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**Adolescent Virginity Pledges, Condom Use
and Sexually Transmitted Diseases
among Young Adults**

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**Robert Rector
The Heritage Foundation**

**Kirk A. Johnson PhD.
The Heritage Foundation
202 546 4400**

Executive Summary

For more than a decade, organizations such as True Love Waits have encouraged young people to abstain from sexual activity. As part of these programs, young people are encouraged to take a verbal or written pledge to abstain from sex until marriage.

A recent article by professors Peter Bearman and Hanna Bruckner in the *Journal of Adolescent Health* claimed that, when they reach young adult years, adolescents who made virginity pledges were as likely to have sexually transmitted diseases (STD's), as were those who never made a pledge. Bearman and Bruckner did not measure whether individuals had ever had an STD or had had an STD during adolescence. They only measured whether young adults were currently infected with an STD. Since seven or more years might have elapsed between the time an adolescent made a virginity pledge and the time STD's were measured, their analysis poses a very rigorous test for virginity pledges. It assesses the long-term health consequences of moral commitments made in adolescence.

Bearman and Bruckner's analysis showed that, as young adults, virginity pledgers actually had lower STD rates than non-pledgers, but that the differences were not statistically significant. They concluded that the STD rate of pledgers "does not differ from non-pledgers." This assertion garnered very widespread press attention. Bolstered by this finding, Bearman and Bruckner called for the critical re-examination of federal funding for abstinence education.

Examination of the Bearman and Bruckner article reveals that the methods employed have serious limitations. For example, the methods used to assess the impact of virginity pledges on STD's also demonstrate that condom use has no effect in reducing STD's. This peculiar result underscores the problematic nature of their analysis.

In the present paper, we re-examine the linkage between adolescent virginity pledging and STD rates among young adults using the same data set employed by Bearman and Bruckner, the National Longitudinal Study of Adolescent Health (Add Health). The current analysis differs in two key respects from Bearman and Bruckner's. While Bearman and Bruckner used only one STD measure (the presence of three STD's in urine samples), the present paper analyzes five STD measures based on urine samples, STD diagnoses, and STD symptoms. Second, the Bearman and Bruckner article was unusual in that it presented only simple descriptive statistics; the present paper employs a wide range of multivariate logistic regressions that simultaneously hold constant relevant background variables such as race, gender and family background.

Our analysis shows that with four of the five STD measures examined, virginity pledging predicts lower STD rates among young adults with statistical significance at the 95 percent confidence level or better. With the fifth STD measure, virginity pledging was found to predict lower STD rates at the 90 percent confidence level. (This fifth STD

measure was the one employed by Bearman and Bruckner: evidence of any of three STD's in urine samples.)

We also analyze the relationship between condom use and STD rates. Three measures of condom use were examined: condom use at last intercourse; condom use at first intercourse and frequency of condom use in the last year. Across the full range of analysis, using all five dependent STD variables, virginity pledging was found to be a better predictor of reduced STD rates when compared to any of the condom use variables. Critically, none of the condom use variables successfully predicts lower STD rates with the STD measure chosen by Bearman and Bruckner (three STD's in urine samples); a fact that emphasizes the problematic nature of that STD variable as a measure of program success.

Bearman and Bruckner's conclusion that virginity pledgers have the same STD rates as non-pledgers is clearly the result of serious limitations in their analytic methods. Our current paper shows that taking a virginity pledge in adolescence is associated with a substantial decline in STD rates in young adult years. Across a broad array of analysis, virginity pledging was found to be a better predictor of STD reduction than was condom use. Individuals who took a virginity pledge in adolescence are some 25 percent less likely to have an STD as young adults, when compared with non-pledgers who are identical in race, gender, and family background. The reduction in STD's for virginity pledgers occurs despite the fact that many years may have elapsed between the time the individual took a virginity pledge and the time that the STD rate was measured. Moreover, after initially taking a pledge, relatively few virginity pledgers will have received continuing social support for their commitment to abstinence.

Lower STD rates is just one among a broad array of positive outcomes associated with virginity pledging. Previous research has shown that, when compared to non-pledgers of similar backgrounds, individuals who have taken a virginity pledge are:

- Less likely to have children out-of-wedlock;
- Less likely to experience teen pregnancy;
- Less likely to give birth as teens or young adults;
- Less likely to have sex before age 18; and,
- Less likely to engage in non-marital sex as young adults.

In addition, pledgers have far fewer life-time sexual partners than non-pledgers. There are no apparent negatives associated with virginity pledging: while pledgers are less likely to use contraception at initial intercourse, differences in contraceptive use quickly disappear. By young adult years, sexually active pledgers are as likely to use contraception as non-pledgers.

Introduction

For more than a decade, organizations such as True Love Waits have encouraged young people to abstain from sexual activity. As part of these programs, young people are encouraged to take a verbal or written pledge to abstain from sex until marriage. In recent years, increased public policy attention has been focused on adolescents who take these “virginity pledges,” as policy-makers seek to assess the social and behavioral outcomes of such abstinence programs.

In the April 2005 issue of the *Journal of Adolescent Health*, professors Peter Bearman and Hannah Bruckner claimed that adolescents who have taken a virginity pledge have the same rate of STD infections as those who have never taken a pledge.¹ This finding was surprising since previous research had shown that taking a virginity pledge was clearly associated with reductions in sexual risk behavior, specifically a delay in initiation of sexual intercourse and decrease in the number of lifetime sexual partners. Bearman and Bruckner suggested that while virginity pledging may be related to a reduction in STD’s in early adolescence, by young adulthood any positive health effects had disappeared. They stated, “As a social policy, pledging does not appear effective in stemming STD acquisition among young adults.”² The authors called for a re-examination of federal funding for abstinence education.

Bearman and Bruckner’s claim was immediately seized on by the press and repeated in hundreds of publications nationwide. For example,

- The Associated Press wire service reported, “teens who pledged abstinence are just as likely to have STDs as their peers.”³
- *The San Francisco Chronicle* stated “Virginity pledgers are just as likely to contract sexually-transmitted diseases as other teens.”⁴
- The CBS news show *Sixty Minutes* reported, “kids who take virginity pledges [are] just as likely to have sexually transmitted diseases as kids who don’t.”

Bearman and Bruckner’s finding has quickly become a key element in the advocacy of groups hostile to abstinence education. For example, the nation’s leading anti-abstinence organization, the Sexuality Information and Education Council of the U.S. (SIECUS)

¹ Hannah Bruckner and Peter Bearman, “After the Promise: the STD consequences of adolescent virginity pledges,” *Journal of Adolescent Health*, April 2005, pp. 271-278.

² *Ibid.*, p. 277

³ Matt Apuzzo, “Study: Many who pledge abstinence substitute risky behavior” AP wire service, March 18, 2005

⁴ *San Francisco Chronicle*, “Key to Sex Education: Discipline or Knowledge,” May 22, 2005.

triumphantly proclaims “pledgers have the same rate of sexually transmitted diseases (STDs) as their peers who had not pledged.”⁵

Clearly, virginity pledge programs and abstinence education are of considerable public and political interest. Previous research by the authors of the present paper has shown that adolescents who take virginity pledgers have substantially improved life outcomes; specifically, they are: less likely to engage in sexual activity while in high school; have fewer sexual partners; are less likely to experience teen pregnancy; and are less likely to bear children out-of-wedlock.⁶ The current paper will examine the link between virginity pledging and sexually transmitted disease with specific reference to the Bearman and Bruckner article.

Background

Our analysis will utilize the same database employed by Bearman and Bruckner, the National Longitudinal Study of Adolescent Health (hereafter simply “Add Health”), funded by the Department of Health and Human Services and other federal agencies.⁷ The Add Health survey is longitudinal which means that it surveys the same group of youth repeatedly over time. Interviews were conducted in three succeeding periods: wave I in 1994, wave II in 1995, and wave III in 2001. When the Add Health survey started with wave interviews in 1994, most of the respondents were junior-high and high-school students nearly all aged 12 to 18. The students were tracked through high school and into early adulthood. By the time of the wave III interviews, the youth in the survey were nearly all young adults between the ages of 19 and 25.

Virginity Pledgers and Non-pledgers

In each of the three waves of the Add Health survey, youth were asked the question: “Have you ever taken a public or written pledge to remain a virgin until marriage?” In the following analysis, youth who reported, in any of the three waves of the survey, that they have taken a pledge are counted as “pledgers”. Youth who did not report taking a virginity pledge in any of the Add Health interview waves are counted as “non-pledgers.” Roughly one fifth of the youth in the Add Health survey report having taken a pledge in

⁵ Sexuality Information and Education Council of the United States, “Virginity Pledgers More Likely to Engage in Risky Sexual Behavior Including Oral and Anal Sex”, press release, March 18, 2005.

⁶ Robert Rector, Kirk A. Johnson, Ph.D., and Jennifer A. Marshall, “Teens Who Make Virginity Pledges Have Substantially Improved Life Outcomes,” *The Heritage Foundation Center for Data Analysis Report No. CDA04-07*, September 21, 2004.

⁷ This research uses data from Add Health, a program project designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris and funded by grant P01-HD31921 from the National Institute of Child Health and Human Development, with cooperative funding from 17 other agencies. Special acknowledgment is due Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design. Persons interested in obtaining data files from Add Health should contact Add Health, Carolina Population Center, 123 West Franklin Street, Chapel Hill, NC 27516-2524 (addhealth@unc.edu).

at least one interview of the survey. The remaining four fifths have never reported taking a pledge.

As Table 1 shows, pledgers are similar to non-pledgers in race, family structure, and family income. Pledgers, in the sample, are slightly younger than non-pledgers. Pledgers are more likely to be female: 61.8 percent of pledgers are girls compared to 46.6 percent of non-pledgers. Pledgers are also somewhat more likely to be religious; on a scale of one to four based on frequency of church attendance, frequency of prayer, and importance of religion to the individual, pledgers have a mean score of 3.4 compared to 2.7 for non-pledgers.

Virginity Pledging and Sexual Activity

Pledging is linked to large reductions in sexual activity during adolescence. For example, 63 percent of non-pledgers had sexual intercourse before age 18 compared to 39 percent of pledgers.⁸ As noted, by the third wave of the Add Health survey in 2001, the adolescents in the survey had become young adults, with ages ranging between 19 and 25. At this point many years may have elapsed since the youth's promise to remain a virgin until marriage. In the intervening years, relatively few pledging youth will have benefited from social support systems aimed at bolstering their commitment to abstinence. As a consequence, it is not surprising that differences in sexual behavior between pledgers and non-pledgers diminish somewhat over time. Nonetheless, by the third wave of the survey, real differences in sexual behavior remain; roughly a fifth of all pledgers have never engaged in any type of sexual activity (vaginal, oral, or anal) compared to 8 percent among non-pledgers.

STDs and the Add Health Survey

Virginity pledge and abstinence education programs have a variety of goals. Such programs seek to: improve the mental health of youth; help youth develop true respect for others; prepare young people for healthy marriages as adults; reduce the risk of teen pregnancy and out-of-wedlock childbearing; and reduce the threat of sexually transmitted diseases. As noted, virginity pledging has been shown to be linked to a wide range of positive outcomes for youth; however, recently, most attention has focused on the association between virginity pledges and STDs.

While the Add Health survey has an abundance of data on STD's, most are imperfect as means of assessing the impact of virginity pledging in reducing STDs. One would expect a virginity pledge program to have its maximum impact in reducing exposure to STDs in the years immediately after the pledge was taken. The peak effectiveness of pledge programs in decreasing STDs probably occurs in late adolescence, the time when the

⁸ Rector, Johnson, and Marshall, *op. cit*

Table 1

Descriptive Statistics All Add Health Youth

	<u>Non-Pledgers</u>	<u>Virginity Pledgers</u>
White	69.5%	66.7%
Black	15.8%	13.8%
American Indian	0.7%	0.7%
Asian	3.2%	4.8%
Hispanic	10.8%	13.9%
Female	46.6%	61.8%
Age at Interview	21.9 years	21.2 years
Family Structure		
Intact	66.1%	72.9%
Step/Cohabiting	5.5%	3.3%
Adopted/Foster		
Single Parent	22.8%	19.4%
Other	5.6%	4.4%
Family Income	\$46,599	\$44,147
Grade Point Average	2.7	2.9
Religiosity (1-4 scale)	2.7	3.4

Source: National Longitudinal Study of Adolescent Health

behavioral differences between pledgers and non-pledgers are greatest and the risk of acquiring STDs is highest.

