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THE IMPACT OF MEDICAID EXPANSIONS ON PREGNANCY RESOLUTION AND OUT-OF-WEDLOCK BIRTHS IN NEW YORK CITY

by

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A dissertation submitted to the Graduate Faculty in Economics in partial fulfillment of the requirements for the degree of Doctor of Philosophy, The City University of New York

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Abstract

THE IMPACTS OF MEDICAID EXPANSIONS ON PREGNANCY RESOLUTION AND OUT-OF-WEDLOCK BIRTHS IN NEW YORK CITY

by

Wenhui Li

Adviser: Professor Michael Grossman
Professor Theodore J. Joyce

Recent aggressive Medicaid expansions have substantially lowered the cost of giving birth and of perinatal care for low income pregnant women and their children. This research tries to reveal some impacts of these expansions. First, the effectiveness of the expansions is measured by observing the change in the Medicaid coverage rate before and after the expansions. Second, the author looks at the change in fertility rates in New York City. Medicaid expansions financed birth but not abortion in New York. Consequently, they lowered the cost of birth relatively more than the cost of abortion for the women who were not previously covered by Medicaid. Do these expansions increase the probability of birth? Are there differences in the effects of Medicaid

expansions between race and ethnicity? These are the questions that this study tries to answer. Third, some welfare programs, such as Aid to Families With Dependent Children (AFDC), food stamps, and Medicaid, may make single parenthood more economically attractive, but very little literature about the influence of Medicaid on out-of-wedlock birth has been seen. This research also investigates the effects of Medicaid expansions on out-of-wedlock births in New York City.

The major findings are as follows. First, nationally, recent Medicaid expansion indeed significantly increased the Medicaid coverage of medical expenditure for pregnant women, but still plenty of eligible pregnant women under expansion did not receive Medicaid benefits for some reason. Second, in New York City, Medicaid expansions encouraged more poor or near poor pregnant women to choose birth rather than abortion regardless of race or ethnicity. The birth ratio (births divided by births plus abortions) increased approximately 11.1 percent for whites, 5.2 percent for blacks and 3.7 for Hispanics between 1988 and 1991. Third, by controlling for the increasing trend of illegitimate births in the estimates, Medicaid expansion had some impacts on reducing the

probability of out-of-wedlock birth for pregnant women among low income whites and blacks in New York City.

Acknowledgment

This research is under the supervision of Professor Michael Grossman and Professor Theodore Joyce. The author is grateful to Professor Linda Edwards for valuable comments. The author thanks Dr. Henshaw in Alan Guttmacher Institute for providing information of abortion data in New York City. The author also wishes to thank Nancy Cuthbert and Ofelia Rabassa for detail editing help.

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I. Introduction

Since 1986 Congress had passed a series of laws that permitted and/or required states to significantly expand the scope of coverage of Medicaid programs for low-income pregnant women and young children with the aim of improving their health status and reducing infant mortality for the nation. By April 1990 a uniform minimum threshold had been established: all states were required to cover pregnant women with incomes up to 133% of the Federal poverty line. States also had the option to expand Medicaid eligibility to 185% of the poverty level. Since the end of the 1980's, every state has expanded its level of Medicaid eligibility rapidly. Meanwhile, Federal expenditure on Medicaid soared from 30 billion dollars in 1988 to about 52 billion dollars in 1991. Similarly, this expenditure in New York state grew from 8.5 billion dollars in 1988 to 14 billion dollars in 1991, which is the highest in the country. New York was among the top five most aggressive states in expanding Medicaid coverage for low income women and children[1].

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[1] See "The Medicaid Eligibility Expansions for Pregnant Women: Evaluating the Strength of State Implementation Efforts" by Rachel Benson Gold, Susheela

An important question to be asked is what impact do these efforts have on women's access to medical care services. According to Ian T. Hill (1992), "states have implemented a wide range of innovative policies and programs aimed at informing women of the importance of prenatal care and the availability of coverage, streamlining women's access to Medicaid coverage, increasing the supply of obstetrical providers available to serve low income women, and enriching the scope and continuity of prenatal benefits covered under Medicaid." The question still remains whether these efforts were effectively translated into increased Medicaid coverage and prenatal care.

Second, in New York Medicaid expansions financed birth, not abortion for pregnant women[2]. Consequently, they lower the cost of birth relatively more than the cost of abortion for the women who were not previously covered by Medicaid.

Singh and Jennifer Frost (1993). They evaluated implementation of Medicaid expansions by ranking states in eligibility and enrollment, outreach activities, enhanced services and reimbursement generosity. Their results showed that overall, North Carolina, Maryland, Massachusetts, New York and Arkansas moved most aggressively to carry out the expansions.

[2] See Appendix.

The likelihood of choosing birth versus abortion for those pregnant women who are newly eligible under Medicaid expansion could increase. Also, in New York City, a big portion of population is black and Hispanic[3]. Minority women have relatively low incomes and therefore are more likely to be eligible for Medicaid coverage. The question to pose is this: Does this 'pronatalist' policy increase the probability of birth and does the change vary by race or ethnicity?

Another important feature of the Medicaid expansions is that the expansion weakened the traditional tie of Medicaid benefit to the AFDC program. States were mandated to increase the income thresholds for Medicaid eligibility, regardless of family structure. On the one hand, this probably permitted Medicaid to cover not only single mothers, but also some low income married women as well. On the other hand, efforts to inform low income women of the availability of expanded Medicaid coverage also encouraged more unmarried women,

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[3] There were 132,226 and 138,148 births reported in 1988 and 1991 respectively in New York City. Among them 30.9% were non-Hispanic black, 30.8% were Hispanic and 30.2% were non-Hispanic white. There were 90,137 and 105,195 comparable abortions reported in 1988 and 1991 respectively. Among them 50.6% were black non-Hispanic, 23.1% were Hispanic and 18.7% were white non-Hispanic.

especially teenagers, to stay single in order to retain AFDC, food stamps and Medicaid benefits. Therefore, the total impact of Medicaid expansion on women's decision to marry can be positive or negative depending on the impact of former dominating latter or reverse. In other words, its impact on the probability of out-of-wedlock birth is ambiguous.

According to the definition of "wantedness" by Theodore Joyce and Michael Grossman (1990), abortion can be viewed in an economic context in which the decision whether to end a pregnancy or to continue it to birth results from a complex weighing of relative costs and benefits. The purpose of this research is to analyze the impacts of the Medicaid eligibility expansions for pregnant women on pregnancy resolution and out-of-wedlock childbirth in New York City. Since New York City, a big Metropolitan city in New York State, expanded the Medicaid eligibility level from 81% to 185% of poverty line in January of 1990, I will concatenate the induced termination file with birth files for 1988 (before expansion) and 1991 (after expansion) to examine whether this change had any impact on the likelihood of terminating a pregnancy between these two years.

The next section begins with a review of the literature

The next section begins with a review of the literature evaluating the effectiveness and analyzing the impacts of recent Medicaid expansions and others which are pertinent to this research. Section III gives the methodology of the research. Section IV presents the empirical results which contain different models and estimates. Section V gives the conclusions of this research and indicates the direction of further study. The tables and figures related to this research and references cited in the text are also appended. Finally, the Appendix, includes the description of Medicaid expansions.

II. Background and Literature Review

The scope and depth of Medicaid expansions for low income pregnant women and their children that took place between the later 1980's and early 1990's were dramatic. To assess or measure the impacts that the Medicaid expansions have had, we need to know briefly what were the policy changes involved in the Medicaid expansion, how significant was the eligibility level increase and, most importantly, what efforts the states made to allow more poor and near poor pregnant women to have adequate prenatal care. In order to make the text succinct

describe several major points and eligibility level changes in the Medicaid expansions in the United States and New York City. The detailed description of Medicaid expansions is put in the Appendix.

Before the Medicaid expansions of 1986, low income pregnant women generally qualified for medical care coverage from Medicaid if they had been eligible for welfare or Aid to Families with Dependent Children (AFDC). Eligibility for AFDC was generally limited to unmarried women with children who had incomes below a state-determined eligibility level. Many states had "medically needy" program which allowed some women get coverage although their incomes exceed the limit for the basic Medicaid program. But in practice this type of coverage was generally limited to individuals with large medical bills. "Medically need" program may cover abortion provided that a doctor certify that the pregnancy endangers mother's health.

Legislation in 1985 allowed pregnant women to qualify for Medicaid on the basis of income only, and not by family structure. Legislation in 1986 further allowed states to expand their eligibility threshold to as much as 100% of poverty line for pregnant women, infants and children up to the age of five. These changes break the link between

Medicaid and AFDC. In 1987, law developed the option by raising threshold level up to 185% of poverty line for Medicaid coverage of pregnant women and infants until age one. Two more legislation in 1988 and 1989 mandated states to raise eligibility level to 100% and 133% of poverty line respectively for pregnant women and infants to age one.

In New York, pregnant women or infant children under age one can qualify for Medicaid as AFDC-related or under the special financial standards if their incomes are within medical assistance (MA) limits and they have sufficient incurred medical expenses. Before 1990 the MA limit for pregnant women and infant was 81% of poverty line. Effective in January of 1990, pregnant women are eligible for full Medicaid coverage through MA program if their incomes are below 100% of the poverty line. And pregnant women not otherwise eligible for MA whose families have incomes below 185% of the poverty line are eligible for Medicaid coverage through the Prenatal Care Assistance Program (PCAP). Some of the services are excluded from coverage in PCAP, such as abortion, podiatry, eye care, alternate level care, etc. Infants under age one are eligible for Medicaid if their family incomes are below 185% of the poverty line. Similar to

the Congress, state legislation mandate that all pregnant women are eligible if poor, no matter what their household compositions are.

Therefore, the dramatic increase of Medicaid eligibility level made thousands of pregnant women eligible for Medicaid coverage in the expansion. It has brought many researchers' attention to its effect and influence on mother and infant's health, social and economic behavior. Some economists and health service policy researchers have been working on evaluating or estimating the impacts of recent Medicaid eligibility expansions, but very few dealt with the effect of Medicaid expansions on pregnancy resolution.

Janet Currie and Jonathan Gruber (1994) built a detailed simulation model of each state's Medicaid policy during the 1979-1990 period, and use this model to estimate the effect of changes in the rules on the eligibility of pregnant women for Medicaid and the effect of Medicaid eligibility changes on birth outcomes in aggregate Vital Statistics data. They found that the later "broad expansions" of Medicaid eligibility to all low income women appear to have had little effect on birth outcomes, primarily because they were not effectively translated into increased Medicaid coverage.

One reason for this ineffectiveness, I believe, is that there is a lag between Medicaid eligibility and the actual coverage. It takes time for people to become aware that they are eligible for Medicaid. Although almost all states raised eligibility to the target level before July of 1990, in 1989 and 1990, only 8.9% and 8.7% of women between ages 15 and 44 reported that they were covered by Medicaid (Current Population Survey, March 1989, March 1990) respectively. By 1993 this percentage rose only to 11.8% (Current Population Survey, March 1993). Furthermore, we must assume a lag of at least one year between Medicaid coverage and any effect upon birth outcomes for pregnant women if we consider prenatal care and if there is, in fact, an effect.

It also should be mentioned here that because a higher proportion of the black and Hispanic population is under the poverty threshold than the white population, there are more eligible blacks and Hispanics for Medicaid eligibility expansions. Hence it is likely that the potential impacts of Medicaid expansions, in terms of medical coverage and prenatal care, on birth outcomes among black or Hispanic pregnant women and their infants may differ from that of whites. Janet Currie and Jonathan Gruber did not do race-specific testing,

which could be another reason why they did not get the results they expected.

Third, they use aggregate Vital Statistics data to examine the impact of Medicaid expansion on birth outcomes. It could obscure the characteristics of the pregnant women. And the determinants that can be used in aggregate data for health production function are limited.

Theodore Joyce and Robert Kaestner (1996) examined the effect of Medicaid income eligibility expansions on abortion in South Carolina, Tennessee and Virginia. Their results suggested that for unmarried, non-black women with less than a high school degree, income eligibility expansions lowered the probability of abortion by between two and five percentage points. Most of the impact of the Medicaid expansions on abortion occurred in the first round of expansions from approximately 45 percent of the federal poverty level to 100 percent. For comparable black women, they generally found no effect of Medicaid income eligibility expansions on abortion.

