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# Income Variability and WIC Eligibility: Evidence from the SIPP

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**Abstract:** This study presents evidence on income variability surrounding the birth of a child using monthly data from the Survey of Income and Program Participation (SIPP), and computes WIC eligibility under a number of different scenarios. Although several unanticipated complications emerge in using the SIPP data, there are 1,100 pregnancies that are used to analyze income variability and WIC eligibility. Several conclusions that emerge. First, there are dramatic declines in the individual earnings of the pregnant women once the baby is born, but earnings rebound relatively quickly. Second, and more importantly for WIC eligibility, this temporary decline in the mother's earnings does not much affect the family's income. Third, self-reported Medicaid and WIC participation rise dramatically during pregnancy, and then fall dramatically thereafter. Finally, WIC eligibility is parameterized. The dynamics of WIC eligibility depend critically on the assumptions about the frequency of recertification. On the other hand, adjunctive eligibility appears to contribute little to total WIC eligibility.

## 1. Introduction

This descriptive study presents evidence on income volatility surrounding the birth of a child using monthly data from the Survey of Income and Program Participation, and computes eligibility for the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC) under a number of different scenarios. There are several motivations, outlined in the National Research Council (NRC) report, for examining income volatility.[1] Current estimates for estimating WIC eligibility rely on the March Annual Demographic Supplement to the Current Population Survey (CPS). The number of income-eligible pregnant and postpartum women is derived from the number of income-eligible infants in the CPS. Because the income questions in the CPS refer to the previous calendar year, a number of measurement issues arise. First, it is possible that the mother's earnings and the family's income is higher during pregnancy than afterwards because the mother might leave the labor force. Thus, the previous calendar year's income may overstate current income and underestimate the number of income-eligible postpartum women. Second, the CPS measures family characteristics as of the March interview. It is possible that couples decide to get married as the birth approaches, and this too affects WIC eligibility. WIC eligibility is based on total family income and family size – both of which are affected by marriage. All else equal, increasing family size will increase WIC eligibility, while increasing family income (through the husband's earnings) will decrease WIC eligibility. Third, the CPS asks about welfare program participation over the entire previous year.[2] It is believed

[1] National Research Council, "Estimating Eligibility and Participation for the WIC Program," 2001, Prepublication Copy, Uncorrected Proofs.

[2] The welfare programs that are considered for adjunctive eligibility are Medicaid, Food Stamps, and Aid to Families with Dependent Children (AFDC) / Temporary Aid to Needy

that individuals under-report their participation in such programs in the CPS (NRC, 2001, page 4-4). Finally, WIC does not recertify eligibility each month. A pregnant woman who is certified as WIC-eligible remains eligible until the birth of the child, and a postpartum remains eligible until 6 or 12 months after the birth. Thus, even if a family's monthly income rises, they may still WIC-eligible for several months.

The Survey of Income and Program Participation (SIPP) can shed light on these issues. The SIPP collects the source and amount of income, labor force information, program participation and eligibility data, and general demographic characteristics to measure the effectiveness of existing federal, state, and local programs. It samples the U.S. civilian noninstitutionalized population. The SIPP content is built around a "core" of labor force, program participation, and income questions designed to measure the economic situation of persons in the United States. It interviews households every four months, asks retrospective questions on a monthly basis, and follows households for up to 48 months. A new cohort is introduced each year, forming a new "panel." In this study, the 1990, 1991, 1992, 1993 and 1996 SIPP panels are used.[3]

Several unanticipated complications emerge in using the SIPP. First, a surprisingly large number of children have inconsistent information on their birthday, which make them difficult to use in the analysis. Second, it is difficult to examine the full 22 months of dynamics of pregnant/postpartum women in the earlier panels of the SIPP (1990-1993), because of the short length of the earlier SIPP panels (32-36 months). Third, the children in the earlier panels do not

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Families (TANF).

[3] There were no SIPP panels in 1994 or 1995.

have identifiers that point to the mother, rather to the parent (although this is no longer a problem in the 1996 panel and beyond). For some children, it is impossible to identify their mother in earlier years.

Despite these issues, there are 1,100 pregnancies with "high-quality" data in these five SIPP panels that are used to analyze income variability and WIC eligibility. I analyze the whole group of 1,100 pregnancies, as well as breaking out the analysis by marital status and race. There are several conclusions that emerge from the data. First, as expected, there are dramatic declines in the individual earnings of the pregnant women once the baby is born, both for all pregnant women and across demographic groups. Within several months, however, the mother's earnings rebound to levels similar to before the baby was born (especially for single women and non-white women). Second, this temporary decline in the mother's earnings does not much affect the family's income. Family income at the $10^{th}$, $25^{th}$, $50^{th}$, and $75^{th}$ percentile look remarkably stable both before and after the baby is born. Those at the upper end of the income distribution ($75^{th}$ percentile) may have a slight decline, but the only noticeable dip is for non-white women. Third, self-reported Medicaid and WIC participation rise dramatically during pregnancy, and then fall dramatically thereafter. AFDC/TANF and food stamp coverage rise slowly throughout the pregnancy and postpartum. These patterns hold across all demographic groups. Finally, WIC eligibility is parameterized. The dynamics of WIC eligibility depend critically on the assumptions about when the applicant applies and the frequency of recertification. On the other hand, adjunctive eligibility (eligibility based on other welfare programs) appears to contribute little to total WIC eligibility, except for initially single women.

The results are also replicated using a shorter horizon – six months on either side of the

birth. This allows me to analyze 1,799 pregnancies, rather than 1,100 pregnancies. The larger sample size does not affect any of the conclusions, however.

The remainder of the paper is arranged as follows. Section 2 describes the construction of the SIPP sample. Section 3 describes the details of WIC eligibility and motivates the assumptions that are used in the analysis. Section 4 presents the results for the entire sample, as well as selected demographic groups.

## 2. Construction of Pregnancies in the SIPP

The analysis is conducted with the 1990-1996 SIPP panels. Although the SIPP started earlier, the analysis does not use the 1984-1989 SIPP panels. These earlier panels generally covered shorter amounts of time (with 9, 8, 7, 7, 6, and 3 waves respectively), and the 1984-1986 panels skipped interviews with some of the participants. These constraints make it extremely difficult or impossible to obtain data on the full pregnancy and postpartum period. Moreover, around 1990, Congress made participants in AFDC, food stamps, and Medicaid "adjunctively eligible" for WIC.[4] Hence, earlier panels do not reflect the current WIC rules.

The 1990 panel consists of approximately 23,000 households who were interviewed eight times between February 1990 and September 1992. The 1991 panel consists of 15,000 households who were interviewed eight times between February 1991 and September 1993. The 1992 panel consists of 21,000 households who were interviewed nine times between February 1992 and January 1995. The 1993 panel consists of 21,000 households who were interviewed

[4] Mathematica Policy Research, Inc., "Estimating the Number of People Eligible for WIC and the Full-Funding Participation Rate: A Review of the Issues," Final report, February 12, 1999.

nine times between February 1993 and January 1996. The 1996 panel was longer and larger than previous panels. It consisted of 40,000 households who were interviewed twelve times between April 1996 and March 2000.

The data set was constructed as follows. From the "core" interviews, I obtained information on family structure, income and program participation from the first 8 waves of the 1990 and 1991 SIPP panels, 9 waves of the 1992 and 1993 panels, and 12 waves of the 1996 panel. Each observation in the SIPP from 1990 onward is arranged in a "person-month" format. Thus, each person appears as many as four times in a given wave of the SIPP. The 1990 SIPP has a total of 1,769,133 "person-months" on 69,101 individuals. The 1991 SIPP has 1,133,515 "person-months" on 44,143 individuals. The 1992 SIPP has 1,748,849 "person-months" on 61,534 individuals. The 1993 SIPP has 1,750,970 "person-months" on 62,346 individuals . The 1996 SIPP has 3,897,232 "person-months" on 116,004 individuals.

The goal of this study is to examine the income variability around pregnancy. The SIPP does not ask about pregnancy, so the only way to figure out whether a woman was pregnant is by the presence of an infant in the household.[5] The number of infant "person-months" / infants in the five panels is: 29,125 "person-months" / 3,506 infants in the 1990 panel, 18,351 / 2,150 in the 1991 panel, 26,622 / 3,128 in the 1992 panel, 25,885 / 3,593 in the 1993 panel, and 47,933 / 5,784 in the 1996 panel. Although there are more than 18,000 infants across the five panels, most infants could not be used for the analysis.

To analyze income variability around the birth of a child, it is critical to have accurate information on when the baby was born. Of the 69,101 individuals in the 1990 SIPP, around

[5] This method obviously misses abortions, miscarriages, adoptions, and infant mortality.

one-third (21,725 individuals) do not report consistent information on birth month and birth year across all months they were in the SIPP. That is, in at least one interview, the birth month or birth year disagrees with the other interviews. Among the 3,506 infants in the 1990 SIPP, 1,003 have inconsistent birthday information. The number of infants with birthday inconsistencies in the 1991-1996 panels are 652, 899, 884, and 159, respectively. Clearly, the birthday information is problematic, especially in the 1990-1993 panels. In the analysis, I exclude infants who had a birthday inconsistency since the timing is critical in the analysis.[6] This reduces the number of infants (pregnancies) by about one-third.

There are several additional screens that further reduce the sample size. First, this study links the baby to the mother. In the 1990-1993 panels, the SIPP asks for the parent's/guardian's line number, not the mother's line number.[7] The SIPP also asks for the spouse's line number. Most infants have a "parent's line number" that points to a woman, and a smaller number (about 5 percent) have a "parent's line number" that points to a man. When the parent's line number points to a man and he is married, I substitute the spouse's line number. There are also a small number of infants that, in different months, have more than one parent/guardian who is female. I exclude infants who appear to have more than one female parent/guardian, as well as infants

[6] In principle, one could try to include infants with birthday inconsistencies to increase the sample size. For example, one could assume the modal response for birthday as the truth, or perhaps take the birthday in the last interview as the truth. Many respondents had inconsistencies in their birth year, so for purposes of measuring pregnancies and postpartum periods, the measurement error is potentially quite severe. Since the focus of this paper depends so critically on the timing of births, it seemed sensible to exclude these observations.

[7] The 1996 SIPP separately asks for the mother and father's line number.

who zero female parents/guardians.[8]

Second, and more importantly for the sample size, assuming I can link a baby to the mother, I must observe the mother for nine consecutive months before and twelve consecutive months after the birth. In practice, I call the birth month "month 0," and require nine consecutive monthly observations on the mother prior to month 0, and twelve consecutive monthly observations on the mother after month 0. Altogether, I must observe the mother for 22 consecutive months. Third, I examine only the earliest observed birth for a mother within the SIPP panel. A small number of mothers had more than one child during the SIPP panel, but even fewer had a set of 22 consecutive months for both children.

Altogether, 1,100 infants/pregnant women meet these screens in the five SIPP panels. There are 179 women from the 1990 panel, and from the 1991-1996 panels, 97, 182, 190, and 452 women, respectively.[9]

## 3. WIC Eligibility

The WIC program has three types of requirements for eligibility: categorical requirements, income requirements, and nutritional risk requirements.

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[8] The SIPP panel has a "topical module" that is usually conducted in the first or second interview that asks about exact family relationships for all household members. Unfortunately this is not useful for my analysis, because none of the children are included in my sample unless I observed the mother for all nine months of pregnancy. Hence, the earliest I would observe an infant is the third wave of a SIPP panel, after this topical module is asked.

[9] To test the robustness of the results, I also examined 1,799 women who had valid information for six months on both sides of the birth (thirteen months total). These 1,799 women are distributed in the 1990-1996 panels as follows: 316, 174, 301, 309, and 699. In general, the results look very similar with either screen.

Five groups fall into the "categorical" requirement: infants (aged 0 to 12 months), children aged 1 to 5, pregnant women, nonbreastfeeding women up to 6 months postpartum, and breast-feeding women up to 12 months postpartum. The focus in this paper is on the pregnant and postpartum women. Since the SIPP does not ask directly about pregnancy or breast-feeding, these women will be identified through the presence of an infant, and it will be assumed that all postpartum women breast-feed.[10]

Second, there are income requirements. Basically, the income requirement to qualify for WIC is that the family's income is less than 185 percent of the poverty line. The poverty line is indexed for inflation, and varies by family size.[11] The WIC eligibility limits appear to be updated every year on July 1st, and are based on the poverty guidelines published by the U.S. Department of Health and Human Services (HHS). The 2001 HHS poverty guidelines, for example, define the WIC income limit from July 1, 2001 to June 30, 2002.

Several descriptions of WIC note that states have the option of setting lower income limits, but very few states exercise that option. There are also subtleties about the accounting period for income, what kinds of income count, and what defines a family. To determine income eligibility in the SIPP, I use the family's total income (abbreviated *FTOTINC* in the SIPP data dictionary) and family size (*FNP*). I do not use the family poverty line (*FPOV*) that is provided in the SIPP data, but rather impute the poverty line based on the HHS guidelines. The

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[10] Since both breast-feeding and nonbreastfeeding postpartum women are eligible for WIC for the first six months after the baby is born, the eligibility results for those months are likely to be more accurate.

[11] The poverty line is uniform across the 48 contiguous states, and is somewhat higher in Alaska and Hawaii.

family poverty line in the SIPP increases each month, which would lead to an increasing WIC income limit each month.

The other avenue to satisfy the WIC income requirement is to qualify through the process of adjunctive eligibility. Starting around 1990, women who meet the categorical requirements for WIC and participate in Medicaid, food stamps, or AFDC are automatically eligible for WIC. Of these three programs, Medicaid is almost certainly the most important in terms of adjunctive eligibility because the income limits for pregnant women can be quite high because of the Medicaid eligibility expansions.[12] In terms of modeling adjunctive eligibility for WIC, I assume a pregnant women is adjunctively eligible only if she is actually participating in one of the other programs, not simply if she is deemed eligible.

There are a number of problems with the imputations if one wants to model adjunctive eligibility for non-participating eligibles. One problem is that eligibility for AFDC, Medicaid, and food stamp is a complicated formula of earned and unearned income, liquid assets, housing and automobile wealth, medical expenses, shelter expenses, and family structure. Moreover, these rules vary by state, and the SIPP neither identifies every state nor is meant to be representative at the state level. In addition to the difficulties of imputing program eligibility, there are the questions related to why some pregnant women do not participate in programs that they are eligible for.[13] Some may not participate because of welfare "stigma," others because of transaction or information costs, and others because the SIPP microdata does not completely

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[12] Yelowitz (1995) describes the Medicaid expansions of the 1980s and 1990s.

[13] Moffitt (1983) formulates a model of welfare participation where there is a "stigma" cost of participating.

measure all factors for eligibility.

The final issue related to imputing welfare eligibility for non-participants is the assumption that income, assets, family structure, and state of residence are exogenous. In principle, a sizable number of households would be eligible for Medicaid (with its relatively high income limits) if the pregnant woman quit her job, yet most discussions about imputing eligibility would take her income as exogenous. In Yelowitz (1995), I showed that female headed households had labor supply responses the Medicaid expansions. Moreover, Yelowitz (1998) and Gruber and Yelowitz (1999) showed that marital status and savings were responsive to the Medicaid expansions as well. Hence, it is not clear where one draws the line in terms of imputing adjunctive eligibility – should the sample be restricted to actual participants, households who are statutorily eligible if no behavioral response is assumed, or households who would be eligible if they adjusted their income, assets, and so on? For sake of simplicity, I draw the line at actual participants in AFDC/TANF, food stamps, and Medicaid.

There is one other important family structure feature of the WIC program that should be noted – the treatment of the fetus in income eligibility calculations for pregnant women. From 1990 to 1994, it appears that the income limit for WIC is based on the number of family members excluding the fetus, but includes the fetus in eligibility calculations for pregnant women from late 1994 onward. Since the poverty line increases in family size, counting the fetus increases the WIC eligibility limit and hence WIC eligibility. The SIPP data spans the time period from October 1989 to February 2000. In imputing WIC eligibility, I do not count the fetus (even after 1994).

The final requirement for WIC eligibility is that a woman has to be at "nutritional risk."

Since the SIPP data has no information on the woman's diet or health habits, I do not model this. Implicitly, this assumes that all women are at nutritional risk.

