Accelerating Teen Pregnancy Prevention in Phillips County, Arkansas and Coahoma County, Mississippi

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About this report

Social and economic barriers, as well as lack of access to quality health education and medical care, likely contribute to the high teen birth rates in the rural South of the United States (Centers for Disease Control and Prevention [CDC] 2019). With high rates of poverty and unemployment, these communities offer few enrichment activities and future opportunities for youth—feeding into youth's apathy toward becoming pregnant (Health Resources and Services Administration 2019).

The Walton Family Foundation funded Mathematica Policy Research to identify strategies to address teen pregnancy in these high-need areas and is supporting a landscape study on teen pregnancy in Phillips County, Arkansas, and Coahoma County, Mississippi. This report presents the findings from this study.

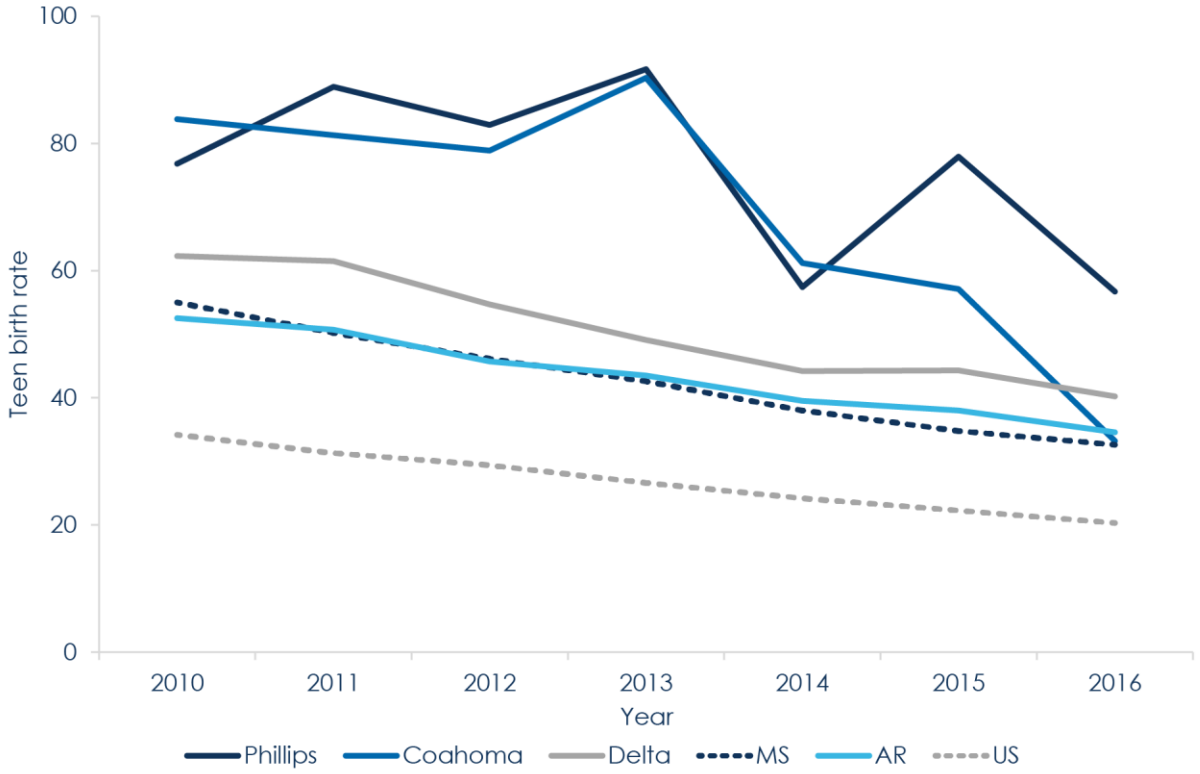
I. INTRODUCTION

Although teen pregnancy rates in the United States have declined in the past two decades, rates remain high among certain populations and in certain areas, such as the rural South. In 2016, Arkansas had the highest teen birth rate of any state, at 34.6 births per 1,000 females ages 15 to 19, and Mississippi had the third highest rate, at 32.6 births (Martin et al. 2018) (Appendix A, Exhibit A.5).[1] In these states, teen birth rates vary substantially but—in general—have declined in most Delta counties since 2010, consistent with national trends (Exhibit A).

These declines in births to teens have also manifested in Phillips County, Arkansas, and Coahoma County, Mississippi. In particular, Phillips County saw a drop of 26 percent—from 76.8 births per 1,000 teens in 2010 to 56.7 in 2016. This decline was among the slowest in the Mississippi Delta (Exhibit B). Counties immediately surrounding Phillips County in Arkansas had varying levels of declines. In comparison, the teen birth rate declined by 60 percent in Coahoma County, from 83.8 in 2010 to 33.2 in 2016. This decline was one of the steepest in the Delta but is consistent with declines in many surrounding counties. However, the level of variation in the county-level trends should be interpreted with caution because of small numbers of teen births in a county, which can lead to large fluctuations in rates from year to year (Exhibit A).

[1] Teen birth rates serve as a proxy measure for teen pregnancy rates. Pregnancies can result in live births as well as miscarriages and elective abortions; however, the abortion rates in the states examined in this study (4 abortions per 1,000 women ages 15 to 44 in Mississippi and 7 abortions per 1,000 women ages 15 to 44 in Arkansas) are well below the national average of 11.8 abortions per 1,000 women ages 15 to 44. Therefore, the teen birth rate is a reliable proxy of the teen pregnancy rate in these states (Lindberg et al. 2016).

Exhibit A. Teen birth rates (per 1,000 females ages 15 to 19) from 2010 to 2016



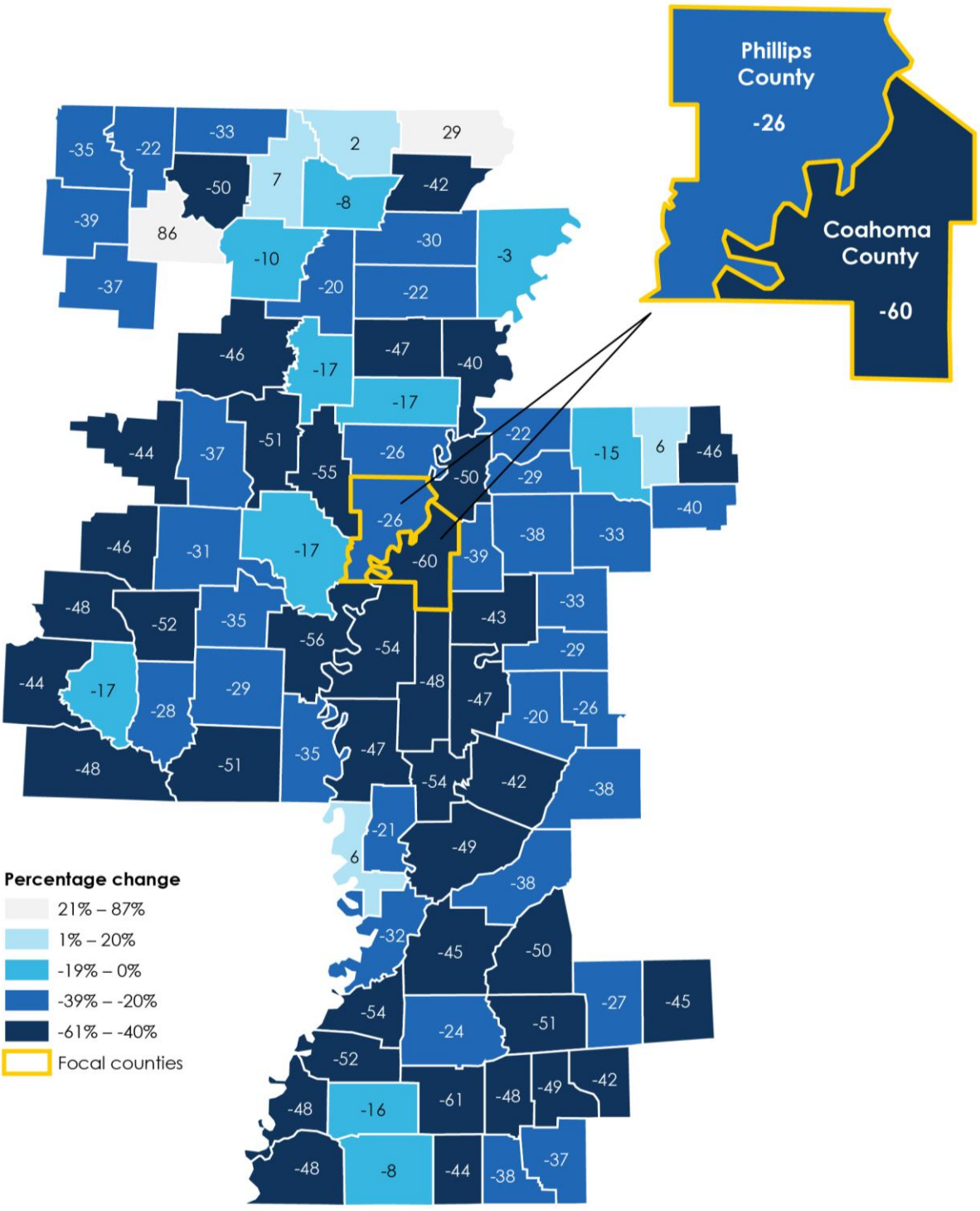
Source: Arkansas Department of Health; Mississippi State Department of Health, CDC National Center for Health Statistics.
Note: The trends in teen birth rates are consistent across the US, Arkansas, Mississippi, and the Delta Region. Due to small numbers of teen births in Phillips and Coahoma County, compared to the other geographies, there is more variation in rates from year to year.

Much of these observed declines have occurred in the context of increased federal funding for teen pregnancy prevention, policies supporting inclusion of sex education in public school curricula, social norms about childbearing changing in the United States, and increased access to hormonal contraception by teens (Boonstra 2014). In particular, Mississippi received several federal grants for teen pregnancy prevention in 2010 and 2015.[2] The state also passed a Sexuality Education Law in 2011 that requires all schools in the state to implement sexuality education. Although the Arkansas Department of Health has also received federal grants for teen pregnancy prevention, the programming is being implemented primarily in Little Rock, not Phillips County.

