Condom and HPV Transmission

- Jamison et al.: no difference in % infected between >75%,, 25-75%, and <25% users.
- Kreiss et al.: no condom effectiveness for preventing warts or cervical intraepithelial neoplasia.
- NIH Consensus Panel on Cervical Cancer: "The data on use of barrier methods of contraception to prevent the spread of HPV is controversial but does not support this as an effective method of prevention."

Sex Trans Dis Jul/Aug 1995, p. 236-43 *STDs* 19:54-9
NIH Reports--April 1-3, 1996 Conference

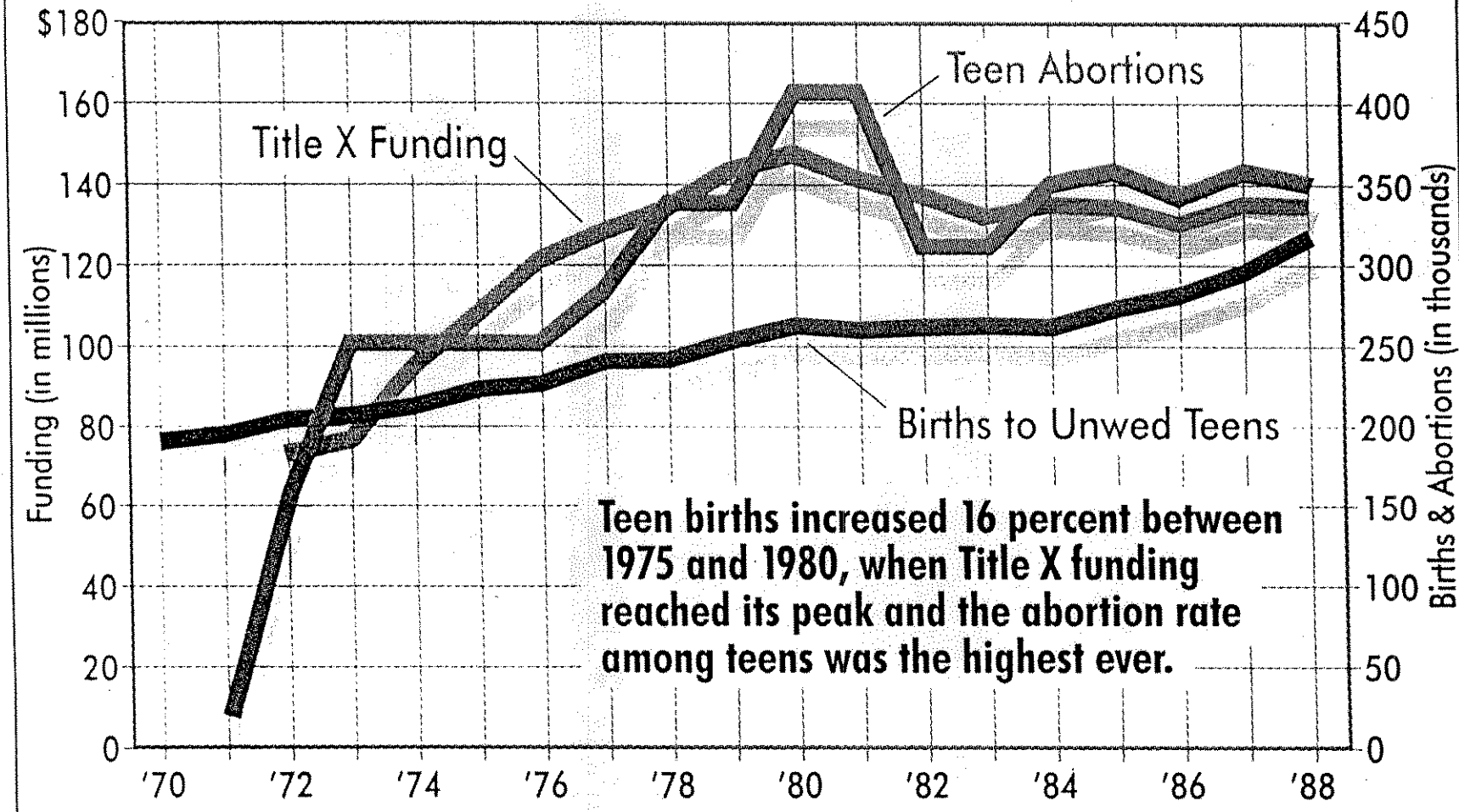
Teenage Girls, Condom Usage, and STD Rates

(Bunnell et al. *Jour Infect Dis* 1999;180:1624)

- **484 girls aged 14-19 visiting teen clinics in a large city over 6 months. These girls were from a spectrum of socio-economic backgrounds (over half with "white collar" parents).**
- **61/484 (12.6%) reported using condoms consistently but 13/484 (21%) had an STD.**
- **423/484 (87.4%) reported using condoms inconsistently or not at all and 99/423 (23%) had an STD.**
- **40% with STD 1st visit; 23% at follow-up: overall rates were chlamydia (38%), herpes (17%), gonorrhea (8%) [did not look at HPV]**
- **Even girls with one sexual partner had 30% STD rate.**
- **3/4ths had >1 lifetime partner; 1/3rd had >5.**

The Failure of Title X Family Planning

(funding; abortions & births by unwed teens, ages 15 to 19)

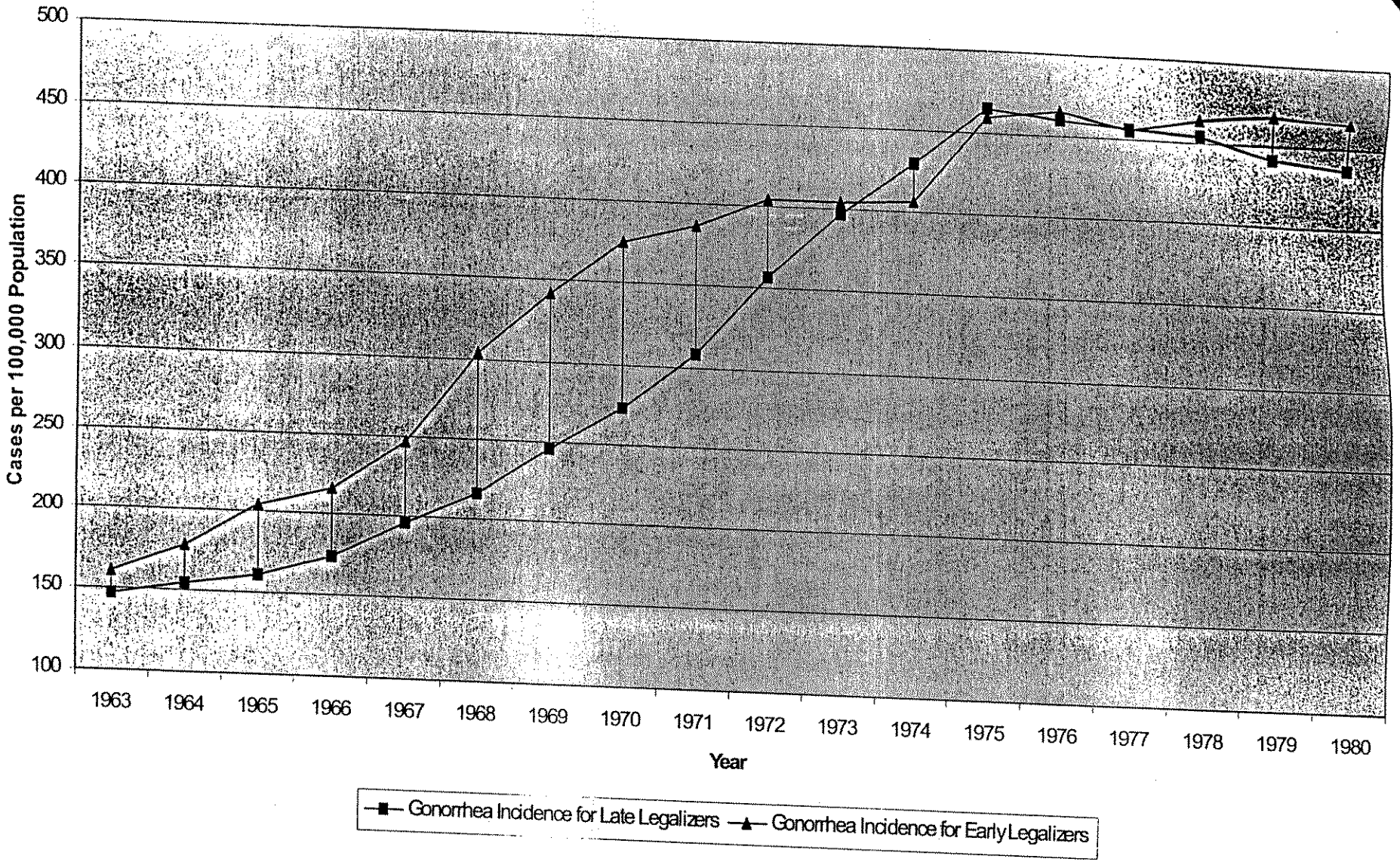


Sources: National Center for Health Statistics, Centers for Disease Control, Congressional Research Service

DOUG STEVENS / INSIGHT

original

Figure 1: Weighted Average of Gonorrhea Incidence



The Effect of Abortion Legalization on Sexual Behavior: Evidence from Sexually Transmitted Diseases

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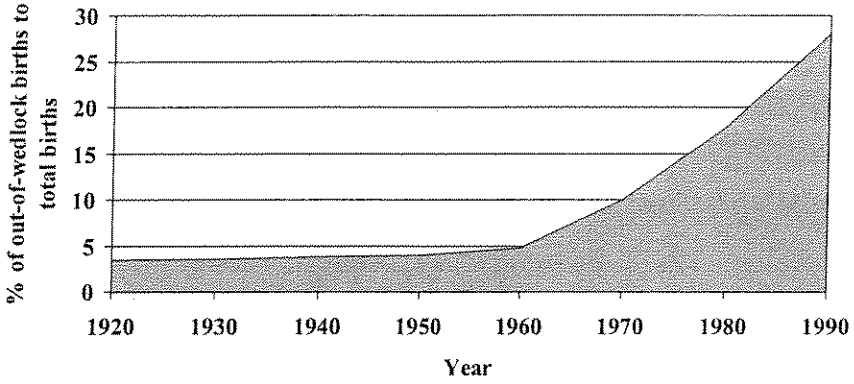
The authors thank Steve Levitt and John Donohue for comments and access to their data and Dick Ippolito, Ted Joyce, Tyler Cowen, and Andrew Goldstein, as well as workshop participants at George Mason University for helpful comments on this paper.