## 4. Descriptive Evidence from the SIPP

### *4a. Earnings of the mother*

The first five figures show how the woman's real monthly earnings evolve over the course of the pregnancy. All dollar amounts are expressed in constant February 2000 dollars. Earnings reflect the income from all jobs including self-employment. The figure shows how the monthly earnings distribution evolves over time, by showing the $10^{th}$ percentile, $25^{th}$ percentile, $50^{th}$ percentile, and $75^{th}$ percentile of monthly earnings. The striking conclusion from Figure 1, for all pregnancies, is that earnings fall dramatically as the birth approaches, and rebound modestly thereafter. For a woman with median earnings, earnings fall from more than $800 per month during the first trimester, to zero at birth, and rebound to approximately fifty percent of their initial level by the end of the postpartum period. At the $75^{th}$ percentile, earnings fall by about 40 percent during pregnancy, but rebound to approximately 90 percent of their initial level by the end of the period.

The next four figures break out earnings by two demographic variables – marital status and race. Figures 2 and 3 break out the earnings variation by marital status. Off the 1,100 pregnancies, 862 were to initially married women and 238 were to initially unmarried women. Since martial status may change over time, the sample is divided by the woman's marital status at the beginning of the pregnancy (t=-9). Somewhat different patterns emerge based on initial marital status. For initially married women, median earnings fall from $1172 to $0 during the

pregnancy, and rise slowly to $701 by the end of the postpartum period. Earnings at the 75th percentile bounce back considerably faster, going from $2154 at the beginning of the pregnancy, to $1529 at birth, and $2035 by the end of postpartum. The overall earnings levels of single women are much lower than married women – perhaps reflecting their increased reliance on the welfare system (and the work disincentives it presents). For initially unmarried women, median earnings are always zero. Earnings at the 75th percentile falls from $901 at the beginning of pregnancy, to zero at birth, fully rebounds to $908 six months after birth, and increases to $1004 by the end of postpartum. Figures 4 and 5 show earnings of white and non-white women. Of the 1,100 pregnancies, 934 were to white women, and 166 were to non-white women. Median real monthly earnings for white women fall from $972 at the beginning of pregnancy to $411 one month before birth, to zero at birth, and then rise to $480 by the end of postpartum. At the 75th percentile, earnings fall during pregnancy from $2078 to $1328, but rise to $1837 by the end of postpartum. Non-white women are clearly more disadvantaged. Median earnings are zero for much of the pregnancy and all of the postpartum period, but real monthly earnings at the 75th percentile fall from $1334 to $466, but more than rebound to $1432 by the end of the period. Figure 2-5 provide some additional insights. First, the drop in earnings is apparent across demographic groups, but earnings rebound more quickly for those who are more disadvantaged and started out at lower initial levels – unmarried women and nonwhite women. This is important to keep in mind for WIC eligibility, as these less advantaged groups are likely the ones with the highest participation rates.

One concern about Figures 1-5 is that although there seems to be a modest amount of variation in earnings surround the birth for the group as a whole, there might be substantially

more variation by individuals. That is, if some women's earnings increase and other's decrease, then the distribution may not change that dramatically even though there is potentially a great deal of income volatility. Figures 6-10 try to capture this notion by comparing an individual's nominal earnings at any period *t* to the earnings at the onset of pregnancy (t=-9).[14] I create four variables to capture earnings declines. The first one is whether nominal monthly earnings is strictly lower in period *t* (t>-9) than it was in period -9. The second one is whether nominal earnings is at least 10 percent lower in period *t* (t>-9) than it was at the onset of pregnancy. The third and fourth variables are cumulative measures of the first two – if income in any period up until *t* has ever been lower (or 10 percent lower) than at the onset of pregnancy, then this variable equals one. These cumulative variables cannot decrease over the course of pregnancy and postpartum. Obviously all of these variables are equal to zero at t=-9. Figure 6 illustrates the evolution of these variables over the pregnancy for the sample as a whole. The number of women who have earnings declines relative to the beginning of pregnancy increases to 47 percent of the sample by the time the baby is born, and then decreases to 35 percent of the sample by the end of the postpartum period. Most of the women who experience an earnings decline had a decline of more than 10 percent – the numbers are nearly identical to those who experience any earnings decline. Cumulatively, 55 percent of the sample experienced a monthly

[14] Although real earnings were used in Figures 1-5, nominal earnings are used here. The numbers in Figures 1-5 were inflated to February 2000 constant dollars with monthly price adjustments, obtained from the Bureau of Labor Statistics (http://www.bls.gov/cpi/home.htm). I use the CPI for all urban consumers, series "CUUR0000SA0." With monthly price adjustments, real earnings would almost certainly fall relative to t=-9, because wages are usually not adjusted for cost of living on a monthly basis. Since the comparisons in Figures 6-10 do not use dollar levels, but rather comparisons to the baseline earnings, then inflation will not be a major issue for these figures.

earnings decline by the time the baby was born, and 50 percent had experience a decline of more than 10 percent. Most of those who did not experience an earnings decline by the time their child was born never did – by the end of the period, cumulatively 60 percent (57 percent) had experienced an earnings decline (of more than 10 percent). Most of the individual declines happen in the months preceding the birth. On the other hand, roughly half the sample did not experience a nominal earnings decline by the time the baby was born. Figures 7 and 8 show earnings declines by marital status, and figures 9 and 10 show earnings declines by race. Single women were less likely to have earnings declines (or substantial earnings declines) than married women. Cumulatively, 64 percent (61 percent) of married women ever experienced an earnings decline (of more than 10 percent) by the end of the postpartum period, whereas the number for unmarried women is 45 percent (44 percent). The numbers by race essentially mirror the marital status results – 62 percent (59 percent) of white women ever experienced an earnings decline (of more than 10 percent) by the end of the postpartum period, compared with 48 percent (46 percent) for non-white women. Taken together, figures 6-10 present a somewhat different picture of *individual* earnings volatility compared to the volatility of the earnings distribution. Many women experience earnings declines during pregnancy / postpartum, though this is more true for white women and married women. Most of this earnings decline comes during the pregnancy, not during the postpartum period.

*4b. Total family income*

The woman's earnings is not necessarily very informative for measuring WIC eligibility, however, since the family's total income is counted. Figures 11-15 show the evolution of total

family income. One key difference between these variables is that total family income includes the husband's earnings. Marriage rates increase over the course of pregnancy – from about 78 percent to 80 percent, so a number of households will presumably experience a substantial increase in total family income through the new husband.

Figure 11 shows real total family income (in constant February 2000 dollars) for the entire sample of pregnancies. One can see dramatically different patterns for total income compared with the pregnant woman's earnings. In the 10$^{th}$ percentile, total income falls slightly from $886 per month at the beginning of pregnancy, to $799 at birth, to $933 by the end of the period. Total income catches up to pre-pregnancy levels by six months after the birth. The declines at other points in the income distribution are fairly small, too. At the 25$^{th}$ percentile, total income falls by about 10 percent during the pregnancy, but reaches its previous level around four months after the birth. At the median, total family income falls varies by less than $130 during the nine months preceding the birth (it starts at $3746 at t=-9 and falls to $3614 at t=-1). At the birth, total income declines to $3365, but increases modestly in the months thereafter. By the end of the postpartum period, total income is $3696. The patterns at the 75$^{th}$ percentile look similar to those at the median.

In Figures 12-15, the patterns are shown by demographic groups. For initially married women, total income tends to decline by about 10-15 percent during the pregnancy, and then rise to pre-pregnancy levels by the end of the postpartum period. Single women had less dramatic declines during pregnancy, in general. From the birth until month 12, total income increases by large amounts (in percentage terms) along all points on the income distribution. Median total family income falls from $1352 to $1277 during the pregnancy, but rises to $1771 by the end of

postpartum. Among whites, there are modest declines in total income in the last months of pregnancy, but total income returns to pre-pregnancy levels by the end of the period. At the median, total income falls from $3994 to $3600 during pregnancy, but bounces back to $3874 by the end of postpartum. Non-whites generally have similar patterns, but in the upper part of the income distribution ($50^{th}$ and $75^{th}$ percentiles), real total family income rises quite dramatically from the birth to the end of postpartum. At the median, total income rises from $2067 at birth to $2485 by the end of the period.

Figures 16-20 explores an individual's total family income, rather than the distribution. The measures are similar to those used for earnings in Figures 6-10. The measures are whether a family's income in period *t* was less than its income at t=-9, whether its income fell by more than 10 percent compared to the level at t=-9, and the cumulative measures. As with earnings, total family income is now measured in nominal dollars. The results for total income look different than for the woman's earnings in a number of respects. First, virtually all women who had an earnings decline (at a given point in time) had a decline of greater than 10 percent. There is a much larger gap for total income (by at least 10 percentage points in most cases). Many families had total income declines relative to the beginning of pregnancy, but relatively fewer of these declines would be classified as "large." On the other hand, many more households experienced a decline in family income compared to a decline in the woman's earnings (presumably this is because many women had zero earnings to begin with). By the time the child was born, fully 81 percent of households had experienced a decline in family income in at least one month since the onset of pregnancy, and 64 percent had experienced a decline of at least 10 percent in at least one month. The cumulative distributions continue to increase after

the baby is born, faster than similar cumulative distributions for the woman's earnings. By the end of the postpartum period, nearly 90 percent of families had experienced a decline in total income in at least one month, while nearly 80 percent had experienced an decline in total income of at least 10 percent in at least one month. The numbers in Figure 17, for married women, essentially mirror the entire sample, while the cumulative distributions in Figure 18 for unmarried women are somewhat lower. The results for total income by race look very similar to each other in Figures 19 and 20, and similar to the entire sample.

Taken together, figures 11-20 offer a somewhat different picture of income volatility than earnings volatility. As far as the group distributions, the declines in total income are smaller approaching pregnancy than the declines in woman's earnings. Moreover, total income rebounds fairly quickly (and sometimes impressively) for some demographic groups. At the same time, the declines appear to spread over more households – almost all households experience at least one month of decline in total family income during the pregnancy / postpartum.

*4c. Welfare programs*

The next five figures, Figures 21-25, show the monthly participation rates in Medicaid, AFDC (and TANF), food stamps, and WIC. These are the participation rates for the pregnant woman. Figure 21 shows that Medicaid and WIC participation increase dramatically over the course of the pregnancy. At the beginning of pregnancy, around 9.7 percent of women participated in Medicaid, and less than 2 percent participated in WIC. By the time the child is born, more than 21 percent of all pregnant women are enrolled in Medicaid, and 14 percent in

WIC. During the same time, AFDC and food stamp participation rise only modestly. The fall in Medicaid and WIC coverage during the postpartum period is equally dramatic. By t=12, around 13 percent of women participate in Medicaid, and 2.7 percent participate in WIC. Interestingly, both AFDC and food stamp coverage continue to rise slowly after the birth of the child, even as Medicaid and WIC are falling.

As one might expect, there are dramatic differences in program coverage for married and unmarried women. The cash welfare program, AFDC/TANF, generally offers benefits to single women. Medicaid and food stamps are available to all women, but the value is likely to be lower for married women because of the higher total family incomes (and the higher likelihood of receiving employer health insurance instead of Medicaid). Among married women, Medicaid coverage rises from 4 percent to 10.4 percent during the pregnancy, and WIC coverage rises from 1.5 percent to 9.6 percent. By the end of the postpartum period, the coverage rates are approximately the same as at the beginning of the pregnancy. Cash welfare participation is very low (always less than 2 percent), and food stamp participation slowly grows over the entire period. The participation rates in Figure 23 are obviously much higher for unmarried women. Medicaid coverage doubles during pregnancy. Approximately 60 percent of single women are covered by Medicaid when their child is born. WIC coverage increases from 2 percent to 34 percent. Both AFDC and food stamps rise as well, though not nearly as fast. Medicaid coverage remains high – by the end of the postpartum period, 45 percent of unmarried women are covered. WIC coverage falls dramatically, while AFDC coverage increases slightly and food stamp coverage decreases slightly. In Figures 24 and 25, one can observe that Medicaid and WIC participation increase during pregnancy, especially for non-whites, and fall thereafter. The

contrast for whites/non-whites resembles the contrast for married/unmarried, although the differences are a bit more muted.

*4d. WIC eligibility*

The final set of figures (Figures 26-40) consider WIC eligibility under three scenarios, for the entire sample and the different demographic groups.[15] "Scenario 1" evaluates a woman's income eligibility and adjunctive eligibility each month; that is, it assumes that a woman must be recertified for WIC each month. "Scenario 2" is the closest approximation to the actual WIC eligibility process. In this scenario, a woman is eligibility is evaluated in each month, but once she is certified as "WIC eligible" – either through income eligibility or adjunctive eligibility, she does not need to be recertified until t=0 and t=6. Thus, a woman in who certified as eligible in the first month of pregnancy will be counted as eligible until her baby is born. If she is certified as eligible at that time, she will continue to be counted as eligible until 6 months after the baby is born. And if she is certified at that time, she will remain eligible for the remainder of the infant's first year.

"Scenario 3" tries to use a CPS-style definition for income and adjunctive eligibility. As discussed in numerous WIC reports, the March CPS asks about income and program participation in the previous calendar year. Computing "CPS-style" income and program participation is done in several steps. For the postpartum period (t=1 to t=12), I found the year

[15] For brevity, I will not discuss the results by demographic group.

in which the infant was alive in March.[16] From the previous calendar year, I took the average of total monthly income. In addition, I examined whether the woman ever participated in Medicaid, food stamps, or AFDC during the months of that previous calendar year. I then use this average total monthly income in *all* months – hence, the variation in WIC income eligibility comes from variations in family structure and the statutory increases in the WIC limit in July of each year. I also use this adjunctive measure for *all* months. Thus, a woman is always adjunctively eligible or never adjunctively eligible.[17] As discussed in Section 3, I assume a women is adjunctively eligible only if she actually participates in Medicaid, food stamps, or AFDC, not if she is a non-participating eligible. Under Scenario 3, I assume the woman must be recertified for WIC eligibility each month.[18]

Figure 26 presents results using Scenario 1 for the entire sample. At the onset of the pregnancy, 29.6 percent of the women are WIC eligible. More than 97 percent of WIC eligible women are eligible based on their income alone. Less than one percent of the entire sample

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[16] Because I define an infant from t=1 to t=12 rather than starting at t=0, there is only on observed March in the infant's first year. To illustrate, a woman who gave birth between January 1, 1996 and February 29, 1996 would have her "CPS-style" income defined from the 1995 calendar year. A woman who gave birth between March 1, 1996 and December 31, 1996 would have her "CPS-style" income defined from the 1996 calendar year.

[17] I take the average of the months of income (program participation) that I observe for the woman, with the constraint that the data comes from $t \geq -9$. Consider a woman who gives birth in February (t=0). The data from eight months, $-9 \leq t \leq -2$ (May through December), is used to compute average monthly income and whether the woman ever participated in welfare. A woman who gives birth in March (t=0), would use data from twelve months, $-2 \leq t \leq 9$, (January through December).

[18] In practice, the recertification assumption is irrelevant in Scenario 3, because income remains constant, and adjunctive eligibility remains constant. Only when family structure changes (e.g., when the baby is born at t=0 or if a family member leaves) or the WIC limit increases will WIC eligibility change.

qualifies based on adjunctive eligibility but not income eligibility. During the pregnancy, total WIC eligibility increases quite slowly, to 34 percent in the month before birth. During the pregnancy, the percentage who qualify based solely on adjunctive eligibility is never greater than 4 percent. WIC eligibility jumps up at the time of the birth (t=0), because the WIC income limit increases based on a larger family size. At the time of the birth, approximately 43 percent of women are WIC eligible, 39 percent based solely on their income. From birth onward, WIC eligibility falls slowly and continuously. By the end of the postpartum period, 36.7 percent are eligible for WIC, 34.2 percent based solely on their income.

