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Original article

Adolescents' Receipt of Sex Education in a Nationally Representative Sample, 2011–2019

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A B S T R A C T

Purpose: Updated estimates of adolescents' receipt of sex education are needed to monitor trends and potential inequities.
Methods: Using nationally representative data from the 2011–2015 and 2015–2019 National Survey of Family Growth, we use logistic regression to examine changes in the receipt of formal sex education by gender. For 2015–2019, we estimate patterns by gender and race/ethnicity for content, timing, and location of instruction.
Results: Between 2011–2015 and 2015–2019, there were few significant changes in adolescents' receipt of formal sex education. Between these periods, instruction on waiting until marriage to have sex declined (73%–67% female [F.], $p = .005$; 70%–58% males [M.], $p < .001$). In both the periods, about half of the adolescents received sex education that meets the minimum standard articulated in national goals. In 2015–2019, there were significant gender differences in the instruction about waiting until marriage to have sex (67% F., 58% M., $p < 001$) and condom skills (55% F., 60% M., $p = .003$). Non-Hispanic Black and Hispanic males were less likely than non-Hispanic White males to receive formal instruction before the first sex on sexually transmitted infection/HIV, birth control, or where to get birth control. Many adolescents reported religious settings as the sources of instruction about waiting until marriage to have sex (56% F. and 49% M.), but almost none received instruction about birth control from those settings.
Conclusions: Differences in the receipt of sex education, by gender, race/ethnicity, and the location of instruction, leave many adolescents without critical information. Gaps in meeting national objectives indicate the need to expand the provision of sex education.

IMPLICATIONS AND CONTRIBUTIONS

This research illuminates concerning inequities in the receipt of sex education that may leave young people vulnerable to health problems and violate their right to accurate and timely information. The findings should spur policymakers at the national, state, and local levels to ensure the broader provision of sex education and that school districts serving young people of color are the focus of additional efforts and funding to ensure critical sex education.

Sex education is essential to promoting healthy sexual development and well-being, and young people have a right to accurate and complete information [1]. A large body of research finds that sex education helps promote behaviors that reduce unintended pregnancy and sexually transmitted infections (STIs) [2–6], as well as positively impact other behaviors, including reducing bullying and sexual abuse and increasing the understanding and ability to consent to sex [7,8]. National public health goals and numerous health organizations recommend and support comprehensive sex education that addresses a range of topics [9–12].

The Surgeon General's Healthy People 2030 puts forth a new objective for adolescents that combines receiving formal instruction on delaying sex, birth control methods, HIV/AIDS prevention, and sexually transmitted diseases [10]. However, states vary widely in whether they require sex education and the content

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requirements for instruction. There is further variation at both the district and school levels [13,14]. Currently, a small number of federal funding streams exist for the development and evaluation of instructional programs that aim to avert adolescent pregnancy: the Teen Pregnancy Prevention Program (TPPP), the Personal Responsibility Education Program (PREP), and the Sexual Risk Avoidance Program (SRA). No federal funding exists to support the widespread implementation of any type of sex education [15]. Most sex education in the U.S. does not meet either national or international standards [3,16].

Healthy People 2030 emphasizes the importance of equity as a cross-cutting principle driving public health. Understanding differences by gender, race/ethnicity, sexual orientation, and residential location is a critical first step in ensuring that educational programs meet the general needs of all youth and the unique needs of specific populations.

This analysis provides a needed update of adolescents' receipt of formal sex education, including changes over time in timing and location of instruction. We use nationally representative, cross-sectional data from the 2011–2015 and 2015–2019 National Surveys of Family Growth (NSFG), extending previous work assessing national trends [17–20]. These analyses are descriptive to provide the ongoing national monitoring needed to inform related research, program development, implementation, and policy.

Methods

This analysis used cross-sectional data from the 2011–2015 and 2015–2019 NSFG, a national probability household survey of women and men aged 15–44 years (2011–2015) and 15–49 years (2015–2019) in the U.S. The NSFG used a multistage stratified clustered sampling design to oversample Black and Hispanic individuals and adolescents aged 15–19 years. Full details of the survey methodology are available online. We limited these analyses to respondents aged 15–19 years, resulting in samples of 2,047 females and 2,087 males in 2011–2015 and 1,894 females and 1,918 males in 2015–2019. Respondents' gender at the time of interview is self-reported, and we do not know if it differs from their gender at birth.

