full-service” LHDs with onsite clinics.

The primary outcome was the proportion of LHDs providing any prescription contraceptive method; secondary outcomes included types of contraceptive methods provided, training level of medical staff, provision of STI screening and treatment, provision of cervical cancer screening, and differences in services provided by state. These secondary outcomes are important components in the provision of quality family planning services [14]. We created categories to reflect availability of any short-acting hormonal contraceptive method (oral contraception pill, contraception patch, vaginal ring, and injectable

depo-medroxyprogesterone acetate) and any long-acting reversible contraceptive method (IUD, implant). We analyzed the proportion of LHDs providing condoms separately. Rurality designations reflect five classifications based on population density: frontier (<6.0 persons per square mile [ppsm]), rural (6.0–19.9 ppsm), densely-settled rural (20.0–39.9 ppsm), semi-urban (40.0–149.9 ppsm), and urban ( $\geq 150.0$  ppsm) [15]. For dichotomous analyses, we grouped rural categories (frontier, rural, densely-settled rural) and urban categories (semi-urban, urban) together. We calculated proportions for categorical variables, and means, medians, and standard deviations (SD) for continuous variables. One LHD that responded provided only state location information; therefore, we were unable to determine Title X funding status or rurality classification. To evaluate differences in proportions between states, we conducted *t*-tests and chi-square tests using SAS version 9.4 (Cary, NC). The IRB at the University of Kansas Medical Center approved this study.

## 3. Results

Of 344 LHDs invited, 237 completed the survey (68.9%). Survey completion ranged from 62.0% to 78.3% by state (Iowa: 62.0%, 62/100; Kansas: 67.0%, 69/103; Missouri: 77.9%, 88/113; Nebraska: 78.3%, 18/23). When we compared LHDs included in analyses to LHDs not included due to either incompleteness or non-response, population density was similar (mean number of people per square mile: 76, SD=332 vs. 59, SD=158; respectively,  $p=.49$ ). Among participating LHDs, the median number of patients served annually was 2000, a third of whom were uninsured (Table 1). Three-quarters of counties were classified as rural (72.5%, 171/236).

One-third of LHDs provided some form of prescription contraception (34.6%); all of these provided at least one type of short-acting hormonal contraception (Table 2). Oral contraception pills were most commonly provided (33.3%), followed by injectable depo-medroxyprogesterone acetate (32.9%). Only 8.4% of participating LHDs provided IUDs, and 7.6% provided implants. Overall, 5.9% provided both types of long-acting methods. LHDs in Nebraska and Kansas were more likely to provide either IUDs or implants (Kansas: 17.4%; Nebraska: 16.7%; Iowa: 8.1%; Missouri: 4.6%;  $p=.04$ ). Short-acting hormonal contraception availability was not uniform across states, ranging from 58.0% of Kansas LHDs providing these types of contraception to 9.7% of LHDs in Iowa ( $p<.01$ ). These differences in short-acting hormonal contraception availability were driven by state differences in the availability of oral contraception and injectable depo-medroxyprogesterone acetate. LHD receipt of Title X funds also differed by state, ranging from 48.5% in Kansas to 5.6% in Nebraska; LHDs that received Title X funds were much more likely to provide robust contraception access (85.1% of Title X LHDs provided short-term hormonal contraception vs. 14.2% of non-Title X LHDs,  $p<.01$ ; IUDs: 23.9% vs. 1.8%; implants: 25.4% vs. 0.6%, respectively, both  $p<.01$ ).

