Funding for Abstinence-Only-Until-Marriage Education and Adolescent Sexual and Reproductive Health Outcomes across the States

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ABSTRACT

While teen birth and pregnancy rates have been falling in the United States since the early 1990s, these rates vary greatly across U.S. states; in 2012 the teen pregnancy rate (per thousand) in New Hampshire was 13.8, while in Arkansas it was 50.7. Historically these wide variations have been attributed to demographic differences such as racial composition and poverty rates, as well as "red state" "blue state" cultural differences. Beginning in 2000, the federal government has been giving grants directly to community-based organizations to provide abstinence only sex education, bypassing state approval and state public health policy. This has created an ongoing funding stream for abstinence only education in "blue" states, which have historically had lower teen pregnancy rates, and better access to reproductive health services. This situation provides a unique opportunity to disentangle the effects of abstinence only sex education from state demographic, socio-cultural, and access-to-care differences.

We obtained data on federal abstinence only funding to the 50 states and the District of Columbia from the Sexuality Information and Education Council of the U.S., data on teen pregnancy and abortion from the Guttmacher Institute, and data on teen birth rates from the CDC. We constructed a longitudinal, state level dataset of abstinence only funding and teen reproductive health outcomes for the years 2005, 2008 and 2010. We used generalized estimating equations (GEE) to examine the relationship between federal abstinence only education funding per student and teen pregnancy-, abortion- and birth- rates. We controlled for potential confounders such as state poverty rates and racial demographics.

Federal funding for abstinence only education was associated with higher teen pregnancy rates ($p<0.01$). Each dollar of federal spending per-pupil was associated with a .01/1000 increase in the pregnancy rate, a finding which remained robust after accounting for state demographic and poverty statistics. In other words, for each $100 invested in abstinence-only, teen pregnancy increased by 1 per 1,000. Federal funding for abstinence only sex education was positively associated with both of the two major components of the teen pregnancy rate: teen birth rate and teen abortion rate, although these associations were not statistically significant. Our results indicate that abstinence only sex education does not lower teen birth or abortion rates, and is significantly associated with higher overall teen pregnancy rates. Ongoing federal funding for abstinence only sex education is counterproductive to public health goals.

Introduction

Although teen birth rates have been declining since the mid-1980s, the United States continues to have the highest teen birth rate of any country in the industrialized world.[i] Teen birth rates also vary widely across states, ranging from a low of 13.7 per 1,000 in New Hampshire to a high of 50.7 per 1,000 in Arkansas in 2010.[ii] Most of the variation in teen birth rates is believed to be explained by state demographic characteristics.[iii] In general, teen birth rates were lowest in the wealthier, whiter states in the Northeast and highest across poorer, more demographically diverse parts of the South and Southwest.[iv,v] In addition to demographics, a few studies have attempted to investigate differences in state laws and policies concerning sexuality education to explain cross-state variation in teen births.[5,vi,vii,viii] However, the states with lower teen birth rates also tend to be "blue" states where sexuality education laws are more liberal, and the Southern and Southwestern states with high adolescent birth rates tend to be "red" states where sexuality education laws are more conservative. State religiosity and political conservatism have been found to be independently associated with higher teen birth rates and with state sexuality education content laws.[5] Consequently, previous studies have been unable to entirely disentangle the degree to which cross-state differences in teen births and other adolescent sexual and reproductive health outcomes

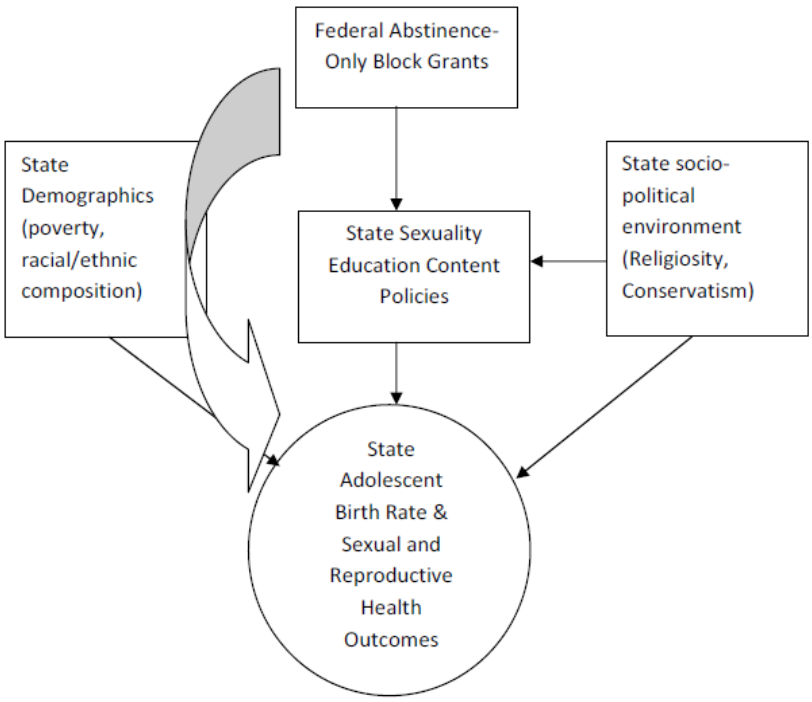
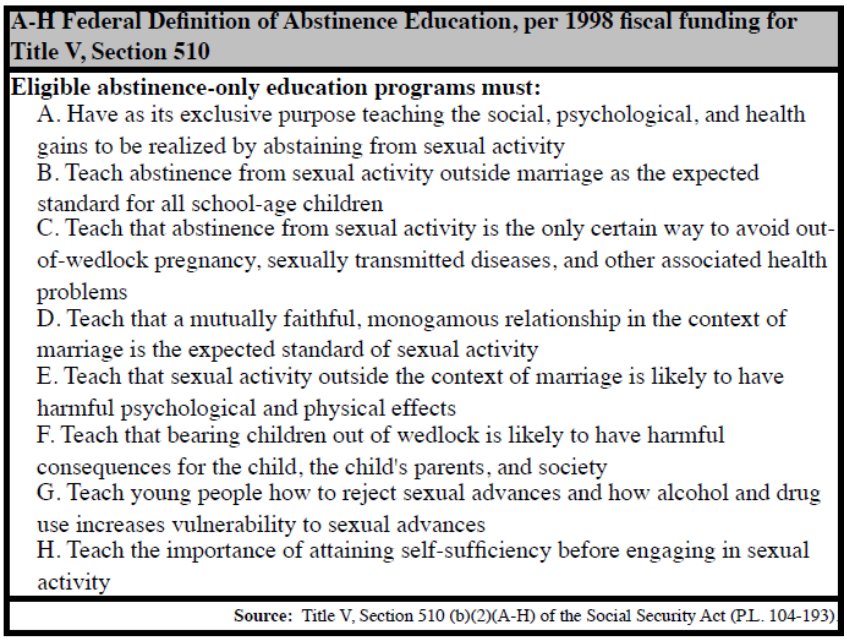


