

Acquired Immune Deficiency Syndrome, Risky Sexual Behavior and Abortion

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Abstract: **Problem statement:** incidence of abortion in the United States has steadily declined since 1990. The question is why? **Approach:** This study, using multiple linear regression, examines whether women's unprotected sexual activity is deterred by the risk of contracting AIDS as reflected in decreased abortion rates. **Results:** The empirical evidence consistently finds that the prevalence of AIDS reduces the risky (unprotected) sexual activity of women of childbearing ages 15-44 as reflected in their abortion rates. The empirical results remain robust for the abortion rates of teens ages 15-17 and for teens ages 15-19. **Conclusion:** The empirical results suggest that the behavioral modification induced by the prevalence of AIDS accounted for 21% of the decrease in abortion rates over the time period 1992-2005.

Key words: AIDS, abortion, sexual behavior

INTRODUCTION

The incidence of abortion in the United States has declined steadily since peaking in 1990. The 1.21 million abortions performed in 2005 represent a 25% decline from 1990. The U.S. had fewer abortions in 2005 than it had in 1976, even though there were 4.5 million more females of childbearing age. Similarly, the abortion rate decreased from 27.4 abortions per 1000 women ages 15-44 in 1990-19.4 in 2005. The abortion ratio fell from 28.0 abortions per 100 pregnancies in 1990-22.4 in 2005 (Jones *et al.*, 2008).

A variety of plausible reasons have been offered to explain this dramatic decline: (1) welfare reform; (2) a decline in the numbers of abortion providers; (3) enactment of informed consent laws that mandate physicians/clinics provide to women seeking an abortion, medical information (e.g., fetal pain, breast cancer, financial assistance) designed to dissuade a woman from having an abortion; (4) use of more efficacious methods of contraception (e.g., Norplant and Depo-Provera); and (5) changing demographic factors (Sawhill, 2006).

However, none of these factors provide an entirely satisfactory explanation for the steady decline in abortion since 1990. First, substantive welfare reform did not occur until 1996 with the passage of the Personal Responsibility and Work Opportunity Reconciliation Act. Second, in 2005, there were 1787 abortion providers; a decline of 25% from 1992. But, most of the decline was providers with small abortion caseloads. In 2005, there were 401 providers with large

caseloads (1000+ abortions) that provided 80% of all abortions (Jones *et al.*, 2008). Third, informed consent laws place no restrictions on abortion access or availability. Fourth, highly reliable and injectable contraceptive methods were used by less than 4% of all contraceptive users in 1995 (Piccinion and Mosher, 1998). Fifth, the proportion of women of childbearing age between the most sexually active ages of 18-24 years increased from 1990-003 (Finer, 2007).

While acknowledging that the above factors may have contributed to the fall in the incidence of abortion, another important factor that may be responsible for the decline in abortion is the emergence and spread of the Acquired Immune Deficiency Syndrome (AIDS) virus. The AIDS virus was first identified in late 1981. By 2005, more than 925,000 cases of AIDS had been reported in the United States, while over 550,000 individuals had died from AIDS (Centers for Disease Control, 2005).

In a seminal article, Kane and Staiger (1996) argue that women's decisions regarding their level of risky (unprotected) sexual activity are endogenous. Increases in the cost of engaging in risky sexual activity may alter women's initial decisions concerning the frequency of unprotected sexual activity, thereby reducing the likelihood of an unintended pregnancy and, consequently, an abortion. Given the fatal consequences of AIDS, sexually active women may be induced to use condoms or abstain from sexual activity, as the risk of contracting AIDS increases. Thus, another reason why the incidence of abortion has declined since 1990 is that the rise in the prevalence of contracting AIDS may

have decreased the level or frequency of women's unprotected sexual activity causing a reduction in the number of unintended pregnancies and, concomitantly, a decline in abortions.

Whether women's unprotected sexual activity is deterred by the risk of contracting AIDS is an important public and social policy question. Yet the behavioral response of sexually active women to the AIDS disease is not well documented. Previous studies on abortion did not account for the risk of contracting AIDS in their analysis. This study empirically investigates whether there has been a behavioral modification in the unprotected sexual activity of women, as reflected in their abortion rates, due to the risk of contracting AIDS. Specifically, this study, employing a difference-in-differences approach, examines whether the risk of contracting AIDS caused a decrease in abortion rates in the United States over the time period 1981-2005.