Figure 31 presents the results under Scenario 2 – where the difference from Scenario 1 is that the woman remains eligible until recertification at t=0 and t=6. If her income increases after she becomes eligible, she still remains eligible until the next recertification. Since all women are recertified at t=0 and t=6, the participation rates under Scenario 2 are identical to Scenario 1 at t=-9, t=0, and t=6, but will otherwise be higher. The dynamics of eligibility are dramatically different in Figure 31. Eligibility rises from 29.6 percent at t=-9 to 44.1 percent at t=-1. Because of this dramatic rise (because the women are not recertified), WIC eligibility actually falls at t=0, even though the WIC income limit rises at that time. At birth, 42.7 percent of women are eligible. From that point, WIC eligibility rises to 51.5 percent at t=5. At the next recertification at t=6, WIC eligibility is 36.8 percent. From there it rises to 48.5 percent. Also evident in Scenario 2 is the close link between total WIC eligibility and adjunctive eligibility. The two paths are nearly identical to each other.

Scenario 1 and Scenario 2 point to the importance about recertification, and the unimportance of adjunctive eligibility. The number who are eligible for WIC becomes quite

high given the actual recertification, because a great number of households experience small temporary drops in their total income (Figure 16).

Figure 36 presents the results using CPS-style income imputation. During the pregnancy, approximately 33.5 percent of the sample is eligible for WIC, but a much higher proportion qualify based on adjunctive eligibility alone. The CPS-style imputation, for example, would suggest that nearly 20 percent of pregnant women would qualify based on adjunctive eligibility alone during the first month of pregnancy, while the computations under Scenarios 1 or 2 would suggest the number is less than 3 percent. Compared to Scenario 1 (monthly recertification), the CPS-style estimates during pregnancy are quite similar. Under Scenario 1, WIC eligibility varies from 29.6 percent to 34.3 percent, while Scenario 3 gives estimates of 33.5 percent. During the postpartum period, the CPS-style estimates in Scenario 3 give participation rates of approximately 37-38 percent. This tends to underestimate WIC eligibility compared to Scenario 1 in the earlier postpartum months, and overestimate WIC eligibility in the later postpartum months. Scenario 1 gives eligibility rates of approximately 42 percent in the months immediately after birth, and eligibility rates of approximately 36 percent in the later months.

Obviously the CPS-style imputation in Scenario 3 cannot come close to replicating the eligibility dynamics in Scenario 2. Again, note that these conclusions are not sensitive to the fact that eligibility is determined on a monthly basis in Scenario 3. Since total income is constant for the whole 22 months under the CPS-style imputation, there will not be temporary drops in income that permit the household to “lock-in” WIC eligibility.

Taken as a whole, the eligibility imputations under these three scenarios suggest that the focus on income volatility before and after the birth may have some effects on measuring WIC

eligibility, but it appears that the month-to-month volatility interacted with the recertification rules has a major impact on WIC eligibility. In addition, adjunctive eligibility appears to be a relatively minor factor in WIC eligibility.

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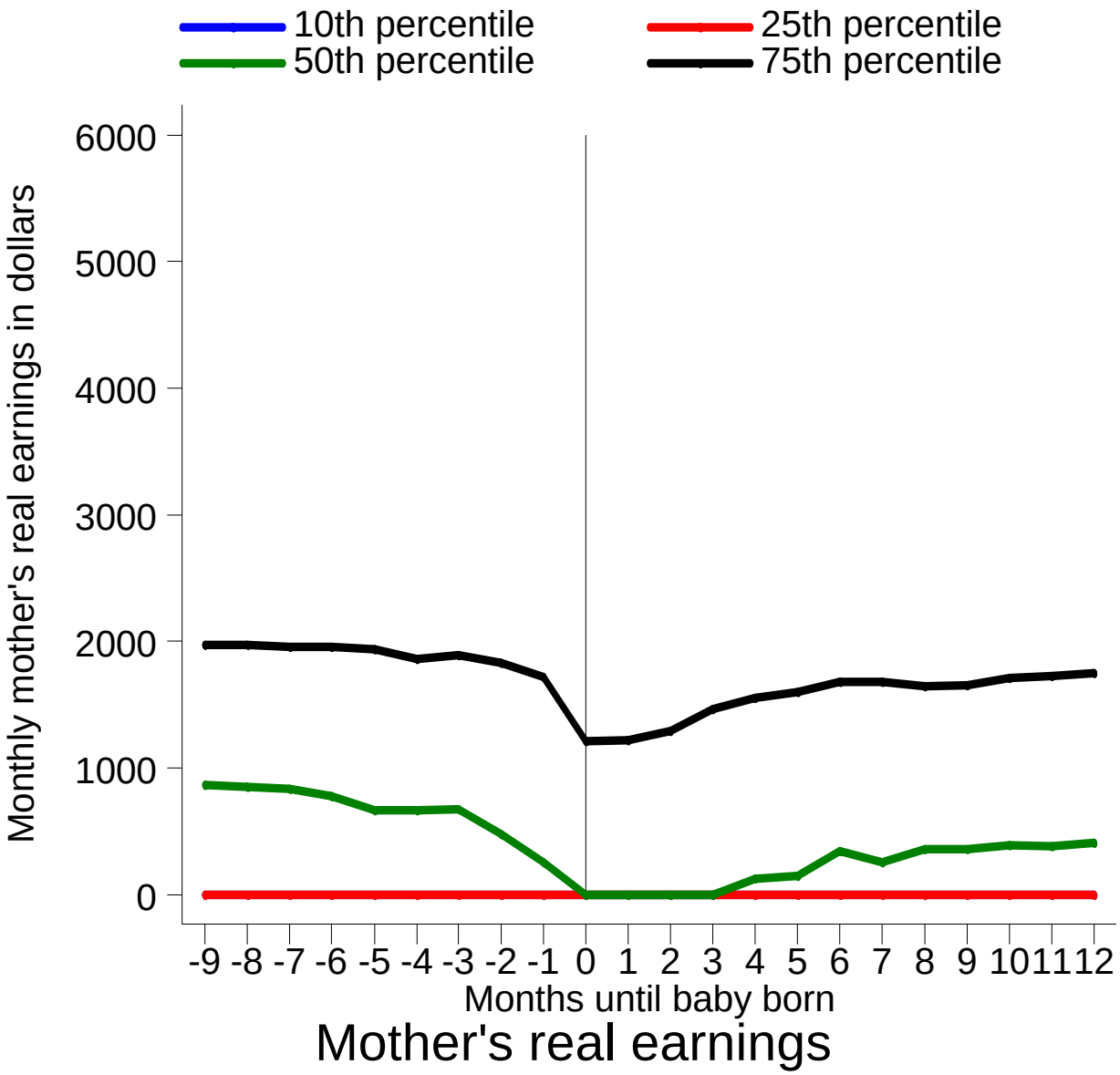


**Figure 1** 1990-1996 SIPP Panels, 1100 pregnancies, Expressed in constant February 2000 dollars.

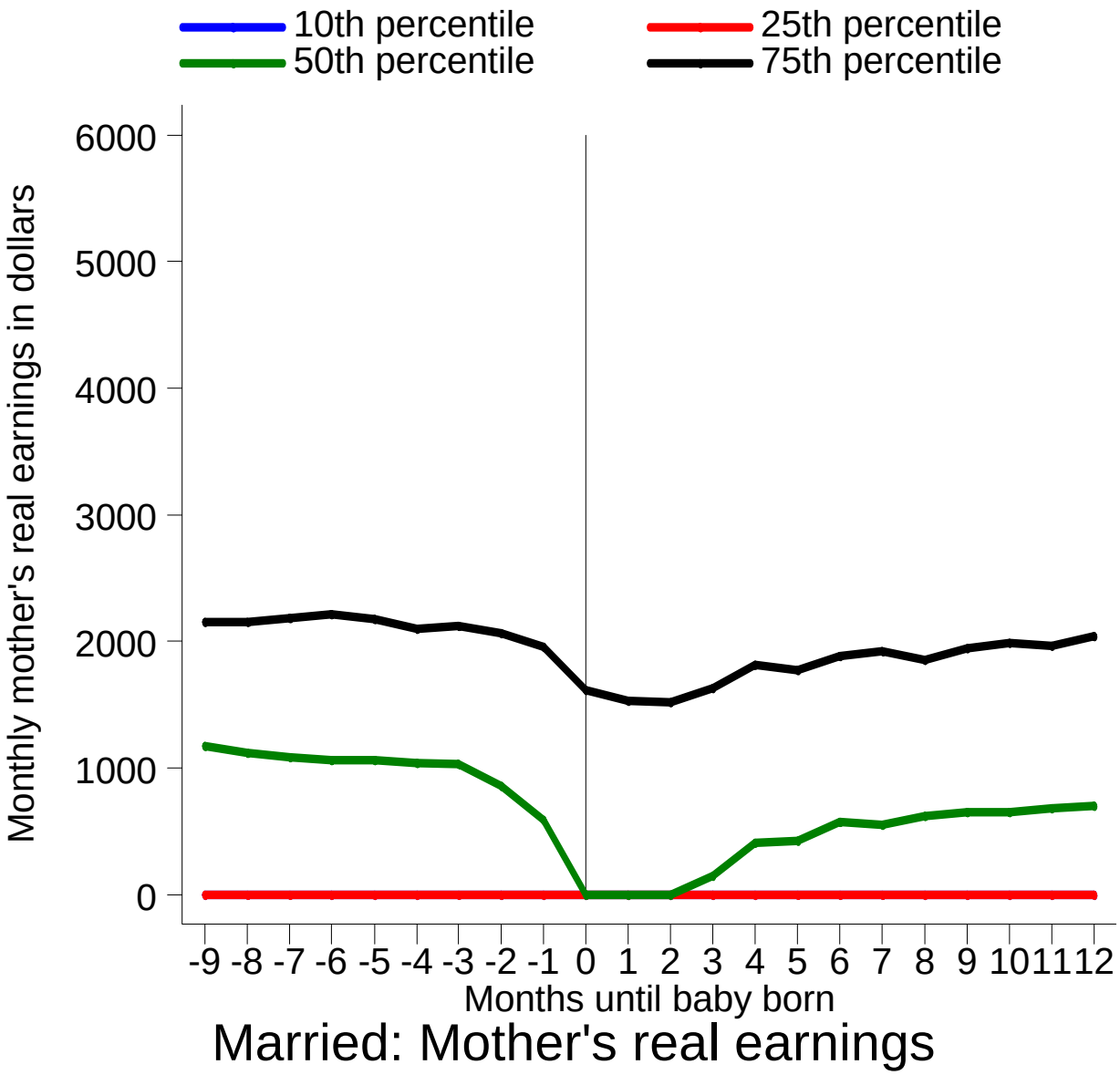


**Figure 2** 1990-1996 SIPP Panels, 862 pregnancies, Expressed in constant February 2000 dollars, Marital status evaluated at t=-9.

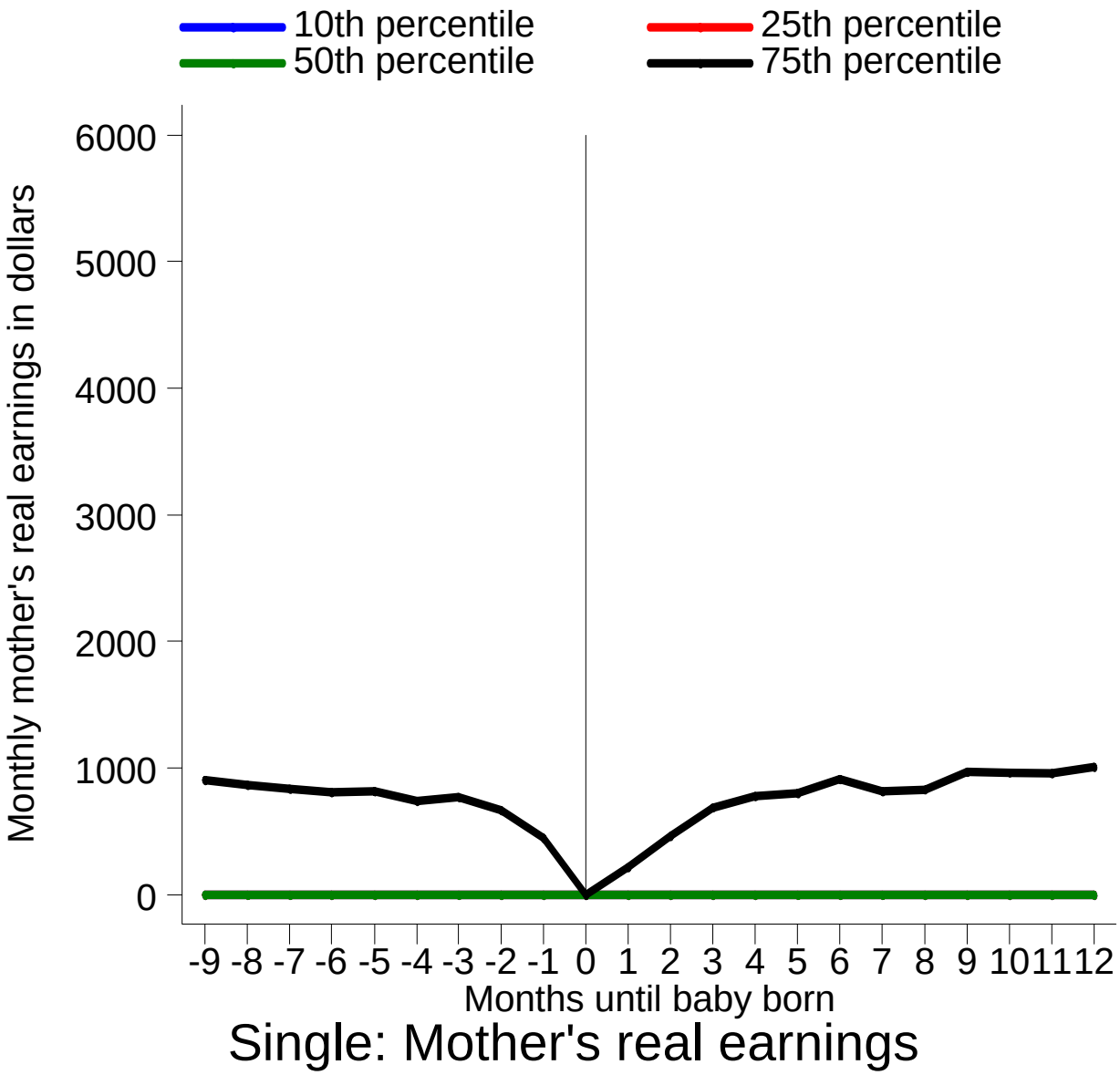


**Figure 3** 1990-1996 SIPP Panels, 238 pregnancies, Expressed in constant February 2000 dollars, Marital status evaluated at t=-9.