To measure the impact of virginity pledges on contraction of STDs, analysts would ideally want to know: whether a youth has ever been infected by a STD; the number of infections and the timing of each; and the date the virginity pledge was taken. Unfortunately, the Add Health survey does not contain this information. Critically, the Add Health survey does not ask respondents whether they have ever had an STD. Instead, most of the STD data in the Add Health survey relate to current or recent STD infections occurring at the third interview wave of the survey. By the third wave interview, as noted, the respondents are no longer adolescents, but are young adults aged 19 to 25. Many years may have passed since an individual made his or her virginity pledge. Thus, the Add Health data provide an imperfect basis for measuring the link between pledging and STDs.

While the question of whether virginity pledges, taken mainly in adolescence, are linked to lower STD rates among young adults is a valid research topic, this approach is very likely to underestimate the effectiveness of pledging in reducing STD infections. Bearman and Bruckner partially acknowledge this point, stating that STD data on young adults “cannot tell us whether pledgers had a lower risk of STD infection as young adolescents.”⁹ With this caveat in mind, the present paper will follow the approach taken by Bearman and Bruckner, measuring the relationship between adolescent virginity pledging and subsequent STD rates among young adults. Again, readers should recognize that this methodology, while informative, is very likely to underestimate the health benefits of pledging.

Bearman and Bruckner’s STD Analysis

To analyze the links between virginity pledging and STD’s, Bearman and Bruckner used STD data from the third interview wave of the Add Health survey. As part of the third wave interviews, urine samples were taken from some 90 percent of Add Health respondents, a total of around 14,000 individuals. The urine samples were examined for evidence of current bacterial infection by three sexually transmitted diseases: Chlamydia, Gonorrhea, and Trichomoniasis. According to the urine sample data, some 6.8 percent of the sample was found to be currently infected with one or more of these diseases.

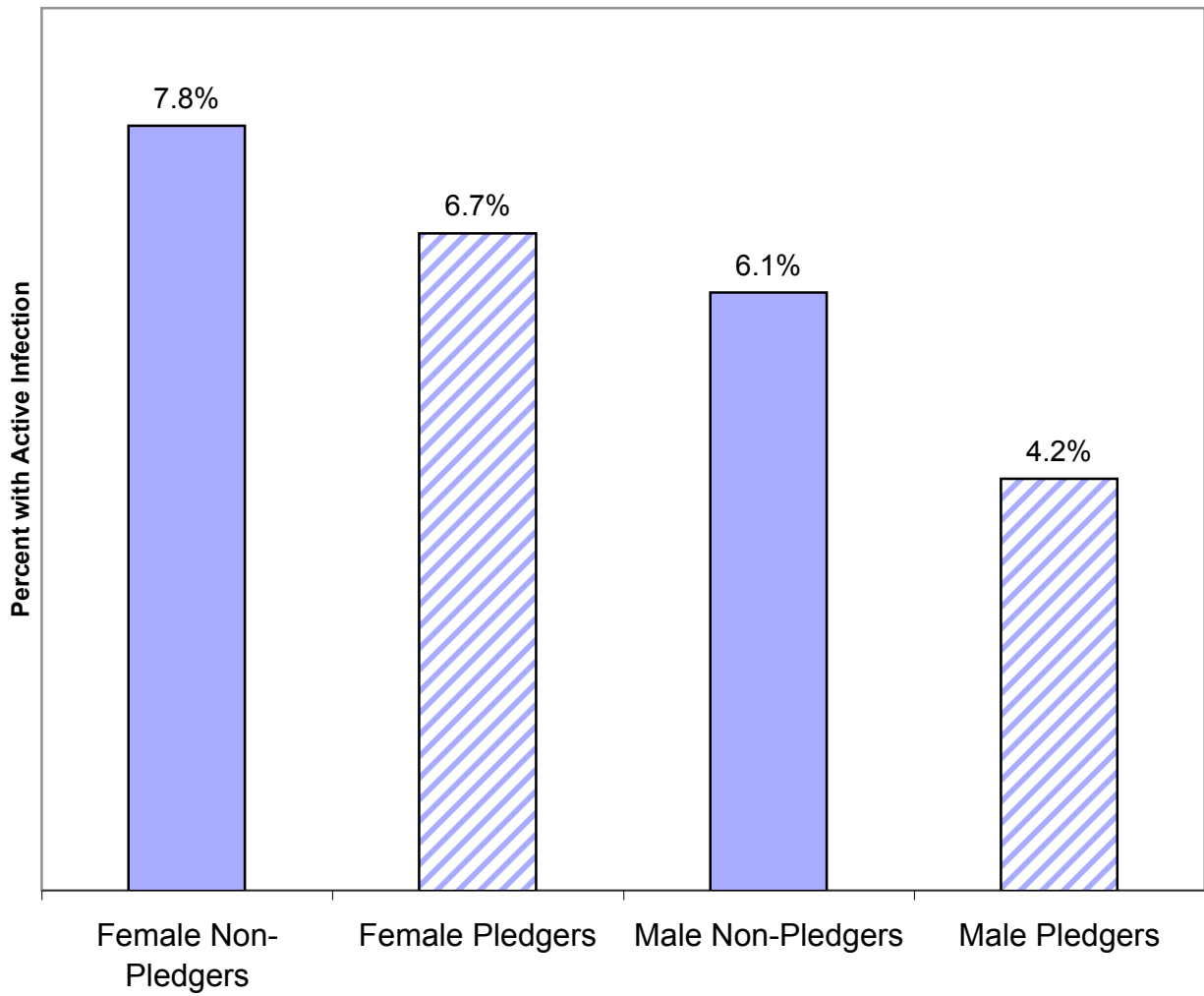
Bearman and Bruckner then determined the pledge status of each interviewee based on data from all three waves of the Add Health survey. On the basis of this analysis, they concluded that “the STD infection rate [of virginity pledgers] does not differ from nonpledgers”¹⁰ This claim has been repeated on television and in hundreds of news stories and has been amplified by other groups.

⁹ Bearman and Bruckner, *op. cit.*, p 277.

¹⁰ *Ibid.*, p. 271

Chart 1

**Incidence of Gonorrhea, Trichomoniasis and Chlamydia
STD's in Urine Sample**



Source: National Longitudinal Study of Adolescent Health

We shall begin our examination of these claims by reporting the actual STD infection rates in the Add Health sample. Chart 1 shows the STD rates for pledgers and non-pledgers; the measure of STD infection is the same one employed by Bearman and Bruckner: evidence of Chlamydia, Gonorrhea or Trichomoniasis in urine samples. (We shall henceforth refer to this variable as the “three STD’s in urine sample” measure.)

Given the aggressive claims of the press and anti-abstinence groups, many will be surprised to find that the Add Health survey data used by Bearman and Bruckner actually show that pledgers have noticeably lower STD infection rates than do non-pledgers. Male pledgers have an infection rate 30 percent lower than non-pledgers (4.2 percent to 6.1 percent.) Female pledgers have an infection rate some 15 percent lower than non-pledgers (6.7 percent to 7.8 percent.) These differences are roughly in line with what might be expected given that the behavioral differences between the two groups have attenuated by young adulthood.

If the Add Health data show pledgers have lower rates of infection, how can Bearman and Bruckner assert that the STD rate of pledgers “does not differ” from non-pledgers? At the foundation of their argument is the legitimate issue of “statistical significance”. Obviously, the Add Health survey does not contain all American youth; it is a representative sample of some 15,000 individuals. In analyzing data from the sample, it is important to estimate whether conditions in the sample: a) reflect real conditions in the U.S. population as a whole; or, b) may be the result of random distortion in the sample itself. (If, for example, we took a sample of 10 persons and found that seven were men, it would not be appropriate to conclude that 70 percent of all persons were male.) Statistical significance measures the degree of confidence that analysts can have that conditions found in the sample mirror conditions in the real world.

Bearman and Bruckner found that the differences in STD rates between pledgers and non-pledgers were not statistically significant at the 95 percent confidence level, a conventional test of significance used in social science. In other words, while the Add Health survey shows differences in STD rates, we cannot be 95 percent certain that these differences exist in the general youth population rather than just within the confines of the Add Health sample.

It is true that, using the urine sample measure of three STDs, the differences in STD rates between pledgers and non-pledgers are not statistically significant at the 95 percent confidence level. But the differences in STD rates do fall within a hairbreadth of the 95 percent significance threshold. Multivariate regressions (presented later), using the three STD’s in urine sample measure as the dependent (predicted) variable reaffirm that pledgers have lower rates of STDs; this finding is significant at the 91 to 94 percent confidence levels.¹¹

While technically accurate, Bearman and Bruckner’s claim that “the STD infection rate [of virginity pledgers] does not differ from nonpledgers” represents rather severe

¹¹ See regression table 1 in the Appendix.

example of the “null hypothesis fallacy.” In effect, they argue: differences in STD rates between pledgers and non-pledgers appear in the Add Health sample, but these differences are significant at the 90 percent rather than the 95 percent confidence level, therefore we assert categorically that no STD differences exist between the two groups. The fallacy of this logic is obvious. A passionate embrace of the null hypothesis (no differences in outcomes exist between the groups) is likely to be misplaced when the STD differences found in the sample are near the 95 percent confidence level and where other evidence exists indicating that these STD differences are real. As we shall see this is the situation with respect to virginity pledges and STDs.

Part of the difficulty of demonstrating statistical significance may lie in the particular STD measure used by Bearman and Bruckner. The three STD in urine sample measure shows a very low rate of current STD infection; only 6.8 percent of young adults have an STD by this measure. In addition, virginity pledgers are a relatively small group, comprising roughly 20 percent of the Add Health sample. Overall, pledgers testing positive for the three STDs in the urine sample were about one percent of the Add Health sample. These factors make it difficult to demonstrate statistically significant effects. Other measures of STD infection in the Add Health data base may more readily yield statistically significant results.

Other Measures of STD Infections

In addition, to the urine sample test, the third wave of the Add Health survey contains other STD data: respondents are asked if they have been diagnosed as having one of fourteen different STDs in the last twelve months; they are also asked if they have had specific physical symptoms of STD infection in the last year. We have utilized these additional data to construct five different measures of STD infection.

A. *Three STDs in urine sample.* We code respondents as having an STD if their urine sample shows the presence of Gonorrhea, Chlamydia, or Trichomoniasis. This is the same measure used by Bearman and Bruckner.

B. *Three STDs in urine sample or three STD diagnosis.* In addition to testing urine for Chlamydia, Gonorrhea, and Trichomoniasis, Add Health also asks the individual if they have been diagnosed as have any of these three diseases in the last 12 months. For this measure, we code individuals as having an STD if they have a positive urine test or have been diagnosed as having one or more of the three diseases in the last year. Gonorrhea, Chlamydia, and Trichomoniasis are bacterial infections. An individual who is diagnosed with one of these diseases will immediately be given antibiotics. In nearly all cases, the antibiotic will quickly eliminate the disease and remove evidence of the disease from the urine. A urine sample alone will understate the prevalence of these three diseases since many individuals will already have been diagnosed and treated for them. Combining the urine sample data with information on diagnoses during the prior 12 months provides a more robust and useful measure of STD incidence.