Figure 1: Conceptual Model

reflect the varied underlying demographics of the states, socio-political characteristics of states, or state laws and policies (see **Figure 1**).

Federal funding of abstinence-only-until-marriage (abstinence-only) sexuality education is an area that allows for potentially improved analyses to disentangle policy influences from demographic and socio-cultural influences because of the way it has been implemented as block grants to the states, which most states have accepted to varying degrees:

- The first abstinence-only funds were made available to states in 1981 via the Adolescent Family Life Act (AFLA).
- In 1996, Title V of the Welfare Reform Act, or the Temporary Assistance for Needy Families (TANF), set up a new system of grants for states providing abstinence-only education that used a specific eight-point criteria, known as the "A-H definition" (see **Figure 2** to left). Many states, including liberal states, accepted these funds seeing them as a way to increase their total budget for sex education. California was the only state to immediately reject the program.[ix]



A-H Federal Definition of Abstinence Education, per 1998 fiscal funding for Title V, Section 510

Eligible abstinence-only education programs must:

A. Have as its exclusive purpose teaching the social, psychological, and health gains to be realized by abstaining from sexual activity

B. Teach abstinence from sexual activity outside marriage as the expected standard for all school-age children

C. Teach that abstinence from sexual activity is the only certain way to avoid out-of-wedlock pregnancy, sexually transmitted diseases, and other associated health problems

D. Teach that a mutually faithful, monogamous relationship in the context of marriage is the expected standard of sexual activity

E. Teach that sexual activity outside the context of marriage is likely to have harmful psychological and physical effects

F. Teach that bearing children out of wedlock is likely to have harmful consequences for the child, the child's parents, and society

G. Teach young people how to reject sexual advances and how alcohol and drug use increases vulnerability to sexual advances

H. Teach the importance of attaining self-sufficiency before engaging in sexual activity

Source: Title V, Section 510 (b)(2)(A-H) of the Social Security Act (P.L. 104-193).

Figure 2: Federal Definition of Abstinence-Only Education

- In 2000 Congress created another abstinence-only education program (Title XI, §1110 of the Social Security Act), funded through the maternal and child health block grant's Special Projects of Regional and National Significance Programs (SPRANS) that bypassed the need for state approval. Through the Community-Based Abstinence Education (CBAE) program, instead of block grants going to the states, grants were made available directly to

community-based (including faith-based) organizations. This funding scheme was extremely restrictive, requiring curriculum to refrain from providing young people with information about contraception or safer-sex practices. Simultaneous with the increases in federal funds for abstinence-only education, states have enacted state specific sexuality education content laws to define the content of state sexuality education and what it would and would not cover.

- In 2006, total funding for abstinence-only education reached a record high of $176 million. However, by 2007, nearly half of all states had decided against applying for state-based abstinence-only education funding due to both its restrictive focus on abstinence alone and the requirement that states contribute matching funds.[x]

This unprecedented increase in earmarked federal abstinence-only funding to states, which many traditionally blue states found to be "an offer too good to refuse," or which bypassed state approval altogether, provides a unique opportunity for a natural experiment to test the impact of increased federal funding for abstinence-only programs on adolescent sexual and reproductive health outcomes by examining the interaction of federal funding and state laws on adolescent sexual and reproductive health outcomes. Previous research has only examined the effect of state sexuality education ***content*** laws on adolescent sexual and reproductive health outcomes, which may be endogenous to the states' socio-political climate.[5,6,7,8] No previous study has directly measured federal abstinence-only ***funding*** flows that may bypass state laws or go directly to faith-based, non-governmental organizations on adolescent public health outcomes, which many states accepted regardless of their political climate.

