

Community Meetings on the Rural Opioid Crisis: Setting a Path Forward by Learning from Others

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ABSTRACT

OBJECTIVES: This study implemented a series of meetings in one rural community struggling with the opioid crisis. Set in the town of Ardmore, Oklahoma, these meetings presented local residents who dealt with the crisis as part of their jobs with four categories of programs aimed at preventing and treating opioid-related issues. The ultimate goal was for the participants to develop a consensus about where resources should be appropriated in the future, based off the needs of the area.

METHODS: Three community meetings were held over a six-week period, with an average of 40 attendees. Data was collected through surveys, study circles, and a participant voting exercise. Surveys were distributed at the beginning and end of the meetings to determine if participant views changed over the course of the study. Study circles broke participants into small groups and prompted them with questions regarding the crisis to encourage group discussion. The participant voting exercise allowed participants to note where they would like future resources to be directed.

FINDINGS: Listening to experts and holding group discussions led to changes in opinions for some participants. Most felt that the most pressing need was to provide accessible opioid treatment options in their community. Youth-based prevention efforts were also noted as being a program that the community should focus on.

CONCLUSIONS: Local perceptions of the most appropriate strategies for combatting the rural opioid crisis can change with group discussions alongside others who are actively involved with this issue. Future research should actively involve affected communities in order to develop relevant and accepted action plans.

KEYWORDS: opioid epidemic, community meetings, opioid treatment, opioid prevention

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Introduction

Although the opioid epidemic has negatively impacted the entirety of the U.S. in recent years, rural areas have been especially affected. The Centers for Disease Control and Prevention (CDC) now estimates that the opioid death rate is higher in rural communities in comparison to urban ones.¹ This difference is due to a variety of factors. Rural areas do not have extensive access to substance abuse treatment options, and also face higher rates of opioid prescribing by physicians.²⁻⁴ Additionally, the societal dynamics of rural communities may promote opioid misuse. Stigmas surrounding receiving substance abuse treatment in a rural close-knit community can discourage utilization.⁵⁻⁷ Those who live in rural locations also typically have wide social networks, which can expedite access to opioids.⁸

Similarly, administering services in rural communities to help with substance misuse can be burdensome. When substance abuse agencies in Washington state were surveyed about their practices, rural clinics noted that their small staff sizes prevented them from being able to devote work time to receive training on evidence-based practices.⁹ Therapists noted that reliable transportation is a significant barrier for their rural clients who are receiving treatment for substance misuse, and this in turn makes

it difficult for them to build a stable relationship with their patients.¹⁰ In focus groups, substance abuse counselors who work in rural areas stated that a lack of available funding makes having an adequate facility to provide services difficult.¹¹

Despite these challenges, studies examining programs targeted at the opioid epidemic in rural areas have found promising results. Albert et al¹² focused on Project Lazarus, a community coalition in North Carolina aiming to help a county reduce their number of prescription opioid overdose deaths. Through outreach efforts such as prescriber education programs and providing naloxoneⁱ kits to at-risk community members, they were successful in lowering the overdose death rate in their target area from 46.6 in 2009 to 29.0 in 2010. In Nevada, a training program where emergency medical technicians (EMTs) in rural communities learned how to effectively administer naloxone was found to increase their knowledge about the signs of an opioid overdose and decrease their concerns about using the product in the field.¹³ Crowley et al¹⁴ assessed the efficacy of school-based youth interventions in rural school districts in Iowa and Pennsylvania. Interventions began in sixth grade for the treated group, and researchers followed the adolescents in the study until they were in twelfth



grade. They found that preventative programs were effective in reducing nonmedical prescription opioid misuse for the youths in their sample. Similar results are seen in Spoth et al¹⁵ when they examined the effectiveness of family-focused and school-based youth intervention programs.

In recent years, the U.S. government has also sought to expand community-based initiatives that target opioid misuse in rural areas. The Rural Communities Opioid Response Program (RCORP) is funded by the Health Resources and Services Administration (HRSA). This program has provided resources to over a thousand rural communities (to date) to assist in their efforts to reduce opioid misuse and increase treatment and recovery access.¹⁶ One specific initiative involves planning grants focusing on formalizing relationships, conducting needs assessments, and developing sustainability plans.¹⁶ In fiscal years 2018 and 2019, over two hundred grantees were each awarded \$200 000 planning grants; however we are not aware of any formal reports documenting their approaches or findings to date. Other federal agencies have also been involved in fighting the opioid epidemic. In 2018, the U.S. Department of Agriculture Rural Development (USDA RD) funded eighty-five projects in rural communities to address the crisis through their Community Facilities Direct Loans and Grants program.¹⁷ USDA RD also recently gave priority to opioid-focused projects as part of their Distance Learning and Telemedicine Grants.¹⁸ These USDA grants are more focused on providing infrastructure to fight the crisis (as opposed to planning), and may be an appropriate avenue for rural communities to consider once a consensus is established on the best path forward. Findings from (or evaluations of) the ongoing RCORP and USDA RD programs have not yet been made available to the public, preventing a direct comparison of our methodology / results to other work being done in the field.

This study examines the timely issue of administering programs to alleviate opioid misuse in rural communities. It describes a series of community meetings in a rural setting, where community stakeholders learned about a variety of programs that can potentially help address the crisis. The primary goal of the meetings was for the participants to pinpoint where they would like future resources to go as they seek to reduce opioid misuse, and this study evaluates those choices made. Participant decisions were based on their perceptions of the needs of the community, and their view of the feasibility / potential benefits of the respective programs. Through involving the community, and hearing their input and views, these meetings laid the groundwork for stakeholders in the community to develop supported strategies in the future. It is important to involve those from the area of interest in community-based research, as it has been shown to increase the knowledge of the community members which leads to better informed resource allocation and policy decisions.¹⁹⁻²¹

The nature of this study is comparable to the work of Palombi et al²² which evaluated community forums centered around the opioid epidemic in rural Minnesota. Like this work, presenters and surveys were implemented in the forums to

increase participant knowledge on opioid-related topics and collect participants' views on how the communities should move forward in curbing opioid misuse. One notable difference, however, between this study and Palombi et al's is that this is a longitudinal study which evaluates the same community over a series of meetings. Thus, we are able to quantify how the meetings affected a similar group of participants and determine if their opinions changed as a result of the presentations and discussions. This before-and-after snapshot of participant beliefs is a key component of this research. We also note that unlike grant-driven programs such as the RCORP planning initiatives, our approach requires little to no funding. This is an important consideration for many rural communities who are already resource-constrained. While not a main objective of this study, the description of the meetings provided can be used to inform researchers who are looking to do similar work in rural communities.

