ORIGINAL ARTICLE

Using a Community Engagement Approach to Enhance Contraception Awareness in Rural Western North Carolina

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BACKGROUND Unintended pregnancy rates remain higher than the national average in North Carolina. Although long-acting reversible contraception (LARC) use has reduced rates of unintended pregnancy, this contraceptive method is widely underused, often due to low community awareness. Boot Camp Translation is a community engagement process that promotes community awareness of evidence-based medical recommendations by designing culturally meaningful messages.

METHODS We tested the feasibility of the Boot Camp Translation process to expand awareness about LARC in 2 rural Western North Carolina counties. After our intervention, we conducted surveys at 4 local clinics, asking patients if and where they saw LARC messages.

RESULTS The recruited community members had a participation rate of 93% throughout the intervention. A local nurse practitioner, health department nursing supervisor, health educator, and pre-medical student collaborated with local community members to disseminate culturally meaningful messages about LARC through social media, a website, promotional items, posters, and sexual education talks at local schools. Among women surveyed, 48.9% saw LARC campaign messages and of those, 57% saw messages through social media posts. Post-intervention, 6 local schools implemented a comprehensive sexual education curriculum.

LIMITATIONS Our pilot project was not designed to quantitatively assess the community reception to our intervention, our intervention's impact on community knowledge about LARC methods, or changes in contraception practices.

CONCLUSIONS We have demonstrated the feasibility of implementing Boot Camp Translation as a tool to enhance public awareness of contraception. This community engagement method underscores the benefit of empowering community members in public health projects.

Unintended pregnancy remains a national public health concern in the United States, with almost half (45%) of women reporting an unintended pregnancy, compared to 27% of women in Western Europe [1]. Unintended pregnancy rates are higher in low-income women, women of color, and women with lower levels of education [2]. The majority of teen births are the result of unintended pregnancies, and although rates have declined in recent years, they remain highest in rural regions [3]. In the United States, 52% of unintended pregnancies occur in women who are not using contraception, and another 43% are due to inconsistent, incorrect, or failed contraception [4].

Long-acting reversible contraception (LARC) is widely regarded as a safe, effective, practical, long-lasting option for reducing unintended pregnancies [5]. The American College of Obstetricians and Gynecologists recommends LARC methods, which include intrauterine devices (IUDs) and contraceptive implants, as the first-line contraceptive choice for most women [6]. However, LARC methods are widely underused in the United States compared to other developed nations [7]. Some barriers to LARC use include high cost, lack of access, personal and cultural preferences, and concerns about the safety of IUDs [8]. In addition, inadequate community awareness and misconceptions about LARC methods have been cited as important barriers to LARC use, particularly among adolescents [9, 10].

It can take years or even decades for accepted medical advances to be implemented broadly in clinical practice in a community [11, 12]. To address this problem, Westfall and colleagues developed the Boot Camp Translation method [13], a process that accelerates implementation of evidence-based recommendations in patient care. In the Boot Camp Translation method, community members and health care professionals collaboratively work to design and disseminate health messages that resonate with members of a given community [14]. Westfall and colleagues utilized the Boot Camp Translation method in rural Colorado and demonstrated higher rates of colon cancer screening and improved management of asthma and hypertension [15, 16].

Our review of the literature found no evidence that the Boot Camp Translation method had been used to promote awareness of contraception. In many communities, especially rural regions, contraception remains a controversial topic. In North Carolina for example, many schools do not provide comprehensive sexual education, including information about LARC [17]. The unintended pregnancy rate in North Carolina is 54%, which is higher than the national average of 45% [18, 19]. Unintended pregnancy in North

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Carolina is more common among Black and Latinx women, low-income women, and women who have attained less than a high school diploma [19]. One qualitative study showed that local community members in rural Appalachia reported "lack of knowledge" about contraception as a critical barrier to reproductive health access [20]. Increased LARC awareness is associated with increased LARC use [9]. Thus, innovative public health approaches that enhance awareness about contraception, including LARC, should be considered to help address the high rate of unintended pregnancies in North Carolina.