Brief history of AIDS: The Centers for Disease Control reported the first case of Acquired Immune Deficiency Syndrome (AIDS) in June 1981. Initially, it was thought that AIDS could only be contracted by men who had sex with other men. Public awareness of AIDS was limited until starting in 1985 when various celebrities (tennis star Arthur Ashe, author Isaac Asimov, actor Rock Hudson, choreographer Alvin Ailey) announced they had contracted the disease and subsequently passed away. These announcements were significant in making the general public aware that AIDS was a deadly disease for which there was no cure.

In 1986, the U.S. Surgeon General issued a report on AIDS. Recommendations for the prevention of sexually transmitted AIDS included abstinence, long-term monogamy with a seronegative partner or a limited number of lifetime sexual partners. In addition, "safe sex" guidelines were developed which urged sexually active heterosexuals to avoid the exchange of bodily fluids, particularly semen, during sexual activity. The consistent and careful use of condoms for sexually active heterosexual males during each and every act of intercourse was recommended.

Heterosexual contact with an infected partner is the greatest risk factor for sexually active women. In 1984, 1% of male AIDS cases and 11% of female cases were attributed to heterosexual contact. By 2005, the percentage had risen to 10% for men and 45% for women. Current medical studies indicate that the use of condoms on a consistent basis reduces the rate of heterosexual transmitted AIDS by 87% (Davis and Weller, 1999). Given the high mortality rate of AIDS, it is hypothesized that sexually active women in states with a high prevalence of AIDS will reduce their level of risky sexual activity resulting in fewer unintended pregnancies as reflected in decreased abortion rates.

Theoretical perspectives: The causal behavioral link between AIDS and the risky (unprotected) sexual behavior of women is straightforward. The possible contracting of AIDS is one of the most notable costs of women's risky sexual activity. As the prevalence of AIDS increases, women engaged in unprotected sexual activity face a higher risk of contracting AIDS.

As the risk of contracting AIDS increases, the cost of engaging in unprotected sexual activity relative to the cost of protected (safe) sexual activity increases. The fundamental law of demand states that an increase in the relative cost of commodity X induces individuals to reduce their consumption of commodity X and increase their consumption of other commodities.

An increase in the cost of unprotected sexual activity due to the increased risk of contracting AIDS should therefore induce sexually active women to substitute away from unprotected sexual activity by using condoms, reducing the number of sexual partners, decreasing the frequency of risky sexual activity or abstaining from sexual activity altogether in order to lessen the risk of contracting AIDS. To the extent that this substitution occurs, the number of unintended pregnancies and, concomitantly, the number of abortions should decrease.

Since the primary way sexually active women contract AIDS is to engage in unprotected sexual activity, this leads to the empirically verifiable hypothesis that, other things being equal, sexually active women residing in states with a greater risk of contracting AIDS should be less prone to engage in unprotected sexual activity resulting in fewer unintended pregnancies and consequently lower abortion rates than their counterparts in states with less risk of contracting AIDS.

Literature review: Very little research has directly examined the impact of AIDS on abortion rates. Most studies have examined the cost factors that affect women's risky sexual behavior that leads to unintended pregnancies and abortions.

Jonathan (2001), using data from the Youth Risk Behavior Survey, found that economic costs as measured by labor market conditions (opportunity cost factors of becoming pregnant) and the generosity of the welfare system (cost of an unintended pregnancy is reduced) are significantly related to changes in teens' risky sexual activity. In particular, decreases in the unemployment rate and welfare benefits are associated with a decline in teen girls' likelihood of risky sexual activity, noncontracepted sexual activity and pregnancy risk. Averett *et al.* (2002), using data from the National Survey of Family Growth, found that the median family

income (an opportunity cost factor) in a teen's census tract neighborhood was negatively related to the probability of a teen being sexually active and positively related to the probability of the teen using contraception. Sen (2006), using data from the National Longitudinal Survey of Youth, found that the family income of a teen (an opportunity cost factor) had a significantly negative impact on the frequency of teen sexual activity. Jones *et al.* (2005), using survey data, found that if parental involvement (an emotional cost) were required, 91% of teen minors whose parents did not know they were visiting a family planning clinic would substitute over-the-counter contraceptives, obtain birth control prescriptions from private doctors or abstain from having sex, while only 9% would still have sex, but use no birth control method.