Methods

Setting

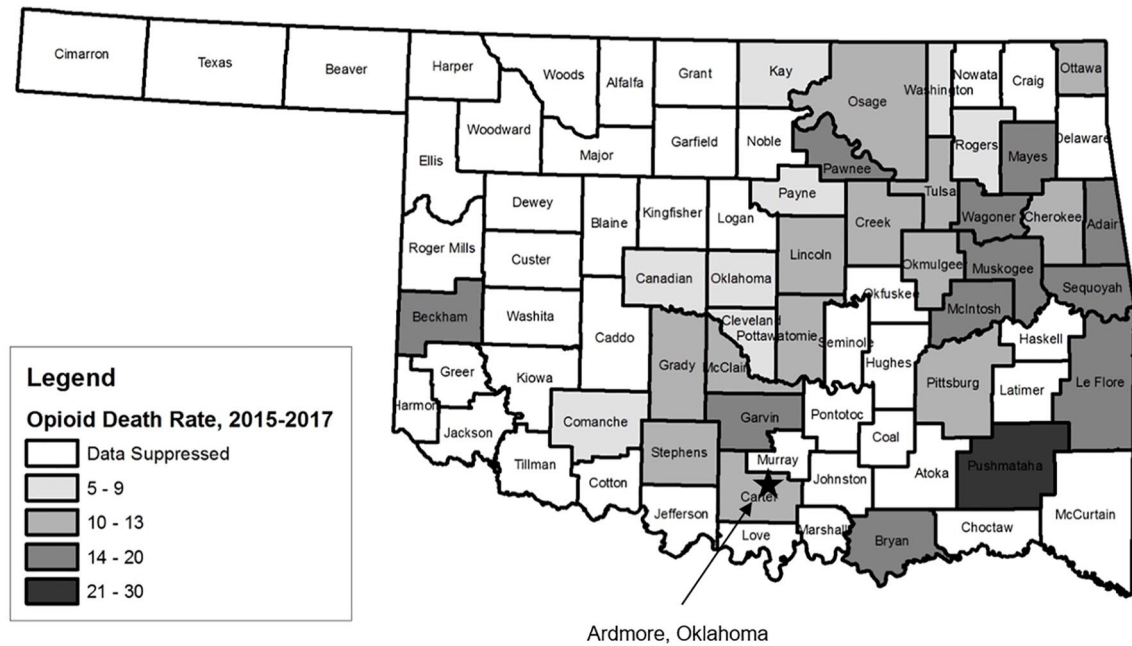
This study occurred in the town of Ardmore, Oklahoma. According to the CDC, about 800 Oklahomans died due to drug overdoses in 2017, which is the twenty-eighth highest total number of deaths by state.²³ One potential explanation for why Oklahoma is experiencing a large number of drug-related deaths could be due to it being a predominately rural state.⁸ According to the Economic Research Service Rural-Urban Continuum Codes, 59 of the 77 counties in Oklahoma are classified as non-metropolitan.

Of all the rural areas in Oklahoma, the community of Ardmore has been especially affected by the opioid epidemic. Ardmore is located in south central Oklahoma, with an estimated 2017 population of about 25 000 residents.²⁴ Ardmore is also the county seat of Carter County, which is classified as non-metropolitan. Using CDC data, opioid-related deathsⁱⁱ for 2015 through 2017 in Oklahoma counties are shown in Figure 4.1. Carter County has a death rate of about 13 per 100 000, which is higher than both the U.S. and Oklahoma rates (12 and 11, respectively). As Figure 1 also shows, the surrounding counties (Garvin and Stephens) also have high opioid death rates for 2015 through 2017 – thus implying that opioid misuse is an issue for the general area.

Ardmore was selected based on its higher opioid-related death rate and discussions with state and local officials about the existence of local capacity to support the meetings envisioned. In particular, a supportive local hospital and an active public health collaborative were crucial for recruiting and engaging the target participants.

Participant recruitment

Stakeholders who live or work in the Ardmore area were recruited primarily through word-of-mouth with the help of the researchers' professional contacts. A flyer was also created



Source: CDC multiple cause-of-death mortality files, 2015-2017

Figure 1. Oklahoma age adjusted opioid-related death rates, 2015-2017.

and distributed throughout the community which explained the overall premise of the meetings, along with other pertinent information. For the purposes of this research, stakeholders were considered to be those who were involved in organizations or jobs who worked on preventing or treating opioid misuse in the Ardmore area. For example, participants included staff from a nearby opioid treatment program, the Carter County sheriff's office, the local hospital, and a behavioral wellness center. Although the participants were not offered any direct incentives, the flyer advertising the sessions noted that participation could help with future grant funding for their organization.

Data collection

All research procedures were approved prior to the meetings by a university human subjects institutional review board (IRB). Data collection occurred throughout the three meetings, with two weeks in between each gathering. During the first two meetings (which lasted about 2 hours), four different categories of programs were introduced to the participants with the goal of providing information that could be used for group discussions and evaluations. The Ardmore area has current efforts in each of these four categories; however, participants' knowledge of the programs was assumed to be varied at the beginning of the meetings. To help explain the different categories of programs, experts were brought in who have experience with these approaches and could speak to their strengths and weaknesses in helping to reduce opioid misuse. These professionals presented information regarding the programs, and answered any questions

participants had. Each professional was given twenty minutes during the meetings for their presentation.

The four categories of programs that participants learned about were: (A) programs that try to reduce the *supply* of opioids, (B) programs that try to reduce the *demand* for opioids, (C) opioid treatment options, and (D) overdose recovery programs. Examples for these categories of programs are listed in Table 1. The first three categories (A, B, and C) came from a National Issues Forums guide regarding different strategies to address the opioid epidemic.²⁵ The last category (D) is included due to overdose-oriented programs being proven in previous studies to be effective in reducing opioid-related deaths in rural areas.^{12,13} These four categories of programs were chosen by the researchers (as opposed to being selected by the participants) prior to the meetings in the interest of time and were selected based on existing literature.

The following are acknowledged strengths and weaknesses for each of the four categories of programs that were presented on during the meetings. It is important to note, however, that the presented information was viewed differently by each participant, so everyone had their own set of perceived strengths and weaknesses for each category. A strength for category (A) included the regulatory power of Oklahoma's prescription drug monitoring program in comparison to other U.S. states, with a cited weakness being that some physicians in the state are still unclear on the details surrounding how to properly use the monitoring program in their practices. For category (B), the presenters noted their success with public health campaigns in the local area, particularly those which publicize

Table 1. Examples of programs from each category.