In 2016–2017, the Mountain Area Health Education Center (MAHEC) in Asheville, North Carolina, in conjunction with a local health department, performed a pilot Boot Camp Translation project to enhance awareness of LARC in 2 rural counties in Western North Carolina. The 2 counties have higher rates of teen births compared to the North Carolina state average (Figure 1) [21]. In addition, the 2 counties are characterized by low population density (less than 40 000 persons combined in a region roughly 250–300 square miles), predominantly White (92.0% and 88.5%) and less-educated populations (15.8% and 15.5% having less than a high school diploma compared to the statewide average of 12.6%), with lower incomes (median household incomes of $39 888 and $44 186, versus the statewide average of $52 413), and higher levels of poverty compared to the state average (Figure 2) [22]. Our primary objective with this pilot project was to test the feasibility of using Boot Camp Translation to expand awareness of LARC in 2 counties in rural Western North Carolina.

Methods

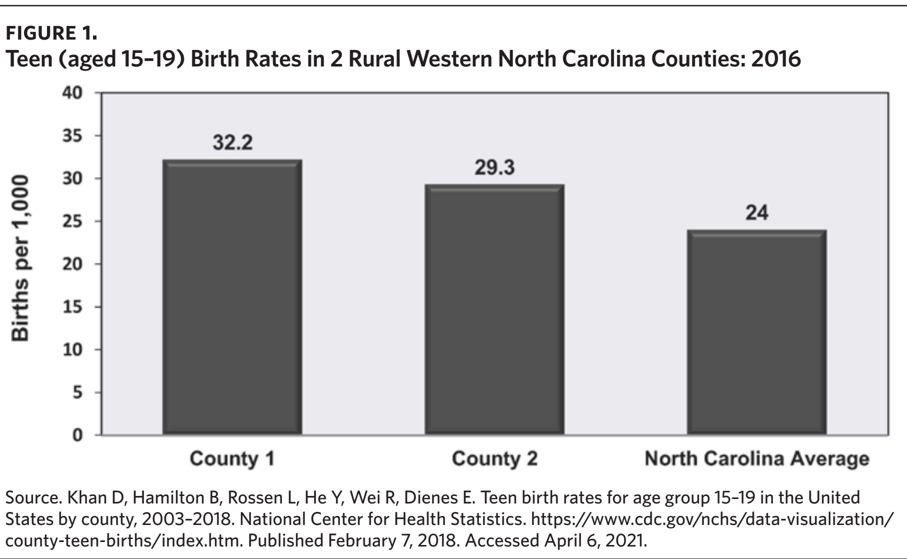
Intervention

A public health educator and a pre-medical college graduate, both MAHEC employees, guided and provided logistical support for the Boot Camp Translation method, subsequently referred to as the boot camp process. The clinical supervisor from the health department recruited participants and disseminated contraception campaign materials. A women's health nurse practitioner at a local private practice provided medical professional consultation and expertise throughout the process.

In August 2016, the clinical supervisor recruited a team of community members from the 2 counties to participate in the boot camp process. Throughout the fall of 2016, the community participants attended 5 meetings to design a medically accurate and culturally sensitive public health campaign about LARC. These meetings helped the group identify relevant medical information about LARC methods (taught by the nurse practitioner); public health messaging strategies (taught by the health educator and pre-medical college graduate); and local culture and community attitudes about contraception and pregnancy (taught by community members) to be woven into the LARC message. Each meeting included a presentation, a group discussion, and a vote by participants regarding the most relevant information to include in the LARC message (Table 1). Boot camp participants then incorporated the key concepts from each session into a LARC message that would resonate with their communities.

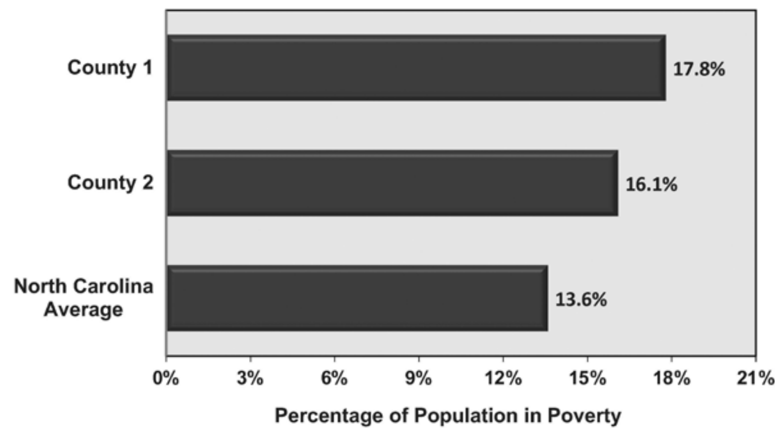
The participants chose to target the following populations for LARC messages: adolescents, couples, parents of both young children and teenagers, women of childbearing age, women with substance use disorders (and their loved ones), and postmenopausal women who might benefit from LARC for nonreproductive reasons. The message they developed was, "LARC (IUDs and implants) is safe, effective, affordable, and available; it works for women of all ages. Plan your story. Start the conversation early." Boot camp participants recruited prominent community members to serve as social media ambassadors for the campaign. Boot camp participants then obtained stories from community members about their personal experiences with pregnancy planning and with LARC to be shared anonymously as part of the campaign.