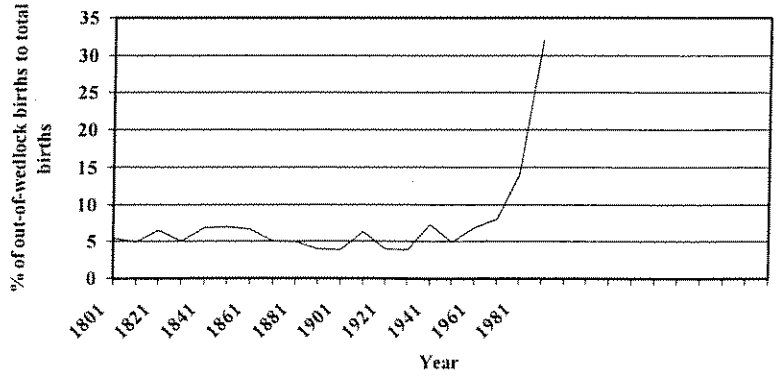
Abstract

The risk of an unwanted pregnancy represents one of the major costs of sexual activity. When abortion was legalized in a number of states during the late 1960s and early 1970s (and nationally with the 1973 Supreme Court case of *Roe v. Wade*), this cost was reduced as women gained the option of terminating an unwanted pregnancy. We predict that abortion legalization generated incentives leading to an increase in sexual activity, accompanied by an increase in sexually transmitted diseases. Using CDC data on the incidence of gonorrhea and syphilis by state, we test the hypothesis that judicial and legislative decisions to legalize abortion lead to an increase in sexually transmitted diseases. We find that gonorrhea and syphilis incidences are significantly and positively correlated with abortion legalization. Further, we find a divergence in STD rates among early legalizing states and late legalizing states starting in 1970 and a subsequent convergence after the *Roe v. Wade* decision, indicating that the estimated correlation between STD rates and abortion legalization is a causal relationship. According to our estimates, abortion legalization might account for as much as one fourth of the average disease incidence, suggesting that sexual behavior is very responsive to changes in incentives.

ILLEGITIMACY IN THE UNTITED STATES, 1920-1991



ILLEGITIMACY IN ENGLAND AND WALES, 1801-1992



THE ECONOMICS OF FAMILY PLANNING AND UNDERAGE CONCEPTIONS

(published in the Journal of Health Economics, 2002, 21, 2 (March),27-45)

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Abstract: *This paper examines whether improved access to family planning services for under sixteens is likely to help in achieving the aim of reducing underage conceptions. A simple model of rational choice is introduced which suggests that family planning increases rates of underage sexual activity and has an ambiguous impact on underage conception and abortion rates. The model is tested on panel data on regions within the UK using two approaches. The first test is whether the 1984 Gillick Ruling had a differential impact on two groups: under sixteens for whom access to family planning was restricted by the Ruling and older teenagers who were not affected. Secondly, attendance by under sixteens at family planning clinics, suitably instrumented, is used as a proxy for access to family planning. With both approaches, no evidence is found that the provision of family planning reduces either underage conception or abortion rates. Socio-economic variables such as children in care rates and participation rates in post-compulsory education are found to be significant predictors of underage pregnancies.*

Keywords: family planning; underage conceptions; abortion; risk; panel data.

JEL Classifications: J13, I18.

The Economics of Family Planning and Underage Conceptions*

1. Introduction

The issue of teenage pregnancy is on the policy agenda in many countries throughout the world. In the UK, a stated aim of the 1998 Green Paper on the family was to reduce the number of underage pregnancies, a task that was subsequently allocated to the Social Exclusion Unit. In June 1999 the Unit presented their report, 'Teenage Pregnancies'. The Report recommended a range of policy proposals aimed at halving the teenage pregnancy rate in the UK within ten years. Many of the suggested policies concentrated on improving the economic and social position of those groups most at risk. Somewhat more controversially, the Report also recommended that teenagers should have easier access to specialised family planning clinic services and advice. This paper uses regional data from the UK to examine whether such a policy is likely to help in reducing underage pregnancies.

Most evaluations of public policy on teenage family planning have focused on micro data gained from questionnaires or interviews (for example, Pearson et al, 1995) or have used simulations to estimate the impact of policy changes under specified regimes (Kahn et al, 1999). Both approaches are problematic. Questionnaire based methods are not necessarily a reliable way of identifying actual (as opposed to stated) behaviour, whilst simulation results are crucially dependent on assumptions built into the model. Although the economic literature has rarely focused specifically on the provision of family planning, several recent papers have addressed issues related to teenage fertility, almost exclusively in the USA. Kane and Staiger (1996) and Akerlof, Yellen and Katz (1996) both propose models in which

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* *Thanks are due to various people for assistance with the collection of data and for many helpful suggestions, most notably, Paul Fenn, Paul Periton, Rachel Dufton of Brook Advisory Centres, Margaret McGovern of the Family Planning Association, Denis Till and Anita Brock at the ONS, Lesz Llancuck and other staff at the Department of Health Statistics Division and Victoria Gillick. In addition, thanks are due to two anonymous referees for constructive and useful suggestions. Naturally the views expressed in this paper are entirely my own.*

decisions about sexual participation and pregnancy are incorporated into rational choice models. Kane and Staiger model teenage pregnancy as being affected not just by exogenous factors such as contraceptive technology but also, endogenously, by access to abortion[1] which may reduce the cost of a pregnancy and therefore encourage the adoption of behaviour that increases the chance of pregnancy. Akerlof et al (1996) examine births to women of all ages and conclude that "contraception may have played a major role in the rise of out-of wedlock childbearing" (p.281). A series of papers in this Journal (Cook et al, 1999; Blank et al, 1996; Levine et al, 1996) have used State-level data to examine the impact of funding restrictions on fertility decisions, generally concluding that such restrictions are associated with a reduction in abortions and either no change or a reduction in pregnancies. Lastly, Oettinger (1999) analyses the impact of sex education on teenage sexual behaviour and finds that, by providing information that enables teenagers to reduce the risks of sexual activity, sex education in the USA has had a small positive impact on the pregnancy rates of some groups of teenagers.

This paper extends this literature by looking directly at the impact of family planning on teenage conceptions and abortions. Specifically I adapt Oettinger's model of teenage sexual behaviour to the provision of family planning to teenagers. I test the model using panel data from regions within the UK. Although tracking of individual decision making such as in Oettinger (1999) is an important exercise, one would hope that a successful programme aimed at reducing teenage pregnancy should have an impact that is observable at a more aggregated level. The case of the UK is particularly useful in this context for a number of reasons. In the first case, UK data on conceptions, abortions and family planning are both consistent and complete compared to other countries. Any attempt, for example, to

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[1]Throughout this paper, the term 'abortion' refers to induced abortion and not to spontaneous abortion (miscarriage).

analyse conception rates across different countries would suffer from the lack of consistency in the recording of data and even its availability.[2] Secondly, the 1984 'Gillick Ruling' had the effect of severely reducing attendance by teenagers at family planning clinics in the UK for a period of time. This ruling provides us with a useful natural experiment involving a change in public policy.

The rest of the paper is set out as follows. Section Two discusses a theoretical model linking family planning to underage conceptions. In Section Three the data are introduced, whilst the empirical approach and panel data results are discussed in Section Four. Some concluding remarks are made in Section Five.

2. Theory

Following Oettinger (1999), consider a teenager for whom utility depends on the discrete decision whether or not to participate in sexual activity. If the teenager decides to participate, utility depends additionally on the consequence of that decision. If the teenager decides to abstain from sex, the net present value of utility over both present and future time periods is fixed at U_0. If the teenager decides to participate, utility in future time periods is uncertain and depends on the consequences of the sexual activity - in this case, the possibility of pregnancy. Discounted utility over present and future time periods is U_1 if no pregnancy occurs and U_2 otherwise. The relative values of U_0, U_1, and U_2 are likely to depend on socio-economic factors as well as on individual characteristics.

Consider first the situation in which there is no family planning and the teenager believes there is a probability, p_1, that sexual activity will result in pregnancy. A rational

[2]For example, as a result of the provisions of the 1967 Abortion Act, all abortions that take place in the UK have to be recorded. Thus, conceptions data include all pregnancies that lead either to induced abortion or to a live birth. In contrast, in the Netherlands, pregnancies terminated under regulations governing 'menstrual extraction' have not always been recorded in official abortion or conceptions figures.

teenager will participate in sexual activity if the expected utility from doing so is greater than the utility from abstaining (U_0). In other words:

$$p_1U_2 + (1-p_1)U_1 > U_0 \quad (1)$$

Alternatively, $p_1 < Z$ where:

$$Z = (U_1 - U_0)/(U_1 - U_2) \text{ and } U_1 > U_2 \quad (2)$$

For simplicity I assume that p is equal to the true probability of pregnancy and is constant across all teenagers but that the utilities (and thus Z) can vary across individuals. I restrict the analysis here to those teenagers for whom $U_1 > U_2$. In other words, teenagers who engage in sex would prefer not to get pregnant. The alternative case is not trivial as many teenage pregnancies are desired, either consciously or otherwise. However, the policy tool in question - increasing access to family planning - is unlikely to affect this group of teenagers directly. Of the remainder, those who prefer abstinence to sexual activity even if pregnancy does not occur ($U_0 > U_1$) will have a negative value of Z and will not be sexually active, irrespective of the value of p_1 probability of pregnancy. For those who prefer sexual activity to abstinence even in the event of pregnancy ($U_2 > U_0$), Z will be greater than unity and condition (1) will be satisfied irrespective of the value of p_1. Lastly, those teenagers who would prefer sexual activity to abstention only if pregnancy does not occur ($U_1 > U_0 > U_2$), will have a value of Z between zero and unity. This group will engage in sexual activity if p_1 is low enough.