Despite the declines in rate of births to teens and emergence of relevant programming, it is clear that Phillips and Coahoma Counties continue to have higher rates of teen births than the national average. These counties continue to be known as medically underserved areas with too few primary care providers, high infant mortality, and high poverty (Health Resources and Services Administration 2019). Thus, further invention could greatly accelerate progress and close the gap between this region and the nation in rates of teen pregnancy.

[2] Federal teen pregnancy prevention grantees in Coahoma County include the Mississippi Department of Health, Delta Health Alliance, and Teen Health Mississippi. Appendix A provides details on these grants. Funds have been used to encourage school districts to adopt evidence-based sexuality education polices; to implement evidence-based sexuality education and technical assistance; and to improve youth friendly clinical services.

Exhibit B. 2016 Percentage change in teen birth rates from 2010 to 2016 in the Delta Region



Source: Arkansas Department of Health; Mississippi State Department of Health.

Rationale for focusing on teen pregnancy in the Mississippi Delta

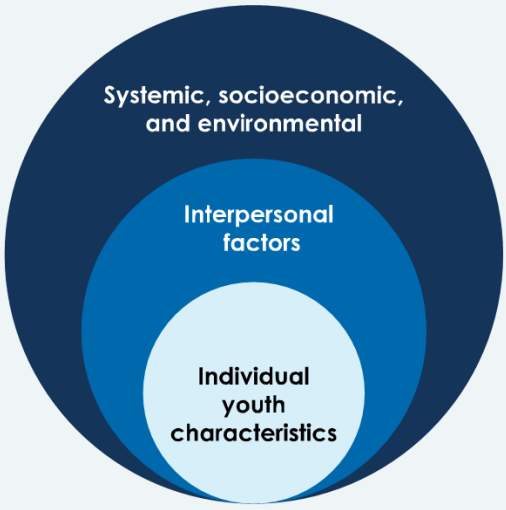
- Teen pregnancy is a "winnable battle," a public health priority issue for which there are strategies shown to have a large impact (CDC 2016).
- Many teen pregnancy prevention efforts have been concentrated in urban areas, yet teen pregnancy rates continue to be significantly higher in rural areas, including in the Mississippi Delta (Ng and Kaye 2015).
- Delaying pregnancy until adulthood can lead to better educational attainment, economic self-sufficiency, and overall health for parents and children, leading to social and economic benefits to entire communities (Hoffman and Maynard 2008).

II. FACTORS UNDERLYING TEEN PREGNANCY IN PHILLIPS AND COAHOMA COUNTIES

Multiple, interrelated factors influence teen sexual behaviors and pregnancy outcomes across the United States and more generally (Exhibit C). At the highest level of influence, *systemic, socioeconomic, and environmental factors* broadly affect the population, including the access to services and other resources to support healthy behaviors among youth; these factors include poverty, state and local policies, and community norms. Next, *interpersonal factors* include relationships with family, health care providers, and peers that can sway youth decisions and behaviors. Finally, *individual youth characteristics* are intrinsic factors behind youth decisions and behaviors, such as age, gender, knowledge, and attitudes. Each factor individually can lead to positive or negative outcomes. But, when factors within or between levels interact, they can amplify the influence on sexual risk behavior. For example, living in poverty can increase a youth's risk of becoming pregnant—but, combined with having an unsupportive family, this factor could intensify that risk. Understanding these factors and their relative influence on youth behaviors and outcomes can help to identify potential areas or combination of areas for intervention.

Exhibit C. Factors influencing teen pregnancy, by level

- **Systemic, socioeconomic, and environmental factors:** poverty, state and local sexuality education policies, discrimination, and community norms
- **Interpersonal factors:** relationships with parents, health care providers, and peers
- **Individual youth characteristics:** age, use of contraception, and knowledge of sexual health



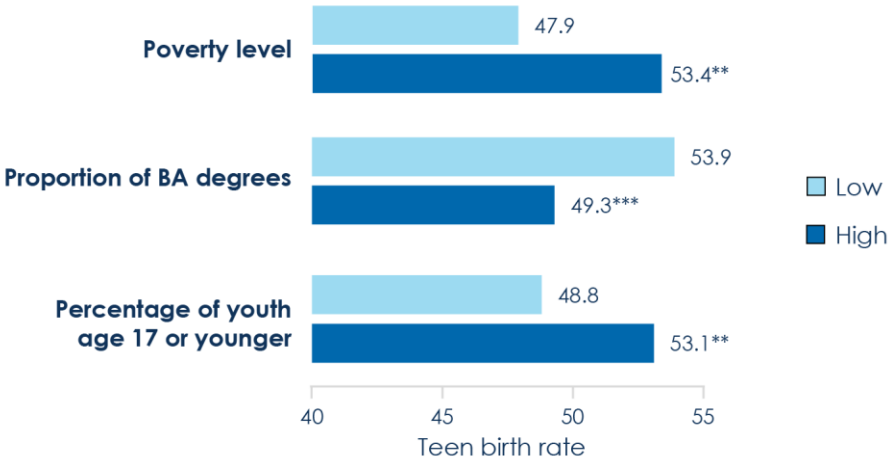
A. Systemic, socioeconomic, and environmental factors

To investigate the systemic, socioeconomic, and environmental factors most strongly associated with teen birth rates, we used county-level U.S. Census data from the Delta regions of Arkansas and Mississippi. We then drew on qualitative information to triangulate this, as well as to provide information on factors that are harder to measure quantitatively.

What do the numbers say?

Our quantitative analysis found evidence of a statistically significant association between teen birth rates and several environmental factors. In particular, the teen birth rate tended to be higher in communities with more individuals living in **poverty** (53.4 versus 47.9), **lacking a bachelor's degree** (53.9 versus 49.3), or having a higher percentage of its population being **age 17 or younger** (53.1 vs 48.8) (Exhibit D).[3] Consistent with these findings, both Phillips and Coahoma Counties have lower than average educational attainment, higher concentrations of youth, and higher percentages of the population living in poverty. See Appendix B for detailed findings from the quantitative analysis. Interviews conducted with policymakers and community leaders, as well as small group discussions with community members, supported these findings.

Exhibit D. Environmental level quantitative findings



Source: Arkansas Department of Health, Mississippi State Department of Health, American Community Survey 5-Year Estimates, Annual Population Estimates Program, Small Area Income and Poverty Estimates, U.S. Bureau of Labor Statistics, CDC National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Power to Decide.

What does the community say?

A variety of other factors could underlie and/or augment those identified through the quantitative analysis. For example, discrimination and community norms could help to perpetuate poverty and low achievement in education level. In contrast, restrictive health education policies and lack of available contraceptive services could serve as additional factors to those in the quantitative analysis that further exacerbate the issue of teen pregnancy in communities. Next, we discuss these underlying and additional factors in greater detail.

[3] Birth rates are per 1,000 young women ages 15-19.

Discrimination based on race and class. Within Phillips and Coahoma Counties, segregation and lack of opportunity in the community feed into a systemic perception among African American and poor youth that they are undervalued members of their community with few opportunities for advancement. In both counties, African American students represent the vast majority of the public school population, and community members said white students typically attend private schools.[4] Some community facilities that might provide places for extracurricular activities, such as the local pool, were said to be "for the white community only" by both youth and adults. In addition, few enrichment activities that can motivate and occupy youth are available in poor neighborhoods. Community members recognized this lack of opportunity as a major impediment to positive youth development and behavior.

Permissive community norms. Many adult and teen community members see teen pregnancy as inevitable in both Phillips and Coahoma Counties. Consequently, teen pregnancy persists across generations. Many youth have parents or grandparents who were teen parents. Also, high school graduates are considered as "grown" and, as such, it is acceptable for 18- or 19-year-olds to have children regardless of their economic or familial stability. One program administrator said that many teens see pregnancy, rather than college attendance and getting a job, as a rite of passage to adulthood.

> *"It's a cycle and parents in our community weren't taught about [pregnancy prevention] so they can't teach their kids."*
>
> **–Parent in Coahoma Co.**

Restrictive sexuality education policies. The emphasis on abstinence-only or abstinence-plus content in the two states might not adequately promote health risk reduction, such as condom use.[5] In addition, policies in Mississippi require parents to opt-in for their children to receive sexuality education—adding an extra hoop to jump through to receive sexuality education. Depending on the school in the Delta region, 30 to 75 percent of parents opt-in their children—an administrator hypothesized that most parents forget to return the form rather than actively opt out. Corroborating this hypothesis, parents and youth in a small-group discussion indicated wanting *more* sexuality education in schools, including information about how to use birth control and condoms.

> *"People seem to think that if we talk about sex, that we will be promoting sex. It was really difficult. I spent a lot of time at school board meetings and meeting with principals and health teachers trying to get them to understand that talking about sex doesn't encourage it."*
>
> **–Health educator in Phillips Co.**

[4] Percentage of African American students: Clarksdale Municipal School District, Mississippi: 96.8 percent; Coahoma County School District, Mississippi: 90.27 percent (Mississippi Department of Education 2019); Lee Academy (Private), Clarksdale, Mississippi: 7.59 percent (National Center for Education Statistics 2019); Barton-Lexa School District, Arkansas: 35.1 percent; Helena-West Helena School District: 93.6 percent; Marvell-Elaine School District: 88.3 percent; KIPP Delta Public Schools: 91.2 percent (Arkansas Department of Education Data Center 2019); Marvell Academy, Marvell, AR: 0 percent (National Center for Education Statistics 2019)

[5] The 2011 Mississippi Sex Education Law requires school districts in Mississippi to adopt either an abstinence-only or an abstinence-plus policy. Abstinence-only programs exclude content on birth control and condoms. Abstinence-plus programs can include this content, although they cannot include condom demonstrations. Although Arkansas does not require schools to teach sex education, laws state that if they choose to do so they must stress abstinence (Arkansas Education Code 2017).

In the absence of reliable other sources, youth turn to media content for information about sexual health. When asked where they learn about sexual health, many youth described learning about sexuality from television shows, movies, and the Internet—with the latter cited most commonly in both counties. Use of the Internet as a source of sexual health information has added negative consequences, such as exposure to explicit sexual content. In several discussions, youth said they thought what they saw in pornography was normal sex and that it was common for teens in their community to learn about sex from pornography. An example of other myths perpetuated among youth by unreliable sources include that long-term use of hormonal birth control methods, such as the pill, shot, or an intrauterine device (IUD), "messes up your insides" or gives you excess body hair. Some learned from the Internet that girls having too much sex could get "blue waffle," a fictional sexually transmitted infection (STI).