C. *Three STDs in urine sample or physical symptoms.* There are many STDs in addition to the three assayed in the urine samples. This measure combines the urine sample data with reported physical symptoms. Under this measure, individuals are coded as having an STD if they have a positive urine test or if they report having experienced any of the following physical symptoms in the last year: “warts on your genitals”, “painful sores or blisters on your genitals” or “oozing or dripping from your penis or vagina”.¹²

D. *Diagnosis of having any of fourteen STDs.* The Add Health survey also asks respondents if, in the last 12 months, they have been told by a doctor or health worker that they have any of the following sexually transmitted diseases: chlamydia, gonorrhea, trichomoniasis, syphilis, genital herpes, genital warts, human papilloma virus (HPV), bacterial vaginosis, pelvic inflammatory disease (PID), cervicitis or mu copurulent cervicitis (MPC), urethritis (NGU), vaginitis, HIV or AIDS, or other STD. Under this measure, individuals are coded as having an STD if they report being diagnosed with any of the diseases on the preceding list.

E. *Fourteen Disease Diagnosis, positive urine sample, or physical symptoms.* This measure combines the previous four measures. Individuals are coded as having an STD if they: have a positive urine test; have any of the three physical symptoms; or have been diagnosed with any of the fourteen STDs in the last year.¹³

Chart 2 shows the incidence and 95 percent confidence intervals for each of the five STD measures. (The confidence intervals indicate that we can have 95 percent certainty that the infection rate in the real world falls within the interval range.) The three STD urine sample measured used by Bearman and Bruckner has the lowest point estimate of incidence (at 6.7 percent) and the largest confidence interval relative to the point estimate. This indicates that it will be comparatively more difficult to make statistically significant predictions with this STD measure compared to the others.

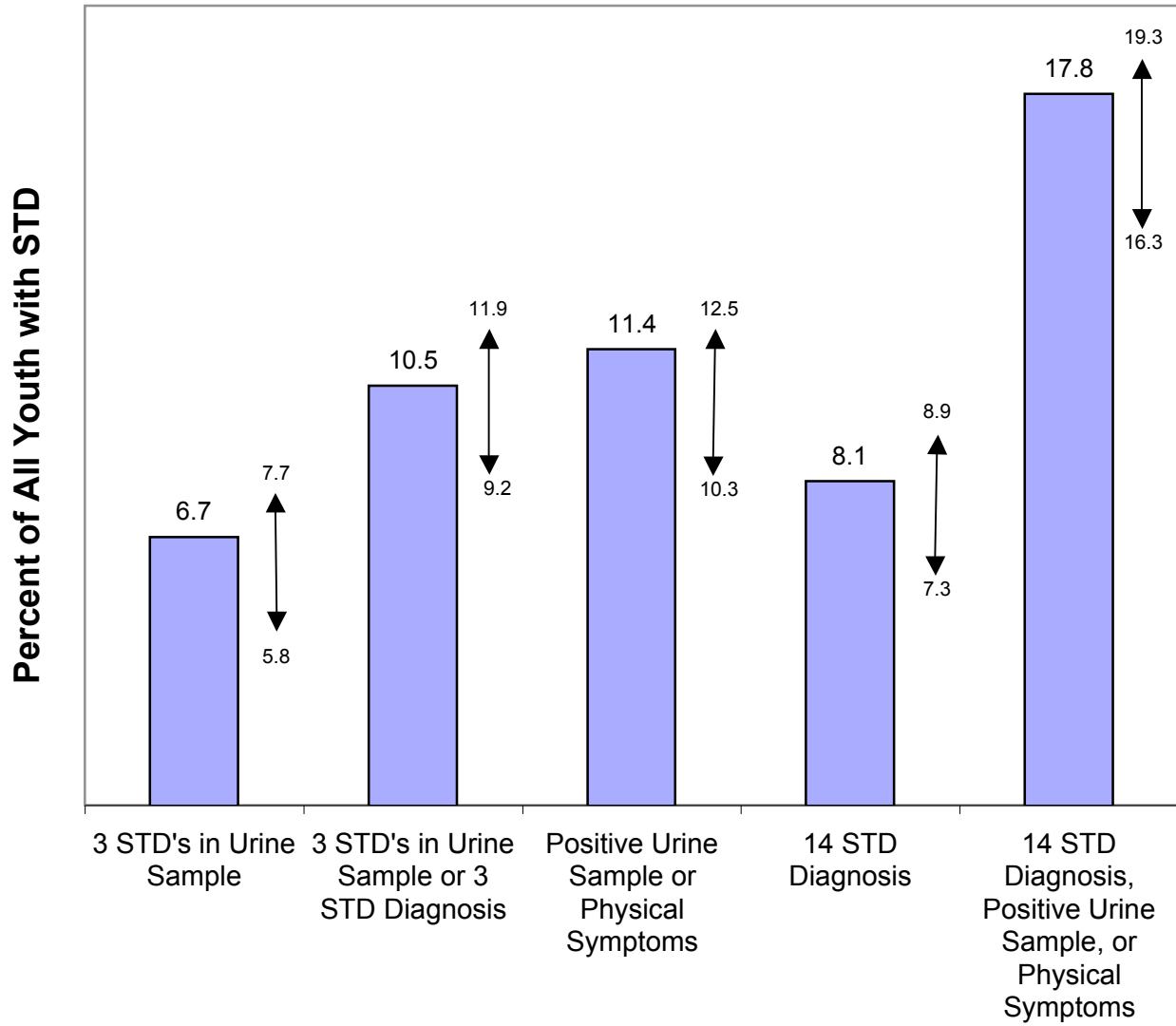
We hypothesize that virginity pledge status is more likely to be a statistically significant predictor of reduced STD infection for the STD measures with higher incidence. We hypothesize further that the same pattern will hold between condom use variables and STD measures. Confirmation of these hypotheses will provide compelling evidence that Bearman and Bruckner’s failure to find significant differences in the STD rates of pledgers and non-pledgers was a result of the operational measure of STD’s they employed.

¹² The Add Health survey also asks three other questions about symptoms: “painful or very frequent urination, bleeding after intercourse or between your periods [for females only], and itching in the vagina or the genital area [females only]”. We did not include these symptoms in the STD measure because of the high probability that they were caused by non-STD factors.

¹³ In each of the five STD measures, individuals are categorized in a binary fashion: “yes” for having an STD if they report positively on one or more of the relevant conditions (urine sample test, symptoms, or diagnosis) and “no” if they report negatively on all the relevant conditions. The measures, thus, do not reflect the degree of disease; for example, an individual diagnosed with three diseases would be coded the same as an individual diagnosed with one disease.

Chart 2

Measures of Sexually Transmitted Diseases in the AddHealth Survey



Note: \longleftrightarrow Represents 95 percent confidence intervals

Source: National Longitudinal Study of Adolescent Health

The Role of Social Background Variables

Teens who make virginity pledges may differ substantially from those who do not in a wide range of important social background factors. If pledgers have better STD outcomes than do non-pledgers, it is possible that the outcome differences are the result of social background factors rather than pledge activity per se. To compensate for this possibility, we analyzed the role of virginity pledges on STD outcomes through a set of multivariate logistic regression analyses which hold relevant social background factors constant. In this statistical procedure, teens who made virginity pledges were compared to non-pledging teens who were otherwise identical in social background characteristics.

A number of independent or predictor variables were used in the regression analyses. These were:

Pledge status -Individuals were identified as “pledgers” if they responded that they had made a virginity pledge in at least one wave of the survey. Individuals were identified as “non-pledgers” if they answered that they had not taken a virginity pledge in each of the three waves of the survey.¹⁴

Gender – whether the individual was male or female

Age – whether the individual was white, black, Asian or Hispanic

Family background – whether the individual came from an intact married family containing both biological parents, a single parent family, a step parent or cohabiting family or other family.

Religiosity – a continuous variable on a scale of 1 to 4 based on the average scores of responses to the questions: how often do you attend religious services, how often do you pray, and how important is religion to you.

All Add Health youths for which STD data were available were included in the regressions. The independent or predictor variables were deployed in four models. These were:

Model One – pledge status was used as a single predictor variable without controls.

Model Two – The independent or predictor variables were: pledge status, age, gender, and race.

Model Three – The independent variables were the same as Model Two but family structure variables were added.

¹⁴ In some cases individuals failed to answer the pledge question on one or more waves of the survey; an individual who responded negatively to this question on at least one wave and gave no response on the other waves was categorized as a non-pledger.

Model Four – The independent variables were the same as Model Three but religiosity was added.

Virginity Pledging as a Predictor of Lower Rates of STD Infection

To fully examine the relationship between virginity pledging and the STD rates of young adults, the five dependent STD measures were each analyzed in all four regression models described above, yielding a total of 20 separate regressions. Data on the individual logistic regressions is provided in the appendix.

Table 2 summarizes the results of the 20 regressions. Using all five dependent STD variables, virginity pledgers were found to have lower STD rates across all 20 regressions; in each case the odd ratios for pledging were below 1.00 indicating that pledging was linked to lower STD rates. Virginity pledging was found to be a statistically significant predictor of lower STD rates at, at least, the 95 percent confidence level, for four of the STD measures: (B) three STDs in urine or three STD diagnosis; (C) three STD's in urine or physical symptoms; (D) diagnosis of any of 14 STDs; and, (E) diagnosis of 14 STD's positive urine sample or physical symptoms. In many cases, statistical significance reached the 99 percent confidence level. (The sole exception to these results was STD measure (C) in model one, a regression without controls; the results here were not significant.)

The regression models using STD measure (A) or three STDs in urine sample, as the dependent variable, differ somewhat from the other regressions. This is the STD measure employed by Bearman and Bruckner. All four models using STD measure (A) show that virginity pledgers have lower STD rates than non-pledgers. The magnitude of STD reduction (odds ratio) is virtually identical to the other sixteen regressions using STD measures (B), (C), (D), and (E) as dependent variables. However, the models using STD measure (A) as a dependent variable fall just short of the 95 percent statistical significance level. With this STD measure, in models 2, 3, and 4, virginity pledge status is shown to be statistically significant as a predictor of reduced STDs at the 92 to 94 confidence level. Unfortunately, STD measure (A) is the only one employed in Bearman and Bruckner's analysis.

In summary, in all cases the Add Health data show that virginity pledgers have lower STD rates when compared to non-pledgers. In four of the five STD measures presented, virginity pledging predicts lower STD rates with a statistical significance of 95 percent or greater. With the fifth STD measure, virginity pledging is shown to predict lower STD rates with a 90 percent confidence. No STD measures in the Add Health survey show virginity pledgers to have same or higher STD rates as non-pledgers. In view of this aggregate data, it is implausible to conclude that pledgers and non-pledgers in reality have the same STD rates. Bearman and Bruckner's conclusion that there were no meaningful differences in STD rates between pledgers and non-pledgers is contingent on

Table 2

Virginity Pledging as a Predictor of STD Reduction

Dependent Variables	Model 1 Pledge Status only		Model 2 Pledge Status, holding constant Gender, Age, Race		Model 3 Pledge Status, holding constant Gender, Age, Race, Family Structure		Model 4 Pledge Status, holding constant Gender, Age, Race, Family Structure, Religiosity	
	Signifi- cance	Prob- ability	Signifi- cance	Prob- ability	Signifi- cance	Prob- ability	Signifi- cance	Prob- ability
A) 3 STD's in Urine Sample	--	.128	*	.057	*	.072	*	.087
B) 3 STD's in Urine Sample or 3 STD Diagnoses	**	.020	***	.001	***	.001	***	.005
C) 3 STD's in Urine Sample or Physical Symptoms	--	.142	**	.015	**	.024	**	.045
D) Diagnosis of 14 STD's	***	.002	**	.000	***	.000	***	.000
E) Diagnosis of 14 STD's, Positive Urine Sample, or Symptoms	***	.005	***	.000	***	.000	***	.000

Note: -- Not Significant

* Predicted Reduction of STD's is Statistically Significant at 90% Confidence Level

** Predicted Reduction of STD's is Statistically Significant at 95% Confidence Level

*** Predicted Reduction of STD's is Statistically Significant at 99% Confidence Level

Source: National Longitudinal Study of Adolescent Health

the single STD measure they employ. Moreover, even with this measure, virginity pledging falls short of statistical significance by a razor thin margin.