Formal sex education measures

The NSFG asked respondents, "Before you were 18, did you ever have any formal instruction at school, church, a community center, or some other place about…" The seven response options included: "how to say no to sex," "methods of birth control," "sexually transmitted diseases," "how to prevent HIV/AIDS," "waiting until marriage to have sex," "where to get birth control," and "how to use a condom." Follow-up questions asked respondents about the grade instruction was first received, and whether this instruction occurred before first penile-vaginal intercourse. The 2015–2019 survey also asked a new question about the location of instruction, but only for the topics of methods of birth control and waiting until marriage to have sex.

Analysis

For each period, we calculated the weighted prevalence of the receipt of formal instruction on each topic. We estimated bivariate logistic regressions to test for differences between 2011-2015 and 2015-2019, stratified by gender and race/ethnicity. We combined STD and HIV/AIDS instruction into a single measure and measured the timing based on either topic's earliest receipt. To monitor the Healthy People 2030 goals, we created a combined variable for receiving instruction about methods of birth control, STDs, HIV/AIDS, and saying no to sex.

To focus on the most recent demographic patterns, for 2015–2019, we estimated bivariate logistic regressions to examine the differentials in the receipt of each sex education topic, stratified by gender. Variables examined were age (15–17 years vs. 18–19 years), race/ethnicity (non-Hispanic White, non-Hispanic Black, Hispanic, and others), household income (less than 200% vs. 200% or greater of poverty line), place of residence (urban, suburban, and rural), religious attendance at the age of 14 years (once a week or more, less than once a week, and never), and sexual orientation (Straight, Queer). In the 2015–2019 survey, the NSFG randomized respondents into two different questions for sexual orientation, with differently worded response options. We coded anyone responding other than "heterosexual or straight" as Queer; this included responses of homosexual, gay, lesbian, bisexual, or "something else." We treated responses of refused, do not know, and not ascertained as missing cases for this variable.

For each topic, we also reported the grade at the first instruction. We estimated the proportion of sexually experienced adolescents who received instruction in each topic before the first intercourse and tested for differences by gender and race/ethnicity. Finally, we reported the location of instruction, stratified by gender.

Data were weighted to be the representative of the two distinct periods (2011-2015 and 2015–2019) and adjusted for the surveys' design using the svy command in Stata 16.1. The National Center for Health Statistics' Institutional Review Board approved data collection methods. Because our analysis used publicly available, deidentified data, the first author's institutional review board granted this study exempt status.

Results

Sample characteristics

Many of the demographic characteristics of the weighted sample of respondents aged 15–19 years did not change between 2011–2015 and 2015–2019 (details in Table A1, by period and gender). In both the periods, the majority were non-Hispanic White and aged 15–17 years. About one-quarter of the sample were Hispanic, and 14% were non-Hispanic Black. Similarly, about one-quarter resided in an urban area, more than half lived in a suburban area, and the balance lived in rural areas. Close to half reported weekly or more frequent religious services at the age of 14 years, whereas one in five said they never attended religious services at this age. However, the proportion in households with income above the 200% household poverty line increased over time for males (44% vs. 51%, $p = .005$). The percentage of females (11%–18%, $p < .0001$) and males (4%–6%, $p = .01$) identifying as queer also increased.

Receipt of instruction, by topic, gender, and period

In both 2011–2015 and 2015–2019, more than 90% of female and male adolescents reported STD or HIV instruction; this was more than any of the other six topics examined (Table 1). More adolescents received instruction about "how to say no to sex"

Table 1
Percentage of females and males aged 15–19 years who received formal instruction on specific sex education topics before the age of 18 years, by gender, 2011–2015 and 2015–2019 National Surveys of Family Growth

Topic	Females					Males					Gender differences	
	2011–2015 (n = 2,047)	95% CI	2015–2019 (n = 1,894)	95% CI	Change over time *p* value	2011–2015 (n = 2,087)	95% CI	2015–2019 (n = 1,918)	95% CI	Change over time *p* value	2011–2015 *p* value	2015–2019
STD/HIV	94	[93–96]	91	[89–94]	.040	94	[92–95]	93	[90–94]	.412	.680	.475
Say no to sex	84	[81–86]	81	[78–84]	.213	82	[79–84]	79	[76–82]	.268	.176	.373
Wait until marriage to have sex	73	[70–76]	67	[63–70]	.005	70	[67–73]	58	[54–61]	.000	.115	.000
Methods of birth control	66	[62–69]	64	[59–68]	.492	58	[55–61]	63	[59–66]	.082	.001	.633
Where to get birth control	53	[49–56]	48	[44–52]	.087	40	[37–44]	45	[41–49]	.079	.000	.166
Condom skills	54	[50–57]	55	[50–59]	.750	60	[56–63]	60	[56–64]	.806	.013	.003
2030 Healthy People goal[a]	55	[51–58]	54	[50–59]	.939	49	[46–53]	53	[49–57]	.191	.023	.464

CI = confidence interval; STDs = sexually transmitted infections.
[a] Receipt of formal instruction before the age of 18 years on each of the following topics: saying no to sex, methods of birth control, HIV/AIDS, and STDs.