Denote the cumulative probability distribution of Z amongst all teenagers as $F(Z)$, where F is an increasing function of Z. The proportion of teenagers who abstain will be $F(p_1)$ whilst $1 - F(p_1)$ will engage in sexual activity. If we assume that p_1 is equal to the true probability of pregnancy, the overall pregnancy rate amongst teenagers will be $p_1.[1 - F(p_1)]$.

The overall pregnancy rate will be affected by any factor that affects the relative utility of pregnancy. For example, consider a decrease in the unemployment rate. For at least some

teenagers, this is likely to increase the opportunity cost of pregnancy and thus decrease the value of U_2 and increase the value of Z. The cumulative distribution function will shift to the right and the overall pregnancy rate will decrease.

Of specific interest here is the impact of family planning that reduces the probability of pregnancy. I consider the impact of family planning both on overall conception rates and on abortion rates.

2.1 Family Planning and Overall Conception Rates

Family planning is assumed to reduce the (perceived and true) probability of pregnancy to p_2, where $0 < p_2 < p_1$, and is available at a cost of k. k comprises the costs of travel, search and 'hassle costs' such as obtaining parental permission or breaking religious or cultural taboos, and, for simplicity, is assumed to be constant across all teenagers.

All those teenagers who previously participated in sexual activity will still find it optimal to do so. The $F(p_1)$ teenagers who previously abstained will now find it optimal to engage in sexual activity if the expected utility of participating and using family planning less the costs of doing so is greater than the utility of abstaining. In other words:

$$p_2.U_2 + (1-p_2).U_1 - k > U_0 \tag{3}$$

Alternatively, $k < Y$ where:

$$Y = p_2.U_2 + (1-p_2).U_1 - U_0 \tag{4}$$

Denoting the cumulative probability distribution of Y amongst the group who previously abstained as $G(Y)$, then $[1-G(k)].F(p_1)$ will switch from abstaining to sexual activity. The overall rate of sexual activity will increase to $1 - F(p_1).G(k)$ and an increase in the value of k will lead to a decrease in the rate of sexual activity.

The pregnancy rate amongst all teenagers (denoted as P_{rate}) depends on the proportion of those engaging in sexual activity who use family planning. All of those who have

switched from abstention to sexual activity use family planning. The $[1 - F(p_1)]$ teenagers who previously participated in sexual activity will decide to use contraception if the following condition is satisfied:

$$p_2U_2 + (1 - p_2)U_1 - k > p_1U_2 + (1 - p_1)U_1 \quad (5)$$

or $k < X$ where

$$X = (p_2 - p_1).(U_2 - U_1) \quad (6)$$

Denoting the cumulative distribution of X as $H(X)$, the proportion of this group that will use family planning is $[1 - H(k)]$ and the overall rate of family planning amongst all teenagers will be $[1 - H(k)].[1-F(p_1] + F(p_1).[1-G(k)]$ or $(1 + H.F - H - G.F)$ which is decreasing in k.

The overall pregnancy rate will be given by:

$$P_{rate} = p_1.[1-F(p_1)].H(k) + p_2.[1-F(p_1)].[1-H(k)] + p_2.F(p_1).[1-G(k)] \quad (7a)$$

This can be re-written to give:

$$P_{rate} = p_1(1-F) + (p_2 - p_1)(1-F)(1-H) + p_2 F(1-G) \quad (7b)$$

In this formulation, the first term is the conception rate without family planning, the second term is the change in the conception rate due to sexually active teenagers having a lower probability of pregnancy and the third term is the change in conception rate due to the greater number of teenagers who are now sexually active. The second term must be negative (as $p_2 < p_1$) and the third term must be positive. Thus, the overall pregnancy rate may be higher or lower with family planning. Further, an increase in the cost of family planning, k, will increase the values of both H and G and will lead to have an ambiguous impact on the pregnancy rate: the second term in (7b) will increase (become less negative) as some sexually active teenagers stop using family planning, whilst the third term will decrease (become less positive) as some teenagers stop being sexually active. In other words, family planning reduces the probability of pregnancy amongst those who use it, but by making sexual activity less risky, increases the total amount of teenagers who are sexually active.

By relaxing the assumption that teenagers know the true value of p, it is possible to envisage scenarios in which family planning is jointly supplied with information and consequently leads to a reduction in sexual activity. For example, if teenagers consistently underestimate the true value of the probability of pregnancy, information that leads them to adjust their estimates upwards will reduce the likelihood of sexual activity. The impact of such a joint supply reduces directly to that analysed in Oettinger (1999). That aside, the rational choice model predicts that increased availability of family planning alone will lead unambiguously to an increase in the rate of sexual activity amongst teenagers. The impact on pregnancy rates, however, is ambiguous. Although this theoretical result contrasts somewhat with simulation evidence reported in the non-economic literature (see, for example, Kahn et al, 1999 who argue that "increased contraceptive availability has little effect on the prevalence of sexual intercourse" p.30) it does have some intuitive appeal. A change in the ability to control the risks of an action seems likely to influence the behaviour of at least some individuals.

If family planning reduces the probability of pregnancy for sexually active teenagers, an empirical test of the effect of family planning availability on pregnancy rates may imply an indirect test of hypothesis that family planning availability will increases sexual activity. Specifically, if family planning is observed to have a non-negative impact on conception rates, this implies a strictly positive impact on sexual activity rates. On the other hand, if family planning is observed to have a negative impact on conception rates, the implied impact on sexual activity is impossible to distinguish.

2.2 Family Planning and Abortion Rates

Although the key policy aim under consideration is a reduction in underage conception rates, the impact of family planning on abortion rates is of interest for two reasons. Firstly,

empirical estimates of actual conception rates will include some teenagers for whom $U_2 < U_1$. That is, teenagers for whom conception is intended rather than due to contraceptive failure or non-use. Put another way, total observed conceptions will be an overestimate of those unwanted conceptions that might be affected one way or another by family planning. In contrast, it is reasonable to assume that only teenagers for whom $U_1 > U_2$ will choose abortion. In other words, all abortions can be viewed as unwanted conceptions.[3] Of course, given that not all unwanted conceptions lead to a termination, the observed number of abortions will be an underestimate of the total number of unwanted conceptions, but it provides a useful point of comparison. Secondly, the impact of family planning on underage abortions may be of interest in its own right, in particular if society is not indifferent to the outcome of a conception.

We can fit the abortion decision into the above framework by denoting U_3 as the discounted net utility to a teenager who has an abortion and U_4 as the utility from giving birth. U_2 is now equal to $max(U_3, U_4)$ and a teenager who becomes pregnant will have an abortion if the following condition applies:

$$U_3 - U_4 = \varphi > 0 \tag{8}$$

Denoting the cumulative probability distribution of φ throughout the population of those becoming pregnant as $J(\varphi)$, then the proportion of pregnancies that are aborted will be equal to $J(0)$.

In the simplest case, $J(.)$ is assumed to be independent of $F(.)$. The abortion rate for teenagers will be given by $J(0)$ times the overall unwanted pregnancy rate and the impact of family planning on abortion rates will be exactly the same as on unwanted conception rates. As noted above, some conceptions are intended and, assuming that none of these are aborted, the impact of family planning on total conception rates (whether negative or positive) will be

[3] This is not entirely true as some conceptions may be quite deliberate but still result in abortion.

smaller in magnitude that the impact on abortion rates.

Clearly, the assumption of independence between *J(.)* and *F(.)* is rather strong. In the first place, it is common for there to be an element of joint supply of family planning and abortion. For example, many family planning clinics in the UK also have facilities to refer young people for abortions. In this case it is possible that a reduction in k will also reduce the costs of abortion and increase the net utility of abortion relative to birth. The cumulative probability distribution for abortion will shift to the right and a higher proportion of unwanted pregnancies will end in abortion than before. Overall, the impact of family planning on abortion rates will be more positive (or less negative) than on overall conceptions.

A counter argument is that for many people, the relative utility of abortion and birth (i.e. the difference between U_3 and U_4) is influenced by personal moral or ethical views to a greater extent than the relative utility between being pregnant and not pregnant (the difference between U_2 and U_1). Other things being equal, a person with a relatively high value of φ (very averse to abortion) is also likely to have a low value of U_2 and, thus, a high value of Z (very averse to pregnancy). A reduction in the cost of family planning, encourages people with a greater aversion to pregnancy to become sexually active. On this argument, these teenagers are also less likely to have abortions and, thus, in this case, the reduction in family planning costs will have a less positive (or more negative) impact on abortion rates than on overall conception rates.

In summary, theory is again ambiguous as to whether the impact of family planning on underage abortion rates will be greater or less than the impact on overall conceptions.

3. Data

The most disaggregated level at which there is consistent family planning information is that of the Regional Health Authorities (RHAs) and our empirical work analyses the determinants

of mean conception rates at this level. Despite the fact that recent UK policy initiatives have focussed on pregnancies amongst all teenagers, there is a considerable advantage in focussing on those below the age of sixteen. Sixteen is the age of consent in the UK and, although some conceptions to children below this age may be intended (whether consciously or not), the legal situation implies that all such conceptions are undesirable from society's point of view *ex ante*[4]. On the contrary, a certain proportion of pregnancies to teenagers over the age of consent will be viewed as desirable (for example, intended conceptions to those over the age of consent in stable relationships). Further, the proportion of such conceptions is likely to have changed over the last 20 years. However, as we will see, teenagers over the age of sixteen provide a potentially useful comparison group in the context of the UK.

The correct measure of access to family planning presents some difficulty. A key element of government policy in the UK in this area, and one re-emphasised by the Social Exclusion Unit report, has been the provision of specialised clinic-based family planning services for young people. Consequently, an appropriate measure of access might be the number of family planning clinics for young people within each area. Apart from the fact that consistent historical data on this is not available in England, such a measure would ignore institutional and legal changes that can significantly affect access to existing clinics. Of key importance in the UK is the 1984 Gillick Ruling. In December of that year, the UK Appeal Court ruled in favour of Mrs Victoria Gillick that contraceptive advice should not be given to those below the age of sixteen without parental consent. This ruling was overturned by the House of Lords in the Autumn of 1985. Even though this had no direct effect on the number of family planning clinics, it had the direct impact of changing the terms on which family planning could be provided for young people in England and Wales during 1985. It also had the indirect effect of significantly reducing attendance at family planning clinics.