Previous research on state abstinence-only policy. In spite of the acrimonious debate over abstinence-only programs versus comprehensive forms of sexuality education, surprisingly few comparative studies have examined the impact of abstinence-only polices on adolescent sexual and reproductive health outcomes. A few randomized trials have been conducted that aim to isolate the effect of abstinence-only versus comprehensive sexuality education on sexual and

reproductive health outcomes.[10,xi,xii] These studies have generally found in favor of comprehensive sexuality education in reducing unwanted pregnancies and improving safer sexual behaviors, results that have been used to advance the argument that abstinence-only policy is not evidence-based.[10] However, the improved internal validity of these targeted experiments may come at the expense of the generalizability of findings across all states and real-world settings. For instance, the effect of abstinence-only education may work differently in socially and religiously conservative parts of the country, where these programs accord with deeply held values, compared with more secular parts of the country. In addition, of the handful of studies that have examined abstinence-only policy, the focus has been exclusively on state sexuality education *content laws* rather than federal *funding flows*.[5,6,8] Yet, state content policies may not be an effective way to measure the impact of abstinence-only policy on outcomes for a variety of reasons. First, due to the multi-month or multi-year implementation period, the timing of the introduction of the content laws and changes in practice may be difficult to measure. Furthermore, policies may be unevenly implemented, ignored entirely, and students may get information about sex education from many different sources or not attend public school. In addition to content laws, other state policies such as those that affect adolescents' access to contraceptives may counterbalance abstinence-only messages that students receive in schools or may compound these messages. By contrast, federal abstinence-only funding to states (independent of state law) provides an opportunity to explore the direct relationship between a national policy input and state adolescent sexual and reproductive health outcomes, and the potential role of state law in moderating that relationship.

1. Specific aims and hypotheses

The following are the specific aims of the study:

1. To assess the relationship between increases in state abstinence-only education funding and changes in state-level sexual and reproductive health outcomes and behaviors among adolescents (teen birth/pregnancy rate), adjusting for state characteristics.

2. To explore the interactions between federal abstinence-only funding and state laws that address sexuality content, and how the combination of these policies affect adolescent sexual and reproductive health outcomes.
3. To assess the interactions between the state socio-political environment, state laws that address sexuality content and access to contraceptives, and how these combine to impact adolescent sexual and reproductive health outcomes.

We hypothesize that:

1. States that receive a greater amount of abstinence-only funding will experience increasing rates of teen pregnancy and births.
2. The effects of abstinence-only funding will vary by state political climate and the deleterious effects of abstinence-only funding on reproductive health outcomes will be offset by other state content and access policies in less socially conservative states.

METHODS

Measures & Data Collection

We constructed a state-year database including available information on federal funding for state abstinence-only education and adolescent sexual and reproductive health outcomes. We will construct a longitudinal, state-year dataset from three primary data sources:

1. *SEICUS State earmarked Federal Abstinence-Only-Until-Marriage Funding by State, 2003-2010.* The Sexuality Information and Education Council of the US (SEICUS) has collected information on federal funding for abstinence only education by state from all sources including Title V, SPRANS-CBAE and AFLA funding for fiscal years 2003-2010. The information is available in policy briefs on their website.[xiii] We will use this information to construct a prospective, population adjusted measure of dollars spent per pupil on abstinence-only education.

2. *CDC Vital Statistics: 2003-2010.* The CDC provides state level data on adolescent birth rates from vital statistics collected by the National Center for Health Statistics. In For analyses with adolescent birth rate as the primary outcome, information on all 50 states will be included.
3. *Guttmacher State Sexuality Education Content Policies, 2003- 2010*: The Alan Guttmacher Institute provides information on the content of state sex education policies and laws affecting access to family planning through a series of Monthly State Policy Briefs.[17] The monthly updates are based on extensive legal and policy review conducted by Guttmacher staff, which is updated regularly and undergo continuous quality review. Staff at Guttmacher have developed consistent methods to abstract state laws on the subject. Information on state content policies date back to 2001. These measures have been used in two previous studies.[5,8] Guttmacher also provides annual estimates of adolescent pregnancy, birth and abortion estimates.

Outcome measures

This study examines two primary outcome measures: 1. Teen births per 1,000; 2. Teen pregnancy per 1,000These measures capture potential sexual and reproductive health outcomes that may be directed impacted by abstinence-only education, either positively or negatively.

Teen births per 1,000. Our primary outcome of interest is state adolescent birthrates per 1,000. Annual data on the number of live births per 1,000 girls aged 15 to 19 each year is available from the CDC and will be extracted for years 2000 through 2010. These rates are based on birth certificates registered in all states and made available from the National Center for Health Statistics at the CDC.[xiv] Guttmacher has also compiled these rates on a semi-annual basis and the data is available through their website.[17]

Teen births are the outcome of unprotected sexual activity. An increase in teen birth after being exposed to abstinence-only education could result from adolescents continuing to have sex in spite of abstinence education, but failing to use contraception due to lack of comprehensive information or a failure to terminate the pregnancy before it goes to term. For

models where teen births are primary outcomes, an additional set of variables need to be accounted for.

Teen pregnancy rates per 1,000. The number of young women who become pregnant each year and the corresponding rate of teen pregnancy is estimated by adding together the number of reported births, abortions, and estimated fetal loss (miscarriage and still births) to young women ages 15–19. Data is available on estimates of teen pregnancy on a biannual basis from the Guttmacher Institute and the CDC.

Adolescent abortion rates. Abortion rates may influence teen birth outcomes as teen pregnancies that terminate in induced abortion will not yield a birth. Likewise, contraceptive use will prevent teen pregnancy. Models with teen births as an outcome will therefore adjust for the state adolescent abortion rate and contraceptive use to account for teen pregnancies that might have ended in abortion or have been prevented from occurring. State adolescent (age 15-19) abortion rates per 1,000 are available for 2000, 2005 and 2008 from the Guttmacher Institute State Center.[17]

Primary exposure variable

Federal block grants for state abstinence-only education. SEICUS publishes detailed information on total federal abstinence-only education funding received by each state from 2003 to 2010. SEICUS funding estimates contain funding from (1) AFLA, (2) Title V, and (3) SPRANS-CBAE funding, as well as a small "other funding sources" category.