(79%–84%) or waiting until marriage (58%–73%) compared with instruction about any of the birth control topics, including the more actionable topics of where to obtain birth control (40%–53%) or how to use a condom (54%–60%). Only about half of the adolescents met the Healthy People 2030 composite sex education goal (49%–55%). Among those not meeting the Healthy People goal, the lack of instruction on birth control methods drove the result for 80% of respondents.

In 2015–2019, females were more likely than males to report receipt of specific instruction in waiting until marriage to have sex (67% F., 58% M., $p < .001$), whereas males were more likely to report instruction in condom skills (55% F., 60% M., $p = .003$). There were no other significant gender differences in 2015–2019, in contrast to the 2011–2015 gender differences in instruction about birth control methods, where to get birth control, and the Healthy People goal.

There were large declines in receipt of instruction about waiting to have sex (73%–67% F., $p = .005$; 70%–58% M., $p < .001$) for both genders. In addition, there is some evidence of increases for males in instruction on birth control methods (58%–63%, $p = .082$) and where to get birth control (40%–45%, $p = .079$), but declines in where to get birth control for females (53%–48%, $p = .087$).

Sociodemographic differences in instruction, 2015–2019

There was evidence of some sociodemographic differentials in instruction among both female and male adolescents in bivariate models for 2015–2019 (Table 2). During this recent period, religious attendance was the sociodemographic characteristic, most consistently associated with sex education. Less frequent religious attendance was generally associated with a larger proportion of adolescents' reporting receipt of instruction about birth control methods, where to get birth control, STD/HIV, and condom use, and fewer reporting instruction about waiting until marriage before having sex. In contrast, religious attendance was not associated with receipt of instruction about "saying no to sex." Black respondents were more likely than their peers to receive instruction about condoms among both females and males.

Among males, there were additional race/ethnicity differences; Black and Hispanic males were less likely to receive instruction about birth control than White males. Fewer than half of Black and Hispanic males received instruction on the combined Healthy People topics (45% Black and 47% Hispanic) compared with 57% among White males. Male respondents with income above versus below 200% poverty line were more likely to receive instruction about STD/HIV, birth control, and where to get condoms, as well as the combined Healthy People measure. Increasing age was associated with increased instruction about some topics, particularly STD/HIV, birth control, where to obtain birth control, and condoms. Queer males were less likely than straight males to report instruction about STD/HIV and where to get birth control; the direction of difference was the same for the other topics but did not meet standard levels of statistical significance.

Among females, Hispanic respondents were less likely to receive instruction about waiting to have sex than non-Hispanic adolescents. Female respondents with income above versus below 200% poverty line were more likely to receive instruction about saying no to sex (85% v. 79%, $p = .039$) or waiting until marriage to have sex (72% v. 64%, $p = .013$), as well as the combined Healthy People measure (58% v. 52%, $p < .061$). Suburban respondents were less likely to receive instruction about

Table 2
Percentage of females and males aged 15–19 years who had received formal instruction on specific sex education topics before the age of 18 years, by selected characteristics, 2015–2019 National Survey of Family Growth