Limited health insurance coverage of reproductive health care. Medicaid policy in both Arkansas and Mississippi could limit access to reproductive health care, such as contraceptive care and testing for STIs. For example, a school health care provider explained that many students who receive Medicaid are unable use the school-based health clinic. She explained this is because the school-based clinic must be designated as a student's primary care provider (to receive reimbursement), but many parents are reluctant to make this designation because the SBHC is only open three days a week and does not offer the full range of services as other health clinics in the community. Cutting access to school-based clinics likely makes it more difficult for students to receive reproductive health services.

B. Interpersonal factors

Beyond media, the people in a teen's life hold large sway over a teen, offering guidance and support or, conversely, encouraging risky behavior. During focus groups, youth and adults said among the variety of players (for example, parent, peers, teachers, health care providers, spiritual leaders, and other community members), parents, health care providers, and peers rose to the top among those with the largest impact on teen's decisions related to sexual behavior.

A common misperception about parents' view of sexuality education

A study conducted by the Center for Mississippi Health Policy in conjunction with Mississippi State University found that 92 percent of Mississippi parents supported delivering sexuality education in schools (Robinson et al. 2018). Similarly, another national study found that rural parents were open to their teenage children receiving sexuality education in schools and as likely as urban parents to discuss sexual health—including birth control and condoms—with their children (Ng and Kaye 2015).

Limiting access to a last-resort reproductive health service

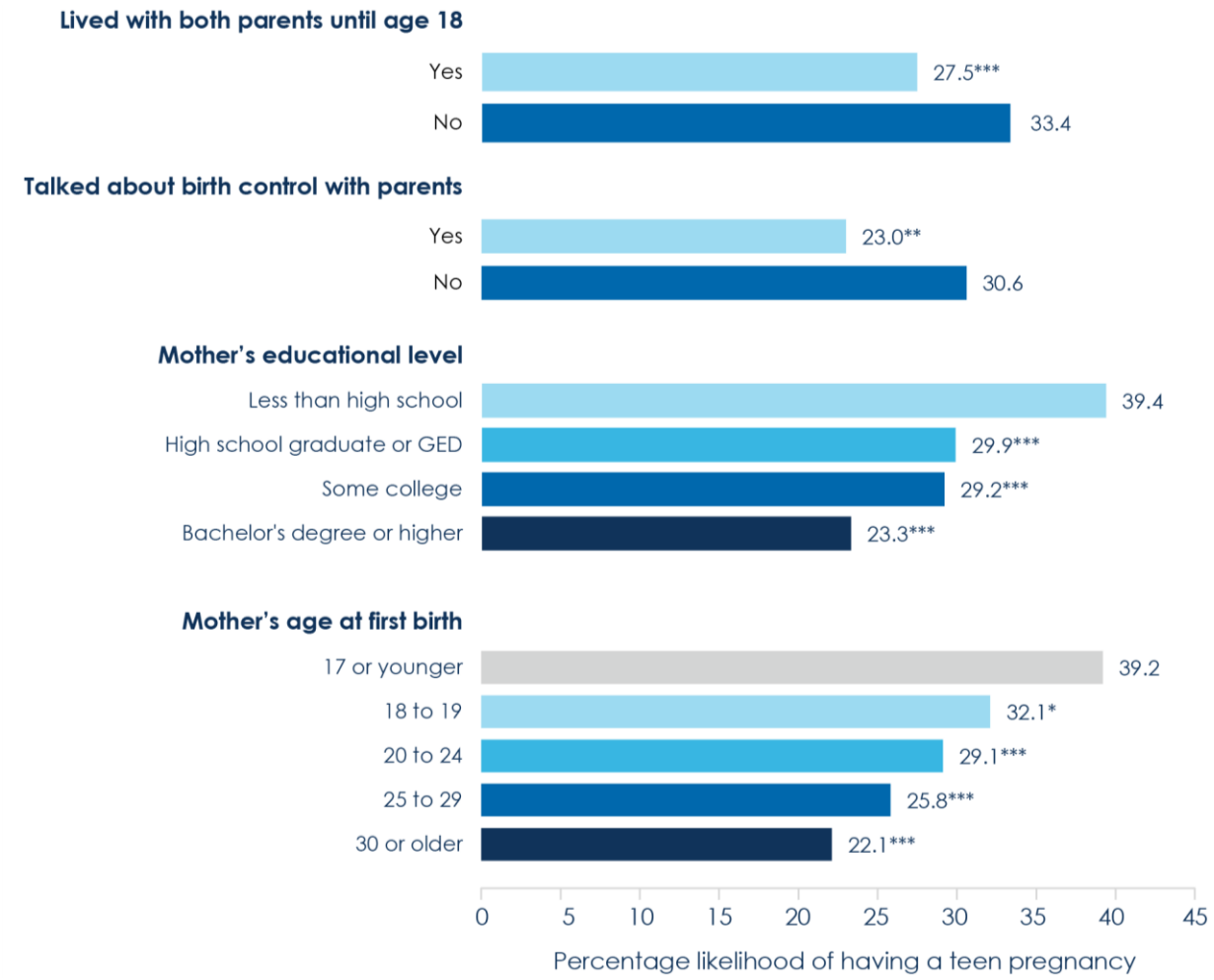
Arkansas and Mississippi have passed legislation that limits to whom, how, and where abortion services are available. Currently, women in both states can get an abortion up to 20 weeks gestation.[a] In February 2019, the Arkansas and Mississippi legislatures passed three bills to restrict when during pregnancy an abortion can be performed (State of Arkansas 2019; Mississippi Legislature 2019a,b). In addition, both states have policies requiring youth to take multiple steps to obtain abortion services, such as mandatory waiting periods (Mississippi: 24 hours; Arkansas: 48 hours) and parental consent (Mississippi: consent of both parents; Arkansas: consent of one parent). In Mississippi, providers must disclose potential side effects of abortion. Due to such conservative policies, few clinics have decided to or can offer abortion services—Mississippi has one abortion clinic in Jackson, and Arkansas has three (one in Fayetteville and two in Little Rock), but only one that offers surgical abortion and abortions past eight weeks gestation.

[a] In March 2018, Mississippi signed into law a ban of most abortions past 15 weeks gestation, but a U.S. District court issued a temporary injunction that prevented the state from enforcing the law.

What do the numbers say?

Demonstrating the importance of **role-modeling and mentoring from parents,** our person-level analysis of National Survey of Family Growth (NSFG) data found that teens who lived with both parents until the age of 18 and had spoken to their parents about birth control were less likely to become pregnant (Exhibit E). The analysis also found that mothers' backgrounds were particularly important—teens whose mother graduated high school and waited until age 18 to have a child were also less likely to become teen parents.

Exhibit E. Interpersonal level quantitative findings



Source: NSFG
Note: Estimates show the predicted likelihood of having a teen pregnancy holding all other characteristics constant.
* *p*-value < 1.0, ** *p*-value < 0.05, *** *p*-value < 0.01

What does the community say?

Aligning with the quantitative analysis, discussions with community members highlighted family structure and communication with parents as a key factor affecting youth sexual behavior. Not captured through quantiative analysis variables, interactions with health care providers and peers emerged as another two important relationships associated with youth sexual behavior.

Lack of parental monitoring. With more than half of the households in Phillips and Coahoma Counties being female-headed single-parent households, youth often do not have adult supervision outside of educational settings. Community members hypothesize that this lack of supervision allows youth more opportunities to engage in sex and other risky behaviors. They also said limited monitoring can provide opportunities for sexual predators to prey on youth—in some of these instances, parents could be well aware but hesitant to report sexual predation because this could lead to being ostracized within smaller communities.[6]

> *"A lot of parents are growing up with their kids. They're acting like friends, not acting like parents."*
>
> **–Parent in Coahoma Co.**

Noncompliance with confidentiality protocols among health care providers. Youth, adults, and local program representatives have provided anecdotes about staff at local clinics failing to protect patients' identity in and out of the health care setting. These staff have violated patient confidentiality by telling other patients or community members about youths' inquiries for sexual health services. To circumvent this, some youth travel to another county for services. However, due to distance and cost, this strategy is not an option for many youth. Furthermore, some providers also misunderstand current laws and regulations to protect confidentiality, leading to such breaches. For example, several clinics in both counties receive Title X federal family planning grant funds, requiring them to provide confidential family planning services to minors without parental consent (Office of Population Affairs 2014). However, a program administrator said most clinic administrators are not aware of this requirement and still ask for parental consent. The lack of confidentiality deters many youth from accessing needed sexual and reproductive health services (Guttmacher Institute 2019).

> *"Kids in the Delta don't have their own clinics, but they don't want to go to the local health department because there's concerns about their confidentiality being breached. In one case, a teen tried to access birth control and the clinic called their parents. The biggest concern is about their confidentiality."*
>
> **–Program administrator in Coahoma Co.**

Peer pressure. Initiation of sex at early ages among peers can lead to other youth feeling pressured to engage in sex to fit in. For instance, interviewed youth explained that some teens engage in sex "for the [Insta]gram," in other words, to be able to brag about it on social media. Peer pressure is not always negative. For example, youth explained that a friend could encourage someone to go to the clinic to get condoms.