[4]Of course the outcome of a conception may very well be welcomed after the event!

As this ruling only affected under sixteens and did not apply to Scotland, differences in patterns of conception and abortion rates between these groups at the time of the Ruling can provide a potentially useful measure of the impact of the exogenous reduction in family planning provision. A related approach is to use available data on the annual attendance rate of under sixteens at family planning clinics within each region. This variable will reflect differences (both regional and time) in the number of clinics, the promotion of their services and also the statutory framework (such as the Gillick ruling) within which they operate. In principal, attendance rates may be endogenous to conception rates. Specifically, an increase in sexual activity may lead to a demand-induced increase in family planning take-up as well as an increase in the conception rate. On the other hand, one contention of the theoretical discussion above is that access to family planning may be a determinant of sexual activity. In this case, it would be appropriate to view family planning attendances as being the outcome of levels of access. In any case, in the work below I use an instrumental variable approach to identify family planning attendance rates.

Figure 1 shows how conception and abortion rates for under sixteens and 16-19 year olds in England and Wales have changed between 1969 and 1999. For under sixteens, the overall conception rate decreased from a peak of 9.23 per thousand women in 1972 to 7.2 in 1980 followed by a slight, gradual upward trend with particular peaks in 1990 (10.09) and in 1997 (9.52). Abortion rates for under sixteens followed the overall conception rates closely throughout the period. For teenagers aged over sixteen, conception rates decreased from a peak of 78.0 per thousand in 1970 to a low of 53.3 in 1977 and have remained relatively stable since. Abortion rates increased steadily during the early seventies and, since then, have closely followed overall conceptions.

The rates of attendance by females at family planning clinics are shown in Figure 2. In order to draw out the different impacts of the 1984 Gillick Ruling, I report indices of

attendance rates for under sixteens and 16-19 year olds in England and also for under sixteens in Scotland, the latter two groups being unaffected, (at least directly) by the Ruling.

Family planning provision for young people was almost non-existent in the UK until Helen Brook opened a centre aimed directly at young unmarried people in 1964. During the late 1960's, the Family Planning Association also began to provide some services for young people. However, the proportion of clients below the age of sixteen was extremely low until the early seventies (Leathard, 1980). In 1974, the then Department of Health and Social Security (DHSS) issued guidelines advising that contraceptive advice could be given to girls under the age of sixteen without parental involvement, advice that was reissued in 1980. The rate of attendance by under sixteens in England increased from 7.5 per 1000 in 1975 to more than twice that figure in 1984. Following the 1984 Gillick Ruling, attendances by under sixteens decreased by over 30%. The attendance rate had recovered to above its previous level by 1988 and has continued on an upward trend to the present day. Although the indices for under sixteens in Scotland and for 16-19 year olds in England also decrease in 1985, the reduction is much less marked. For 16-19 year olds, the attendance rate decreased by only 4%. Inspection of Figure 2 suggests that the reduction for 16-19 year olds was part of a longer-term downward trend which was reversed at the end of the 1980s. The downward trend after 1985 is also present in the data for women over the age of nineteen, suggesting that it is unrelated to the Gillick Ruling. Attendance for under sixteens in Scotland reduced by 11% in 1985. This reduction may have been due to a misunderstanding by Scottish teenagers as to whether the Ruling applied to them. In any case, it is clear that the Gillick ruling had much larger and more significant impact on family planning attendance for under sixteens in England.

Currently about 75 women out of every 1000 aged between 13 and 15 attend a family planning clinic each year. For 15 year olds, the figure is over 140 per 1000 (14%). Family

planning is also available from other sources, most notably from General Practitioners. Unfortunately, systematic data on such provision to under sixteens is not collected in the UK. However, the available evidence suggests that the vast majority of provision for under sixteens is via clinics. For example, the Social Exclusion Unit (1999, p.53) states that well over 70% of all under sixteens who received family planning advice or services did so either from NHS or private clinics (all included in the above figures).[5] Further, the Social Exclusion Unit (1999, p.43) estimates that, by the 1990s, just under 20% of women engaged in sexual intercourse before the age of 16. Thus, family planning clinic attendance covers a significant proportion of sexually active young women, and one would expect any strong impact of such clinics to be evident in aggregate pregnancy rates.

Regional data on conception rates (including both live births and abortions) for under sixteens are taken from the Birth Statistics series for England and from relevant series published by Scottish and Welsh Offices. The age of the mother at the time of conception is estimated by the Department of Health. Thus, the data correspond directly to those on family planning attendance. Data are available for all fourteen of the English Regional Health Authorities (RHAs). The relevant data for individual health authorities within Wales and Scotland are not readily available for both conceptions and family planning. However, the population size in both cases is of the same order of magnitude as for the English RHAs, suggesting that it is appropriate to combine the aggregate Scottish and Welsh data with the English regional data. In any case, the results reported below are robust to the omission of the Scottish and Welsh series.

Regional data on attendances at family planning clinics each year for the two age groups are obtained from the Department of Health for the English RHAs and from the Welsh

[5] In fact as the Social Exclusion Unit point out, the percentage is likely to be considerably higher than this due to double counting.

and Scottish Offices for Scotland and Wales.[6] One difficulty is that, after 1986, family planning data for the English RHAs are collected for the periods 1st April to 31st March, whereas data on conceptions are for calendar years.[7] A further problem is that the figures on family planning attendance published by the Department of Health vary in their treatment of providers outside of the National Health Service. Importantly, attendance at most Brook Advisory Centres is omitted from the regional data between 1988/9 and 1995/6. Brook have been significant providers of family planning to young people since the 1960's. As their clinics are not uniformly distributed throughout the regions and as the distribution has changed over the relevant time period, omitting attendance at Brook clinics would be likely to lead to a systematic bias in the family planning data. Fortunately, data on attendance at all Brook clinics by under sixteens are available for the period in question. I combine them with the data published by the Department of Health to arrive at an overall figure for each region. Brook data for London is only available at an aggregated level. As each of the four Thames RHAs covers a part of London, I distribute the London attendance figures to the Thames RHAs in proportion to their population of women aged 13-15.[8]

Some regional data on conceptions and family planning is available from the early eighties. The use of lagged values in some of the work below results in a balanced sample of 16 regions over the period 1984 to 1997, a total of 224 observations. A summary of the data for under sixteens is given in Table 1. There is considerable variation both in the mean rates of conceptions and family planning attendance across the units. Mean conception rates over the period 1984 to 1997 range from 6.16 per thousand women aged 13-15 in South West

[6]An alternative data source for family planning is provided by various surveys which have taken place over the past twenty years (see McEuan et al, 1997). However, these provide little or no information on the under-sixteen age group.

[7] We experimented with adjusting the RHA data after 1986 by using a weighted average of two years and found little impact on our central result.

[8]In any case, the reported results are robust to the omission of the Thames RHAs.

Thames to 11.36 in the Northern RHA. Mean family planning rates are lowest in Scotland at 21.91 per thousand and again highest in the Northern RHA at 45.14.

A particular point of interest is the pattern of conception rates over the period of the Gillick Ruling. In 1984 (the year before the Gillick Ruling) the conception rate in England and Wales was 1.37% higher than the previous year. In 1985, when restrictions were imposed on underage family planning, the conception rate in England and Wales was unchanged. In the following year, when the restrictions had been lifted (although family planning attendance had not yet recovered to previous levels) conception rates rose by just 0.01%. Across the fifteen affected regions, seven experienced an increase in their underage conception rate in 1985 and eight experienced a decrease. In 1986, conception rates increased in eight of the 16 regions and went down in just six. In contrast, conception rates in Scotland (which was not directly affected by the ruling) increased by 7.58% in 1985 and again by a further 5.63% in 1986, whilst conception rates of 16-19 year olds increased by 3.32% and 1.30% respectively. Thus, there is no *a priori* evidence in the raw data that the Gillick Ruling had the effect of increasing underage conceptions in England and Wales.

4. Empirical Model and Results

4.1 The Gillick Ruling and Underage Pregnancies

Our initial approach is to estimate the following models of conception and abortion rates:

$$CONCEPTION_{it} = \alpha D1985 + \beta' \mathbf{X} + v_i + \tau + \varepsilon_{it} \quad (9a)$$

$$ABORTION_{it} = \gamma D1985 + \delta' \mathbf{X} + v_i + \tau + \mu_{it} \quad (9b)$$

where $CONCEPTION_{it}$ is the conception rate in region i in year t; $ABORTION_{it}$ is the abortion rate; *D1985* is a dummy variable for 1985 when the Gillick Ruling was in place[9]; **X** is a

[9] As noted above, it is likely that the Gillick Ruling had indirect impacts on family planning attendances by under sixteens for at least the following year. Re-specifying the dummy to include 1986 as well as 1985 does not alter our results.

vector of socio-economic factors which are likely to affect conception rates, ν_i is a set of regional fixed effects; τ represents time and ε_{it} is an error term. I estimate this model for two age groups in England and Wales - under sixteens who were directly affected by the Ruling and 16-19 year olds who were unaffected. The difference in α and γ across the two groups represents the impact of the exogenous restriction in family planning for under sixteens on conception or abortion rates.