Demographics	STD/HIV			Say no to sex			Wait until marriage			Methods of birth control			Where to get birth control			Condom skills			Healthy people goal[a]		
	%	95% CI	*p* value	%	95% CI	*p* value	%	95% CI	*p* value	%	95% CI	*p* value	%	95% CI	*p* value	%	95% CI	*p* value	%	95% CI	*p* value
Females																					
Race/ethnicity																					
NH White	91	[87–94]		82	[77–86]		70	[65–74]		63	[57–69]		47	[41–53]		50	[44–57]		55	[48–61]	
NH Black	92	[89–94]	.503	80	[74–85]	.604	69	[60–76]	.799	58	[49–65]	.260	48	[40–56]	.873	65	[58–72]	.002	50	[41–58]	.314
Hispanic	92	[89–95]	.533	82	[77–87]	.862	61	[54–66]	.017	68	[62–74]	.218	49	[44–55]	.607	56	[51–62]	.136	57	[51–63]	.607
Other	92	[76–98]	.775	77	[66–86]	.381	64	[52–74]	.322	64	[51–75]	.954	48	[36–60]	.943	56	[45–66]	.371	55	[44–66]	.985
Age																					
15–17	91	[88–94]		81	[76–85]		65	[61–69]		61	[56–66]		46	[41–51]		52	[47–57]		53	[49–58]	
17–19	92	[88–94]	.848	82	[78–85]	.646	69	[63–74]	.288	67	[60–73]	.134	51	[45–57]	.132	58	[51–64]	.093	56	[49–62]	.517
Religious attendance																					
≥Weekly	87	[83–91]		78	[73–83]		75	[71–80]		57	[51–64]		43	[37–48]		49	[42–55]		48	[42–55]	
<Weekly	96	[93–97]	.000	84	[79–89]	.116	65	[59–71]	.009	68	[62–74]	.018	50	[44–56]	.053	56	[50–62]	.070	59	[53–65]	.019
Never	94	[91–96]	.001	83	[77–88]	.195	50	[41–58]	.000	71	[64–78]	.005	56	[48–64]	.003	65	[56–73]	.002	62	[55–68]	.005
Household poverty																					
<200%	91	[88–93]		79	[75–82]		64	[59–68]		62	[57-66]		47	[42–51]		55	[50–60]		52	[48–56]	
≥200%	93	[89–95]	.312	85	[80–89]	.039	72	[66–77]	.013	67	[60–74]	.172	50	[44–57]	.240	53	[46–60]	.526	58	[51–65]	.061
Residence																					
Urban	90	[85–93]		81	[76–86]		66	[60–72]		68	[60–75]		51	[44–58]		61	[54–68]		60	[52–66]	
Suburban	92	[88–95]	.345	81	[77–84]	.865	68	[63–72]	.68	62	[58–67]	.161	45	[39–50]	.155	50	[44–55]	.003	52	[48–57]	.071
Rural	92	[86–96]	.426	84	[76–89]	.483	65	[53–76]	.895	61	[48–72]	.259	55	[46–64]	.475	60	[51–69]	.898	53	[41–64]	.298
Sexual orientation																					
Straight	92	[90–94]		82	[79–85]		67	[63–71]		63	[58–68]		49	[44–53]		54	[49–59]		54	[49–58]	
Queer	88	[81–93]	.078	80	[72–86]	.595	65	[59–71]	.560	67	[58–74]	.395	46	[38–54]	.523	56	[49–64]	.593	58	[49–66]	.348

	STD/HIV			Say no to sex			Wait until marriage			Methods of birth control			Where to get birth control			Condom skills			Healthy people goal[a]		
	%	95% CI	*p* value	%	95% CI	*p* value	%	95% CI	*p* value	%	95% CI	*p* value	%	95% CI	*p* value	%	95% CI	*p* value	%	95% CI	*p* value
Males																					
Race/ethnicity																					
NH White	93	[89–95]		80	[75–84]		58	[53–63]		67	[62–72]		46	[41–52]		58	[52–63]		57	[52–63]	
NH Black	93	[89–96]	.847	81	[75–85]	.826	66	[60–72]	.039	51	[44–58]	.000	39	[32–45]	.091	67	[60–73]	.038	45	[38–52]	.004
Hispanic	93	[88–96]	.971	78	[73–82]	.484	56	[49–62]	.621	58	[51–64]	.019	46	[40–52]	.850	62	[56–68]	.187	47	[41–53]	.007
Other	91	[83–95]	.483	76	[67–84]	.394	52	[41–63]	.346	66	[56–75]	.861	43	[34–53]	.562	59	[48–68]	.860	54	[43–64]	.542
Age																					
15–17	91	[87–93]		78	[73–83]		58	[53–62]		59	[54–64]		42	[37–47]		56	[51–60]		50	[45–55]	
17–19	95	[92–97]	.025	81	[77–85]	.385	58	[53–63]	.828	67	[62–72]	.023	49	[43–55]	.085	66	[60–72]	.002	56	[51–61]	.120
Religious attendance																					
≥Weekly	91	[87–93]		77	[72–82]		70	[65–75]		56	[51–61]		38	[34–44]		58	[52–64]		47	[42–52]	
<Weekly	94	[91–97]	.075	83	[78–87]	.068	53	[47–58]	.000	68	[63–74]	.001	52	[46–58]	.000	66	[61–71]	.019	59	[53–65]	.002
Never	93	[88–96]	.235	77	[70–83]	.982	40	[34–47]	.000	67	[60–74]	.010	46	[38–54]	.083	55	[48–63]	.566	53	[45–61]	.242
Household poverty																					
<200%	91	[87–93]		78	[74–81]		59	[55–64]		58	[53–63]		41	[36–46]		59	[54–63]		49	[44–54]	
≥200%	94	[91–96]	.018	81	[77–85]	.149	57	[52–62]	.422	67	[62–71]	.004	48	[43–54]	.028	61	[55–67]	.504	57	[52–62]	.013
Residence																					
Urban	93	[90–96]		82	[77–85]		59	[53–64]		64	[58–70]		48	[42–55]		62	[56–68]		54	[48–60]	
Suburban	93	[89–96]	.890	79	[74–83]	.356	56	[51–62]	.560	63	[58–67]	.628	44	[39–49]	.167	57	[51–63]	.180	52	[47–57]	.610
Rural	89	[80–95]	.223	77	[68–85]	.357	62	[53–71]	.528	60	[49–70]	.453	42	[33–52]	.263	67	[59–75]	.297	54	[43–64]	.977
Sexual orientation																					
Straight	93	[91–95]		80	[77–83]		59	[55–62]		63	[59–67]		46	[42–50]		61	[56–65]		53	[50–57]	
Queer	83	[65–93]	.030	73	[58–84]	.219	48	[34–62]	.141	58	[44–71]	.440	31	[21–42]	.011	53	[41–65]	.264	45	[33–59]	.233

