



## Review Article

# Concerning Trends in Hormonal Birth Control Use among Adolescent Females between Politically Conservative versus Liberal States

Aruna Chandran<sup>1\*</sup>, Ritika Purbey<sup>2</sup>, Lorie Benning<sup>3</sup>, Magdalena Gareca<sup>4</sup>, Emily Knapp<sup>5</sup>

<sup>1</sup>Department of Epidemiology and Pediatrics, Johns Hopkins Bloomberg School of Public Health, 615 N. Wolfe Street #6501, Baltimore, MD, 21205, USA.

<sup>2</sup>Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, 21205, USA.

<sup>3</sup>Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, 700 E. Pratt Street, Baltimore, MD, 21205, USA.

<sup>4</sup>College of Public Health, Temple University, 5518 Reid Lane, Allentown, PA, 18104, USA.

<sup>5</sup>Department of Epidemiology, Johns Hopkins Bloomberg School of Public Health, 700 E. Pratt Street #1022, Baltimore, MD, 21205, USA

**\*Corresponding author:** Aruna Chandran, Department of Epidemiology and Pediatrics, Johns Hopkins Bloomberg School of Public Health, 615 N. Wolfe Street #6501, Baltimore, MD, 21205, USA.

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## Abstract

**Introduction:** Unintended teen pregnancies are associated with adverse health consequences. Strategies effective in preventing unintended pregnancy include comprehensive sexual education programs and access to hormonal contraception. Given the widening divide at the state level in access, funding, education, and sociopolitical context surrounding birth control, we explored how hormonal birth control use for the prevention of pregnancy in 2019 may have differed compared with prior years between liberal vs conservative states. **Methods:** State support for Donald J. Trump vs. Hillary R. Clinton in the 2016 US Presidential election was our exposure. The primary outcome was reported use of hormonal birth control among female students from the Youth Risk Behavior Surveillance System (YRBSS) in 2013-2019. A weighted adjusted linear regression model evaluated whether there was a change in the reported use of hormonal birth control in 2019 by election result status. **Results:** We analyzed data from 7,714 females from 39 states; of these, 2,425 reported having used hormonal birth control to prevent pregnancy. In 2019, the proportion of hormonal birth control use in Clinton-supporting states was 41.9% compared with 30.2% in Trump-supporting states ( $p=0.01$ ; no difference between these states in 2013-2017). In 2019, hormonal birth control use decreased by 9.8% (95% CI: -0.187, -0.010) among females from Trump-supporting states. **Discussion:** Our study highlights a dramatic shift in reported hormonal birth control use among teens in a short period of time between politically conservative vs. liberal states. This mirrored a change in the sociopolitical environment related to support for family planning. This suggests potential for a significant increase in unintended pregnancies among teens who live in politically conservative compared with liberal states. It is important for public health officials not to shy away from confronting the sociopolitical context in which health-related decisions are made, and protect our children's health and health equity.

**Keywords:** Hormonal Birth Control; Sociopolitical Context; YRBSS

## Introduction

The teen birth rate in the United States (US) in 2020 was 15.4 per 1,000 females ages 15-19 years; although this rate has been steadily declining since 2009, the rate is still higher than in most high-income countries [1]. There are substantial sociodemographic and regional variations in teen pregnancy rates, with higher rates among non-Hispanic Black and Hispanic teens compared with non-Hispanic white teens, in teens from families with lower income and lower education, and in teens living in the South and Southeast US compared with the Northeast US [2,3]. Importantly, an estimated 75% of pregnancies in this age group are unintended [4]. Unintended pregnancies are associated with several individual and societal-level adverse health-related consequences [5,6]. These risks can affect both the young mother and the baby; adolescent motherhood has been associated with delayed prenatal care, social isolation, lower levels of education, and maternal depression; while babies can experience preterm birth and low birthweight, and the long-term sequelae of these [7,8].

There have been several strategies shown to be effective in preventing unintended pregnancy, including comprehensive sexual education programs and access to effective hormonal contraception [9-11]. Beginning in the early 1970s, health centers received funding through Title X of the Public Health Service Act and state Medicaid programs were required to provide comprehensive family planning services [12,13]. Into the early 2000s, government spending on family planning increased substantially, adolescents were given further access to family planning services through the State Children's Health Insurance Program (SCHIP), and states were allowed waivers to offer services to adolescents and women whose incomes were just above the threshold for Medicaid eligibility [14]. An evaluation by Kearney and Levine showed that the 25 states that implemented the waiver program (starting with South Carolina in 1993 and ending with Texas in 2006) had an over 4% reduction in teen pregnancies [14]. Subsequently in 2012, the Affordable Care Act included a contraceptive coverage provision that expanded coverage for privately-insured women [15]. Numerous evaluations have shown health and economic benefits from expanded access to contraception [16,17].