C. Individual youth characteristics

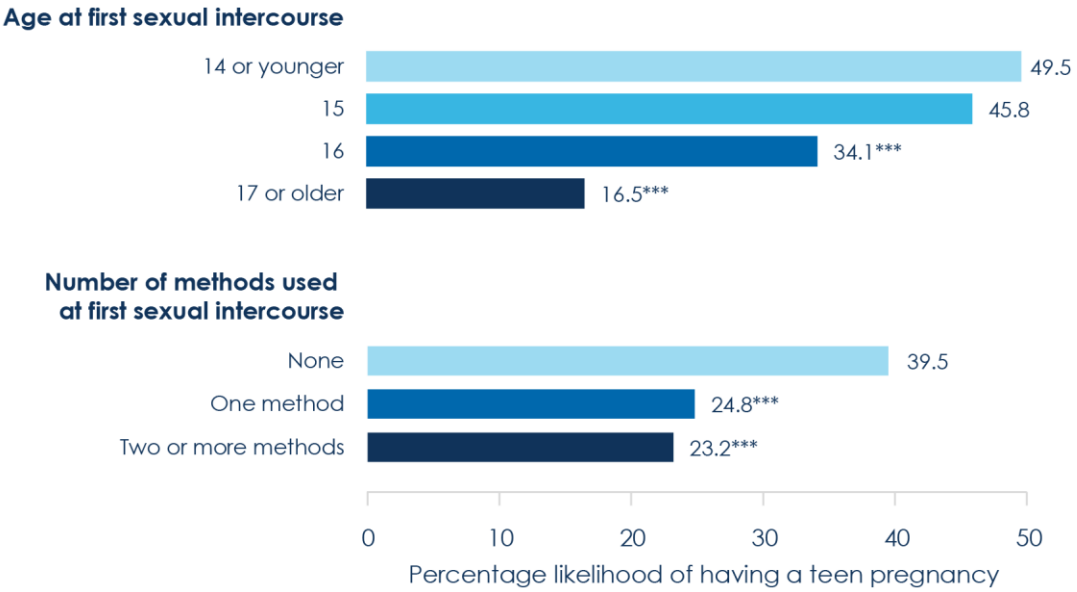
Ultimately, how youth react to their environment and the people around them depends on their individual characteristics. Some characteristics do not necessarily change over time, such as genetic make-up or age (nonmodifiable), and others might, such as knowledge (modifiable). Next, we explain how both types of individual-level characteristics influence youth sexual behaviors.

[6] Research has found that reporting sexual assault in rural communities is low. This is due the small knit nature of many of these communities that facilitate lack of anonymity and increase the likelihood of personal connections between law enforcement officers and the perpetrator (Lewis 2003).

What do both the numbers and the community say?

Quantitative and qualitative data were consistent and found that an individual's **young age at initiation of sex** and **lack of contraceptive use at first intercourse** were key characteristics associated with a higher likelihood of having a teen pregnancy (Exhibit F). Youth and adults in the community, as well as program providers, stated that most youth in the two counties begin having sexual intercourse by age 11 or 12, which is significantly younger than the average age of 17 for women in the rural South overall, based on the NSFG data analysis. When they do begin having sex, teens in these counties seem to have little interest in using condoms; common reasons teens stated for not using condoms include "it won't feel as good" and "free condoms are the ones that break."

Exhibit F. Individual level quantitative findings



Source: NSFG
Note: Estimates show the predicted likelihood of having a teen pregnancy holding all other characteristics constant.
* *p*-value < 1.0, ** *p*-value < 0.05, *** *p*-value < 0.01

III. OPPORTUNITIES FOR INTERVENTION

Our quantitative findings suggest that systemic factors, such as poverty and education, have as great an influence on teen pregnancy in these counties as do family and peer relationships and individual attitudes, beliefs, and behaviors. Therefore, significantly reducing teen pregnancy in these counties requires a multipronged approach in government, community, school, and clinical settings. This section discusses interventions within each setting demonstrating promise in reducing teen pregnancy in Phillips and Coahoma Counties. Due to the limited research available on effective interventions in the focal counties or the Delta Region more generally, many of the strategies discussed are those that have evidence of effectiveness in the rural South or the United States more generally, and could have promise in these counties.[7]

[7] See Appendix C for detailed findings from studies presented in this section.

A. Government (policy) interventions

Policies that allocate additional funding to education, vocational training, and job creation programs in the Delta could stimulate economic stability in families, leading to better parental monitoring and perceptions of economic opportunities beyond high school among youth. Other potential policy areas to influence include those related to providing service through Medicaid and the public educational system. Although these types of advocacy and systems change interventions are critical, they can be hard to measure and few studies have shown a specific strategy's effectiveness on preventing teen pregnancy in the rural South.

> *"If [young people] are able to get in touch with the sense that they have something to offer the world, they won't want to get pregnant now, but [they will] want to go to college, get a job, and have a baby later. That's what our program tries to do."*
>
> **–Program administrator in Phillips Co.**

B. Community-based interventions

Research indicates that increasing services in the community to support youth and their families can reduce youth risky behaviors, such as substance use and early initiation of sex (National Research Council and Institute of Medicine [NRC IOM] 2002). Moreover, these opportunities can help teens perceive future outcomes other than becoming pregnant as a teen. Next, we discuss two key categories of these community-based programs: youth development and parenting education.

- **Youth development programs.** Several youth development programs found positive short-term impacts for teen pregnancy prevention in rural areas, including the *Teen Outreach Program* and the *Carrera Program* (Daley et al. 2015; Tucker and Langley 2016). These programs include content on life skills, community service, parent–child communication, and other valuable topics (NRC IOM 2002).
- **Parenting education.** Strong parent–child communication plays an important role in improving sexual health outcomes for youth and improving community and family norms (Terzian and Mbwana 2009; King Jones 2010; Boyas et al. 2012; Ng and Kaye 2015). Examples of parenting education curricula shown to improve teen pregnancy-related outcomes include *Families Talking Together*, *Keepin' it R.E.A.L.: Mother-Adolescent HIV Prevention Program*, and *Parents Matter!* (Guilamo-Ramos et al. 2011; DiIorio et al. 2006; Forehand et al. 2007). These programs focus on increasing effective communication skills regarding sexuality and risk reduction, building parent–adolescent relationships, and helping parents develop successful monitoring strategies.

C. School-based interventions

Schools provide an easy venue through which to reach youth, promote awareness, correct misinformation, and increase access to services for preventing teen pregnancy. They also are among the interventions that have the strongest evidence-base for preventing teen pregnancy. These school-based interventions often occur in classroom settings, though school-based health centers (SBHCs) can also be the setting for intervention.

- **Classroom interventions.** Teens across Phillips and Coahoma Counties receive varying degrees of sexuality education. Educators reported about half of school districts in Phillips County provided sexuality education, compared to all three districts in Coahoma County. Of students who receive sexuality education, the curricula largely adhered to the National Sexuality Education Standards, although schools do not typically include the condom demonstration to comply with state laws.[8] These curricula are also typically provided in 8th grade and above, limiting their effectiveness in these counties where sexual initiation often begins much earlier. A meta-analysis of sexuality education programs conducted by the Community Preventative Task Force found improvements in all seven key outcomes—current sexual activity, frequency of sexual activity, number of sex partners, frequency of unprotected sexual activity, use of protection (condoms and/or hormonal contraception), pregnancy, and STIs—for programs that include content on the effectiveness of contraception and condoms (Chin et al. 2012).
- **School-based health care.** One high school each in Phillips and Coahoma Counties has SBHCs, though access to these services varies by coverage under Medicaid due to state or clinic policy, such as whether services can be reimbursed if the SBHC is not designated as the primary health care provider for a youth. Changing these policy may require advocating for expanded Medicaid access or working with the SBHC clinic administrator to identify barriers to student access at the clinic level. Both SBHCs provide primary health care services, but only the SBHC in Coahoma County provides family planning.[9] Providing these services in school settings can lead to improved contraceptive use as well as improved academic achievement (Knopf et al. 2016).

D. Clinical-setting interventions

Providing access to the full range of contraceptive options, including long-acting reversible contraception (LARC), at local health clinics is an effective way to prevent teen pregnancy (CDC 2019).[10] To offer the full range of contraceptive options, clinics can conduct several types of interventions to increase providers' skills in counseling about and inserting LARCs, improve health clinic operations to stock and manage LARCs and other contraceptive options, and provide reimbursement for LARC services.

> *"We need a safe space where youth can be made aware of better ways to stay safe with sex."*
>
> **–Youth in Coahoma Co.**

Provider technical training. A statewide program in Colorado to expand access to LARCs for low-income women by training providers and providing operational support and low- or no-cost LARCs to clinics resulted in an almost 50 percent drop in teen pregnancy from 2009 to 2014 in both urban and rural areas (Colorado Department of Public Health and Environment 2017). In Phillips and

[8] The National Sexuality Education Standards outline the ideal requirements for sexuality education programs, which include covering a full range of topics (anatomy and physiology, puberty and adolescent development, identity, pregnancy and reproduction, STIs and HIV, healthy relationships, and personal safety) (Future of Sex Education Initiative 2012).

[9] The SBHC in Phillips County cannot distribute contraception or condoms.

[10] LARCs include intrauterine devices (for example, Mirena and Paraguard) and implants (such as, Nexplanon). When inserted, LARCs are effective for 3 to 12 years, depending on the method selected, and there is a significant body of research on the efficacy and safety of LARCs for teens (CDC 2015; Stoddard et al. 2011; Colorado Department of Public Health and Environment 2017).

Coahoma Counties, many providers are not trained to insert LARCs or they have concerns about inserting them.

- **Health center operations capacity building.** Building capacity in health centers to increase access to the full range of contraceptive services has shown promise in preventing unplanned pregnancy (National Institute for Children's Health Quality 2017; Kaye et al. 2014). The Colorado demonstration and efforts from Upstream USA, have shown evidence that reproductive health capacity-building efforts can increase clinics' capacity to provide the full range of contraception options, including LARCs (Colorado Department of Public Health and Environment 2017; Upstream USA 2019). There is one clinical capacity-building program focused on sexual and reproductive health in Coahoma County, but there is not a comparable program in Phillips County.

Leveraging and building on current interventions

Phillips and Coahoma Counties offer an array of existing interventions that can be built upon or leveraged to further expand efforts to address teen pregnancy prevention.