Condom Use and STD's

The next step in our analysis was to examine the relationship between STD's and an array of measures of condom use. This enables us to compare the efficacy of virginity pledges and condom use as predictors of STD's. It also provides an independent method of assessing the utility of various measures of STD infection. We hypothesized that those STD measures that lacked a statistical significant association with the virginity pledge as a predictor would also lack a statistically significant link to condom use as a predictor. If true, this could underscore the problematic nature of those dependent STD variables.

Using Add Health interview data, we constructed three independent (predictor) variables for condom use. They were:

Condom Use at First Vaginal Intercourse. This measures whether an individual used a condom during the first instance of intercourse in his or her life. The variable is a three part dummy variable: never had vaginal intercourse; had vaginal intercourse and used condom in first intercourse; and had vaginal intercourse and did not use condom in first intercourse. (The last category was the default.)

Condom Use in Last Vaginal Intercourse. This variable measures whether a condom was used during last intercourse. It is a three part dummy variable: never had vaginal intercourse; had vaginal intercourse and used a condom during last intercourse; and, had intercourse and did not use a condom during last intercourse. (The last category was treated as the default.)

Frequency of Condom Use. For individuals who report they had vaginal intercourse during the last year, the Add Health survey asked how frequently condoms were used during intercourse: never; some of the time; half of the time; most of the time; or, all of the time. A five point continuous independent variable was created with these responses. Regressions using this variable were necessarily limited to those who reported having vaginal intercourse during the last year.

We tested each of these condom use variables as predictors of the five dependent STD measures. Socio-economic control variables were used according to the four models specified earlier in the paper. A total of twenty logistic regressions were performed using each of the three independent variables of condom use, for a total of 60 regressions in all. (Information on the individual regressions is presented in the appendix.)

The results are summarized in table 3. Each of the condom use independent variables either fails to predict or predicts inadequately with respect to the three STD measures at the top of the table: three STDs in urine sample; three STDs in urine sample or three

Table 3

Condom Use and STD's

Dependent STD Variables	Independent Variable: Condom Use at First Vaginal Intercourse				Independent Variable: Condom Use at Last Vaginal Intercourse				Independent Variable: Frequency of Condom Use in Last Year (Sexually Active Only)			
	Model I	Model II	Model III	Model IV	Model I	Model II	Model III	Model IV	Model I	Model II	Model III	Model IV
A) Three STD's in Urine Sample	--	--	--	--	--	--	--	--	✓✓	--	--	--
B) Three STD's in Urine Sample or Three STD Diagnosis	--	*	*	*	--	--	--	--	--	*	*	*
C) Three STD's in Urine Sample or Physical Symptoms	--	*	*	*	--	--	--	--	--	--	--	--
D) Diagnosis of 14 STD's	*	***	***	***	***	***	**	**	***	***	***	***
E) Diagnosis of 14 STD's, Positive Urine Sample, or Physical Symptoms	--	**	**	**	*	**	**	**	***	***	***	***

Note: ✓✓ Predicted Increase in STD's is Statistically Significant at 95% Confidence Level
 -- Not Significant
 * Predicted Reduction of STD's is Statistically Significant at 90% Confidence Level
 ** Predicted Reduction of STD's is Statistically Significant at 95% Confidence Level
 *** Predicted Reduction of STD's is Statistically Significant at 99% Confidence Level

Source: National Longitudinal Study of Adolescent Health

STD diagnoses; and three STDs in urine sample or physical symptoms. Using these three STD measures as dependent variables, statistical significance is not achieved in 27 of 36 regressions; in 9 regressions, significance reaches the 90 percent confidence level.

The two STD measures at the bottom of the table (diagnosis of fourteen STD's, and diagnosis of fourteen STD's combined with positive urine sample or physical symptoms) present a different story. With these STD measures, the three condom use variables are able to predict, in almost all models, a reduction of STD's at 95 or 99 percent confidence levels. These patterns of significance loosely match those found with virginity pledge variable. The data in table 3 underscore the fact that statistical significance of predictor variables is highly contingent on the particular STD measure used. The data suggest that it would be unwise to base conclusions on one measure only.

The failure of all three condom use variables to successfully predict reductions in Bearman and Bruckner's chosen STD measure (a positive test for 3 STD's in the urine sample) is important. The condom use variables not only failed to predict a reduction in STD's according to this measure, they failed very badly. (Specific information is provided in regression tables 6, 11, and 16 in the appendix.) While the virginity pledge variable predicted STD reduction at the 90 percent confidence level according to this STD measure, the condom use independent variables achieved, at best, a 35 percent confidence in predicting reductions in this STD variable. One variable actually achieves a statistically significant prediction of increased STD's using this STD measure under model I. This is undoubtedly a fluke, but it calls attention to the problematic nature of the three STDs in urine sample measure as a dependent variable.

Comparison of Virginity Pledge and Condom Use as Predictors of STD Reduction

Table 4 compares the predictive power of the virginity pledge variable to the predictive power of the condom use variables (condom use at first intercourse, condom use at last intercourse and frequency of condom use in last year). The virginity pledge variable predicts a reduction in STD's with at least a 95 percent confidence with four of the five dependent STD variables. It predicts reduction in the fifth STD variable with 90 percent confidence. By contrast the three condom use variables predict reductions at 95 percent confidence with only two of the five STD measures.

The virginity pledge variable predicts reduced STD's at the 99 percent confidence with three STD variables. It predicts at 95 percent confidence with the fourth STD variable and 90 percent with the fifth STD measure (A). By contrast, the most effective condom use variable (condom use at first intercourse) predicts STD reduction at the 99 percent confidence level with one measure and at the 95 percent confidence with another. It achieved 90 percent confidence with two other STD measures and failed to predict with the final dependent measure (A): three STD's in urine sample.

Table 4

Comparison of Virginty Pledge and
Condom Use as Predictors of STD Reduction

Dependent STD Variables	Virginty Pledge	Use of Condom at First Intercourse	Use of Condom at Last Intercourse	Frequency of Condom Use
A) 3 STD's Urine Sample	*	--	--	--
B) 3 STD's in Urine Sample or 3 STD Diagnoses	***	*	--	*
C) 3 STD's in Urine Sample or Physical Symptoms	**	*	--	--
D) Diagnosis of 14 STD's	***	***	***	***
E) Diagnosis of 14 STD's, Positive Urine Sample, or Physical Symptoms	***	**	**	***

Note: -- Not Significant

* Predicted Reduction of STD's is Statistically Significant at 90% Confidence Level

** Predicted Reduction of STD's is Statistically Significant at 95% Confidence Level

*** Predicted Reduction of STD's is Statistically Significant at 99% Confidence Level

All data based on Model Two using gender, race, age, and family structure as controls

Source: National Longitudinal Study of Adolescent Health

Overall, in the analysis 80 regressions were performed: 20 with the virginity pledge variable and 60 with the three condom use variables. In every instance, across all 80 regressions, the virginity pledge variable always achieved higher levels of confidence as a predictor of STD reduction when compared to any of the corresponding condom use variables. In other words, in predicting reduction of each dependent STD variable in each of the four regression models, the virginity pledge variable always outperformed all the condom variables. While it is possible that future research may improve the predictive power of both the pledge variable and the condom use variables, it is very difficult in light of the evidence in table 4 to conclude, as Bearman and Bruckner did, that “the STD infection rate [of pledgers] does not differ from non-pledgers”.¹⁵

Finally, note that the comparison of virginity pledging against condom use is unfair to virginity pledge programs because it compares pledging, which is merely a promise to behave a certain way in the future, against actual behavior: the use of condoms. A fair comparison would be to contrast the outcomes of virginity pledges against adolescent promises to use condoms in the future. Of course, no “condom promise” programs exist; if they did they would be unlikely to compare well against virginity pledge programs.

Methodological Differences with Bearman and Bruckner Analysis

While the present analysis and the Bearman-Bruckner article both used the same Add Health database, they reached very different conclusions concerning the relationship between the virginity pledges and STD’s. These differences stem from three factors. First, and most obvious, Bearman and Bruckner examined only one measure of STD occurrence whereas the present paper examines five. Second, the Bearman and Bruckner article presented only simple descriptive statistics and confidence intervals. The present paper relies primarily on multivariate logistic regressions. The use of simple descriptive data can cause difficulties when groups compared differ in background characteristics. In this case, the fact that pledgers are more likely to be women and that women are more likely to have STD’s is particularly relevant.

Third, the Bearman and Bruckner article divided Add Health respondents into three categories: non-pledgers, inconsistent pledgers, and consistent pledgers.¹⁶ Structuring the pledge data in this way, Bearman and Bruckner actually found, as expected, that non-pledgers had the highest STD rates, followed by inconsistent pledgers in the middle, while consistent pledgers had the lowest rates; however, the differences were not statistically significant. This three-part division of pledge status is heuristically useful, and the present authors have successfully used it in previous research; however, it does have drawbacks. Dividing the already small population of pledgers into two smaller sub-

¹⁵ Bruckner and Bearman, p. 271

¹⁶ Consistent pledgers are individuals who affirmed in at least one wave of the survey that they had made a pledge and did not provide contradictory information in any subsequent wave. Inconsistent pledgers reported that they had ever taken a pledge in at least one wave of the survey, but then contradicted themselves by reporting they had never taken a pledge in a subsequent wave. In our analysis, we were able to precisely duplicate Bearman and Bruckner’s pledge categorization. As noted, for purposes of the present paper, we merged the inconsistent and consistent pledgers into the single category of pledgers.

groups reduces the probability of achieving statistically significant predictions. Consequently, in the present paper, we have followed the Bearman and Bruckner's approach to pledge status closely, but the two categories of inconsistent and consistent pledgers have been combined into the single group called "pledgers."

Considerations on Differences in STD Measures

If pledgers and non-pledgers truly had identical rates of STD infection, one would expect to see a wider variation in outcomes across various STD measures; some STD measures would probably show the pledgers had higher disease rates; others would show the STD rates of pledgers and non-pledgers to be nearly identical, and other measures would show pledgers to have lower rates. The Add Health data clearly do not show this pattern; all five STD measures show that pledgers have lower STD rates. The only real difference between the five STD measures is that four show the relationship between pledging and reduced STD's is significant at the 95 to 99 percent confidence levels while the fifth measure shows significance at a 90 percent confidence. This seems to build a prima facie case that virginity pledgers do have lower STD rates in their young adult years despite the fact that many years may have elapsed since they took their pledges.

Despite the array of different STD data available from the Add Health survey, Bearman and Bruckner analyzed only the urine sample data. They apparently regard the Add Health STD diagnoses data to be biased against non-pledgers, arguing that non-pledgers are more likely to perceive themselves at risk of STD's and more likely to go to a doctor and be diagnosed and treated. Assuming that this idea has some validity, it has interesting implications. Diagnosis and treatment will remove evidence of gonorrhea, Chlamydia and Trichomoniasis from the urine. If it is true that medical diagnoses rates of STD's are biased against non-pledgers because they are differentially more likely to be diagnosed and treated for each STD occurrence, it follows that post-treatment physical evidence (such as the urine sample) would be biased, conversely, against pledgers.

For example, if it were true, that, 1) pledgers and non-pledgers have identical rates of pre-treatment STD infections; and, 2) non-pledgers are more likely to go to a doctor and be diagnosed and treated, then it would follow that the post-treatment urine samples should show non-pledgers with lower rates of current infection. Obviously, this is not the case. This provides yet another piece of evidence indicating that pledgers do in fact have lower STD rates than non-pledgers.

Table 5 shows the STD rate ratios for the five STD measures. The ratios represent the STD rate of pledgers divided by the STD rate of non-pledgers; they report raw or non-standardized data. The ratios have inconsistencies but they provide some evidence suggesting that non-pledgers may, indeed, be differentially more likely to go to a doctor and be diagnosed per STD occurrence. The ratio for the 14 STD diagnosis measure (which is based on diagnosis only) is lower than the other measures based on physical evidence or physical evidence and diagnosis combined.