The results of these empirical studies suggest that increases in the economic and emotional costs of engaging in unprotected sexual activity do induce a modification in women's behavior regarding risky sexual activity and contraceptive use.

Data: The data on AIDS are available in the HIV/AIDS Surveillance Report 1992, 1996, 2000, 2005 (Centers for Disease Control). All the socioeconomic data used in this study are from the U.S. Census of Population 1980, 1990, 2000 (USBC, 1983) and the Statistical Abstract of the United States. The data on religious denominations in each state are from the Association of Religious Data Archives. State abortion policies are from the Guttmacher Institute (2008).

State abortion data is available from two different sources: The Centers for Disease Control (CDC) and the Guttmacher Institute (GI). The CDC publishes state abortion figures on a yearly basis based upon information supplied by each state's public health department. The CDC acknowledges that its state abortion figures are incomplete and underreported. Not all states provide abortion figures to the CDC every year. Not all abortion providers report figures to their state public health agencies every year.

In addition, the CDC abortion figures are reported only by the state in which the abortion was performed (state of occurrence) rather than by the state of residence. Occurrence-based state abortion figures ignore travel by women to nearby states to obtain an abortion. This distinction is important because a state may have a restrictive abortion law that reduces the access or availability of abortion, inducing women to seek abortions in nearby states without such restrictive laws. The use of occurrence-based state abortion figures will create an upward bias (a larger impact than actually exists) because abortion rates are underestimated in those states with restrictive abortion laws and

overestimated in contiguous states without such restrictive abortion laws.

The Guttmacher Institute is generally acknowledged to collect more accurate and comprehensive state abortion data because their figures are obtained directly from all abortion providers in a state. The GI uses a consistent collection methodology, but it does not collect state abortion data every year. The GI does report abortion figures by state of residence, but only on an even more limited basis. This study uses the GI abortion figures for the years 1981, 1992, 1996, 2000 and 2005, because these five sample years are the only years in which the GI reports abortion figures by state of residence. Summary statistics for all the variables used in this study are reported in Table 1.

Empirical framework: A difference-in-differences method is used to estimate the effect of the prevalence of AIDS on abortion rates in the United States over the period 1981 to 2005. In October 1991, basketball star Magic Johnson publicly announced that he had contracted the precursor disease to AIDS through a heterosexual contact. This announcement and the resulting nationwide publicity was a major factor in increasing the public's awareness of heterosexual transmission of AIDS and the need for safe (i.e., prophylactic) sexual practices. Prior to 1992, the possibility of contracting AIDS through heterosexual activity had very little informational effect on women's risky sexual behavior. This means that there are approximately ten years prior to the treatment date of 1992 and thirteen years after. Since AIDS cases were reported to the CDC at different rates in different states, we are able to exploit this variation to investigate the effect of the risk of contracting AIDS on abortion rates.

The abortion equation to be estimated takes the form:

$$\text{Abortion Rate}_{st} = b_0 + b_1 \text{AIDS}_{st} + b_2 X_{st} + b_3 \text{AbortionCosts}_{st} \quad (1)$$

Table 1: Summary statistics

Variable	Mean	Standard deviation
Abortion rate	19.06	8.62
AIDS	524.01	624.09
Abortion price	391.75	76.75
Female income	23910.73	4336.27
Education	79.09	6.69
Single	35.07	4.11
% Women 18-24	23.35	3.13
Evangelicals	14.54	13.58
No Medicaid funding	0.70	0.45
Parental involvement	0.48	0.50
Informed consent	0.34	0.47
Two-visit law	0.08	0.27

The dependent variable is the *abortion rate*-the number of abortions per 1000 women of childbearing ages 15-44 years-in state s at time period t = 1981, 1992, 1996, 2000 and 2005. Thus there are 250 observations.

The independent variable of particular interest, AIDS, is the measure of the risk of contracting AIDS. We follow the epidemiological literature by using the cumulative number of reported AIDS cases per 1000 women of childbearing ages 15-44 in state s during time period t to measure the risk of contracting AIDS. Data on the prevalence of AIDS cases is only available at the state level due to federal confidentiality restrictions.