- **Government interventions.** Teen Health Mississippi (THMS) advocates for the Mississippi legislature to expand access to evidence-based, comprehensive sexuality education through its youth movement programs. Additional partners and aligning with other ongoing initiatives, such as the Mississippi Department of Health's Creating Healthy and Responsible Teens (CHART) initiative, could augment this movement.
- **Youth development programs.** Several youth development programs already exist in Phillips and Coahoma Counties, including Spring Initiative, Griot Arts, Boys & Girls Club of the Mississippi Delta, and Boys & Girls Club of Phillips County. These programs address academics, relationship skills, and social service needs of youth in an after-school setting. Incorporating formal teen pregnancy prevention curricula could enhance these programs' impacts on outcomes. Additional resources could help them expand the programs' reach and serve more youth.
- **Classroom interventions.** In Coahoma County, THMS and the Delta Health Alliance provide two evidence-based programs: *Draw the Line, Respect the Line (DTL)* and *Reducing the Risk*. The three high schools and one middle school that use these programs have adapted them by removing condom demonstrations to align with state law. In Phillips County, the University of Arkansas Medical Sciences (UAMS) East implements *Making Proud Choices* in high schools and DTL in middle schools. The U.S. Department of Health and Human Services Evidence Review lists all of these programs, though only *Reducing the Risk* has been studied in a rural area (U.S. Department of Health and Human Services 2018; Goesling et al. 2018). Goesling et al. found that *Reducing the Risk* did not change the likelihood of having sex in the three months before the two-year follow-up survey, but it did reduce the likelihood of sex without a condom in the three months before the two year follow-up for a subsample of youth who were already sexually active before they enrolled in the study (42 versus 52 percent) (Goesling et al. 2018).
- **Clinical interventions.** The Focus4Teens project through THMS is training providers on delivering contraceptive counseling and LARC insertion, making clinics more youth friendly, increasing community referral linkages, and educating the community on the safety and efficacy of LARCs and other contraceptive methods in Coahoma County. This grantee reports that the Aaron E. Henry Community Health Clinic in Clarksdale, MS offers the full range of contraception, including LARCs. The study team was unable to verify contraceptive options being provided at other health clinics in Phillips and Coahoma Counties.

There are also gaps in the intervention areas without existing programs or projects. For example, neither county has parenting education programs. Phillips County is also lacking policy-focused initiatives or SBHCs providing family planning.

IV. CONCLUSION

> ***"Addressing the social determinants of health that influence teen pregnancy is paramount to eliminating disparities and achieving health equity. Expanding prevention efforts from purely individual behavior change to improving the social, political, economic, and built environments in which people live, learn, work, and play may better equip vulnerable youth to adopt and sustain healthy decisions."***
>
> **–Fuller et al. 2018**

Public health research confirms that addressing factors across settings simultaneously is the most effective strategy to decrease teen pregnancy rates (Frieden 2010; Ng and Kaye 2015; Jozkowski and Crawford 2016; Barfield et al. 2017). However, the literature also documents the challenges inherent to systemic and community-wide efforts, such as lack of community will for change, ineffective coordination, and need for substantial resources.

Overcoming these challenges requires making targeted investments across social sectors, such as labor, education, youth development, and health care. Although these investments might be cross-sectoral, they should align toward achieving a common goal of developing a cohesive vision and plan for addressing teen pregnancy that brings together stakeholders across social sectors and levels of influence. These efforts could accelerate closing the more than double-digit gap between Phillips and Coahoma Counties' rates of teen births and that for the nation.

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APPENDIX A: FEDERAL GRANTS SERVING COAHOMA COUNTY

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Exhibit A.1 Federal grants serving Coahoma County, Mississippi

Grant period	Funder and grant	Recipient	Amount	Description of program
2015-2019	Office of Adolescent Health (OAH), Department of Health and Human Services (DHHS): Implementing Evidence-Based Programs to Scale Teen Pregnancy Prevention Grant	Delta Health Alliance, Inc.	$1,499,999	The Delta Health Alliance, Inc.'s Delta Futures project is designed to assist public school districts and five local Rural Health Clinics across 9 rural counties (Bolivar, Coahoma, Leflore, Panola, Quitman, Sunflower, Tallahatchie, Tunica, and Washington) in replicating evidence-based teen pregnancy prevention programs in school, clinic, and community settings. The goal of this initiative is to have the greatest impact on preventing teen pregnancy and reducing disparities in the Mississippi Delta by implementing evidence-based programs (EBPs) in communities with the greatest need, ensuring that EBPs selected are a good fit for those populations, and adopting strategies to implement the EBPs in a way that increases the programs' reach to as many youth as possible.
2015-2019	OAH, DHHS: Phase 1 New and Innovative Strategies Teen Pregnancy Prevention Grant	Delta Health Alliance, Inc.	$374,773	Delta Health Alliance will administer the Delta Futures II program with adolescents ages 16-19 in six rural counties (Bolivar, Coahoma, Humphreys, Leflore, Sunflower, and Washington) in the Mississippi Delta region. More specifically, Delta Health Alliance will implement and evaluate the Pre-Conception Peer Educator model for pregnancy prevention and delay in partnership with local colleges, GED prep programs, and workforce development centers. The program recruits and trains youth who are not enrolled in public school to conduct outreach and education with their peers regarding pre-conception health, risk reduction, strategies for avoiding unplanned pregnancy, and long-term goal setting related to family planning. The program aims to promote healthy decision-making and to enhance protective factors for youth, with the goal of preventing adolescent pregnancies and reducing disparities among older adolescents in the Mississippi Delta region.
2010-2018	Family Youth Services Bureau, Administration for Children and Families, DHHS: State Personal Responsibility Education Program [PREP]	Mississippi Department of Health	Approximately $470,000 annually	Mississippi's PREP program serves mostly African-American youth, ages 10 to 19. The program is implementing four evidence-based models — *Draw the Line/Respect the Line*, *Reducing the Risk*, *Becoming a Responsible Parent*, and *Sexual Health & Adolescent Risk Prevention* — in school, youth detention, and community-based settings statewide (including Coahoma County). Mississippi PREP plans to serve 7,000 youth annually, providing adulthood preparation subjects to include adolescent development, parent-child communication, healthy life skills, and healthy relationships.

Grant period	Funder and grant	Recipient	Amount	Description of program
2015-2019	CDC	Mississippi First (Teen Health Mississippi)	$3,072,999.75	Funding is used for the Focused Pregnancy Prevention for Mississippi Teens (Focus4Teens) project. Focus4Teens will develop the capacity of health center partners through a comprehensive training and technical assistance program to provide youth-friendly sexual and reproductive health services and increase the number of youth accessing and receiving these services by working with youth-serving partners. Referral systems will be developed to link vulnerable youth to care and to increase awareness of health services in the community. Mississippi First will be working with partners in Coahoma County, Quitman County, and Tunica County.

Sources: Office of Adolescent Health; Family Youth Services Bureau, Administration for Children and Families; CDC

Note: The grants listed in this table were identified as funding programs in Coahoma County, Mississippi specifically. The study team did not identify any federal grants since 2010 that funded programming in Phillips County, Arkansas.

APPENDIX B: TECHNICAL APPENDIX

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I. QUANTITATIVE METHODS

A. Person-level analysis

We modeled the associations between becoming pregnant during adolescence and various individual- and household-level factors, using data from the 2011 to 2015 National Survey of Family Growth (NSFG).[1] For our analyses, we restricted the sample to women who reside in the rural South, as county and state identifiers are not available in the NSFG, but these women are arguably more similar to those living in Coahoma and Phillips Counties than the average survey respondent. To model the associations, we used regression analysis. The dependent variable was a yes-or-no indicator for having had a teen pregnancy and the variables listed in Exhibit B.1 were explanatory variables. Exhibit B.2 reports the findings from the person-level regression model.

Exhibit B.1. Descriptive statistics of the variables used in the person-level analysis

	Percentage of respondents		
	All respondents	Women who had a teen pregnancy	Women who did not have a teen pregnancy
Had a teen pregnancy	31.7	100.0	0.0
Demographics			
Race			
Black	23.1	26.5	21.5
White	71.2	68.2	72.5
Other	5.8	5.2	6.0
Hispanic	16.0	18.6	14.9
Foreign born	12.5	11.9	12.7
Family background			
Respondent's family was intact through age 18	51.8	40.7	57.0
Respondent was ever in foster care	2.3	3.9	1.6
Respondent attended church at age 14[a]	78.7	66.6	82.0
Respondent was raised Catholic	23.0	21.3	23.8
Respondent was raised Baptist	31.8	35.5	30.0
Mother's educational level			
Less than high school	23.0	33.4	18.2
High school graduate or GED	31.6	32.2	31.2
Some college	24.6	21.6	25.9
Bachelor's degree or higher	20.9	12.7	24.7
Mother's labor force participation			
Full-time	61.0	59.4	61.7
No work	21.7	24.4	20.4
Mother's age at her first birth			
Younger than 18 years old	17.2	26.2	13.1
18 to 19 years old	19.6	22.3	18.3
20 to 24 years old	40.6	39.6	41.1
25 to 29 years old	17.1	10.0	20.4
30 years old or older	5.5	1.9	7.2
Mother was married at time of respondent's birth	75.8	71.0	78.0

[1] The NSFG is a nationally representative sample of women ages 15 to 44 in the civilian, noninstitutionalized population of the United States. It is one of the most comprehensive sources of data on family life, pregnancy, use of contraception, and women's reproductive health in the United States. Government and other agencies use the survey results from the NSFG to inform health and reproductive policies.

	Percentage of respondents		
	All respondents	Women who had a teen pregnancy	Women who did not have a teen pregnancy
Sexual history			
Age of partner at first sexual intercourse			
Older than respondent	76.2	79.2	74.8
Younger than respondent	6.1	3.6	7.2
Age at first sexual intercourse			
Younger than 14 years old	5.6	11.4	2.9
14 years old	8.7	15.7	5.5
15 years old	14.8	25.1	10.0
16 years old	29.9	22.2	33.6
17 years old or older	41.0	25.7	48.1
Sexuality education			
Received sexuality education in school[a,b]	87.1	78.2	89.5
Type of contraception used at first sexual intercourse			
None	26.2	42.2	18.7
Condom	49.5	37.0	55.4
Pill, patch, other contraception	24.3	20.8	26.0
Age respondent first used contraception			
Younger than 15 years old	9.3	11.6	8.2
15 to 17 years old	74.6	73.5	75.0
18 to 19 years old	7.6	9.7	6.6
20 or older	8.6	5.2	10.2
Number of respondents	**3,037**	**969**	**2,068**

Source: National Survey of Family Growth 2011–2015.

[a] Question was asked only of respondents ages 25 and younger.

[b] Receipt of sexuality education in school includes receiving education in school on any of the following topics: saying no, birth control methods, where to obtain birth control, condoms, STIs, HIV, or abstinence.

[c] Type of contraceptive methods includes condoms, birth control pill, patch, withdrawal, Dep-Provera, injectables, implant, calendar rhythm, diaphragm, IUD, foam, jelly or cream, today sponge, emergency contraception, and safe period.

GED = General Educational Development.