One way of modelling time would be to include a set of effects for each year. As I wish to isolate the impact of the Gillick Ruling which is contained within 1985, I take a slightly more restrictive approach and model time as a piecewise linear spline.[10] The variables in the vector **X** are a range of socio-economic factors that are likely to have an impact on the relative utility of pregnancy and, consequently, conceptions (see, Kane and Wellings, 1999). I include three such variables: claimant unemployment rate (*UNEMPLOYMENT*), rate of children in statutory care (*CARE*) and the proportion of young people staying on in post-compulsory education (*EDUCATION*). A high unemployment rate is likely to imply fewer opportunities for young people and, thus, a lower opportunity cost of pregnancy. Consequently, I would expect a positive impact of this variable on conceptions. By a similar argument, I expect the proportion staying on in education to have a negative impact on conceptions. The rate of children in statutory care proxies for the extent of family breakdown and deprivation and is expected to have a positive impact on conceptions. The likely impact of the socio-economic variables on abortion rates is more ambiguous. For example, a decrease in economic prospects (perhaps due to higher unemployment) may decrease the opportunity cost (and thus increase the relative utility) of being pregnant. However, once pregnant, the impact of increased poverty may decrease the utility of giving

[10] We construct the spline with four cut-off points over the whole sample (1984 to 1997). An alternative would be to use a trend term instead of the spline. It would also be possible to include individual year effects and to isolate the impact of the Gillick Ruling by including the data on Scotland. We continue to

birth relative to abortion. If the former effect is significantly greater than the latter, then variables such as unemployment will have a much larger impact on total conceptions than on abortions alone.[11]

As I wish to isolate the impact of the Gillick Ruling, I restrict the model to the period before 1990, although in fact extending the sample period does not significantly alter our results. I have no prior assumptions about the appropriate functional form for the model and so I use a double log specification that allows for non-linearities without the loss of degrees of freedom that would follow from using quadratic or cubic forms.

I report the results of (9a) and (9b) in Table 2. The estimates for conception rates are reported in columns 1 and 2 and those for abortion rates are in columns 3 and 4. I report standard errors robust to heteroscedasticity and also report tests for first order serial correlation and normality of the residuals. None of these tests are significant at greater than the 5% level. In each case, the coefficients on the socio-economic variables attract the expected sign although they vary in significance. Unemployment and numbers of children in care are positively associated with both conception and abortion rates whilst education has a negative impact. The coefficients on statutory care are significant in every case whilst education is estimated to have a significant impact in every case except for under sixteen

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find the impact of the Gillick Ruling insignificant using both of these approaches.

[11] In principle, care rates and post-compulsory education rates are both endogenous to underage conceptions. However, the relatively small number of underage conceptions suggests this is unlikely to be a problem. We also hoped to include a measure to take into account the extent of religious practice within each region as this may affect the relative utility of abstention from sexual activity. Unfortunately, there is no direct regional information on religion published in the UK for the period in question. The only indirect data available is the percentage of marriages that are civil (as opposed to religious) ceremonies. Although we experimented with the inclusion of this variable, it had no significant effect in any model and results are not reported.

conceptions. Unemployment is significant only in the under sixteen conceptions model. There is little evidence of significant differences in the impact of the socio-economic variables on conceptions and abortions. For example, using a formal chi-square test, the null hypotheses that each coefficient is the same for abortions and conceptions, can only be rejected at better than the 1% level for unemployment in the under sixteen conceptions model.

Of specific interest here is the difference between the value of the coefficient on the 1985 dummy for under sixteens and that for 16-19 year olds. In the case of conceptions for 16-19 year olds, the coefficient is positive and significant. For under sixteens, the coefficient is positive and larger in magnitude but insignificant. I formally test the hypothesis that the difference between the coefficients is zero by using a pooled regression (not reported here). In this regression, I allow both the intercept and the slope coefficients of the socio-economic variables and time effects to vary across the two age groups. The t-value for the differential effect on under sixteens during 1985 is -0.69 (p-value = 0.493), so I am unable to reject the null. A similar picture arises in the case of abortion rates. The coefficient on the dummy for 1985 is only significant for 16-19 year olds and is larger in magnitude in this case. The t-value for the differential effect on under sixteens in the pooled regression is -0.78 (p-value = 0.438) which is, once again, clearly insignificant.

In summary, I cannot reject the hypothesis that the restriction in family planning provision to under sixteens in England and Wales arising from the 1984 Gillick Ruling had no impact on either conceptions or abortion rates.

4.2 Family Planning Clinics and Underage Pregnancies

As I argued above, data on rates of family planning attendances, suitably instrumented, are potentially a good proxy for overall family planning provision for under sixteens. Thus, I re-specify our models for under sixteen conception and abortion rates as follows:

$$CONCEPTION_{it} = \kappa FAMILY\ PLANNING_{it} + \beta'\mathbf{X} + \nu_i + \tau + \varepsilon_{it} \quad (10a)$$

$$ABORTION_{it} = \lambda FAMILY\ PLANING_{it} + \delta'\mathbf{X} + \nu_i + \tau + \mu_{it} \quad (10b)$$

where *FAMILY PLANNING*$_{it}$ is the rate of attendance at family planning clinics in region i in year t. I continue to model time as a piecewise linear spline and to include regional fixed effects.

I report two specifications of the model. Initially I estimate a standard instrumental variable (IV) estimation of (10a) and (10b) using four instruments for *FAMILY PLANNING*. The first is *GILLICK* - a dummy variable for regions affected by the Gillick Ruling during 1985 as discussed above. In this specification I include the data on Scotland. As the Ruling did not apply to Scotland, this provides an additional cross-sectional source of variation in this instrument. Secondly, I use the number of Brook Advisory Centres as a proportion of the relevant population in each region (*BROOK*). Brook are by far the most significant individual providers of family planning services to young people in the UK and the extent of their presence in a region has a significant impact on both the perception and actual provision of family planning. Thirdly, I use the population density of each region as a proxy for the relative cost of family planning services in the area (*DENSITY*). Teenagers living in a very sparsely population area are likely to face greater costs than others in accessing the same level of clinic services.[12] The last instrument I use is the first difference of *FAMILY PLANNING*. I argue that this is likely to reflect additional exogenous information, such as differential responses to the Gillick Ruling (most especially in Scotland) across the UK.[13]

In the second specification I include a lagged dependent variable to allow for impacts on conception (or abortion) rates of more than one period. For example, attendance by a teenager at family planning clinics may have an impact on their behaviour over several years

[12] As discussed above, there is no comprehensive historical record of NHS clinics in each region which would allow a more accurate estimate of travel costs.

[13] The sensitivity of results to the choice of instrument set is potentially an important issue. Our central result is very robust to experimentation with alternative sub-sets of these instruments.

and also on that of friends and siblings. It is well known that the inclusion of a lagged dependent variable in panel data can lead to inconsistent estimates. A standard procedure is such a situation is to transform the equation into first differences and to use appropriate instruments for the lagged dependent variable. Arellano and Bond (1991) show that efficient and consistent estimates can be found in a Generalised Method of Moments (GMM) framework by constructing an instrument matrix involving lagged levels of the endogenous variables and first differences of the exogenous variables (including all instruments). Arellano and Bond (1991) also derive a Sargan test of the over-identifying restrictions implied by the instrument matrix and tests for autocorrelation. Consistency requires the absence of serial correlation in the original error term. In turn this requires significant negative first order but no second order correlation in the differenced error term. Although, it is common to use all available lags as instruments, there is some evidence that using too many lags can lead to biased results when the cross-sectional sample size is small (see Doornik, Arellano and Bond, 1999, p.8). As this is the case in our data, I restrict the instruments to a maximum of three lags.[14] Blundell and Bond (1998) show that if there are instruments that are uncorrelated with the individual effects, these variables can be used as instruments for the equations in levels and a more efficient GMM estimator can be found by combining the differenced equations with the levels equations. In our case, the first differences of the lagged dependent variables and the family planning variable, together with other family planning instruments, may be appropriate instruments for the levels equations. Although this approach leads to a gain in efficiency, the requirements for consistency (i.e. that the instruments are uncorrelated with the individual effects) are quite restrictive. Consequently, I report both the differenced and combined estimates of the dynamic model,

[14] The relatively small number of cross-sectional units in our data is potentially problematic, as many of the GMM results rely on asymptotic consistency. In fact, more standard instrumental variable estimators lead to similar results in the dynamic model.

treating the lagged dependent variable and the family planning variable as endogenous.

IV estimates of the static model on the full sample (from 1984 to 1997) for under sixteens are reported in Table 3 and the GMM estimates of the dynamic model in Table 4. Taking the IV estimates first, those for conception and abortion rates are very similar. In neither case is unemployment estimated to have a significant impact. Statutory care is found to have a positive and strongly significant association with both underage conception and abortion rates whilst, education has negative and strongly significant association. The coefficient on family planning attendance rates is negative for both conceptions and abortions but is very small in magnitude and insignificant at all conventional levels.

With the GMM differenced estimates (reported in Table 4, columns 1 and 2), the coefficient on the lagged dependent variable is positive and significant for both conceptions and abortions, suggesting that there is evidence of dynamic effects. The diagnostic tests suggest the model is well specified. Based on the Sargan test statistics, I cannot reject the null hypothesis that the instrument sets are valid. Further, the tests for first and second order serial correlation in the differenced residuals suggests no evidence of serial correlation in levels. The coefficients on the socio-economic variables retain their expected signs but are reduced in significance as compared to the previous models. The coefficient on family planning is now positive, but again insignificantly different to zero.

With the combined differences and levels estimator for conceptions (column 3), both the unemployment and education variables are now estimated to have a strongly significant impact. In addition, the coefficient on family planning is positive and strongly significant. The coefficient implies that a 1% increase in family planning attendances is associated with a short run increase of 0.1% in the rate of underage conceptions. The estimated long run impact is about twice this value. With the combined estimator for abortions (column 4) the coefficient on family planning is not significant at conventional levels. In addition, the low

significance level of the coefficient on the lagged dependent variable suggests much weaker evidence for dynamic effects

Taking the results as a whole, the socio-economic variables behave generally as expected, although their significance varies across models. Rates of unemployment and children in statutory care are positive predictors of underage conception and abortion rates, whilst participation in post-compulsory education is a negative predictor. Using a range of different approaches and estimation techniques, I am unable to find any evidence that provision of family planning has reduced either conception rates. Indeed there is some evidence that family planning provision has been associated with an increase in conception rates for under sixteens in the UK over the sample period.