CI = confidence interval; STDs = sexually transmitted infections.
[a] Receipt of formal instruction before the age of 18 on each of the following topics: saying no to sex, methods of birth control, HIV/AIDS, and STDs.

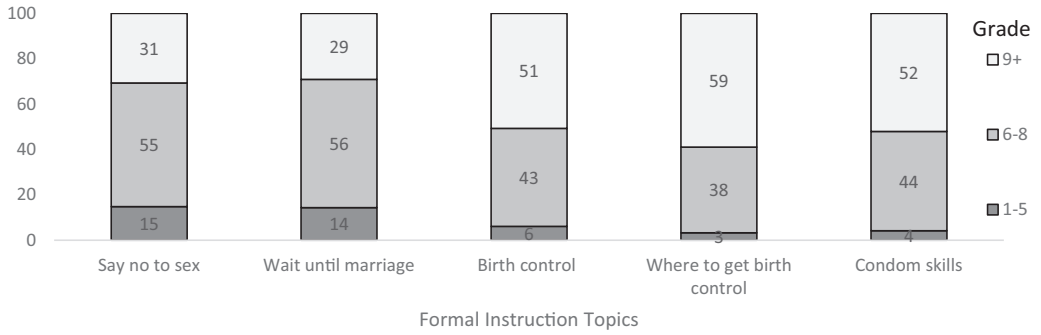

Figure 1. Percentage distribution of grade first received formal sex education by topic, among adolescents aged 15–19 years, 2015–2019 National Survey of Family Growth.

condoms than other young women. There was no variation by age or sexual orientation.

Timing of formal instruction, 2015–2019

For the period 2015–2019, we examined the grade of first receiving formal instruction in each topic among adolescents who reported any receipt of instruction (Figure 1). Although females received instruction on where to obtain birth control methods earlier than males ($p = .013$, not shown), this was the only topic with gender differences, so we combined the estimates for males and females.

Instruction about each sex education topic was less likely in elementary school than in older grades. Young people received instruction about birth control methods, where to get birth control, and how to use a condom received primarily in grades nine and above.

Many sexually experienced adolescents did not receive formal instruction on key topics before the first sex (Table 3). Instruction about STDs or HIV before the first sex was more frequent than other topics. Males were more likely to receive instruction on STD/HIV before the first sex than females (78% M., 69% F., $p = .01$). More sexually experienced adolescents reported instruction about how to say no to sex before the first sex (71% M., 70% F.) than instruction about waiting until marriage to have sex (49% M., 55% F.). Condom instruction before the first sex was more common among males than among females (64% M., 50% F., $p < .001$), as was instruction about birth control methods (61% M., 54% F., $p = .06$). Fewer than half of adolescents of both genders received instruction on where to get birth control, or the Healthy People combined measure, before the first sex.

