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## Adolescent Sexual Behavior: Examining Data from Texas and the US

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## Adolescent Sexual Behavior: Examining Data from Texas and the US

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Although the teen birth rate in the United States fell to an all-time low in 2009, it remains one of the highest among all developed countries accounting for an annual \$9.1 billion in social and medical costs.<sup>1-3</sup> The US also leads developed countries in rates of sexually transmitted infections (STI) among youth,<sup>4</sup> with one in four adolescent girls testing positive for an STI.<sup>5</sup> Texas youth are disproportionately represented in these numbers – Texas has the 3<sup>rd</sup> highest teen birth rate in the US (63.1 per 1000 vs. 39 per 1000 for females 15-19 years), and the second highest for school-aged females (15-17 years).<sup>6</sup> By 2015 the Texas teen pregnancy rate is estimated to increase by 13% to a projected rate of 127 per 1000.<sup>7</sup> Texas ranks 4<sup>th</sup> among US states for Chlamydia (15.3%) and 6<sup>th</sup> for gonorrhea (2.0%) among females ages 15-24 years screened at family planning clinics.<sup>8</sup> Texas also ranks 12<sup>th</sup> among states for diagnosed HIV cases among teens ages 13-19.<sup>9</sup>

Early sexual initiation increases the risk of teen pregnancy and STIs, including HIV.<sup>10,11</sup> These outcomes have serious public health consequences. Teen pregnancy is a major factor in high school dropout – only 40% of teen mothers graduate from high school.<sup>12</sup> They are also less likely to graduate from college and more likely to become dependent on welfare than non-teen mothers.<sup>3</sup> Teen fathers are more likely to drop out of school, be unemployed, and have lower incomes than non-teen fathers.<sup>13</sup> They are less likely to marry the mother of their first child and often experience poor involvement with their children.<sup>14</sup> Children of teen parents are at increased risk of school failure, living in poverty, neglect or abuse, being placed in foster care, and becoming a teen parent themselves.<sup>3</sup> STIs increase the risk of other reproductive health problems, including pelvic inflammatory disease, ectopic pregnancy, infertility, and cervical cancer.<sup>15</sup> Medical costs associated with STIs among youth are estimated at \$6.5 billion per year.<sup>16</sup> With advances in antiretroviral therapy, mortality and morbidity related to HIV infection have dramatically declined and HIV has become a chronic disease requiring lifetime management.<sup>17</sup> However, all of these consequences are preventable.

In order to develop effective strategies to address these public health issues, it is important to examine what we know about adolescent sexual behavior. A detailed understanding of the risk behaviors in which youth engage, and the age at which these behaviors begin, will allow policy makers and practitioners to make evidence-based decisions about the content and timing of educational programming and about the sexual and

reproductive health services that teens need to make informed decisions about sex.

This article reviews local, state, and national data to better understand adolescents' engagement in sexual risk behaviors, with particular focus on Texas. First, we compare local, state, and national data on sexual initiation and other sexual risk behaviors, such as condom and contraceptive use and dating violence, to identify areas in which Texas may seek improvement. Second, we estimate the number of sexually experienced students in Texas public high schools to inform the type and timing of educational programming and sexual and reproductive healthcare services required for Texas youth. Third, we examine Texas high school students' engagement in sexual risk behaviors by subgroups to identify any disparities by gender, race/ethnicity, and grade. Finally, we examine the age of onset for non-coital behaviors, i.e., oral and anal sex, to inform decisions regarding the age-appropriateness of content for middle and high school educational programs. Teens often view oral and anal sex as less risky behaviors compared to vaginal sex,<sup>18-21</sup> however, both behaviors have been shown to increase the risk of STIs and HIV.<sup>15, 22, 23</sup>

Collectively, these analyses provide a foundation to inform the development of evidence-based policies at local, state, and national levels and to inform evidence-based practices in schools, clinics, and other youth-serving agencies. These actions are needed to help teens make informed decisions about their sexual health and ultimately to alleviate the potentially negative consequences of early sexual behavior.

## **METHODS**

Three primary data sources were used for this review: (1) The Centers for Disease Control and Prevention's (CDC) Youth Risk Behavior Survey (YRBS); (2) CDC's Middle School Youth Risk Behavior Survey (MSYRBS); and (3) The University of Texas Prevention Research Center's *All About Youth* study.

### **YOUTH RISK BEHAVIOR SURVEY (YRBS)**

The YRBS is a national school-based survey conducted biennially by the CDC among high school students to monitor priority health-risk behaviors. The sampling frame for the 2009 YRBS included private and public schools throughout the US, yielding a nationally representative sample of 9<sup>th</sup> through 12<sup>th</sup> grade students (n = 16,410). Oversampling of schools with high minority enrollment ensured adequate representation of black and Hispanic students. Texas sampling techniques produced a representative sample of public school students in grades 9 to 12 (n = 3,506). Each state

followed local parental consent procedures. The YRBS was approved by the CDC Institutional Review Board.<sup>24</sup>

The YRBS is a pencil-paper survey administered in school during regular school hours. The 2009 YRBS contained nine items on sexual behavior and one item per topic on dating violence, forced sex, and school-based HIV/AIDS education. The sexual behavior items asked about “sexual intercourse” without providing an explicit definition. Thus, these items are implicitly understood to refer to vaginal sex.