The Medicaid expansions in those three states differ from those in New York State in several ways. First, they were not so dramatic, in terms of the effective date and the eligibility level, as that of New York. In South Carolina,

Medicaid eligibility was expanded from 50 percent of the federal poverty level to 100 percent of the poverty level in October 1987, and then further expanded to 185 percent of poverty level in July 1989. Tennessee's first expansion was from 45 percent to 100 percent of the federal poverty level and it occurred in July 1987. Two more expansions took place in Tennessee. In January 1990, eligibility was expanded to 150 percent of poverty level and in July 1991, eligibility was expanded to 185 percent of the federal poverty level. In Virginia, the expansions took place in July 1988 and April 1990. The first expansion increased the income eligibility from 46 to 100 percent of the federal poverty level, and the last expansion increased eligibility to 133 percent of poverty level. Second, none of these three states are listed in the top five most aggressive states in expanding Medicaid coverage for low income women and children[4]. One of the major reasons for Joyce and Kaestner to choose South Carolina, Tennessee and Virginia to do their estimates is that underreporting of induced abortions in these states is minor. The underreporting problem in New York City is not trivial. The

[4] See footnote 1.

numbers of induced terminations reported by New York City Department of Health are 20.7% and 15.1% lower than that from Alan Guttmacher Institute in 1988 and 1991 respectively. But the methodology I am using in this research will eliminate the bias from the problem of underreporting provided that the degree of underreporting in these two years is similar. I will explain this in Section III. Finally, Joyce and Kaestner restricted their sample to only out-of-wedlock pregnant women. The impact of Medicaid expansion on pregnancy resolution for all low income women still needs to be explored.

Lundberg and Plotnick (1995) developed an empirical model of adolescent premarital childbearing in which a woman's decisions affect a sequence of outcomes: premarital pregnancy, pregnancy resolution, and the occurrence of marriage before the birth. Using data from the National Longitudinal Survey of Youth (NLSY) and a three-stage nested Logit framework, they found state welfare, abortion, and family planning policies alter the costs and benefits of these outcomes among white adolescents but not black. They did not test this for Hispanic adolescents because the small number of observations. By simulation, they also found that change of welfare benefit level will change the likelihood of marrying among white

pregnant teenagers, given that the pregnancy is carried to term. However, welfare has a small effect on pregnancy resolution and a negligible impact on premarital pregnancy. Their conclusion is that "it would be premature to draw strong conclusions or policy recommendations that hinge on the precise results of this exercise."

Haas et.al (1993) evaluated the Health Start, a state-funded program providing health coverage to uninsured pregnant women with incomes below 185% of the federal poverty level in Massachusetts in 1985. The program is very similar to the Medicaid expansion in eligibility, comprehensive coverage for both prenatal and inhospital care, presumptive eligibility and community outreach for low-income pregnant women although it happened before recent Medicaid expansion. They measured the effectiveness of the program by evaluating rates of satisfactory prenatal care, care initiated before the third trimester and adverse infant outcome for uninsured women and for two concurrent control groups, women with Medicaid, and women with private insurance. They calculated the difference in rates between the uninsured and each concurrent control. To assess the effect of the program, they examined the change in these interpayer differences in rates between 1984 and

1987. Their finding suggested that access to prenatal care may have declined for all women in Massachusetts between 1984 and 1987. "In the setting of this statewide decline in access, the expansion of health coverage to uninsured low-income pregnant women was not associated with an improvement in access to prenatal care or birth outcomes" (JAMA, Vol.269, No.1, page 91).

Rebecca M. Blank, Rebecca A. London and Christine C. George (1994) used data on abortion rates, by state and year from 1974-88, to estimate two-stage least square models with fixed state and year effects. Their results indicated that implementing restrictions on Medicaid funding for abortion resulted in lower aggregate abortion rates in-state and higher abortion rates among nearby states. Their estimates showed that "one of the main effects of these policies is to induce cross-state migration for abortion services" and "the effect of these restrictions on actual abortions among state residents is much smaller: a maximal estimate suggested that 22 percent of the abortions among low-income women that are publicly funded do not take place after funding is eliminated (NBER working paper #4853)." Although they focused on cross-state migration for abortion services, their finding implies

that the restrictions on abortion may reduce the abortion rate or increase the birth rate.

Janet Currie, Lucia Nixon and Nancy Cole (1996) used NLSY data and reduced form models to estimate the effects of restrictions on Medicaid funding of abortion on birth weight and pregnancy resolutions. In their estimates, the potential endogeneity of abortion laws was explored by comparing jurisdictions with abortion restrictions to jurisdictions where restrictive laws have been passed but are enjoined by the courts. In general, their findings suggested that restrictive laws increase the probability of a birth by 3 percent among whites and about 10 percent among African-Americans. But they found that these laws have little direct effect on the incidence of low birth weight.

The main drawback of their research, I believe, is that the number of abortions in NLSY is significantly underreported (Jones and Forrest 1992), which could undermine the significance of their findings. Although they mentioned it in the discussion, the methodology they used in the estimations seem unable to diminish the bias from underreporting.

The illegitimacy rate continues to climb in the United States. It was estimated that at least 1.2 million children,

30 percent of all babies, are expected to be born out of wedlock in 1994 and welfare outlays for single mothers are expected to reach 60 billion dollars in same time (Smith, Lee 1994). The literature on the relationship between the welfare program, mainly AFDC program, and out-of-wedlock birth is fruitful. For example, Duncan and Hoffman (1990) presented a model of teenage out-of-wedlock births that incorporates the effects of both welfare and non-welfare economic opportunities. They constructed measure of the likely "medium-run" income available to a teenage girl in the event of an out-of-wedlock birth and in the absence of a birth and then estimate a Logit model to determine the importance of this difference in influencing fertility behavior. Their model is estimated with data from Panel Study of Income Dynamics on nearly 900 black teenagers. They found weak and statistically insignificant positive effects of AFDC benefit levels and stronger and significant negative effects of economic opportunities on the probability of AFDC-related out-of-wedlock teen births.

The widely cited study by Ellwood and Bane (1985) examined the relationship between AFDC benefit levels (for a family of four) and two dependent variables, the probability

that an unmarried woman gave birth to a first child in the year prior to the survey and the probability that a never-married woman had ever had a birth. Using data from the 1976 Survey of Income and Education, they found no significant relationship between benefit levels and either births to young, never-married women or first births to women of any age. They did find significant, positive effects, however, of benefit levels on births to never-married women age 25-34, which they attributed to the effects of AFDC benefits on marital rather than fertility behavior. Their general conclusion is that one of "little evidence that welfare influences childbearing decisions of young unmarried women."

In conclusion, the impacts of recent Medicaid expansions on pregnancy resolution have not been fully explored. Much research has been done on the effect of welfare, mainly AFDC, on out-of-wedlock births, but so far there is no clear answer to the question of why researchers fail to find the statistical significance for the causality between welfare income and out-of-wedlock births, whereas the cause and effect relationship between these two would seem to be straightforward. Moreover, the influence of Medicaid on out-of-wedlock births has not been adequately tested, although

AFDC, food stamps and Medicaid are all considered to make single parenthood more economically attractive. My research will focus on New York City which has a large population affected by Medicaid expansion and therefore is a good natural experiment to study the impact of these policy changes. The racial and ethnic composition of the City affords the opportunity to analyze the individual impact on black, white, and Hispanic groups of women. Additionally in New York City the proportion of pregnancies that are terminated by induced abortions far exceed national estimates.[5]

IV. Methodology

1. Theoretical and Empirical Model

Recent Medicaid expansions have lowered the cost of prenatal medical care for women when they are pregnant, the cost of child delivery and the cost of pediatric care after birth. Put simply, Medicaid expansions lowered the cost of having an additional child for low-income families. Since in

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[5] New York State Department of Health reported that the percentage of induced abortions among pregnant women was 41% for New York City in 1991, the corresponding figure for the U.S. as a whole was 27.5%.

New York City, as in New York State, abortion is not covered by Medicaid for the most of those in the group newly included in the expansions, so the cost of birth relative to the cost of abortion has reduced for this group of pregnant women. It is therefore possible that this cost reduction could increase optimal family size. Adopting the model of Becker and Lewis (1973), which permits substitution between the number (quantity) of children and the condition of their health (quality), the impact on birth probability is ambiguous, because the Medicaid expansions lower not only the cost of birth for low-income women, but also the prenatal and perinatal care cost which could reduce the probability of any adverse birth outcome and post-neonatal death[6]. In short, it reduces the cost for both quantity and quality. It could increase the birth rate provided it lowers shadow price of quantity relatively more than that of quality, or vice versa. Suppose that in any family which has a pregnant woman, parents maximize a lifetime utility function in the form of

$$U = u[n, h(m), c], \qquad (1)$$

---

[6] Effective 4/1/90, States are required to cover pregnant woman or infant children under age six whose income is less than 133% of poverty line.

Where n is the number of children in the family, h, as a measure of quality, is the health of each child. c can be defined as a parents' aggregate consumption of all other commodities. c is defined as separate item because there are no good substitutes for children. Given a pregnancy, if one more child will raise family utility based on evaluating relative costs and benefits, the parent(s) will choose birth, until arriving at optimal family size. If one more child will lower family utility, which means optimal family size had already been reached, they will choose abortion. Health depends on maternity care m and does not vary among children in the same family. Because it is reasonable that more maternity care will result in better health, we can have a derived utility function which is consistent with equation (1) of the form

$$V = v(n, m, c). \qquad (2)$$

Suppose the family utility function is well behaved in that a second derivative exists. Let the price of c be $1, let p be the price of m, and let I be family income. Then the budget constraint is:

$$I = c + pmn + gn + f(r-n). \qquad (3)$$

In equation (3) g denotes the positive fixed cost of a

birth (for example, the value of time that the mother must withdraw from the labor market or from other activities due to pregnancy), f is the cost of fertility control (for instance, the cost of contraception and abortion), and r is the maximum number of children that a woman would have in the absence of fertility control.

First-order conditions for c, n, and m are

$$\partial V/\partial c = u, \qquad (4)$$

$$\partial V/\partial m = upn, \qquad (5)$$

$$\partial V/\partial n = u(pm + g - f). \qquad (6)$$

Where u is the marginal utility of consumption or income. Division of (5) by (6) equates the marginal rate of substitution between m and n to the shadow price of m relative to the shadow price of n:

$$\partial V/\partial_m \; / \; \partial V/\partial_n = pn \; / \; (pm + g - f) \; . \qquad (7)$$

It is plausible to assume that g is greater than f. Then a reduction in p decreases the shadow price of m more relatively to n and induces a substitution toward m and away from n. Meanwhile, from (6) divided by (4), I can get marginal rate of substitution between n and c.

$$\partial V/\partial n \; / \; \partial V/\partial c = pm + g - f. \qquad (8)$$

Apparently, the price of n falls relative to that of c as p falls. Hence, both m and n may rise as p falls. The effect of a reduction in the price of maternity care on birth probability or optimal family size is ambiguous. Leibowitz (1990) found that reductions in the costs of maternity and newborn care raised childbearing (n) in the short run among families in the Rand Health Insurance Experiment. It might be also expected that changes in Medicaid coverage will have a greater impact on the price of child quantity than the price of child quality, with the likelihood that birth might increase. Suppose a pregnant women simultaneously made decision to have a birth or an abortion and to marry or keep single if she had premarital pregnancy. A birth probability function can be defined as following:

$$b_i = \alpha_0 + \alpha_{1i}m_i + \alpha_{2i}d_i + \alpha_{3i}y_i + \alpha_i z_i + \epsilon_i \qquad (9)$$

And a marriage probability can be defined as following:

$$m_i = \beta_0 + \theta_{1i}b_i + \beta_{2i}d_i + \beta_{3i}y_i + \beta_i x_i + \theta_i \qquad (10)$$

Where *b* is birth probability; i is the *i*th child the family is going to have; *m* is probability of marriage; d is dummy variable which indicates whether this birth or abortion is financed by Medicaid or not; y is the year dummy which

reflects the impact of the law changes before and after; z is the vector of all other characteristics which can influence family's decision of optimal number of children for each individual, including mother's age, education level, previous pregnant experience and some medical service availability variables, such as number of family planning clinics and number of abortion providers in the health area where the family currently lives. Since family income or poverty status variable is unavailable for each individual which could have a big influence on a birth decision and Medicaid participation, poverty rates by health area in New York City are used as a proxy for income; x is the vector of other characteristics which can influence a pregnant women's decision to marry; ϵ and θ are error terms reflecting some hard to measure components, such as preferences, psychological factors and some omitted variables.

Reduced forms of the probability of birth and marriage can be derived from equation (9) and (10):

$$b_i = \alpha_0' + \alpha_{2i}'d_i + \alpha_{3i}'y_i + \tau_i z_i' + \epsilon'_i \qquad (11)$$

$$m_i = \beta_0' + \beta_{2i}'d_i + \beta_{3i}'y_i + \sigma_i x_i' + \theta'_i \qquad (12)$$

It is reasonable to assume that marriage decision is

conditional on continuing the pregnancy. Hence, it is more appropriate to use only the birth sample and marital status information when women give birth to estimate whether these births are premarital or postmarital and the impacts on decision to marry from the Medicaid expansions. A scrutiny reader may ask the possible sample selection bias. I will test this in the empirical study.