There were significant racial/ethnic differences in the relative timing of instruction. Non-Hispanic Black and Hispanic males were less likely than non-Hispanic Whites to receive instruction on STI/HIV, birth control, where to get birth control, or the combined Healthy People measure before the first sex. Non-Hispanic Black females were less likely than their non-Hispanic White peers to learn about where to get birth control before the first sex (30% vs. 45%, $p = .038$); the other instruction topics did not vary by race/ethnicity among females.

Location of formal instruction

Adolescents report different patterns of where they received instruction about birth control methods and instruction about waiting until marriage to have sex (Table 4). Among adolescent females who received instruction about waiting until marriage to have sex, 56% received this instruction in church, either alone (38%) or in addition to other sources of instruction (18%). More than half (53%) received this instruction in school, and 13% in community settings. In contrast, among girls receiving instruction about birth control methods, 92% received this instruction in school. Only 2% of females reported receiving instruction about birth control methods at church, and 14% reported receiving instruction at another community setting. Patterns for birth control instruction were similar among males.

Overall, about 20% of adolescents received instruction from multiple sources about waiting until marriage, but only 5%–8% received birth control information from multiple settings.

Discussion

This research analyzes new national data and finds that only about half of the adolescents receive sex education that meets the minimum standard set in current national goals. Many adolescents do not receive any instruction on essential topics or do not receive this instruction until after the first sex. These gaps in sex education in the U.S. are uneven, and gender, racial, and other disparities are widespread. Between 2011–2015 and 2015–2019, there was limited change in adolescents' receipt of formal sex education.

Young people today are less likely to receive instruction on key sex education topics than they were 25 years ago, as indicated by comparing the prevalence estimates from 2011–2015 and 2015–2019 calculated in this study to published estimates from earlier NSFG rounds (Figure 2) [17,20]. The share of adolescents receiving instruction about birth control was higher in 1995 than in 2015–2019 for both the genders; in 1995%, 87% of females and 81% of males reported sex education about birth control methods, compared with 64% and 63% in 2015–2019, respectively [17]. For females, this pattern holds for instruction about saying no to sex, with 92% reporting instruction in 1995 compared with 81% in 2015–2019; for males, instruction on this topic increased from 1995 to 2002, but estimates have been stable thereafter [17]. Between 2011–2015 and 2015–2019, among males, there is some evidence of an increase in the percentage who reported learning about birth control methods and where to get birth control. These trends align with the characteristics of programs that have demonstrated efficacy in helping to shift young people's behaviors to reduce unintended pregnancy and sexually transmitted

Table 3
Percentage of sexually experienced females and males aged 15–19 years who received formal instruction on specific sex education topics before the first intercourse, by gender and race/ethnicity, 2015–2019 National Survey of Family Growth

Topic	Females					Males					Gender difference
	Total	NH White	NH Black	Hispanic		Total	NH White	NH Black	Hispanic		(Total) *p* value
STD/HIV	69 [64–73] *p* value	71 [62–78](ref)	70 [56–81] .871	73 [64–80]0.786		78 [73–81] *p* value	84 [77–89] (ref)	70 [59–79] .010	72 [65–78] .005		.010
Say no to sex	70 [64–75] *p* value	75 [66–82] (ref)	68 [55–79] .337	75 [65–83] .903		71 [66–75] *p* value	74 [65–81] (ref)	63 [51–74] .128	72 [65–78] .666		.894
Wait until marriage	55 [49–61] *p* value	57 [49–65] (ref)	54 [42–66] .700	60 [50–68] .706		49 [44–53] *p* value	48 [41–56] (ref)	57 [46–67] .214	49 [41–57] .905		.113
Methods of birth control	54 [48–60] *p* value	61 [50–71] (ref)	47 [34–60] .124	53 [43–63] .322		61 [56–67] *p* value	75 [67–81] (ref)	41 [32–51] .000	54 [43–64] .001		.060
Where to get birth control	42 [36–47] *p* value	45 [36–54] (ref)	30 [20–41] .038	49 [40–58] .517		48 [41–54] *p* value	56 [47–65] (ref)	36 [27–47] .005	42 [34–51] .022		.152
Condom skills	50 [45–56] *p* value	54 [45–62] (ref)	54 [40–67] .984	48 [38–58] .384		64 [58–68] *p* value	67 [58–74] (ref)	67 [56–76] .952	58 [50–65] .125		.000
Healthy people goal[a]	43 [37–49] *p* value	47 [37–57] (ref)	41 [29–53] .448	44 [34–55] .666		47 [41–53] *p* value	58 [49–66] (ref)	33 [23–44] .000	41 [31–51] .005		.293

STDs = sexually transmitted infections.
[a] Receipt of formal instruction before the age of 18 years on each of the following topics: saying no to sex, methods of birth control, HIV/AIDS, and STDs.

diseases [3]. However, the failure to expand receipt of formal sex education reflects limited federal funding, with total funding across all the four available federal programs less than $300 million annually [15].