Beyond prescription contraception, substantial variation in the proportion of LHDs that provided common sexual health services existed (Table 2). Overall, LHDs in Kansas and Missouri were more likely than LHDs in Iowa or Nebraska to provide clinical services for STI testing

**Table 1**  
Characteristics of participating local health departments (LHDs) in HHS Region VII, by state, 2017–2018 ( $n=237$ )

	Overall ( $n=237$ )	Iowa ( $n=62$ )	Kansas ( $n=69$ )	Missouri ( $n=88$ )	Nebraska ( $n=18$ )
Number of eligible LHDs	339	100	103	113	23
Number of employees	14 ± 20	12 ± 13	10 ± 22	16 ± 20	19 ± 30
Number of patients served per year	4295 ± 6613	1231 ± 2131	2686 ± 4129	7010 ± 8269	6096 ± 8212
Percentage of patients who are racial or ethnic minorities	15.6 ± 20.9	12.2 ± 16.7	19.6 ± 25.0	12.8 ± 17.6	25.6 ± 27.2
Percentage of patients who are uninsured	34.3 ± 27.7	27.0 ± 31.0	23.7 ± 21.4	45.9 ± 24.7	40.9 ± 28.4
Percentage of patients aged <18 years	45.3 ± 26.8	34.6 ± 31.5	48.3 ± 22.0	52.9 ± 23.4	36.9 ± 27.1

Data presented as mean ± standard deviation.<sup>a</sup>

HHS=Health and Human Services.

<sup>a</sup> A variable number of missing values were present in each category (range: 8 to 39). The mean and standard deviation were calculated using the data from all local health departments that provided information.

**Table 2**  
Types of reproductive health services provided at local health departments in HHS Region VII, by state, 2017–2018 (n=237)

	Overall (n=237)	Iowa (n=62)	Kansas (n=69)	Missouri (n=88)	Nebraska (n=18)
Short-acting hormonal contraception					
Any <sup>a,b</sup>	82 (34.6)	6 (9.7)	40 (58.0)	33 (37.5)	3 (16.7)
Oral contraception pill <sup>b</sup>	79 (33.3)	6 (9.7)	37 (53.6)	33 (37.5)	3 (16.7)
Contraception patch	25 (10.6)	4 (6.5)	9 (13.0)	10 (11.4)	2 (11.1)
Vaginal ring	28 (11.8)	4 (6.5)	10 (14.5)	12 (13.6)	2 (11.1)
Depo-provera <sup>b</sup>	78 (32.9)	6 (9.7)	39 (56.5)	31 (35.2)	2 (11.1)
Long-acting reversible contraception					
Any <sup>a,b</sup>	24 (10.1)	5 (8.1)	12 (17.4)	4 (4.6)	3 (16.7)
Both IUD and implant	14 (5.9)	4 (6.5)	5 (7.3)	3 (3.4)	2 (11.1)
IUD	20 (8.4)	4 (6.5)	10 (14.5)	3 (3.4)	3 (16.7)
Implant	18 (7.6)	5 (8.1)	7 (10.1)	4 (4.6)	2 (11.1)
Condom availability <sup>b</sup>	165 (69.6)	30 (48.4)	51 (73.9)	82 (93.2)	2 (11.1)
Pregnancy testing <sup>b</sup>	155 (65.4)	11 (17.7)	60 (87.0)	81 (92.1)	3 (16.7)
STI testing and treatment <sup>b</sup>	138 (58.2)	12 (19.4)	50 (72.5)	71 (80.7)	5 (27.8)
Cervical cancer screening <sup>b</sup>	80 (33.8)	9 (14.5)	34 (49.3)	32 (36.4)	5 (27.8)
Under 18 able to consent <sup>b,c</sup>	114 (48.1)	13 (21.0)	42 (60.9)	56 (63.6)	3 (16.7)
Title X recipient <sup>b,d</sup>	67 (28.4)	6 (9.7)	33 (48.5)	27 (30.7)	1 (5.6)

Data presented as n (%).

IUD = intrauterine device; STI = sexually transmitted infection; HHS=Health and Human Services.

<sup>a</sup> Any short-acting hormonal contraceptive method includes: oral contraception pill, contraception patch, vaginal ring, and injectable depo-medroxyprogesterone acetate. Any long-acting reversible contraceptive method includes: IUD and implant.

<sup>b</sup> For state-level comparisons, p<.01 (chi-square test). For any long-term contraception, p=.04.

<sup>c</sup> Respondents were asked if youth under the age of 18 were able to consent for sexual health services.