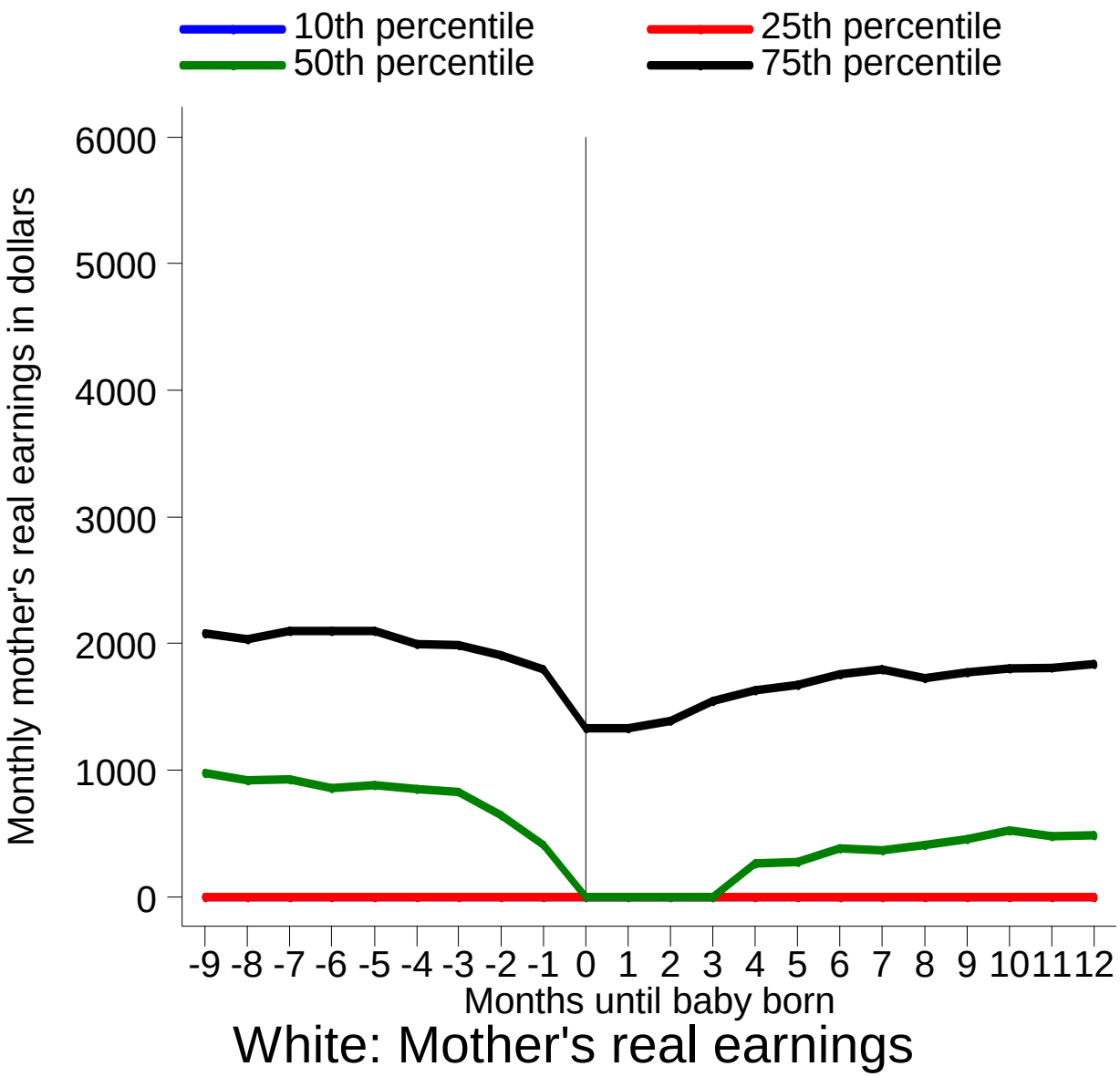


**Figure 4** 1990-1996 SIPP Panels, 934 pregnancies, Expressed in constant February 2000 dollars.

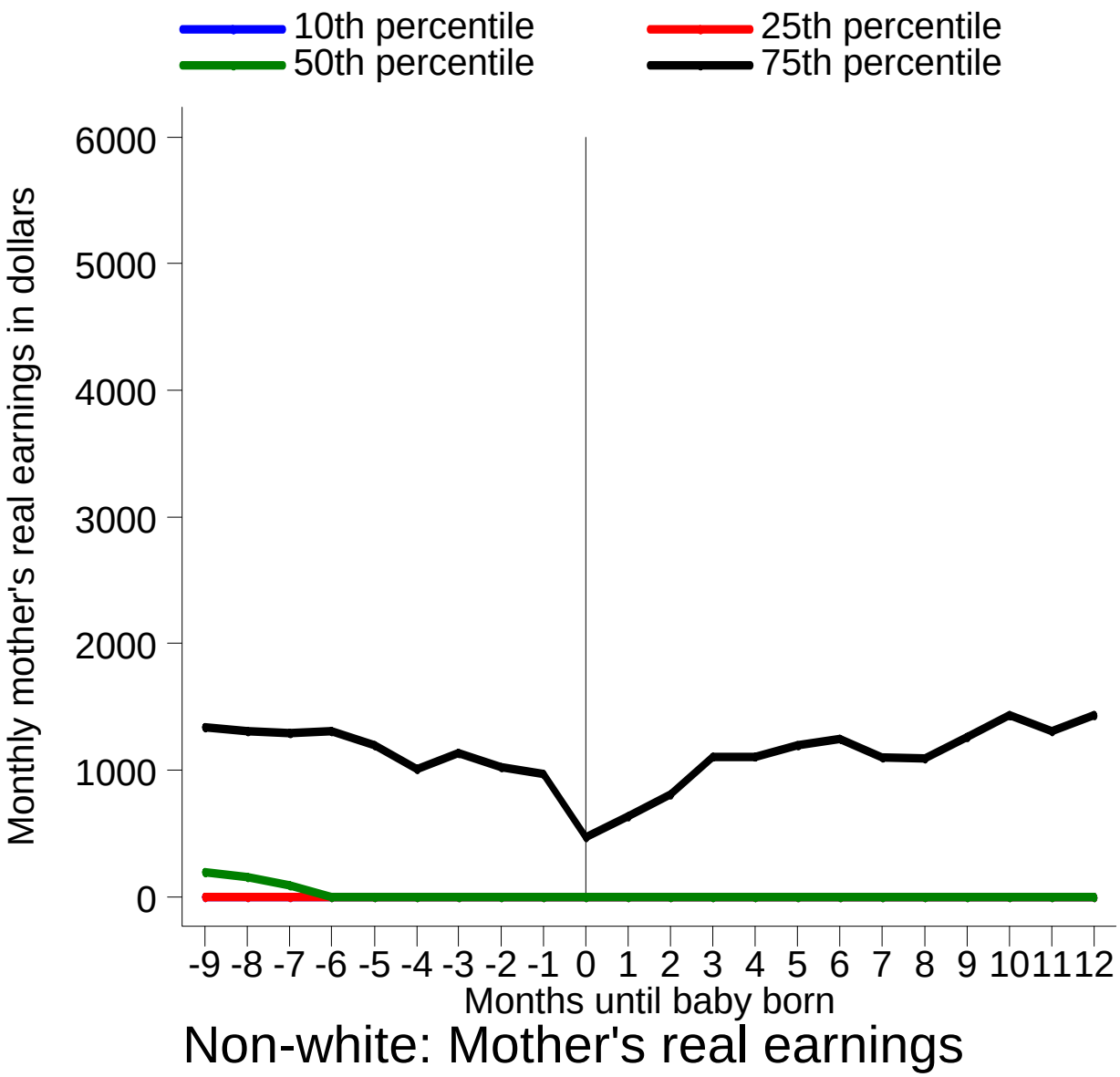


**Figure 5** 1990-1996 SIPP Panels, 166 pregnancies, Expressed in constant February 2000 dollars.

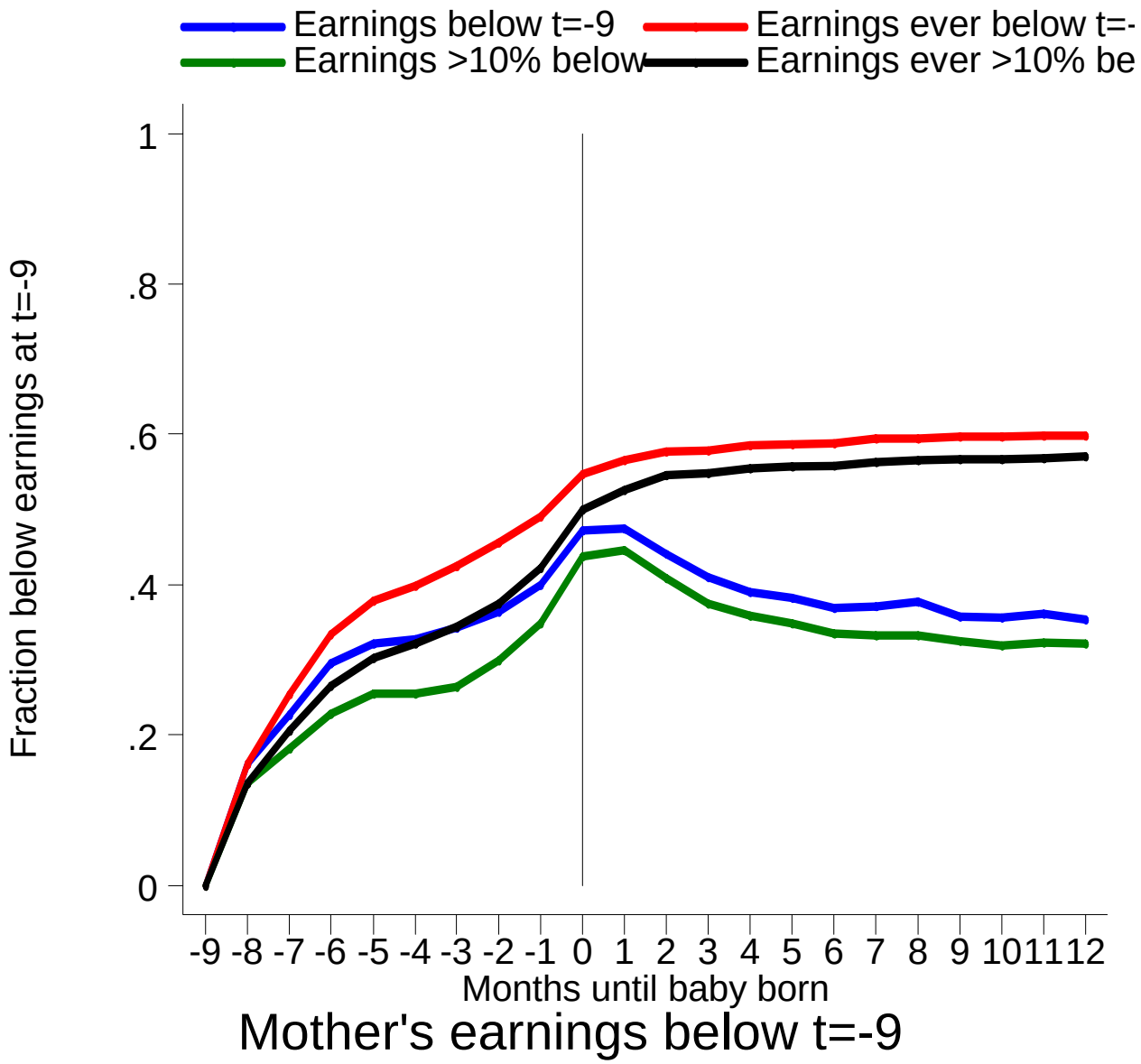


**Figure 6** 1990-1996 SIPP Panels, 1100 pregnancies, Nominal earnings are compared to the earnings at t=-9.

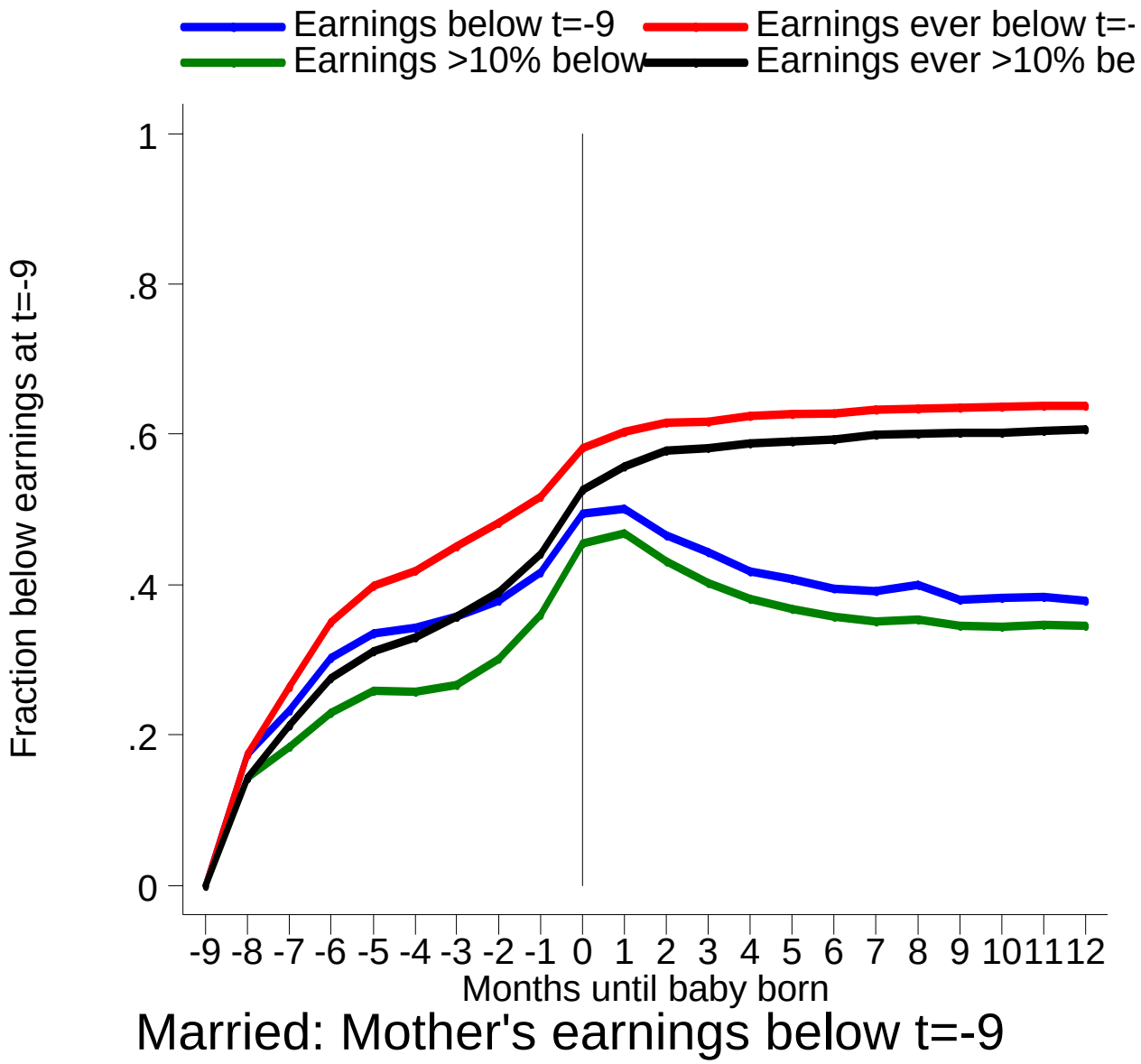


**Figure 7** 1990-1996 SIPP Panels, 862 pregnancies, Nominal earnings are compared to the earnings at t=-9, Marital status evaluated at t=-9.

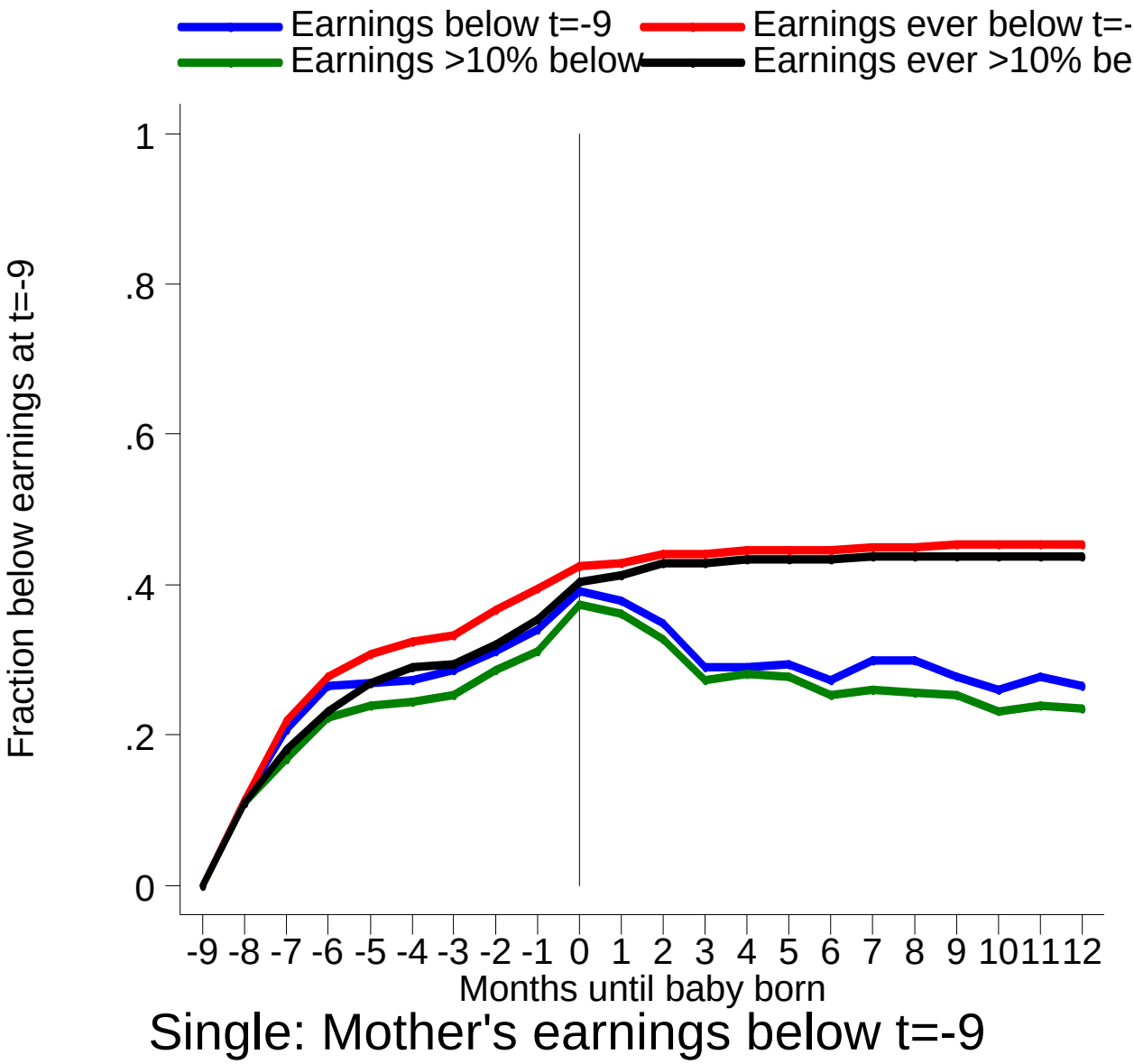


**Figure 8** 1990-1996 SIPP Panels, 238 pregnancies, Nominal earnings are compared to the earnings at t=-9, Marital status evaluated at t=-9.