2. Differences-in-Differences

The goal of the empirical work in this study is to identify the effect of laws on particular groups of individuals (treatment group), which requires controlling for any systematic shocks to the pregnancy resolution of the treatment group that are correlated with, but not due to, the law. More specifically, the empirical work will look at the differences in pregnancy resolution before and after Medicaid expansion among the women in treatment group while eliminating any systematic shocks to all women on pregnancy resolution between these two points in time. The "differences-in-differences" estimator[7] exploited in recent literature is

[7] The "differences-in-differences" estimator is used by David Card (1990) and extended to "differences-in-differences-in-differences" by Jonathan Gruber (1994).

appropriate to accomplish this task. First, I will include year effect, to capture any time-varying effects of Medicaid expansions on pregnant resolution among pregnant women. Second, the inclusion of a treatment dummy will capture any differences in pregnancy resolution between treatment and control groups holding time-varying constant. Finally, and most importantly, the interaction term (treatment x year) distinguishes the effect of the change in the Medicaid eligibility level on those in the treatment group from unobserved time-varying trends that equally affect all pregnant women. Thus, the differences-in-differences estimator yields an estimate of the effect of Medicaid expansions on pregnancy resolution controlling for differences due to year and other systematic unobservable factors.

Equation (11) and (12) should be changed as following:

$$b_i = \alpha_0' + \alpha_{1i}'y_i + \alpha_{2i}'t_i + \beta_{3i}'(y_i*t_i) + \tau_i z_i + \epsilon'_i \quad (13)$$

$$m_i = \beta_0' + \beta_{1i}'y_i + \beta_{2i}'t_i + \beta_{3i}'(y_i*ti) + \sigma_i x_i + \theta'_i \quad (14)$$

The definitions of treatment and control groups are crucial in this research. The treatment group should include those pregnant women who are most likely affected by Medicaid eligibility expansion and, by contrast, the control group

should contain those pregnant women who are most likely to be unaffected by Medicaid expansions. The composition of the treatment and control group will be described in detail in section V.

3. Data

The data used are "Current Population Survey (CPS), 1988-1993" from U.S. Bureau of the Census and the birth and induced termination certificate files from New York City Department of Health (1988 and 1991). Neither of the data sets contains personal identifiers. Current Population Survey data provides detailed household and demographic information. In particular, the information about family income in CPS data allows me to identify the eligible women for Medicaid expansion and therefore I am able to evaluate the effectiveness of the expansion accurately. Birth and induced termination certificate files from New York City Department of Health contain detailed information of each pregnant women, such as, their age, education background, race or ethnicity, previous pregnant experience, marital status, employment status when pregnancy and the most important, financial coverage of this birth or abortion. Thus, all these enable me to test the hypotheses properly.

To use these data appropriately, I must take into account the following points:

1) In the Current Population Survey data, there is no questionnaire about pregnancy, such as "were you pregnant or not in last year." If we restrict the sample only to potentially pregnant women between the age of 15 and 44, it will underestimate the effectiveness of the Medicaid expansions. To solve this problem, I will try to identify every mother with a child under one year of age, which means this mother was pregnant in the previous year. I believe this group has a higher Medicaid coverage rate than that "broad expansions" group defined by Janet Currie and Jonathan Gruber (1993). Hence, it might be more useful in evaluating the effectiveness of the Medicaid expansions. Fortunately, the family income information and Medicaid coverage questions refer to the year prior to the current survey, and thus reflects accurately Medicaid coverage at the time of birth. The drawback of this sample is that it does not include all pregnant women. It is restricted to the women who actually gave birth. Pregnant women who had abortions are excluded from the sample. This problem will be solved when I use the data for New York City from New York City Department of Health

which includes all women who were pregnant in New York City in years 1988 and 1991.

2) Concerning the underreporting of abortions which has been criticized by some research institutions[8], New York City Department of Health has made some efforts to improve the reporting of abortions in New York City. After 1988, they found some new abortion providers and added their records to the file. These improvements are reflected in the 1991 file. To make it consistent and comparable, I will exclude these new providers from the data in 1991 before I combine the birth file and abortion file.

3) Although New York State (City) raised Medicaid eligibility threshold level in January of 1990, year 1988, instead of year 1989, is defined as the time before Medicaid expansion since New York experienced recession in 1989. More pregnant women were covered by Medicaid in 1989 solely because of business cycle.

4) Finally, since Medicaid expansions in New York were

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[8] For example, in "Underreporting of Abortion in Survey of U.S. Women: 1976 to 1988" by Elise F.Jones and Jacqueline Darroch Forrest (1992) from Alan Guttmacher Institute. They estimated that the percentage of abortions as actually having occurred in the United states only 31% to 40% in 1984 to 1987.

more aggressive and lenient than that of the neighboring states, such as New Jersey and Pennsylvania[9], as measured by income eligibility level and effective dates. Some low income women might have come to New York to deliver their babies. This could distort the results of my estimation. To avoid this cross-state migration problem, I will restrict the sample to New York City residents only when estimating the impacts of Medicaid expansions on the probability of birth or out-of-wedlock birth.

V. Empirical Results

1. Effectiveness of Recent Medicaid Expansions

Table 1 and Figure 1 shows the percentage of Medicaid eligibility and coverage for women age 15 - 44 with a one year old child. The data come from the Current Population Survey and cover the entire U.S. As I explained in the last Section, I use this group of women who were pregnant one year ago

[9] New Jersey raised Medicaid eligibility threshold level for pregnant women and infants from 71% to 100% of poverty line in July of 1987, to 133% in April of 1991 and to 185% in July of 1991. Pennsylvania lifted Medicaid eligibility threshold level for pregnant women and their infants from 56% to 100% in April of 1988 and to 133% in April of 1990.

because the information about pregnancy at the time of the survey is not available. From Figure 1 we can see that the percentage of women eligible for Medicaid and the proportion of women covered by Medicaid increased sharply in the years between 1988 and 1992. Although the differences between eligibility and actual Medicaid coverage still exist, it is much less than those of potentially pregnant women between the ages of 15 and 44 which Janet Currie and Jonathan Gruber defined as "broad expansion" group. The difference between eligibility level and actual coverage becomes larger year by year. The reason for this difference is that the increase of coverage cannot catch up with the fast pace of the Medicaid eligibility expansion. The difference will be narrowed after states stop expanding eligibility level. We can see the trend from 1991 to 1992 in Figure 1. The "take-up" rate in Table 1 is defined as the women in the sample who both were eligible for Medicaid coverage and reported that they were covered by Medicaid. This variable, I think appears to a reliable measurement for the efficiency of the Medicaid expansions. We can see the take-up rate almost doubled from 13.2% in 1988 to 23% in 1992.

However, although each state has made great efforts to

implement various policies and programs aimed at increasing the prenatal care utilization for the pregnant women under Medicaid, the efficiency of the Medicaid expansions cannot be over emphasized. If we look at the eligible group (Table 1 and Figure 2), the percentage covered by Medicaid decreased from 61.3% in 1988 to 49.9% in 1992 despite the fact that the population under Medicaid coverage increased from 498 thousand to 871 thousand for the same period. Meanwhile, for the same group, the percentage of women who paid all their own bills changed slightly, from 23.7% to 25.3%, which shows that many women either weren't aware that they were eligible for Medicaid or were at the high-end of the eligibility level and might be willing to pay themselves to get better services. This result reveals that the time lag between eligible and actual Medicaid coverage dates does exist. We might not find any significant impact if we use the data before 1991.

2. Characteristics of Pregnant Women

For the following and major part of the study I will use birth and induced termination files for New York City in 1988 and 1991 to do a series of analyses and tests to reveal the impacts of recent Medicaid expansions on pregnant women in the City. The women's ages will be restricted to 15-24 since a

homogeneous group is needed to show the impact of Medicaid expansions when I try to control the trend. This point will be explained in detail in the later section. The variables and their definitions used in these estimations are listed in Table 3.

First, the comparison of the birth ratio, percentage of Medicaid coverage and out-of-wedlock childbearing by age and race or ethnicity in 1988 (before the Medicaid eligibility expansion) and 1991 (after the expansion) for pregnant women in New York City (shown in Table 4) enables me to do some primary analyses. The evidence that the birth ratio, which I defined here to be the ratio of the number of births to that number of births plus the number of induced abortions, coincidentally increased with the rapid increasing of Medicaid coverage for pregnant women in New York City is consistent with my hypothesis, stated in section I, that Medicaid eligibility expansions may encourage more pregnant women to choose birth instead of abortion. The birth ratio increased 4 percentage points for whites, 1.4 points for blacks and 3.4 points for Hispanics between those three years for pregnant women between the ages of 15 and 24. However, multivariate analyses are needed to test this hypothesis.

Second, from Table 4 we can see that the Medicaid coverage rate in New York City increased significantly between 1988 and 1991, from a low of 12 percentage points for blacks to a high of 15.3 percentage points for Hispanic group. Meanwhile, the rate of self payers for either birth or abortion declined between 2.5 and 4.7 percentage points for different ethnic groups. This indicates that Medicaid expansion did help some lower-income pregnant women get health insurance coverage. Furthermore, when compared with the rate of self-payer from Table 1, this result shows that Medicaid expansion in New York City to be more effective than the average level in the nationwide. Hence, this evidence supports the evaluation by Rachel Benson Gold et al.(1993) that New York is among the most aggressive states to carry out Medicaid eligibility expansions. One may ask why the declining rate of self-pay is less than the increasing rate of Medicaid. From Table 4 we can see, for the same period, medical expenditure financed by a third party also declined from 8.6 to 9.5 percentage points for different race or ethnic groups. This is the evidence that Medicaid expansions may also crowd out some private health insurance providers, which is consistent with the findings nationwide by David Culter and

Jonathan Gruber, and Paul Fronstin[10]. Another possible explanation for this could be that New York City was in a serious recession in 1990. The recession may have caused some women, their spouses, or their parents losing their jobs and their job related health benefits. When their incomes fell below the Medicaid coverage threshold level and they did not have a third party to pay their birth or abortion bills, they would chose Medicaid instead of paying themselves. This basic data analysis suggests an outline of further study. However, the birth ratio increase cannot be necessarily attributed to the Medicaid expansions. Nor does the preliminary analysis determine how much can be attributed to Medicaid eligibility expansions and how much can be attributed to other factors. These questions need to be addressed in further multivariate

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[10] David Culter and Jonathan Gruber (1996) found the evidence that public insurance has crowded out private insurance since 1989 for the United States. They believe that Medicaid eligibility expansion, recession and income redistribution are the contributions to this. Paul Fronstin (1996) in Employee Benefit Research Institution employed a regression-based decomposition analysis model and Current Population Survey data to identify the factors affecting the decline in U.S. employment-based health insurance coverage between 1988 and 1993. His results indicate that increasing health care costs, decreases in real wages, a relatively small movement toward the use of part-time workers and the movement of workers across industry sectors accounted for most of the decrease in employment-based health insurance.

analyses.

Third, there is an increased trend in the rate of out-of-wedlock childbearing and out-of-wedlock births. In the U.S., the percentage of out-of-wedlock births among total live births grew from 63.5% to 68.2% for blacks, from 34% to 38.5% for Hispanics and changed little, from 17.7% to 18.0%, for whites in years between 1988 and 1991. New York City has a similar pattern. During the same period, out-of-wedlock childbearing increased more among blacks and Hispanics than whites. As I mentioned in Section II, this could be due to the much greater rate of Medicaid coverage among blacks and Hispanics compared with that of whites under the dramatic Medicaid expansion environment. The impact of expansion would therefore differ between the black and Hispanic populations and the white population. Again, this argument needs to be tested by using more complicated multivariate analyses.

The level of education of pregnant women in New York City is generally in accord with other research findings: more whites have greater than high school degrees than blacks and Hispanics. Another item of interest from Table 4 is that the percentage of pregnant women who have 12 years schooling dropped more than ten percentage points in the data set

between 1988 and 1991 regardless of race or ethnic group. This big drop is mainly contributed by those pregnant women who chose abortion.

Finally, we can see from Table 4 that Hispanic pregnant women are much less likely to be born in the United States than blacks or whites due to the higher proportion of immigrants from South America in New York City.

3. Does Medicaid Eligibility Expansion Increase Birth Probability?

a) Maximum Likelihood Estimates:

As Table 4 and other studies have shown, characteristics of different race and ethnic groups differ greatly. The differences in behavior cannot be adequately captured simply by the inclusion of race/ethnicity dummy variables since the effects of explanatory variables tend to differ among the groups. Thus, all analyses hereafter will be done separately by race or ethnic group.

The results of the basic model are presented in Table 5, which includes the possible determinants for pregnant women to make decision for the optimal family size. When I try to interpret the results in the model, I should bear in mind that these are the estimates without controlling for a time trend.