These data will be cross-checked and supplemented with data from the TAGGS system, which tracks federal grant funding, using the search term "abstinence" and then removing anything that was clearly unrelated to sex-ed (e.g. drug abstinence programs). Estimates for 1998-2003 and 2011+ will be supplement the SEICUS data.

We will calculate the per pupil abstinence only expenditure by dividing the total expenditure by the total number of high school students in the state and observe changes in per pupil expenditure over time. Information on the total number of middle and high school students

per state can be found at the National Center for Education Statistics.[xv] In contrast with previous studies that have only examined sexuality education content laws, by measuring federal abstinence-only block grants, this study is able to capture the impact of funding for abstinence-only programming that may be provided outside of school such as through after-school programs and therefore measure a wider degree of exposure.

State sexuality education content laws as an effect modifier. Detailed state sexuality education content laws are available through the Alan Guttmacher Institute described above. Following previous studies,[8] although states have different regulations regarding sexuality education and HIV/STD education, we will combine these as abstinence-only funding may be budgeted towards either activity and should have similar impacts on outcomes. In addition, as previously described, states have a variety of other content –related provisions about what topics are required to be covered or not covered. State content laws may counterbalance the effects of federal abstinence-only funding by requiring additional content, such as contraceptives, life skills and medically accurate information, to be covered or may compound funding by ensuring that abstinence is stressed in the curriculum. We will therefore treat state sexuality content laws as an effect modifier- we hypothesize that having more comprehensive content laws (laws that require states to cover a broader range of topics apart from abstinence-only) will lessen the impact of receiving abstinence-only funds on state health outcomes versus having more restrictive laws, which will compound the impact. States are categorized as having high, medium or low content restrictiveness in a given year. States that require abstinence content be stressed were coded as 2, states require that abstinence be covered were given a 1 and states that set no rules were coded as a 0.

Control variables and additional effect modifiers

Ironically, the most religiously conservative states in the US have the highest teen pregnancy rates.[5] Conservative, religious Southern and Southwestern states tend to be poorer and more racially and ethnically diverse. Previous studies have found that states with a higher

proportion of whites, a lower average poverty level, and higher religiosity and conservatism have lower adolescent birthrates.[5] These states also likely have more conservative laws regarding access to family planning. Therefore, following other studies,[5,6,8] to isolate the impact of federal abstinence-only funding on state-level sexual and reproductive health outcomes, we will adjust for the following variables:

State poverty-level. State poverty will be measured as the percentage of children younger than 18 who live under the poverty threshold as defined by the US Office of Management and Budget. The Census Bureau's small-area income and poverty estimate files provide annual state-level information on poverty thresholds that can be publicly accessed. [xvi]

Adolescent race/ethnicity distribution. Information on adolescent race/ethnicity distribution is available through the census.[22]

State political ideology: red, blue and purple states. Following previous studies, states will be defined as red, blue or purple according to their vote shares for Bush in 2000 and 2004 and McCain in 2009 (red if popular vote went for Republican candidate, blue if popular vote went for Democratic candidate, purple for states that switch from election to election). State data on vote share for particular candidates are available online through the Federal Election Commission, Public Disclosure Division.[xvii]

A related concept to state ideology is state political culture. In addition to the gross distinction between red and blue states, studies of American politics have distinguished states by long-run differences in their political culture, which is considered to capture relatively stable cultural orientations of different places. A frequently cited definition of political culture is the "particular pattern of orientations to political action" (Almond and Verba, 1963). Segmenting states according to political culture produces a classification different from classifying states strictly according to partisanship, or red, blue and purple. To test the impact of state political culture, we employ Elazar's (1984) classical framework of state political culture. Elazar (1984) defined three types of states with distinct political cultures related to how public policy is

formulated in these states and characteristics of the state populace-Moralistic, Individualistic and traditionalistic states (Figure 3). "Moralistic" states are those states where political positions are typically justified by appeals to the "public interest," rather than narrower interests, and public administration is strong. In "individualistic" states, in contrast, government tends to serve more specific interests. Parties are strong, each standing for coalitions of groups seeking advantages from government. Finally, in the "traditionalistic" culture, chiefly in the South, government is limited largely to defending traditional values (originally the racial caste system). Bureaucracy is underdeveloped and distrusted. These classifications have been validated in a several studies (Mead, 2004; French & Stanley).

Classification according to the state political culture was based on Elazar's (1984) classification system. Moralistic states were assigned "1", individualistic states "2" and traditionalistic states are assigned "3".

We hypothesize that federal abstinence-only funds may have different effects on outcomes in states with different political ideologies/cultures and will treat this variable as an effect modifier (discussed in analysis section below).

2. Data Analysis

Repeat Measures GEE. State adolescent sexual and reproductive health outcomes were modeled over time (2003 through 2010) using linear mixed-effects models for repeated measures (repeated observations over time nested within states). The basic model will be specified as follows: $y_{st} = \mu_t + \beta x_{st} + \gamma z_s + Є_{st}$, s= 1,...,50; t=2003,…,2011, where y_{st}= e.g., teen births/pregnancy/abortions per 1,000 in state *s* at time *t*. x_{st} is a column vector of variables that vary both over states and over time (e.g., per pupil abstinence-only funding and state sexuality education content). z_s is a column vector of variables that describe states but do not change over time (e.g., state socio-demographic and political characteristics). Each dependent variable will be modeled separately and in a stepwise fashion. First, demographic controls will be

entered. Next, measures of the socio-political climate will be entered along with interaction terms for state sexuality education content laws. Finally, stratified analysis by state political climate will be performed. As an additional robustness check, we will make targeted comparisons of states with similar demographic and socio-political contexts but that differ in whether they received abstinence-only funding over the time period. All data analysis will be performed using STATA version 12.