CATEGORY	EXAMPLES
(A): Programs that try to reduce the supply of opioids	Law enforcement efforts, prescribing guidelines for physicians, and legislative measures to reduce doctor shopping
(B): Programs that try to reduce the demand for opioids	Public health campaigns, youth intervention programs, and reduced marketing for opioids in the community
(C): Opioid treatment programs	Medication-assisted treatment (MAT), physician prescribing of buprenorphine, abstinence-based programs, and peer recovery support
(D): Overdose recovery programs	Making naloxone available to those in the community and providing education on how to administer naloxone safely

prescription drug take back days in the community. A weakness for category (B) is the difficulty in getting schools to partner with organizations to organize and carry out youth-based programs. Category (C)'s strengths included the low price of some of the medications used to treat opioid-use disorders in patients, with a weakness being the lack of programs currently available in the Ardmore area. For category (D), a strength is the widespread availability in Oklahoma to attend a naloxone training program, however, a noted weakness is that these programs are not well publicized to the targeted populations.

Surveys

The first method in which data was collected in this study was through two surveys. Meeting members were provided with written informed consent forms before they took the surveys, which stated that their participation was voluntary. Paper-based surveys were distributed by the researchers at the beginning of the first meeting (the 'pre' survey), and at the end of the third meeting (the 'post' survey). Participants were given fifteen minutes during the meetings to complete each survey. The pre and post surveys are identical, and were three pages in length. The rationale behind distributing surveys at the beginning and end of the meetings was to determine if participants' opinions changed as a result of the presentations and group discussions. A unique anonymous ID allowed for matching the pre and post surveys responses across participants.ⁱⁱⁱ

Questions on the surveys first elicited participant's opinions on issues related to the opioid epidemic, and came from the same National Issues Forum guide²⁵ that was used to develop the four categories of programs in the study. The remainder of the survey questions were developed by the researchers. The next group of questions assessed their level of familiarity about the four categories of programs discussed during the meetings. Then, questions were asked about how effective participants think each category's current efforts are in addressing the opioid epidemic in Ardmore, and if they believe more or less resources should be devoted to efforts in the category. Participants were also asked the percentage of total efforts (out of 100) they believe Ardmore currently puts into each category, and how much effort should be directed towards that category

in the future. The last subgroup of questions asked about the participant's demographics, including their race, household income, highest education level received, political affiliation, age, gender, and how long they have lived in the Ardmore area. A copy of the survey used in this study can be made available upon request.

Study circles

The second data collection technique used in this study was study circles. Study circles are a tool for encouraging group discussion where participants are randomly broken into smaller groups (of 5 to 6 participants), given a list of questions to prompt dialogue, and then report as a group. A comparable study used study circles to address poverty in rural communities in Idaho.²⁶ Two study circles occurred during the community meetings, with one at the second meeting and one at the third. The first study circle (at the second meeting) asked the groups why they believe opioid misuse is an issue for the area, and had them report back the top three reasons they came up with. Questions on the first study circle prompt also included asking the participants whether any of the categories of programs discussed directly address the underlying reasons for opioid misuse that they developed, and which reasons will be the easiest and hardest to address in the future. For the second study circle, groups were asked about the assets present in the Ardmore area that help each of the four categories of programs be effective. Groups were also asked what specific programs they believe should be expanded (and conversely, reduced) in the future, and reported back the programs they identified.

Category voting

To quantify how the participants felt about the future allocation of resources across the four categories, a voting exercise was conducted at the final community meeting. In this exercise, each participant was handed a strip of four different colored stickers and verbally given a hypothetical scenario. In this scenario, they had ten dollars to devote to the four categories of programs. Yellow stickers denoted four dollars, blue was for three dollars, green was for two dollars, and red was for one

Table 2. Descriptive statistics of meeting participants.

CHARACTERISTIC ²	AGGREGATE		MATCHED	CENSUS ¹
	PRE	POST		
Ethnicity				
White	75%	63%	72%	67%
Non-White	25%	38%	28%	33%
Yearly household income				
Below \$50 000	19%	19%	22%	55%
Above \$50 000	64%	72%	67%	46%
Education				
Less than college degree	25%	28%	17%	78%
College degree or higher	74%	72%	83%	22%
Gender				
Male	17%	25%	11%	47%
Female	79%	75%	89%	53%
Political affiliation				
Republican	34%	34%	33%	
Democrat	30%	25%	33%	
Independent	9%	19%	6%	
Mean or median age	42	42	38	37
Mean number of years lived in Ardmore	21	19	18	
Number of participants	53	32	18	

¹Census estimates come from the 2013 to 2017 American Community Survey for Ardmore city, Oklahoma.

²Due to a 'Prefer Not to Answer' option for some of the survey questions, the response categories might not sum to 100%.

dollar. Participants had to decide how they wanted to allocate their ten dollars between the programs, and therefore choose which program they believe should receive the most (and least) resources.^{iv} Each participant marked their final decision on a large sheet of paper in the meeting room which had the four categories listed and spaces for the stickers. This method provided a visual representation of how the meeting participants individually allotted their theoretical funds, which serves as a proxy for which program they believe should receive more resources in the future.

Results

Survey results

Descriptive statistics for the meeting participants are displayed in Table 2. These descriptive statistics come from the surveys that were distributed at the first and third community meetings. Fifty three participants took the first survey (the 'pre' survey), with 32 participants taking the survey at the third community meeting (the 'post' survey).^v This group of 53 pre and 32 post

responses makes up the aggregate sample in this study. Due to the longitudinal nature of our meetings, participant retention throughout the course of the meetings was affected. Thus, a matched sample of participants is created which is comprised of those who were at both the first and third meetings. Between the pre and post survey, 18 participants were matched using the four-digit ID they provided. The descriptive statistics that follow look at two distinct groups: the pre/post aggregate groups, and the matched group (which should more accurately capture changes in individual perceptions).

Looking at the descriptive statistics, there is not a wide variation in demographics between the pre, post, and matched group. Most of the participants at the meetings were white, had household yearly incomes above \$50 000, were college educated, female, and in their late 30's to early 40's. Among the groups, the participants had lived in the Ardmore area for an average of around 20 years, which means they have an extensive familiarity with the community. Political affiliation was split between Republican and Democrat, with only a small portion of the participants identifying as Independent.^{vi}

