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Short Communication

Trends in participation in teen pregnancy and STI prevention programming, 2002–2016☆

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ABSTRACT

Programs designed to help youth prevent early/unwanted pregnancy and sexually transmitted infection (STI) have been shown to yield a positive impact on youth behavior and key outcomes. However, recent evidence suggests that youth participation in prevention programming for health-risk behavior may be declining. The aim of the present study is to provide up-to-date information on the national trends in adolescent participation in prevention programming targeting early pregnancy and STI in the United States. We examined fifteen years of cross-sectional data (2002–2016, N = 234,803) from the National Survey on Drug Use and Health. Our main outcome was youth self-reported (no/yes) past-year participation in a pregnancy or STI prevention program. Survey adjusted prevalence estimates and logistic regression analysis were used to examine trends in participation. Youth participation in pregnancy and STI prevention programming decreased significantly from a high of 15% in 2003 to a low of 7% in 2016. Representing a 53% proportional decline in youth participation, this downward trend was significant even when controlling for age, gender, race/ethnicity, household income, and urbanicity (AOR: 0.947, 95% CI: 0.943–0.951). The downward trend in participation was observed across racial/ethnic subgroups. A consistent pattern of differences in prevalence was observed with African-American youth reporting the highest levels of participation followed by Hispanic, and then White youth. It is incumbent upon concerned citizens, scientists, and policymakers to push for change that can shift the trend line in adolescent participation in teen pregnancy and STI prevention programming to an upward tilt.

Recent evidence suggests that fewer American youth are having sex during their teenage years and that, among those who are sexually active, the number of total sexual partners is on the decline (Kann et al., 2018). Nevertheless, we also see evidence that among sexually active youth rates of condom use have declined substantially (to roughly 50% in 2017), and that fewer than one in three teens report using some form of hormonal or intrauterine birth control before their last sexual intercourse (Centers for Disease Control and Prevention [CDC], 2018). It is therefore unsurprising that rates of sexually transmitted infections (STI) are elevated among American youth and, despite steady declines in teen pregnancy and childbearing, rates of teen pregnancy are far higher in the United States (US) than in other developed nations (Coyne and D'Onofrio, 2012; Lindberg et al., 2016; National Center for Health Statistics, 2018; Satterwhite et al., 2013).

While multifaceted efforts are needed to address the challenge of sexual risk behavior and associated consequences, prevention is an integral part of any comprehensive solution. Fortunately, a number of programs designed to help youth prevent early/unwanted pregnancy and STI have been shown to yield a positive impact on youth behavior and key outcomes (see Chin et al., 2012; Fonner et al., 2014; Goesling et al., 2014). Moreover, we know that prevention—particularly when rooted in evidence-based principles and rigorously tested—is a cost-effective strategy for addressing youth risk behavior in general and sexual risk behavior in particular (Catalano et al., 2012; Nation et al.,

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2003). That said, prevention programs must be *implemented* to yield an impact, and recent evidence suggests that participation in prevention programming may be declining (AbiNader et al., 2019; Salas-Wright et al., 2019).

The aim of the present study is to provide up-to-date information on the national trends in adolescent participation in prevention programming targeting pregnancy and STI in the US. Given the noteworthy racial and ethnic disparities in sexual risk behavior and related outcomes (CDC, 2017a, b, 2018), we paid particular attention to trends in participation among White, African-American, and Hispanic youth. Moreover, we examined trends by gender as the experiences of male and female youth are often distinct, and many programs focus on youth of only one gender (e.g., HIV prevention programming for boys) (DiIorio et al., 2007). An in-depth understanding of the trends in sexual risk behavior prevention participation among youth in the US, particularly one focused on racial/ethnic and gender differences, will provide information that is critical to informing ongoing and future policy decisions.

1. Methods

1.1. Data and sample

Data from the National Survey on Drug Use and Health (NSDUH) were used for the present study. The NSDUH, administered by the Substance Use and Mental Health Services Administration (SAMHSA, 2019), provides annual estimates for substance use risks among a nationally representative sample of civilian, noninstitutionalized Americans ages 12 and older. The present study's analytic sample included 234,803 adolescents, ages 12–17, interviewed between 2002 and 2016 as part of the NSDUH.