The variable X is a vector of socioeconomic characteristics of women of childbearing ages in state s that the literature has found to be determinants of women's pregnancy resolution decision. These include the average full-time Income of women (in year 2000 dollars) to measure the opportunity cost of a woman's time and the potential income foregone as a result of bearing a child. Education is the percentage of women ages 25-44 who have completed twelve years or more of schooling-women with relatively greater human capital may be more aware of the risks and fatal consequences of contracting AIDS as well as have better knowledge about effective contraceptive methods. Single is the percentage of women ages 15-44 who are unmarried-single women have a higher opportunity cost of childbearing, more likely to have multiple sexual partners and higher outlays for childbearing than married women. The % Women 18-24 is the percentage of women of childbearing ages 15-44 who are between the most sexually active ages of 18-24.

The sexual behavior of women is also likely to be influenced by their religion's tenets or precepts. The Catholic Church strongly disapproves of any artificial birth control methods and has publicly proclaimed the sinfulness of such methods (particularly abortion). Prior research, however, has consistently found that Catholic women do not support the official position of the Catholic Church on contraception or abortion (Medoff, 2012). One religious group that requires strict adherence to its moral absolutes about the sinfulness of premarital sexual activity, the importance of a large family and the sanctity of life are Evangelical Christians. The variable *Evangelicals* is the percentage of each state's population that belongs to a religious denomination that believes in the literal interpretation of the Bible.

It is also important to control for other observable state-specific policy variables that may have changed over time causing a change in the direct or indirect cost of an abortion. The Abortion Price is the average cost

(in year 2000 dollars) of an abortion performed in state s in year t. During the sample period many states enacted various restrictive abortion laws designed to reduce the access or availability of abortion. There are four types of restrictive abortion laws that have been enacted by states and ruled to be constitutional by the U.S. Supreme Court.

A vector of indicator variables represents whether these restrictive abortion laws were in effect in each state/year. No Medicaid Funding is equal to one if state s prohibited its public funds from being used to pay for abortions for indigent women. Parental Involvement is equal to one if state s requires parental involvement (either permission or notification) before an unmarried teen minor (less than 18 years of age) could have an abortion. Informed Consent equals one if state s requires that an abortion provider furnish to women patients state-mandated abortion-specific information by mail, telephone, fax or the Internet at least 24 h before the procedure is performed. But only one visit to an abortion provider is required in these states since the information does not have to be provided in person. The variable Two-Visit Law equals one if state s requires that the state-mandated abortion-specific information must be provided in person at least 24 h before the procedure, thereby necessitating two separate trips to the abortion provider.

Empirical results: In Eq. 1, the price of an abortion is endogenous since, as noted by Jonathan (2001) "...prices are determined by the behavior of those who supply abortion services and those who demand them." The econometric solution to this problem is to find instruments for the abortion price that are correlated with the abortion price, but do not directly affect the demand for abortion and then estimate equation (1) using two-stage least squares (Gujarati, 2007). Following Blank *et al.* (1996), the instruments selected for the abortion price are (a) the number of nurses per 100,000 population; (b) the number of non-OBGYN physicians per 100,000 population; and (c) the average weekly wage of employees in clinics and offices of physicians. These instruments are related to the overall level of availability and accessibility of health care providers of general medical services, but should not be significantly affected by the demand for abortion within a state.

Estimates of Eq. 1 for two alternative specifications are presented in Table 2. Model 1 in the first column of Table 2 controls for unobserved time-invariant differences in sexual-abortion attitudes in each state which may induce changes in women's risky behavior by including a state-specific fixed effects model (a dummy variable for each state).