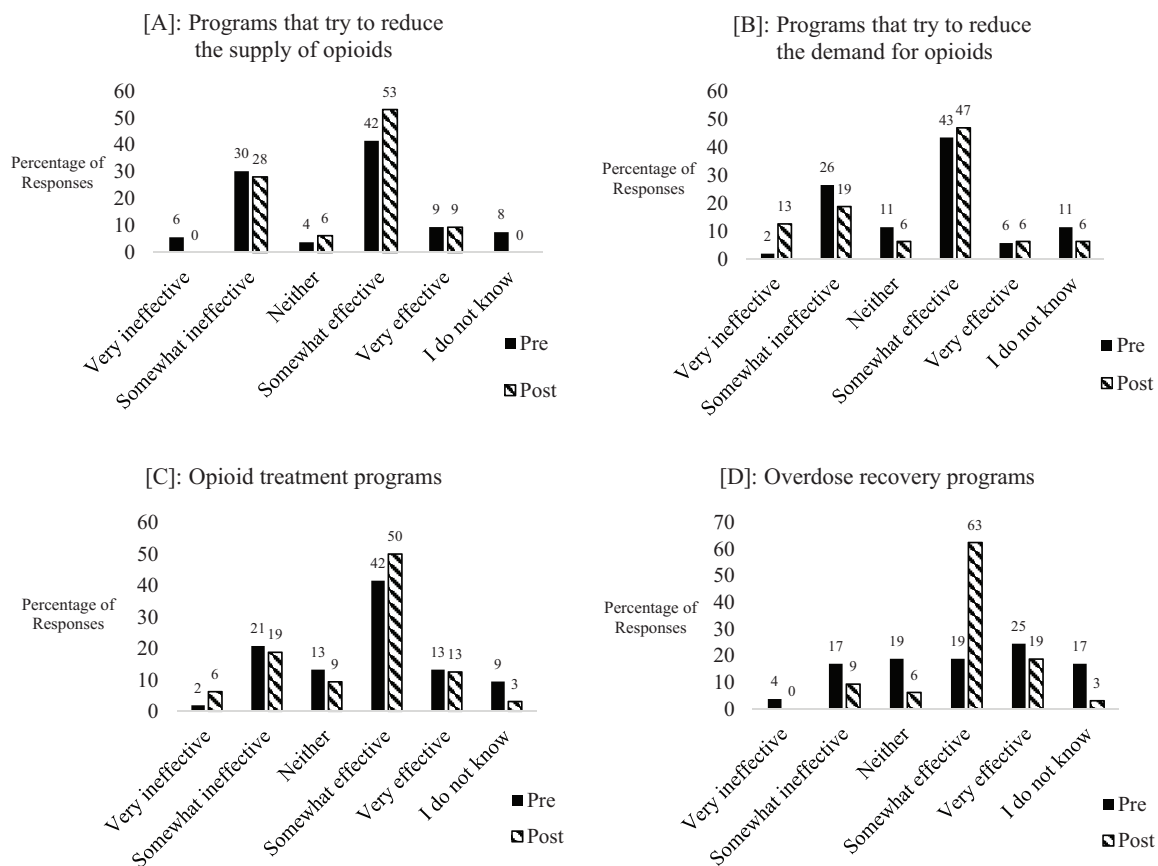


Figure 2. Percentage of responses for how effective these efforts currently are in addressing the opioid epidemic in Ardmore (aggregate sample).

Compared to the general Ardmore population, our sample has a higher percentage of females, but is similar in terms of race. Additionally, the median age of Ardmore is around 37 whereas our samples had a mean age of 38 and 42. Our sample also has a higher income, and a larger proportion of those with a Bachelor's degree or higher in relation to the population of Ardmore.

Survey responses for questions asking participants their perception of the effectiveness of the four categories in addressing the opioid epidemic in the Ardmore area are seen in Figures 2 (aggregate sample) and 3 (matched sample). Most notably, all four categories saw an increase as being "somewhat effective" between the pre and post surveys, for both the aggregate and matched samples. As a result, a sizable portion of the responses indicated that all four categories of programs were somewhat effective in combatting the crisis in the community; however, all categories also still had some participants rating them as ineffective. Thus, after the group discussions and presentations, a considerable share of the participants still believe that current efforts in these categories are lacking in their efficacy and have room for improvement. Another notable finding from Figures 2 and 3 is that the percentage of responses in the "very ineffective" option for category B (programs that try to reduce the demand for opioids) saw a large increase between the pre and post period for both samples. For the aggregate sample, the "very ineffective" option rose from 2% prior to any

presentations or discussion to 13% afterwards, and for the matched sample it went from 0% to 17%. This result implies that at the end of the meetings, a significant portion of participants did not believe that present efforts focused on trying to reduce the demand for opioids in Ardmore were effective at all. This could suggest that this subset of participants did not believe that category B is useful at reducing opioid misuse in any capacity, and resources should be devoted to other types of programs. Alternatively, it could imply that the general approach of trying to reduce demand is viable, but that the current efforts in this category are not effective.

Figure 4 shows the mean percentage of efforts (out of 100) that participants estimated currently go (Figure 4a) and should go (Figure 4b) in to each category for the aggregate sample. Figure 5 displays the same findings for the matched sample. Going from the pre to post periods, a majority of the means stayed the same. However, for the aggregate sample's responses for the percentage of efforts that Ardmore should put into each category (Figure 4b), noteworthy changes are seen for categories B (programs that try to reduce the demand for opioids) and D (overdose prevention and recovery). Participants thought more resources should go towards category B, with less resources allocated to category D moving from the pre to post periods. Another result worth mentioning is observed in Figure 5a, where the matched sample's percentage of efforts that they believe are currently in Ardmore decreased for category C