1.1.1. Participation in prevention programming

A single, self-report variable (no, yes) was used to examine youth participation: "During the past 12 months have you participated in pregnancy or sexually transmitted disease prevention programs?"

1.1.2. Sociodemographic and behavioral risk factors

Sociodemographic variables include age, gender, race/ethnicity, household income, and urbanicity. We also examined self-reported (no, yes) use of tobacco, alcohol or illicit drugs, pregnancy status, and school enrollment.

1.2. Analyses

We present prevalence estimates for participation across all survey years (see Fig. 1). Trend analyses were conducted using binomial logistic regression ($p < .05$) per the methods outlined by the CDC (2016a). Survey year was specified as a continuous independent variable and our dichotomous measure of participation specified as a dependent variable. Sociodemographic variables shown to be related to program participation trends were included as control variables. We also examined percentage point change and the percent change of youth participation in prevention programming by sociodemographic and behavioral risk categories. All estimates were weighted to account for the NSDUH's complex sampling design using Stata 13.

2. Results

Youth participation in pregnancy and STI prevention programming decreased significantly from a high of 15.1% in 2003 to a low of 7.1% in 2016. Representing a 53% proportional decline in youth participation, this downward trend was significant even when controlling for age, gender, race/ethnicity, household income, and urbanicity (AOR: 0.947, 95% CI: 0.943–0.951). This downward trend in participation was observed across racial/ethnic subgroups and a consistent pattern of differences in prevalence—with African-American youth reporting the highest levels of participation followed by Hispanic and then White youth—was identified across the fifteen years of survey data examined (see Fig. 1).

As shown in Table 1, a significant downward trend in pregnancy/STI prevention participation was observed among male and female youth for virtually all sociodemographic and behavioral risk categories examined. Among males, significant declines were observed for all categories with the largest proportional declines observed among Latino youth (−56%) and youth not enrolled in school (−77%) (AOR range: 0.928–0.958). Among females, significant declines were observed for all subgroups (AOR range: 0.931–0.942) *except* among those who were pregnant at the time of interview. Although not a significant change, the prevalence of participation among pregnant youth increased slightly from 20.4% in 2002–2003 to 22.6% in 2015–2016. As with boys, the largest proportional declines were among Latinas (−59%).

As a supplemental analysis, we tested for trends in pregnancy among female respondents between 2002 and 2016 using the same method utilized for examining trends in prevention participation. We conducted this analysis using two equations, one controlling only for sociodemographic factors (AOR = 0.935, 95% CI = 0.915–0.954) and another controlling for sociodemographic factors plus the prevention participation variable (AOR = 0.939, 95% CI = 0.918 = 0.959). Notably, the AORs for survey year for the two equations are very similar with overlapping confidence intervals, suggesting that declines in participation were not related concomitant to declines in teen pregnancy.

3. Discussion

Findings from the present study provide compelling evidence that adolescent participation in programs designed to prevent pregnancy and STI was remarkably low, and that participation decreased substantially between 2002 and 2016. Specifically, we saw that participation dropped by more than 45% among males (from 14% in 2002–2003 to 7.5% in 2015–2016) and by 55% among females (from 15% in 2002–2003 to 7% in 2015–2016). Declines in participation were significant even when controlling for a host of sociodemographic confounds. In fact, significant and substantively meaningful declines in participation were observed among both male and female youth in nearly every subgroup examined (e.g., across differences in age, race/ethnicity, family income, urbanicity, substance use, and school enrollment). Notably, the only exception is that no change in prevalence was observed among a particularly unique subgroup: participants who were pregnant at the time of survey. Although NSDUH data do not allow us to determine whether these declines are driven by funding decreases, changes in policy or the social environment, or increased access to pregnancy/STI information online, it is clear that participation in prevention programs is down substantially.