Table 2: Estimates of Abortion Demand, 1981-2005

Independent Variables	Dependent variable: Abortion rate of women ages 15-44	
	Model 1	Model 2
AIDS	-0.0015 (6.87)***	-0.0014 (4.22)***
Abortion Price	-0.0002 (1.67)*	-0.0001 (1.66)*
No Medicaid Funding	-0.1299 (3.23)***	-0.1271 (3.12)***
Parental Involvement	-0.1431 (3.63)***	-0.1331 (3.25)***
Informed Consent	0.0040 (.09)	0.0017 (.04)
Two-Visit Law	-0.2501 (1.71)*	-0.2359 (1.64)
Female Income	0.0000 (1.65)*	0.0000 (1.71)*
Single	0.0200 (3.15)***	0.0173 (2.63)**
Education	0.0294 (7.24)***	0.0288 (6.65)***
% Women 18-24	0.0192 (2.30)**	0.0191 (2.10)**
Evangelicals	-0.0057 (2.75)***	-0.0055 (2.63)***
State-Specific Fixed Effects	Yes	Yes
Year-Specific Fixed Effects	No	Yes
F- Statistic	918.97	857.73

Note: N = 250. Absolute value of t-statistics in parentheses: *p<0.10, **p<0.05, ***p<0.01

Model 2 in the second column of Table 2 controls for time-varying factors that may have affected the risky sexual behavior of women equally in all states. If these time-varying factors were correlated with the prevalence of AIDS then the estimated coefficient of the AIDS variable in column 1 would be spurious since it includes some of the effects of the omitted time-varying factors. In order to control for this possibility, a year-specific fixed effects model (a dummy variable for each year) was included in the estimation of Model 1.

While the principal focus of this study is the impact of the risk of contracting AIDS on the demand for abortion, the estimated effects of the other control variables presented in Table 2, columns 1 and 2 are briefly discussed. The empirical results are consistent with the abortion literature (Levine, 2003, 2007). The price of an abortion, no state Medicaid funding of abortions, parental involvement laws and two-visit laws are associated with significantly lower abortion rates. Informed consent laws have no significant impact on a state's abortion rate, which suggests that informed consent laws represent a negligible increase in the effective cost to women of obtaining an abortion since there is no requirement that women actually read the state-mandated abortion specific materials given to them. Women's income, the percentage of women of childbearing age between the ages 18-24 years, education and single marital status are associated with significant increases in the abortion rate. The significantly positive coefficient of the single marital status and the education variable is consistent with prior empirical results. Single women are more likely to have an unintended pregnancy and terminate that unintended pregnancy than married women, whereas more educated women are more likely to terminate unintended pregnancies because of educated women's greater opportunity cost of childbearing.

After controlling for women's socioeconomic characteristics and restrictive state abortion laws, the variable of primary interest in this study, the risk of contracting AIDS, has a highly significant ($p<0.005$) and negative impact on the demand for abortion. Women's risky sexual behavior is responsive to the prevalence of contracting AIDS. To place the coefficient value of the AIDS variable in columns 1 and 2 of Table 2 in perspective, a one standard deviation (= 624) increase in the prevalence of AIDS would result in between 0.87 and 0.94 fewer abortions per 1000 women of childbearing age or equivalently a decrease in the mean abortion rate by between 4.6 and 5%.

Alternatively, McCloskey and Ziliak (1996) argue that it is more informative to describe the impact (responsiveness) of an independent variable in terms of its numerical impact on the dependent variable (i.e., its elasticity of demand). An elasticity of demand is a numerical measure of the responsiveness of the dependent variable in equation (1) -the number of abortions per 1000 women of childbearing age-resulting from a 1% increase in the value of an independent variable. The AIDS prevalence elasticity of demand is between -0.73 (Model 2) and -0.78 (Model 1). These values mean that a 10% increase in the prevalence of AIDS will cause a decrease in abortion rates by approximately 7%.

The above empirical results suggest that the increase in the risk of contracting AIDS reduced the level or frequency of women's risky sexual activity accounting for some of the decrease in the incidence of abortion between 1992 and 2005. The coefficient estimate of the AIDS variable in Table 2 can be used to quantitatively estimate how much of the decrease in the incidence of abortion can be attributed to the increase in the prevalence of AIDS. The abortion rate decreased from 20.6 in 1992 to 15.6 in 2005- a decline of 5 abortions per 1000 women of childbearing age (15-44). During the same time period, the prevalence of AIDS increased from 250.7 in 1992-987.6 in 2005 -an increase of 736.9 cases per 100,000 women of childbearing age. Multiplying this figure by the estimated AIDS coefficient of -.0014 reported in Table 2, Model 2 means that over the time period 1992-2005 the increase in the risk of contracting AIDS caused a decrease in the abortion rate by 1.03 abortions per 1000 women of childbearing age. This implies that the change in the risk of contracting AIDS accounted for 21% (1.03/5) of the overall decline in the abortion rate over the time period 1992-2005.