### **MIDDLE SCHOOL YOUTH RISK BEHAVIOR SURVEY (MSYRBS)**

Several states and cities in the U.S. also conduct a YRBS in middle schools; however, these data are not nationally representative. In 2009, weighted data<sup>i</sup> were available from 14 states, 10 of which included items on sexual behavior (n = 25,172).<sup>ii</sup> Texas did not participate. Ten individual school districts also yielded weighted data, six of which included sexual behavior items (n = 10,627).<sup>iii25</sup> As in the high school survey, the sexual behavior items asked about “sexual intercourse” without providing an explicit definition. Only the item, “ever had sex,” (implicitly understood as vaginal sex) was examined for this review.

### **ALL ABOUT YOUTH**

No state or national school-based surveys have included items on non-coital behaviors. To examine these behaviors, we used data from a study conducted by Markham and colleagues in a large urban school district in Texas (one of the top 10 largest districts in the US). The *All About Youth* study was a randomized controlled trial conducted in 15 public middle schools to assess the efficacy of two sexual education programs. A cohort of predominantly low-income, black and Hispanic students was followed from 7<sup>th</sup> to 10<sup>th</sup> grade.<sup>26</sup> For this review, we used data from the control group (n = 396) to estimate the prevalence of oral, vaginal, and anal sex among students in 7<sup>th</sup> to 10<sup>th</sup> grade. Surveys were conducted using a computer assisted self-interview (ACASI) with automated skip patterns so that non-sexually experienced students were not exposed to sexually explicit items. Parental consent and student assent were required for participation. The study was approved by the University of Texas Health Science Center at Houston Institutional Review Board.

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<sup>i</sup> Weighted data were available from states with a response rate of 60% or greater.

<sup>ii</sup> Alabama, Delaware, Hawaii, Kentucky, Maine, Mississippi, New Mexico, Rhode Island, South Carolina, and Wyoming.

<sup>iii</sup> Chicago, IL, Duval County, FL, Memphis, TN, Miami-Dade, FL, Milwaukee, WI, and San Bernardino, CA.

## **ANALYSES**

Analysis of YRBS and MSYRBS data was conducted using weighted data to account for the complex sampling designs. For 2009 MSYRBS data, median values and ranges for “ever had sex” were calculated for participating states and districts respectively.<sup>27</sup> For 2009 YRBS data, *t*-tests were used to compare prevalence estimates for sexual risk behaviors between Texas and US high school students and to compare pairwise differences by gender, racial/ethnic, and grade-level subgroups among Texas students (e.g., Black vs. Hispanic; Black vs. White). Differences between prevalence estimates were considered statistically significant if the *t*-test *p* value was < 0.05. These analyses were conducted using CDC’s online database, *Youth Online: High School YRBS*.<sup>28</sup>

To estimate the number of sexually experienced students in Texas high schools, we multiplied the number of public school students per grade<sup>29</sup> by the percent of students who had sex per grade estimated from Texas-specific YRBS data.<sup>28</sup>

Analysis of *All About Youth* data used simple frequency counts and percentages to estimate the prevalence of oral, vaginal, and anal sex by grade.

## **RESULTS**

### **COMPARING LOCAL, STATE, AND NATIONAL DATA**

#### ***Sexual initiation***

Data from states that conducted the 2009 middle school YRBS indicate that sexual initiation ranged from 5% to 15% (median of 8%) for 6<sup>th</sup> graders; from 9% to 33% (median 13%) for 7<sup>th</sup> graders; and from 14% to 42% (median 25%) for 8<sup>th</sup> graders. Data from school districts that conducted the 2009 middle school YRBS indicate a pattern of slightly higher prevalence for sexual initiation – ranges for these districts were 10% to 21% (median 13%), 13% to 27% (median 22%), and 25% to 36% (median 29%) for 6<sup>th</sup>, 7<sup>th</sup>, and 8<sup>th</sup> graders, respectively.<sup>27</sup> (See Table 1).

**Table 1. Percentage of middle school students who ever had sex: Data from states and school districts that participated in the 2009 middle school YRBS, by grade<sup>27</sup>**