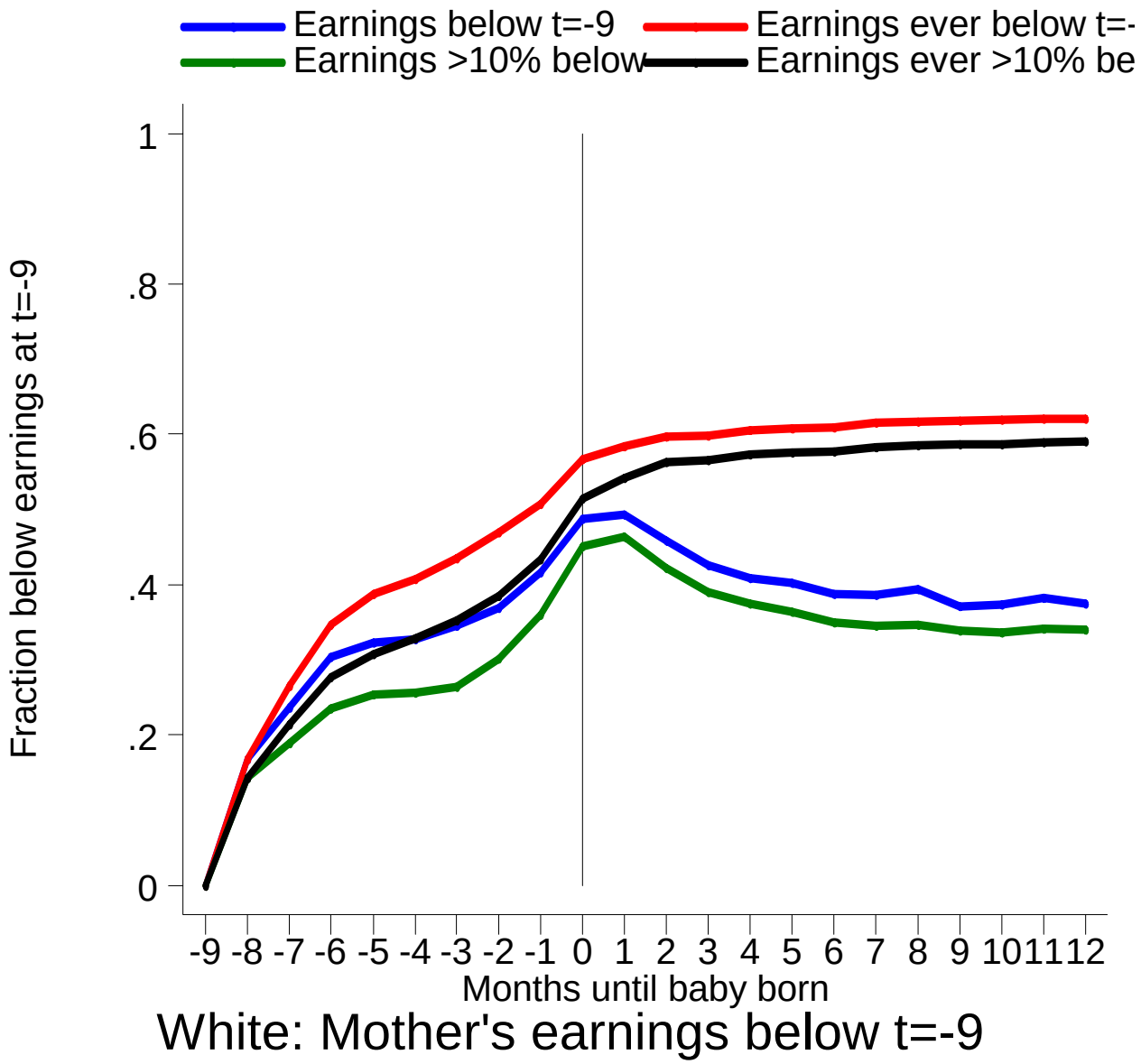


**Figure 9** 1990-1996 SIPP Panels, 934 pregnancies, Nominal earnings are compared to the earnings at t=-9.

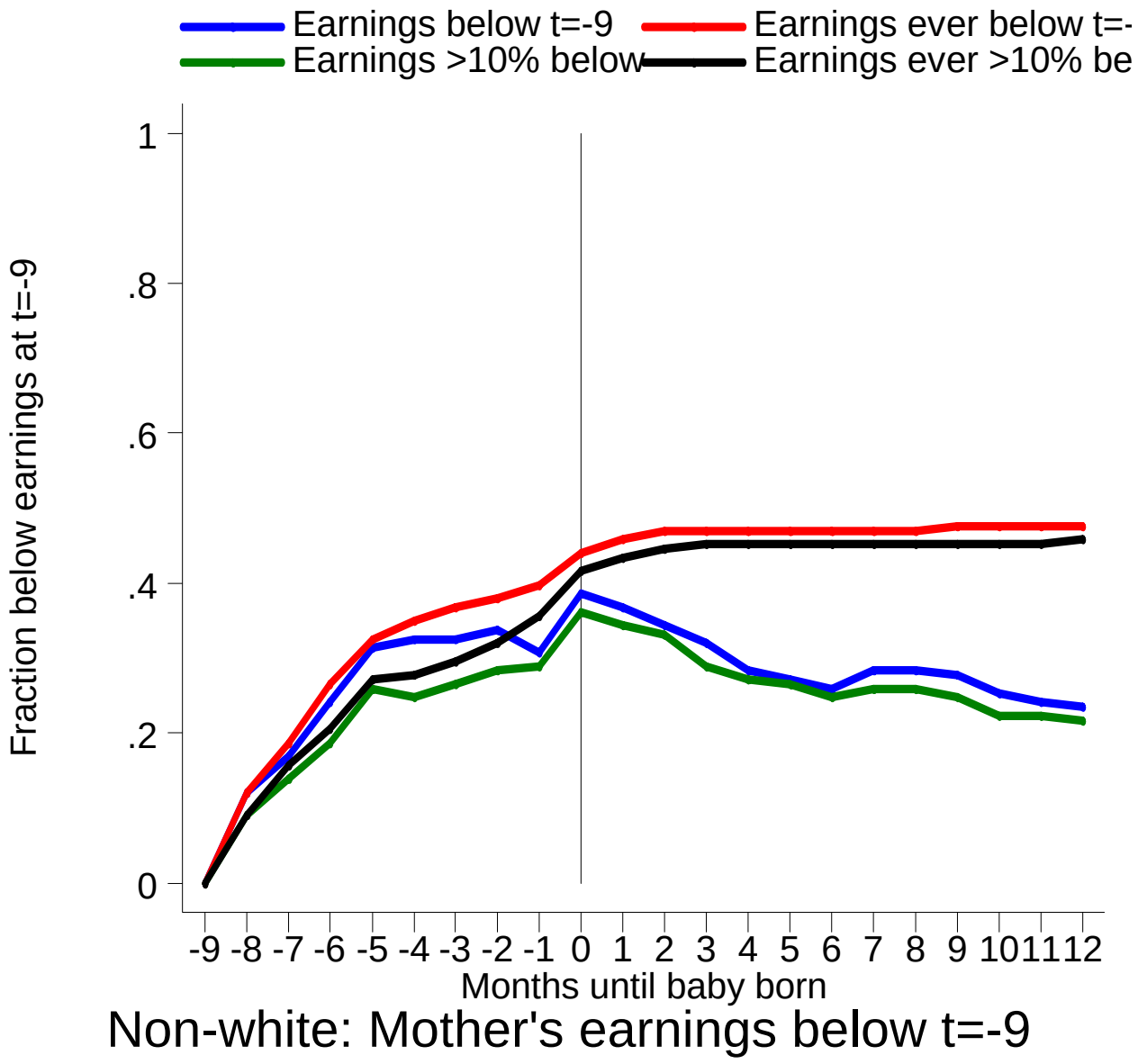


**Figure 10** 1990-1996 SIPP Panels, 166 pregnancies, Nominal earnings are compared to the earnings at t=-9.

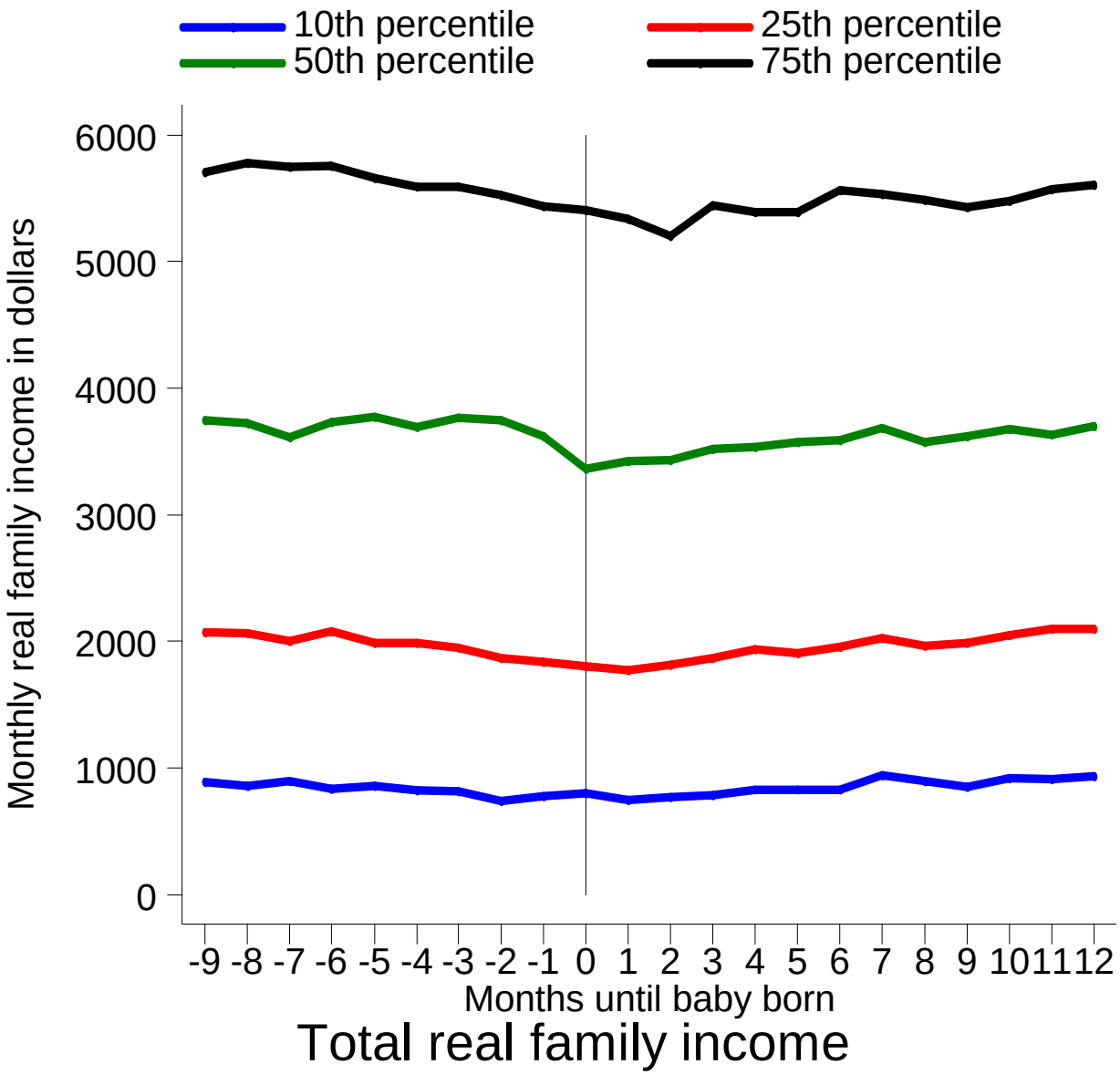


**Figure 11** 1990-1996 SIPP Panels, 1100 pregnancies, Expressed in constant February 2000 dollars.

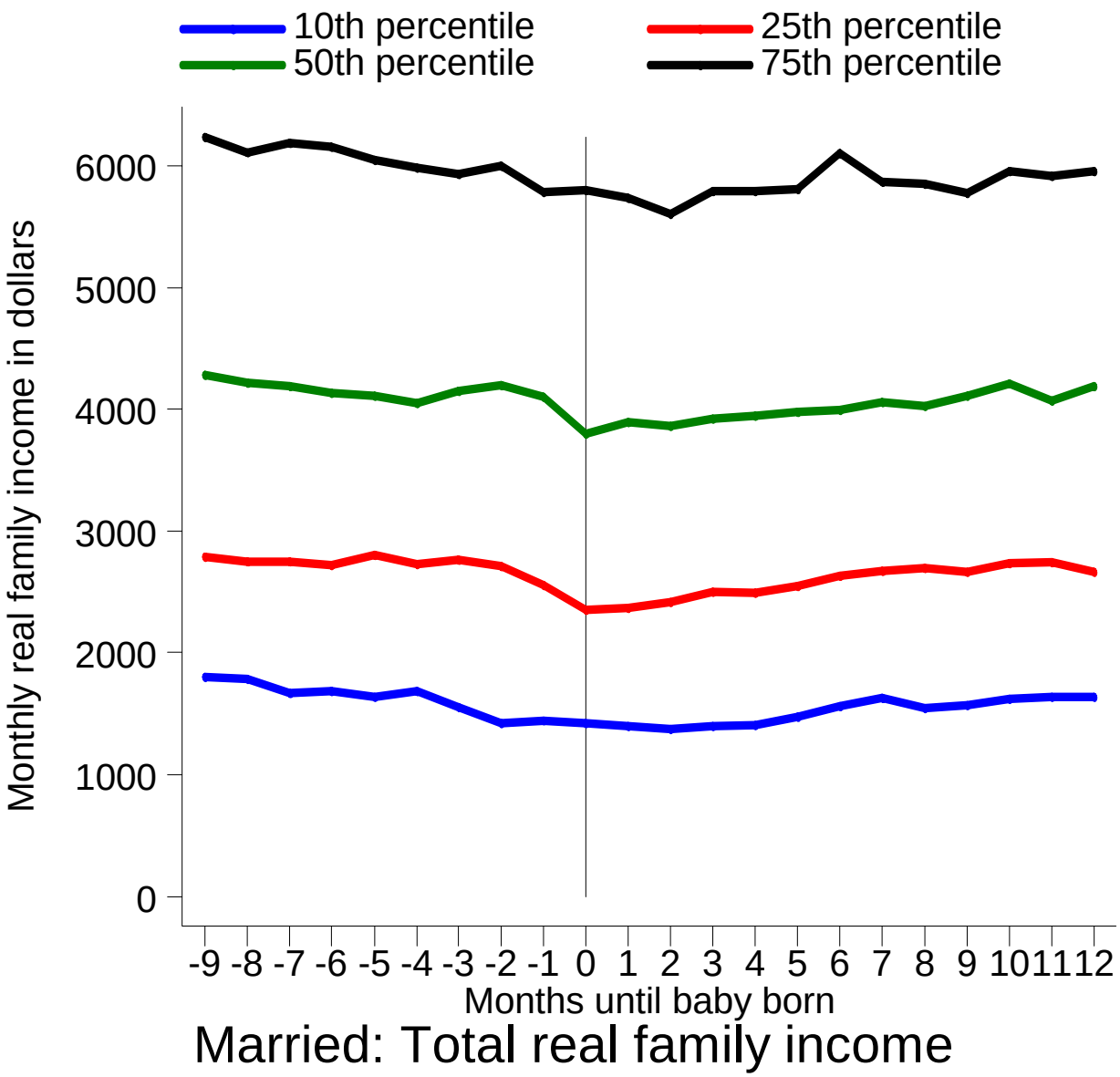


**Figure 12** 1990-1996 SIPP Panels, 862 pregnancies, Expressed in constant February 2000 dollars, Marital status evaluated at t=-9.