<sup>d</sup> One respondent from Kansas did not indicate county, so receipt of Title X funds could not be determined.

and cervical cancer screening. Pregnancy testing was also widely available in Missouri and Kansas (92.1% and 87.0%, respectively) and less commonly available in Iowa and Nebraska (17.7% and 16.7%) (p<.01). Condoms were provided at most LHDs in Missouri (93.2%), but rarely in Nebraska (11.1%) (p<.01), with 48.4% of LHDs in Iowa and 73.9% of LHDs in Kansas providing condoms.

While there were no differences in the proportion of LHDs providing prescription contraception by population density, urban LHDs were more likely than rural LHDs to offer a broader range of contraceptive methods. Both urban and rural LHDs had similar availability of oral contraception and injectable depo-medroxyprogesterone acetate, but rural LHDs were less likely to provide vaginal rings (7.6% vs. 23.1%, respectively, p<.01) and patches (7.0% vs. 20.0%, p<.01). IUD availability was similar between urban and rural LHDs, but subdermal implants were provided less frequently in rural LHDs (5.3% vs. 13.9%, p=.03). STI testing and cervical cancer screening were also more likely to be provided in urban LHDs (data not shown). Title X funding did not differ by LHD population density.

Most LHDs relied on a registered nurse (RN) to provide medical care (Table 3). Nearly all LHDs reported staffing an RN at least one day a month, and 81.0% (192/237) reported that an RN provided care on 20

or more days per month. Most LHDs did not utilize a physician to provide healthcare services (86.9%). Of the 31 LHDs that reported any physician availability, 61.3% (19/31) reported physician access on two or fewer days per month. Kansas and Missouri were more likely than Iowa and Nebraska to engage a nurse practitioner (NP) or physician's assistant (PA). Of the LHDs that reported having an NP or PA provide care, 56.4% (44/78) utilized these providers on two or fewer days per month. Overall, LHDs serving rural populations were less likely than urban health departments to utilize medical staff with advanced training beyond RNs (rural vs. urban; physician: 8.2% vs. 24.6%; NP/PA: 28.7% vs. 44.6%; p<.01). While 76.0% of all surveyed LHDs reported the ability to bill third parties for costs, we found state-level variations ranging from 91.3% of LHDs in Kansas to 61.1% of Nebraska LHDs (p<.01).

**4. Discussion**

Access to prescription contraception, particularly long-acting reversible methods, in LHDs across the four surveyed Midwest states is limited. Substantial differences existed between states; LHDs in Kansas and Missouri were more likely to provide short-acting hormonal contraception, STI testing, pregnancy testing, and condoms.

**Table 3**  
Healthcare provider availability at local health departments in HHS Region VII, by state, 2017–2018 (n=237)

	Overall (n=237)	Iowa (n=62)	Kansas (n=69)	Missouri (n=88)	Nebraska (n=18)
Healthcare provider availability (≥1 days/month)					
Any physician	31 (13.1)	8 (12.9)	11 (15.9)	9 (10.2)	3 (16.7)
General physician	25 (10.6)	7 (11.3)	8 (11.6)	7 (8.0)	3 (16.7)
Obstetrician/gynecologist	9 (3.8)	2 (3.2)	3 (4.4)	3 (3.4)	1 (5.6)
Mid-level (NP/PA) <sup>a</sup>	79 (33.3)	8 (12.9)	33 (47.8)	35 (39.8)	3 (16.7)
Registered nurse <sup>a</sup>	232 (97.9)	60 (96.8)	68 (98.6)	88 (100.0)	16 (88.9)
Other services offered					
Substance abuse treatment <sup>a</sup>	214 (90.3)	49 (79.0)	66 (95.7)	84 (95.5)	15 (83.3)
Mental health services	30 (12.7)	7 (11.3)	9 (13.0)	12 (13.6)	2 (11.1)
Able to bill third party <sup>a</sup>	180 (76.0)	43 (69.4)	63 (91.3)	63 (71.6)	11 (61.1)

Data presented as n (%).

NP/PA = nurse practitioner/physician assistant; HHS=Health and Human Services.

<sup>a</sup> For state-level comparisons, p<.01 (chi-square test); for registered nurse comparisons, p=.02.