Exhibit B.2. Regression estimates from the person-level analysis

Dependent variable = Had a teen pregnancy	Regression coefficient	*p*-value
Demographic characteristics		
Race		
Black	0.03	0.38
White (reference category)	--0--	
Other	0.01	0.75
Hispanic	0.03	0.29
Foreign born	-0.02	0.66
Family background		
Respondent's family was intact through age 18	-0.06***	**0.01**
Respondent was ever in foster care	0.08*	**0.08**
Respondent attended church at age 14	-0.02	0.63
Respondent was raised Catholic	-0.01	0.61
Respondent was raised Baptist	0.02	0.36
Mother's educational level		
Less than high school (reference category)	--0--	
High school graduate or GED	-0.09***	**0.01**
Some college	-0.10***	**0.01**
Bachelor's degree or higher	-0.16***	**0.00**

Dependent variable = Had a teen pregnancy	Regression coefficient	*p*-value
Mother's labor force participation		
Full-time	-0.04	0.27
No work	0.02	0.70
Mother's age at birth of first child		
17 or younger (reference category)	--0--	
18 to 19	-0.07*	**0.08**
20 to 24	-0.10***	**0.01**
25 to 29	-0.13***	**0.00**
30 or older	-0.17***	**0.00**
Mother was married at time of respondent's birth	-0.02	0.59
Sexual history		
Age of partner at first sexual intercourse		
Older than respondent	0.01	0.72
Younger than respondent	-0.08	0.11
Age at first sexual intercourse		
14 or younger (reference category)	--0--	
15	-0.04	0.43
16	-0.15***	**0.00**
17 or older	-0.33***	**0.00**
Sexuality education		
Received sexuality education in school[a]	-0.22***	**0.00**
Talked about birth control with parents	-0.08**	**0.03**
Contraceptive use history		
Number of contraceptive methods used at first sexual intercourse		
None (reference category)	--0--	
One method	-0.15***	**0.00**
Two or more methods	-0.16***	**0.00**
Age respondent first used birth control		
14 or younger (reference category)	--0--	
15 to 17	0.06	0.22
18 to 19	0.09**	**0.05**
20 or older	-0.14**	**0.02**
Used condom at first sexual intercourse	0.00	0.98
Control variable		
Respondent older than 25 at time of survey	-0.15**	**0.03**
Ever had sex	0.22***	**0.01**
Number of respondents	**3,037**	

Source: NSFG 2011–2015.
Note: Estimates are regression coefficients from a multivariate model.

--0-- = Reference category. Coefficient estimates for mutually exclusive categories are relative to the reference category.

[a] Receipt of sexuality education in school includes receiving education in school on any of the following topics: saying no, birth control methods, where to obtain birth control, condoms, STIs, HIV, or abstinence.

[b] Other forms of contraception include withdrawal, Dep-Provera, injectables, implant, calendar rhythm, diaphragm, IUD, foam, jelly or cream, today sponge, emergency contraception, and safe period.

* *p*-value < 1.0, ** *p*-value < 0.05, *** *p*-value < 0.01

B. Community-level analysis

We conducted two community-level analyses, one at the city level and one at the county level. Due to differences in data quality and availability, the main report described only the county-level findings.

County-level analysis. For this analysis, we used county-level data on the Arkansas and Mississippi Delta Region (Cosby and Bowser 2008). We modeled the associations between teen birth rates and county-level demographic, socioeconomic, and other factors, such as access to reproductive health services. The regression model used the teen birth rate, defined as the number of teen births per 1,000 women ages 15 to 19, as the dependent variable. The county-level characteristics listed in Exhibit B.3 were used as explanatory variables, with each observation reported at the county-year level. The analysis sample included data from 2010 to 2016. Exhibit B.4 reports findings from the county-level analysis.

Exhibit B.3. Average county-level characteristics

Percentage of population	Counties within Mississippi Delta	Coahoma County	Counties within Arkansas Delta	Phillips County
Demographics				
Age birth to 17	24.3	28.1	22.6	27.2
Male	48.8	46.1	49.5	46.9
Black	50.1	75.8	21.5	62.6
Hispanic	2.2	1.4	3.1	1.6
White	48.3	22.9	76.0	35.7
U.S. born	98.4	99.2	97.9	99.2
Socioeconomic characteristics				
Bachelor's degree or higher	16.3	16.9	13.6	12.1
Population in poverty	27.8	37.6	22.7	35.8
Unemployment rate	6.7	10.4	5.3	10.1
Other health indicators				
Teen birth rate per 1,000	50.9	69.4	50.8	76.0
Infants born with low birthweight	12.8	17.8	9.6	12.4
Chlamydia rate per 100,000	803.6	1,585.9	563.9	1,180.8
Number of clinical providers	2.4	2.0	2.8	1.0
Contraceptive deserts	36.2	100.0	23.8	100.0
Number of county-year observations	**329**	**7**	**294**	**7**

Sources: Arkansas Department of Health, Mississippi State Department of Health, American Community Survey (ACS) 5-Year Estimates, Annual Population Estimates Program, Small Area Income and Poverty Estimates, U.S. Bureau of Labor Statistics, CDC National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, and Power to Decide.

Note: Power to Decide defines a contraceptive desert as an area without access to at least one public clinic offering the full range of contraceptive methods for every 1,000 women in need of publicly funded contraception (2019).

▫ Contraceptive desert is a yes-or-no indicator (that is, a county is either a contraceptive desert or it is not). The percentages reported represent the percentage of counties within the Mississippi and Arkansas Delta that were classified as a contraceptive desert. Both Coahoma and Phillips Counties are contraceptive deserts.

Exhibit B.4. Regression estimates from the county-level analysis

Dependent variable = teen birth rate	Regression coefficient	*p*-value
Demographics		
Percentage between age 0 to 17	1.31**	**0.02**
Percentage male	0.16	0.76
Percentage black	-1.45	0.48
Percentage Hispanic	-0.66	0.35
Percentage white	-1.30	0.53
Percentage U.S. born[a]	-0.61	0.60
Socioeconomic characteristics		
Percentage with bachelor's degree or higher[a]	-0.89***	**0.00**
Percentage of population in poverty	54.77**	**0.02**
Unemployment rate	0.42	0.41
Other health indicators		
Infants born with low birthweight	0.19	0.53
Chlamydia rate per 100,000	0.03***	**0.00**
Number of clinical providers	-2.28	0.14
Number of clinical providers (squared)	0.21	0.13
Contraceptive desert	2.03	0.38
Control variables		
Year		
2011	-1.06	0.49
2012	-7.90***	**0.00**
2013	-11.34***	**0.00**
2014	-14.67***	**0.00**
2015	-13.00***	**0.00**
2016	-16.16***	**0.00**
Mississippi state indicator	-2.44	0.39
Number of county-year observations	**623 teens**	

Sources: Arkansas Department of Health; Mississippi State Department of Health; ACS 5-Year Estimates; Annual Population Estimates Program; Small Area Income and Poverty Estimates; U.S. Bureau of Labor Statistics; CDC National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention; and Power to Decide.

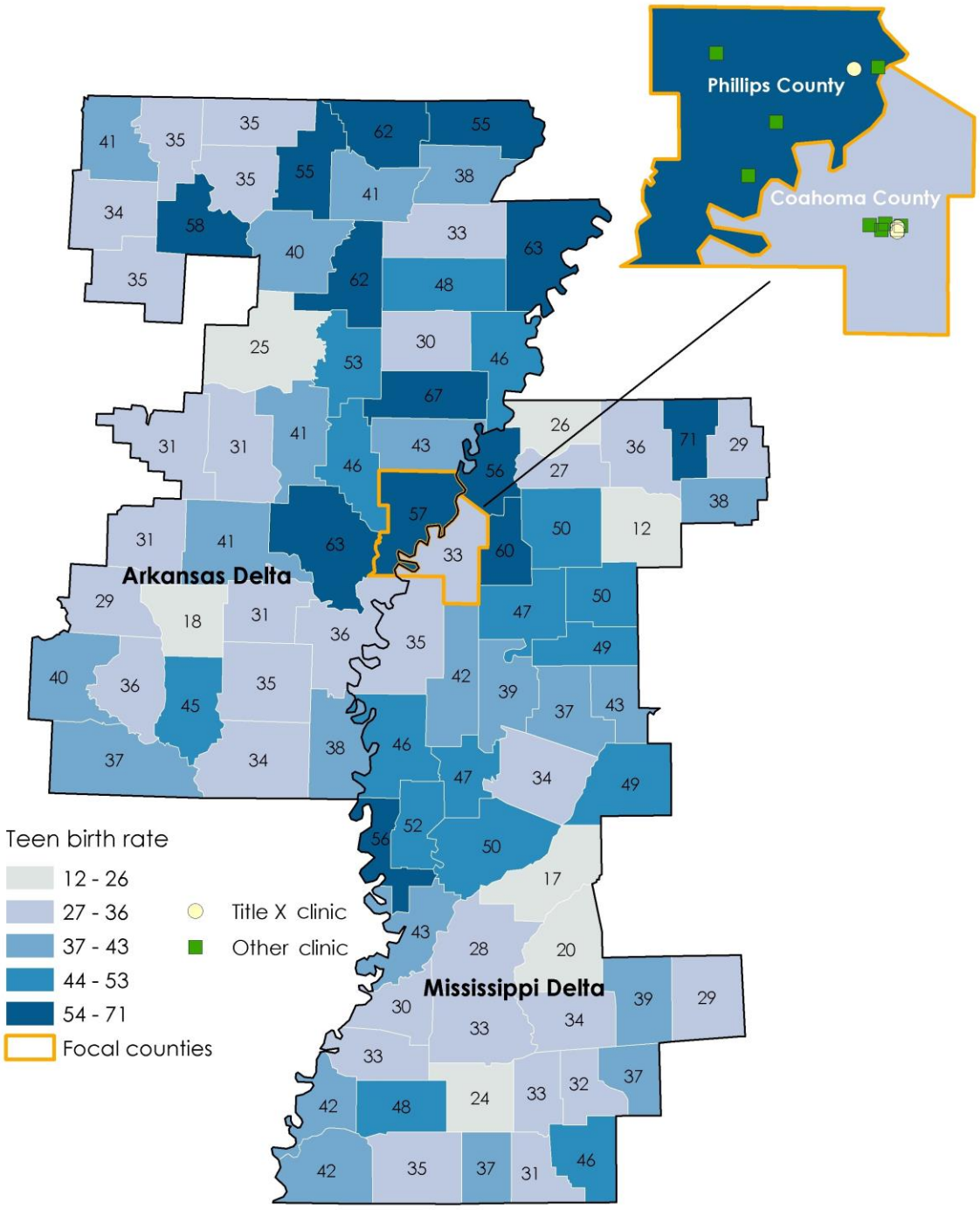
Notes: Estimates are regression coefficients from a multivariate model.