FIGURE 1.
Teen (aged 15–19) Birth Rates in 2 Rural Western North Carolina Counties: 2016



Source. Khan D, Hamilton B, Rossen L, He Y, Wei R, Dienes E. Teen birth rates for age group 15–19 in the United States by county, 2003–2018. National Center for Health Statistics. https://www.cdc.gov/nchs/data-visualization/county-teen-births/index.htm. Published February 7, 2018. Accessed April 6, 2021.

FIGURE 2.
Poverty Rates in 2 Rural Western North Carolina Counties: 2019



Source. U.S. Census Bureau. QuickFacts: Yancey County, North Carolina; Mitchell County, North Carolina; North Carolina. https://www.census.gov/quickfacts/fact/table/yanceycountynorthcarolina,mitchellcountynorthcarolina,NC/PST045219. Published 2019. Accessed October 10, 2020.

From March through May 2017, MAHEC staff and boot camp participants spread the planMYstory campaign (Table 1) through the health department's web page; social media posts; posters distributed to local social service organizations, businesses, and high school bathrooms (Table 2); posters, lip balms, and emery boards with LARC messages distributed in gift bags for graduating high school students, parents at kindergarten registration, and 400 participants at a children's festival; a newspaper article; and a radio show. The health department clinical supervisor and pre-medical college graduate conducted education sessions for parents about how to talk to children about values, sexual activity, and contraception. In addition, content related to LARC was integrated into sexual education talks at the middle schools and high school health education classes.

Evaluation

Two months after the campaign launched, a post-campaign voluntary, anonymous, paper-pencil survey was distributed in the waiting rooms of 2 health departments sites and 2 hospital-owned obstetrics and gynecology practices located in the main towns of each county. It included 3 demographic questions; 13 questions assessing knowledge, attitudes, and beliefs about LARC; and the following 2 questions to assess the campaign's reach: 1) "In recent months, have you seen or heard any messages about IUDs, implants or the planMYstory project?" and 2) "If so, where have you seen or heard the messages?" The Mission Hospital Institutional Review Board exempted this project from review because it was an anonymous survey.

Fifteen months after the campaign was launched, a semi-structured interview was conducted with the clinical supervisor at the health department to assess whether and how the campaign materials were still being used and to explore the impact of the campaign on community member practices and institutional policies.

Results

Feasibility

The clinical supervisor at the health department recruited 14 community participants within 1 month of project initiation. Community participants included a mayor, a school nurse, multiple high school staff, 3 high school students, 2 ministers, a labor and delivery nurse, a social worker, a community college counselor, an elementary school principal, and the director of a broad-based partnership of organizations and community members addressing local health issues. Among the recruited boot camp participants, 93% (13 of 14) continued their participation for the duration of the project. The boot camp participants and other community members they recruited eagerly served as social media ambassadors, which entailed posing in campaign photographs and sharing anonymous stories about pregnancy and contraception. Participants also reported sharing their newly acquired knowledge about LARC with colleagues, friends, and patients, when they had previously not discussed contraception openly. Local restaurants and businesses enthusiastically participated in posting the campaign materials and distributing posters.

The planMYstory campaign included in-person parent education sessions in 2 counties. One county historically had not provided comprehensive sexual education in schools, and participants in both counties reported widespread discomfort with discussing contraception. Attendance at initial optional parent education sessions was poor, but when the health department nurse arranged for the education sessions to be held at different businesses and community organizations during lunch hours, attendance improved, with most sessions having approximately 8–10 attendees.