Several factors may impact whether LHDs offer prescription contraception. LHDs in our survey rely on RNs to provide healthcare, consistent with national staffing profiles of small LHDs in the United States [12]. While RNs are critical to the function of LHDs, the scope of clinical services they can offer is limited. In some settings, RNs can follow standing orders to provide prescription medication, which may facilitate offering short-acting contraceptive methods. In addition to staffing limitations and additional training needs, provision of long-acting reversible methods can be costly, both to have devices onsite and to provide for patients unable to pay for services. While most LHDs surveyed reported the ability to bill third parties for health services, we did not assess the frequency of this billing. National data suggest that insurance revenue is low, with 12% of LHD revenue coming from Medicare/Medicaid and 1% coming from private insurers [12].

Federally Qualified Health Centers (FQHCs) are another source of publicly-funded contraceptive methods. Availability of IUDs and implants varies at FQHCs [16,17]. One survey found that 71% of large FQHCs offered IUDs onsite compared with 56% of small/medium FQHCs, and even fewer offered implants [16]. Barriers cited included the cost of stocking devices, lack of trained staff to place devices, and poor reimbursement, similar to the barriers faced by LHDs. Conversely, receipt of Title X funds increases the likelihood of publicly-funding health centers offering long-acting reversible methods, similar to our findings [17]. In one study of clinics offering reproductive health services, health departments were substantially less likely than other locations (Planned Parenthood clinics, hospital-based clinics) to offer long-acting reversible contraceptive methods. Rural health centers offered these methods less often than urban centers (40% vs. 69%), consistent with our LHD findings. In contrast, most LHDs in our survey offered at least one clinical service (most commonly prenatal education), but rarely provided more resource-intensive services, like the provision of IUDs or implants.

Investing in family planning services available through publicly-funded health centers has potential for considerable cost-savings by reducing unintended pregnancies. Public insurance pays for over two-thirds (68%) of unintended pregnancies, compared to 38% of planned pregnancies [18]. LHDs are also largely publicly-funded; 87% of LHD revenue comes from federal, state, and local public sources [12]. Ultimately, public costs for births, abortions, and miscarriages from unintended pregnancies total over \$20 billion. In 2008, the estimated Medicaid cost for one birth was \$12,613 [19]. In comparison, the yearly cost for contraception care was \$257 per woman. Every \$1 spent on publicly-funded family planning saves \$3.94 in prenatal care and \$7.09 for Medicaid overall [20]. Long-acting reversible contraceptive methods are particularly cost-effective, largely due to their effectiveness at preventing pregnancy [21]. Investing in the prevention of unintended pregnancies can reduce future public expenditures.

LHDs serve a unique patient population that often faces health disparities. Barriers to contraception use align with disparities at multiple levels: patient, providers, and the health system [22]. Minority women and women of lower socio-economic status experience worse family planning outcomes, including unintended pregnancies. These women are also less likely to use contraception. Insurance availability further complicates contraception access, as low-income women are less likely to be consistently insured [23]. Additionally, many women who live in rural states have limited geographic access to prescription contraception, especially IUDs and implants, through publicly-funded health centers. This is particularly true for women in Nebraska, where fewer LHDs serve large geographic areas, although we also found inconsistent access across Kansas, Missouri, and Iowa [24].

While direct service provision is a feasible way to increase population access to all types of prescription contraception, a more sustainable approach may be for LHDs to take a greater leadership role in expanding contraception access through a Public Health 3.0 approach [25]. In this approach, LHDs partner with local healthcare providers—primary care providers, area hospitals, rural health clinics, other Title X clinics—and leverage other aspects of public health promotion, such as community

education, to increase access to and facilitate patient linkage with clinical preventive services. LHDs in the four states we surveyed are funded at lower levels than other LHDs across the country, and expansion of services at LHDs may not be feasible [12]. Further, proposed Title X changes that would exclude funding for clinics offering abortion services will likely reduce the number of clinics able to offer contraception to low-income women [26]. These changes will also eliminate the requirement that Title X recipients offer a broad range of contraceptive options [26]. Based on our findings, LHDs in our region are not prepared to absorb the resulting contraceptive access gap from the proposed Title X changes.