Using information for all available years and states, we conducted a time-series mixed modeling analysis to analyze the impact of additional federal abstinence-only funding to states on state adolescent sexual and reproductive health outcomes adjusting for: 1.) State demographic, socio-cultural and political characteristics; and 2.) Laws and policies affecting access to family planning within a state. State sexuality education content policies were then entered as effect modifiers of the relationship between abstinence-only funding and adolescent sexual and reproductive health outcomes. In addition to these primary tests, we will do a series of additional tests and robustness checks described below.

Stratified analysis by State Political Culture to test for effect modification. States that traditionally vote Democratic, "blue" states, differ from states that traditionally vote Republican, "red" states, demographically and socio-culturally in a way that might influence how abstinence-only messages are received by students. These states also have different state sexuality education content laws and laws influencing access to contraceptives that may mitigate any impact of abstinence-only messages received in the classroom. We hypothesize that abstinence-only funding will have different effects on sexual and reproductive health outcomes in states with different socio-political environments. Specifically, we hypothesize that abstinence-only funding could have its intended effect on adolescent sexual behavior in red states, where abstinence-only messages may accord with deeply held values. On the other hand, we hypothesize no effect in blue states where abstinence-only will be less likely to accord with the values of the majority and an ambiguous effect in "purple" swing states.

Results

There was a secular trend in the direction of declining teen births and pregnancy across states, although teen births experienced an uptick between 2006 and 2009. In spite of the secular trend, higher levels of federal funding for abstinence only education was associated with an increase in teen pregnancy rates ($p<0.01$). Each dollar of federal spending per-pupil was associated with a .01/1000 increase in the pregnancy rate, a finding, which remained robust after accounting for state demographic and poverty statistics. In other words, for each $100 invested in abstinence-only, teen pregnancy increased by 1 per 1,000. Federal funding for abstinence-only was also associated with an increase in teen birth rates, however, this relationship disappeared once demographic and other state characteristics were entered in the model. No relationship was found between teen abortion rates and federal abstinence only sex education funding.

School abstinence-only curriculum content laws were associated with increasing pregnancy and birth rates, though negatively associated with abortion rates. The interaction between state content laws and state abstinence-only funding was marginally significantly associated with increasing teen births, but not pregnancy or abortion. Thus, states where abstinence-only is required to be stressed and have higher federal abstinence-only funds increased the teen birth rate more.

Stratified analysis by state political culture revealed that the increase in pregnancy rates associated with abstinence-only funding was driven largely by moralistic states, which tend to adopt more liberal policies. When stratified according to state political ideology, abstinence-only funding had a negative influence on teen births whereas funding had a positive impact among purple states. There were no differences across states in the influence of abstinence-only funds on pregnancy or abortion.

Discussion

Teen pregnancy and birth rates have been declining across the country and even accounting for state differences, teen pregnancy has been experiencing a secular decline.

Conclusions

Our results indicate that abstinence only sex education does not lower teen birth or abortion rates, and is significantly associated with higher overall teen pregnancy rates. Ongoing federal funding for abstinence only sex education is counterproductive to public health goals.