Although our campaign was generally well received by the community, we encountered skepticism about the safety of LARC methods from a nurse living in the community; she

TABLE 1.
Development of the LARC Message in 2 Rural Western North Carolina Counties

Meeting	Topic	Key Concepts Boot Camp Participants Identified to Incorporate into the Development and Dissemination of the LARC Message
9/2016	Key medical information	▪ LARC (IUDs and implants) is safe, effective, affordable, and available ▪ LARC works for women of all ages
10/2016	How to say the message	▪ Use tailored and plain language ▪ Identify where things are going well ▪ Appeal to cultural identity of targeted community ▪ Spread message through multiple channels with unexpected messengers to deliver message
10/2016	County values, interests, attitudes about contraception and pregnancy	▪ Consider the important roles of sports and church in these communities ▪ Parents are concerned about talking to their teens about sexual activity, and they are afraid that talking about it condones it ▪ Teens in these communities receive sexual education after they have already initiated sexual activity ▪ There is not much knowledge about LARC, but people are supportive when they learn about its effectiveness—even parents of teens
12/2016	The LARC message	▪ New and improved IUDs and implants are safe, affordable, available, and more effective ▪ Plan for your future, start the conversation early
1/2017	How to spread the message	▪ Make a website with information about IUDs and implants and include local community members' (anonymous) stories about contraception and pregnancy ▪ Create posters featuring images of local community members with LARC message and information about availability and cost ▪ Create promotional items (lip balms and nail files) with LARC message, website link, and campaign hashtag ▪ Distribute promotional items and posters around public spaces (at restaurants, local businesses, schools) and at community events (5k race, high school prom) ▪ Use social media campaign to post information about LARC and share locals' stories (using hashtag #planMYstory); give presentations to organizations and parents ("how to talk to kids about this") ▪ Publish newspaper articles about campaign with medical information about IUDs and implants

responded to our local newspaper article about LARC and expressed her concerns about the safety of IUDs in a follow-up article. We responded to her concern in a follow-up opinion piece published in the same local newspaper, explaining that current scientific evidence supports the safety of LARC methods, that LARC is not the right method for everyone, and that women should ask their health care provider for more information. This exchange generated public interest and led to further public dialogue about LARC.

Post-Campaign Survey

Our post-campaign survey had a response rate of 92% (n = 92). The vast majority of participants were White, the age range was 18–44 years, and there was a wide range of education levels (Table 3). In the post-campaign survey data, 48.9% (n = 45) of respondents reported that in recent months they had seen messages about IUDs, contraceptive implants, or the planMYstory project. Among those who reported seeing the messages, 23 respondents provided additional information about where they saw the messages with the following responses: social media 57% (n = 13); community locations 18% (n = 4); radio 13% (n = 3); nail files and lip balms 4% (n = 1); presentations 4% (n = 1); and community events 4% (n = 1).

Post-Campaign Interview with Health Department Clinical Supervisor

In the post-intervention interview, the health department clinical supervisor provided several salient anecdotes about the impact of the campaign. First, several health department staff reported community members feeling more comfortable discussing teen sexuality, talking about LARC with their teenage children and children's friends, and having LARC discussed in school-based sexual education classes. Second, the planMYstory campaign led 1 of the county middle schools to expand its sexual education curriculum, which was previously abstinence-only, to include content about contraception. This change generated major attention and spurred 5 other schools in the 2 counties to adopt comprehensive sexual education curricula that included information about contraception. A total of 6 schools (4 middle schools and 2 high schools) in our targeted counties have allowed the health department staff to teach comprehensive sexual education since the campaign launched. Third, the health department supervisor observed a moderate increase in LARC placements at both local health departments following the planMYstory campaign; there was 1 LARC placed in the 1-month period prior to the campaign launch, 5 placed in the month following the campaign launch, and 13 LARCs placed in a 4-month period after the campaign had launched.

Discussion

Our recent review of the literature found no prior use of the Boot Camp Translation method to improve contraception awareness. We achieved our primary aim, demonstrating the feasibility of the Boot Camp Translation method for enhancing LARC awareness in a rural community. Despite having a small team and limited resources, we were read-

ily able to recruit a diverse group of community members and implement the Boot Camp Translation to promote LARC awareness in a rural setting. These community participants remained engaged and committed throughout the project and also volunteered to serve as social media ambassadors. The feasibility of our project was further enhanced by the reception from community leaders who eagerly participated in the social media campaign, and the numerous local businesses that enthusiastically agreed to help distribute campaign materials and posters.

Our post-project survey conducted at women's health clinics showed that nearly 50% of women had seen community messages, suggesting this type of community campaign can potentially reach targeted populations. In addition, our survey data showed that social media was the most common way women saw campaign messages. Based on our experience, we believe the Boot Camp Translation process is well suited to promote public health messages, especially through social media platforms.