Power to Decide defines a contraceptive desert as an area without access to at least one public clinic offering the full range of contraceptive methods for every 1,000 women in need of publicly funded contraception (2019).

[a] Information is derived from the ACS 5-year estimates. For purposes of this analysis, we treated the 5-year estimate as a single-year estimate. For instance, the 2012–2016 5-year estimate for the percentage of the population with a bachelor's degree or higher is included in the model as a 2016 estimate.

* *p*-value < 1.0, ** *p*-value < 0.05, *** *p*-value < 0.01

Exhibit B.5. 2016 teen birth rates in the Delta Region



Source: Arkansas Department of Health; Mississippi State Department of Health; U.S. Department of Health and Human Services Title X Family Planning Directory.

City-level analysis. The city-level analysis modeled the associations between the city-level teen birth rate and community-level socioeconomic and demographic information (Exhibit B.5). Each observation was reported at the place-year level, where year represents the five-year period for which the American Community Survey (ACS) data are pooled. The analysis sample included data from ACS five-year estimates from 2009 to 2016. Although findings from the city-level analysis were largely consistent with those found at the county level, the paucity and poor quality of information on key characteristics associated with teen birth rates, such as the number of clinical health providers and STI rates for cities located within the Delta, hindered the analysis. Furthermore, we could use only the five-year pooled estimates from the ACS for all demographic and socioeconomic characteristics for the city-level analysis, which smoothed out potentially important annual variations within these characteristics. However, unless there is reason to believe that the factors associated with teen birth rates within the two counties differ systematically from all other counties within the Mississippi and Arkansas Delta, we would expect the factors identified in the county-level analysis to apply at the city level as well. We anticipate that cities exhibiting high proportions of the characteristics identified in Exhibit B.3 to be correlated with teen birth rates.

Exhibit B.5. Regression estimates from the city-level analysis

Dependent variable = teen birth rate	Regression coefficient	*p*-value
Demographics		
Percentage ages birth to 19	0.11	0.87
Percentage male	1.14	0.18
Percentage black	0.32	0.11
Percentage Hispanic	1.41	0.44
Percentage U.S. born	3.29	0.23
Socioeconomic characteristics		
Percentage with bachelor's degree or higher	-1.28***	**0.00**
Percentage of population in poverty	0.64	0.23
Unemployment rate	-0.64	0.68
Control variables		
ACS 5-year pooled sample		
2006–2010	13.63**	**0.05**
2007–2011	14.00*	**0.07**
2008–2012	15.05	0.11
2009–2013	9.26	0.33
2010–2014	1.53	0.87
2011–2015	-8.98	0.30
2012–2016	-19.33**	**0.02**
Mississippi state indicator	-5.08	0.64
Number of county-year observations	**3,091**	

Source: American Community Survey (ACS) 5-Year Estimates.

Note: Estimates are regression coefficients from a multivariate model.
* *p*-value < 1.0, ** *p*-value < 0.05, *** *p*-value < 0.01

II. QUALITATIVE METHODS

A. Bellwether interviews

The study team interviewed 11 bellwethers and stakeholders, including state department of health staff, national foundation staff, and local teen pregnancy prevention program administrators. The team conducted phone interviews in November and December 2018 that each lasted about 60 minutes. A researcher and research analyst used a semi structured interview protocol. The interviews covered (1) the extent of the issue of teen pregnancy in Phillips and Coahoma Counties, (2) the approaches used to prevent teen pregnancy in these counties, and (3) the successes and challenges with these approaches.

B. Literature review

A senior library scientist conducted a literature search using select databases and websites using the parameters listed in Exhibit B.6. The search identified 56 relevant articles in the academic and grey literature, including government reports and dissertations. A team of three research staff reviewed 56 articles and abstracted relevant data to identify (1) factors associated with teen pregnancy in the rural south and (2) approaches that have been used to prevent teen pregnancy in these areas.

Exhibit B.6. Sample table

Parameter	Description
Time frame	2009 to 2018
Population definition	Adolescents or teenagers or minor or juvenile or youth or young people or young women or young men or young adults, emerging adults
Setting	Mississippi, Arkansas, Delta Region, rural south
Databases searched	Academic Search Premier, ERIC and Education Research Complete, PsycINFO, SCOPUS, MedLine, SocIndex, Proquest Dissertations, Cochrane Database of Systematic Reviews; Customized Google Search and Google Scholar used to identify grey literature
Subject headings and key search terms	Teen pregnancy prevention, pregnancy avoidance, sexuality education, reproductive health, long-acting reversible contraception, LARC, birth control, sexual health, sexual behavior, sexual intercourse, health/healthy behaviors, behavior modification, behavior change, abortion

LARC = long-acting reversible contraception.

C. Community leader interviews

The study team conducted four community leader interviews with school, community group, and health clinic staff in Phillips and Coahoma Counties. Interviews occurred both in person and over the phone and lasted about 60 minutes. A researcher and research analyst team used a semi structured interview guide to discuss community factors influencing teen pregnancy in Coahoma and Phillips Counties and potential strategies to address them.

D. Focus groups

In Early February 2019, two study team members conducted four youth focus groups with a total of 30 youth, and two adult focus groups with a total of 15 parents, in Coahoma and Phillips Counties. The team conducted each focus group in person, and each lasted about 90 minutes. A researcher and

research analyst team used a semi structured interview guide to understand local attitudes and beliefs toward teen pregnancy and services available for local teens to prevent teen pregnancy.

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APPENDIX C: SUMMARY FINDINGS OF REVIEWED LITERATURE

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Exhibit C.1. Summary findings of reviewed literature

Article	Sample and setting	Study type	Findings
Barfield et al. 2017	N/A	Commentary	This article discusses the rationale behind the CDC's Community-wide Teen Pregnancy Prevention grant program.
Boyas et al. 2012	252 rural 7th graders in Arkansas	Cross-sectional study	Multiple regression results suggest that being a female, being a youth of color, level of closeness with father, and spending enough time with one's father predicted increased frequency of sex-related communication between parent and child. Study findings show that situational and sociodemographic differences play a significant role in predicting frequency levels of sex communication.
Chin et al. 2012	National	Meta-analysis	Meta-analyses were conducted on the effectiveness of two strategies for group-based behavioral interventions for adolescents: (1) 66 studies of comprehensive risk reduction and (2) 23 studies of abstinence education on preventing pregnancy, HIV, and other STIs. For each strategy, seven key outcomes were assessed—current sexual activity; frequency of sexual activity; number of sex partners; frequency of unprotected sexual activity; use of protection (condoms and/or hormonal contraception); pregnancy; and STIs. The results of these meta-analyses for comprehensive risk reduction showed favorable effects for all of the outcomes reviewed. For abstinence education, the meta-analysis showed a small number of studies, with inconsistent findings across studies that varied by study design and follow-up time, leading to considerable uncertainty around effect estimates.
Colorado Department of Public Health and Environment 2017	Colorado (state-wide initiative)	Descriptive	The Colorado Family Planning LARC Initiative helped cut unintended pregnancy rates by 40 percent among women aged 15-19 and 20 percent for women aged 20-24 between 2009 and 2014 and helped cut the fertility rate nearly in half for women aged 15-19 and by 20 percent for women aged 20-24. An estimated half to two-thirds of the decline in the number of births to women aged 15-24 between 2009 and 2014 can be attributed to the Colorado Family Planning Initiative, with associated averted public assistance costs totaling between $66.1 and $69.6 million.
Daley et al. 2015	26 high schools in 10 Florida counties (4,063 youth)	School-based longitudinal cluster randomized controlled trial	For the outcome of ever having had sexual intercourse at the end of the program, TOP was found to be effective in reducing the number of youth who reported engaging in sexual intercourse relative to the comparison group. Exposure to the intervention reduced the number of youth having sex by approximately 3.7 percent. For the outcome of ever being pregnant or causing a pregnancy, the intervention was found to be statistically significantly effective, compared to the comparison group, at the end of the program. Neither outcome was significantly effective 10 months after the program ended.
Dilorio et al. 2006	11-14 year old African-American youth, setting unknown	Randomized controlled trial	The primary analyses showed no difference among groups in abstinence rates for adolescents. However, adolescents demonstrated an increase in the condom use rate. Mothers showed substantial increases over time in comfort talking about sex and self-efficacy.

Article	Sample and setting	Study type	Findings
Forehand et al. 2007	1115 African American parent-preadolescent dyads (child, aged 9-12 years) in Athens, Georgia; Atlanta, Georgia; and Little Rock, Arkansas	Randomized controlled trial	Participants in the enhanced intervention had higher mean changes from baseline scores, indicating more sexual communication and responsiveness to sexual communication at each assessment after intervention for all continuous measures than those in the control intervention and single-session intervention. Preadolescents whose parents attended all 5 sessions of the enhanced intervention had a likelihood of sexual risk at the 12-month follow-up of less than 1.00 relative to those whose parents attended the control (relative risk, 0.65; 95 percent confidence interval, 0.41-1.03) and single-session (relative risk, 0.62; 95 percent confidence interval, 0.40-0.97) interventions.
Frieden 2010	N/A	Theoretical article	The Public Health Impact Model, a 5-tier pyramid, best describes the impact of different types of public health interventions and provides a framework to improve health. At the base of this pyramid, indicating interventions with the greatest potential impact, are efforts to address socioeconomic determinants of health. In ascending order are interventions that change the context to make individuals' default decisions healthy, clinical interventions that require limited contact but confer long-term protection, ongoing direct clinical care, and health education and counseling. Interventions focusing on lower levels of the pyramid tend to be more effective because they reach broader segments of society and require less individual effort. Implementing interventions at each of the levels can achieve the maximum possible sustained public health benefit.
Goesling et al. 2018	9th and 10th grade (mostly White) students in 13 schools in rural central and southwest Kentucky, sample	Randomized controlled trial	Students in both the Reducing the Risk schools and control schools had a similar likelihood of having sex and having sex without a condom in the three months before the follow-up survey. At the two-year follow-up, 33 percent of students in the Reducing the Risk schools and 30 percent of students in the control schools reported having had sex in the three months before the survey. Students in the two groups also had a similar likelihood of having sex without a condom, with 19 percent of students in the Reducing the Risk schools and 22 percent of students in the control schools reporting sex without a condom in the three months before the survey. For sexually experienced students, the program did not reduce the likelihood of having sex in the three months before the follow-up survey. However, students in the Reducing the Risk schools were less likely than students in the control group to report having had sex without a condom in the three months before the survey (42 versus 52 percent). The difference in rates was marginally statistically significant at the 10 percent level.
Guilamo-Ramos et al. 2011	264 Latino and black mother-adolescent (ages 11-14) dyads in New York City	Randomized controlled trial	Relative to the control group, statistically significant reduced rates of transitioning to sexual activity and frequency of sexual intercourse were observed, with oral sex reductions nearly reaching statistical significance ($p < .054$). Specifically, sexual activity increased from 6 percent to 22 percent for young adults in the "standard of care" control condition, although it remained at 6 percent among young adults in the intervention condition at the 9-month follow-up. A parent-based intervention delivered to mothers in a pediatric clinic as they waited for their child to complete a physical examination may be an effective way to reduce sexual risk behaviors among Latino and African American middle-school young adults.