However, in the years leading into the 2016 presidential election, the sociopolitical environment and attitudes towards family planning services changed. This was evident by changes in sex education; data from the National Survey of Family Growth showed that in 1995, 87% of adolescent females reported having received formal instruction about birth control methods, whereas, by 2011-2013, this had fallen to 60%, with 28% of these females reporting having received instruction about abstinence but no

instruction about birth control [18,19]. Around that time, states began restricting funding to health centers that provided abortion services, thereby restricting access to family planning services for many adolescents and women [20,21]. In October 2017, the administration of President Donald J. Trump expanded employer exemptions to the ACA contraceptive coverage mandate; this exemption was extended to Title X-funded clinics in May 2019 [22,23]. With these federal rules restricting access to contraception came widespread support and funding for less-comprehensive "abstinence-only" sex education programs, the efficacy of which are unsupported by evidence [19,24]. Simultaneously, several states began enacting legislation to protect and even expand access to contraception; these changes occurred more commonly in states that supported Democratic Presidential nominee Hillary R. Clinton in the 2016 presidential election [25].

Given this widening divide at the state level in the access, funding, education, and sociopolitical context surrounding birth control, we explored how reports of birth control use for pregnancy prevention among adolescent females may have changed through the 2010s. We utilized the Youth Risk Behavior Surveillance System (YRBSS) run by the Centers for Disease Control and Prevention (CDC); a bi-annual survey of middle and high school students centered around risk behaviors and select health outcomes. We hypothesized that support for Republican Presidential candidate Donald J. Trump would align with support for state-level policies restricting access to and education regarding hormonal birth control. Therefore, we hypothesized that in 2019, trends in hormonal birth control use for the prevention of pregnancy would diverge in states that supported Republican Presidential candidate Donald J. Trump in the 2016 US presidential election compared with states that supported Democratic Presidential candidate Hillary R. Clinton. We believe this information could be critical to protecting the health, well-being, and health equity of teen females across the US.

## Material & Methods

### Data Source

The Youth Risk Behavior Surveillance System (YRBSS) administered every other year by the CDC in collaboration with state/territorial health departments monitors health-related behaviors that contribute to leading causes of death and disability among youth. For this analysis, national-level YRBSS data for the years 2013, 2015, 2017, and 2019 with state identifiers were obtained directly from the CDC [26].

### Exposure

The primary exposure for this analysis was the 2016 US election result for each state, specifically whether the state voted for Republican Presidential candidate Donald J. Trump vs. Democratic

Presidential Candidate Hillary R. Clinton. Election results were extracted from The New York Times 2016 Presidential Election Results article [27].

### **Outcome**

The primary outcome of this analysis was the reported use of hormonal birth control among individuals reporting female sex and sexual intercourse within the previous three months. A summary variable was created by the CDC representing those who reported using birth control pills, an Intrauterine Device (IUD) or implant, or a shot/patch/birth control ring during the last time they had sexual intercourse to prevent pregnancy. This variable was extracted across 4 survey years (2013, 2015, 2017, and 2019).

### **Covariates**

The following state-level covariates identified in the literature as important predictors of hormonal birth control use were extracted from the US Census Bureau's American Community Survey 5-year estimates 2012-2016: Proportion female, proportion aged 13 – 18, proportion Black/African-American, proportion Hispanic/Latinx (any race), median household income, proportion without health insurance, and proportion with a high school education/equivalent or greater. We included individual-level age, race, and ethnicity in the models. At the individual level, race and ethnicity are coded in the YRBS into one variable, with categories being American Indian/Alaska Native, Asian, Black or African American, Native Hawaiian/Other Pacific Islander, White, Hispanic/Latino, Multiple-Hispanic, or Multiple-non-Hispanic. We also adjusted for the year of YRBS as our timescale.

### **Statistical Analysis**

All analyses incorporated the survey weights provided by the CDC in the YRBSS datasets. We compared the demographic profiles of females reporting and not-reporting hormonal birth control use by age group, grade in school, and race and ethnicity category using the Rao-Scott adjusted chi-square test. We compared proportions of females reporting and not-reporting hormonal birth control use by election results and year using the Student's T-Test. We fit a linear regression model with year as a time tracker, a fixed effect for state, the above-mentioned covariates, and an interaction term for election results and 2019 to evaluate whether there was a significant change in the reported use of hormonal birth control in 2019 by election result status.