Following our campaign, 6 schools in our campaign region changed their abstinence-only sexual education school policy and implemented a comprehensive sexual education curriculum that included content on contraception. Although this outcome was not an objective of the project, these policy changes could have a significant impact on contraception education and future use of LARC in these rural communities, especially among adolescents and young adults [23, 24].

Limitations

Our pilot project had several limitations. First, it was beyond the scope of our project to quantitatively assess the impact of our public health campaign on community knowledge about LARC or to objectively determine whether our education campaign significantly altered the rate of LARC utilization in these communities. Second, due to limitations of our survey methodology, we could not evaluate changes in knowledge or contraception practices in the subset of women who participated in the surveys. Third, the scope and funding of our pilot project limited the time frame for before-

TABLE 2.
PlanMYstory Campaign Strategies

Campaign Strategy	Outcome
Webpage for planMYstory	Web page was added to health department website containing the following sections: ▪ What's planMYstory? ▪ Why are IUDs and implants the first choice for birth control? ▪ How do these methods work (hormonal IUDs, nonhormonal IUDs, implants)? ▪ Debunking myths about IUDs and implants ▪ Rationale and tips for planning your future ▪ Why it's important to start the conversation early ▪ Real stories; what local community members are saying about pregnancy prevention, IUDs, and implants ▪ Talk to your doctor about whether an IUD or implant is right for you
Social media	▪ Facebook, Twitter, and Instagram pages were created for the planMYstory campaign ▪ 7 boot camp participants served and recruited other well-connected community members to serve as social media ambassadors ▪ The hashtag #planMYstory was used
Posters	▪ Prominent community members were recruited by boot camp participants to be featured in poster images ▪ The following images were used: 1) a mother talking to a teenager; 2) 2 male athletes and 1 female athlete wearing local high school sports jerseys; 3) a young couple; 4) a new mother and her baby; and 5) young women comforting an anxious peer ▪ Posters were created by MAHEC marketing with headlines tailored to different target audiences ▪ All posters had the planMYstory campaign message: "New and improved IUDs and Implants are safe, affordable, available, and more effective" and either said "Plan for your future" or "Start the conversation early" with additional phrases, "Talk to your doctor or contact the Health Department" with the phone numbers for each clinical location, the campaign webpage, and the hashtag #planMYstory ▪ Posters were distributed at public locations and businesses throughout the 2 counties, including medical practices, high schools, nail and beauty salons, restaurants, churches, and community centers
Promotional items	▪ Lip balms and nail files with the phrases, "Start the conversation early" or "Plan your future" and the campaign's webpage and hashtag were created ▪ Promotional items and posters were distributed at 7 community events for students, young parents, families
Education sessions	▪ Presentations were given by the health department supervisor for women, parents, and health professionals to learn more about LARC methods at 5 community sites, including the county DSS offices, middle and high schools, and the county library. At sessions, she distributed posters and promotional items
News coverage	▪ A newspaper article was published in both counties' newspapers titled "Sites of national innovation: community using a cutting-edge model to spread birth control message," featuring information about IUDs and implants, the planMYstory campaign, and the boot camp translation process, with quotes from boot camp participants ▪ The health department clinical supervisor was interviewed on a local radio show, where she discussed LARC methods and promoted the planMYstory campaign

TABLE 3.
Demographic Data for LARC Post-Campaign Survey Participants*

Characteristic	Survey Participant Response (N = 92)
Age (years)	
18–19	6 (6.5%)
20–24	21 (23%)
25–29	20 (22%)
30–34	13 (14%)
35–44	21 (23%)
> 44	10 (11%)
Education	
No high school diploma	7 (7.6%)
High school diploma or GED	31 (34%)
Some college	40 (44%)
Bachelor's degree or higher	13 (14%)
Race	
Black	0 (0.0%)
White	86 (94%)
Native American/American Indian	0 (0.0%)
Asian or Pacific Islander	1 (1.0%)
Other	2 (2.2%)

*The frequencies for many of these values do not exactly add up to 100% since the survey participants were able to select multiple answers or chose to not respond to questions.

intervention evaluation, implementation of the public health messages, and after-intervention follow-up. Fourth, it was beyond the scope of our project to perform a randomized intervention that would have included paired control counties that did not utilize the process to have a public health contraception campaign.