Table 5

Ratios of STD Rates:
Pledgers to Non-Pledgers

	Three STD's in Urine Sample	Three STD's in Urine Sample or 3 STD Diagnosis	Three STD's in Urine Sample, or Physical Symptoms	Diagnosis of 14 STD's	Diagnosis of 14 STD's, Positive Urine Sample, or Physical Symptoms
Ratio: STD Rate of Pledgers Divided by STD Rate of Non-Pledgers	0.83	0.81	0.87	0.73	0.82

Source: National Longitudinal Study of Adolescent Health

If it is true that non-pledgers are more likely to seek treatment per STD occurrence, then STD measures using diagnosis would be somewhat biased in favor of pledgers and STD measures based on post-treatment physical evidence (such as urine samples) would be biased against pledgers. The real inter-group difference would lie somewhere between the urine sample STD measure and the STD diagnosis measure.

The question of biases in the STD measures would be critical if the different STD measures presented opposite findings: if one measure showed pledgers had better outcomes while another showed non-pledgers had better outcomes. But, of course, all the STD measures show pledgers have better outcomes.

Again, if the real pre-treatment STD rates for pledgers and non-pledgers were identical we would expect that the urine measure would show non-pledgers with lower STD rates while the diagnosis measure would show non-pledgers with higher rates. Of course, this is not the case. All the measures show that pledgers have lower STD rates; the only difference is between those that show significance at the 95 or 99 percent confidence level and the one measure with 90 percent confidence. Thus, the potential bias of the individual STD measures for or against pledgers does not disturb the large body of evidence indicating pledgers have lower STD rates.

Magnitude of Predicted STD Reduction

The power or magnitude of STD reduction predicted by the virginity pledge variable is fairly constant across all the regression models. In general, virginity pledgers were found to have STD rates about 25 percent lower than the STD rates of non-pledgers of the same gender, race and family background. This is illustrated in Chart 3. The chart uses the broadest STD measure: the combined measure of diagnosis of fourteen STD's, three STD's in the urine or physical symptoms. Chart 3 shows the predicted STD rates for an Hispanic male age 22 raised in a step-family. If this individual had never taken a virginity pledge, the predicted probability of STD's would be 19.9 percent. If he had taken a virginity pledge, the predicted probability would be around one fourth lower at 14.6 percent. The chart also shows the predicted STD rates for a white male, also aged 22 and raised in a step family. If this individual had never taken a virginity pledge, the predicted probability of STD's would be 12.5 percent. If he had taken a pledge, the probability of STD's would be around one fourth lower or 9.0 percent. Similar STD reductions would occur for individuals different gender, race or family background.

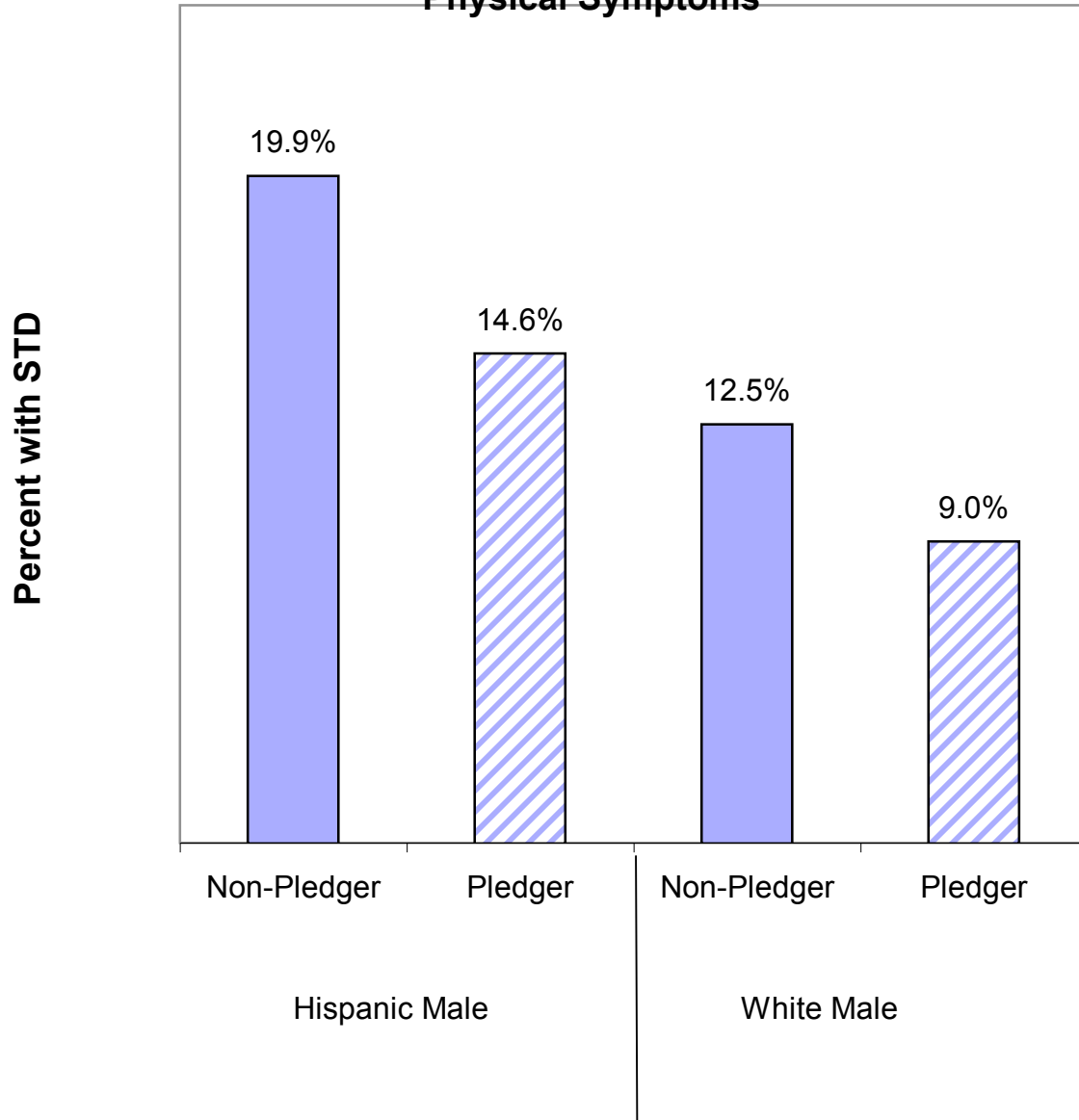
Other Behavioral Outcomes

The fact that virginity pledgers are less likely to have STD's is just one among a broad array of positive outcomes associated with virginity pledging.¹⁷ Previous research has

¹⁷ Rector, Johnson, and Marshall, *op. cit.*

Chart 3

Predicted Reduction in STD Rate
STD Measure: 14 STD Diagnosis, Positive Urine Sample or
Physical Symptoms



Based on Model Three Regression.
Assumes all individuals are 22 years old and from a step-parent home

Source: National Longitudinal Study of Adolescent Health

shown that, when compared to non-pledgers of similar backgrounds, individuals who have taken a virginity pledge are:

- Less likely to have children out-of-wedlock;
- Less likely to experience teen pregnancy;
- Less likely to give birth as teens or young adults;
- Less likely to have sex before age 18; and,
- Less likely to engage in non-marital sex as young adults.

Pledgers will have fewer life-time sexual partners than non-pledgers. Pledgers engaging in sexual activity in young adult years are as likely to use contraceptives as are non-pledgers. Pledgers are also less likely to have abortions although the reported incidence low enough that the difference is not statistically significant.

Success or Failure?

Virginity pledge programs provide a strong positive social message emphasizing: self-control; future orientation and respect for self and others. Adolescents who make virginity pledges promise to abstain until marriage. Virginity programs are often criticized because a majority of those making pledges fail to meet their goal and do have sex before marriage. However, this criticism seems misplaced. Even if pledgers fail to abstain till marriage, pledging is still associated with positive life decisions. As noted, when compared to non-pledgers, pledgers are more likely to delay substantially the onset of sexual activity and to have fewer sex partners. Pledging is linked to strong positive outcomes for the individual and society.

Given such outcomes, it is difficult to imagine how virginity pledge programs could be judged failures. Consider, for example, a hypothetical program in which a group of adolescents all promised to attend Harvard. Two years later, few were attending Harvard, but the overall college attendance rate was up 30 percent compared to adolescents who never made such a promise. Would such a program possibly be deemed a failure?

Questions of Causation

This paper has presented a strong finding showing that adolescent virginity pledging is associated with lower STD rates. This should not be surprising, because in young adult years virginity pledgers have lower levels of sexual activity and fewer sexual partners when compared to non-pledgers. Overall, the evidence concerning the positive effects of virginity pledges is extremely strong. Still, skeptics might argue that the simple fact that teens who make virginity pledges have substantially improved behaviors does not prove that virginity pledge programs themselves have a positive impact on behavior. It is conceivable that participating in a virginity pledge program and taking a pledge merely

ratifies pro-abstinence decisions that the teen would have made without the program or pledge. From this perspective virginity pledge programs may be a redundant fifth wheel with no effect, rather than an operative factor leading to less risk behavior.

The fact that research on the outcomes of associated with virginity pledging controls for a wide range of social background variables makes this less likely. Still, given the limitations of the Add Health data, it is impossible to fully disprove this type of skepticism. Nonetheless, such an argument violates common sense. Teens do not make decisions about sexual values in a vacuum. A decision to abstain and delay sex activity does not emerge in a teen's mind, *ex nihilo*, but will reflect the sexual values and messages that society communicates to the adolescent. Unfortunately, teens today live in a sex saturated popular culture that celebrates casual sex at an early age. To practice abstinence, teens must resist peer and media pressure, as well as control physical desire. It seems implausible to expect teens to abstain in the absence of social institutions (such as virginity pledge programs) that teach strong abstinence values. Similarly, it seems implausible that programs that teach clear abstinence values will have no influence on behavior, even among teens who embrace those values.

Since decisions to practice abstinence do not emerge in a vacuum, it seems very likely that the messages in virginity pledge programs contribute to positive behavior among youth. Participation in virginity pledge programs encourages youth to make pro-abstinence choices, and taking a public abstinence pledge reinforces the teen's commitment, helping him to stick with the abstinence life style.

Public Policy Issues

Today's teens live in a sex-drenched media culture that promotes vulgarity, permissiveness and casual sex. Most parents are eagerly seeking social forces that can counteract this tide of permissiveness and communicate an uplifting message of self restraint to youth. Nearly 90 percent of parents want schools to teach youth to abstain from sex until they are married or in an adult relationship that is close to marriage.¹⁸ This is the predominant message of abstinence education programs.

Unfortunately, these parental values are rarely taught in the classroom. The focus of government continues to be on "safe sex," or promoting contraceptive use. Today, government spends, at least, twelve dollars promoting and distributing contraception for every one dollar spent encouraging abstinence.¹⁹ If the comparison is limited to funding for teens, government still spends at least four dollars promoting contraceptives for every dollar spent on abstinence. Moreover these figures dramatically undercount the efforts to promote contraception since they do not include most state and local spending of sex

¹⁸ Robert Rector, Melissa Pardue, and Shannan Martin, "What Do Parents Want Taught in Sex Education Programs?," Heritage Foundation *Backgrounder No. 1722*, January 28, 2004.

¹⁹ Melissa Pardue, Robert Rector, and Shannan Martin, "Government Spends \$12 on Safe Sex and Contraceptives for Every \$1 Spent on Abstinence," Heritage Foundation *Backgrounder No. 1718*, January 14, 2004.

education, nearly all of which continues to have a heavy, if not exclusive, emphasis on contraception.