Location	6 <sup>th</sup> Grade	7 <sup>th</sup> Grade	8 <sup>th</sup> Grade
<b>States</b>			
Alabama	NA	32.9 (23.9-43.4)*	30.9 (23.0-40.0)
Delaware	15.0 (10.2–21.6)	20.2 (17.3-23.5)	30.8 (25.8-36.4)
Hawaii	5.8 (3.7-9.0)	9.7 (7.3-12.9)	19.3 (15.2-24.0)
Kentucky	10.6 (6.9-15.9)	13.4 (9.5-18.4)	27.2 (20.5-35.1)
Maine	NA	9.9 (8.7-11.4)	13.9 (12.4-15.5)
Mississippi	13.9 (9.7-19.7)	22.8 (16.6-30.4)	41.6 (34.9-48.5)
New Mexico	5.2 (3.7-7.2)	9.3 (6.8-12.7)	17.3 (14.3-20.8)
Rhode Island	5.7 (4.7-6.9)	12.0 (9.3-15.3)	22.5 (19.5-25.8)
South Carolina	13.2 (9.3-18.5)	24.8 (18.2-32.8)	32.0 (25.3-39.7)
Wyoming	5.9 (4.1-8.4)	13.3 (10.5-16.7)	20.7 (17.5-24.3)
<b>Median</b>	<b>8.3</b>	<b>13.4</b>	<b>24.9</b>
<b>Local</b>			
Chicago, IL	11.7 (7.8-17.1)	20.3 (14.3-28.0)	25.6 (17.8-35.3)
Duval Co., FL	14.7 (11.7-18.4)	22.8 (18.7-27.5)	32.3 (27.8-37.3)
Memphis, TN	20.5 (14.4-28.3)	26.9 (22.0-32.4)	35.7 (29.7-42.2)
Miami-Dade Co., FL	11.7 (7.5-17.7)	17.6 (13.1-23.4)	24.6 (19.7-30.4)
Milwaukee, WI	15.0 (11.6-19.1)	25.5 (20.4-31.4)	35.2 (31.2-39.4)
San Bernardino, CA	9.7 (5.5-16.5)	13.2(10.3-16.8)	24.9 (21.2-29.0)
<b>Median</b>	<b>13.2</b>	<b>21.6</b>	<b>29.0</b>

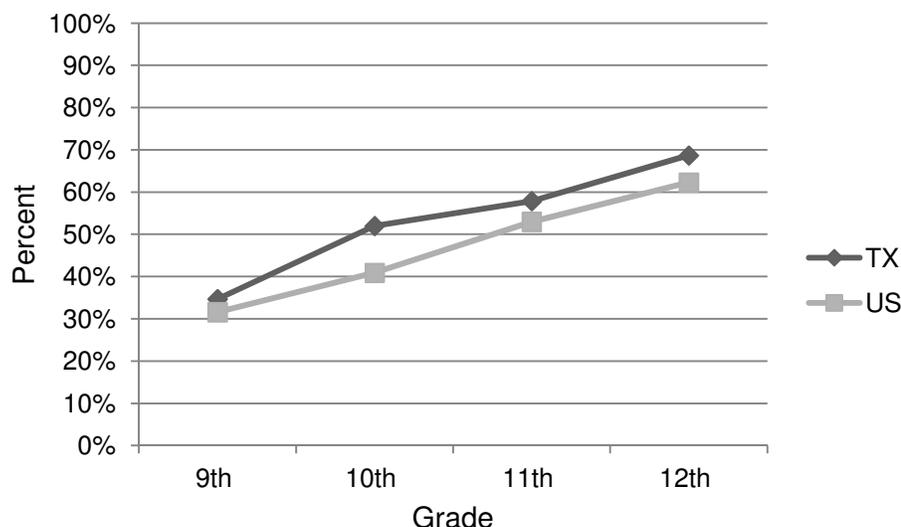
\* Percentage, confidence interval

NA = < 100 respondents for the subgroup

National data from the 2009 high school YRBS indicate that 32% of 9<sup>th</sup> grade students are sexually experienced. This percentage increases to 41% and 53% of 10<sup>th</sup> and 11<sup>th</sup> grade students, respectively. By the end of high school, 62% of 12<sup>th</sup> grade students – almost two thirds – report being sexually experienced.<sup>24</sup>

Comparison of Texas and national data indicates that Texas high school students are more likely to be sexually experienced than their peers nationwide. Overall, in 2009, 52% of Texas 9<sup>th</sup>-12<sup>th</sup> graders reported ever having sex compared to 46% of 9<sup>th</sup>-12<sup>th</sup> graders nationally ( $p < 0.05$ ). Looking at specific grade levels, Texas 10<sup>th</sup> grade students and 12<sup>th</sup> grade students were more likely to have had sex compared to their US peers (52% vs. 41%,  $p < 0.01$ ; 69% vs. 62%,  $p < 0.05$ ).<sup>28</sup> (See Figure 1).

**Figure 1. Initiation of sexual intercourse in Texas and US high schools by grade<sup>28</sup>**



### ***Other sexual risk behaviors***

2009 YRBS data indicate that Texas high school students are more likely to engage in sexual risk behaviors compared to high school students nationally. Texas students are more likely to report having had sex with four or more partners (17% vs. 14%,  $p < 0.05$ ) and to have had sex with at least one person in the past 3 months (38% vs. 34%,  $< 0.05$ ) compared to their US peers. Texas students who are sexually active are also more likely to report not using birth control pills (86% vs. 80%,  $p < 0.001$ ), not using Depo-Provera (98% vs. 97%,  $p < 0.001$ ), and not using birth control pills or Depo-Provera (84% vs. 77%,  $p < 0.001$ ) the last time they had sex compared to students nationwide. Further, sexually active Texas students are more likely to report not using dual protection against STIs and pregnancy, i.e., using a condom and birth control pills or Depo-Provera, the last time they had sex compared to their peers nationally (94% vs. 91%,  $p < 0.05$ ). Finally, Texas students are significantly less likely to receive education about HIV or AIDS in school compared to high school students nationally (17% vs. 13%,  $< 0.05$ ).<sup>28</sup> (See Table 2).

