Background
Adolescence is a formative time for sexual behavior; risky sexual behaviors can lead to adverse health outcomes. We investigated if age at first sex is associated with ever being diagnosed with an STI among a nationally representative sample of 1,886 U.S. adults aged 18-59. We examined if this association is explained by sexual identity, monthly family income, and gender, and modified by current age. We hypothesize that participants who are younger at age of first sex are more likely to have been diagnosed with an STI than participants of older age.

Methods
Our analysis used NHANES 2015-2016 data. Exposure was continuous and based on an individual's response to "How old were you when you had sex for the first time?" The outcome was operationalized as a binary variable; if a respondent responded YES to questions asking if they had ever been told by an MD they had HPV, genital herpes, genital warts, gonorrhea, or chlamydia, they were coded as having been diagnosed with an STI. NHANES doesn't ask about syphilis and other STIs; HIV was excluded due to its unique biological (non-curable) and social characteristics. Sexual identity was operationalized as a binary variable, with lesbian or gay, bisexual, and something else categorized as Queer (versus straight). Socioeconomic status was operationalized with a categorical variable of the following monthly family income categories: $0-$1,249, $1,250-$2,899, $2,900-$5,399, $5,400+. We excluded individuals with "missing," "refused," or "don't know" values for all variables. We ran two regression models, one with our exposure and outcome variable and one including all covariates.

Results
Eleven percent of the 2,660 survey respondents reported ever being told they had an STI. Mean age at first sex was 17.38 years, with a standard deviation of 3.89 years.
Among those diagnosed with an STI, 23.03% were male and 76.97% were female; 88.49% identified as straight and 11.51% identified as queer.

In an unadjusted analysis, for every one-year increase in age at first sex, participants' odds of ever being diagnosed with an STI decreased by 15.2% (OR = 0.848, 95% CI: 0.811, 0.886) After adjusting for gender, sexual identity and monthly family income, age of first sex was still associated with STI diagnoses (OR =0.733, 95% CI:0.650, 0.827).

Current age modifies interaction of age of first sex and STI diagnoses (Joint Test p-value: 0.0214; OR (95% CI): 18-29 years = 0.733 (0.650, 0.827); 30-39 years = 1.131 (0.973,1.314); 40-49 years = 1.097 (0.947, 1.271); 50-59 years = 1.244 (1.076,1.438).

Discussion
Our findings provide evidence that participants who are younger at age of first sex are more likely to have been diagnosed with an STI than participants of older age at first sex. The relatively high prevalence of STI history in females could be due to female only HPV testing. Our study's strengths include its large sample size and nationally representative sample. Weaknesses include the data's cross-sectionality and the lack of sexual education as a confounder of the relationship of interest. Our results could be used to improve STI prevention methods as part of sex education.

Table 1:

Demographics	Frequency	Percent
Sexual Identity		
Straight	2466	92.71
Non-Straight	194	7.29
Monthly Income		
$0-$1,249	425	15.98
$1,250-$2,899	637	23.95
$2,900-$5,399	813	30.56
$5,400+	785	29.51
Age		
18-29	774	29.1
30-39	658	24.74
40-49	633	23.8
50-59	595	22.37
STI Status		
Never	2356	88.57
Ever Diagnosed	304	11.43
Gender		
Male	1268	47.67
Female	1392	52.33

Table 2:

	Unadjusted Odds Ratio (95%CI)	Covariate-adjusted* Odds Ratio (95% CI)
One-year increase in age at first sex	0.848 (0.811, 0.886)	0.733 (0.650, 0.827)
***adjusting for gender, sexual identity and monthly family income**		

Effect Modifier	Wald Chi-Square	p-value
Current age	9.6857	0.02114

Current age (years)	Odds Ratio (95% CI)
18-29	0.733 (0.650, 0.827)
30-39	1.131 (0.973,1.314)
40-49	1.097 (0.947, 1.271)
50-59	1.244 (1.076,1.438)