The maximum likelihood estimates of the birth probability show that for the whites, the coefficient of the year dummy, which represents the change of birth probability between 1988 and 1991, is positive but not significant. The same coefficient for blacks is negative and significant. Comparing this result with the birth ratio in Table 4, we can see that if we allow other determinants to vary, or in other words, put it in multivariate analysis, it may weaken the significance or even reverse the sign, indicating that this age group of black pregnant women in 1991 is more likely to choose abortion compared with the same group in 1988. But remember, this is the result without controlling the trend. Therefore, I cannot conclude that it is the result of Medicaid expansion.

The coefficients of age are positive and significant which indicate that this age group of pregnant women is more likely to choose birth when they are older. The purpose of the age square variable is to adjust for the possibility of a non-linear age effect. The dummy variable indicating whether a pregnant woman was born in the United States or not shows a big disparity among different races and ethnic groups. Hispanics and blacks born in the United States are more likely to choose abortion over birth.

Women with 12 or more years of schooling are more likely to terminate a pregnancy than women with 9-11 years of schooling, which is consistent with other research findings. Those women who did not report their educational background show similar patterns as women who have 12 years or more of schooling, but the magnitudes are smaller.

Women who have experienced induced abortion are much more likely to choose abortion than those who have not. The result is consistent with the interpretation that the psychic costs of abortion are lower for women who have had an abortion in the past (Theodore Joyce and Michael Grossman, 1990). But for women who have experienced spontaneous abortion, only Hispanics tend to terminate subsequent pregnancies.

Among the area characteristics, the availability of family planning clinics has the unexpected negative sign and significant among whites and blacks. An increase in family planning availability is supposed to raise the use of contraception and lower the use of abortion. The negative sign here may reflect the fact that more family planning clinics are established in the health areas where abortion rates are higher to meet the demand of family planning consultation and birth control. For example, federally funded

Health Start/NYC project has been financing 60 endeavors in three disadvantaged communities: Bedford, Central Harlem and Mott Haven to conduct maternal services and family planning. The availability of abortion providers has the anticipated sign among Hispanics but is not statistically significant. The signs before the coefficients of the poverty rate reveal again the disparity between race and ethnic groups. White and black women living in neighborhoods above the average local poverty level are more likely to carry the pregnancy to term.

Women who are covered by Medicaid have a much larger likelihood of giving birth than those who are not covered. Among those not covered by Medicaid, women who pay for their own medical expenses are more likely to have an abortion than to have a child, a finding that is consistent with the fact that the cost of birth is much higher than that of abortion. It also reflects that, sometimes, the psychological cost of contraception is greater than that of abortion although the monetary cost of abortion could be higher than that of contraception.

Note that in Table 5, the sample is all the pregnant women whose ages are between 15 and 24 in New York City, including those whose incomes are above expanded eligibility

level for Medicaid and whose incomes are lower than the eligibility level before expansion. To make the estimates more convincing, it is necessary to show that the impacts are greater for the group of pregnant women who are most likely to be affected by Medicaid expansion, compared with those who are not apt to be influenced by it. For this purpose, DD estimates, which I will discuss in the next section, are more appropriate.

b) DD estimates:

In order to do the differences-in-differences analysis, it is necessary to have a proper treatment group which is most likely affected by Medicaid expansions to show the impacts of expansion are true and a control group which is least likely affected by expansions to control the trend between these two years. Since Medicaid expansion only finance induced termination if family income is below 100% of poverty line, the ideal treatment group should be the pregnant women whose family incomes are between 100% and 185% of poverty level. This group of women are eligible for Medicaid coverage only if they choose to carry this pregnancy to term. If they want to terminate this pregnancy, they have to pay themselves. The ideal control group should include those pregnant women who

are homogeneous to the treatment group except for family income difference. First, they should have the same characteristics as the women in treatment group, including education background, previous pregnancy experience, family structure etc. Second, their family incomes should be either above 185% of poverty level (they are never eligible for Medicaid coverage) or below 81% of poverty level (they are eligible for Medicaid coverage before expansion). Pregnant women whose incomes are between 81% and 100% are uncertain since they are eligible for Medicaid coverage for both birth and abortion in Medicaid expansion. The discussions of ideal treatment and control groups are guidelines for defining appropriate treatment and control groups in following.

First, the sample is restricted to women between the ages of 15 and 24. Since teenagers and women in the 30-40 age group could be different generations, they may have different family sizes, different previous pregnancy experiences and hence may react to Medicaid eligibility expansion in dissimilar way. Second, as previously mentioned, income information is unavailable for pregnant women of these two years, which is the major drawback of this data set. There are two possible variables which could be used as proxy for

family income in the data for this research. One is the educational background of pregnant women since it is well known, by human capital theory, that education levels are positively correlated with income. The other is the poverty rate in 1990 by health area in New York City. At first I tried to use women's education level at the time when they had births or abortions to be the proxy of family income. I also tried to use the Current Population Survey data to determine what possible education levels are associated with corresponding poverty threshold level or Medicaid eligibility level. Among the different family income groups, high school graduates are more likely to be within the expansion group, who are supposed to have family income from 81% to 185% of federal poverty level. But the change for women who have 12 years of education seems so dramatic between 1988 and 1991 (see Table 3) that it could exaggerate the impact of Medicaid expansion if I put this group of women in the Treatment group (see preliminary draft of this thesis).

The health area is the smallest geographical area identified on the birth and abortion certificates, which is defined by New York City Department of Health. To determine if the poverty rate by health area is a good proxy for family

income, I put some characteristics of pregnant women by race or ethnicity and poverty quintiles in Table 6. In Table 6, Quintile 1 is the richest area and Quintile 5 is the poorest. The increase gradient rate of Medicaid coverage and out-of-wedlock childbearing from Quintile 1 (richest health area) to Quintile 5 (poorest health area) clearly indicates that poverty rate by health area could be a good proxy of family income although it is a rough measure since it is not on an individual base. Women who live in Quintile 1 and 2 could have family income above the eligibility level of Medicaid coverage before and after expansion. Therefore, they are unlikely to be affected by the Medicaid eligibility expansion. On the other side, women who live in Quintile 4 and 5 could have family income within Medicaid expansion coverage (family income between 81% and 185% poverty level) and are likely to be affected by Medicaid expansion. Hence, I define those women who live in Quintile 1 and 2 as two possible control groups and women who live in Quintile 4 and 5 as two possible treatment groups.

However, these definitions seem very rough since there could be some poor women living in rich health areas and vice versa. It is easy to infer that pregnant women who were

covered by Medicaid before Medicaid eligibility expansions should be indifferent to Medicaid expansion. We know that before Medicaid expansion, Medicaid coverage was generally restricted to AFDC (Aid to Family with Dependent Child) recipients. If I can find women on AFDC in the sample, they could be better to be used as a control group. Numerous researches have shown that most single mothers are on welfare. For example, June O'Neill and Dave O'Neill (1994) found that in the Current Population Survey sample, 52.1% of single mothers whose ages are between 20-24 were receiving AFDC. This percentage should be much higher among blacks and Hispanics. Hence I define women who were single mothers at the time of this birth or abortion and live in poverty Quintile 4 and 5 as another control group.

Another issue that should be mentioned here is that besides the impact of Medicaid expansions on pregnancy resolution, it may also have an impact on contraception decision. Although this is beyond the scope of my topic, inclusion of only pregnant women in this research could be subject to selection bias. To reduce this bias, on the condition that I do not have ready data to estimate the probability of pregnancy, I chose women who have not previous

had a child as another Treatment group. This group of women, I believe, is more desirous of having a baby than those who have already had a previous live birth, hence it could lessen the bias due to contraception decision. Again, to keep it homogeneous, this group of women is also restricted to the women in poverty Quintiles 4 and 5. To make them clear, I list the definitions of treatment and control groups at the top of Table 7.

The Differences-in-Differences in the birth ratio are shown in Table 7. I use Treatment group 3 and Control group 3 to compare with other control and treatment groups since I assume Treatment group 3 and Control group 3 are better defined. The table entries for each year are uncontrolled for any possible co-varying factors. As expected, all treatment groups show increases of birth ratio regardless of race or ethnicity. Birth ratio increased most for whites, from 6.26 to 7.59 percentage points; second for blacks, from 3.85 to 4.34 percentage points; and least for Hispanics, from 2.52 to 3.94 percentage points. By contrast, changes of birth ratio for control groups show a mixed picture. Most of them are slightly dropped or unchanged. Only the birth ratio for control groups 1 and 2 among Hispanics demonstrate more than

5 percentage points increase. The differences-in-differences of birth ratio are generally positive (13 out of 15) and significant (10 out of 15). The only two negative cases here are among Hispanics, which are due to big jumps in the birth ratio of two control groups, but it is significant only in Control group 1 versus Treatment group 3. If we look at better defined Treatment group 3 versus Control group 3, all differences-in-differences of birth ratio are positive and significant at least at 10% level. This result demonstrates that, in New York City, more pregnant women chose birth rather than induced termination after the Medicaid expansion when I control the trend between 1988 and 1991. In other words, Medicaid expansions indeed encouraged more pregnant women to choose birth versus abortion.

The outcomes in Table 7 are meaningful. However, if I can put them in multivariate analysis and the results still hold, they should be more convincing. The outputs of the multivariate analysis for different races and ethnicities are listed in Table 8 column I. I only present the results from Treatment group 3 and Control group 3 because they are more reliable than other treatment and control groups. The variables used here are the same as that in the basic model

except without a Medicaid dummy, since treatment and year dummies are used to capture the Medicaid change in DD estimates. In this model, a year dummy is used to show birth ratio variation between 1988 and 1991 for those pregnant women who are not in a Treatment group. The "treat" dummy tells the birth ratio differences between the women in treatment group and control group before expansion. The most important variable is the interaction of Treatment and year dummy, which display the differences in differences between 1988 and 1991, treatment group and control group. For easier comparison, the simple DD estimate results are also listed in Table 8 column II. The coefficients of the interaction of Treatment and Year dummy in column I and column II are almost identical for whites and black. The same coefficient for Hispanics changes a little bit but keeps a positive sign and becomes more significant. In other words, the changes between model I and II for DD estimates are generally only the standard errors when I shift from basic model to multivariate analysis. This result displays that, in New York City, the probability of birth versus abortion increased 3.1 to 9 percentage points in 1991 against 1988 among those pregnant women in a treatment group in contrast with the women in a control group for

different race or ethnicity. Put differently, under the environment of dramatic Medicaid expansions and by controlling the trend of birth probability, more pregnant women were willing to give birth instead of induced termination after the Medicaid expansions regardless of race or ethnicity.

Since birth probability, the dependent variable, is dummy variable, it is more appropriate to use maximum likelihood estimates to do the analysis. The output of the maximum likelihood estimates (probit) are shown in Table 9 and the results are generally the same. To interpret the coefficients easily and compare them with the OLS in Table 8, marginal effects of the probit model are also included in Table 9. Marginal effects are obtained by multiplying density function $\phi(\beta_i' x_i)$ by corresponding coefficients. Comparing with Table 8 we can see the results are very similar and therefore the previous interpretations for Table 8 are reliable. Probability of birth increased approximately 11.6 percent for whites, 5.2 percent for blacks and 3.4 for Hispanics among Treatment group 3 versus Control group 3 between 1988 and 1991.

4. What Was the Impact on Out-of-Wedlock Births?

a) General Analysis

To estimate the impact of Medicaid expansions on out-of-wedlock birth, I will use birth records only. The selected characteristics of the pregnant women in the birth sample are presented in Table 10. As expected, the illegitimate birth ratio (number of women had out-of-wedlock births divided by number of live births) are much higher among blacks and Hispanics than that among whites. More than 60 of percent births are premarital among Hispanics and the ratio of out-of-wedlock birth is above 80% among black women whose ages are between 15 and 24. If we look at the changes before and after Medicaid expansions, we can see Medicaid coverage increased dramatically. The percentage increases of Medicaid coverage are smaller in blacks and Hispanics than that in whites because more than 60% of blacks and Hispanics were already covered by Medicaid before the Medicaid expansions. The ratio of illegitimate birth showed modest increases in whites and blacks but it increased 10 percent in Hispanics. From this, however, I cannot conclude that Medicaid expansions have had a positive effect on out-of-wedlock births or that Medicaid expansions have made out-of-wedlock birth more attractive. The fact is that there was an increasing trend in out-of-wedlock births even before the Medicaid expansion (see Figure

3). It is also under expectation that whites have a higher education level and higher employment rate than that blacks and Hispanics have. And more than 54 percent of Hispanics were not born in the United States, which is twice as whites or blacks.

Table 11 presents the result of basic models for estimating the probability of illegitimate birth. To interpret easily, illegitimate birth is used as dependent variable. By assuming that the availability of family planning clinics, the availability of abortion providers and prior spontaneous abortion have no impact on the decision to marry and to avoid an identification problem, these models omit those areal variables to impose exclusion restriction. Furthermore, several variables that differ from birth probability equation are used as determinants for the out-of-wedlock birth.