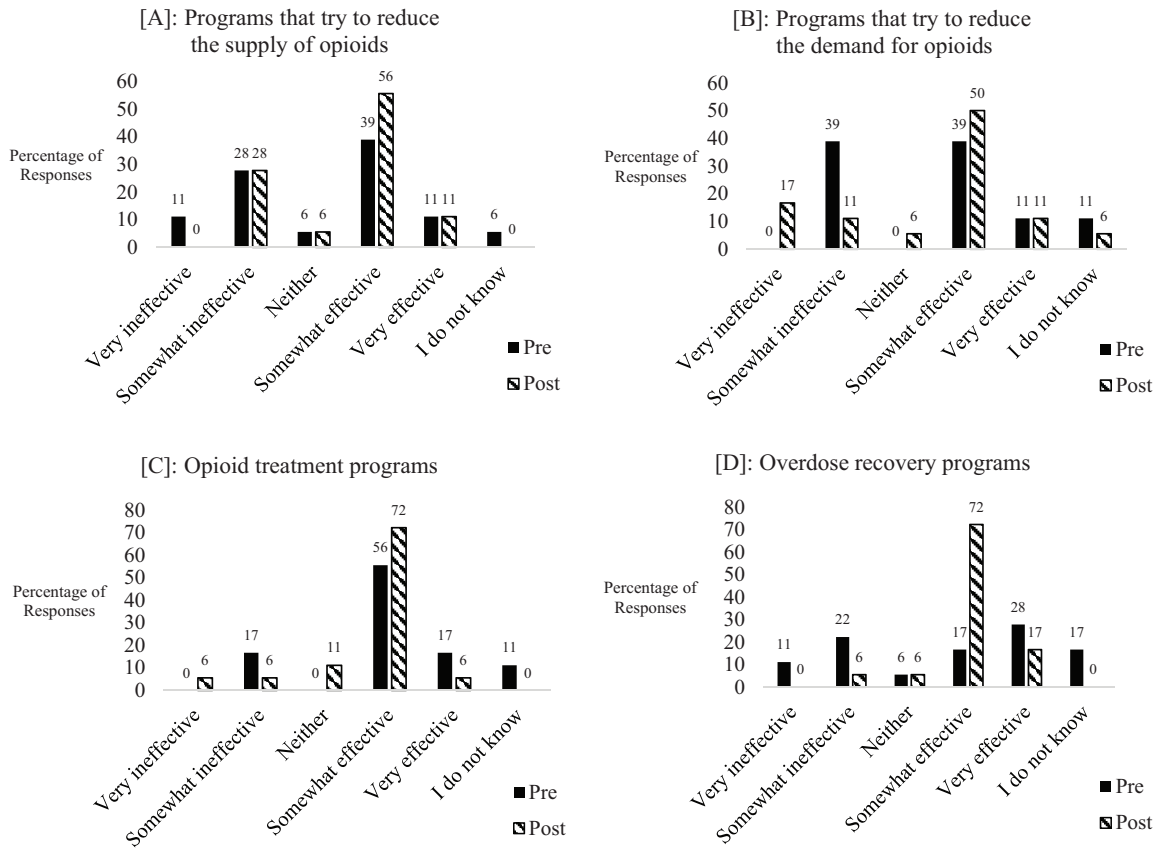


Figure 3. Percentage of responses for how effective these efforts currently are in addressing the opioid epidemic in Ardmore (matched sample).

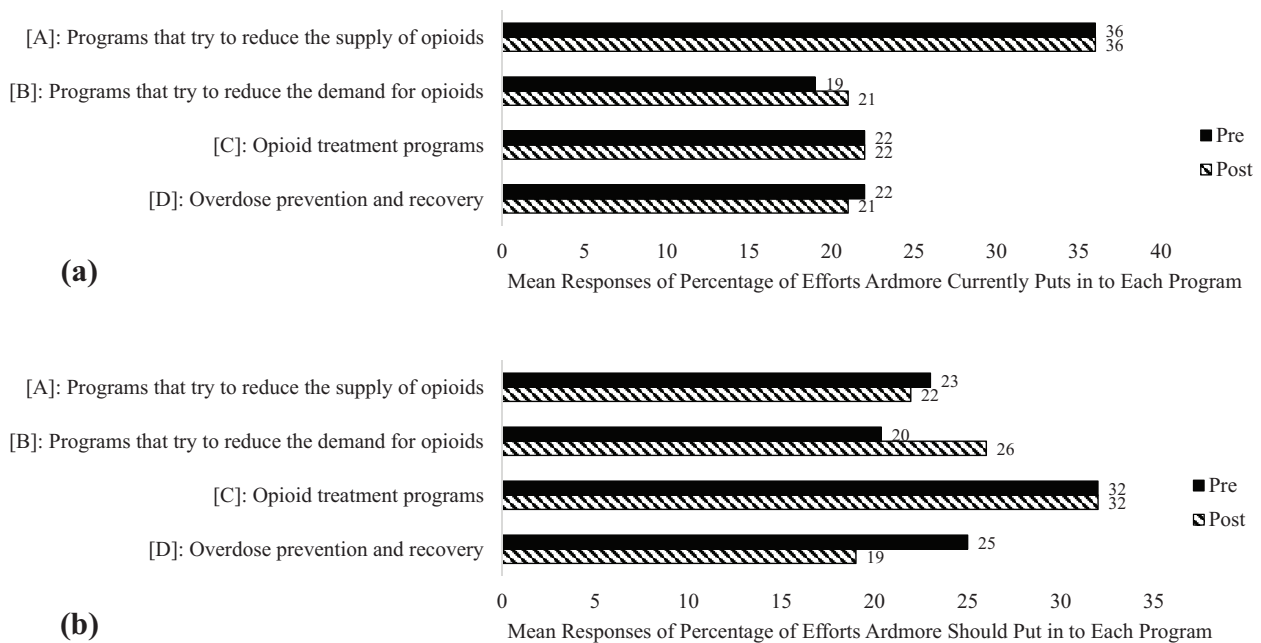


Figure 4. Mean percentage of efforts Ardmore (a) currently puts in to each category and (b) should put in to each category (aggregate sample).

(treatment options) between the periods. This change is likely due to participants learning about different treatment options not readily available for members of the Ardmore community.

For both the aggregate and matched samples, similar trends are observed. Participants believe that the most efforts in the Ardmore area are currently centered in category A (programs

that try to reduce the supply of opioids). However, when asked how many efforts should go into each category, they indicate that category C (treatment options) should receive the most. As a result, it is logical that treatment options for opioid misuse would be given the highest percentage of future efforts by participants.

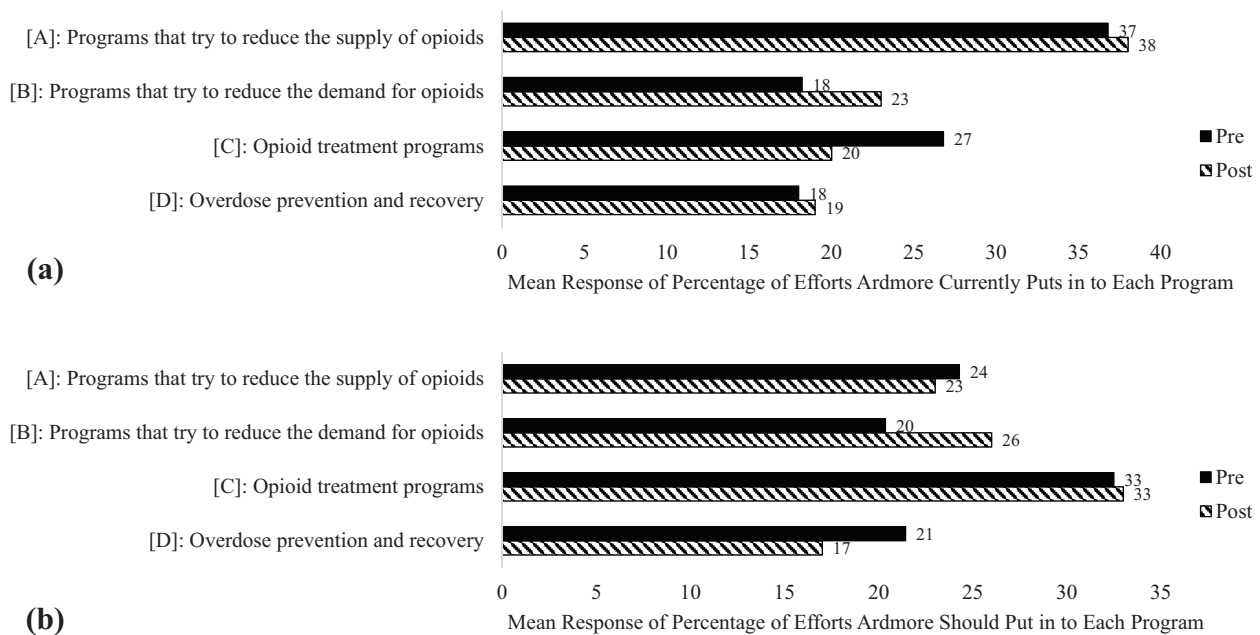


Figure 5. Mean percentage of efforts Ardmore (a) currently puts in to each category and (b) should put in to each category (matched sample).

