

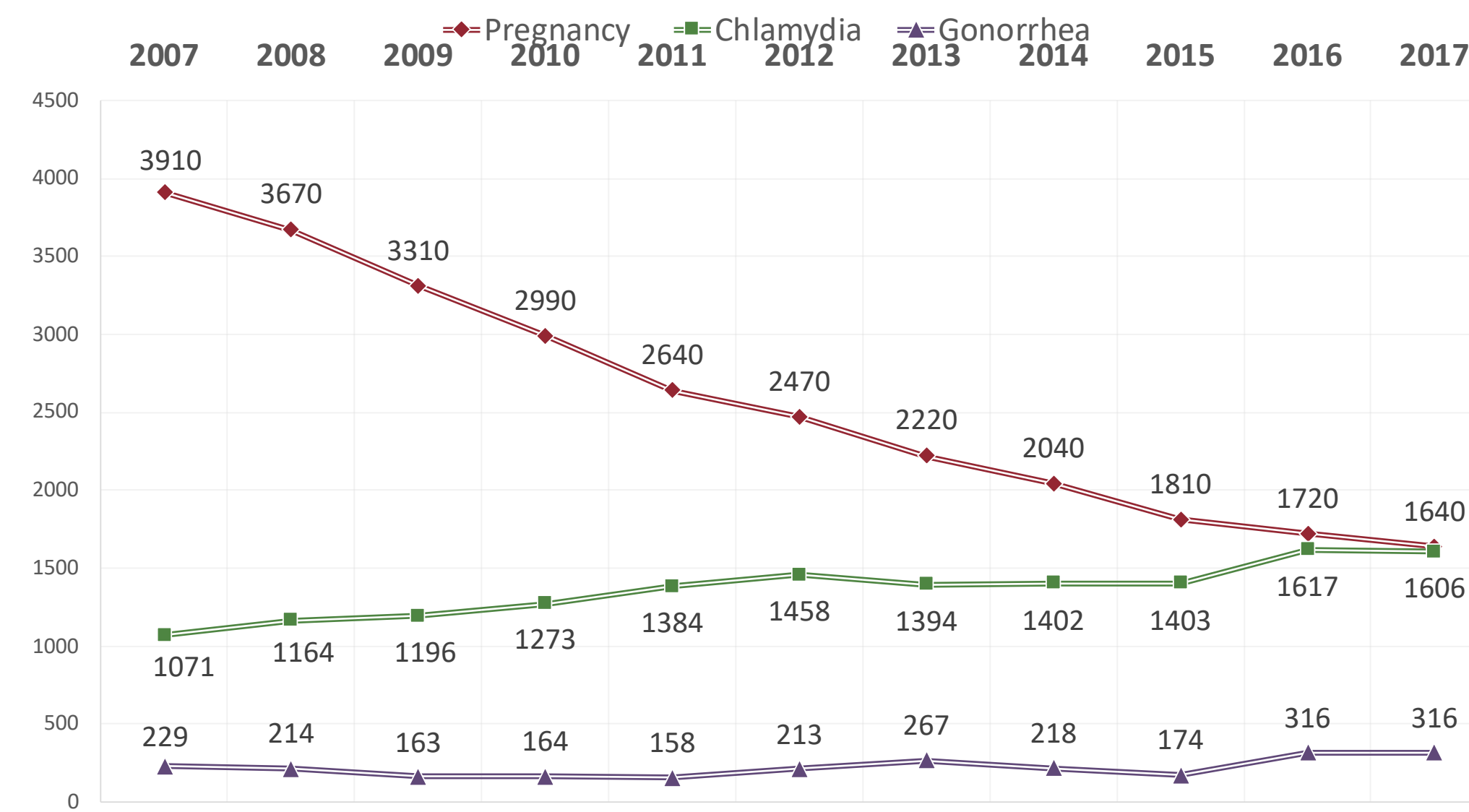
Feel the Burn: Sexually Transmitted Infections and Birth Control Choices in U.S. Young Adults

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Introduction

There are a number of positive trends in U.S. adolescent sexual health. For the last decade, the CDC's Youth Risk Behavior Survey (YRBS) has shown steadily declined numbers of high school students reporting sexual activity dropping from 47.9% in 2007 to 39.5% in 2017¹. Pregnancy rates among young people ages 15-19 have been declining for 30 years. In MN, the adolescent pregnancy rate has dropped by more than 58% in the last decade². Unfortunately, youth are reporting decreased condom use over this same time period with a decline of 7.7 percentage points among YRBS respondents from 2007-2017¹. Meanwhile, sexually transmitted infection (STIs) rate are increasing. While overall incidence rates for STIs in Minnesota are lower than many areas of the U.S., rates of chlamydia have more than doubled for adolescents since 2000. Rates of gonorrhea have also grown and since 2007 and infections among 15-19 year-olds have increased by 47%. These infections disproportionately affect young women as well as African Americans. The majority of new cases are diagnosed in the Twin Cities metro area but high STI rates are impacting a number of counties in greater Minnesota².