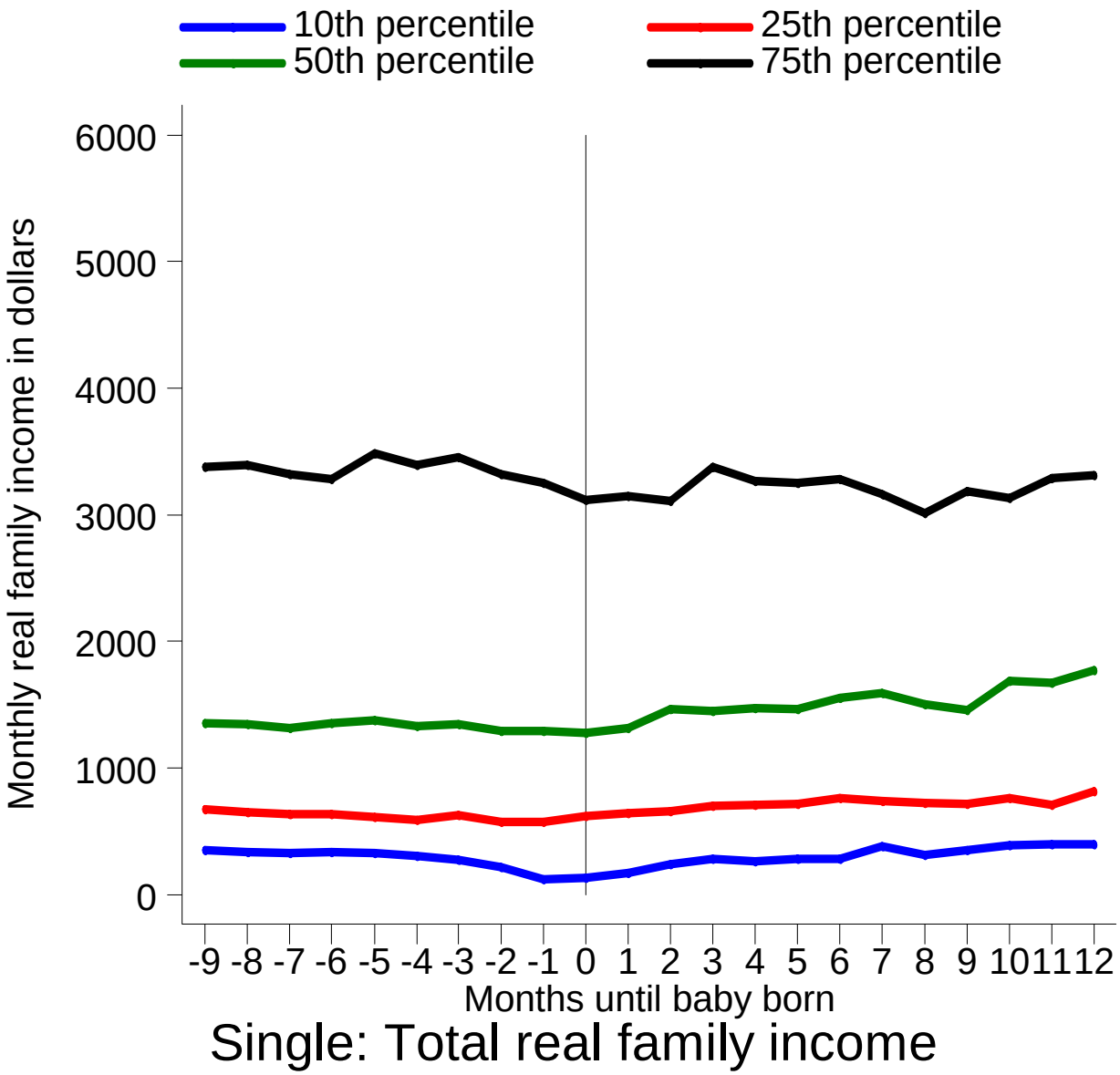


**Figure 13** 1990-1996 SIPP Panels, 238 pregnancies, Expressed in constant February 2000 dollars, Marital status evaluated at t=-9.