Study circle results

The reasons for opioid misuse in the Ardmore community that groups identified in the first study circle are listed in Table 3. The most common reason was overprescribing by physicians, which has been identified as a significant contributor to the opioid crisis in previous research.^{27,28} Another reason was high incidences of adverse childhood experiences (ACE) in the community. ACEs consist of exposure to abuse and household dysfunction during ones childhood.²⁹ An individual's ACE score has been shown to be positively related to their likelihood of opioid misuse,³⁰ so it is reasonable that participants would recognize this as a main reason for opioid misuse in their area.

Other reasons that the groups noted are societal factors such as social access and acceptability of opioids, which again have been identified as issues for rural areas.^{8,31} Some causes were particular to the Ardmore area. The location of Ardmore was recognized as being a contributing factor, since the community is situated off a major interstate highway (I-35) and between the major metropolitan areas of Oklahoma City and Dallas. Another reason was that a majority of the people in Ardmore are involved in working class jobs, which participants believe have a higher risk of injury than middle or upper class positions. Participants stated that those who become injured in the workplace are then prescribed opioids for pain management, which leads to misuse problems.

Table 4 shows the programs listed by the second study circle group participants as ones they would like to expand in the future. The most frequently cited program was youth education efforts that target school-age adolescents, which are a part of category B (programs that try to reduce the demand for opioids). The remaining programs cited by the study circle groups were a variety of different treatment options including

providing treatment for uninsured persons, medication-assisted treatment (MAT) with buprenorphine, inpatient services, and drug courts.

Category voting results

Table 5 displays the findings for the participant voting exercise that occurred at the third meeting. In this exercise, participants had to denote with stickers how they would assign a hypothetical ten dollars, with each sticker representing a different dollar amount. Category C (opioid treatment options) received the most theoretical funding (\$109) with categories A (programs that try to reduce the supply of opioids) and B (programs that try to reduce the demand for opioids) falling in second and third place, respectively. Category A obtained \$86, while category B received \$79. The small dollar difference (\$7) between the two categories indicates that participants valued these programs to a similar degree.

The category of program that earned the least dollar allocation was category D (overdose recovery) with \$49. A possible reason for this result in the voting exercise could be because after the presentations and discussions, participants believed current efforts in this category are sufficient and future resources should be directed elsewhere. Going back to the survey results seen in Figures 3 and 4, 82% of the responses in the aggregate sample and 89% of the responses in the matched sample believed that category D was either "somewhat effective" or "very effective" in addressing the opioid epidemic in Ardmore in the post period.

Discussion

This study presents the findings from a series of three community meetings focused on the opioid epidemic in Ardmore,

Table 3. Study circle 1 findings, reasons for opioid misuse in Ardmore area.

REASON	NUMBER OF TIMES REPORTED BY GROUPS
Overprescribing by physicians	5
High ACE scores	3
Social access / accessibility	3
Lack of entertainment / boredom	2
Lack of patient education	2
Location of area	2
High injury risk industries in area	2
Lack of treatment options	1
Prescription justification	1
Drug dealers and gangs	1

Table 4. Study circle 2 findings, programs to be expanded in the future.

PROGRAM	NUMBER OF TIMES REPORTED BY GROUPS
Youth education programs in schools	4
Treatment for uninsured	2
MAT with buprenorphine	1
Inpatient services	1
Drug court	1

Oklahoma. In these meetings, participants learned about four different categories of programs that could be utilized to help with the high rates of opioid misuse in their area. The aim of these meetings was to use surveys, study circle discussions, and a voting exercise to determine participant perceptions of the opioid crisis, and how they believe resources should be allocated among the different programs in the future. Results reveal that participant perceptions can change after hearing expert opinions and engaging in group discussions. After these meetings, the participants indicated a preference for directing future resources towards treatment services in their community. Participants would also like to expand efforts for youth education programs regarding opioids.

It is not surprising that participants believed that the most resources should go towards treatment options for those with opioid use disorders, since access to viable treatment is a problem for rural areas.^{2,3} The Ardmore area does have a dedicated opioid treatment facility; however presentations and group discussions revealed that it has a long wait list and that those needing immediate treatment often do not see this as a viable option. It was also identified that treatment options for those

without health insurance are limited in the Ardmore area. When prompted during the second study circle, participants listed that they would like to expand treatment for uninsured populations, inpatient services, and drug court programs. Another treatment option that was listed for future expansion was MAT with buprenorphine. In a MAT program with buprenorphine, patients have to visit the facility less frequently than if they were in a MAT program with methadone.³² Patients can also receive the medication from their primary care physician, if the physician is trained and has the waiver to prescribe it.³³ Because of the features of a MAT program that uses buprenorphine, it has been identified as being a worthwhile treatment option for rural patients.³⁴ Thus our study reinforces previous research suggesting that stakeholders in rural areas should look into expanding this form of treatment.

During the second study circle, the groups reported that youth education programs in schools should be expanded in the future. These programs fall under category B (programs that try to reduce the demand for opioids). It is worthwhile to note that only a small percentage of responses denoted category B as being “very effective”, as seen in Figures 2 and 3. It may be the case that the meeting participants believe that category B is generally ineffective due to the lack of resources being directed towards such programs. Calling for the increase in programs targeting at adolescents in Ardmore is understandable, considering that previous research has demonstrated that rural drug users typically begin their use at a younger age in comparison to their urban counterparts.³¹ Research has shown that youth intervention programs are useful tools in decreasing opioid misuse in nonmetropolitan areas.^{14,15} Directing resources towards youth education programs could also aid in mitigating the perceived high ACE scores in the Ardmore area, which was cited as participants as being an important contributor to the opioid epidemic in the community. Although the youth education programs discussed during the meetings did not specifically mention targeting children with high ACE scores, the programs in category (B) were the only programs brought up in the meetings that relate to adolescent populations. Future research should continue to look into the effects of providing youth education programs to rural adolescents on later opioid misuse – and in particular what type of intervention works best.

Category A (programs that try to reduce the supply of opioids) received the second highest amount of funding in the resource allocation exercise. This follows from the study circle results in Table 3, where overprescription of opioid medications was the most-cited cause of opioid misuse in Ardmore. The study circles also listed social access to (and social acceptability of) opioids as being a contributing factor. These two causes of opioid misuse are directly related to category A, as programs in this category would aim to end overprescription by physicians and keep the number of opioids low in the community – thus reducing the accessibility of these types

Table 5. Category voting findings, dollar allocation to each program.