5. Conclusions

A simple model of rational choice suggests that improving access to family planning can have an ambiguous impact on underage conception and abortion rates. On the one hand, teenagers who will engage in sexual activity in any case face a reduced risk of pregnancy. On the other hand, family planning raises the likelihood of engaging in sexual activity in the first place. The overall effect may be either to increase or decrease underage conceptions. I use regional data from the UK over the period 1984 to 1997 to test these competing hypotheses using two approaches. The first approach uses the 1984 Gillick Ruling which affected family planning provision for under sixteens in England and Wales. Using older teenagers, who were unaffected by the Gillick case, as a control group, I cannot reject the null hypothesis that the Ruling had no impact either on underage conception or abortion rates. The second approach uses instrumental variables to estimate conception and abortion rates for under sixteens as a function of attendance at family planning clinics. Using a range of specifications, I find no evidence that greater access to family planning has reduced underage conceptions or

abortions. Indeed, there is some evidence that greater access is associated with an increase in underage conceptions in our sample. The observed non-negative impact of family planning on conception rates is consistent with the predictions of the rational choice model that availability of family planning will have a positive impact on rates of underage sexual activity. As expected, socio-economic factors are found to be important predictors of underage conception and abortion rates. The proportion of children in statutory care and the unemployment rate are found to be positively associated with conception rates, whilst the participation rate in post-compulsory education displays a negative association.

Whether these results can be generalised outside the scope of the UK is a question that future work should consider. In addition, issues such as model dynamics and causality might be explored in more detail through the analysis of individual time series. The longest series of data available in the UK (specifically, data are available for England from 1975) is still relatively short, but these issues might usefully be revisited as more data points become available over time.

The results in this paper provide strong support for many of the policy initiatives currently proposed in the UK. Measures which improve educational and work prospects of those groups most at risk seem likely to help achieve the stated aim of reducing underage conceptions. However, the UK experience does not provide evidence that improving access to family planning will, in itself, be successful in reducing the rate of underage conceptions.

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Data Appendix

Family Planning. Rates for under sixteens are per 1000 women aged 13-15. Rates for 16-19 year olds are per 1000 women aged 15-19. NHS clinic data in England are taken from 'Family Planning Clinic Services: summary information', (various issues), Department of Health. Scottish data are taken from 'Family Planning', chapter A3 in *Health, Morbidity and Mortality'*, Information and Statistics Division, NHS in Scotland. Welsh data were obtained from the Statistical Directorate of the Welsh Office. The data on Brook Advisory Centres are taken from *Brook Advisory Centres Annual Report*, various issues. The figures for the South East Thames RHA in 1989 and for Yorkshire RHA in 1990 are unavailable and are estimated by linear interpolation. The 1997/8 figures are not published for the old RHA definitions and were supplied directly by the Statistics Division at the Department of Health.

Conceptions. Rates for under sixteens are per 1000 women aged 13-15. Rates for 16-19 year olds are per 1000 women aged 15-19. Data for England and Wales are taken from *Birth Statistics*, (various issues), Office for National Statistics. Data for Scotland are from *Teenage Pregnancies in Scotland: a fifteen year review 1983-1997*, Information and Statistics Division, NHS in Scotland. From 1994, the figures were no longer published for the old RHA definitions and these were supplied directly by the Office of National Statistics.

Socio-economic Variables:

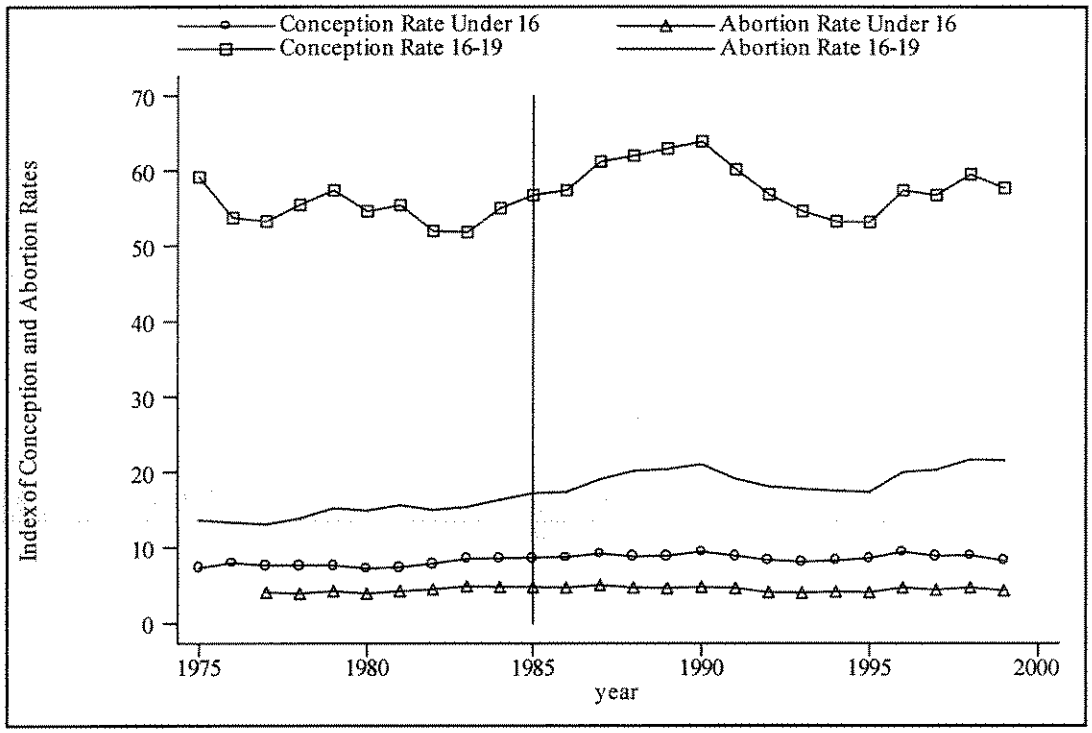
Unemployment. Claimant unemployment rate in percentages.

Education. The percentage of pupils aged 16 staying on in education.

Children in Care. The rate of children in statutory care per 1000 of the population aged under eighteen.

The source for the socio-economic variables is Regional Trends (various issues) and the Scottish Registrar's Report (various issues).

Figure 1: Conception and Abortion Rates in England and Wales, ages 16-19 and under 16: 1975-1999



Source: *See Data Appendix.*

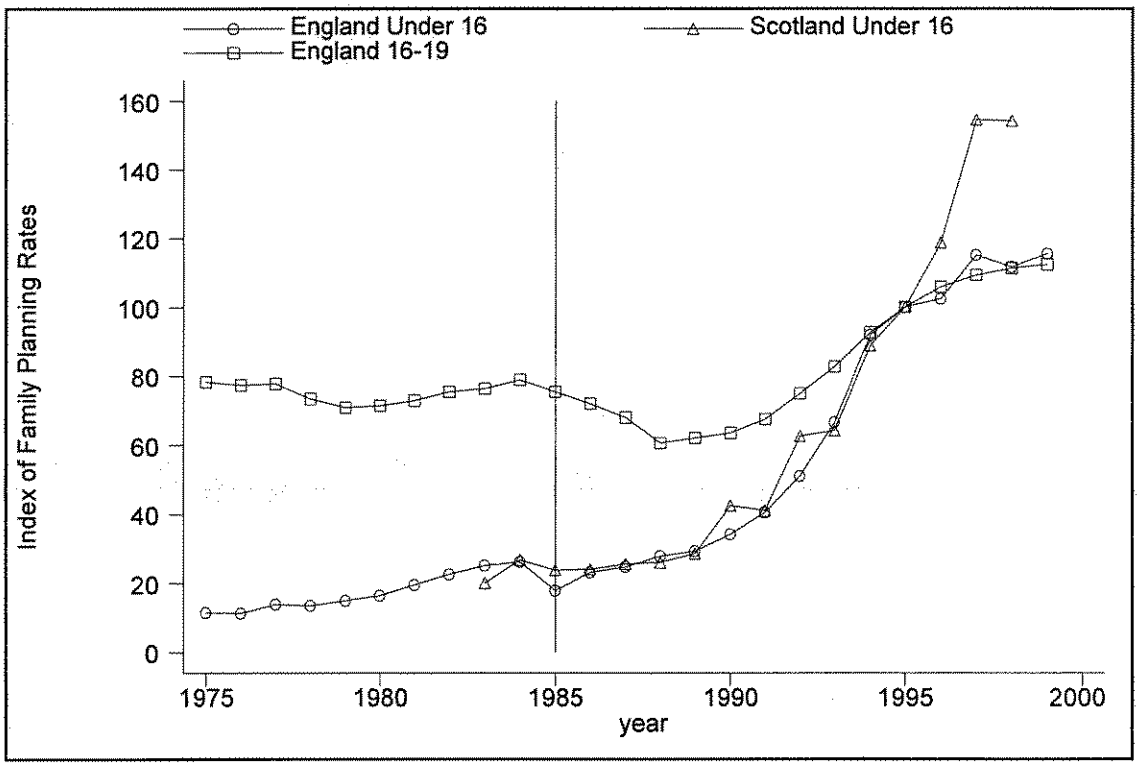
Notes

(i) Rates for under sixteens are per 1000 women aged 13-15. Rates for 16-19 year olds are per 1000 women aged 15-19.

(ii) Abortion rates are only available from 1977.

(iii) The vertical line indicates the year of the Gillick Ruling.

Figure 2: Index of Family Planning Attendance Rates, England (women under 16s and 16-19) and Scotland (under 16): 1975 - 1999, 1995=100



Source: *see Data Appendix.*

Notes

(i) No family planning data is available for Scotland prior to 1983. The index is reported for England as data from Wales are not available for the full period.

Table 1: Mean Underage Conception and Family Planning Rates by GB Regions 1984-1997

Region or Country	Mean Family Planning Rates	Mean Rates of Underage Conceptions	Annual % Change in Conception Rates	
	1984 - 1997	1984 - 1997	1984-1985	1985-1986
East Anglia	28.79	7.64	-1.21	1.23
Mersey	42.70	8.53	-7.32	1.32
Northern	45.14	11.36	11.11	3.00
North Western	40.08	10.72	2.94	-1.90
Oxford	25.79	7.02	-1.33	-2.70
South Western	33.67	7.46	-3.90	-1.35
Thames: North East	30.08	8.39	-1.19	-8.43
Thames: North West	23.46	6.29	1.67	4.92
Thames: South East	41.96	9.05	-11.95	4.94
Thames: South West	30.75	6.16	11.86	-1.52
Trent	41.96	10.34	5.20	0.00
Wessex	42.05	7.79	9.21	1.20
West Midlands	42.64	10.62	-2.90	8.00
Yorkshire	40.42	9.98	-4.30	12.36
Wales	27.13	9.49	8.24	-8.70
England & Wales	34.66	8.80	0.00	0.01
Scotland	21.91	8.21	7.58	5.63
Great Britain (< 16)	33.40	8.75	0.71	1.54
Great Britain (16-19)	156.5	57.93	3.32	1.30

Source: see Data Appendix.