Age variables are all negative and significant, which reflect the fact that younger women are more likely to have out-of-wedlock births. The magnitudes are the highest for whites and the lowest for blacks.

First births tend to be out-of-wedlock. This is probably due to the relatively younger age of women in the sample (15-

24). The variable representing women who are employed when pregnant are negatively correlated with out-of-wedlock births. More than 20 percent of pregnant women did not report their employment status. This group of women was also found to be less likely to have illegitimate birth. Possibly they may have cash jobs or not have employment authorization and for tax or other reasons they do not want to reveal their employment status. The negative sign and significant level of the coefficient before immigrant variable indicates the pregnant women who were not born in the U.S. are less likely to have illegitimate births.

Schooling variables are usually negative and significant which implies pregnant women in these three schooling categories are not likely to have illegitimate births compared with women in the omitted category who have an education of 9-11 years. It is expected that the higher the father's educational level, the lower the possibility that the mother would have an out-of-wedlock birth. There are about thirty percent of families did not report father's educational background, which tend to be single parent families. Mean numbers of father's educational level is used for these families to avoid possible correlation with the dependent

variable and to keep the sample size same.

Pregnant women who are covered by Medicaid are more likely to have illegitimate births than others. White women are less likely to have out-of-wedlock births after the Medicaid expansion. But it is not true for black and Hispanic women which reflect the increasing trend of out-of-wedlock birth. Induced abortions are usually positively correlated with illegitimate births, which is under expectation.

White and black women who had WIC benefit are more likely to have illegitimate birth but the same is not true for Hispanic women.

By using the Inverse of Mill's ration to correct the possible sample selection bias, with or without Inverse of Mill's ratio seems no significant difference. Hence I assume sample selection bias is not a problem.

Similar to the estimation of birth probability, the basic model tells us only what the determinants of out-of-wedlock birth are, but it cannot tell what the impacts of Medicaid expansions are. Again I try to use DD estimates to reveal these impacts.

b) DD Estimates

The procedure for the DD estimates is similar to that

used for the estimates of birth probability. The results of DD estimates are presented in Table 12. The definitions of treatment group and control group are the same as used in the estimation of birth probability. One exception is that all pregnant women in Control group 3 had already had out-of-wedlock births and can not be used to estimate illegitimate birth. Therefore, Control group 3 is excluded in DD estimates.

As expected, all control groups show increases of out-of-wedlock birth rates regardless of race or ethnicity which indicates the trend of illegitimate births. But the magnitude of these increases differ for each race or ethnicity: 2.97 to 3.04 percentage points for whites, 3.34 to 5.04 percentage points for black and 3.7 to 10.89 percentage points for Hispanics. By contrast, changes in the illegitimate birth ratio in all treatment groups reveal a mixed picture: they decreased among whites, slightly increased among blacks and increased more than 4.25 percentage points among Hispanics. The final and most important differences-in-differences estimates are mostly negative (15 out of 18) and significant (12 out of 18) which is consistent with my hypothesis that Medicaid eligibility expansions may lower the probability of

out-of-wedlock births. DD estimates of illegitimate birth probability drop 3.91 to 11.97 percentage points among whites and 2.51 to 4.27 percentage points among blacks. Only among Hispanics the DD estimates of illegitimate birth probability show mixed results: they increase and are significant at 10% level once (Treatment group 3 vs. Control group 1) and decrease and significant at 1% to 5% level when I use Control group 2 versus other treatment groups. A possible explanation is that the Hispanic population in New York City is dominated by immigrants; the same is true for Hispanic pregnant women (see Table 10). They generally live in several specific areas and have less information about the Medicaid eligibility expansions. There are very few Hispanics living in certain health areas, such as Central Harlem, Flushing and Richmond. The treatment groups and control groups defined by poverty rate quintile within a health area are very rough for Hispanics. Therefore, the result of DD estimation for Hispanics is not as reliable as those for whites and blacks.

Similarly to the procedure in analyzing the treatment effects for the birth ratio variable, I put DD estimates in multivariate analyses and the results are presented in Table 13. Since I want to concentrate on Differences-In-Differences

estimates and all other coefficients do not differ too much from the basic model, I only list the coefficients of treatment and year interaction dummies and their t-statistics. After I add other characteristics of pregnant women, the results are consistent. They are negative and significant in all six alternative combinations for whites. They are negative and significant in the case of Treatment group 2 versus Control group 1 and Treatment group 2 versus Control group 2 for blacks. This result indicates that after Medicaid eligibility expansions the probability of out-of-wedlock birth decreased approximately 4 to 9 percentage points among whites 2 to 3 percentage points among blacks when I control the increase trend of out-of-wedlock birth. Generally, there is some evidence that Medicaid eligibility expansions encouraged some white and black women to marry before their delivery when compared with the same group of women in 1988. Only for Hispanics, there is no such evidence.

From the experience in estimating birth probability, the sample size is big enough to ignore the fact that the dependent variable is bivariate. Maximum likelihood estimates will not differ too much from the OLS estimates. Therefore, maximum likelihood estimates for DD analyses are skipped.

VI. Conclusion and Direction of Further Research

Above all, my research shows that recent Medicaid expansions did boost the coverage of medical care for pregnant women in New York City. This leads to some evidence of increased birth probability versus abortion among low income families. Following the theory of substitution between the number of children (quantity) and their health (quality), however, an increase in births may result in a decline in the health of new born babies, as measured by birth weight or infant mortality rate.

Table 14 presents national data obtained from the Statistical Abstract of the United States. From Table 14 we can see that although infant mortality rates in the United States dropped from 10 per one thousand births in 1988 to 8.9 per one thousand births in 1990, this decline is driven by the decline for whites. In the same period, the rate for blacks and other minorities was 15 and 15.1 respectively and for blacks alone it stayed the same at 17.6. The percentage of low birth weight of newborns went up for whites and blacks and stayed constant for Hispanics between the years 1988 and 1991. In New York City, the infant mortality rate indeed dropped, from 13.4 to 10.9 per thousand live births, but some research

has shown the Medicaid eligibility expansions hardly contributed to this decline[11].

This evidence could be explained by that Medicaid expansions had increased coverage of medical expenditure and early initiation of medical care for poor or near poor pregnant women, but the effect of increase coverage on prenatal care and postnatal care was out-weighed by encouraging pregnant women to give birth rather than have an abortion at least in New York City. This result, to some extent, contradicts to the original aim of Medicaid expansions, and therefore it weakened the effectiveness of the

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[11] In the report for the conference "Reaching Infant Mortality Goals for New York City", Theodore Joyce and Andrew Racine (1996) concluded that the most of the decline in infant mortality between 1988-89 and 1992-93 resulted from improvements in birth weight specific death rates rather than from shifts in the birth weight distribution of the population. In fact, the improvement of low birth rate over this period of time was very limited. White low birth weight rate even showed modest increase but infant mortality rate decreased most among whites. In other words, the early initiation and intension of prenatal care in Medicaid expansion did not result in significant low birth weight improvement and therefore hardly contributed to the drop of infant mortality. Aaron Hamvas et al. (1996) reasoned that the increased use of surfactant therapy after its approval by the Food and Drug Administration (FDA) in 1990 might have reduced neonatal mortality more among whites than among blacks. This founding bolsters the reality in New York City and U.S.

Medicaid expansions. The increase of dozens of billion dollars in expenditures did not effectively translate into significantly lowering the infant mortality rate or diminishing the percentage of low birth weight.

The last part of my research shows that Medicaid expansion lowered the probability of illegitimate birth for low income white and black pregnant women in New York City. Income level seems the determining factor in the decision to marry among low income women. Raising the threshold level for Medicaid or other welfare benefits will encourage women, especially pregnant women, to marry because the income of married couples is likely to still remain within the threshold level under the expansions. If we follow the rapid expansion of Medicaid and other welfare programs through these years, we might be able to explain why many researchers couldn't find the causality of welfare income to out-of-wedlock birth[12] although they seem to be strictly tied together. The evidence

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[12] For example, Moore and Caldwell (1977) conclude that, overall, the findings do not support the contention that more generous welfare programs induce premarital childbearing; The widely cited study by David Ellwood and Mary Bane reported that no relationship between AFDC benefits and out-of-wedlock childbearing among blacks or whites in several age groups.

of declining the out-of-wedlock birth for low income women, in conjunction with the increased awareness for the problems of children raised in single parent family, their health condition, their education, and their cognitive development, we may say it is an unexpected result of the Medicaid expansion although it is the by-product of it.

One limitation of this research is that it was only possible to use logical reasoning and approximation to get the treatment and control groups because information of family income for each individual pregnant woman was not available in the data. This could undermine the accuracy of these results. The results would be downward biased if the treatment group includes too many pregnant women who have income above 185% of poverty level or below 81% of poverty level. They also could be downward biased if the control group includes too many Medicaid expansion eligible women. Secondly, although I have the information regarding AFDC benefits for those pregnant women in the sample. I decided not to use it in estimating the illegitimate birth because of concerns with the problem of endogenity. I want to mention this at this juncture because AFDC, a big component of the welfare program, which is tied directly to out-of-wedlock births in the literature, should

not be completely ignored when trying to analyze any impact on illegitimate birth. In fact, it would be interesting to compare the impact of the Medicaid expansion with the AFDC expansion or to estimate the combined effects of these two on the out-of-wedlock birth. Both of theses topics are areas of further research.

Table 1: Eligibility and Coverage of Medicaid for Women Age 15-44 with One Year Old Child, U.S.A.					
Year	1988	1989	1990	1991	1992
Eligibility Rate	21.5	31.2	37.9	43.9	46.2
Eligible Population (000's)	813	1,182	1,504	1,644	1,746
Medicaid Takeup Rate	13.2	16.0	18.5	22.5	23.0
Percentage Covered					
by Medicaid	17.8	19.5	21.0	23.8	25.2
by Third Party	68.7	66.8	65.0	61.6	58.4
by Self	13.5	13.7	14.0	14.6	16.4
Among Eligibles					
Medicaid Population (000's)	498	605	735	842	871
Percentage Covered					
by Medicaid	61.3	51.2	48.8	51.2	49.9
by Third Party	15.0	25.6	27.4	24.0	24.8
by Self	23.7	23.2	23.7	24.8	25.3

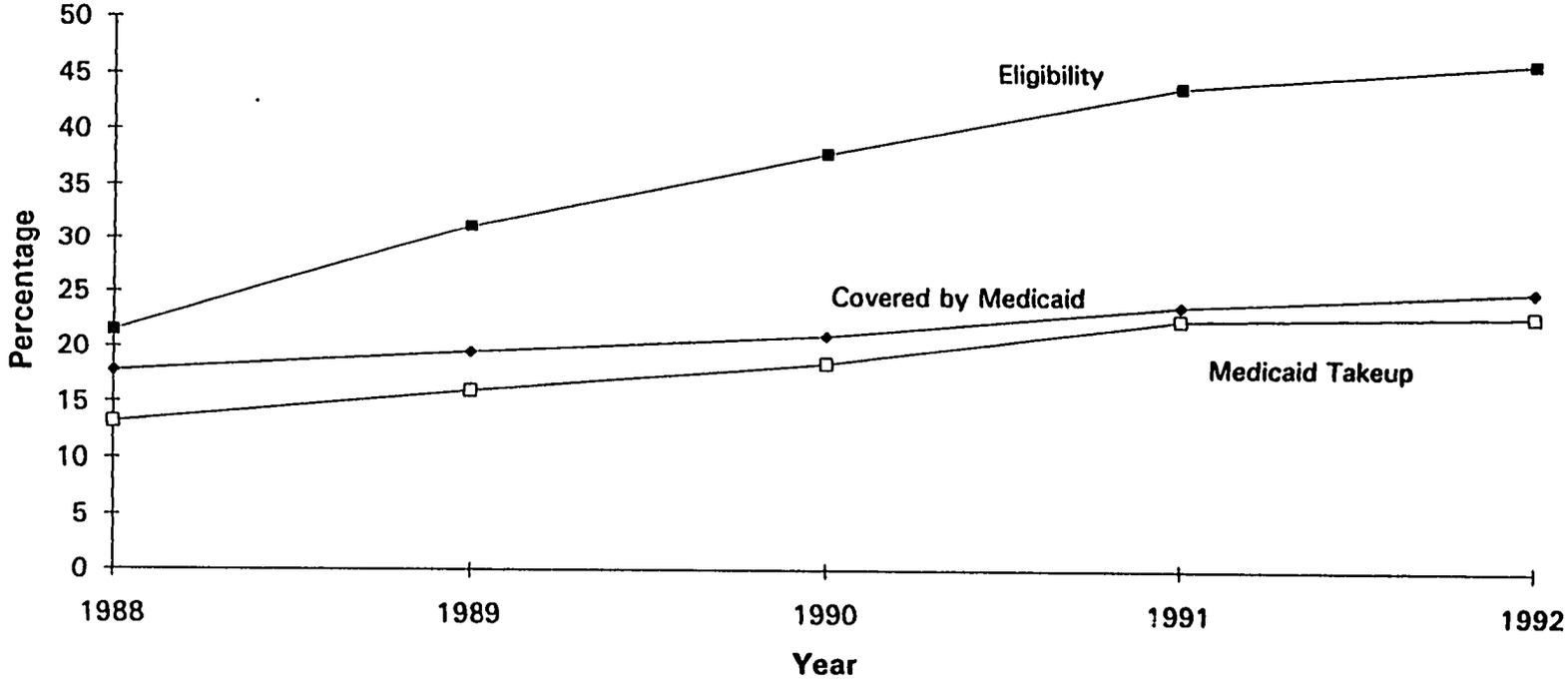
Source: Current Population Survey, 1989-1993.