Prior research suggests a pattern of racial and ethnic disparities in terms of sexual risk behavior, teen pregnancy, and STI (CDC, 2017a, b, 2018). Our results point to important differences in the prevalence and trends in participation in programming designed to target these outcomes. Namely, we found that—although rates of participation were low for all youth—*prevalence* of participation was lowest among White youth, slightly higher among Hispanic youth, and highest among African-American youth across all years. These findings suggest that there may be an effort among service providers and policymakers to provide targeted services to youth for whom, based on demographic characteristics, risk of adverse outcomes is elevated.

As noted above, the one subgroup that stood out as unique in terms of prevalence and trends was the subset of females who were pregnant at the time of survey. While fewer than 7% of non-pregnant girls participated in prevention programming in 2015–2016, the rate of participation among *pregnant* girls was 22.5%. Moreover, while rates of

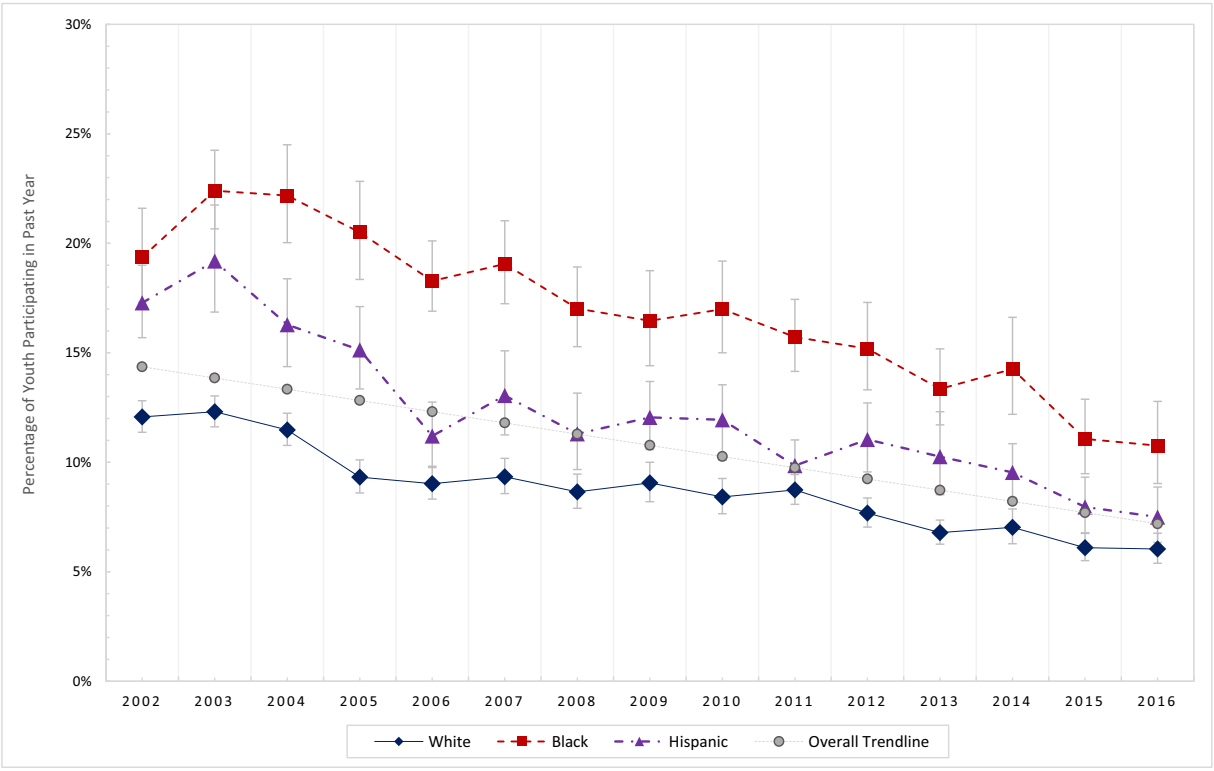

Fig. 1. Prevalence of participation in pregnancy and sexually transmitted infection prevention programming, by race.