We then conducted a sensitivity analysis repeating all procedures as above using the reported provider diagnosis of asthma as the outcome variable. This variable was extracted across the four survey years as indicated above for our primary outcome. We hypothesized that there would be no significant change in asthma diagnoses among female students in 2019 following the 2016 election and subsequent modifications in access to

reproductive care. All analyses were done in Stata Version 17 (College Station, TX).

## Results

We analyzed data from 7,714 individuals from 39 states self-identifying as female and reporting sexual intercourse within the previous three months; of these, 2,425 reported having used hormonal birth control (birth control pills, and Intrauterine Device (IUD) or implant, or a shot/patch/birth control ring) to prevent pregnancy (Table 1). Over one-third (33.9%) were 17 years of age, followed by 25.9% being 16 years of age and 21.3% being

18 years or older. Most were in 12<sup>th</sup> (36.2%) or 11<sup>th</sup> (29.6%) grade. Over half (56.1%) reported non-Hispanic white race and ethnicity, and 9.5% reported Hispanic ethnicity. The majority (40.2%) were from the South region of the US. At the state level, the average proportion of Black or African American individuals was 10.2%, and the average proportion of Hispanic individuals was 16.6%. The median income was \$58,393, with 10% of the population living below the Federal Poverty Level. The average proportion with at least a high school education was 87.4% and the average proportion eligible for Medicaid was 8.4%.

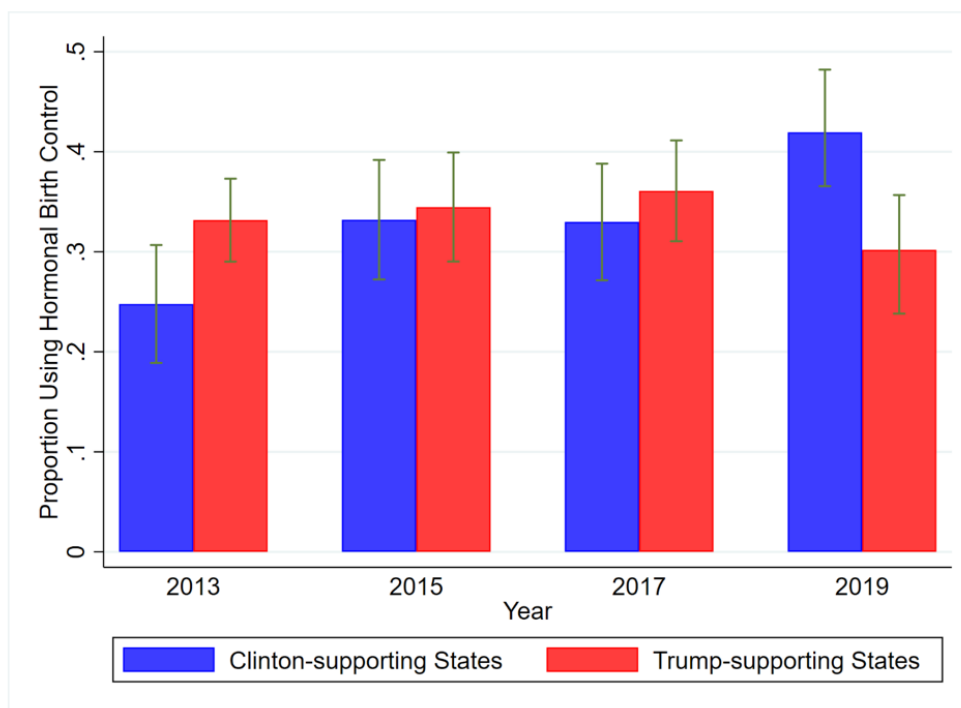
	Overall (n=7,714)	Reporting Hormonal Birth Control Use* (n=2,425)	Not Reporting Hormonal Birth Control Use* (n=5,289)	P-Value**
<b>Individual-Level Variables</b>				
<b>Age</b>				
12 years	0.24%	0.17%	0.28%	<0.001
13 years	0.03%	0	0.05%	
14 years	4.2%	2.3%	5.1%	
15 years	14.5%	9.8%	16.8%	
16 years	25.9%	24.7%	26.4%	
17 years	33.9%	36.5%	32.6%	
18 years and older	21.3%	26.5%	18.8%	
<b>Grade</b>				
9 <sup>th</sup> grade	12.1%	7.0%	14.7%	<0.001
10 <sup>th</sup> grade	21.9%	19.2%	23.2%	
11 <sup>th</sup> grade	29.6%	30.5%	29.1%	
12 <sup>th</sup> grade	36.2%	43.2%	32.7%	
Other/ungraded	0.23%	0.06%	0.32%	