Last, we conducted in our intervention in a predominantly White community, which may limit the generalizability of our findings. We expect using the same Boot Camp Translation method with a different population would result in a very different message and dissemination plan. Further investigation is warranted to clarify whether this community engagement approach promoting contraception education would be feasible in Black and Latinx communities, given the history of forced sterilization imposed on these populations. It is important to note that this campaign sought to maintain a reproductive justice approach and focused on contraception education, encouraging women to decide if LARC was right for them, rather than discouraging pregnancies.

Conclusions

This pilot project suggests that the Boot Camp Translation method offers a promising approach in efforts to improve community awareness about LARC and other contraceptive methods. Our project underscores the power of recruiting community members to participate in public health projects that promote awareness about potentially controversial topics, such as contraception. To effectively disseminate culturally sensitive messages about contraception throughout local North Carolina communities, we believe public health approaches that engage local community members and use social media platforms may be more effective than standardized national campaign methods [12]. This approach could help North Carolina communities achieve the Healthy North Carolina 2030 objective of reducing the teen birth rate [25]. Furthermore, this strategy could be a component of broader efforts to reduce rural health disparities in North Carolina [26].

Future initiatives are needed to more extensively implement and evaluate Boot Camp Translation as a tool for enhancing contraception awareness in both rural and urban communities in North Carolina. We conducted our intervention in majority-White, rural, low-income communities; further initiatives are needed to explore whether this approach would successfully promote contraception in communities with more racial and ethnic diversity, especially given that Black and Latinx women have the highest risk for unintended pregnancy in North Carolina. Given the historical legacy of reproductive coercion and forced sterilization of vulnerable populations in North Carolina [27], particularly among communities of color, a reproductive justice approach must be maintained with future boot camp initiatives, ensuring that subsequent public health campaigns provide educational materials about contraception in a patient-centered, noncoercive way that promotes reproductive autonomy.

Future studies should also include adequate infrastructure to perform multiyear dissemination of Boot Camp Translation campaigns, adequate baseline evaluation, and long-term follow-up to assess whether use of this community-engagement strategy will have a significant impact on contraception use and unintended pregnancy rates. Finally, future studies should evaluate the optimal strategies and the promising role of using social media platforms when implementing public health educational initiatives in rural communities. NCMJ