Table 2: Eligibility and Coverage of Medicaid for Women Age 15-44 with One Year Old Child, by Race or Ethnicity, U.S.A.

Year	1988			1989			1990			1991			1992		
Race or Ethnic	Black	Hispa	White	Black	Hispa	White	Black	Hispa	White	Black	Hispa	White	Black	Hispa	White
Eligibility Rate	50.4	34.2	12.5	66.9	55.4	19.2	69.2	55.4	25.5	77.4	69.7	30.8	76.6	70.1	33.3
Eligible Population (000's)	292	148	329	384	255	501	473	292	666	443	375	771	489	393	807
Medicaid Take-up Rate	37.8	20.8	6.4	47.2	16.8	8.8	45.1	22.4	10.8	53.8	24.9	15.1	51.6	29.4	14.3
Percentage Covered															
by Medicaid	45.7	25.2	10.1	50.5	21.3	12.3	48.0	24.1	13.3	54.9	25.5	16.7	53.8	30.6	16.7
by Third Party	39.3	47.3	79.5	35.7	42.7	77.8	40.1	46.6	75.4	29.5	36.1	74.1	29.8	35.3	70.8
by Self	15.0	27.5	10.4	13.8	36.0	9.9	11.9	29.3	11.3	15.6	38.4	9.2	16.4	34.1	12.5
Among Eligibles															
Medicaid Population	219	90	169	271	77	230	308	118	282	308	134	378	329	165	346
Percentage Covered															
by Medicaid	74.9	60.9	51.4	70.6	30.3	45.9	65.1	40.5	42.4	69.4	35.8	49.0	67.4	42.0	42.9
by Third Party	12.7	10.4	19.0	17.1	26.1	32.4	19.2	24.6	33.4	15.0	16.9	31.6	14.4	18.3	33.5
by Self	12.4	28.7	29.7	12.2	43.6	21.7	15.7	34.9	24.2	15.5	47.3	19.4	18.2	39.7	23.6

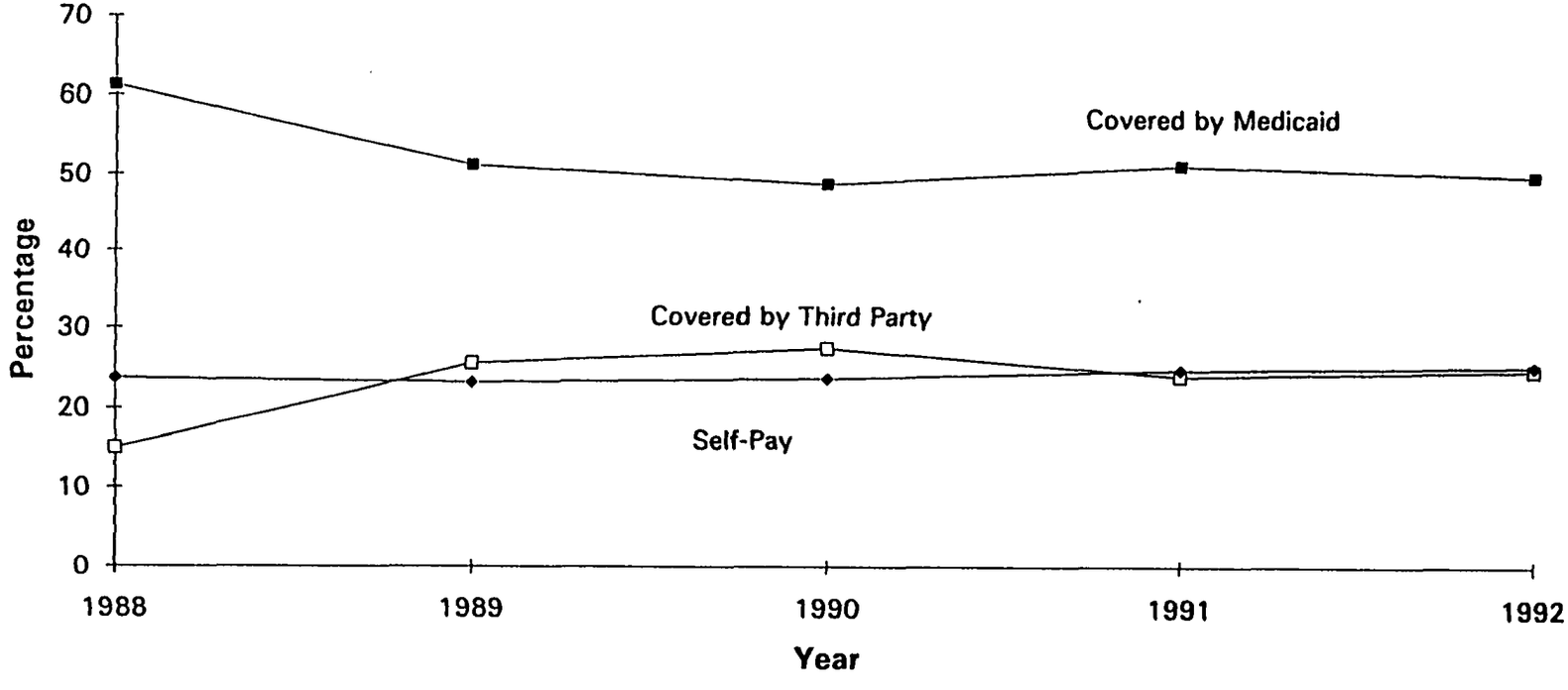
Source: Current Population Survey, 1989-1993.

Figure 1: Eligibility and Coverage of Medicaid for Women Age 15-44 with One Year Old Child, U.S.A.



Source: Current Population Survey, 1989-1993

Figure 2: Coverage of Medicaid for Women Age 15-44 with One Year Old Child, Among Eligibles, U.S.A.



Source: Current Population Survey, 1989-1993

Table 3 Description of Variables

Variables	Definition
Birth	A dichotomous variable that equals 1 if birth, 0 if abortion
Illegitimate Birth	A dichotomous variable that equals 1 if a woman is not married, 0 if married.
Medicaid	A dichotomous variable that equals 1 if the birth or abortion was financed by Medicaid
Self-pay	A dichotomous variable that equals 1 if the birth or abortion was self-financed
Induced Abortion	A dichotomous variable that equals 1 if a woman had induced abortion before
Spontaneous Abortion	A dichotomous variable that equals 1 if a woman had spontaneous abortion before
Age	A continuous variable that equals mother's age
Age Square	Square of mother's age
Born in US	A dichotomous variable that equals 1 if the woman was born in US.
School<9	A dichotomous variable that equals 1 if the woman completed less than 9 years schooling
School=12	A dichotomous variable that equals 1 if the woman completed 12 years of schooling
School>12	A dichotomous variable that equals 1 if the woman completed more than 12 years of schooling
Family planning clinic	The number of family planning clinics per 10,000 woman aged 15-44 in a health area
Abortion providers	The number of abortion providers per 10,000 woman aged 15-44 in a health area
Parity	Number of previous live births
First Birth	This birth is first birth.
Poverty Rate	Race- or ethnic-specific percentage of people below the poverty in a health area
Immigrant	A dichotomous variable that equals 1 if the woman was not borne in the United States
Employed	A dichotomous variable that equals 1 if the woman was employed when pregnant
WIC	A dichotomous variable that equals 1 if the women had WIC benefit
Year91	A dichotomous variable that equals 1 if the woman had birth or abortion in 1991

Table 4. Selected Characteristics of Pregnant Women in New York City, Age 15-24

	White			Black			Hispanic		
	1988	1991	Change	1988	1991	Change	1988	1991	Change
Birth Ratio (%)	54.3	58.3	4.0	44.4	45.8	1.4	62.3	65.7	3.4
Covered by Medicaid (%)	22.5	36.0	13.5	52.2	64.2	12.0	58.5	73.8	15.3
Self-pay (%)	36.6	32.2	-4.4	19.9	17.4	-2.5	15.5	10.8	-4.7
Covered by Third Party (%)	37.8	29.2	-8.6	25.0	15.8	-9.2	22.5	13.0	-9.5
Out-of-wedlock (%)	14.3	16.0	1.7	35.9	38.2	2.3	38.5	44.7	6.2
School = 1-8 (%)	2.9	3.6	0.7	1.4	1.6	0.2	7.6	9.9	2.3
School 9-11 (%)	15.4	25.9	10.5	24.4	35.4	11.0	32.3	42.5	10.2
School = 12 (%)	58.4	46.9	-11.5	57.8	46.9	-10.9	48.0	35.4	-12.6
School = 13 + (%)	23.3	23.6	0.3	16.4	16.1	-0.3	12.1	12.2	0.1
Born in US (%)	73.3	74.1	0.8	75.1	76.8	1.7	50.7	53.2	2.5
Previous Induced Abortion (%)	23.4	22.8	-0.6	37	37.7	0.7	24.6	26	1.4
Previous Spontaneous Abortion (%)	5.9	6.9	1.0	7.8	8.4	0.6	7.4	8.8	1.4

Source: Birth file and induced termination file, Department of Health, New York City, 1988 and 1991.

Table 5:

Maximum Likelihood Estimates of the Birth Probability for Whites, Blacks and Hispanics New York City, Age 15-24

Variables	White	Black	Hispanic
Intercept	-8.1439	-7.2997	-4.9934
	(-12.61)	(-22.54)	(-12.83)
Age	0.6802	0.6920	0.5121
	(10.68)	(21.20)	(13.09)
Age square	-0.0122	-0.0146	-0.0102
	(-7.90)	(-18.06)	(-10.49)
Born in US	0.0442	-0.0282	-0.2611
	(2.20)	(-2.31)	(-20.92)
School<9	0.5736	0.1124	0.2827
	(9.13)	(2.61)	(10.34)
School=12	-0.3814	-0.8508	-0.7284
	(-14.13)	(-64.87)	(-49.12)
School>12	-0.6919	-0.5939	-0.6297
	(-21.90)	(-34.20)	(-29.91)
Education unknown	-0.3806	-0.4464	-0.3355
	(-8.11)	(-15.20)	(-10.11)
Induced abortion	-1.6101	-1.2512	-1.3572
	(-70.58)	(-110.82)	(-96.50)
Spontaneous abortion	-0.0453	-0.0358	-0.0721
	(-1.21)	(-1.89)	(-3.28)
Family planning clinic	-0.1942	-0.0165	-0.0140
	(-11.78)	(-2.12)	(-1.36)
Abortion providers	0.0303	0.0296	-0.0121
	(1.88)	(3.45)	(-1.13)
Poverty rate	0.0064	0.0016	-0.0024
	(8.37)	(3.99)	(-5.34)
Medicaid	0.3134	0.3686	0.3262
	(14.76)	(34.08)	(24.44)
Year91	0.0194	-0.0741	-0.0034
	(1.09)	(-7.19)	(-0.28)
-2 Log Likelihood Ratio	8043.87	20745.77	16632.27
Sample Size	26121	74621	56275

Note: T-statistics are in parentheses

Table 6. Selected Characteristics of Pregnant Women in New York Cit by Poverty Quintile, Age 15-24

	White				
	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Birth Ratio	55.0	51.5	57.5	60.2	60.6
Medicaid (%)	17.6	24.2	28.4	38.8	55.2
Self-payer (%)	35.6	38.5	34.4	30.0	20.4
Third Party (%)	43.6	34.9	34.2	28.6	21.6
Out-of-Wedlock Childbearing (%)	12.3	14.6	14.6	17.9	20.1
Poverty Rate,1990	5.1	9.0	14.3	25.3	49.0
	Black				
	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Birth Ratio	39.9	43.0	45.8	46.6	47.4
Medicaid (%)	43.4	47.9	57.8	64.5	68.7
Self-payer (%)	26.6	26.8	20.3	17.6	14.8
Third Party (%)	27.5	22.7	19.0	14.9	13.5
Out-of-Wedlock Childbearing (%)	28.5	33.2	37.5	40.0	41.4
Poverty Rate,1990	7.0	14.4	23.6	34.1	45.7
	Hispanic				
	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
Birth Ratio	60.0	62.7	64.4	64.9	64.1
Medicaid (%)	45.1	51.2	60.5	70.5	75.4
Self-payer (%)	25.8	23.3	20.7	16.4	13.3
Third Party (%)	26.0	22.5	16.0	10.1	8.3
Out-of-Wedlock Childbearing (%)	30.4	34.1	38.9	43.5	46.7
Poverty Rate,1990	9.6	17.3	27.0	38.7	51.6

Note: Percentage of coverage by Medicaid, self-payer and third party are not sum to 1 due to some coverage unknowns.