Table 1
Past year prevalence of pregnancy and STI prevention program participation among youth by gender, 2002–2016.

	Male							Female						
	2002–2003		2015–2016		Δ *pp*	% change	AOR	2002–2003		2015–2016		Δ *pp*	% change	AOR
	%	95% CI	%	95% CI				%	95% CI	%	95% CI			
Total	14.08	13.42–14.77	7.62	7.04–8.23	−6.46	−0.46	**0.953**	15.16	14.59–15.76	6.83	6.24–7.47	−8.33	−0.55	**0.940**
Sociodemographic subgroups														
Age														
12–14	14.78	13.78–15.83	8.37	7.43–9.42	−6.41	−0.43	**0.951**	14.9	14.06–15.78	6.18	5.50–6.94	−8.72	−0.59	**0.936**
15–17	13.36	12.52–14.23	6.89	6.14–7.73	−6.47	−0.48	**0.955**	15.43	14.61–16.3	7.43	6.64–8.31	−8.00	−0.52	**0.943**
Race/ethnicity														
White	12.23	11.52–12.99	6.75	6.13–7.43	−5.48	−0.45	**0.954**	12.14	11.44–12.88	5.37	4.83–5.95	−6.77	−0.56	**0.945**
Black	18.3	16.13–20.68	10.82	8.94–13.04	−7.48	−0.41	**0.958**	23.41	21.44–25.50	11.01	9.35–12.93	−12.4	−0.53	**0.938**
Latino	17.6	45.64–19.74	7.75	6.51–9.19	−9.85	−0.56	**0.945**	18.93	16.88–21.17	7.71	6.63–8.96	−11.22	−0.59	**0.931**
Income														
< $20,000	15.8	14.53–17.15	8.82	7.13–10.88	−6.98	−0.44	**0.955**	18.81	17.19–20.55	9.06	7.64–10.72	−9.75	−0.52	**0.940**
$20,000–$39,999	15.04	13.69–16.49	8.86	7.3–10.72	−6.18	−0.41	**0.960**	17.96	16.49–19.53	9.57	8.19–11.16	−8.39	−0.47	**0.934**
$40,000–$74,999	13.20	11.92–14.61	7.74	6.39–9.34	−5.46	−0.41	**0.953**	13.24	12.20–14.34	6.14	5.17–7.29	−7.1	−0.54	**0.945**
≥$75,000	13.20	11.89–14.63	6.51	5.68–7.46	−6.69	−0.51	**0.945**	12.55	11.49–13.69	4.95	4.20–5.82	−7.6	−0.61	**0.941**
Urbanicity														
Rural	15.50	12.91–18.51	8.1	5.94–10.93	−7.4	−0.48	**0.958**	15.95	13.61–18.60	7.43	5.71–9.61	−8.52	−0.53	**0.948**
Urban	13.97	13.32–14.64	7.59	6.99–8.23	−6.38	−0.46	**0.952**	15.1	14.51–15.71	6.79	6.18–7.46	−8.31	−0.55	**0.939**
Behavioral risk subgroups														
Any tobacco, alcohol, marijuana, or other drug use—past year														
No	14.39	13.56–15.28	7.73	7.02–8.51	−6.66	−0.46	**0.950**	14.93	14.1–15.81	6.64	5.99–7.34	−8.29	−0.56	**0.940**
Yes	13.61	12.56–14.74	7.3	5.99–8.87	−6.31	−0.46	**0.958**	15.49	14.50–16.52	7.32	6.31–8.48	−8.17	−0.53	**0.943**
Currently pregnant														
No	–	–	–	–	–	–	–	15.13	14.54–15.73	6.73	6.15–7.37	−8.4	−0.56	**0.940**
Yes	–	–	–	–	–	–	–	20.39	13.99–15.77	22.65	11.29–40.26	2.26	0.11	0.984*
Enrolled in school														
No	11.21	9.28–13.49	2.59	1.49–4.48	−8.62	−0.77	**0.928**	14.09	11.74–16.83	6.49	4.25–9.80	−7.6	−0.54	**0.937**
Yes	14.36	13.67–15.08	7.92	7.31–8.57	−6.44	−0.45	**0.953**	15.28	14.66–15.92	6.84	6.26–7.48	−8.44	−0.55	**0.939**