Today, nearly all students in the U.S. are taught about contraception²⁰; however, students rarely receive more than token references to abstinence. Authentic abstinence programs which strongly encourage youth to abstain from sexual activity are rare. The abstinence programs that do exist are limited, generally providing 10 to 15 hours of instruction per year. It is true that, in the limited time available, abstinence programs teach abstinence not contraception; however, this does not mean that youth participating in abstinence programs never receive information about contraception. In schools where abstinence is taught, students will generally receive information about contraception as well, in a separate venue such as a biology or health class. Polling shows that a majority of parents believe that, if contraception is to be taught, it should be taught separately from abstinence.²¹

Bearman charges that youth who participate in abstinence education are ignorant and afraid of contraception. He states that virginity pledgers “have been taught that condoms don’t work; they’re fearful of them. They don’t know how to use them...They have no experience with them. They don’t know how to get them.” While it is true that participants in abstinence programs are taught about the limitations of contraception, there is no evidence to substantiate the rest of Bearman’s claim. The wave II interviews of the Add Health survey contains a “knowledge quiz” that section that tests individuals’ knowledge of contraception and reproduction. The differences between pledgers and non-pledgers in this knowledge are marginal; moreover, the degree of contraceptive knowledge does not predict lower STD rates. As young adults, virginity pledgers are no less likely to use contraception than non-pledgers.²²

To recapitulate, the general situation in sex education and sexuality issues in the U.S. is as follows: The vast majority of government funding is focused on the distribution and promotion of contraception. Nearly, all youth receive instruction in contraception. Even where abstinence is taught, students will generally still receive information about contraception in a separate school program. Despite the fact that nearly all parents want

²⁰ Eighty percent of 7-12th grade students report that their most recent sex education course was considered comprehensive. 82 percent of 7-12th grade students report receiving information about birth control in their sex education course. See The Kaiser Family Foundation, *Sex Education in America: A Series of National Surveys of Students, Parents, Teachers, and Principals*, September 2000, pgs. 17-18.

²¹ Rector, Pardue, and Martin, “What Do Parents Want Taught in Sex Education Programs?,” Heritage Foundation *Backgrounder No. 1722*, January 28, 2004.

²² While it is true, that virginity pledges are less likely to use contraception during their very first experience of intercourse, by young adult years differences in contraceptive use between sexually active pledgers and non-pledgers have completely disappeared. The main importance of contraceptive or condom use at first intercourse as a variable is that it predicts subsequent contraceptive use; lower rates of contraceptive use at first intercourse may indicate lower contraceptive use in later years. However, as noted, sexually active virginity pledgers are not less likely to use contraceptives by Wave III of the Add Health survey. Thus, the fact that pledgers are less likely to contracept at first intercourse seems to have little significance.

youth taught a very strong abstinence message, the real teaching of abstinence is still relatively rare. Few students receive more than token references to abstaining.

Remarkably, despite the overwhelming popularity of abstinence education among parents, there is currently a vigorous effort to eliminate abstinence education from the schools, led by groups such as the Sexuality Information and Education Council of the United States (SIECUS) and Advocates for Youth. The focal point of this campaign is an effort to eliminate federal funding for abstinence education. The attack of Bearman and Bruckner against virginity pledge programs plays a major role in the advocacy of these groups.

Those seeking to eliminate abstinence education wish to replace it with “comprehensive sex ed” programs, sometimes also called “abstinence plus.”²³ While proponents of these programs claim they emphasize abstinence, content analyses reveal such curricula contain virtually no abstinence material, in fact, many such materials implicitly undermine and denigrate abstinence.²⁴ Comprehensive sex ed curricula all convey the message that it is okay for teens to have sex as long as they use contraception. Only seven percent of parents agree with that message. Very few parents want youth taught materials that condone and accept casual sex at an early age; unfortunately, that is the message contained in comprehensive sex ed curricula.²⁵

The main issue in sex education today is not, as Bearman and Bruckner apparently believe, whether society should “ban discussion of contraception and STD protection from sex education.”²⁶ As noted, nearly all youth are currently taught about contraception. The real question is whether youth will be taught anything besides contraception. Evidence from the virginity pledge programs indicates that youth can respond positively to messages of self-restraint contained in abstinence programs. Other evaluations show that abstinence education is effective in reducing sexual activity.²⁷ Parents want-- and youth need-- more uplifting messages of self-control from abstinence education, not less.

Conclusion

The analysis of Bearman and Bruckner indicating that virginity pledgers have the same STD rates as non-pledgers has garnered widespread media and political attention. However, the same methods used by Bearman and Bruckner to analyze virginity pledges

²³ Shannan Martin, Robert Rector, and Melissa Pardue, *Comprehensive Sex Education vs. Authentic Abstinence: A Study of Competing Curricula*, The Heritage Foundation, 2004.

²⁴ *Ibid.*

²⁵ A major reason that law governing the federal funding of abstinence education stipulates that funded abstinence programs should not teach or promote contraceptive use is to prevent the piracy of abstinence funds by pseudo “abstinence plus” programs that pretend to teach abstinence, but, in reality, denigrate it.

²⁶ Bruckner and Bearman, *op.cit.*, p. 277.

²⁷ See Robert Rector, “The Effectiveness of Abstinence Education Programs in Reducing Sexual Activity Among Youth,” The Heritage Foundation *Background No. 1533*, April 8, 2002 and Melissa Pardue, “More Evidence of the Effectiveness of Abstinence Education Programs,” The Heritage Foundation *WebMemo No. 738*, May 5, 2005.

also show that condom use has no effect in reducing STD's. This clearly illustrates the serious limitations of Bearman and Bruckner's methodology.

The paper has shown that taking a virginity pledge in adolescence, in fact, is associated with a substantial decline in STD rates in young adult years. Across a broad array of analysis, virginity pledging was found to be a better predictor of STD reduction than was condom use. Individuals who took a virginity pledge in adolescence are some 25 percent less likely to have an STD as young adults, when compared with non-pledgers who are identical in race, gender, and family background. The reduction in STD's for virginity pledgers occurs despite the fact that many years may have elapsed between the time the individual took a virginity pledge and the time that the STD rate was measured. Moreover, after initially taking a pledge, relatively few virginity pledgers will have received continuing social support for their commitment to abstinence.

Other research has shown that, when compared to non-pledgers of similar backgrounds, individuals who have taken a virginity pledge are:

- Less likely to have children out-of-wedlock;
- Less likely to experience teen pregnancy;
- Less likely to give birth as teens or young adults;
- Less likely to have sex before age 18; and,
- Less likely to engage in non-marital sex as young adults.

Pledgers will have fewer lifetime sexual partners than non-pledgers, and pledgers engaging in sexual activity in young adult years are as likely to use contraceptives as are non-pledgers.

Virginity pledge and similar abstinence education programs are among the few forces in our society pushing back against a tide of sexual permissiveness. These efforts need to be strengthened and expanded.

Appendix Table 1

Condom Use at First Intercourse as a Predictor of STD Reduction

Dependent Variables	Model 1 Condom Use Only		Model 2 Condom Use, Gender, Race		Model 3 Condom Use, Gender, Race, Family Structure		Model 4 Condom Use, Gender, Race, Family Structure and Religiosity	
	Signifi- cance	Prob- ability	Signifi- cance	Prob- ability	Signifi- cance	Prob- ability	Signifi- cance	Prob- ability
A) 3 STD Urine Sample	--	.80	--	.64	--	.64	--	.65
B) 3 STD Urine Sample or Diagnosis	--	.33	*	.058	*	.064	*	.062
C) 3 STD Urine Sample or Physical Symptoms	*	.354	*	.088	*	.091	*	.09
D) Diagnosis of 14 STD's	*	.054	***	.003	***	.005	***	.005
E) Diagnosis of 14 STD's, Urine Sample or Symptoms	--	.173	**	.016	**	.02	**	.018

Note: -- Not Significant

* Predicted Reduction of STD's is Statistically Significant at 90% Confidence Level

** Predicted Reduction of STD's is Statistically Significant at 95% Confidence Level

*** Predicted Reduction of STD's is Statistically Significant at 99% Confidence Level

Source: National Longitudinal Study of Adolescent Health

Regression Table 1												
Logistic Regression Output for Virginitly Pledge Models												
Dependent Variable: Three STD's in Urine Sample												
	Model I			Model II			Model III			Model IV		
Independent Variables	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.
Virginitly Pledge	0.821	0.128		0.785	0.057	*	0.798	0.072	*	0.810	0.087	*
Age at Interview				0.995	0.865		0.995	0.855		0.994	0.845	
Gender = Female				1.351	0.003	***	1.340	0.004	***	1.347	0.003	***
Race = Black				7.183	0.000	***	6.726	0.000	***	6.830	0.000	***
Race = American Indian				4.368	0.000	***	4.194	0.000	***	4.184	0.000	***
Race = Asian				1.374	0.121		1.397	0.105		1.416	0.093	*
Race = Hispanic				2.745	0.000	***	2.695	0.000	***	2.716	0.000	***
Raised in Step/Cohabiting Family							1.414	0.080	*	1.401	0.087	*
Raised in Single Parent Family							1.235	0.084	*	1.225	0.088	*
Raised in Other Family Type							1.138	0.437		1.128	0.463	
Religiosity Index Score										0.969	0.472	
Source: National Longitudinal Study of Adolescent Health												
*** Significant at a 99 percent level												
** Significant at a 95 percent level												
* Significant at a 90 percent level												

Regression Table 2												
Logistic Regression Output for Virginty Pledge Models												
Dependent Variable: Three STD's in Urine Sample, or Three STD Diagnosis												
	Model I			Model II			Model III			Model IV		
Independent Variables	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.
Virginty Pledge	0.790	0.020	**	0.709	0.001	***	0.721	0.001	***	0.755	0.005	***
Age at Interview				0.961	0.082	*	0.953	0.039	**	0.951	0.031	**
Gender = Female				1.631	0.000	***	1.617	0.000	***	1.639	0.000	***
Race = Black				6.727	0.000	***	6.108	0.000	***	6.390	0.000	***
Race = American Indian				4.453	0.000	***	4.203	0.000	***	4.165	0.000	***
Race = Asian				1.081	0.708		1.104	0.640		1.135	0.548	
Race = Hispanic				2.333	0.000	***	2.277	0.000	***	2.331	0.000	***
Raised in Step/Cohabiting Family							1.599	0.003	***	1.558	0.005	***
Raised in Single Parent Family							1.296	0.005	***	1.262	0.011	**
Raised in Other Family Type							1.641	0.002	***	1.606	0.002	***
Religiosity Index Score										0.915	0.017	**
Source: National Longitudinal Study of Adolescent Health												
*** Significant at a 99 percent level												
** Significant at a 95 percent level												
* Significant at a 90 percent level												

Regression Table 3												
Logistic Regression Output for Virginitly Pledge Models												
Dependent Variable: Three STD's in Urine Sample or Physical Symptoms												
	Model I			Model II			Model III			Model IV		
Independent Variables	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.
Virginitly Pledge	0.857	0.142		0.776	0.015	**	0.791	0.024	**	0.810	0.045	**
Age at Interview				0.973	0.281		0.971	0.255		0.970	0.242	
Gender = Female				1.742	0.000	***	1.726	0.000	***	1.737	0.000	***
Race = Black				4.174	0.000	***	3.940	0.000	***	4.027	0.000	***
Race = American Indian				2.147	0.009	***	2.060	0.011	**	2.052	0.012	**
Race = Asian				0.938	0.713		0.958	0.806		0.975	0.883	
Race = Hispanic				1.920	0.000	***	1.885	0.000	***	1.906	0.000	***
Raised in Step/Cohabiting Family							1.591	0.002	***	1.570	0.003	***
Raised in Single Parent Family							1.193	0.088	*	1.178	0.110	
Raised in Other Family Type							1.223	0.175		1.208	0.203	
Religiosity Index Score										0.957	0.177	
Source: National Longitudinal Study of Adolescent Health												
*** Significant at a 99 percent level												
** Significant at a 95 percent level												
* Significant at a 90 percent level												