Our findings have limitations. We only asked about the provision of contraception; this may be an underestimate of actual services made available through LHDs. It is possible that these services are being provided through contracts with local partners. However, only 6% of LHDs report using outside contracts to provide family planning services [12]. We also did not ask about the provision of emergency contraception, possibly underestimating overall access to short-acting contraception. Additionally, the data we collected are self-reported and may not be entirely accurate. For example, just under half of LHDs indicated that youth under the age of 18 years were able to consent for sexual health services, with substantial differences by state. In all four of the states surveyed, minors are legally able to consent for some sexual health services [27]. These reported discrepancies between state laws and local practice may be due to: 1) lack of local awareness of state-level statutes, 2) possible consent practices dictated by the LHDs that conflict with state policy, 3) limited availability of patient-level services (i.e., LHD only offered vaccines), making the applicability of youth consent less pertinent, or 4) broad survey question phrasing that failed to capture situations where youth consent was not uniformly available.

Our findings highlight that LHDs in HHS Region VII are currently ill-equipped to offer comprehensive contraceptive services. State level policy changes that support the role of LHDs in contraception care would improve access for women, particularly those in rural counties.

## Acknowledgements

We would like to thank Brynne Musser and Katherine Gwynn for their invaluable help in collecting data.

## Funding

This work was supported by the National Cancer Institute, National Institutes of Health (grant R21 CA204767, “Correctional and public health links to bolster HPV vaccine and cancer prevention,” PI: Megha Ramaswamy).

## References

- [1] American College of Obstetricians and Gynecologists. Access to contraception. Committee opinion no. 615. *Obstet Gynecol* 2015;125:250–5.
- [2] Pace LE, Dusetzina SB, Keating NL. Early impact of the affordable care act on uptake of long-acting reversible contraceptive methods. *Med Care* 2016;54(6):811–7.
- [3] Ricketts S, Klingler G, Schwalberg R. Game change in Colorado: widespread use of long-acting reversible contraceptives and rapid decline in births among young, low-income women. *Perspect Sex Reprod Health* 2014;46(3):125–32.
- [4] Colorado Department of Public Health and Environment. Taking the unintended out of pregnancy: Colorado's success with long-acting reversible contraception, January 2017. [https://www.colorado.gov/pacific/sites/default/files/PSD\\_TitleX3\\_CFPPI-Report.pdf](https://www.colorado.gov/pacific/sites/default/files/PSD_TitleX3_CFPPI-Report.pdf), Accessed date: 30 January 2019.
- [5] Sanders JN, Myers K, Gawron LM, Simmons RG, Turok DK. Contraceptive method use during the community-wide HER salt Lake contraceptive initiative. *Am J Public Health* 2018;108(4):550–6.
- [6] Allison M, Musser B, Satterwhite C, Ault K, Kelly P, Ramaswamy M. Human papillomavirus vaccine knowledge and intention among adult inmates in Kansas, 2016–2017. *Am J Public Health* 2018;108(8):1000–2.
- [7] Kansas Department of Health and Environmental Resources. Bureau of Community Health Systems, Kansas Public Health Directory. [http://www.kdheks.gov/olrh/download/health\\_directory.pdf](http://www.kdheks.gov/olrh/download/health_directory.pdf), Accessed date: 1 August 2017.
- [8] Iowa Department of Public Health, Bureau of Local Public Health Services, County Public Health Contacts. [https://idph.iowa.gov/Portals/1/userfiles/147/lph\\_addresses.pdf](https://idph.iowa.gov/Portals/1/userfiles/147/lph_addresses.pdf), Accessed date: 1 August 2017.