Note. Δ *pp* = percentage point change from 2002 to 2003 to 2015–2016. % change determined by dividing the *pp* change by the 2002–2003 value. AOR = Adjusted odds ratios for survey year predicting prevention participation while controlling for sociodemographic factors (values in bold indicate a significant [$p < .001$] trend change). *p value = .572.

participation declined markedly among every other subgroup examined, the rate among pregnant youth remained flat, increasing by 2% over the fifteen years studied. What is perhaps most noteworthy is that nearly four in five pregnant teenagers reports that they did *not* participate in any kind of prevention programming for pregnancy/STI. This is remarkable, particularly given evidence suggesting that youth who become pregnant during adolescence experience many social/behavioral risks (Salas-Wright et al., 2015).

Findings from the present study have a number of implications for policy and practice. *First*, as noted above with respect to pregnant youth, the findings make clear that the overwhelming majority of youth are not participating in prevention programs for teen pregnancy and STI, and that the low rates of participation have only intensified of late. This is consistent with evidence from the School Health Policies and Practices Study (SHPPS) (2014b) suggesting that, between 2000 and 2014, the percentage of schools requiring students to receive instruction on STD prevention decreased from 48.6% to 38.2%. That said, we should note that the CDC's School Health Profiles (2014a) indicates that many schools are making efforts to provide training/information to teachers and parents related to pregnancy/STI risk. Similarly, findings from the SHPPS (2016b) indicate that a majority of middle/high schools in the US have policies stating that schools will teach about pregnancy and STI prevention. And yet, results from the present studies suggest that most youth are not reporting participation in formal programs designed to target these outcomes, suggesting the need to provide prevention programming for youth, be it in schools, youth organizations, community centers, or online.

Second, we should also note that rates of participation are dropping among subgroups we know to be of elevated risk, including adolescents who report having dropped out of school. Indeed, in 2015/2016, fewer than 3% of boys—the lowest percentage in any group examined—who were not enrolled in school reported participation in a teen pregnancy/STI prevention program. Given evidence that youth who drop out of school face greatly elevated risk of adverse behavioral and health outcomes (Maynard et al., 2015), and the connections between dropout and teen pregnancy (Freudenberg and Ruglis, 2007), it is imperative that prevention programming target this population.

3.1. Limitations

Findings from the present study should be interpreted in light of several limitations. First, NSDUH data is entirely based on respondent self-report. As such, it is possible that some participants may have under or over reported their participation in pregnancy/STI prevention programming. It is also possible that some youth may have struggled to understand the meaning of a rather complex, multipronged question tapping both pregnancy and STI programming. For example, some youth may have attended a class on pregnancy or STI prevention or spoken to a school health professional about these topics, but not considered such encounters to be a prevention program. Second, our measure of participation in pregnancy/STI prevention programming is a simple yes/no question and does not provide information on the quality or intensity of the prevention programming. Future research should examine the rates of implementation of evidence-based prevention programs as we know that not all programs are equally effective (see Catalano et al., 2012; Nation et al., 2003).

4. Conclusion

Examining fifteen years of nationally representative survey data collected from more than 230,000 adolescents across the US, the present study provides clear evidence that the rate of adolescent participation in pregnancy and STI prevention programs is low and has decreased steadily since the early 2000's. Indeed, while the rate of participation was low in 2002–2003 (14–15%), rates have dropped by roughly 50% to only 7% of American youth participating in a teen pregnancy/STI prevention program in 2015–2016. Unplanned/early pregnancy and STI continue to be major issues impacting the lives of millions of youth and we know evidence-based prevention programs are a cost-effective and proven way to address these challenges. It is incumbent upon concerned citizens, scientists, and policymakers to push for change that can shift the trend line in participation in teen pregnancy/STI prevention programming to an upward tilt.

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