AIDS, Teen abortions and teen pregnancies: The 1986 U.S. Surgeon General report identified teenagers as an especially vulnerable subpopulation to contracting AIDS because they have high rates of unprotected sexual activity.

Table 3: Estimates of Teen Abortion Demand, 1981-2005

Dependent variable	Estimated AIDS coefficient	
	Model 1	Model 2
Teen abortion rate (ages 15-17)	-0.0012 (10.81)***	-0.0018 (8.34)***
Teen abortion rate (ages 15-19)	-0.0012 (10.42)***	-0.0020 (7.61)***
State-specific fixed effects	Yes	Yes
Year-specific fixed effects	No	Yes

Note: N=250. All specifications include all the remaining independent variables listed in Table 2. Absolute value of t-statistics in parentheses. ***p<0.01

Table 4: Estimates of teen pregnancy rates, 1981-2005

Dependent variable	Estimated AIDS coefficient	
	Model 1	Model 2
Teen pregnancy rate (ages 15-17)	-0.0011(7.68)***	-0.0012 (2.72)**
Teen Pregnancy Rate (ages 15-19)	-0.0012 (6.74)***	-0.0009 (1.75)*
State-specific fixed effects	Yes	Yes
Year-specific fixed effects	No	Yes

Note: N=250. All specifications include all the remaining independent variables listed in Table 2. Absolute value of t-statistics in parentheses. *: p<0.10, **: p<0.05, ***: p<0.01

Estimates of Models 1 and 2 of Eq. 1 are reported for teen abortion rates in order to corroborate that the previously reported empirical results are identifying a causal relationship between the risk of contracting AIDS and abortion rates.

Equation 1 was reestimated with the dependent variable being either the abortion rate of teens ages 15-17 or teens ages 15-19. Because of space limitations, only the estimated coefficient for the AIDS variable from Model 1 and Model 2 are reported in Table 3. The empirical results in Table 3 show that the risk of contracting AIDS on teen abortion rates parallels those for the abortion rates of all women of childbearing age (15-44 years) reported in Table 2. Across the two different model specifications, the prevalence of AIDS significantly ($p<0.005$) reduces teens' risky sexual activity as reflected in their abortion rates. Moreover, there are no statistically significant differences between the impact of the prevalence of AIDS on the abortion rates of all women of childbearing age and teens. The risk of contracting AIDS does not have a differential effect on the risky sexual activity of teens.

Another way of determining whether there is a causal relationship between the risk of contracting AIDS and women's risky sexual activity is to examine unintended pregnancy rates. Unfortunately, state-specific population-based data on pregnancy intentions before a birth does not exist. However, since over 75% of all teen pregnancies are unintended (Finer and Henshaw, 2008), we can use teen pregnancy rates to check the validity of the effects of the prevalence of AIDS on women's risky sexual activity.

Equation 1 was reestimated with the dependent variable being either the pregnancy rate of teens ages

15-17 or teens ages 15-19. The estimated coefficient of the AIDS variable from Model 1 and from Model 2 appear in Table 4 (due to space limitations, the complete empirical results are available upon request). The empirical results in Table 4 show that the risk of contracting AIDS has a significant and negative impact on the pregnancy rates of teens. As hypothesized, increases in the risks of contracting AIDS induces teens to reduce their level of unprotected sexual activity resulting in fewer unintended teen pregnancies.

CONCLUSION

This study examines the impact of the risk of contracting AIDS on the abortion rates of women of childbearing ages 15-44 years over the time period 1981-2005. The empirical results consistently find that the prevalence of AIDS reduces women's risky (unprotected) sexual activity as reflected in their abortion rates. The empirical results remain robust for the abortion rates of teens ages 15-17 and for teens ages 15-19.

Over the time period 1992-2005, abortion rates in the United States decreased from 20.6 abortions per 1000 women of childbearing age to 15.6. The empirical results suggest that the behavioral modification induced by the prevalence of AIDS accounted for 21% of this decrease in abortion rates over the time period 1992-2005.