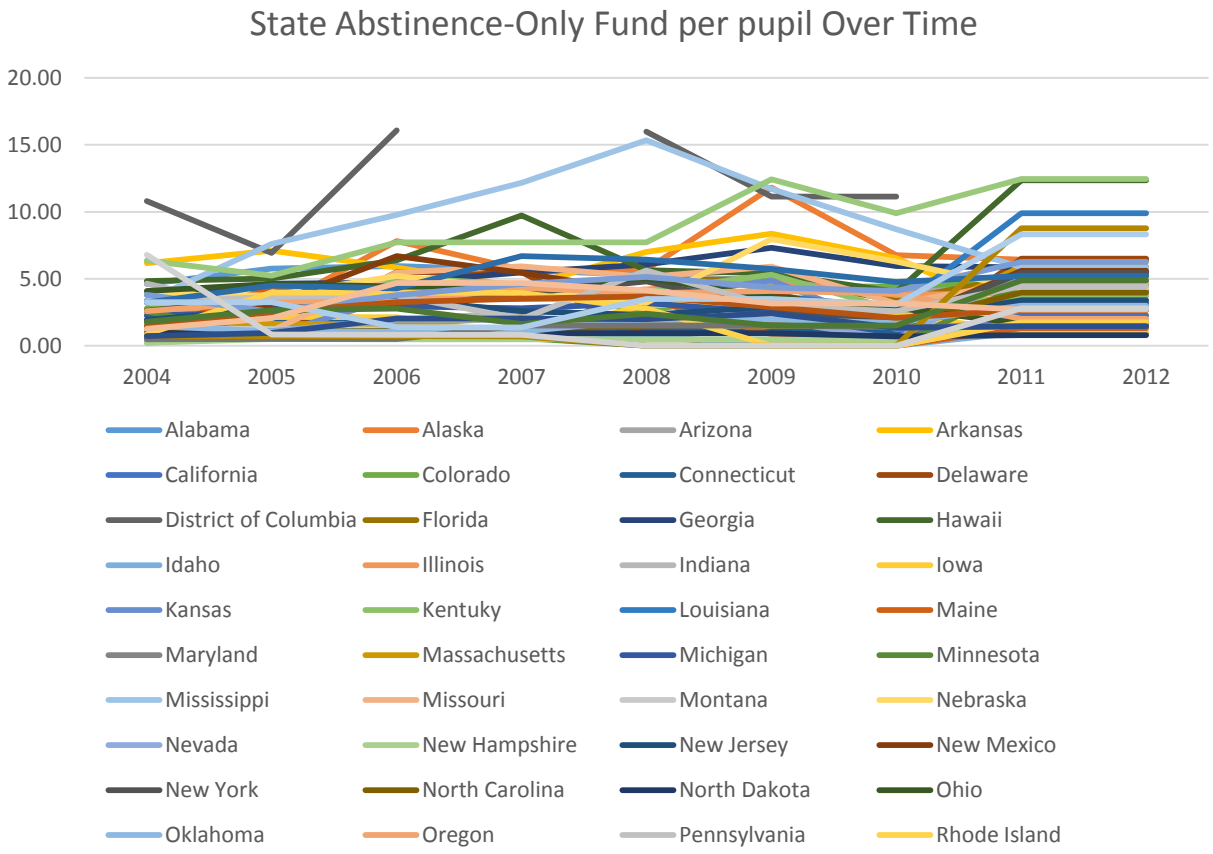

State Abstinence-Only Fund per pupil Over Time
20.00
15.00
10.00
5.00
0.00
2004
2005
2006
2007
2008
2009
2010
2011
2012
Alabama
Alaska
Arizona
Arkansas
California
Colorado
Connecticut
Delaware
District of Columbia
Florida
Georgia
Hawaii
Idaho
Illinois
Indiana
Iowa
Kansas
Kentuky
Louisiana
Maine
Maryland
Massachusetts
Michigan
Minnesota
Mississippi
Missouri
Montana
Nebraska
Nevada
New Hampshire
New Jersey
New Mexico
New York
North Carolina
North Dakota
Ohio
Oklahoma
Oregon
Pennsylvania
Rhode Island

Table 1: Teen Pregnancy per 1,000 by Abstinence Only Funding per Pupil

	(1) Pregnancy Rate	(2) Pregnancy with Demographics	(3) Pregnancy with Demographics and Laws	(4) Pregnancy with Demographics and Law-funding Interaction	(5) Pregnancy Moralistic States	(6) Pregnancy Individualistic States	(7) Pregnancy Traditionalistic States
VARIABLES							
Abstinence Only Funds per Pupil	0.01***	0.01***	0.01***	0.01***	0.01*	0.01	-0.02
	(0.002)	(0.003)	(0.003)	(0.004)	(0.007)	(0.010)	(0.063)
School curriculum must stress abstinence			0.04*	0.04*	0.08*	0.01	-0.05
			(0.021)	(0.024)	(0.048)	(0.038)	(0.122)
School curriculum must stress abstinence* abstinence only funding per pupil				-0.00	-0.01*	0.00	0.01
				(0.003)	(0.008)	(0.008)	(0.031)
% white <60% (ref)		0	0	0	0	0	0
% white 60-74.9%		0.03	0.03	0.03	-0.39***	0.02	0.01
		(0.022)	(0.022)	(0.022)	(0.123)	(0.041)	(0.045)
% white 75%+		-0.17***	-0.16***	-0.16***	-0.39***	-0.29***	-0.06
		(0.031)	(0.031)	(0.031)	(0.121)	(0.069)	(0.062)
Median household income <$50,000 (ref)		0	0	0	0	0	0
Median household income $50,000-64,999		0.01	0.01	0.01	0.01	-0.05	0.11**
		(0.016)	(0.016)	(0.016)	(0.020)	(0.051)	(0.045)
Median household income $65,000+		-0.04	-0.03	-0.03	0.01	-0.17**	-0.34**
		(0.025)	(0.025)	(0.025)	(0.030)	(0.071)	(0.151)
% below poverty <10% (ref)		0	0	0	0	0	0
% below poverty 10-14.9%		0.02	0.02	0.02	0.02	0.00	-0.08
		(0.014)	(0.014)	(0.014)	(0.018)	(0.028)	(0.091)
% below poverty 15%+		0.03	0.03	0.03	-0.01	-0.01	-0.07
		(0.021)	(0.021)	(0.021)	(0.040)	(0.055)	(0.098)
Year							
2005 (ref)							
2008	0.00	-0.00	-0.00	-0.00	0.02*	-0.02	0.03
	(0.006)	(0.009)	(0.008)	(0.008)	(0.011)	(0.019)	(0.026)
2010	-0.15***	-0.17***	-0.16***	-0.16***	-0.14***	-0.17***	-0.13***
	(0.006)	(0.010)	(0.009)	(0.009)	(0.013)	(0.024)	(0.027)

Constant	4.14***	4.19***	4.13***	4.13***	4.20***	4.34***	4.46***
	(0.019)	(0.034)	(0.043)	(0.045)	(0.128)	(0.095)	(0.231)
Observations	153	153	153	153	51	51	48
Number of id	51	51	51	51	17	17	16