Regression Table 4												
Logistic Regression Output for Virginitly Pledge Models												
Dependent Variable: Diagnosis of Any 14 STDs												
	Model I			Model II			Model III			Model IV		
Independent Variables	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.
Virginitly Pledge	0.710	0.002	***	0.579	0.000	***	0.590	0.000	***	0.635	0.000	***
Age at Interview				0.963	0.128		0.956	0.078	*	0.953	0.054	*
Gender = Female				3.633	0.000	***	3.621	0.000	***	3.701	0.000	***
Race = Black				2.794	0.000	***	2.528	0.000	***	2.709	0.000	***
Race = American Indian				2.185	0.099	*	2.081	0.127		2.046	0.149	
Race = Asian				0.656	0.140		0.672	0.164		0.702	0.216	
Race = Hispanic				1.339	0.066	*	1.308	0.086	*	1.357	0.051	*
Raised in Step/Cohabiting Family							1.493	0.012	**	1.434	0.023	**
Raised in Single Parent Family							1.322	0.007	***	1.273	0.020	**
Raised in Other Family Type							1.502	0.008	***	1.441	0.019	**
Religiosity Index Score										0.874	0.001	***
Source: National Longitudinal Study of Adolescent Health												
*** Significant at a 99 percent level												
** Significant at a 95 percent level												
* Significant at a 90 percent level												

Regression Table 5												
Logistic Regression Output for Virginity Pledge Models												
Dependent Variable: Diagnosis of Any 14 STDs, Positive Urine Sample, or Physical Symptoms												
	Model I			Model II			Model III			Model IV		
Independent Variables	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.
Virginity Pledge	0.786	0.005	***	0.676	0.000	***	0.691	0.000	***	0.728	0.001	***
Age at Interview				0.988	0.588		0.985	0.481		0.983	0.415	
Gender = Female				2.467	0.000	***	2.444	0.000	***	2.477	0.000	***
Race = Black				4.056	0.000	***	3.725	0.000	***	3.905	0.000	***
Race = American Indian				2.212	0.017	**	2.110	0.027	**	2.092	0.036	**
Race = Asian				0.924	0.630		0.946	0.737		0.976	0.884	
Race = Hispanic				1.777	0.000	***	1.736	0.000	***	1.779	0.000	***
Raised in Step/Cohabiting Family							1.628	0.000	***	1.584	0.001	***
Raised in Single Parent Family							1.306	0.001	***	1.270	0.004	***
Raised in Other Family Type							1.335	0.016	**	1.302	0.029	**
Religiosity Index Score										0.911	0.004	***
Source: National Longitudinal Study of Adolescent Health												
*** Significant at a 99 percent level												
** Significant at a 95 percent level												
* Significant at a 90 percent level												

Regression Table 6												
Logistic Regression Output for Condom at First Intercourse Models												
Dependent Variable: Three STD's in Urine Sample												
	Model I			Model II			Model III			Model IV		
Independent Variables	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.
Virgin	0.527	0.007	***	0.516	0.007	***	0.528	0.009	***	0.528	0.008	***
Condom at First Intercourse (ref=no condom)	1.040	0.797		0.928	0.636		0.930	0.645		0.931	0.648	
Age at Interview				1.031	0.385		1.031	0.384		1.032	0.374	
Gender = Female				1.365	0.013	**	1.355	0.015	**	1.350	0.016	**
Race = Black				6.697	0.000	***	6.071	0.000	***	6.030	0.000	***
Race = American Indian				3.162	0.033	**	3.036	0.044	**	3.035	0.043	**
Race = Asian				1.548	0.067	*	1.595	0.052	*	1.598	0.050	*
Race = Hispanic				2.750	0.000	***	2.679	0.000	***	2.668	0.000	***
Raised in Step/Cohabiting Family							1.633	0.026	**	1.640	0.023	**
Raised in Single Parent Family							1.405	0.014	**	1.412	0.010	**
Raised in Other Family Type							1.205	0.289		1.208	0.282	
Religiosity Index Score										1.014	0.807	
Source: National Longitudinal Study of Adolescent Health												
*** Significant at a 99 percent level												
** Significant at a 95 percent level												
* Significant at a 90 percent level												

Regression Table 7												
Logistic Regression Output for Condom at First Intercourse Models												
Dependent Variable: Three STD's in Urine Sample or Three STD Diagnoses												
	Model I			Model II			Model III			Model IV		
Independent Variables	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.
Virgin	0.367	0.000	***	0.344	0.000	***	0.354	0.000	***	0.360	0.000	***
Condom at First Intercourse (ref=no condom)	0.887	0.330		0.776	0.058	*	0.782	0.064	*	0.780	0.062	*
Age at Interview				0.974	0.333		0.968	0.240		0.965	0.200	
Gender = Female				1.559	0.000	***	1.546	0.000	***	1.573	0.000	***
Race = Black				6.205	0.000	***	5.604	0.000	***	5.860	0.000	***
Race = American Indian				3.474	0.024	**	3.318	0.038	**	3.322	0.044	**
Race = Asian				1.111	0.612		1.148	0.513		1.176	0.442	
Race = Hispanic				2.341	0.000	***	2.280	0.000	***	2.337	0.000	***
Raised in Step/Cohabiting Family							1.807	0.001	***	1.760	0.002	***
Raised in Single Parent Family							1.378	0.003	***	1.341	0.006	***
Raised in Other Family Type							1.614	0.005	***	1.583	0.006	***
Religiosity Index Score										0.923	0.067	*
Source: National Longitudinal Study of Adolescent Health												
*** Significant at a 99 percent level												
** Significant at a 95 percent level												
* Significant at a 90 percent level												

Regression Table 8												
Logistic Regression Output for Condom at First Intercourse Models												
Dependent Variable: Three STD's in Urine Sample or Physical Symptoms												
	Model I			Model II			Model III			Model IV		
Independent Variables	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.
Virgin	0.459	0.000	***	0.449	0.000	***	0.463	0.000	***	0.469	0.000	***
Condom at First Intercourse (ref=no condom)	0.901	0.354		0.813	0.088	*	0.815	0.091	*	0.815	0.090	*
Age at Interview				0.977	0.419		0.977	0.429		0.975	0.399	
Gender = Female				1.767	0.000	***	1.756	0.000	***	1.773	0.000	***
Race = Black				3.891	0.000	***	3.591	0.000	***	3.686	0.000	***
Race = American Indian				1.601	0.293		1.545	0.341		1.546	0.350	
Race = Asian				1.010	0.956		1.039	0.838		1.057	0.769	
Race = Hispanic				1.935	0.000	***	1.890	0.000	***	1.916	0.000	***
Raised in Step/Cohabiting Family							1.644	0.002	***	1.617	0.003	***
Raised in Single Parent Family							1.336	0.012	**	1.315	0.015	**
Raised in Other Family Type							1.151	0.395		1.137	0.436	
Religiosity Index Score										0.954	0.228	
Source: National Longitudinal Study of Adolescent Health												
*** Significant at a 99 percent level												
** Significant at a 95 percent level												
* Significant at a 90 percent level												

Regression Table 9												
Logistic Regression Output for Condom at First Intercourse Models												
Dependent Variable: Diagnosis of Any 14 STDs												
	Model I			Model II			Model III			Model IV		
Independent Variables	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.
Virgin	0.169	0.000	***	0.163	0.000	***	0.170	0.000	***	0.176	0.000	***
Condom at First Intercourse (ref=no condom)	0.830	0.054	*	0.735	0.003	***	0.740	0.005	***	0.740	0.005	***
Age at Interview				0.959	0.100		0.954	0.074	*	0.944	0.031	**
Gender = Female				3.438	0.000	***	3.422	0.000	***	3.557	0.000	***
Race = Black				2.837	0.000	***	2.558	0.000	***	2.849	0.000	***
Race = American Indian				1.758	0.404		1.697	0.447		1.699	0.464	
Race = Asian				0.729	0.273		0.755	0.325		0.792	0.417	
Race = Hispanic				1.371	0.059	*	1.333	0.083	*	1.411	0.039	**
Raised in Step/Cohabiting Family							1.456	0.035	**	1.365	0.083	*
Raised in Single Parent Family							1.393	0.003	***	1.316	0.014	**
Raised in Other Family Type							1.456	0.044	**	1.387	0.087	*
Religiosity Index Score										0.831	0.000	***
Source: National Longitudinal Study of Adolescent Health												
*** Significant at a 99 percent level												
** Significant at a 95 percent level												
* Significant at a 90 percent level												

Regression Table 10												
Logistic Regression Output for Condom at First Intercourse Models												
Dependent Variable: Diagnosis of Any 14 STD's, Positive Urine Sample, or Physical Symptoms												
	Model I			Model II			Model III			Model IV		
Independent Variables	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.
Virgin	0.345	0.000	***	0.335	0.000	***	0.347	0.000	***	0.358	0.000	***
Condom at First Intercourse (ref=no condom)	0.888	0.173		0.793	0.016	**	0.797	0.020	**	0.796	0.018	**
Age at Interview				0.985	0.509		0.982	0.454		0.977	0.331	
Gender = Female				2.456	0.000	***	2.440	0.000	***	2.500	0.000	***
Race = Black				3.852	0.000	***	3.502	0.000	***	3.740	0.000	***
Race = American Indian				1.738	0.271		1.682	0.317		1.687	0.337	
Race = Asian				1.023	0.886		1.055	0.737		1.093	0.569	
Race = Hispanic				1.831	0.000	***	1.785	0.000	***	1.853	0.000	***
Raised in Step/Cohabiting Family							1.663	0.001	***	1.596	0.002	***
Raised in Single Parent Family							1.402	0.000	***	1.347	0.001	***
Raised in Other Family Type							1.296	0.047	**	1.259	0.081	*
Religiosity Index Score										0.889	0.002	***
Source: National Longitudinal Study of Adolescent Health												
*** Significant at a 99 percent level												
** Significant at a 95 percent level												
* Significant at a 90 percent level												

Regression Table 11												
Logistic Regression Output for Condom at Last Intercourse Models												
Dependent Variable: Three STD's in Urine Sample												
	Model I			Model II			Model III			Model IV		
Independent Variables	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.
Virgin	0.455	0.000	***	0.464	0.000	***	0.473	0.001	***	0.478	0.001	***
Condom at Last Intercourse (ref=no condom)	1.160	0.165		0.948	0.643		0.953	0.679		0.954	0.682	
Age at Interview				1.002	0.939		1.003	0.932		1.002	0.953	
Gender = Female				1.360	0.002	***	1.352	0.003	***	1.363	0.002	***
Race = Black				7.282	0.000	***	6.858	0.000	***	6.988	0.000	***
Race = American Indian				3.453	0.000	***	3.322	0.000	***	3.302	0.000	***
Race = Asian				1.559	0.031	**	1.584	0.027	**	1.604	0.024	**
Race = Hispanic				2.720	0.000	***	2.674	0.000	***	2.702	0.000	***
Raised in Step/Cohabiting Family							1.426	0.084	*	1.411	0.091	*
Raised in Single Parent Family							1.225	0.088	*	1.213	0.092	*
Raised in Other Family Type							1.131	0.470		1.120	0.502	
Religiosity Index Score										0.964	0.402	
Source: National Longitudinal Study of Adolescent Health												
*** Significant at a 99 percent level												
** Significant at a 95 percent level												
* Significant at a 90 percent level												