Taken together, the empirical results support the Kane and Staiger (1996) model that an unintended pregnancy is not a predetermined event, but is an outcome based on prior decisions made by women regarding their risky sexual activity that affects the likelihood of an unintended pregnancy. As a consequence, the risk of contracting AIDS may induce women to alter their level or frequency of risky sexual activity reducing the likelihood of an unintended pregnancy and, concomitantly, abortion rates. The empirical presented in this study support the hypothesis that AIDS increases the cost of women's risky (unprotected) sexual activity.

REFERENCES

- Averett, S.L. D.I. Rees and L.M. Argys, 2002. The impact of government policies and neighborhood characteristics on teenage sexual activity and contraceptive use. *Am. J. Public Health*, 92: 1773-1778. DOI: 10.2105/AJPH.92.11.1773
- Blank, R.M., C.C. George and R.A. London, 1996. State abortion rates the impact of policies, providers, politics, demographics and economic environment. *J. Health Econ.*, 15: 513-553. DOI: 10.1016/S0167-6296(96)00494-8
- Centers for Disease Control, 2005. HIV/AIDS surveillance report. Government Printing Office, Washington, D.C.

- Davis, K.R. and S.C. Weller, 1999. The effectiveness of condoms in reducing heterosexual transmission of HIV. *Family Plann. Perspectives*, 31: 272-279.
- Finer, L.B. and S.K. Henshaw, 2008. Disparities in rates of unintended pregnancy in the United States, 1994 and 2001. *Perspectives Sexual Reproductive Health*, 38: 90-96. DOI: 10.1363/3809006
- Finer, L.B., 2007. Trends in premarital sex in the United States. *Public Health Reports*, 122: 73-78.
- Gujarati, D.N., 2007. *Basic Econometrics*. 4th Edn., Tata McGraw Hill, New York, ISBN-10: 9780070660052, pp: 1036.
- Guttmacher Institute, 2008. State policies in brief. Guttmacher Institute, New York.
- Jones, R.K., A. Purcell, S. Singh and L.B. Finer, 2005. Adolescents' reports of parental knowledge of adolescents' use of sexual health services and their reactions to mandated parental notification for prescription contraception. *J. Am. Med. Assoc.*, 293: 340-348. DOI: 10.1001/jama.293.3.340
- Jones, R.K., M.R. Zolna, S.K. Henshaw and L.B. Finer, 2008. Abortion in the United States: Incidence and Access to Services, 2005. *Perspectives Sexual Reproductive Health*, 40: 6-16. DOI: 10.1363/4000608
- Kane, T.J. and D. Staiger, 1996. Teen motherhood and abortion access. *Q. J. Econ.*, 111: 467-506. DOI: 10.2307/2946685
- Jonathan, G., 2001. *Risky Behavior Among Youths: An Economic Analysis*. 1st Edn., NBER, Cambridge, pp: 538.
- Levine, P.B., 2003. Parental involvement laws and fertility behavior. *J. Health Econ.*, 22: 861-878. DOI: 10.1016/S0167-6296(03)00063-8
- Levine, P.B., 2007. *Sex and Consequences: Abortion Policy and the Economics of Fertility*. Princeton University Press, Princeton, ISBN-10: 0691070989 pp: 215.
- McCloskey, D.N. and S.T. Ziliak, 1996. The standard error of regressions. *J. Econ. Literature*, 34: 97-114.
- Medoff, M.H., 2012. Restrictive abortion laws, antiabortion attitudes and women's contraceptive use. *Soc. Sci. Res.*, 41: 160-169. DOI: 10.1016/j.ssresearch.2011.09.010
- Piccinion, L.J. and W.D. Mosher, 1998. Trends in contraceptive use in the United States. *Family Planning Perspectives*, 30: 4-10.
- Sawhill, I.V., 2006. Teenage sex, pregnancy and nonmarital births. *Gender Issu.*, 23: 48-59. DOI: 10.1007/BF03186789
- Sen, B., 2006. Frequency of sexual activity among unmarried adolescent girls: Do state policies pertaining to abortion access matter? *Eastern Econ. J.*, 32: 313-330.
- USBC, 1983. State reports, detailed characteristics, 1980, 1990, 2000. U. S. Government Printing Office, Washington, D.C.