Although there are no significant differences between Texas and US high school students for other examined sexual risk behaviors, the level of engagement in these behaviors is worth noting. Six percent of both Texas and US high school students report having sex for the first time before age 13; 22% of both Texas and US high school students used alcohol or drugs

the last time they had sex; and, among sexually active students, 42% of Texas students and 39% of US students did not use a condom the last time they had sex. Regarding dating violence, 10% of both Texas and US high school students report having been hit, slapped or physically hurt on purpose by their boyfriend or girlfriend in the past year, and 7% of both Texas and US students have ever been physically forced to have sex against their will.<sup>28</sup> (See Table 2).

**Table 2. Comparison of the Percentage of Texas and US high school students who engaged in sexual risk behaviors, 2009<sup>28\*</sup>**

<b>Risk Behavior</b>	<b>Texas students %</b>	<b>US students %</b>	<b>Texas students significantly more likely to engage in behavior than US students? <sup>†</sup></b>
Ever had sexual intercourse	52	46	√
Had sexual intercourse for the first time before age 13 years	6	6	
Had sexual intercourse with four or more partners	17	14	√
Had sexual intercourse with at least one person in past 3 months	38	34	√
Drank alcohol or used drugs before last sexual intercourse <sup>a</sup>	22	22	
Did not use a condom during last sexual intercourse <sup>a</sup>	42	39	
Did not use birth control pills before last sexual intercourse <sup>a</sup>	86	80	√
Did not use Depo-Provera before last sexual intercourse <sup>a</sup>	98	97	√
Did not use birth control pills or Depo-Provera before last sexual intercourse <sup>a</sup>	84	77	√
Did not use a condom and birth control pills or Depo-Provera before last sexual	94	91	√

intercourse <sup>a</sup>			
Hit, slapped or physically hurt on purpose by their boyfriend or girlfriend <sup>b</sup>	10	10	
Ever physically forced to have sexual intercourse (when they did not want to)	7	7	
Never taught in school about AIDS or HIV infection	17	13	√

\*Overall sample size: Texas, n = 3,506, US n = 16,410. N's for specific risk behaviors varied due to missing data.

<sup>a</sup> Among students who were currently sexually active (i.e., had sex in past three months).

<sup>b</sup> During the 12 months before the survey.

<sup>†</sup> Checked behaviors,  $p < 0.05$

### **NUMBER OF SEXUALLY EXPERIENCED STUDENTS IN TEXAS HIGH SCHOOLS**

Extrapolating from Texas-specific data on sexual initiation among high school students,<sup>28</sup> we estimated the number of sexually experienced students in Texas public high schools for the 2009-2010 school year.<sup>29</sup> In Texas public high schools, 689,512 students are estimated to be sexually experienced – over half (52%) of the total high school population. (See Table 3).

**Table 3. Estimate of sexually experienced students in Texas high schools by grade**

Grade	Percent of Students who Have Had Sex	Number of Students Enrolled in Texas	Estimated Number of Sexually Experienced Students
9th	35%	392,040	136,038
10th	52%	334,823	174,108
11th	58%	310,070	179,531
12th	69%	290,882	199,836
<b>Total</b>	<b>52%</b>	<b>1,327,815</b>	<b>689,512</b>

Notes: The percent of students having sex is from 2009 YRBS Texas data.<sup>28</sup> Public school enrollment data are from the Texas Education Agency, *Enrollment in Texas Public Schools, 2009-10*.<sup>29</sup>

### **SEXUAL RISK BEHAVIORS AMONG TEXAS HIGH SCHOOL STUDENTS BY SUBGROUPS**

#### ***Gender***

2009 YRBS data indicate that male high school students in Texas are significantly more likely than their female counterparts to report having initiated sex before age 13 (9% vs. 3%), to have had sex with four or more partners (20% vs. 13%), and to have used alcohol or drugs the last time they had sex (25% vs. 18%), all at  $p < 0.01$ . Among sexually active students, males are significantly more likely than females to report non-use of birth control pills (90% vs. 83%), birth control pills or Depo Provera (89% vs. 80%), or dual protection (97% vs. 92%) by themselves or their partner at last sexual intercourse, all at  $p < 0.01$ . In contrast, female high school students who are sexually active are significantly more likely than males to report that they or their partner did not use a condom the last time they had sex (47% vs. 37%) and to have ever been physically forced to have sex against their will (11% vs. 4%), both at  $p < 0.01$ .

Although there are no significant differences between male and female students in the following behaviors, the level of engagement across

genders is noteworthy. Approximately half of all male and female students have ever had sex (54% and 49%); over one third have had sex with at least one person in the past three months (37% and 39%); almost all sexually active students reported that they or their partner did not use Depo Provera the last time they had sex (99% and 98%); approximately 1 in 10 male and female students reported having experienced dating violence in the past year (9% and 10%), and nearly one in five (17%) male and female students did not receive education about HIV or AIDS in school.<sup>28</sup> (See Table 4).