- [9] Missouri Department of Health & Senior Services Local Public Health Agencies. <https://health.mo.gov/living/lpha/pdf/printablelisting.pdf>, Accessed date: 1 August 2017.
- [10] Department of Health & Human Services Nebraska Health Departments. <http://dhhs.ne.gov/publichealth/Documents/contacts.pdf>, Accessed date: 1 August 2017.
- [11] Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, Conde JG. Research electronic data capture (REDCap) – a metadata-driven methodology and workflow process for providing translational research informatics support. *J Biomed Inform* 2009;42(2):377–81.
- [12] National Association of County & City Health Officials. 2016 National Profile of Local Health Departments. [http://nacchoprofilestudy.org/wp-content/uploads/2017/10/ProfileReport\\_Aug2017\\_final.pdf](http://nacchoprofilestudy.org/wp-content/uploads/2017/10/ProfileReport_Aug2017_final.pdf).
- [13] Office of Population Affairs. Title X Family Planning Directory, September 2017. <https://www.hhs.gov/opa/sites/default/files/Title-X-Directory-September-2017.pdf>.
- [14] Centers for Disease Control and Prevention (CDC). Providing quality family planning services: Recommendations of CDC and the U.S. Office of Population Affairs. *MMWR Morb Mortal Wkly Rep* 2014;63(RR04):1–29.
- [15] Gunter J, Hurd GM, Wedel S, Weller T. Kansas statistical abstract 2017. University of Kansas Institute for policy and Social Research. <https://ipsr.ku.edu/ksdata/ksah/KSA52.pdf>; 2018.
- [16] Beeson T, Wood S, Bruen B, Goetz Goldberg D, Mead H, Rosenbaum S. Accessibility of long-acting reversible contraceptives (LARCs) in federally qualified health centers (FQHCs). *Contraception* 2014;89(2):91–6.
- [17] Bornstein M, Carter M, Zapata L, Gavin L, Moskosky S. Access to long-acting reversible contraception among US publicly funded health centers. *Contraception* 2018;97(5):405–10.
- [18] Sonfield A, Kost K. Public Costs from Unintended Pregnancies and the Role of Public Insurance Programs in Paying for Pregnancy-Related Care: National and State Estimates for 2010. New York: Guttmacher Institute. <https://www.guttmacher.org/report/public-costs-unintended-pregnancies-and-role-public-insurance-programs-paying-pregnancy>; 2015.
- [19] Cleland K, Peipert JF, Westhoff C, Spear S, Trussell J. Family planning as a cost-saving preventive health service. *N Engl J Med* 2011;364(18):e37.
- [20] Frost JJ, Sonfield A, Zolna MR, Finer LB. Return on investment: a fuller assessment of the benefits and cost savings of the US publicly funded family planning program. *Milbank Q* 2014;92(4):696–749.
- [21] Trussell J, Lalla AM, Doan QV, Reyes E, Pinto L, Gricar J. Cost effectiveness of contraceptives in the United States. *Contraception* 2009;79(1):5–14.
- [22] Dehlendorf C, Rodriguez MI, Levy K, Borrero S, Steinauer J. Disparities in family planning. *Am J Obstet Gynecol* 2010;202(3):214–20.
- [23] The Henry J. Kaiser Family Foundation. Women's coverage, access, and affordability: Key findings from the 2017 Kaiser Women's health survey. Women's health policy. <https://www.kff.org/womens-health-policy/issue-brief/womens-coverage-access-and-affordability-key-findings-from-the-2017-kaiser-womens-health-survey/>; 2018.
- [24] Power to Decide. Access to Birth Control. <https://powertodecide.org/what-we-do/access-access-birth-control>, Accessed date: 14 August 2018.
- [25] DeSalvo KB, O'Carroll PW, Koo D, Auerbach JM, Monroe JA. Public health 3.0: time for an upgrade. *Am J Public Health* 2016;106(4):621–2.
- [26] Sobel L, Rosenzweig C, Salganicoff A. Proposed changes to title X: Implications for women and family planning providers. The Henry J. Kaiser Family Foundation. <https://www.kff.org/womens-health-policy/issue-brief/proposed-changes-to-title-x-implications-for-women-and-family-planning-providers/>; 2018.
- [27] An overview of Minors' consent law. New York: Guttmacher Institute; 2018. <https://www.guttmacher.org/state-policy/explore/overview-minors-consent-law>.