This study includes concerning new findings regarding equity in the receipt of sex education, with widespread racial disparities in the receipt and timing of formal sex education. In 2015–2019, young men of color were less likely than their White peers to receive instruction on critical topics, at all and before the first sex. Black females were less likely than White females to receive information on where to get birth control before the first sex. Furthermore, the majority of Black males did not receive instruction in each of the topics set as objectives by the Healthy People 2030. These differences reflect both earlier age at the first sex among some Black males and less access to sex education generally. Sex education cannot wait until high school to meet the needs of young people initiating sex earlier, especially given that as many as one in four non-Hispanic Black males have sex before the age of 13 years in some metropolitan areas [21]. Disparities in receipt of sex education likely underlie some of the documented race-ethnicity differentials in sexual health knowledge [22]. This inequity leaves youth of color more vulnerable and results in racial and ethnic differences in the rates of unintended pregnancy and sexually transmitted diseases. These inequitable patterns align with the history of sex education, in which venereal disease was a primary focus for African-Americans, while "purity" was emphasized for Whites, especially White women [23]. Current patterns also reflect ongoing residential segregation that separates young people into school settings by race/ethnicity [24]. Building a greater equity focus into sex education policies and programs could help eliminate these troubling racial gaps in sex education which leave youth of color at a greater risk of negative health outcomes.

Queer males are less likely to receive instruction about STIs or HIV/AIDS, despite men who have sex with men being disproportionately affected. More generally, sex education often centers heterosexual relationships, excluding or pathologizing queer identities and behaviors [25–27]. Earlier surveillance efforts did not monitor the receipt of sex education by sexual orientation. These new findings indicate that changes in policies and practice are necessary to provide sex education that addresses the needs of LGBTQ teens in an inclusive manner [28,29].

This analysis highlights the role of religiosity and religious institutions in sex education. Adolescents' religious attendance emerged as a key correlate of their receipt of sex education, with more frequent religious attendance associated with a greater likelihood of instruction about delaying sex and less likelihood of instruction about contraception. Religious institutions are a significant source of instruction about waiting until marriage to have sex but rarely offer birth control information. While religious denominations are not monolithic in their stance on birth control or their orientation to sex education, most are unlikely to integrate messages about birth control into their programming [30,31]. School-based sex education offers an opportunity to provide the needed instruction that is not provided in religious or other community settings.

While this study examines formal sex education received in schools, religious organizations, and other community settings, it is important to recognize that parents, healthcare providers, and peers can also be the sources of sex education [32,33]. Adolescents also receive a great deal of information about sex through the media and digital sources such as social media and videos.

Table 4
Distribution of the source of instruction among females and males aged 15–19 years who received formal instruction on specific sex education topics, by gender, 2015–2019 National Survey of Family Growth

	Females				Males			
	Wait until marriage	95% CI	Birth control	95% CI	Wait until marriage	95% CI	Birth control	95% CI
Source								
Church								
Total	56	[51–61]	2	[2–4]	49	[44–55]	3	[2–4]
Alone	38	[34–43]	1	[0– 2]	32	[28–36]	1	[0–2]
W/other sources	18	[14–22]	2	[1–3]	18	[14–22]	2	[1–3]
School								
Total	53	[48–57]	92	[89–95]	59	[55–64]	98	[97–99]
Alone	35	[31–41]	84	[80–88]	42	[37–47]	93	[91–95]
W/other sources	17	[14–21]	8	[6–11]	18	[14–22]	5	[3–7]
Other								
Total	13	[10–16]	14	[10–18]	11	[8–14]	4	[3–6]
Alone	6	[5–9]	7	[5–10]	7	[5–10]	1	[1– 2]
W/other sources	7	[5–9]	6	[5–9]	4	[3–5]	3	[2–5]
Single source	80	[76–84]	92	[89–94]	81	[76–85]	95	[93–97]
Multiple sources	20	[16–24]	8	[6–11]	19	[15–24]	5	[3–7]

CI = confidence interval.