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

TABLE 2: Adolescent Birth Rate per 1,000 by Abstinence Only Funding

VARIABLES	(1) Birth Rate	(2) Birth Rate w Demographics	(3) Birth Rate w Demographics and Laws	(4) Birth Rate Moralistic States	(5) Birth Rate Individualistic States	(6) Birth Rate Traditionalistic States
Abstinence Only Funds per Pupil	0.00***	0.00	-0.00	0.01**	0.01**	0.02***
	(0.001)	(0.001)	(0.002)	(0.004)	(0.003)	(0.009)
School curriculum must stress abstinence			0.12***	0.04	0.05	0.29***
			(0.026)	(0.053)	(0.041)	(0.076)
School curriculum must stress abstinence* abstinence only funding per pupil			0.00*	-0.01***	-0.00	-0.01**
			(0.002)	(0.004)	(0.002)	(0.005)
% white <60% (ref)						
% white 60-74.9%		0.04***	0.03**	-0.19	-0.00	0.07***
		(0.011)	(0.013)	(0.155)	(0.020)	(0.014)
% white 75%+		-0.02	-0.03	-0.20	0.06	0.05*
		(0.018)	(0.021)	(0.154)	(0.043)	(0.025)
Median household income <$50,000 (ref)						
Median household income $50,000-59,999		0.01	0.01	-0.01		0.01
		(0.008)	(0.010)	(0.025)		(0.008)
Median household income $60,000-74,999		-0.02**	-0.03**	-0.01	0.02	0.02
		(0.011)	(0.013)	(0.029)	(0.012)	(0.027)
Median household income $75,000+		-0.05***	-0.05***	0.00	-0.02	-0.03
		(0.015)	(0.018)	(0.035)	(0.023)	(0.034)
% below poverty <10% (ref)						

% below poverty 10-14.9%		-0.01	-0.00	-0.00	-0.04***	-0.05**
		(0.006)	(0.007)	(0.011)	(0.011)	(0.021)
% below poverty 15%+		-0.03***	-0.02**	-0.03	-0.04*	-0.06***
		(0.009)	(0.011)	(0.027)	(0.021)	(0.023)
Year						
2004 (ref)						
2005	-0.02***	-0.02***	-0.02***	-0.01	-0.01	-0.02**
	(0.006)	(0.006)	(0.007)	(0.011)	(0.012)	(0.009)
2006	0.02***	0.02***	0.02***	0.03***	0.02	0.03***
	(0.006)	(0.006)	(0.007)	(0.011)	(0.012)	(0.009)
2007	0.04***	0.04***	0.04***	0.06***	0.04***	0.05***
	(0.006)	(0.006)	(0.007)	(0.012)	(0.012)	(0.010)
2008	0.02***	0.02***	0.02***	0.05***	0.03**	0.03***
	(0.006)	(0.006)	(0.007)	(0.011)	(0.012)	(0.010)
2009	-0.07***	-0.07***	-0.07***	-0.04***	-0.07***	-0.06***
	(0.007)	(0.006)	(0.007)	(0.012)	(0.013)	(0.010)
2010	-0.17***	-0.17***	-0.17***	-0.13***	-0.17***	-0.16***
	(0.007)	(0.007)	(0.008)	(0.012)	(0.015)	(0.010)
2011	-0.26***					
	(0.008)					
2012	-0.31***					
	(0.008)					
Constant	3.70***	3.71***	3.57***	3.64***	3.50***	3.45***
	(0.022)	(0.027)	(0.043)	(0.159)	(0.064)	(0.135)
Observations	455	355	355	119	119	111
Number of id	51	51	51	17	17	16

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 3: Adolescent Abortion Rate per 1,000 by abstinence funding

VARIABLES	(1) Abortion	(2) Abortion w/ Demographics	(3) Abortion w/ Demographics and Laws	(4) Abortion w/ Demographics and Laws Interaction	(5) Abortion Moralistic States	(6) Abortion Individualistic States	(7) Abortion Traditionalistic States
Abstinence Only Funds per Pupil	0.00	0.01	0.01	0.01	-0.01	0.02	-0.04
	(0.005)	(0.005)	(0.005)	(0.006)	(0.019)	(0.015)	(0.095)
School curriculum must stress abstinence			-0.14***	-0.15***	0.21**	0.01	0.10
			(0.041)	(0.045)	(0.098)	(0.067)	(0.247)
School curriculum must stress abstinence* abstinence only funding per pupil				0.00	0.00	-0.00	0.02
				(0.005)	(0.018)	(0.012)	(0.047)
% white <60% (ref)		0	0	0	0	0	0
% white 60-74.9%		0.06*	0.06*	0.06*	-0.73***	0.14**	0.19***
		(0.036)	(0.038)	(0.037)	(0.219)	(0.057)	(0.068)
% white 75%+		-0.26***	-0.29***	-0.29***	-0.78***	-0.70***	-0.07
		(0.055)	(0.058)	(0.058)	(0.210)	(0.127)	(0.115)
Median household income <$50,000 (ref)							
Median household income $50,000-59,999		0.09***	0.09***	0.09***	-0.13		0.10**
		(0.029)	(0.031)	(0.031)	(0.086)		(0.043)
Median household income $60,000-74,999		0.05	0.05	0.05	-0.11	-0.05	0.43
		(0.037)	(0.039)	(0.039)	(0.098)	(0.037)	(0.330)
Median household income $75,000+		0.01	-0.00	-0.00	-0.10	-0.08	0.24
		(0.050)	(0.051)	(0.051)	(0.127)	(0.065)	(0.317)
% below poverty <10% (ref)		0	0	0	0	0	0
% below poverty 10-14.9%		0.03	0.03	0.03	-0.00	0.08*	0.04
		(0.023)	(0.023)	(0.023)	(0.039)	(0.042)	(0.115)
% below poverty 15%+		0.09***	0.09***	0.09***	-0.04	0.10	0.16
		(0.034)	(0.035)	(0.034)	(0.081)	(0.082)	(0.128)
Year							
2005 (ref)							
2008	-0.05***	-0.05***	-0.06***	-0.06***	-0.05**	-0.05*	0.03