Notes:
(i) Rates are expressed per 1000 women aged 13-15.
(ii) Family planning for 16-19 year olds relates to England only.

Table 2: Fixed Effects Estimates of Conception and Abortion Rates, static model: 1984-1989

	1	2	3	4
	Conception Rates		**Abortion Rates**	
	Under 16s	**16-19**	**Under 16s**	**16-19**
D1985 (Gillick ruling in effect)	0.019	0.015**	0.023	0.032***
	(0.016)	(0.007)	(0.020)	(0.012)
UNEMPLOYMENT	0.190**	0.031	0.061	0.038
	(0.078)	(0.034)	(0.095)	(0.057)
CARE	0.428***	0.168***	0.369**	0.184*
	(0.147)	(0.064)	(0.180)	(0.108)
EDUCATION	-0.211	-0.117*	-0.553***	-0.328***
	(0.164)	(0.072)	(0.201)	(0.121)
Sample size	90	90	90	90
Time	20.25***	103.77***	6.15***	82.15***
Region Effects	30.40***	116.84***	33.73***	66.20***
F-test	101.90***	420.71***	31.17***	122.38***
Serial Correlation	1.75	0.07	3.58*	0.02
Normality	0.86	0.25	3.43	3.34
t-test for Gillick effect	-0.69		-0.78	

Notes:

(i) Dependent variable in 1 and 2 is the log of conception rates (*CONCEPTION*); in 3 and 4 it is the log of abortion rates (*ABORTION*).

(ii) Figures in brackets are robust standard errors.

(iii) *** indicates significance at the 1% level; ** at the 5% level; * at the 10% level.

(iv) F-test is a joint significance test for all the regression coefficients. Time is an F-test of the joint significance of the piecewise linear spline variables. Region Effects is an F-test of the joint significance of the regional fixed effects.

(v) Serial Correlation is an LM test for first order serial correlation and is distributed as $\chi^2(1)$ (see Baltagi, 1995). Normality is a test of kurtosis and skewness of the residuals and is normally distributed on the null hypothesis.

(vi) t-test for Gillick effect is a test that the difference in the 1985 for under sixteens and 16-19 year olds is equal to zero in a pooled regression.

Table 3: IV Estimates of Impact of Family Planning Attendance on Underage Conception and Abortion Rates, static model: 1984-1997

	1 Conceptions	2 Abortions
FAMILY PLANNING	-0.014	-0.021
	(0.046)	(0.055)
UNEMPLOYMENT	0.042	-0.048
	(0.039)	(0.041)
CARE	0.451***	0.330***
	(0.092)	(0.123)
EDUCATION	-0.312**	-0.769***
	(0.144)	(0.245)
Sample size	224	224
Time	19.28***	2.71**
Region Effects	42.62***	13.57***
F-test	95.95***	28.48***

Notes:
(i) Dependent variable in 1 is the log of conception rates (*CONCEPTION*); in 2 it is the log of abortion rates (*ABORTION*).
(ii) *FAMILY PLANNING* is treated as endogenous and instrumented by its first difference, *GILLICK*, *BROOK* and *DENSITY* as described in the text.
(iii) See also notes (ii) to (iv) in Table 2.

Table 4: GMM Estimates of Impact of Family Planning Attendance on Underage Conception and Abortion Rates, dynamic model: 1984-1997

	1 Conceptions	2 Abortions	3 Conceptions	4 Abortions
CONCEPTION$_{t-1}$	0.137**	0.374***	0.532***	0.195
	(0.062)	(0.073)	(0.140)	(0.135)
FAMILY PLANNING	0.044	0.075	0.102***	0.036
	(0.036)	(0.054)	(0.023)	(0.034)
UNEMPLOYMENT	0.042	0.016	0.139***	0.065
	(0.054)	(0.049)	(0.036)	(0.057)
CARE	0.230**	0.077	0.126	0.149
	(0.147)	(0.173)	(0.135)	(0.146)
EDUCATION	-0.224	-0.343	-0.388**	-0.722***
	(0.148)	(0.217)	(0.169)	(0.229)
Sample size	224	224	224	224
Time	17.06***	15.01***	32.75***	28.95***
Sargan	14.02	8.73	9.62	9.64
$\mathbf{m_1}$	-3.43***	-3.45***	-3.20***	-3.15***
$\mathbf{m_2}$	-0.92	-0.69	-0.93	-0.394

Notes:
(i) Dependent variable in 1 and 3 is the log of conception rates (*CONCEPTION*); in 2 and 4 it is the log of abortion rates (*ABORTION*).
(ii) Models 1 and 2 are estimated on first differences. The instrument matrix includes up to three lags of the lagged dependent variable and FAMILY PLANNING as well as *GILLICK*, *BROOK* and *DENSITY*. Models in 3 and 4 are the combined levels and differenced estimators. First differences of the lagged dependent variable and family planning are used as additional instruments.
(iii) Sargan is a Sargan test of the overidentifying restrictions in the instrument matrix and follows a χ^2 distribution. m_1 and m_2 are tests for first and second order serial correlation are normally distributed on the null hypothesis.
(iv) See also Table 2, notes (ii) to (iv).

STATE OF WISCONSIN
WAIVER REQUEST

MEDICAID FAMILY PLANNING SERVICES FOR WOMEN OF CHILD BEARING AGE IN THE STATE OF WISCONSIN

To

Health Care Financing Administration
U. S. Department of Health and Human Services

From

Joe Leean, Secretary
Wisconsin Department of Health and Family Services

June 25, 1999

FAMILY PLANNING WAIVER REQUEST

TABLE OF CONTENTS

State of Wisconsin
Family Planning Waiver Application

I. OVERVIEW

The State of Wisconsin is requesting a waiver under the authority of Section 1115 (a) of the Social Security Act to extend Medicaid eligibility for family planning services to women 15-44 years of age whose income is at or below 185% of the federal poverty level (FPL). Specifically, we are requesting a waiver of the following provisions of the Social Security Act: Sections 1902(a)(10)(A); 1902(l)(1); 1902(a)(10)(B); 1902(a)(17)(D); 1902(a)(34); and 1902(a)(47).

The primary goal of the Wisconsin family planning demonstration project is to reduce unintended pregnancies in the project population and thereby reduce the number of births, and birth related costs, paid for by Medicaid.

Target Population and Need for Services

Wisconsin is seeking approval to extend Medicaid coverage of family planning services to all women who:

- Are between the ages of 15 and 44;
- Have income at or below 185% FPL; and
- Are not enrolled in Medicaid or BadgerCare, both of which provide family planning services.

Extending the eligibility criteria in this manner is expected to create a new Medicaid population of 47,000 women enrolled for Medicaid family planning services.

(See Appendix A for a complete calculation of the estimated family planning users for this demonstration project and Appendix B for a description of BadgerCare.)

The Alan Guttmacher Institute's 1995 estimates of Wisconsin women in need of publically supported contraceptive services reflect similar numbers of women in need of services (see Appendix C).

Scope of the Project

Wisconsin will provide family planning services under this demonstration project for five years beginning October 1, 1999. Services will be available statewide, on a fee-for-service basis and are subject to all the applicable federal family planning regulations. Covered services include office visits, limited laboratory services, sterilization and contraceptive devices and pharmaceutical supplies. Eligible women may obtain family planning services from any qualified Medicaid provider. Providers will include physicians, nurse midwives, nurse practitioners, federally qualified health centers, hospital clinics and pharmacies. All Title V and Title X family planning clinics will be providing services under this demonstration project.

Outreach

Outreach will be conducted using a variety of methods, including:

- Medicaid provider notification,
- Presumptive Eligibility (PE),
- Provider training,
- Recipient notification,
- Title V program,
- The Early Identification of Pregnancy (EIDP) program,
- *Brighter Futures: The Wisconsin Plan to Prevent Adolescent Pregnancy,*
- Title X agencies,
- Wisconsin Family Planning and Reproductive Health Association, Inc., (WFPRHA), and
- The State Medical Society.

Cost Neutrality and Evaluation

Wisconsin will assess the impact of this demonstration project by using historical base-line data and future trends expected without the waiver, compared to data collected following project implementation. Final net savings from the family planning waiver for the five-year period are estimated at $10,103,375.

II. BACKGROUND AND NEED FOR SERVICES

Problem Definition

Programs such as Medicaid and BadgerCare traditionally cover women who are disabled, have children, or are pregnant. Low-income women who do not qualify for such programs are unlikely to have either insurance coverage, or sufficient personal funds to purchase family planning and reproductive health services in the private sector. Therefore, they are at a higher risk of unintended pregnancy and in greater need of subsidized family planning services (Forrest and Samara, 1996).

Unintended Pregnancies

According to the Alan Guttmacher Institute, the $715 million in federal and state tax revenues used nationally to provide contraceptive services in 1994 prevented at least 1.5 million unintended pregnancies (Forrest and Samara, 1996). Nationally, of all pregnancies in 1994 (excluding miscarriages), approximately 51% concluded in intended births, 23% in unintended births, and 26% ended in abortions (Henshaw, 1998).

Over 49.0% of all pregnancies are unintended, and approximately 31.0% of all births are also unintended. The proportions of unintendedness increase with young age and low-income, as shown in the following table (Alan Guttmacher, 1995). Women within these demographic categories are particularly vulnerable to the negative consequences of unintended pregnancy and birth.

Demographics	Unintended Pregnancies	Unintended Births
Ages 15-17	82.7%	72.9%
Ages 18-19	75.0%	61.7%
Under 100% FPL	61.4%	44.8%
100-199% FPL	53.2%	37.2%

The importance of this demonstration project is also reflected in two of the five goals of the "Campaign to Reduce Unintended Pregnancy," recommended by the Institute of Medicine in its 1995 report, *The Best of Intentions: Unintended Pregnancy and the Well-being of Children and Families,* to: 1) improve knowledge about contraception and reproductive health, and 2) increase access to contraception. The Institute of Medicine report documents the serious consequences associated with unintended pregnancy. These include increased risks for women, children and families, delayed prenatal care, increased risk of fetal exposure to harmful substances due to late confirmation of pregnancy, increased risk of low birthweight, and infant mortality. Unintended pregnancies lead to 1.5 million abortions each year in the United States (Brown and Eisenberg, eds., 1995).