<b>Race &amp; Ethnicity</b>				
AI/AN	0.53%	0.60%	0.50%	<0.001
Asian	1.7%	1.3%	1.9%	
Black/AA	12.0%	7.6%	14.2%	
NH/Other PI	0.68%	0.60%	0.71%	
White	56.1%	70.2%	49.9%	
Hispanic/Latino	9.5%	4.7%	11.9%	
Multiple Race – Hispanic	13.6%	8.7%	16.0%	
Multiple Race – non-Hispanic	5.4%	6.2%	5.0%	
<b>Census Region</b>				
Northeast	17.6%	18.5%	17.1%	0.23
Midwest	20.3%	22.5%	19.1%	
South	40.2%	38.1%	41.2%	
West	22.0%	20.9%	22.5%	
<b>State-Level Variables (Mean, Standard Error)</b>				
Median Age	38.3 (0.16)	38.5 (0.18)	38.2 (0.16)	0.01
Proportion Female	50.8 (0.04)	50.8 (0.04)	50.8 (0.04)	0.32
Proportion Black or African American	10.2 (0.60)	10.3 (0.61)	10.2 (0.62)	0.77
Proportion Hispanic or Latinx, any race	16.6 (1.01)	15.8 (1.08)	17.0 (1.05)	0.09
Median Income, USD	58,393 (752)	58,070 (807)	58,555 (770)	0.29
Proportion living below Federal Poverty Level	10.1 (0.20)	10.0 (0.22)	10.2 (0.20)	0.16
Proportion without Health Insurance	8.4 (0.27)	8.0 (0.26)	8.5 (0.29)	0.03
Proportion with High School Education or Above	87.4 (0.23)	87.7 (0.25)	87.3 (0.23)	0.02

**Table 1:** Weighted Proportions of Demographic Characteristics of Females by Report of Hormonal Birth Control Use (N=7,714) Hormonal birth control use reported among female students who reported having sexual intercourse within the past 3 months. \*\*P-values from T-test or Chi-Square value calculated using the Rao-Scott adjustment.

When stratified by the report of hormonal birth control use, the two groups did differ. The individuals reporting hormonal birth control use were older (26.5% vs. 18.8% being 18 years or older ( $p < 0.001$ ); 43.2% vs. 32.7% being in 12<sup>th</sup> grade ( $p < 0.001$ )). In addition, more (70.2% vs. 49.4%;  $p < 0.001$ ) reported non-Hispanic white race and ethnicity. In terms of state-level covariates, those reporting hormonal birth control use lived in states with higher median age (38.5 vs. 38.2 years;  $p = 0.01$ ) and lower proportion Hispanic (15.8% vs. 17.0%;  $p = 0.09$ ). Students reporting hormonal birth control use lived in states with lower proportions of people without health insurance (8.0% vs. 8.5%;  $p = 0.03$ ), and higher proportion with a high school education or above (87.7% vs. 87.3%;  $p = 0.02$ ).

The overall proportion of female students reporting hormonal birth control use the last time they had sex steadily increased from 29.8% in 2013 to 35.2% in 2019 (data previously published by the CDC) [28]. When stratified by students living in states that supported Donald J. Trump vs. Hillary R. Clinton in the 2016 presidential election, there was a similar steady increase from 2013 to 2017, but then a notable change in 2019 (Figure 1). There were no statistically significant difference in proportion of hormonal birth control use between Donald J. Trump vs. Hillary R. Clinton-supporting states through 2017; however, in 2019, the proportion of hormonal birth control use in Hillary R. Clinton-supporting states was 41.9% compared with 30.2% in Donald J. Trump-supporting states ( $p = 0.01$ ).



**Figure 1:** Weighted Proportions of Female Students Reporting Hormonal Birth Control Use the Last Time they had Sexual Intercourse 2013 – 2019, Stratified by Clinton vs. Trump-Supporting States in the 2016 Presidential Election; Legend: Hormonal birth control use reported among females reporting having had sexual intercourse within the past 3 months.

Model results showed a statistically significant 1.6% (95% Confidence Interval (CI): 0.004, 0.028) increase in the proportion of female students reporting hormonal birth control use in each survey year across the study period (Table 2). There was a statistically significant 9.8% (95% CI: -0.187, -0.010) decrease in hormonal birth control use in 2019 among females from Trump-supporting states. Overall, there was no statistically significant difference in hormonal birth control use in 2019 compared with prior years, or between female students from Donald J. Trump vs. Hillary R. Clinton-supporting states.