### ***Race/Ethnicity***

2009 YRBS data indicate that black and Hispanic high school students in Texas are significantly more likely than non-Hispanic white students to have ever had sex (63% vs. 54% vs. 45%,  $p < 0.01$ ) and to have had sex with at least one person in the past three months (43% vs. 40% vs. 33%,  $p < 0.05$ ). Sexually active black and Hispanic students are also more likely to report not using birth control pills (94% vs. 90% vs. 78%,  $p < 0.01$ ), not using birth control pills or Depo-Provera (91% vs. 89% vs. 75%,  $p < 0.01$ ), and not using dual protection (97% vs. 96% vs. 90%,  $p < 0.05$ ) the last time they had sex compared to non-Hispanic white students.

Black students are more likely than Hispanic and non-Hispanic white students to have had sex for the first time before age 13 (12% vs. 6% vs. 4%,  $p < 0.05$ ) and to have had sex with four or more partners (29% vs. 15% vs. 14%,  $p < 0.01$ ). Black students are also more likely than non-Hispanic white students to have experienced dating violence in the past year (13% vs. 9%,  $p < 0.05$ ). Hispanic students are more likely than black and non-Hispanic white students to have never received education about HIV and AIDS in school (25% vs. 12% vs. 11%,  $p < 0.01$ ).

There are no significant differences between racial/ethnic groups for the remaining behaviors: using alcohol or drugs before last sexual intercourse, not using a condom or Depo-Provera, and having been physically forced to have sex.<sup>28</sup> (See Table 4).

### ***Grade Level***

2009 YRBS data indicate that most grade-level differences in sexual risk behavior occur between 9<sup>th</sup> and 10<sup>th</sup> grades. Compared to 9<sup>th</sup> grade students, 10<sup>th</sup> grade students are more likely to have ever had sex (35% vs. 52%), to have had sex with four or more partners (9% vs. 16%), to have had sex with at least one person in the past three months (23% vs. 36%), to have used alcohol or drugs before having sex (among sexually active students) (19% vs. 26%), and to have experienced dating violence

in the past year (5% vs. 11%), all at  $p < 0.01$ . Additionally, compared to 11<sup>th</sup> grade students, 12<sup>th</sup> grade students are more likely to have had sex with four or more partners (19% vs. 26%,  $p < 0.05$ ). There are no other significant differences between consecutive grade levels.<sup>28</sup> (See Table 4).

**Table 4. Percentage of Texas high school students who engaged in risk behaviors in 2009 by gender, race/ethnicity, and grade<sup>28\*</sup>**

Risk Behavior	Gender			Race/Ethnicity			Grade			
	Total %	Males %	Females %	Black %	Hispanic %	White %	9 <sup>th</sup> %	10 <sup>th</sup> %	11 <sup>th</sup> %	12 <sup>th</sup> %
Ever had sexual intercourse	52	54	49	63 <sup>c**</sup>	54 <sup>d**</sup>	45	35	52 <sup>g**</sup>	58	69
Had sexual intercourse for the first time before age 13 years	6	9 <sup>**</sup>	3	12 <sup>ce**</sup>	6	4	7	8	5	4
Had sexual intercourse with four or more partners	17	20 <sup>**</sup>	13	29 <sup>ce**</sup>	15	14	9	16 <sup>g**</sup>	19	26 <sup>h*</sup>
Had sexual intercourse with at least one person in past 3 months	38	37	39	43 <sup>c*</sup>	40 <sup>d*</sup>	33	23	36 <sup>g**</sup>	44	54
Drank alcohol or used drugs before last sexual intercourse <sup>a</sup>	22	25 <sup>**</sup>	18	22	21	22	19	26 <sup>g**</sup>	19	22

Did not use a condom during last sexual intercourse <sup>a</sup>	42	37	47**	38	46	40	33	39	47	46
Did not use birth control pills before last sexual intercourse <sup>a</sup>	86	90**	83	94 <sup>c**</sup>	90 <sup>d**</sup>	78	92	87	82	85
Did not use Depo-Provera before last sexual intercourse <sup>a</sup>	98	99	98	98	99	98	100	98	98	98
Did not use birth control pills or Depo-Provera before last sexual intercourse <sup>a</sup>	84	89**	80	91 <sup>c**</sup>	89 <sup>d**</sup>	75	92	85	80	83
Did not use a condom and birth control pills or Depo-Provera before last sexual intercourse <sup>a</sup>	94	97**	92	97 <sup>c**</sup>	96 <sup>d*</sup>	90	96	92	93	95

Hit, slapped or physically hurt on purpose by their boyfriend or girlfriend <sup>b</sup>	10	9	10	13 <sup>c*</sup>	10	9	5	11 <sup>g**</sup>	11	13
Ever physically forced to have sexual intercourse (when they did not want to)	7	4	11 <sup>**</sup>	6	7	7	6	6	7	10
Never taught in school about AIDS or HIV infection	17	17	17	12	25 <sup>df**</sup>	11	18	17	15	17

\*Overall sample size: Texas, n = 3,506. N's for specific risk behaviors varied due to missing data.