PROGRAM	NUMBER OF ALLOCATED STICKERS				TOTAL DOLLAR AMOUNT
	YELLOW (\$4)	BLUE (\$3)	GREEN (\$2)	RED (\$1)	
(C): Opioid treatment programs	15	12	4	3	\$107
(A): Programs that try to reduce the supply of opioids	9	10	7	6	\$86
(B): Programs that try to reduce the demand for opioids	7	7	14	2	\$79
(D): Overdose recovery programs	1	3	7	22	\$49

of medications. This suggests that participants would like to continue supporting category A in the future because it addresses several of the opioid epidemic causes uncovered during the study circle discussions.

Of special note in this study is the category of programs that did not receive a lot of funding in terms of the hypothetical voting exercise, category D. This category was for overdose recovery programs, and was allocated about half of the funds as category C (opioid treatment programs), as seen in Table 5. When evaluating the survey responses, over 80% of the responses in the post survey deemed category D as being either “somewhat” or “very” effective in addressing opioid misuse in Ardmore for both the aggregate and matched samples. These findings could be attributed to Oklahoma currently being highly involved in taking measures to reduce fatal opioid overdoses. The Oklahoma Department of Mental Health and Substance Abuse Services is active in training citizens to use naloxone, and having it available across the state for free.³⁵ Additionally, Oklahoma passed a Good Samaritan law which went into effect in 2018.³⁶ Good Samaritan laws allow persons to report an overdose to authorities, without being prosecuted under certain circumstances. Thus, the limited hypothetical funding given to this option may speak to how successful its rollout has already been as opposed to a statement about its limited effectiveness.

This study is not without its limitations. The findings from this research are specific to the Ardmore, Oklahoma community and the participants that partook in the meetings. Future researchers should expand on these meetings in their areas of interest, and determine if these results hold for other rural communities – which may face very different circumstances. The conclusions of these meetings are also limited by the small size of the matched sample of participants ($n = 18$). Additionally, participants’ opinions regarding the programs may have been swayed by the presenting skills of the experts, which varied across the categories. Participant perceptions about the cost of each category of program could have also influenced the voting exercise. Category C (opioid treatment programs) may have received the most funds due to the fact that these programs cost more to implement in the community in comparison to the other categories of programs. The results of this study could have also been influenced by participant

characteristics not elicited during our surveys, such as their (or their families) present or past opioid use or where they are currently employed. Another limitation is that although the categories of programs discussed in this study were broad in nature, they did not encompass every possible tool available to address the crisis. For example, the harm reduction strategy of a syringe exchange program was not discussed, and participants’ views on this approach was not elicited through our data collection techniques. The use of syringe exchange programs has been shown to be associated with subsequent retention in substance use treatment.³⁷ Additionally, researchers found that about half of their sample of 186 syringe service program attendees in rural Kentucky regularly utilize such services.³⁸ This finding signals a possible demand in rural areas for syringe exchange programs. Future studies may want to include a wider variety of options than the ones considered here.

Overall, this study has described a series of community meeting seeking to develop a consensus for moving forward to address the opioid crisis in rural communities. The results show that perceptions of options can change with active discussions, and that participants were generally interested in focusing on treatment and youth-based prevention efforts in their area. These findings are useful results for communities interested in pursuing opioid-related funding or developing a publicly supported initiative. To help guide future research efforts, a short list of ‘lessons learned’ has been developed which reflect changes that would be made by the researchers in future iterations of these community meetings. They include:

- Incentivizing continual participation to increase the matched sample size.
- Relying on the study circles more intensively for data collection, due to the participant group discussions providing valuable insights into individual perceptions and thought processes.
- Expanding the time allotted to the presentations so all audience questions can be asked and addressed by the presenters.
- Using the data collection methods to discern whether participants believe the programs are not effective *in general* in combatting opioid misuse, or not effective *in the community* due to a lack of available resources.

While specific to Ardmore, this process could be replicated by other rural communities struggling with the opioid epidemic. The presented programs and speakers would vary, but the process should allow stakeholders to come together and begin taking steps towards bettering the health and well-being of their communities.

Author contribution

DM and BW both developed the idea for this study, the structure of the community meetings, and the methods to collect data from participants. DM analyzed the data and wrote the first draft of the manuscript. BW assisted with data analysis and edits to the manuscript. Both authors were involved in the revision process for publication.

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Supplemental material

Supplemental material for this article is available online.

Notes

- i. Naloxone is a medication that aids in reversing the effects of an opioid overdose.
- ii. Opioid-related deaths are gathered from the CDC multiple cause-of-death mortality files, and are considered to be any death with the following ICD-10 codes: T40.0 (opium), T40.1 (heroin), T40.2 (Other opioids), T40.3 (Methadone), and T40.4 (Other synthetic narcotics).
- iii. To match the surveys among the two different time periods, participants provided a four digit ID at the start of their survey. To avoid participants forgetting their ID between the first and third meetings, the ID was comprised of the first and third letters of their first name and the day of the month they were born. Therefore, the unique nature of the number ensured that each participant would provide the same ID for the pre and post surveys
- iv. Participants were told they could not allocate more than one sticker to a particular option, allowing the voting to be used as a ranking exercise.
- v. It is important to note that the 32 participants at the third meeting were comprised of both participants who were present at the first meeting, and new participants.
- vi. A significant percentage of survey respondents abstained from the political affiliation question.