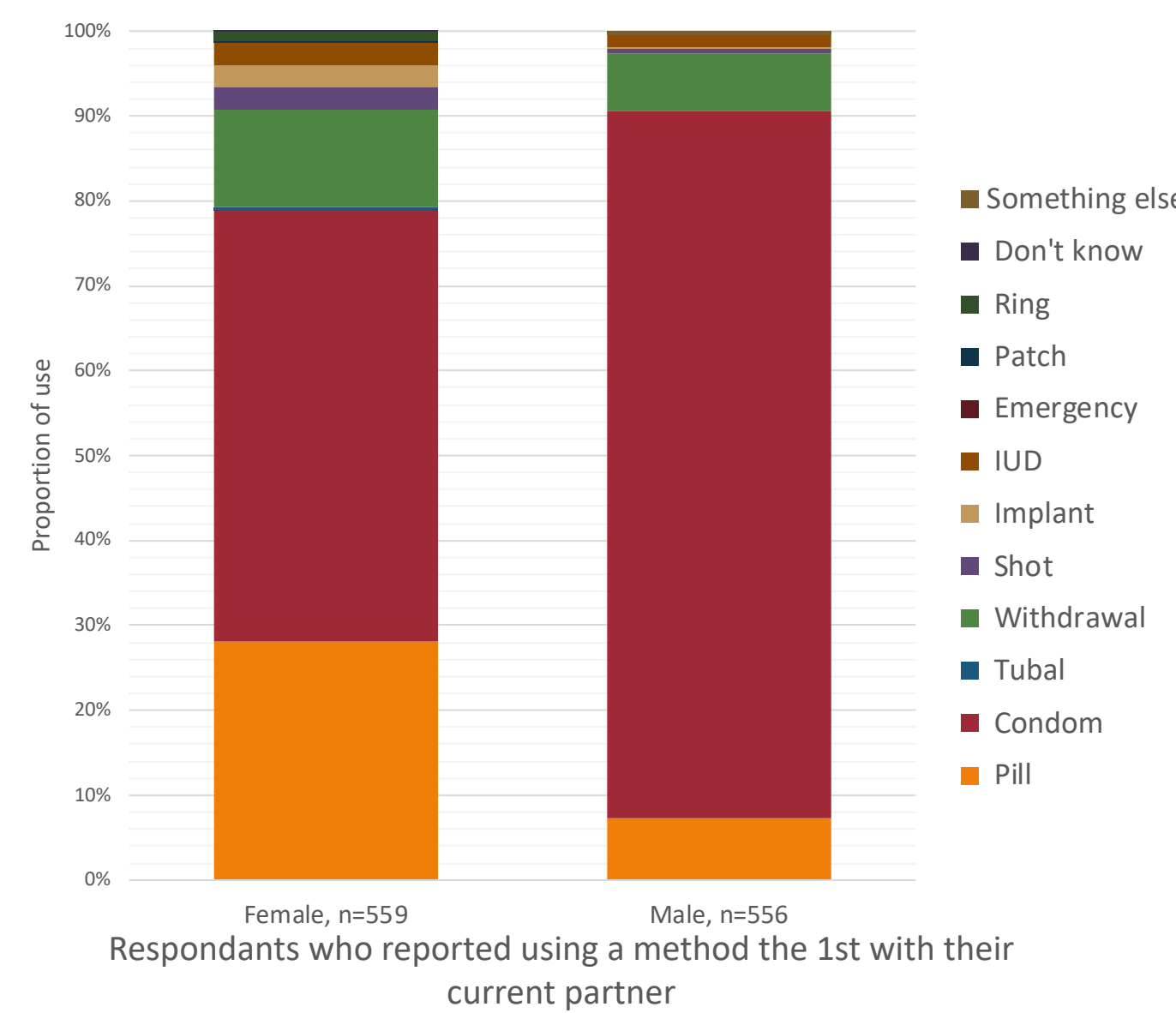
Minnesota Pregnancy, Chlamydia, & Gonorrhea Rates, Per 100,000, For 15-19 Year-olds^{2,4}