<sup>a</sup> Among students who were currently sexually active (i.e., had sex in past three months)

<sup>b</sup> During the 12 months before the survey

<sup>c</sup> Black students more likely than white students to engage in risk behavior

<sup>d</sup> Hispanic students more likely than white students to engage in risk behavior

<sup>e</sup> Black students more likely than Hispanic students to engage in risk behavior

<sup>f</sup> Hispanic students more likely than black students to engage in risk behavior

<sup>g</sup> 10<sup>th</sup> grade students more likely than 9<sup>th</sup> grade students to engage in risk behavior

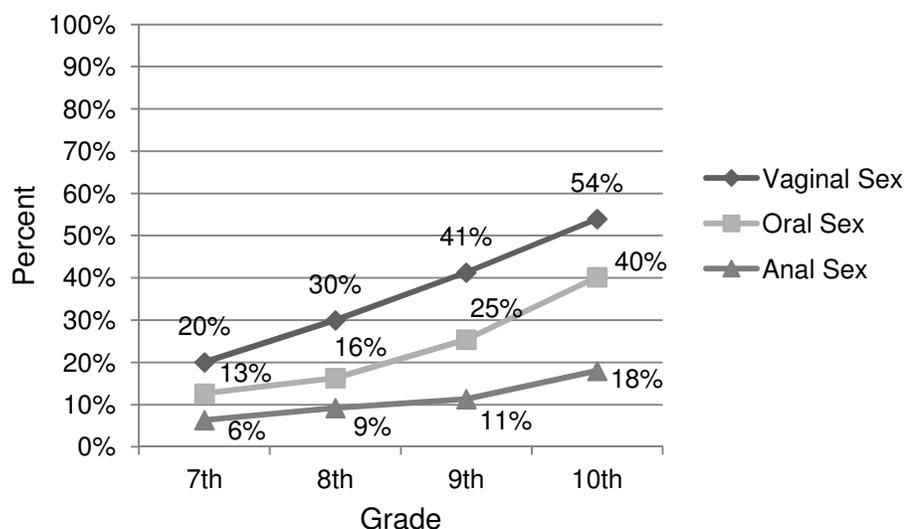
<sup>h</sup> 12<sup>th</sup> grade students more likely than 11<sup>th</sup> grade students to engage in risk behavior

\* p < 0.05 \*\* p < 0.01

## INITIATION OF NON-COITAL BEHAVIORS

Data from a large Texas urban school district indicate that some middle and high school students are engaging in non-coital behaviors. Thirteen percent of 7<sup>th</sup> grade students have ever had oral sex. This percentage rises to 16% in 8<sup>th</sup> grade, 25% in 9<sup>th</sup> grade, and 40% in 10<sup>th</sup> grade. Six percent of 7<sup>th</sup> grade students have ever had anal sex. This percentage rises to 9% in 8<sup>th</sup> grade, 11% in 9<sup>th</sup> grade, and 18% in 10<sup>th</sup> grade. (See Figure 2). At each grade level, over half of all sexually experienced students has engaged in two or more types of sex.<sup>26</sup>

**Figure 2. Initiation of oral, vaginal, and anal sex by grade**



## DISCUSSION

A substantial proportion of middle and high school students are having sex. Sexual initiation begins as early as 6<sup>th</sup> grade and increases steadily through 12<sup>th</sup> grade with almost two-thirds of high school seniors nationally being sexually experienced. Many teens are not protecting themselves from unintended pregnancy or STIs – nationally, 80% and 39% of sexually active high school students did not use birth control pills or a condom, respectively, the last time they had sex.<sup>24</sup> Further, many middle and high school students may be engaging in oral and anal sex, two behaviors which increase the risk of contracting an STI and HIV.<sup>15, 30</sup> In Texas, an estimated 689,512 public high school students are sexually experienced. Texas high school students surpass their US peers in several sexual risk behaviors including number of lifetime sexual partners, being currently

sexually active, and not using effective methods of birth control or dual protection when having sex. They are also less likely to receive HIV/AIDS education in school.<sup>28</sup> Changes in policy and practice at the state and national levels are urgently needed to address these issues effectively.

### ***Collecting Data on Adolescent Sexual Behavior***

Having state-specific data on adolescent sexual behavior is a critical first step for evidence-based planning. Texas-specific data on sexual behavior among middle school students are not available. However, high school YRBS data indicate that 7% of 9<sup>th</sup> grade students in Texas initiated sexual intercourse before age 13.<sup>28</sup> Given the levels of sexual experience reported by other states at the middle school level, it is likely that many middle school students in Texas are sexually experienced. State-wide implementation of the middle school YRBS would provide policy-makers and practitioners with valuable data to assess the needs of middle school students related to sexual health and to monitor changes in early adolescent sexual behavior over time.

### ***Providing Effective Sexual Education Programs***

Providing sexual education to middle school students has been shown to delay sexual initiation<sup>31-35</sup> and to reduce sexual risk behaviors.<sup>31,35-37</sup> Thus, widespread implementation of effective sexual education programs in middle school or earlier, i.e., before students start having sex, is essential to provide students with the knowledge and skills they need to make informed decisions about sex. Implementation of *evidence-based* programs, i.e., programs that have been rigorously evaluated, been shown to impact behavior change, and whose results are published in a peer-reviewed journal,<sup>38</sup> is critical to ensure that limited resources are used for the greatest effect. Several such programs exist;<sup>39</sup> however, few are being implemented. Given the early initiation of non-coital behaviors and the limited use of condoms and contraception once students become sexually active, middle school curricula should include age-appropriate content on oral, anal, and vaginal sex and medically accurate information on condoms and contraception.