REFERENCES

1. Mack K, Jones CM, Ballesteros MF. Illicit drug use, illicit drug use disorders, and drug overdose deaths in metropolitan and nonmetropolitan areas – United States. *Am J Transplant.* 2017;17(12):3241–3252.
2. Rosenblatt RA, Andrilla CHA, Catlin M, Larson EH. Geographic and specialty distribution of U.S. physicians trained to treat opioid disorder. *Ann Fam Med.* 2015;13(1):23–26.
3. Hirschak KA, Murphy SM. Assessing differences in the availability of opioid addiction therapy options: rural versus urban and American Indian reservation versus nonreservation. *J Rural Health.* 2017;33(1):102–109.
4. Garcia MC, Heilig CM, Lee SH, et al. Opioid prescribing rates in nonmetropolitan and metropolitan counties among primary care providers using an electronic health record system – United States, 2014–2017. *MMWR Morb Mortal Wkly Rep.* 2019;68(2):25–30.
5. Jackson A, Shannon L. Barriers to receiving substance abuse treatment among rural pregnant women in Kentucky. *Matern Child Health J.* 2012;16(9):1762–1770.
6. Browne T, Priestler MA, Clone S, et al. Barriers and facilitators to substance use treatment in the rural south: a qualitative study. *J Rural Health.* 2016;32(1):92–101.
7. Rigg KK, Monnat SM, Chavez MN. Opioid-related mortality in rural America: geographic heterogeneity and intervention strategies. *Int J Drug Policy.* 2018;57:119–129.
8. Keyes KM, Cerda M, Brady JE, Havens JR, Galea S. Understanding the rural-urban differences in nonmedical prescription opioid use and abuse in the United States. *Am J Public Health.* 2014;104(2):52–59.
9. Dotson JAW, Roll JM, Packer RR, Lewis JM, McPherson S, Howell D. Urban and rural utilization of evidence-based practices for substance use and mental health disparities. *J Rural Health.* 2014;30(3):292–299.
10. Godlaski TM, Clark JJ. Implementation issues in an innovative rural substance misuser treatment program. *Subst Use Misuse.* 2012;47(13–14):1439–1450.
11. Pullen E, Oser C. Barriers to substance abuse treatment in rural and urban communities: counselor perspectives. *Subst Use Misuse.* 2014;49(7):891–901.
12. Albert S, Brason FW, Sanford CK, et al. Project Lazarus: community-based overdose prevention in rural North Carolina. *Pain Med.* 2011;12(suppl 2):S77–S85.
13. Zhang X, Marchand C, Sullivan B, Klass EM, Wagner KD. Naloxone access for emergency medical technicians: an evaluation of a training program in rural communities. *Addict Behav.* 2018;86:79–85.
14. Crowley DM, Jones DE, Coffman DL, Greenberg MT. Can we build an efficient response to the prescription drug abuse epidemic? Assessing the cost effectiveness of universal prevention in the PROSPER trial. *Prev Med.* 2014;62:71–77.
15. Spoth R, Trudeau L, Shin C, et al. 2013. Longitudinal effects of universal preventive intervention on prescription drug misuse: three randomized control trials with late adolescents and young Adults. *Am J Public Health.* 2013;103(4):665–672.
16. Health Resources & Services Administration. *Rural Communities Opioid Response Program.* Rockville, MD: HRSA. Available at: <https://www.hrsa.gov/rural-health/rcorp>. Accessed October 28, 2019.
17. United States Department of Agriculture. *USDA Partners with Communities to Support Opioid Prevention, Treatment and Recovery Opportunities in Rural America.* Washington, DC: USDA; 2018. Available at: <https://www.usda.gov/media/press-releases/2018/09/10/usda-partners-communities-support-opioid-prevention-treatment-and>. Accessed October 28, 2019.
18. United States Department of Agriculture. *USDA Prioritizes Investments in Telemedicine to Address Opioid Crisis in Rural America.* Washington, DC: USDA, 2019. Available at: <https://www.usda.gov/media/press-releases/2019/02/14/usda-prioritizes-investments-telemedicine-address-opioid-crisis>. Accessed October 29, 2019.
19. Israel BA, Schulz AJ, Parker EA, Becker AB. Review of community-based research: assessing partnership approaches to improve public health. *Annu Rev Public Health.* 1998;19:173–202.
20. Macaulay AC, Commanda LE, Freeman WL, et al. Participatory research maximises community and lay involvement. *North American Primary Care Research Group. BMJ.* 1999;319(7212):774–778.
21. O'Brien MJ, Whitaker RC. The role of community-based participatory research to inform local health policy: a case study. *J Gen Intern Med.* 2011;26(12):1498–1501.
22. Palombi L, Olivarez M, Bennett L, Hawthorne AN. Community forums to address the opioid crisis: an effective grassroots approach to rural community engagement. *Subst Abuse.* 2019;13:1178221819827595.
23. Centers for Disease Control and Prevention. *Drug Overdose Deaths.* Atlanta, GA: CDC; 2018. Available at: <https://www.cdc.gov/drugoverdose/data/statedeaths.html>. Accessed March 10, 2019.
24. United States Census Bureau. *QuickFacts Ardmore City, Oklahoma.* Washington, DC: US Census; 2019. Available at: <https://www.census.gov/quickfacts/fact/table/ardmorecityoklahoma,US/PST045218>. Accessed March 20, 2019.
25. Wharton T. *What Should We Do About the Opioid Epidemic?* 2018. Available at: <https://www.nifi.com>. Accessed March 18, 2019.
26. Cummins M, Petty B, Hansen L, Hoffman K, Wittman G. Expanding the reach of extension to underserved audiences through study circles in rural Idaho. *J Ext Educ.* 2012;50(4):1–5.
27. Compton WM, Boyle M, Wargo E. Prescription opioid abuse: problems and responses. *Prev Med.* 2015;80:5–9.
28. Makary MA, Overton HN, Wang P. Overprescribing is major contributor to opioid crisis. *BMJ.* 2017;359:1–2.
29. Felitti VJ, Anda RF, Nordenberg DA, et al. Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: the adverse childhood experiences (ACE) study. *Am J Prev Med.* 1988;14(4):245–258.
30. Stein MD, Conti MT, Kenney S, et al. Adverse childhood experiences effects on opioid use initiation, injection drug use, and overdose among persons with opioid use disorder. *Drug Alcohol Depend.* 2018;179:325–329.

31. Young AM, Havens JR, Leukefeld CG. A comparison of rural and urban non-medical prescription opioid users' lifetime and recent drug use. *Am J Drug Alcohol Abuse*. 2012;38(3):220–227.
32. Center for Substance Abuse Treatment. *Medication-Assisted Treatment for Opioid Addiction in Opioid Treatment Programs*. Rockville, MD: CSAT; 2005. Available at: https://www.ncbi.nlm.nih.gov/books/NBK64164/pdf/Bookshelf_NBK64164.pdf. Accessed March 1, 2019.
33. Substance Abuse and Mental Health Services Administration. *Buprenorphine Waiver Management*. Rockville, MD: SAMHSA; 2019. Available at: <https://www.samhsa.gov/medication-assisted-treatment>. Accessed March 18, 2019.
34. Quest TL, Merrill JO, Roll J, Saxon AJ, Rosenblatt RA. Buprenorphine therapy for opioid addiction in rural Washington: the experience of the early adopters. *J Opioid Manag*. 2012;8(1):29–38.
35. Oklahoma Department of Mental Health and Substance Abuse Services. *Opioid Overdose*. Oklahoma City, OK: ODMHSAS; 2019. Available at: <http://okim-ready.org/overdose/>. Accessed March 15, 2019.
36. Oklahoma State Legislature. *Bill Information for SB 1367*. Oklahoma City, OK: Oklahoma State Legislature; 2018. Available at: <http://www.oklegislature.gov/>. Accessed March 17, 2019.
37. Hagan H, McGough JP, Thiede H, et al. Reduced injection frequency and increased entry and retention in drug treatment associated with needle-exchange participation in Seattle drug injectors. *J Subst Abuse Treat*. 2000;19(3):247–252.
38. Surratt HL, Otachi JK, Williams T, Gulley J, Lockard AS, Rains R. Motivation to change and treatment participation among syringe service program utilizers in rural Kentucky. *J Rural Health*. 2020; 36(2):224–233.