Most of this digital content is not intentional education (e.g., it is not designed to ensure that young people receive medically accurate information or make healthy decisions), but there are increasing efforts to create educational content about sexuality for the digital space and to ensure that young people are aware of these offerings [34,35]. Together, these additional sources of sex education can help ensure the receipt of information at younger ages and across gender, race/ethnicity, and sexual orientation and that young people receive the full complement of topics, including birth control information. Ideally, high-quality sex education would be available widely in both formal and informal settings.

Limitations

Although the measures of sex education in the NSFG appear straightforward, it is not clear whether young people interpret the language consistently. Furthermore, the available survey measures lack information about time spent on each topic, instructional quality, or student engagement, which influence if

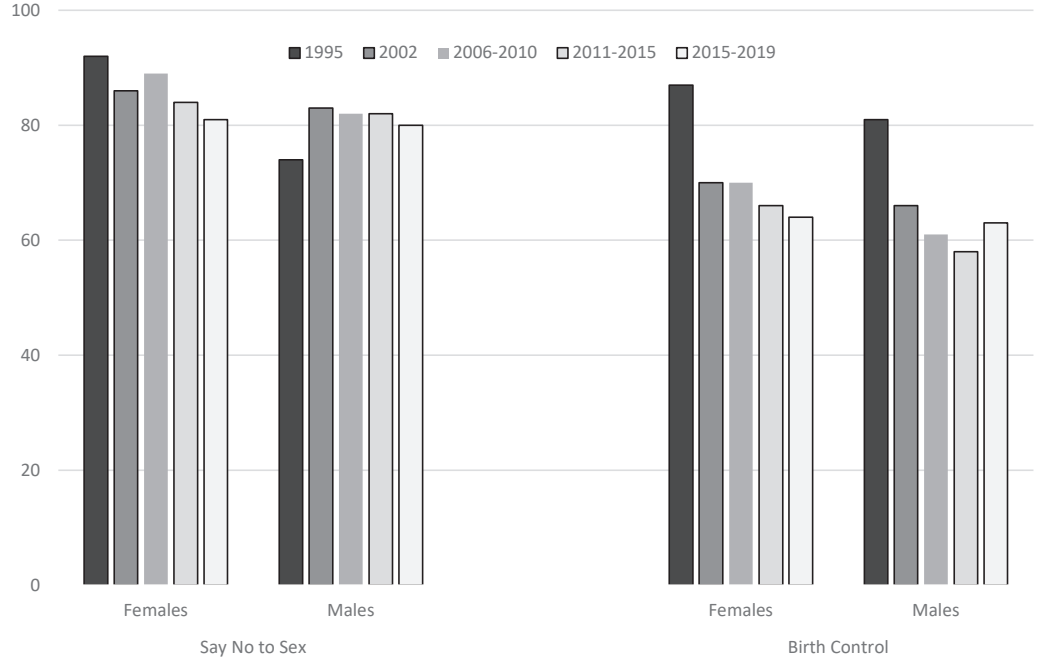

Figure 2. Percentage of females and males aged 15–19 years who received instruction on specific sex education topics before the age of 18 years, by survey year, the National Survey of Family Growth. Source: Estimates for 1995 and 2002 are from Lindberg LD, Santelli JS, Singh S. Changes in formal sex education: 1995–2002. Perspectives on Sexual and Reproductive Health. 2006;38(4):182-189. Estimates for 2006–2010 are from Lindberg LD, Maddow-Zimet I, Boonstra H. Changes in Adolescents' Receipt of Sex Education, 2006–2013. Journal of Adolescent Health. 2016;58(6):621-627. Estimates for 2011–2015 and 2015–2019 are from Table 2 of this paper.

young people retain and use what is taught. We do not make explicit adjustments for multiple comparisons, which could result in some spurious significant comparisons, but we do provide the full range of *p* values for review.

Conclusion

Young people in the U.S. today are less likely to receive sex education on key topics needed to protect their sexual health than they were 25 years ago. Although there have been modest federal efforts to support better education, these have not been funded at the scale needed to ensure that there is widespread receipt of sex education. Inequities in the receipt of sex education on key topics are particularly concerning, and robust efforts are needed to ensure that youth of color and queer youth receive timely sex education on the full range of topics to ensure equity and reduce health disparities.

Supplementary Data

Supplementary data related to this article can be found at https://doi.org/10.1016/j.jadohealth.2021.08.027.

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