Table 7. Differences-In-Differences Estimates of Medicaid Expansions on Birth Ratio by Race or Ethnicity, Age 15-24

Treatment 1: Poverty Quintile 4.				Control 1: Poverty Quintile 1.					
Treatment 2: Poverty Quintile 5.				Control 2: Poverty Quintile 2.					
Treatment 3: No previous live birth, Poverty Quintile 4-5.				Control 3: Single mother, Poverty Quintile 4-5.					
	White			Black			Hispanic		
	1988	1991	Differences	1988	1991	Differences	1988	1991	Differences
Treatment Group 3	58.82	65.08	6.26	52.23	56.08	3.85	70.82	74.11	3.29
Control Group 3	33.83	31.17	-2.66	39.30	38.81	-0.49	52.30	53.76	1.46
Differences-in-									
Differences (DD)			8.92 **			4.34 **			1.83 +
	1988	1991	Differences	1988	1991	Differences	1988	1991	Differences
Treatment Group 2	67.97	75.56	7.59	53.77	57.87	4.10	69.92	73.86	3.94
Control Group 3	33.83	31.17	-2.66	39.30	38.81	-0.49	52.30	53.76	1.46
Differences-in-									
Differences (DD)			10.25 **			4.59 **			2.48 *
	1988	1991	Differences	1988	1991	Differences	1988	1991	Differences
Treatment Group 1	64.80	72.17	7.37	51.59	55.93	4.34	70.51	73.03	2.52
Control Group 3	33.83	31.17	-2.66	39.30	38.81	-0.49	52.30	53.76	1.46
Differences-in-									
Differences (DD)			10.03 **			4.83 **			1.06
	1988	1991	Differences	1988	1991	Differences	1988	1991	Differences
Treatment Group 3	58.82	65.08	6.26	52.23	56.08	3.85	70.82	74.11	3.29
Control Group 2	49.36	54.04	4.68	42.20	43.84	1.64	59.82	65.24	5.42
Differences-in-									
Differences (DD)			1.58			2.21 +			-2.13
	1988	1991	Differences	1988	1991	Differences	1988	1991	Differences
Treatment Group 3	58.82	65.08	6.26	52.23	56.08	3.85	70.82	74.11	3.29
Control Group 1	52.96	57.54	4.58	39.35	40.37	1.02	55.15	64.35	9.20
Differences-in-									
Differences (DD)			1.68			2.83 *			-5.91 **

** Significant at %1 level. * Significant at %5 level. + Significant at %10 level.

Source: Birth file and Induced termination file, Department of Health, New York City, 1988 and 1991.

Table 8:

Differences-In-Differences Estimates of Medicaid Expansions on Birth Probability for White, Black and Hispanic (Treatment Group 3 Versus Control Group 3)

Variables	White		Black		Hispanic	
	I	II	I	II	I	II
Intercept	-3.9680		-2.6032		-1.4593	
	(-9.85)		(-16.54)		(-9.85)	
Age	0.4128		0.2923		0.1927	
	(10.23)		(18.56)		(13.01)	
Age square	-0.0092		-0.0063		-0.0039	
	(-9.26)		(-16.07)		(-10.59)	
Born in US	0.0453		0.0830		-0.0449	
	(3.28)		(11.53)		(-9.25)	
School< =8	0.1488		0.0424		0.0551	
	(4.68)		(2.26)		(6.46)	
School=12	-0.1689		-0.3320		-0.2883	
	(-10.68)		(-55.73)		(-52.46)	
School> =13	-0.2737		-0.3006		-0.2666	
	(-12.80)		(-34.08)		(-31.17)	
Education unknown	-0.0744		-0.1161		-0.0914	
	(-2.72)		(-8.57)		(-7.32)	
Spontaneous abortion	0.0030		0.0292		0.0154	
	(0.13)		(3.19)		(1.77)	
Induced termination	-0.4615		-0.3846		-0.4051	
	(-32.74)		(-71.98)		(-72.37)	
Abortion provider	0.0374		-0.0128		-0.0018	
	(3.16)		(-2.06)		(-0.41)	
Family planning provider	-0.0624		-0.0003		-0.0030	
	(-6.27)		(-0.07)		(-0.79)	
Poverty rate	0.0021		-0.0001		-0.0001	
	(4.11)		(-0.27)		(-0.41)	
Treatment	0.1872	0.2500	0.1289	0.1293	0.1615	0.1852
	(9.93)	(12.01)	(17.85)	(16.39)	(23.13)	(23.85)
Year	-0.0564	-0.0266	-0.0426	-0.0049	-0.0162	0.0146
	(-2.64)	(-1.11)	(-6.18)	(-0.62)	(-2.34)	(1.81)
Treatment* Year	**0.0902**	**0.0891**	**0.0454**	**0.0434**	**0.0310**	**0.0183**
	(3.52)	**(3.06)**	**(4.56)**	**(3.76)**	**(3.32)**	**(1.68)**
Sample Size	5230		29395		30345	

Note: T-Statistics are in parentheses.

Table 9:

Maximum Likelihood Estimates of Medicaid Expansions on Birth Probability for for Whites, Blacks and Hispanics (Treatment Group 3 Versus Control Group 3)

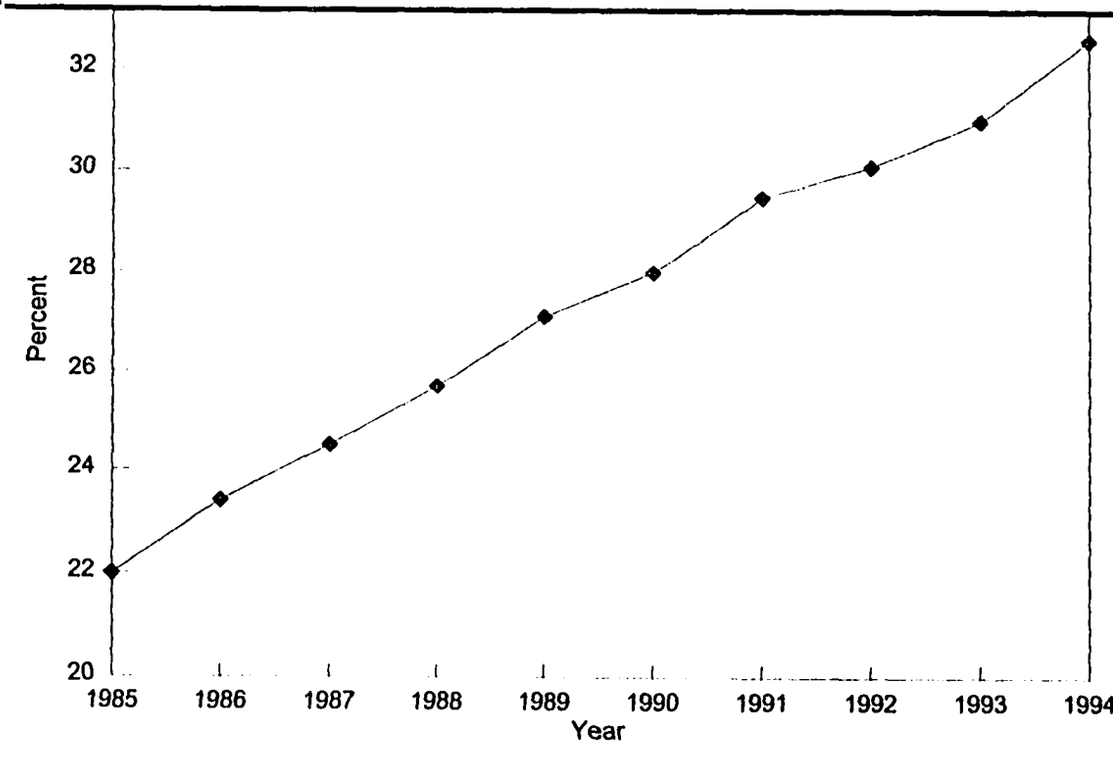
Variables	White			Black			Hispanic		
	Parameter	T-statistic	Marginal Effect	Parameter	T-statistic	Marginal Effect	Parameter	T-statistic	Marginal Effect
Intercept	-14.4990	-10.48	-5.5459	-10.0437	-19.37	-3.9723	-7.3278	-13.92	-2.9106
Age	1.3299	9.61	0.5087	0.9392	18.10	0.3715	0.7073	13.41	0.2809
Age square	-0.0297	-8.68	-0.0114	-0.0202	-15.67	-0.0080	-0.0144	-10.94	-0.0057
Born in US	0.1662	3.53	0.0636	0.2700	11.42	0.1068	-0.1653	-9.58	-0.0657
School < =8	0.5884	4.82	0.2251	0.1294	2.10	0.0512	0.3122	8.80	0.1240
School = 12	-0.5944	-10.66	-0.2274	-1.0402	-51.84	-0.4114	-0.9735	-48.53	-0.3867
School > =13	-0.9256	-12.57	-0.3540	-0.9424	-32.66	-0.3727	-0.9456	-31.25	-0.3756
Education unknown	-0.2621	-2.80	-0.1003	-0.3737	-8.59	-0.1478	-0.3384	-7.64	-0.1344
Spontaneous abortion	0.0271	0.33	0.0104	0.0970	3.23	0.0384	0.0468	1.51	0.0186
Induced termination	-1.4420	-28.30	-0.5516	-1.1729	-64.94	-0.4639	-1.2119	-62.46	-0.4814
Abortion provider	0.1211	2.98	0.0463	-0.0407	-1.99	-0.0161	-0.0081	-0.51	-0.0032
Family planning provider	-0.2071	-6.01	-0.0792	0.0004	0.03	0.0002	-0.0082	-0.60	-0.0033
Poverty rate	0.0071	3.98	0.0027	-0.0005	-0.41	-0.0002	-0.0008	-0.74	-0.0003
Treatment	0.6363	9.69	0.2434	0.4279	17.89	0.1692	0.5862	23.03	0.2328
Year	-0.1891	-2.49	-0.0723	-0.1293	-5.60	-0.0511	-0.0592	-2.43	-0.0235
Treatment * Year	0.2902	3.26	0.1110	0.1311	4.02	0.0519	0.0931	2.79	0.0370
-2 Log likelihood ratio	1764.52			9004.97			9900.18		
Sample Size	5030			29395			30345		

Table 10. Selected Characteristics of Women, Birth File New York City, Age between 15 and 24

	White			Black			Hispanic		
	1988	1991	%Change	1988	1991	%Change	1988	1991	%Change
Covered by Medicaid	26.1	38.2	46.4%	60.0	73.0	21.7%	61.6	78.8	27.9%
Covered by Self-payer	14.0	13.0	-7.1%	12.1	6.4	-47.1%	14.8	6.9	-53.4%
Illegitimate birth	26.4	27.5	4.2%	80.7	83.4	3.3%	61.9	68.1	10.0%
School 1-8	4.9	5.0	2.0%	2.3	2.3	0.0%	10.9	13.0	19.3%
School 9-11	19.9	23.7	19.1%	41.4	41.2	-0.5%	43.0	44.2	2.8%
School 12	54.5	51.2	-6.1%	40.3	40.4	0.2%	34.9	32.2	-7.7%
School 13+	20.7	20.1	-2.9%	16.0	16.1	0.6%	11.2	10.6	-5.4%
Immigrant	26.3	29.0	10.3%	22.9	25.4	10.9%	54.4	54.1	-0.6%
WIC	10.1	17.7	75.2%	32.4	42.6	31.5%	35.3	46.0	30.3%
Spontaneous abortion before	5.0	6.5	30.0%	7.6	7.1	-6.6%	7.0	7.9	12.9%
Induced abortion before	6.3	7.9	25.4%	14.6	16.2	11.0%	9.1	13.0	42.9%
Employed this pregnancy	21.0	19.3	-8.1%	15.7	15.6	-0.6%	10.9	9.7	-11.0%
Mean of birth weight (g)	3309	3326	0.5%	3060	3095	1.1%	3209	3206	-0.1%

Figure 3: Births to Unmarried Women As Percent of All Births

U.S.A. 1985-1994



Sorce: Statistical Abstract of the United States, 1989-1990; Monthly Vital Statistics Report, 1990-1996

Table 11:

Maximum Likelihood Estimates of Illegitimate Birth for Whites, Blacks and Hispanics, Age 15-24