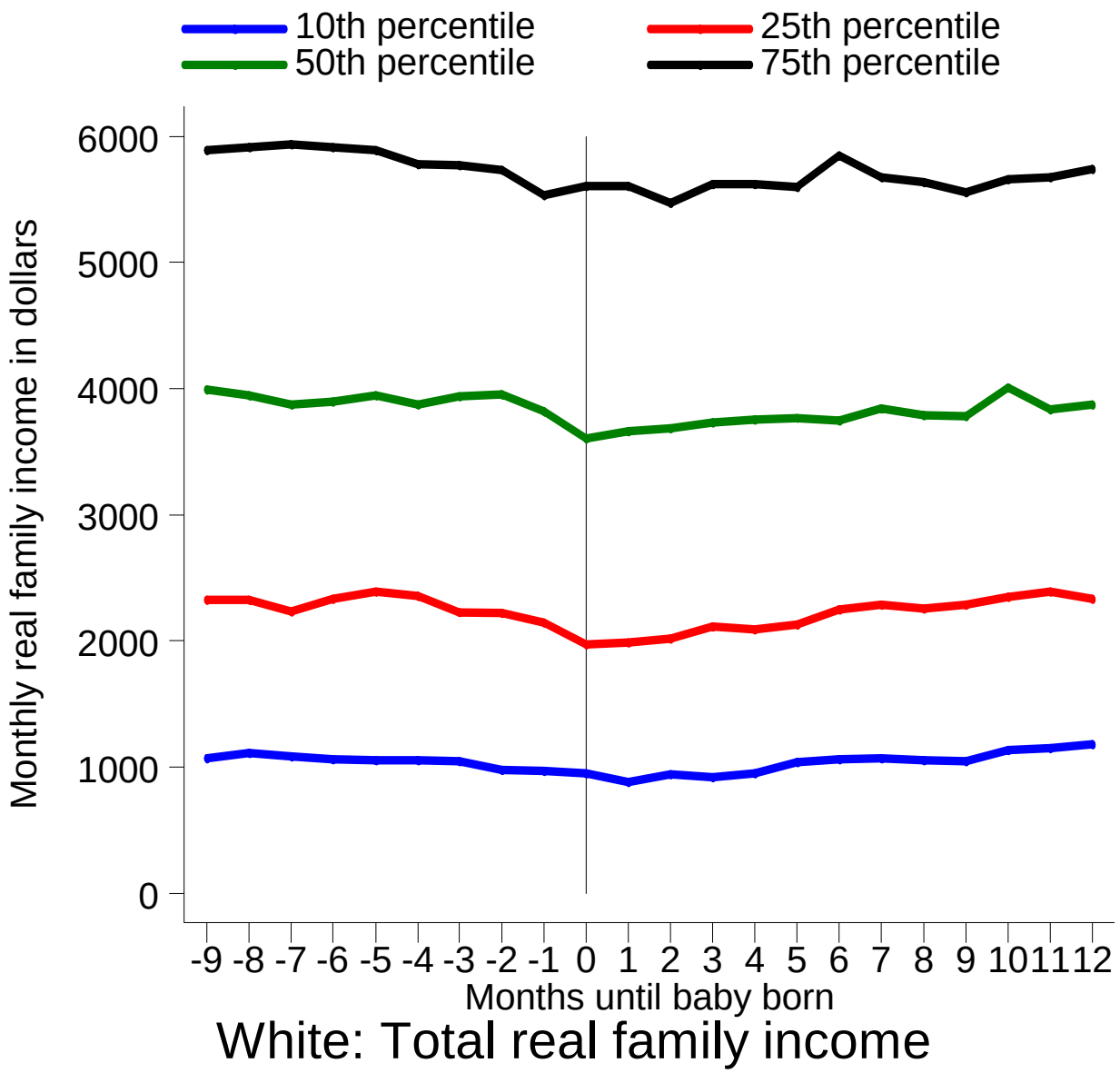


**Figure 14** 1990-1996 SIPP Panels, 934 pregnancies, Expressed in constant February 2000 dollars.

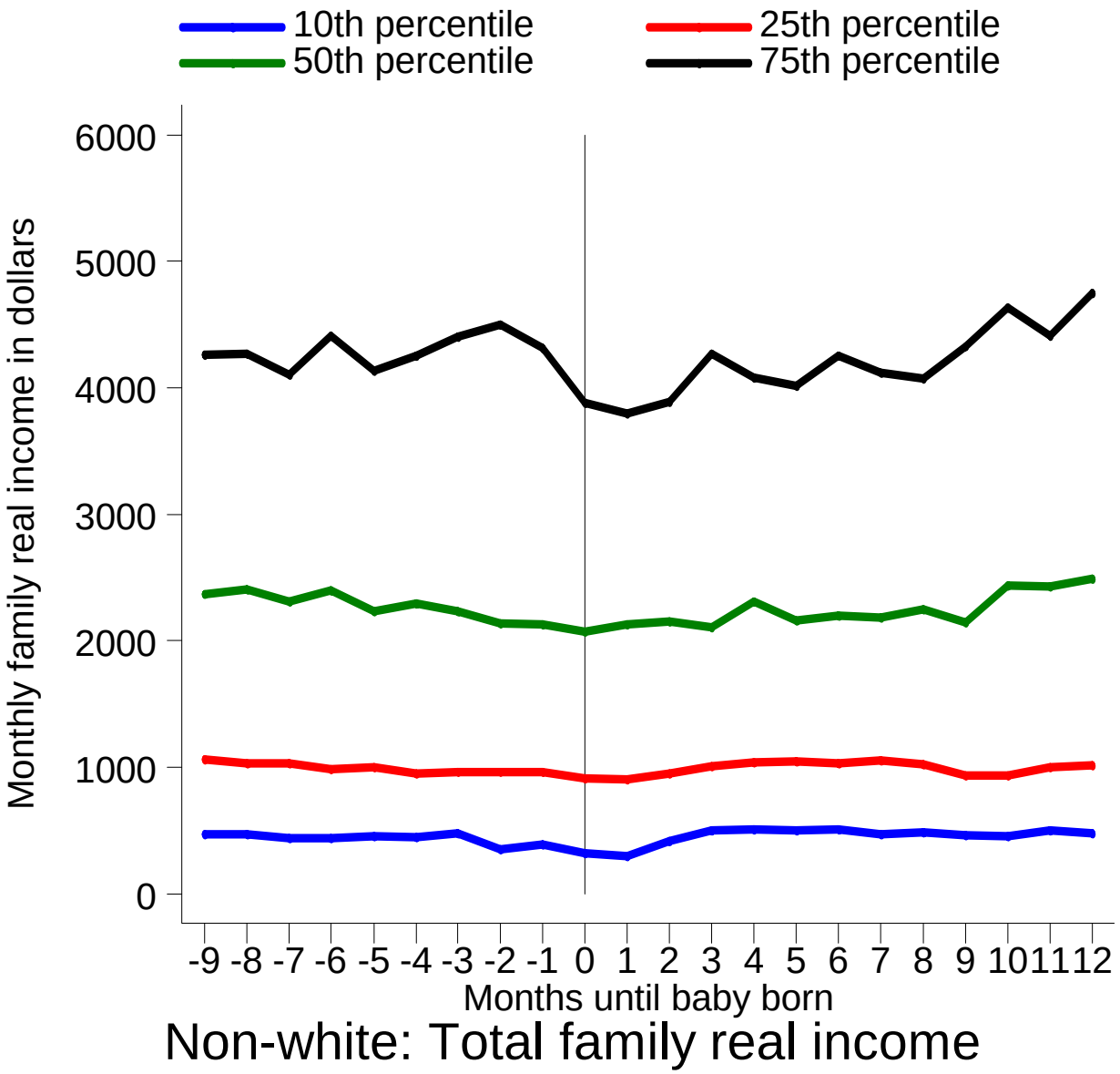


**Figure 15** 1990-1996 SIPP Panels, 166 pregnancies, Expressed in constant February 2000 dollars.

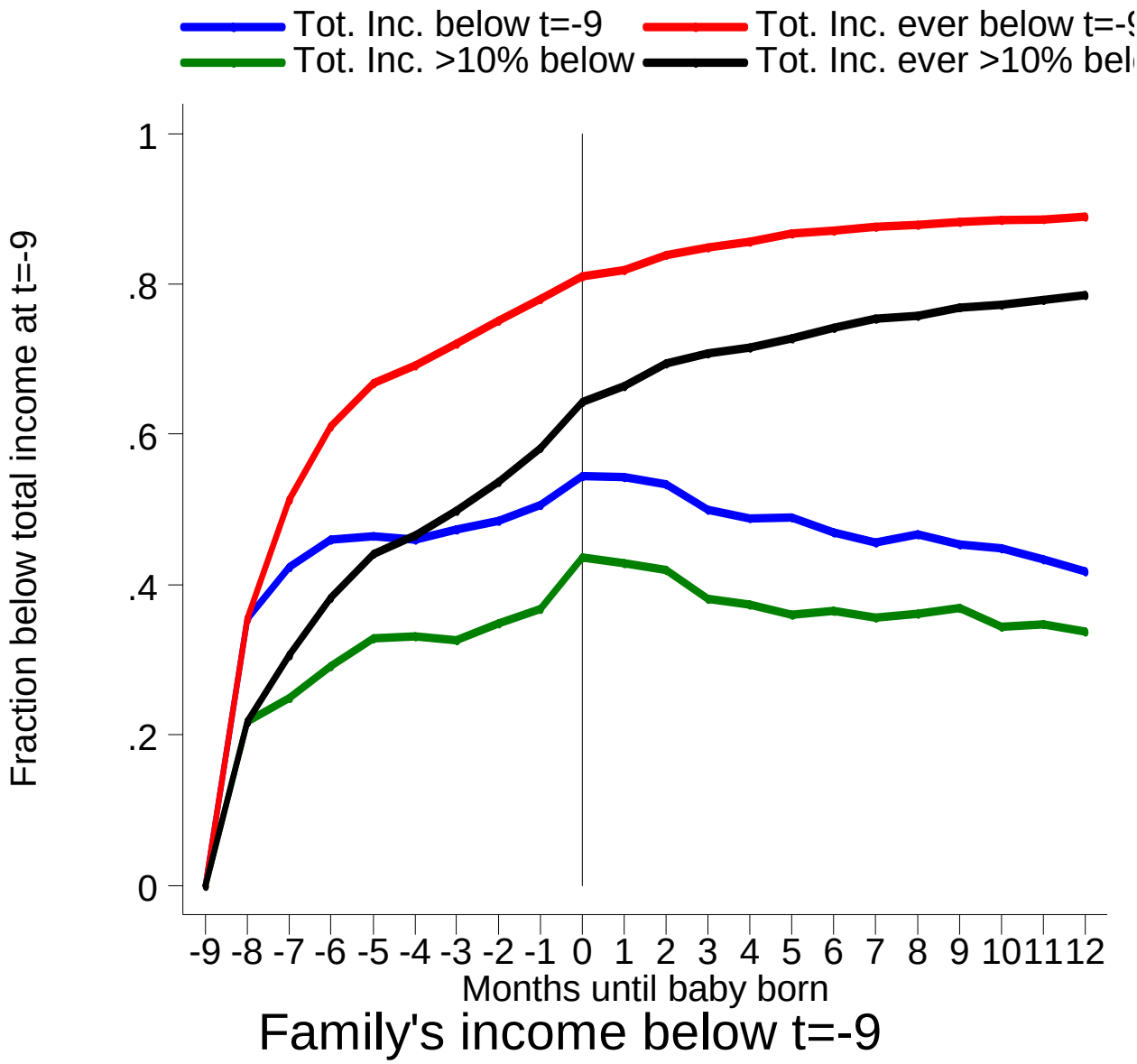


**Figure 16** 1990-1996 SIPP Panels, 1100 pregnancies, Nominal family income is compared to the family income at t=-9.

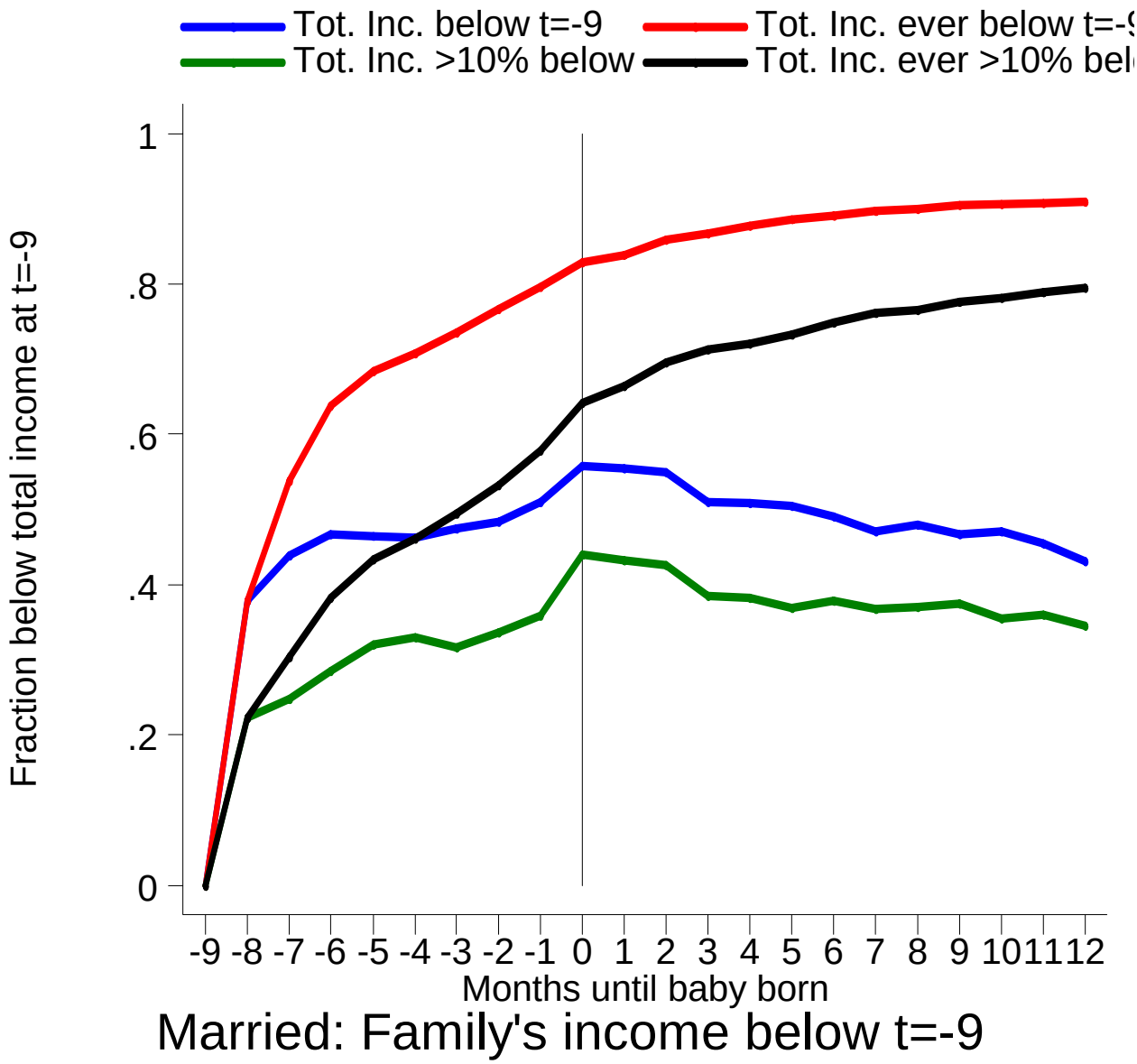


**Figure 17** 1990-1996 SIPP Panels, 862 pregnancies, Nominal family income is compared to the family income at t=-9, Marital status evaluated at t=-9.

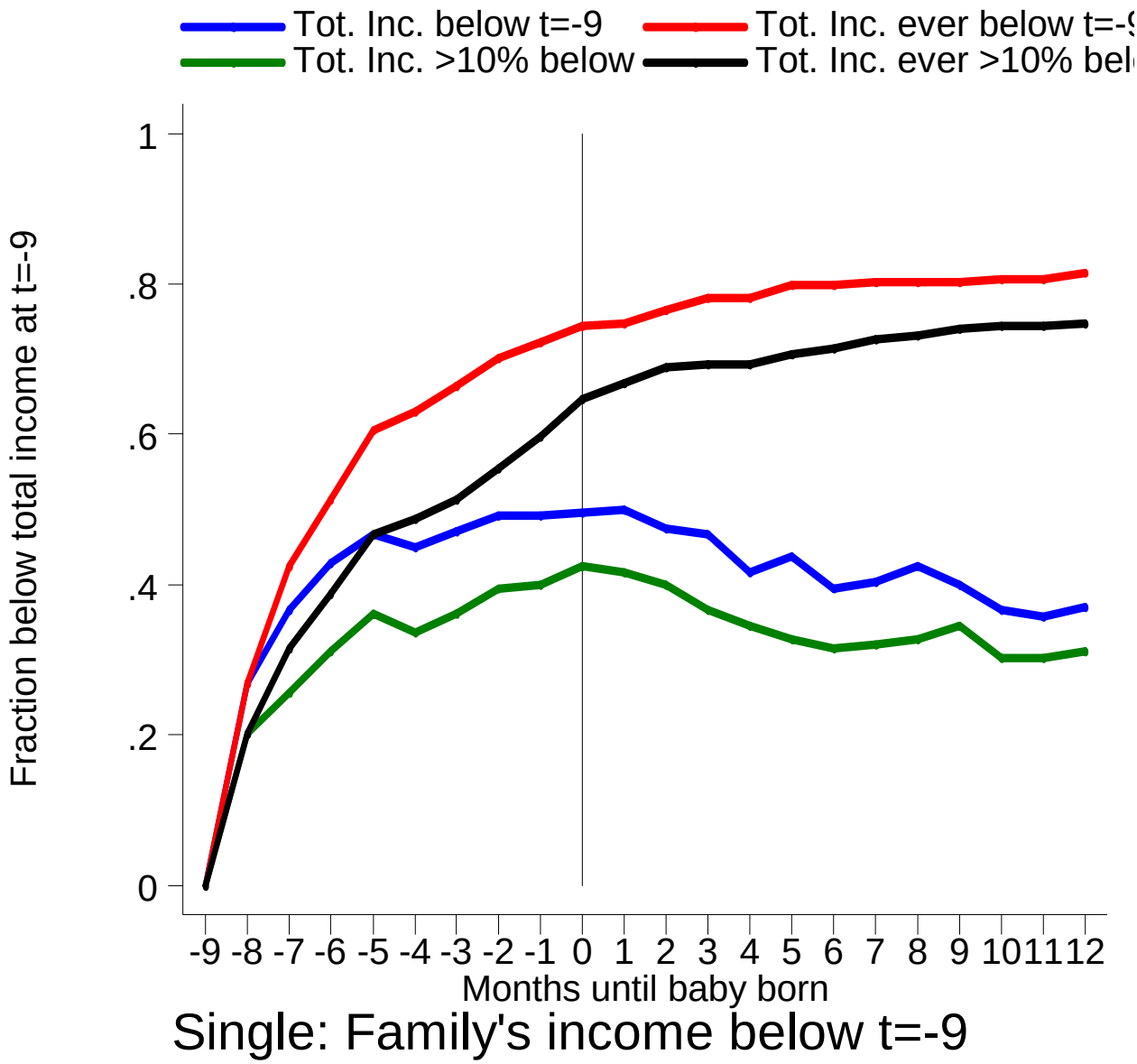


**Figure 18** 1990-1996 SIPP Panels, 238 pregnancies, Nominal family income is compared to the family income at t=-9, Marital status evaluated at t=-9.