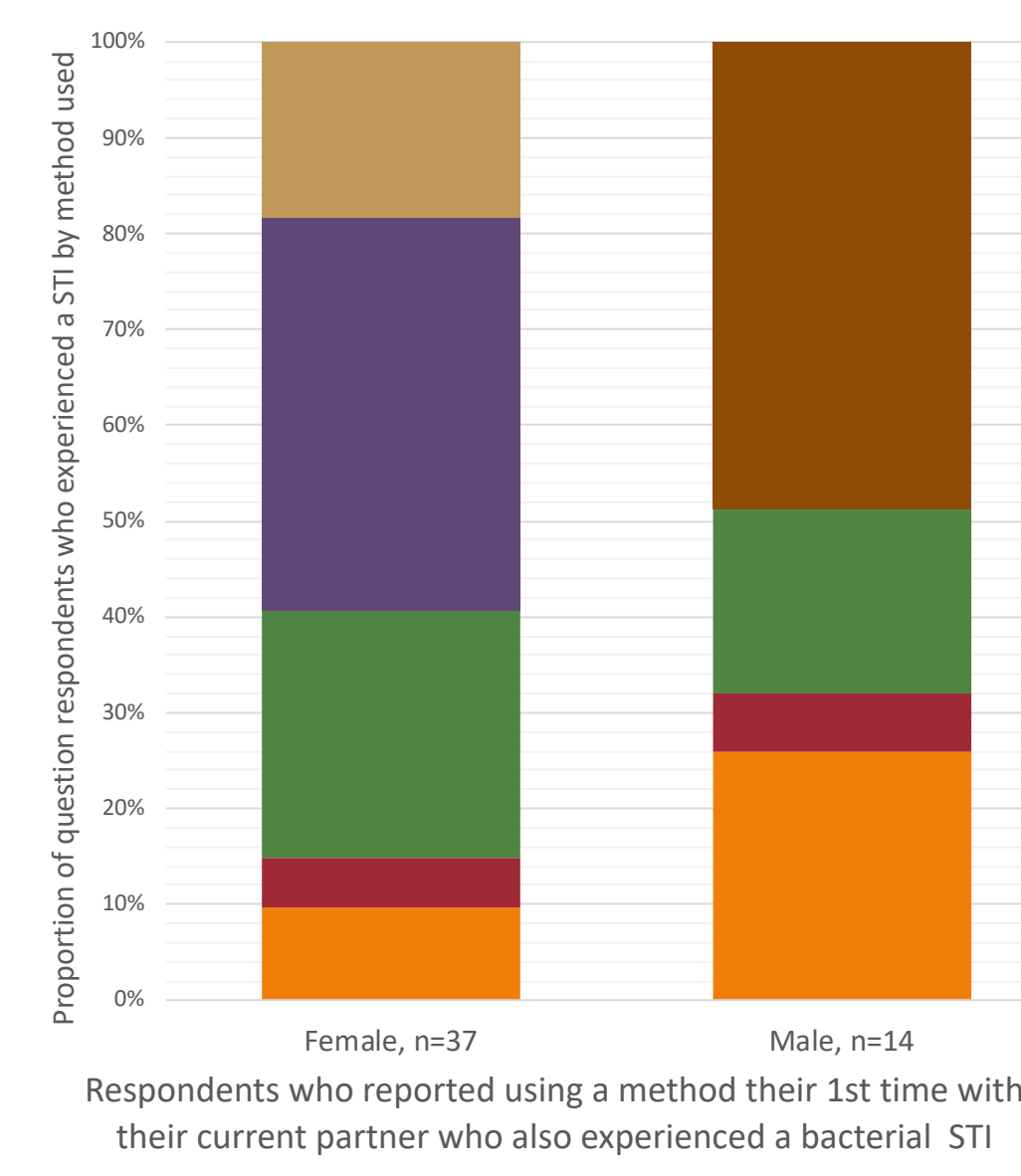
Abstract

High rates of STIs present unique risks for young adults. In 2017, 62% of new chlamydia cases and 45% of new gonorrhea cases in Minnesota were diagnosed in 15-24 year-olds. These bacterial STIs, along with syphilis, have significantly increased in the last decade; from 2016-2017 the chlamydia rate increased by 4%, the rate of gonorrhea increased by 28%, and rates of reported syphilis increased by 10% with adolescents, young adults, and people of color disproportionately affected². In the research we use data from the Center for Disease Control's (CDC) National Survey of Family Growth (NSFG), 2015 to 2017 survey cycle. We investigated if increased STI rates are an unintended consequence of birth control choices. Looking at how gender, race/ethnicity and levels of sex education contribute to contraception use, pregnancy and infection rates. Our key analysis compressed our data with weights and used ordinary least squares regressions to look for patterns. We hypothesized that barrier contraception methods would have an effect on lower STI rates and lower pregnancy rates but that hormonal methods would only have an effect on reduced pregnancy rates while possibly explaining some of STI rate increases. Preliminary results do not support this hypothesis however we have not accounted for variation in method or analyzed data from previous surveys cycles.