	(0.013)	(0.014)	(0.014)	(0.014)	(0.026)	(0.027)	(0.037)
2010	-0.24***	-0.27***	-0.27***	-0.27***	-0.29***	-0.22***	-0.23***
	(0.013)	(0.016)	(0.016)	(0.016)	(0.031)	(0.038)	(0.037)
Constant	2.79***	2.78***	2.95***	2.96***	3.14***	3.18***	2.14***
	(0.037)	(0.063)	(0.080)	(0.081)	(0.237)	(0.118)	(0.464)
Observations	153	153	153	153	51	51	48
Number of id	51	51	51	51	17	17	16

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figure 13: State Political Culture Categories

Moralistic States	Individualistic States	Traditionalistic States
CALIFORNIA	ALASKA	ALABAMA
COLORADO	CONNECTICUT	ARIZONA
IDAHO	DELAWARE	ARKANSAS
IOWA	HAWAI	FLORIDA
KANSAS	ILLINOIS	GEORGIA
MAINE	INDIANA	KENTUCKY
MICHIGAN	MARYLAND	LOUISIANA
MINNESOTA	MASSACHUSETTS	MISSISSIPPI
MONTANA	MISSOURI	NEW MEXICO
NEW HAMPSHIRE	NEBRAKA	NORTH CAROLINA
NORTH DAKOTA	NEVADA	OKLOHAMA
OREGON	NEW JERSEY	SOUTH CAROLINA
SOUTH DAKOTA	NEW YORK	TENNESSEE
UTAH	OHIO	TEXAS
VERMONT	PENNSYLVANIA	VIRGINIA
WASHINGTON	RHODE ISLAND	WEST VIRGINIA
WISCONSIN	WYOMING	

Unassigned= DISTRICT OF COLUMBIA

REFERENCES

[i] Woolf SH, ed, Aron L, ed. U.S. Health in International Perspective: Shorter Lives, Poorer Health. National Research Council and Institute of Medicine. Institute of Medicine. Washington, DC: National Academies Press; 2013. Retrieved from: http://sites.nationalacademies.org/ DBASSE/CPOP/US_Health_in_International_Perspective/index.htm#.Ue5-ox1lXK1

[ii] Mathews TJ, Sutton PD, Hamilton BE, Ventura SJ. State Disparities in Teenage Birth Rates in the United States. *NCHS Data Brief* 2010; 46: 1-7. Retrieved from: http://www.cdc.gov/nchs/data/databriefs/db46.pdf

[iii] Hamilton BE, Mathews TJ, Venture SJ. Declines in state teen birth rates by race and Hispanic origin. NCHS data brief. No. 123. Hyattsville, MD: National Center for Health Statistics. 2013.

[iv] Martin JA, Hamilton BE, Ventura SJ. Births: Final data for 2011. *National Vital Statics Report* 2013; 61(1):1-34. Retrieved from: http://www.cdc.gov/nchs/data/nvsr/nvsr62/nvsr62_01.pdf

[v] Cavazos-Rehg PA, Krauss MJ, Spitznagel EL, Iguchi M, Schootman M, Cottler L, Grucza RA, Bierut LJ. Associations between sexuality education in schools and adolescent birthrates: A state-level longitudinal model. Arch Perdiatr Adolesc Med 2012; 166(2): 134-140. doi: 10.1001/archpediatrics.2011.657

[vi] Stanger-Hall KF, Hall, DW. Abstinence-only education and teen pregnancy rates: Why we need comprehensive sex education in the US. *PLoS ONE* 2011; 6(10): 1-11. doi: 0.1371/journal.pone.0024568

[vii] Hogben M, Chesson H, Aral SO. Sexuality education policies and sexually transmitted disease rates in the United States of America. *Int J STD AIDS* 2010; 21(4): 293-7: doi: 10.1258/ijsa.2010.009589

[viii] Atkins D, Bradford WD: The effect of state-level sex education policies on youth sexual behaviors. Panel Paper for Association for Public Policy Analysis & Management Conference, 2012. Retrieved from: https://appam.confex.com/appam/2012/ webprogram/Paper2155.html

[ix] SEICUS. A history of federal funding for abstinence-only-until-marriage programs. *SEICUS factsheets* 2010. Retrieved from: http://www.siecus.org/document/docWindow.cfm?fuseaction=document.viewDocument&documentid=68&documentFormatId=68

[x] Santelli J. Ott MA, Lyon M, Rogers J, Summers D, Schleifer R. (2006). Abstinence and abstinence-only education: A review of US policies and programs. *Journal of Adolescent Health*, 38: 72-81.

[xi] Kirby D. Emerging Answers: Research Findings on Programs to Reduce Teen Pregnancy. Washington, DC: National Campaign to Prevent Teen Pregnancy, 2007. Retrieved from: http://www.thenationalcampaign.org/resources/pdf/pubs/EA2007_final.pdf

[xii] Manlove J, Romano-Papillo, A. Ikramullah E. Not yet: Programs to delay first sex among teens. Washington, DC: National Campaign to Prevent Teen Pregnancy, 2004. Retrieved from: http://www.thenationalcampaign.org/resources/pdf/pubs/notyet.pdf

[xiii] Guttmacher Institute. State Data Center. http://www.guttmacher.org/datacenter/table.jsp#. July, 2013.

[xiv] National Center for Health Statistics. Vital Statistics: http://www.cdc.gov/nchs /vitalstats.htm

[xv] National Center for Education Statistics. http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2007352

[xvi] United States Census Bureau. Small Area Income and Poverty Estimates. http://www.census.gov/did/www/saipe/data/statecounty/data/2010.html July, 2013.

[xvii] Federal Election Commission: http://www.fec.gov/pubrec/2000presgeresults.htm