Regression Table 12												
Logistic Regression Output for Condom at Last Intercourse Models												
Dependent Variable: Three STD's in Urine Sample or Diagnosis												
	Model I			Model II			Model III			Model IV		
Independent Variables	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.
Virgin	0.355	0.000	***	0.351	0.000	***	0.358	0.000	***	0.366	0.000	***
Condom at Last Intercourse (ref=no condom)	1.058	0.472		0.876	0.134		0.885	0.175		0.886	0.175	
Age at Interview				0.960	0.101		0.953	0.053	*	0.950	0.039	**
Gender = Female				1.567	0.000	***	1.558	0.000	***	1.589	0.000	***
Race = Black				6.777	0.000	***	6.221	0.000	***	6.524	0.000	***
Race = American Indian				3.694	0.000	***	3.518	0.001	***	3.464	0.001	***
Race = Asian				1.228	0.327		1.247	0.299		1.278	0.251	
Race = Hispanic				2.256	0.000	***	2.212	0.000	***	2.271	0.000	***
Raised in Step/Cohabiting Family							1.492	0.016	**	1.454	0.024	**
Raised in Single Parent Family							1.256	0.015	**	1.223	0.028	**
Raised in Other Family Type							1.611	0.003	***	1.576	0.004	***
Religiosity Index Score										0.913	0.021	**
Source: National Longitudinal Study of Adolescent Health												
*** Significant at a 99 percent level												
** Significant at a 95 percent level												
* Significant at a 90 percent level												

Regression Table 13												
Logistic Regression Output for Condom at Last Intercourse Models												
Dependent Variable: Three STD's in Urine Sample or Physical Symptoms												
	Model I			Model II			Model III			Model IV		
Independent Variables	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.
Virgin	0.450	0.000	***	0.466	0.000	***	0.477	0.000	***	0.485	0.000	***
Condom at Last Intercourse (ref=no condom)	1.020	0.813		0.913	0.325		0.920	0.370		0.921	0.369	
Age at Interview				0.974	0.312		0.972	0.295		0.971	0.267	
Gender = Female				1.740	0.000	***	1.729	0.000	***	1.748	0.000	***
Race = Black				4.326	0.000	***	4.101	0.000	***	4.218	0.000	***
Race = American Indian				1.776	0.056	*	1.712	0.056	*	1.697	0.058	*
Race = Asian				1.122	0.507		1.142	0.449		1.162	0.391	
Race = Hispanic				1.924	0.000	***	1.893	0.000	***	1.923	0.000	***
Raised in Step/Cohabiting Family							1.501	0.010	**	1.475	0.013	**
Raised in Single Parent Family							1.188	0.088	*	1.170	0.114	
Raised in Other Family Type							1.190	0.268		1.172	0.311	
Religiosity Index Score										0.947	0.100	
Source: National Longitudinal Study of Adolescent Health												
*** Significant at a 99 percent level												
** Significant at a 95 percent level												
* Significant at a 90 percent level												

Regression Table 14												
Logistic Regression Output for Condom at Last Intercourse Models												
Dependent Variable: Diagnosis of Any 14 STDs												
	Model I			Model II			Model III			Model IV		
Independent Variables	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.
Virgin	0.171	0.000	***	0.181	0.000	***	0.187	0.000	***	0.193	0.000	***
Condom at Last Intercourse (ref=no condom)	0.793	0.005	***	0.796	0.009	***	0.802	0.012	**	0.803	0.012	**
Age at Interview				0.954	0.053	*	0.949	0.038	**	0.943	0.021	**
Gender = Female				3.294	0.000	***	3.282	0.000	***	3.390	0.000	***
Race = Black				2.896	0.000	***	2.653	0.000	***	2.864	0.000	***
Race = American Indian				2.079	0.128		1.997	0.158		1.949	0.188	
Race = Asian				0.824	0.570		0.843	0.617		0.877	0.700	
Race = Hispanic				1.325	0.072	*	1.298	0.094	*	1.355	0.050	*
Raised in Step/Cohabiting Family							1.386	0.039	**	1.324	0.077	*
Raised in Single Parent Family							1.284	0.012	**	1.235	0.037	**
Raised in Other Family Type							1.426	0.027	**	1.373	0.050	*
Religiosity Index Score										0.868	0.001	***
Source: National Longitudinal Study of Adolescent Health												
*** Significant at a 99 percent level												
** Significant at a 95 percent level												
* Significant at a 90 percent level												

Regression Table 15												
Logistic Regression Output for Condom at Last Intercourse Models												
Dependent Variable: Diagnosis of Any 14 STD's, Positive Urine Sample, or Physical Symptoms												
	Model I			Model II			Model III			Model IV		
Independent Variables	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.
Virgin	0.332	0.000	***	0.347	0.000	***	0.357	0.000	***	0.367	0.000	***
Condom at Last Intercourse (ref=no condom)	0.895	0.084	*	0.835	0.010	**	0.843	0.015	**	0.843	0.015	**
Age at Interview				0.982	0.399		0.979	0.335		0.975	0.251	
Gender = Female				2.370	0.000	***	2.355	0.000	***	2.406	0.000	***
Race = Black				4.264	0.000	***	3.942	0.000	***	4.163	0.000	***
Race = American Indian				1.883	0.073	*	1.804	0.093	*	1.776	0.112	
Race = Asian				1.085	0.666		1.107	0.591		1.141	0.482	
Race = Hispanic				1.772	0.000	***	1.737	0.000	***	1.791	0.000	***
Raised in Step/Cohabiting Family							1.511	0.002	***	1.465	0.004	***
Raised in Single Parent Family							1.290	0.002	***	1.251	0.006	***
Raised in Other Family Type							1.292	0.037	**	1.257	0.064	*
Religiosity Index Score										0.902	0.003	***
Source: National Longitudinal Study of Adolescent Health												
*** Significant at a 99 percent level												
** Significant at a 95 percent level												
* Significant at a 90 percent level												

Regression Table 16												
Logistic Regression Output for Condom in Past 12 Months Models												
Dependent Variable: Three STD's in Urine Sample												
	Model I			Model II			Model III			Model IV		
Independent Variables	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.
Frequency of Condom Use, Past 12 Months	1.071	0.042	**	1.020	0.553		1.022	0.511		1.023	0.500	
Age at Interview				1.006	0.845		1.008	0.801		1.007	0.824	
Gender = Female				1.351	0.003	***	1.339	0.004	***	1.352	0.003	***
Race = Black				6.799	0.000	***	6.435	0.000	***	6.576	0.000	***
Race = American Indian				4.596	0.000	***	4.450	0.000	***	4.431	0.000	***
Race = Asian				1.471	0.109		1.498	0.098	*	1.513	0.093	*
Race = Hispanic				2.720	0.000	***	2.675	0.000	***	2.709	0.000	***
Raised in Step/Cohabiting Family							1.488	0.051	*	1.471	0.056	*
Raised in Single Parent Family							1.224	0.107		1.210	0.116	
Raised in Other Family Type							1.089	0.631		1.078	0.670	
Religiosity Index Score										0.960	0.378	
Source: National Longitudinal Study of Adolescent Health												
*** Significant at a 99 percent level												
** Significant at a 95 percent level												
* Significant at a 90 percent level												

Regression Table 17												
Logistic Regression Output for Condom in Past 12 Months Models												
Dependent Variable: Three STD's in Urine Sample or Three STD Diagnoses												
	Model I			Model II			Model III			Model IV		
Independent Variables	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.
Frequency of Condom Use, Past 12 Months	1.004	0.896		0.949	0.058	*	0.952	0.081	*	0.953	0.084	*
Age at Interview				0.945	0.024	**	0.938	0.012	**	0.936	0.008	***
Gender = Female				1.556	0.000	***	1.542	0.000	***	1.571	0.000	***
Race = Black				6.682	0.000	***	6.182	0.000	***	6.461	0.000	***
Race = American Indian				4.390	0.000	***	4.255	0.000	***	4.209	0.000	***
Race = Asian				1.210	0.378		1.226	0.355		1.250	0.315	
Race = Hispanic				2.249	0.000	***	2.210	0.000	***	2.267	0.000	***
Raised in Step/Cohabiting Family							1.526	0.013	**	1.494	0.019	**
Raised in Single Parent Family							1.233	0.032	**	1.205	0.053	*
Raised in Other Family Type							1.602	0.003	***	1.572	0.004	***
Religiosity Index Score										0.921	0.047	**
Source: National Longitudinal Study of Adolescent Health												
*** Significant at a 99 percent level												
** Significant at a 95 percent level												
* Significant at a 90 percent level												

Regression Table 18												
Logistic Regression Output for Condom in Past 12 Months Models												
Dependent Variable: Three STD's in Urine Sample or Physical Symptoms												
	Model I			Model II			Model III			Model IV		
Independent Variables	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.
Frequency of Condom Use, Past 12 Months	0.987	0.615		0.956	0.100		0.958	0.123		0.959	0.127	
Age at Interview				0.962	0.141		0.962	0.139		0.960	0.126	
Gender = Female				1.731	0.000	***	1.716	0.000	***	1.734	0.000	***
Race = Black				4.154	0.000	***	3.923	0.000	***	4.026	0.000	***
Race = American Indian				2.272	0.006	***	2.207	0.006	***	2.192	0.008	***
Race = Asian				1.119	0.580		1.141	0.522		1.155	0.487	
Race = Hispanic				1.802	0.000	***	1.771	0.000	***	1.798	0.000	***
Raised in Step/Cohabiting Family							1.547	0.006	***	1.525	0.008	***
Raised in Single Parent Family							1.216	0.060	*	1.200	0.078	*
Raised in Other Family Type							1.183	0.310		1.168	0.347	
Religiosity Index Score										0.952	0.177	
Source: National Longitudinal Study of Adolescent Health												
*** Significant at a 99 percent level												
** Significant at a 95 percent level												
* Significant at a 90 percent level												

Regression Table 19												
Logistic Regression Output for Condom in Past 12 Months Models												
Dependent Variable: Diagnosis of Any 14 STD's												
	Model I			Model II			Model III			Model IV		
Independent Variables	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.
Frequency of Condom Use, Past 12 Months	0.865	0.000	***	0.857	0.000	***	0.859	0.000	***	0.860	0.000	***
Age at Interview				0.928	0.005	***	0.924	0.004	***	0.920	0.002	***
Gender = Female				3.472	0.000	***	3.458	0.000	***	3.567	0.000	***
Race = Black				2.995	0.000	***	2.777	0.000	***	2.978	0.000	***
Race = American Indian				2.041	0.142		1.984	0.165		1.939	0.194	
Race = Asian				0.823	0.584		0.840	0.624		0.868	0.689	
Race = Hispanic				1.238	0.188		1.216	0.223		1.265	0.140	
Raised in Step/Cohabiting Family							1.322	0.095	*	1.272	0.151	
Raised in Single Parent Family							1.240	0.036	**	1.197	0.082	*
Raised in Other Family Type							1.357	0.074	*	1.315	0.111	
Religiosity Index Score										0.881	0.003	***
Source: National Longitudinal Study of Adolescent Health												
*** Significant at a 99 percent level												
** Significant at a 95 percent level												
* Significant at a 90 percent level												

Regression Table 20												
Logistic Regression Output for Condom in Past 12 Months Models												
Dependent Variable: Diagnosis of Any 14 STD's, Positive Urine Sample, or Physical Symptoms												
	Model I			Model II			Model III			Model IV		
Independent Variables	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.	Odds Ratio	Prob.	Sign.
Frequency of Condom Use, Past 12 Months	0.946	0.010	**	0.928	0.001	***	0.930	0.002	***	0.931	0.002	***
Age at Interview				0.961	0.065	*	0.958	0.055	*	0.955	0.037	**
Gender = Female				2.465	0.000	***	2.444	0.000	***	2.494	0.000	***
Race = Black				4.132	0.000	***	3.837	0.000	***	4.037	0.000	***
Race = American Indian				2.207	0.023	**	2.134	0.033	**	2.111	0.044	**
Race = Asian				1.055	0.793		1.077	0.718		1.102	0.634	
Race = Hispanic				1.652	0.000	***	1.620	0.000	***	1.669	0.000	***
Raised in Step/Cohabiting Family							1.536	0.002	***	1.497	0.004	***
Raised in Single Parent Family							1.281	0.003	***	1.246	0.009	***
Raised in Other Family Type							1.276	0.058	*	1.247	0.089	*
Religiosity Index Score										0.911	0.010	**
Source: National Longitudinal Study of Adolescent Health												
*** Significant at a 99 percent level												
** Significant at a 95 percent level												
* Significant at a 90 percent level												