According to this report, the significance of increased access to contraceptive services is illustrated by the relationship between contraception and unintended pregnancy. Among women not planning to become pregnant but not using contraception, 44 out of 100

experience unintended pregnancy. This sharply contrasts to unintended pregnancy among women also not planning to become pregnant but using contraception: 7 out of 100 experience an unintended pregnancy (Brown and Eisenberg, eds., 1995).

Increased access to contraceptive services has significant prevention and cost savings potential. The Alan Guttmacher Institute has estimated that every public sector dollar spent on family planning services saves an average of $3. (Forrest and Samara, 1996).

Wisconsin Medicaid/Healthy Start (Title XIX)

Beginning in the late 1980's, Congress enacted a series of laws to reduce infant mortality and improve birth outcomes by expanding Medicaid coverage of low-income pregnant women and their children. Wisconsin refers to this Medicaid expansion for poverty-related pregnant women and children as Healthy Start. In Wisconsin, pregnant women and their children, under age six, qualify for Healthy Start up to 185% FPL. As of April 1999, children ages six through age eighteen qualify for Healthy Start up to 100% FPL. (BadgerCare will cover children ages six through eighteen with family income up to 185% FPL.)

To reduce the barriers low-income women face in accessing prenatal care, Wisconsin has taken measures to streamline the Healthy Start eligibility process. These measures include eliminating the asset test for Healthy Start eligibility, expanding presumptive eligibility to include more providers, and developing and implementing outreach programs, including outstationing.

Outstations

Several years ago, Milwaukee County eligibility workers were located in three Healthy Start outstation sites to increase benefit access for pregnant women and young children. Wisconsin is now embarking on a major expansion of outstationing, and will be locating Milwaukee county eligibility staff in more than twenty new sites, including hospitals, clinics and community-based agencies. Eight outstations have also been established in Kenosha County and plans for outstations in three additional counties have been approved (including Dane County, where the capital, Madison, is located). At this writing we have received proposals from another three counties, and we expect proposals from additional county and tribal agencies as well.

Since the passage of OBRA '90, Wisconsin has established a number of OBRA outstation sites which assist pregnant women and young children in completing Healthy Start applications, and then forward the completed applications to county staff. Wisconsin Medicaid is expanding and improving on these Healthy Start/OBRA outstation sites in conjunction with the Wisconsin Primary Health Care Association. This association was awarded a HCFA/HRSA demonstration grant to support private/public partnerships in Medicaid outstationing in Wisconsin.

Healthy Start Caseload and Expenditures

We are using Healthy Start recipients and expenditures for pregnant women, newborns and children, and fee-for-service family planning recipients and expenditures for the projections of our Medicaid costs with and without the waiver to show the impact of the

family planning waiver. Over the past three years, the number of Wisconsin Healthy Start recipients has increased, while the number of AFDC-related Medicaid cases has decreased. In January 1995, Wisconsin had a total of 486,858 Medicaid recipients. This figure included 44,665 Healthy Start women and children, which represents nine percent of the total Medicaid caseload. In January 1998, the total number of recipients was 398,572, but the number of Healthy Start women and children at that time expanded to 80,830, or twenty percent of the total Medicaid caseload. The unduplicated count of Healthy Start recipients for SFY 98 was 162,441 compared to 98,017 in SFY 1994 (these counts may have a slight duplication of newborns in the children category). This annual count is the total number of pregnant women and children who were eligible at any time during a given fiscal year.

In SFY 98, the total Medicaid cost for Healthy Start pregnant women was $36,971,071 (including PE expenditures). The cost for Healthy Start newborns was $17,421,348 and $78,802,410 for children during that same fiscal year.

Historic data on Healthy Start eligibles and costs are included as Appendix E-1. Projections of Healthy Start costs without and with the family planning waiver are presented in Appendix E-2 and E-3.

Subsequent Healthy Start Pregnancies

While Healthy Start has improved access to prenatal care for low-income women, benefits continue only through the end of the month in which the sixtieth postpartum day occurs. This policy leaves many women without access to family planning services at a time when they are at risk of another pregnancy.

Using the same Medicaid claims data as that used for Appendix E-1, we found that during SFY 94-SFY 98, 1,887 Healthy Start women had a subsequent pregnancy within two years of an initial birth. The total Medicaid costs for these pregnancies, births and children are estimated at approximately $9.4 million, based on the 5-year average prenatal and birth costs of $1897 per pregnancy, the 3-year average newborn costs of $558 per newborn, and the 5-year average cost per child of $518 per year.

One focus of this demonstration project is to address this shortcoming by making women automatically eligible for the family planning demonstration project, if they are not enrolled in either Medicaid or BadgerCare when their Healthy Start eligibility ends. A recently reported study in the MMWR on "Risk Factors for Short Interpregnancy Interval (IPI)—Utah, June 1996-June 1997", dated November 6, 1998, found that Medicaid women are at greater risk for short IPIs and may "benefit from extended Medicaid coverage or other means of assuring access to family-planning services" (MMWR, 1998).

Title X and Title V Family Planning

Currently, women who do not qualify for Medicaid or BadgerCare can receive family planning services through programs supported by Title X or Title V block grants.

Planned Parenthood of Wisconsin administers the Title X block grant. Under this grant, family planning services are provided at nine Planned Parenthood clinics, and three

community-based health clinics that are not operated by Planned Parenthood. Patients under 100% FPL receive free services at Title X clinics.

Title X grant funding has remained virtually level at $2.7 million in FFY 95 and $2.8 million from FFY 96 through FFY 98. Inflation for professional medical services has increased an average of 3.9% annually for this same time period (see Appendix F). Over the past five years, the number of low-income clients being served at these clinics has decreased due to the clinics not having the financial resources to do outreach, or provide services for an increased number of clients who must be served free of charge.

Even among women who are insured, contraceptives are often a non-covered service. Planned Parenthood of Wisconsin estimates that approximately 5% of their clients have private insurance and only 20% of those are insured for contraceptives. According to the National Family Planing and Reproductive Health Association, one third of large group fee-for-service plans cover oral contraceptives and less than 20% of large group fee-for-service and less than 40% of HMOs routinely cover all five of the major reversible methods of contraceptives (Planned Parenthood of Wisconsin, personal communication, 1998).

The table in Appendix G demonstrates the need for expanded contraceptive services in Wisconsin. Access to these services has steadily decreased over the past five years: 16,000 fewer patients received services in 1993 compared to 1997: 60,727 patients received services in Title X clinics in 1993, declining to 44,250 in 1997. This is a significant problem considering the relationship between unintended pregnancy and lack of contraceptive use described above.

The Division of Public Health (DPH), within the Department of Health and Family Services, administers Title V, the Maternal and Child Health Block Grant Program. Title V funding is used to support a number of projects including prenatal, infant and child health services, and family planning services in areas not supported by Title X funding. Title V family planning funds ($1,824,710) are supplemented by $1,980,200 in state general purpose revenue (GPR) funds, and serve low-income clients at 33 agencies including local health departments, tribal agencies and community-based health clinics in 51 counties throughout Wisconsin. (See map and list of providers in Appendix H.)

As with Title X, funding for both the Title V block grant and GPR support has remained level from FFY 94 through FFY 98. However, increased medical costs, due to inflation, have been passed along to all clients. Fewer low-income clients are being served because of increased charges. Unlike Title X clinics, the Title V clinics use a sliding fee-scale that applies to all clients, including those who are low-income. In Title V/GPR clinics in 1993, public funds accounted for approximately 80%-85% of the total operating budgets of these family planning clinics. In 1997, public funding accounted for 53% of the total cost of providing services; generated income (largely patient fees) paid for 47% of the cost of services. This shift in revenue sources reflects a decreasing proportion of low income patients (under 100% of poverty) served by these clinics, for whom services are increasingly unaffordable.

In 1993, approximately 47% of all patients (Title X and Title V/GPR) were below 100% of poverty compared to 40% of all patients in 1997. The decrease in the number of patients served and the proportion of women below 100% of poverty are noteworthy because women below 100% of poverty have a higher proportion of unintended pregnancies, are more vulnerable to the economic and social consequences of unintended pregnancy, and are more likely to enroll in Healthy Start. According to the latest National Survey of Family Growth, 61.4% of women under 100% of poverty had unintended pregnancies; this compares with 49.2% of all women, 53.2% between 100% and 200% of poverty, and 41.2% over 200% of poverty. The low-income clients who can not afford to receive services at the Title V clinics, or who do not know about the free services being offered by the Title X clinics, are the population most likely to qualify for Healthy Start if they do become pregnant (see table in Appendix G).

Effect of this Demonstration Project on Title V and Title X Agencies

Expanding Medicaid coverage for family planning services as proposed here will augment funding for both of these programs. The 1115 waiver will allow Wisconsin to allocate additional Title V and Title X dollars for community education and outreach, and offer more affordable services for other clients, such as low-income men, and women between 185% and 250% FPL (similar to proposals submitted by other state e.g., Oregon). The occurrence of unintended pregnancy among individuals at this income level remains high, leaving them vulnerable to its negative economic and health consequences (see Appendix C).

(See Appendix F for historical data on Title V and Title X funding and client numbers in Wisconsin.)

The Wisconsin Department of Health and Family Services is required to "provide for delivery of family planning services throughout the state by developing and by annually reviewing and updating a state plan for community-based family planning programs" (Wisconsin statutes: 253.07). The DPH's Maternal and Child Health Advisory Committee is charged to "conduct an annual review of the Wisconsin Family Planning Program and make recommendations for an updated plan." This review was completed and a report made to DPH/DHFS on September 21, 1998 (Attachment III). Many of the recommendations relate directly to implementation of this demonstration project: "A waiver, if effectively implemented, has the potential to significantly increase accessibility and affordability of services statewide."

A map showing the locations of Title V and Title X clinics is included as Appendix H.