Implementing effective sexual education in high school is also important and can produce substantial cost savings in terms of cases of pregnancy, STIs, and HIV averted. Economic analysis of a school-based high school sexual education showed that for every dollar invested in the program, \$2.65 in total medical and social costs were saved.<sup>40</sup> YRBS data indicate that 9<sup>th</sup> grade is a critical year for intervention to reduce the increase in risk behaviors that occurs in the transition to 10<sup>th</sup> grade.

However, given the steady increase in sexual initiation across grade levels, ongoing sexual education in grades 10-12 is strongly recommended. Given the proportion of sexually experienced students in high school, it is critical to include medically accurate information on condoms and effective contraception and to provide links to reproductive health services, including pregnancy, STI, and HIV testing, in the local community. One fifth of high school students report using alcohol or drugs the last time they had sex; thus, including activities that demonstrate the impact of substance use on sexual decision-making and that provide refusal skills training to avoid substance use, is also recommended. Approximately 1 in 10 high school students has experienced dating violence; a slightly smaller number has experienced forced sex. These data indicate the need to provide instruction on healthy dating relationships as well as referrals to dating violence and rape counseling services in the local community.

Gender differences are evident in teen sexual behavior. Although co-education sexual education programs have shown positive impact by reducing sexual risk behaviors and enhancing protective behaviors among males and females,<sup>39</sup> some teens may benefit from gender-specific programs. For example, *R.E.A.L. Men* is an evidence-based sexual education program for middle school-aged boys and their fathers. In a randomized controlled trial conducted in seven urban Boys and Girls Clubs, boys who participated in the program were more likely to delay sexual initiation and to use condoms if sexually active than boys in the control group.<sup>41</sup> Similarly, *SiHLE (Sistas, Informing, Healing, Living, Empowering)* is an evidence-based sexual education program developed specifically for African-American teen girls. The clinic-based program integrates elements of gender and ethnic pride and has been shown to reduce the number of sexual partners and increase condom use among program participants, resulting in decreased pregnancy and STI rates over a year compared to girls in the control group.<sup>42</sup>

### ***Enhance Access to Sexual and Reproductive Health Services***

Between 1995 and 2002, 77% of the decline in teen pregnancy among 15–17 year olds in the US was attributed to improved contraceptive use.<sup>43</sup> However, 2009 YRBS data indicate limited use of effective contraceptive methods by high school students – nationally, over 70% of students did not use birth control pills or Depo Provera the last time they had sex. Furthermore, YRBS data from 1999 to 2009 indicate that the proportion of high school students nationally using effective contraceptive methods has not increased over the past decade.<sup>44</sup> This suggests that an important

strategy for teen pregnancy prevention is being under-utilized. Similarly, low use of condoms and dual protection (i.e., condoms and effective birth control) indicate that many youth are not using effective methods to protect against STIs and HIV.

These issues highlight the need to increase adolescents' access to sexual and reproductive health services, including testing and treatment for STIs and HIV. However, many obstacles exist, such as cost, lack of transportation, inconvenient clinic hours, embarrassment, and fear of loss of confidentiality.<sup>45</sup> Although decisions regarding sexual health and contraception ideally involve conversations between a teen and their parent, many teens avoid or delay accessing sexual and reproductive health services if parental notification is required. A study by Reddy and colleagues reported that 59% of teenage girls who were using reproductive healthcare services would stop or delay seeking services, including STI and HIV testing, if parental consent were required.<sup>46</sup> Although all fifty US states have enacted laws that explicitly allow minors to consent to STI services without parental notification, only 21 states have similar laws for contraceptive services.<sup>47, 48</sup> Further, Title X funding, the only federal funding program that provides family planning services for teens without parental notification, is currently under threat.<sup>49</sup> Thus, identifying effective strategies to increase confidential access to reproductive and sexual healthcare services is essential.

School-based health centers provide enhanced healthcare access for youth and offer an effective venue for the provision of contraceptives, STI testing, and mental health services.<sup>50, 51</sup> In California, students who reported low to moderate use of school-based health centers were also one-third less likely to drop out of high school compared to students who do not access school-based centers.<sup>52</sup> Aside from school-based health services, making community health services more integrated and teen-friendly, i.e., providing low-cost, comprehensive, confidential STI, HIV, and family planning services by staff whom teens like and trust, has been shown to increase adolescent utilization of health care services.<sup>53</sup> Thus, enacting policies that promote the provision of sexual and reproductive health services via school-based health centers and that promote integrated, teen-friendly community health services would markedly increase adolescents' access to and utilization of sexual and reproductive health services.