Variables	White	Black	Hispanic
Intercept	11.4350	5.2698	5.1223
	(10.99)	(7.72)	(9.80)
Age	-0.9511	-0.1801	-0.4089
	(-9.43)	(-2.72)	(-7.98)
Age square	0.0199	0.0016	0.0080
	(8.19)	(1.02)	(6.36)
First Birth	0.0825	0.1198	-0.0026
	(3.08)	(6.55)	(-0.17)
Immigrant	-0.5531	-0.3515	-0.2071
	(-18.21)	(-18.42)	(-13.75)
WIC	0.1101	0.0446	-0.0683
	(2.97)	(2.26)	(-4.35)
Employed	-0.1446	-0.1354	-0.2133
	(-3.99)	(-5.70)	(-8.85)
Employment unknown	-0.1454	-0.0755	-0.0962
	(-4.68)	(-3.25)	(-4.89)
School < 9	-0.3262	-0.3424	0.0208
	(-5.35)	(-5.68)	(0.83)
School = 12	-0.3554	-0.2290	-0.2787
	(-10.47)	(-10.47)	(-15.90)
School > 12	-0.4115	-0.2856	-0.5143
	(-8.79)	(-10.08)	(-20.05)
Education unknown	-0.0964	0.1322	0.2029
	(-1.53)	(2.44)	(4.93)
Father's education	-0.0662	-0.1134	0.0194
	(-8.86)	(-16.03)	(-5.07)
Induced abortion before	0.3946	0.1134	0.2165
	(8.76)	(4.73)	(9.28)
Medicaid	**0.7963**	**0.4049**	**0.4857**
	(27.30)	**(20.63)**	**(28.47)**
Year91	**-0.0590**	**0.0414**	**0.0680**
	(-2.34)	**(2.37)**	**(4.70)**
-2 Log Likelihood Ratio	3725.42	4232.05	4242.09
Sample Size	14638	33521	35977

Note: T-statistics are in parentheses

Table 12. Differences-In-Differences of Medicaid Expansions on Illegitmate Birth by Race or Ethnicity, Age 15-24

Treatment 1: Poverty Quintile 4. Control 1: Poverty Quintile 1.
Treatment 2: Poverty Quintile 5. Control 2: Poverty Quintile 2.
Treatment 3: No previous live birth, Poverty Quintile 4-5.

	White			Black			Hispanic		
	1988	1991	Differences	1988	1991	Differences	1988	1991	Differences
Treatment Group 3	36.45	30.24	-6.21	88.05	90.58	2.53	66.62	74.21	7.59
Control Group 1	21.07	24.04	2.97	69.86	73.20	3.34	48.42	52.12	3.70
Differences-in-									
Differences (DD)			-9.18**			-0.81			3.89+
	1988	1991	Differences	1988	1991	Differences	1988	1991	Differences
Treatment Group 3	36.45	30.24	-6.21	88.05	90.58	2.53	66.62	74.21	7.59
Control Group 2	26.98	30.02	3.04	74.70	79.74	5.04	48.33	59.22	10.89
Differences-in-									
Differences (DD)			-9.25**			-2.51*			-3.30*
	1988	1991	Differences	1988	1991	Differences	1988	1991	Differences
Treatment Group 2	37.62	28.69	-8.93	86.96	87.73	0.77	70.55	74.80	4.25
Control Group 1	21.07	24.04	2.97	69.86	73.20	3.34	48.42	52.12	3.70
Differences-in-									
Differences (DD)			-11.90**			-2.57+			0.55
	1988	1991	Differences	1988	1991	Differences	1988	1991	Differences
Treatment Group 2	37.62	28.69	-8.93	86.96	87.73	0.77	70.55	74.80	4.25
Control Group 2	26.98	30.02	3.04	74.70	79.74	5.04	48.33	59.22	10.89
Differences-in-									
Differences (DD)			-11.97**			-4.27**			-6.64**
	1988	1991	Differences	1988	1991	Differences	1988	1991	Differences
Treatment Group 1	30.16	29.29	-0.87	84.37	87.31	2.94	63.49	70.48	6.99
Control Group 1	21.07	24.04	2.97	69.86	73.20	3.34	48.42	52.12	3.70
Differences-in-									
Differences (DD)			-3.84+			-0.40			3.29
	1988	1991	Differences	1988	1991	Differences	1988	1991	Differences
Treatment Group 1	30.16	29.29	-0.87	84.37	87.31	2.94	63.49	70.48	6.99
Control Group 2	26.98	30.02	3.04	74.70	79.74	5.04	48.33	59.22	10.89
Differences-in-									
Differences (DD)			-3.91+			-2.10			-3.90*

** Significant at %1 level. * Significant at %5 level. + Significant at %10 level.

Table 13. Differences-In-Differences of Medicaid Expansions on Illegitimate Birth by Race or Ethnicity, Age 15-24 (Multivariate Analyses)

Treatment 1: Poverty Quintile 4. Control 1: Poverty Quintile 1.
Treatment 2: Poverty Quintile 5. Control 2: Poverty Quintile 2.
Treatment 3: No previous live birth, Poverty Quintile 4-5.

	White		Black		Hispanic	
Treatment Group 3 Control Group 1	Parameter	-0.0705	Parameter	-0.0171	Parameter	0.0395
	T-statistic	-3.24	T-statistic	-1.20	T-statistic	1.78
	R-square	0.2246	R-square	0.1497	R-square	0.1119
	Sample size	5465	Sample size	10973	Sample size	13853
Treatment Group 3 Control Group 2	Parameter	-0.0701	Parameter	-0.0177	Parameter	-0.0174
	T-statistic	-3.05	T-statistic	-1.49	T-statistic	-1.09
	R-square	0.1955	R-square	0.1240	R-square	0.1190
	Sample size	5485	Sample size	13651	Sample size	16289
Treatment Group 2 Control Group 1	Parameter	-0.0903	Parameter	-0.0329	Parameter	0.0055
	T-statistic	-3.49	T-statistic	-2.22	T-statistic	0.25
	R-square	0.2227	R-square	0.1337	R-square	0.0958
	Sample size	4577	Sample size	10807	Sample size	13082
Treatment Group 2 Control Group 2	Parameter	-0.0889	Parameter	-0.0347	Parameter	-0.0508
	T-statistic	-3.19	T-statistic	-2.80	T-statistic	-3.17
	R-square	0.1833	R-square	0.1115	R-square	0.1069
	Sample size	4597	Sample size	13485	Sample size	15518
Treatment Group 1 Control Group 1	Parameter	-0.0384	Parameter	-0.0054	Parameter	0.0376
	T-statistic	-1.94	T-statistic	-0.36	T-statistic	1.63
	R-square	0.2266	R-square	0.1336	R-square	0.0959
	Sample size	6151	Sample size	11076	Sample size	13351
Treatment Group 1 Control Group 2	Parameter	-0.0367	Parameter	-0.0115	Parameter	-0.0167
	T-statistic	-1.77	T-statistic	-0.92	T-statistic	-1.02
	R-square	0.2020	R-square	0.1137	R-square	0.1026
	Sample size	6171	Sample size	13754	Sample size	15787

Table 14. Infant Mortality, Percent of Low Birth Weight and Out-of-Wedlock Birth in the US, 1988-1992					
Year	1988	1989	1990	1991	
Infant Mortality:					
White	8.5	8.2	7.6	7.3	
Black and other	15.0	15.2	15.5	15.1	
Black	17.6	17.7	18.0	17.6	
Total	10.0	9.8	9.2	8.9	
Percent of low birth weight:					
White	5.6	5.7	5.7	5.8	
Black	13.0	13.2	13.3	13.6	
Hispanic	6.2	6.2	6.1	6.1	
Out-of wedlock birth:					
White	17.7	19.0	16.9	18.0	
Black	63.5	64.5	66.7	68.2	
Hispanic	34.0	35.5	36.7	38.5	
Source: Statistical Abstract of the United States 1992-1994.					

Appendix. Medicaid Expansions[13]

To exploit any impacts of the Medicaid expansions on pregnancy resolution or out-of-wedlock birth, it is necessary to understand the significance and the scope of Medicaid expansions. In this appendix I will briefly review the Medicaid expansions for pregnant women and children nationwide and in New York State.

1. Eligibility levels.

The four main Federal laws that would bring about Medicaid expansions were:

1) The Omnibus Budget Reconciliation Act of 1986 (OBRA-86). OBRA-86 gave states the option to expand Medicaid income eligibility thresholds above AFDC levels to as high as the Federal poverty level. States exercising this option were required to, at minimum, extend enhanced coverage to pregnant women and infants less than one year old. OBRA-86 also gave states the option to phase in, one year at a time, coverage of children between the ages of one and five in families with

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[13] Some information provided in this appendix are excerpted from "The Medicaid Expansions for Pregnant Women and Children: a State Program Characteristics Information Base" by Ian T. Hill, February, 1992, and "New York Medicaid Eligibility" by Barry Storm, March 1990.

income below the Federal poverty level.

2) The Omnibus Budget Reconciliation Act of 1987 (OBRA-87). OBRA-87 further expanded states' flexibility by allowing them to raise Medicaid income thresholds for pregnant women and infants to as high as 185 percent of the Federal poverty level. OBRA-87 also permitted states to cover any child living in poverty who was born on or after October 1, 1983. Therefore, as of OBRA-87's July 1988 effective date, states could immediately cover children under the age of five living below 100 percent of poverty. In addition, OBRA-87 permitted states to continue phasing in coverage of children up to the age of eight on the same schedule.

3) The Medicare Catastrophic Care Amendments of 1988 (MCCA). For those states that had not already voluntarily expanded their programs, MCCA mandated minimum coverage of pregnant women and infants at 100 percent of poverty. This required expansion was to take place over a 2-year phase-in period, i.e., affected states were to raise income limits to 75 percent of poverty by July 1989 and to 100 percent of poverty by July 1990.

4) The Omnibus Budget Reconciliation Act of 1989 (OBRA-89). OBRA-89 required all states to cover, at minimum, all

children up to the age of six living in families with income below 133 percent of poverty.

In New York State, pregnant women can be eligible for two types of coverage -- full Medicaid coverage and coverage under the Prenatal Care Assistance Program (PCAP). PCAP supplies comprehensive ambulatory prenatal care by prenatal care providers or medical providers enrolled in the Medical Assistance (MA) program.

USC §1396a(a) (10) (A) (I) (IV), 1396a(l) requires that "pregnant women of infant children under age one must be covered without regard to resources if their countable income is less than 100% of the poverty level." "An infant up to age one not otherwise eligible for MA whose family has income below 185% of the poverty line for a household the size of the family in which he or she is included is eligible for MA coverage without regard to resources."

Soc. Ser. L. §366 (4) (o) (1), (2), 18 NYCRR §360-4.7 (b) (3), 360-4.8(a) (2) (ii) as added at NYS Register 28 (1/10/90) (emergency.proposed rule), 90 ADM-9 permitted "a pregnant woman not otherwise eligible for MA whose family has income below 185% of the poverty line for a household the size of the family in which she is included is eligible for the PCAP

without regard to resources."

In New York, abortion, alternate care, podiatry, eye care, physical therapy, etc. are excluded from Medicaid covered services for pregnant women if their incomes are between 100% - 185% of poverty line.

2. Streamlining Medicaid eligibility

1) Continuous Eligibility: OBRA-86 also permitted states to grant pregnant women continuous coverage throughout the course of their pregnancy and a sixty-day post-partum period, regardless of any fluctuations in income. States adopting this option were, therefore, allowing women to forgo traditional schedules for eligibility redetermination, judging that the risk of interrupting access to care was less acceptable than the risk that a family's income might increase above allowable limits during a pregnancy.

2) Dropping the Assets Test: One provision of OBRA-86 permitted states to either liberalize or eliminate resource restrictions from the Medicaid eligibility criteria. Specifically, the law said that assets tests for pregnant women could be more generous, but no more restrictive than those imposed under the Supplemental Security Income program and those asset limits for children could be more liberal, but

no more restrictive, than those used under the state's AFDC program.

3) Presumptive Eligibility: The presumptive eligibility option, made possible by OBRA-86, permits states to make Medicaid-financed prenatal care available to pregnant women form their first visit to a prenatal care provider, based on preliminary financial information that indicates that their income falls below the state's Medicaid eligibility threshold. The special presumptive eligibility period can last up to forty-five days and, during that period, pregnant women are required to apply for full Medicaid coverage.

In New York State, presumptive eligibility is available as soon as the provider determines a woman meets the income standard (185% of the poverty line). Presumptive eligibility continues until the woman is found eligible, until 45 days elapse from the original determination of presumptive eligibility, or the woman fails to file an application for the program within 14 days of the original determination of presumptive eligibility. Presumptive eligibility does not extend to inpatient hospital or institutional care.

Other aspects of Medicaid eligibility expansions include: shortening the Medicaid Application Form, expediting

eligibility determinations, enhancing prenatal care services under Medicaid and outstationing Medicaid workers.

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