Protection Methods Used During 1st Sexual Encounter w/Current Partner



Experienced a Bacterial STI and Methods Used 1st Time w/Current Partner



Context

STIs and unintended pregnancies have numerous economic costs. Shame and social stigma have negative effects on individuals, their relationships, and decisions to seek testing/treatment. Social pressures contributes to information failure when individuals experience strong incentives to withhold key details from partners, healthcare providers and even researchers. Untreated STIs exact short and long term consequences, from medical expenses to infertility. Other studies have found youth tend to use hormonal birth control methods and prioritize the decreased chance of pregnancy over infection protection^{5,6}. This costs the public as youth transition into adulthood and become agents in the network effects of sexual health. Likewise, unintended pregnancies have significant public and private costs, from lost education and wages to increased healthcare use. Public policy can create incentives for young people to take care of their sexual health. Literature reviews continue to show a positive effect of comprehensive school-based sex education^{7,8,9}.

Method/Data/Limitations

The NSFG is a robust survey with multiple skip-patterns and it was necessary for us to limit what we worked with. Our data consists of 10,094 respondents aged 15-24 years-old from a random, demographically representative sample of the U.S. The subset included 4,540 observations coded as male and 5,554 coded as female. Participants were interviewed in-person between September 2015 and September 2017, some sensitive questions were answered privately by self-administration. We selected variables from questions about respondent's sexual health behaviors, education, relationship, and family dynamics. For sexually transmitted infections we created a bacterial STIs outcome variable which combined several questions about chlamydia, gonorrhea, and syphilis. For pregnancy outcomes we combined responses to several different sex-specific questions. Our measures for contraception were not sophisticated enough to establish temporality between use of protection methods and behaviors that exposed respondents to risks of pregnancy or STI.

Results

$$\text{outcome}_y = \alpha + \beta_1 \text{HORMBC} + \beta_2 \text{BARR} + \beta_3 \text{HADSEX} + \epsilon$$

(outcome_y = STI proportion | Pregnancy proportion)

Table 1: Bacterial STI Regression Results

	Dependent variable:		
	(1)	(2)	(3)
Used Hormonal BC	-0.003 (0.021)	-0.005 (0.021)	-0.005 (0.021)
Used Barrier Method	-0.030*** (0.015)	-0.035** (0.014)	-0.035** (0.014)
Had Sexual Intercourse	0.051*** (0.015)	0.050** (0.014)	0.049** (0.014)
Age	-0.001 (0.001)	-0.001 (0.001)	-0.001 (0.001)
Female	0.013 (0.009)	0.013 (0.009)	0.013 (0.009)
Black	0.051*** (0.019)	0.052*** (0.019)	0.052*** (0.019)
Hispanic	0.003 (0.010)	0.003 (0.010)	0.003 (0.010)
Other Race	-0.007 (0.006)	-0.006 (0.006)	-0.006 (0.006)
Sex Ed		0.011 (0.015)	0.011 (0.015)
Constant	0.004** (0.002)	0.007 (0.017)	-0.003 (0.023)
Observations	3,194	3,187	3,187
R-Squared	0.020	0.036	0.036
Adjusted R-Squared	0.019	0.034	0.034
Log Likelihood	766.817	794.263	794.526
Akaike Inf. Crit.	-1,525.634	-1,570.527	-1,569.053

Note: *p<0.1; **p<0.05; ***p<0.01

Table 2: Pregnancy Regression Results

	Dependent variable:		
	(1)	(2)	(3)
Used Hormonal BC	-0.034 (0.036)	-0.108*** (0.036)	-0.108*** (0.036)
Used Barrier Method	-0.183*** (0.028)	-0.137*** (0.023)	-0.137*** (0.024)
Had Sexual Intercourse	0.257*** (0.025)	0.198*** (0.023)	0.198*** (0.023)
Age	0.016*** (0.003)	0.016*** (0.003)	0.016*** (0.003)
Female	0.215*** (0.016)	0.215*** (0.016)	0.215*** (0.016)
Black	0.057*** (0.022)	0.057*** (0.022)	0.057*** (0.022)
Hispanic	0.017 (0.019)	0.017 (0.019)	0.017 (0.019)
Other Race	-0.010 (0.028)	-0.010 (0.028)	-0.010 (0.028)
Sex Ed		-0.003 (0.037)	-0.003 (0.037)
Constant	0.002** (0.001)	-0.386*** (0.051)	-0.383*** (0.064)
Observations	3,194	3,187	3,187
R-Squared	0.117	0.236	0.236
Adjusted R-Squared	0.116	0.234	0.234
Log Likelihood	-1,285.929	-1,062.777	-1,062.771
Akaike Inf. Crit.	2,579.858	2,123.554	2,125.541

Note: *p<0.1; **p<0.05; ***p<0.01

Next Steps

- Add interactions, look deeper into the variables and refine our data cleaning to better address bias
- Download additional survey cycles to add year fixed effects to our models
- Evaluate results by region
- More research is needed before making generalizable conclusions
- Investigate questions that came up about about gender confounding ceteris paribus with survey questions and exclusive language

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