### ***Needs of Urban Youth***

Comparison of district- and state-level data from the 2009 middle school YRBS indicates higher levels of sexual initiation among urban middle

school students compared to students statewide.<sup>26</sup> This observation is corroborated by the high rate of sexual initiation among middle school students in the *All About Youth* study, which was conducted in a large urban school district.<sup>27</sup> Neighborhood effects including widespread poverty, high unemployment and residential instability, all more common in urban areas, have been associated with early sexual initiation and increased adolescent sexual risk behavior.<sup>54-56</sup> These neighborhood effects account, in part, for racial/ethnic differences in adolescent sexual risk-taking.<sup>54</sup> Black and Hispanic youth are disproportionately more likely to live in poverty and to have inadequate access to healthcare than non-Hispanic white youth,<sup>57, 58</sup> factors which contribute greatly to racial/ethnic disparities in teen births, STIs, and HIV.<sup>1, 8, 59</sup> Thus, effective strategies that impact poverty and other neighborhood socioeconomic effects are needed to redress disparities in adolescent sexual health. Youth development programs that provide after-school activities including life skills and career training, as well as access to reproductive health services, have been shown to have a long-term impact on increasing contraceptive use and reducing teen pregnancy.<sup>60</sup> Similarly, sexual education programs that include community service learning projects for inner-city youth have been shown to enhance academic achievement and to reduce teen pregnancy and other adverse outcomes.<sup>61</sup> However, these types of program are time and resource intensive and are limited in the number of youth that they can enroll. Additional evidence-based strategies are needed to impact larger numbers of urban youth.

### ***The Situation in Texas***

Why are teens in Texas more likely to engage in sexual risk behaviors than teens nationwide? Several factors may contribute. First, high school students in Texas are less likely than their US peers to receive HIV/AIDS education in school. Furthermore, in Texas, Hispanic students are less likely than black and non-Hispanic white students to receive HIV/AIDS education.<sup>28</sup> Additionally, 94% of Texas middle and high schools are implementing non-evidence-based sexual education programs; many are using state-approved health education textbooks that omit medically accurate information on condoms and contraception.<sup>62</sup> Texas also has more restrictive policies than many other states regarding adolescents' access to reproductive health services.<sup>48</sup> With few exceptions, Texas law requires that youth under age 18 obtain parental consent for prescribed contraceptives.<sup>63, 64</sup> Texas law also requires healthcare providers to notify law enforcement officials of all patients under age 17 whom they suspect are sexually active.<sup>65, 66</sup> An economic study conducted by Franzini and

colleagues<sup>67</sup> estimated the projected costs in terms of the additional number of pregnancies, births, abortions and STIs to teenage girls using publicly funded healthcare services in Texas once these laws were enacted. Estimated additional costs totaled \$43.6 million – costs that could have been averted by less restrictive notification laws. Similar economic analyses have been conducted to examine potential changes in Title X funding in Texas. In 2006, contraceptive services provided via Title X funding averted 9,708 unintended pregnancies to girls ages 19 or younger in Texas.<sup>68</sup> If Title X services were defunded, Texas' teen pregnancy levels would be 13% higher than current levels.<sup>68</sup>

In 2009, 24% of Texas children lived in poverty compared to 20% of children nationally, and Texas ranked joint first among US states for the percentage of children living below 200% poverty (49% in Texas vs. 42% in the US).<sup>69</sup> Texas ranks first among US states for the percentage of residents aged 19 and younger living without health insurance.<sup>70</sup> Texas has 89 school-based health centers statewide that provide basic health care to medically underserved children and adolescents. However, sexual and reproductive health services are not explicitly part of the healthcare offered to youth.<sup>71</sup> Thus, a strategic resource for increasing access to sexual and reproductive health services for underserved youth is being overlooked.

### ***Limitations***

Although the data presented in this article provide an overview of sexual risk behaviors among teens in Texas and the US, several limitations should be noted. Middle and high school YRBS data are limited to mainstream public schools and do not include youth attending alternative education settings and out-of-school youth, who may engage in higher levels of sexual risk behavior.<sup>72</sup> The *All About Youth* study was conducted in one large urban Texas school district; thus, findings may not generalize to other smaller or non-Texas school districts. Finally, YRBS and *All About Youth* data are self-reported; thus, they may be susceptible to over- or under-reporting.<sup>73</sup>

### ***Renewed Emphasis on Adolescent Sexual Health***

The federal government has placed renewed emphasis on adolescent sexual health. *Healthy People 2020* objectives focus on reducing teen pregnancy rates by increasing the proportion of teens who have never had sex, who use condoms and effective contraceptive methods when having sex, and who have received formal instruction on reproductive health topics by age 18.<sup>74</sup> CDC has named teen pregnancy as one of its 6

“winnable battles”<sup>75</sup> and the US Department of Health and Human Services’ newly established Office of Adolescent Health has allocated \$75 million for the implementation of evidence-based sexual education programs.<sup>76</sup> Similar steps are needed in Texas to effectively advance adolescent sexual health. Given the extensive social and economic costs associated with teen pregnancy, STIs, and HIV, there is an urgent need to implement evidence-based strategies at the state and national levels to help teens make informed, responsible decisions about sex and ultimately to avert these negative public health outcomes.

## **CONCLUSION**

Changes in policy and practice, including implementation of evidence-based sex education programs and increased access to integrated, teen-friendly sexual and reproductive health services, are urgently needed at the state and national levels to combat the negative public health consequences associated with early sexual initiation. Policies and practices targeting urban youth are especially warranted.

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