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References

1. Sedgh G, Singh S, Hussain R. Intended and unintended pregnancies worldwide in 2012 and recent trends. Stud Fam Plann. 2014;45(3):301–314. doi:10.1111/j.1728-4465.2014.00393.x
2. Finer LB, Zolna MR. Declines in unintended pregnancy in the United States, 2008–2011. N Engl J Med. 2016;374(9):843–852. doi:10.1056/NEJMsa1506575
3. Hamilton BE, Rossen LM, Branum AM. Teen birth rates for urban and rural areas in the United States, 2007-2015. NCHS Data Brief. 2016;(264):1–8.
4. Sonfield A, Hasstedt K, Gold R. Moving Forward: Family Planning in the Era of Health Reform. Guttmacher Institute; 2014. Accessed June 15, 2020.https://www.guttmacher.org/sites/default/files/report_pdf/family-planning-and-health-reform.pdf
5. Sundaram A, Vaughan B, Kost K, et al. Contraceptive failure in the United States: estimates from the 2006-2010 national survey of family growth. Perspect Sex Reprod Health. 2017;49(1):7–16. doi:10.1363/psrh.12017
6. Committee Opinion No. 642: Increasing access to contraceptive implants and intrauterine devices to reduce unintended pregnancy. Obstet Gynecol. 2015;126(4):e44–e48. doi: 10.1097/AOG.0000000000001106
7. Whitaker AK, Sisco KM, Tomlinson AN, Dude AM, Martins SL. Use of the intrauterine device among adolescent and young adult women in the United States from 2002 to 2010. J Adolesc Health. 2013;53(3):401–406. doi:10.1016/j.jadohealth.2013.04.011
8. Coles CB, Shubkin CD. Effective, recommended, underutilized: a review of the literature on barriers to adolescent usage of long-acting reversible contraceptive methods. Curr Opin Pediatr. 2018;30(5):683–688. doi:10.1097/MOP.0000000000000663
9. Secura GM, Allsworth JE, Madden T, Mullersman JL, Peipert JF. The contraceptive CHOICE project: reducing barriers to long-acting reversible contraception. Am J Obstet Gynecol. 2010;203(2):115.e1–115.e7. doi:10.1016/j.ajog.2010.04.017
10. Frost JJ, Lindberg LD, Finer LB. Young adults' contraceptive knowledge, norms and attitudes: associations with risk of unintended pregnancy. Perspect Sex Reprod Health. 2012;44(2):107–116. doi:10.1363/4410712
11. Morris ZS, Wooding S, Grant J. The answer is 17 years, what is the question: understanding time lags in translational research. J R Soc Med. 2011;104(12):510–520. doi:10.1258/jrsm.2011.110180
12. Woolf SH. The break-even point: when medical advances are less important than improving the fidelity with which they are delivered. Ann Fam Med. 2005;3(6):545–552. doi:10.1370/afm.406
13. Westfall JM, Zittleman L, Felzien M, et al. Reinventing the wheel of medical evidence: how the Boot Camp Translation Process is making gains. Health Aff (Millwood). 2016;35(4):613–618. doi:10.1377/hlthaff.2015.1648
14. English AF, Dickinson LM, Zittleman L, et al. A community engagement method to design patient engagement materials for cardiovascular health. Ann Fam Med. 2018;16(Suppl 1):S58–S64. doi:10.1370/afm.2173
15. Thompson JH, Davis MM, Leo MC, et al. Participatory research to advance colon cancer prevention (PROMPT): study protocol for a pragmatic trial. Contemp Clin Trials. 2018;67:11–15. doi:10.1016/j.cct.2018.02.001
16. Norman N, Bennett C, Cowart S, et al. Boot Camp Translation: a method for building a community of solution. J Am Board Fam Med. 2013;26(3):254–263. doi:10.3122/jabfm.2013.03.120253
17. Sex Ed for Social Change. The SEICUS State Profile: North Carolina State Profile. Published April 7, 2020. Accessed October 11, 2020. https://siecus.org/state_profile/north-carolina-state-profile.
18. Kost K. Unintended Pregnancy Rates at the State Level: Estimates for 2010 and Trends Since 2002. Guttmacher Institute; 2015. Accessed April 6, 2021. https://www.guttmacher.org/sites/default/files/report_pdf/stateup10.pdf
19. State Center for Health Statistics. North Carolina PRAMS fact sheet: unintended pregnancies 2004–2006. NCDHHS; 2009. Accessed April 6, 2021. https://schs.dph.ncdhhs.gov/schs/pdf/Unintended-Pregnancies.pdf
20. Swan LET, Auerbach SL, Ely GE, Agbemenu K, Mencia J, Araf NR. Family planning practices in Appalachia: focus group perspectives on service needs in the context of regional substance abuse. Int J Environ Res Public Health. 2020;17(4):1198. doi:10.3390/ijerph17041198
21. Khan D, Hamilton B, Rossen L, He Y, Wei R, Dienes E. Teen Birth Rates for Age Group 15–19 in the United States by County, 2003–2018. National Center for Health Statistics; 2018. Accessed April 6, 2021. https://www.cdc.gov/nchs/data-visualization/county-teen-births/index.htm.
22. US Census Bureau. QuickFacts: Yancey County, North Carolina; Mitchell County, North Carolina; North Carolina. Published 2019. Accessed October 10, 2020. https://www.census.gov/quickfacts/fact/table/yanceycountynorthcarolina,mitchellcountynorthcarolina,NC/PST045219
23. Denford S, Abraham C, Campbell R, Busse H. A comprehensive review of reviews of school-based interventions to improve sexual-health. Health Psychol Rev. 2017;11(1):33–52. doi:10.1080/17437199.2016.1240625
24. Paik A, Sanchagrin KJ, Heimer K. Broken promises: abstinence pledging and sexual and reproductive health. J Marriage Fam. 2016;78(2):546–561. doi:10.1111/jomf.12279
25. North Carolina Institute of Medicine. Healthy North Carolina 2030: A Path Toward Health. NCIOM; 2020. Accessed October 10, 2020. http://nciom.org/wp-content/uploads/2020/01/HNC-REPORT-FINAL-Spread2.pdf.
26. Richman L, Pearson J, Beasley C, Stanifer J. Addressing health inequalities in diverse, rural communities: an unmet need. SSM - Popul Health. 2019;7:100398. doi:10.1016/j.ssmph.2019.100398
27. Price GN, Darity WA. The economics of race and eugenic sterilization in North Carolina: 1958–1968. Econ Hum Biol. 2010;8(2):261–272. doi:10.1016/j.ehb.2010.01.002