Variable	Estimate	95% Confidence Interval
Trump-supporting States in 2019	-0.098 <sup>^</sup>	-0.187, -0.010
Survey Year	0.016 <sup>^</sup>	0.004, 0.028
Trump-supporting States	0.106	-0.103, 0.314
2019 vs. Prior Years	0.010	-0.079, 0.100
<b>Individual Covariates</b>		
Age	0.058 <sup>^</sup>	0.044, 0.071
Race & Ethnicity	0.002	-0.008, 0.013
<b>State Covariates</b>		
Median Age	-0.079	-0.228, 0.070
Proportion Female	4.876	-13.841, 23.593
Proportion Black/African American	-0.377	-1.776, 1.021
Proportion Hispanic Ethnicity	0.554 <sup>^</sup>	0.003, 1.104
Median Income	0.001	-0.001, 0.001
Proportion living below Federal Poverty Level	7.812	-10.032, 25.646
Proportion without Health Insurance	-7.121	-15.792, 1.551
Proportion with High School Education or Above	3.049	-5.183, 11.282

**Table 2:** Longitudinal Associations with Hormonal Birth Control Use among Female Students in the Youth Risk Behavior Surveillance System, 2013 – 2019; Hormonal birth control use reported among females reporting having had sexual intercourse within the past 3 months; <sup>^</sup>Denotes statistical significance (p<0.05).

We repeated the entire analysis with reported asthma diagnosed by a healthcare provider among the same population. No significant differences were noted in asthma diagnoses in 2019 between Hillary R. Clinton vs. Donald J. Trump-supporting states (data not shown).

## Discussion

We show that adolescent female students living in states that supported Republican candidate Donald J. Trump in the 2016 presidential election reported a 9.8% lower rate of using hormonal birth control to prevent pregnancy the last time they had sex in 2019 compared with those living in states that supported Hillary R. Clinton. Importantly, young people living in these same states had no difference in reported rates of hormonal birth control use between 2013 – 2017, indicating a dramatic shift in hormonal birth control use in a short period of time in certain areas of the country.

The outcome of the 2016 presidential election at the state level mirrors the local sociopolitical environment related to support for comprehensive family planning education, funding, access, and provision. Our study highlights the potential for a significant increase in unintended pregnancies among teens that live in politically conservative compared with liberal states.

Despite having a new administration following the 2020 presidential election, the potential for disparities in unintended teen pregnancies between politically conservative and liberal states to continue and also to widen significantly is very real. In June 2022, the US Supreme Court overturned *Roe vs. Wade*, thus eliminating federal protection of an individual’s right to abortion services [29]. Following this landmark decision, numerous states (primarily politically conservative states) immediately followed with bans or restrictions on abortions [30]. Many of the states

that restricted access to abortion in this time period already had higher than average rates of unplanned pregnancies. Historically, restriction of access to family planning services has mirrored abortion rights in each state [31]. Thus it is likely that adolescents in politically conservative states will continue to receive sub-standard sex education and face limited access to comprehensive family planning services.

Our findings of potential concerns for adverse health effects of unintended pregnancy among teens living in politically conservative states in the wake of the 2016 presidential election are not unique. Since the 2016 presidential election, voting patterns have been linked to increases in mortality, deaths due to drugs and alcohol, worsening mental health concerns including suicide, and decreases in life expectancy [32-35]. More research is certainly needed to understand the longer-term health-related ramifications for teens living in politically conservative vs. liberal states, and how to protect? Insulate? Children and teens from the resulting policy decisions. As we consider the potential volatility of state-level health-related decision-making in response to the local sociopolitical environment, it is important to encourage federal-level protections to maintain optimal health policies for children and adolescents. This serves as a call to action for all public health professionals for optimizing the health and well-being of young women across the United States.

Our study has several limitations. Data from the YRBS is based on adolescent self-reported information from a sampling of students in US public schools. It will be important to confirm reported rates of hormonal birth control use among teens over time using other data sources. Second, the YRBS collects no information on individual-level socioeconomic status, which has known associations with access and use of contraceptives. Thus, these findings should be corroborated using data from other sources that have SES information available. Finally, we based inferences about the sociopolitical context of each state based solely on the state-level results of the 2016 presidential election, despite substantial within state heterogeneity in voting results. Unfortunately, YRBS data cannot be linked to county of residence or other smaller geographic units, so more in-depth explorations of changing political environments in certain areas/states are warranted.

## Conclusion

Scholars have called for conducting strong policy evaluations, and the need for encouraging policymakers to use these data to promote child health and well-being [36]. It is important for public health officials not to shy away from confronting the sociopolitical context in which health-related decisions are made, and work to protect our children by giving their needs the attention they deserve.

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