Article	Sample and setting	Study type	Findings
Jozkowski and Crawford 2016	Alabama, Arkansas, Louisiana, Oklahoma, Texas	Descriptive data synthesis describing the current state of sexual and reproductive health among five states in the southern region of the USA	A review of public health data for the 50 states shows that southern states including Alabama, Arkansas, Louisiana, Oklahoma, and Texas consistently have the highest teen pregnancy, teen birth, and sexually transmitted disease (STD) rates in the USA. Furthermore, these states also lack mandates regarding sexuality education; and when sexuality education is provided, abstinence must be stressed while medically accurate information is not a specific requirement. Policymakers, school districts, health care providers, and parents should work together to change the status quo in order to improve sexual and reproductive health outcomes for teens in these southern states. Based on surveillance data and a review of best practices, three policy recommendations are (1) continue and improve investment in sex education; (2) amend current sex education policies; and (3) improve access to sexual health services in school- and community-based clinics.
Kaye et al. 2014	N/A	Policy summary	In the United States, women using no contraception or using it inconsistently account for 52 percent and 43 percent of unplanned pregnancies respectively, and similar proportions of abortions. Only 5 percent of unplanned pregnancies result from method failure. The proportion of unplanned pregnancies and abortions attributable to women using no contraception is particularly striking given that they account for only 8 percent of women at risk of an unplanned pregnancy. Difficulties related to contraceptive cost and access factor prominently among these women. For example, one study found that, among women seeking an abortion, nearly one third (32 percent) reported that they had not been using their desired method of contraception at the time they conceived due to access or cost barriers. At the same time, highly effective methods of birth control such as the implant or the intrauterine device (IUD) are more than 99 percent effective when used consistently, and research shows that efforts to improve women's access to and use of contraception significantly reduce unplanned pregnancy as well as the abortions that often follow.
King Jones 2010	15 pregnant 15-19 year olds. Location not noted, just says all recruited from same clinic. The author is from Little Rock, AR	Qualitative	Qualitative interviews with pregnant adolescents to look back on why they had sex and influence of school-based sex education identified six drivers of sexual risk taking. Internal factors were fitting in, curiosity, and forbidden fruit and external factors were partner pressure, peer pressure, and media. Even though participants did not describe why they thought adults did not talk about sex, they seemed to believe what they were hiding (sex) had to be something worth trying. The findings of the current study demonstrate that this lack of disclosure by parents propagates the curiosity of adolescents.
Knopf et al. 2016	Mostly urban, low-income, and racial or ethnic minority high school students	Systemic literature review	Most of the 46 studies included in the review evaluated onsite clinics serving urban, low-income, and racial or ethnic minority high school students. The presence and use of SBHCs were associated with improved educational (i.e., grade point average, grade promotion, suspension, and non-completion rates) and health-related outcomes (i.e., vaccination and other preventive services, asthma morbidity, emergency department use and hospital admissions, contraceptive use among females, prenatal care, birth weight, illegal substance use, and alcohol consumption). More services and more hours of availability were associated with greater reductions in emergency department overuse.

Article	Sample and setting	Study type	Findings
Lindberg et al. 2016	Young women ages 15-19 in the United States	Pregnancy risk analysis using NSFG data	Sexual activity in the last 3 months did not change significantly from 2007 to 2012. Pregnancy risk declined among sexually active adolescent women (p = .046), with significant increases in the use of any method (78–86 percent, p = .046) and multiple methods (26–37 percent, p = .046). Use of highly effective methods increased significantly from 2007 to 2009 (38–51 percent, p = .010). Overall, the PRI declined at an annual rate of 5.6 percent (p = .071) from 2007 to 2012 and correlated with birth and pregnancy rate declines. Decomposition estimated that this decline was entirely attributable to improvements in contraceptive use. Improvements in contraceptive use appear to be the primary proximal determinants of declines in adolescent pregnancy and birth rates in the United States from 2007 to 2012. Efforts to further improve access to and use of contraception among adolescents are necessary to ensure they have the means to prevent pregnancy.
National Institute for Children's Health Quality 2017.	Delaware	Policy paper on the Delaware "Contraceptive Access Now" Initiative	Delaware is investing $1.75 million of its Division of Public Health dollars for the multi-year CAN project. Additionally, Upstream USA has raised over $10 million from private sources, including the Robert Wood Johnson Foundation, the William and Flora Hewlett Foundation, and the Silicon Valley Community Foundation. Delaware CAN investments have the potential for major cost savings; according to projections from the University of Wisconsin, the CAN initiative is estimated to have a net cost annual savings of $16.2 million, and a three-year net cost savings of $48.5 million. An independent evaluation launched in 2016 will measure progress by tracking pregnancy and birth outcomes, as well as spending in Medicaid and private insurance plans. Delaware was also awarded four years of grant funding by the Centers for Medicaid & Medicaid Services to support the collection and reporting of data on women's use of contraceptive methods, which the state can leverage in evaluating CAN's success in improving pregnancy planning and birth spacing.
National Research Council and Institute of Medicine 2002	Young people ages 10-18 in the U.S.	Systematic literature review of youth development programs	Conclusions include: (1) Community programs for youth should be based on a developmental framework that supports the acquisition of personal and social assets in an environment, and through activities, that promote both current adolescent well-being and future successful transitions to adulthood. (2) Adolescents who spend time in communities that are rich in developmental opportunities for them experience less risk and show evidence of higher rates of positive development. A diversity of program opportunities in each community is more likely to support broad adolescent development and attract the interest of and meet the needs of a greater number of youth. And (3) very few high-quality comprehensive experimental evaluations of community programs for youth have adequately assessed the impact of the programs on adolescents. Some high-quality experimental and quasi-experimental evaluations show positive effects on a variety of outcomes, including both increases in the psychological and social assets of youth and decreases in the incidence of such problem behaviors as early pregnancy, drug use, and delinquency. Experimental designs are still the best method for estimating the impact of a program on its participants and should be used when this is the goal of the evaluation.

Article	Sample and setting	Study type	Findings
Ng and Kaye 2015	Rural U.S.	Secondary data analysis of teen birth rates and numerous risk factors for all counties across the United States using a multivariate model	The most prominent factors explaining higher rates of teen childbearing in rural areas were college enrollment, poverty, access to health services, and whether the county was losing rather than attracting residents. Other factors such as transportation barriers, access to recreation facilities, and religiosity played only a minor role in explaining the disparity between rural and metropolitan counties. Differences in the racial/ethnic composition of the population also accounted for very little of the disparity, as did marriage among teens.
Terzian and Mbwana 2009.	U.S. Adolescents ages 12 to 17.	Systemic literature review	A combined focus on parents and teens does not appear to improve adolescent reproductive health outcomes. None of the six reproductive health programs with a dual focus on parents and children improved adolescent reproductive health outcomes. However, all of these programs focused on abstinence, so it is unclear whether a combined parent-teen approach does not work for reproductive health outcomes generally.
Tucker et al. 2016	400 6th and 7th graders in rural, micropolitan, and urban Boys & Girls Clubs (BCG) in Georgia	Quasi-experimental longitudinal study	After one year, Carrera youth were significantly lower in regard to "ever had sex" than BGC youth. Of Carrera youth, 11.7 percent "ever had sex" compared to 28.3 percent of p=0.02) youth in the BGC program. After two years, youth who engaged in sex appeared to be less prevalent among the Carrera youth (12.2 percent) than those in the BGC clubs (25.6 percent); however, this difference was not statistically significant.
Upstream USA 2019	Patients attending Upstream-partner clinics in Delaware	Descriptive study	Nearly three quarters (72 percent) of the 489 patients reported that they discussed birth control with health center staff during their visit. The survey found that following contraceptive counseling, some patients reported changing their contraceptive method. In almost every case, the new method chosen was one of the most or moderately effective methods: Among the 52 patients who reported using a birth control before the visit and starting a new method at the visit, 85 percent moved to a method that was more effective or as effective as the original method. Among the 92 patients who reported not using any contraception prior to their visit, over one third (34 percent) reported starting a method at the visit. This number may not include patients who chose a method that required a prescription or a pharmacy visit (for example, oral contraceptives or condoms). This uptake in a contraceptive method during the visit among non-users is notable. The survey data also documented consistent health center adherence to the Upstream model's emphasis on patient-driven decision-making: Of the 351 patients who reported discussing birth control during their visit, 343 patients (98 percent) reported that they did not feel pressured by someone to use a particular birth control method. Of this same group, 324 patients (92 percent) reported that they were listened to, listened to fairly closely, or listened to closely. Of the 330 patients asked to rate their satisfaction level with their birth control decisions via five separate questions, 281 (85 percent) affirmed their satisfaction on all five satisfaction scales, and 322 (98 percent) affirmed their satisfaction in at least one of the five scales. Among the 83 patients who discussed birth control and chose to start a new method at the current visit, 99 percent reported that they were involved in their own contraceptive method decision.