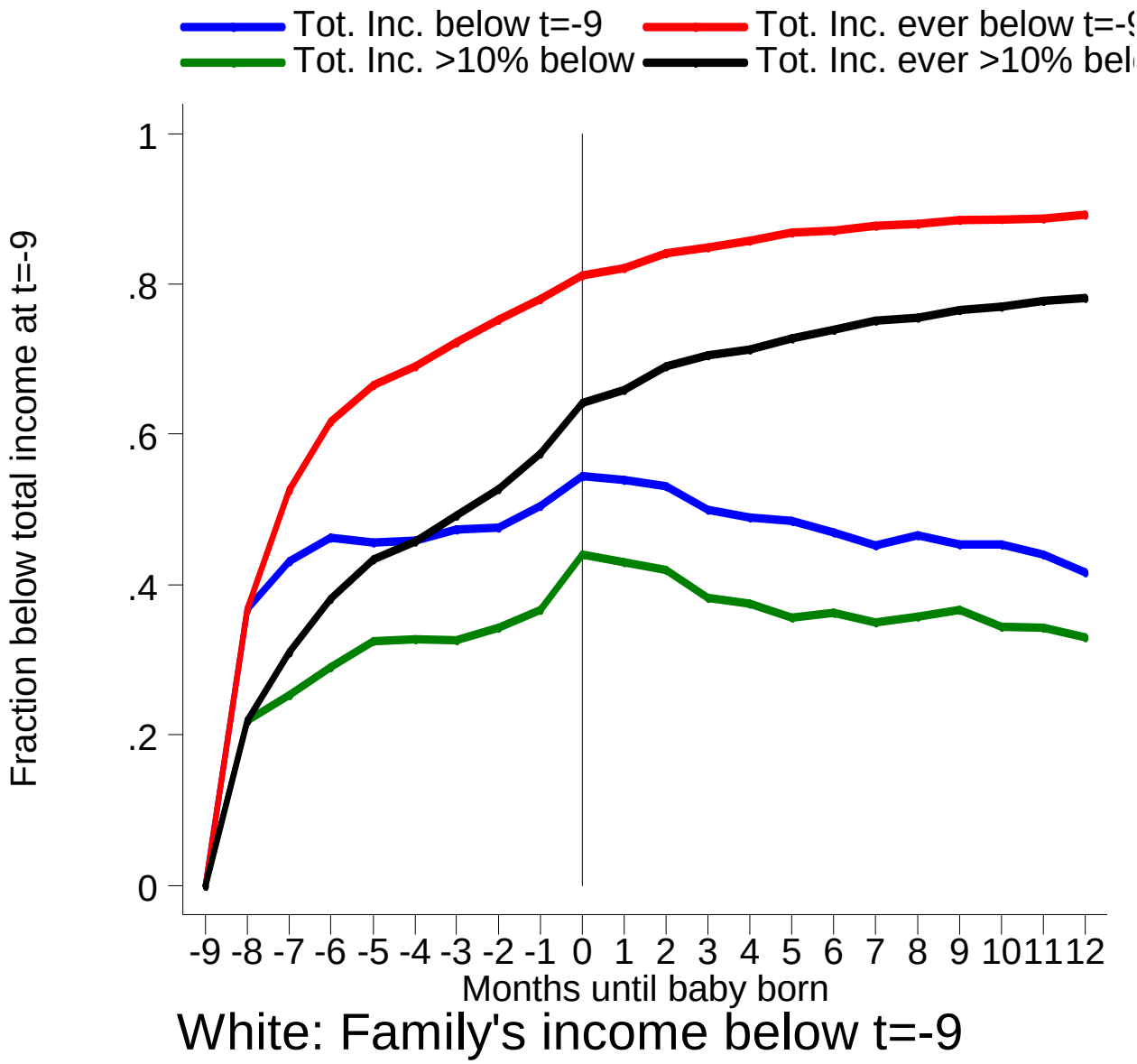


**Figure 19** 1990-1996 SIPP Panels, 934 pregnancies, Nominal family income is compared to the family income at t=-9.

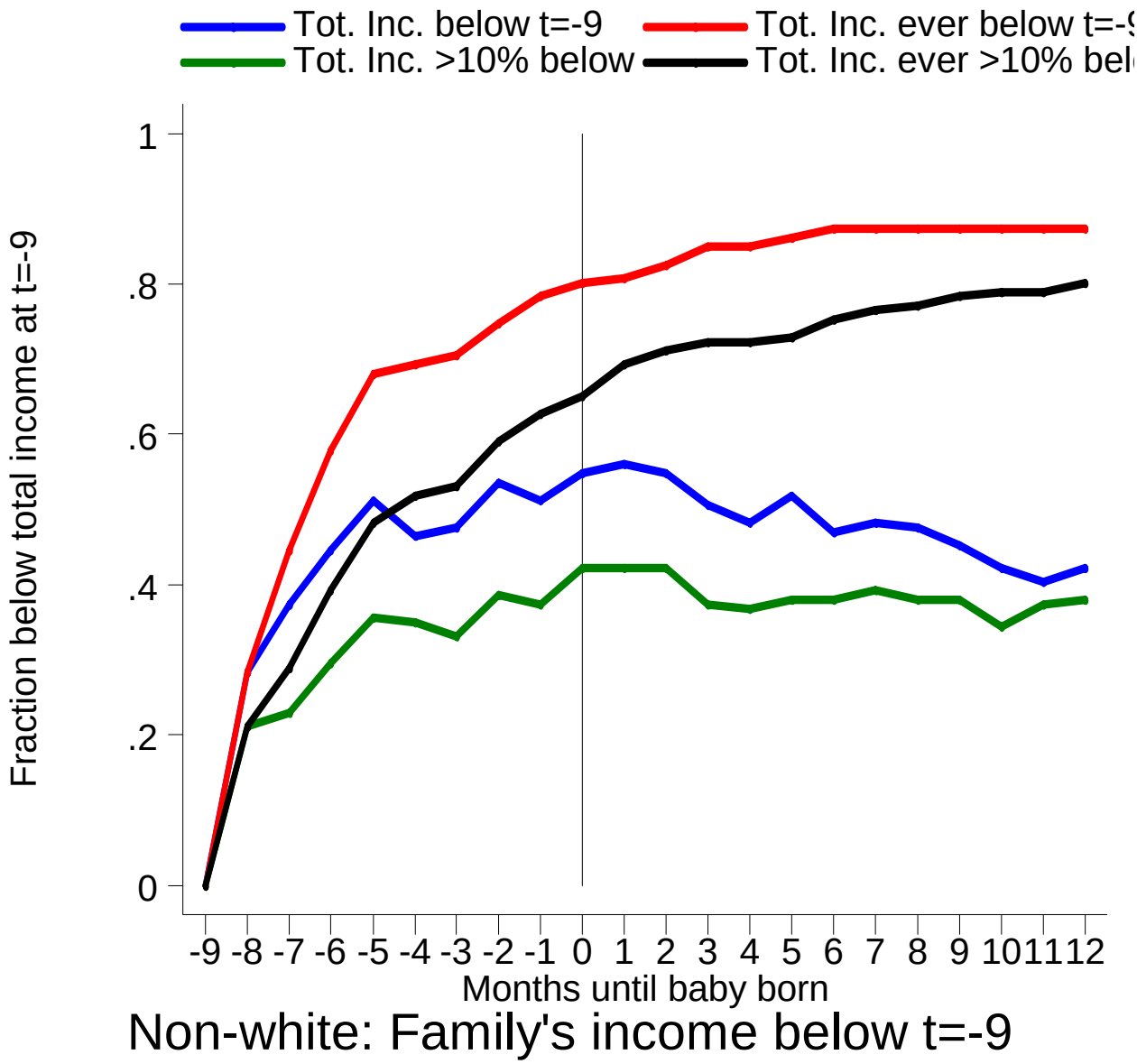


**Figure 20** 1990-1996 SIPP Panels, 166 pregnancies, Nominal family income is compared to the family income at t=-9.

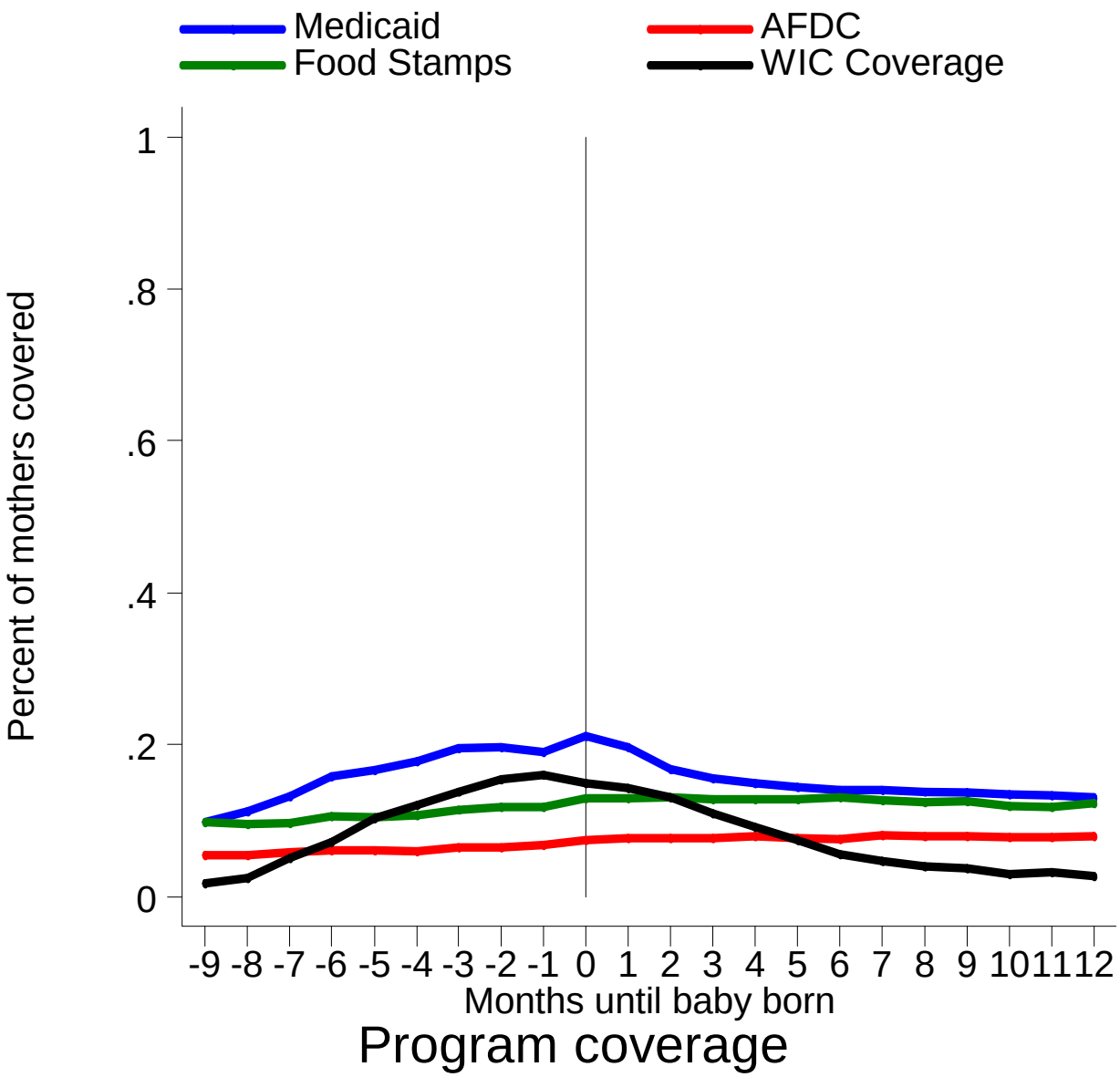


**Figure 21** 1990-1996 SIPP Panels, 1100 pregnancies.

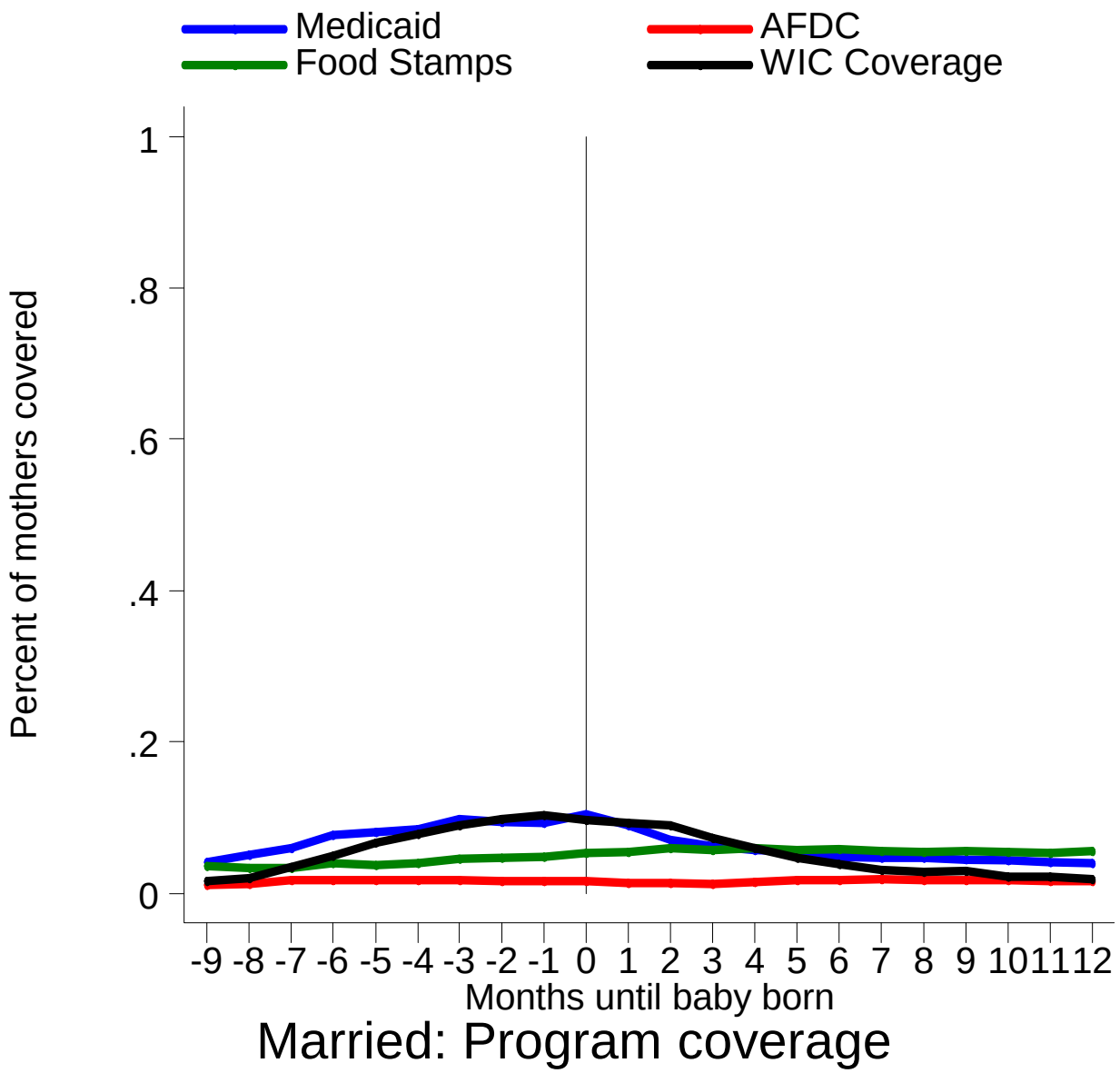


**Figure 22** 1990-1996 SIPP Panels, 862 pregnancies, Marital status evaluated at t=-9.

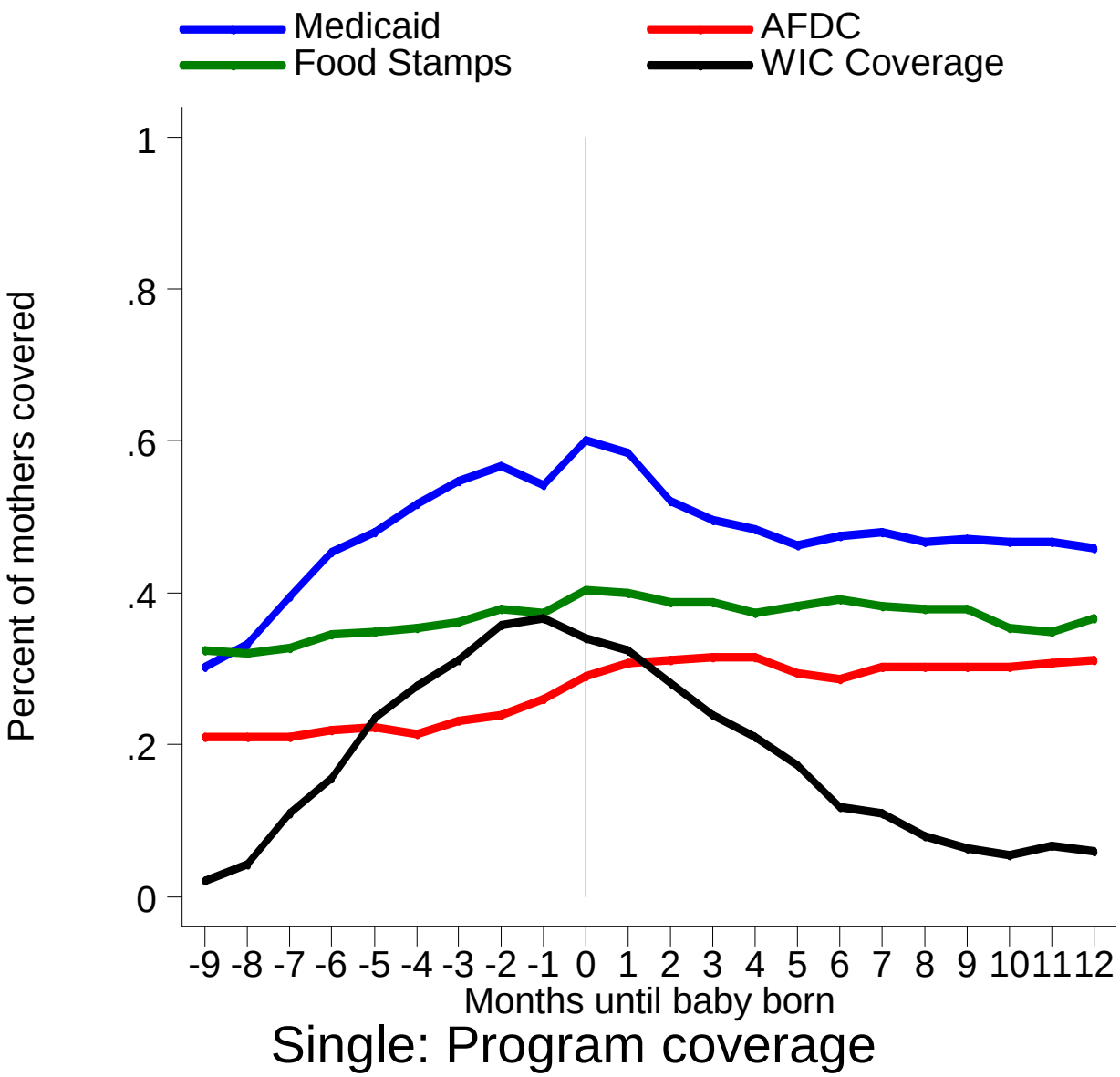


**Figure 23** 1990-1996 SIPP Panels, 238 pregnancies, Marital status evaluated at t=-9.

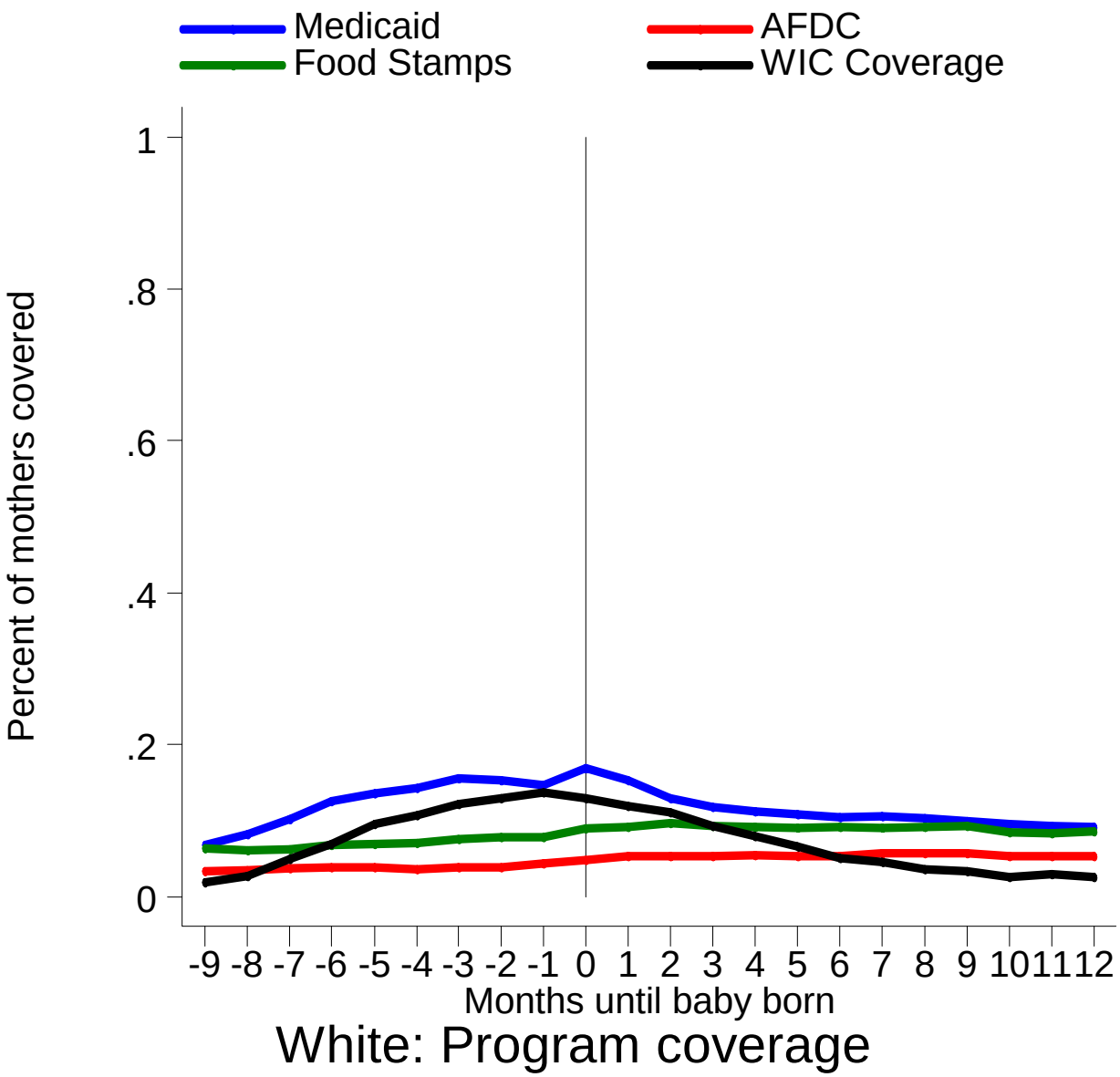


**Figure 24** 1990-1996 SIPP Panels, 934 pregnancies.

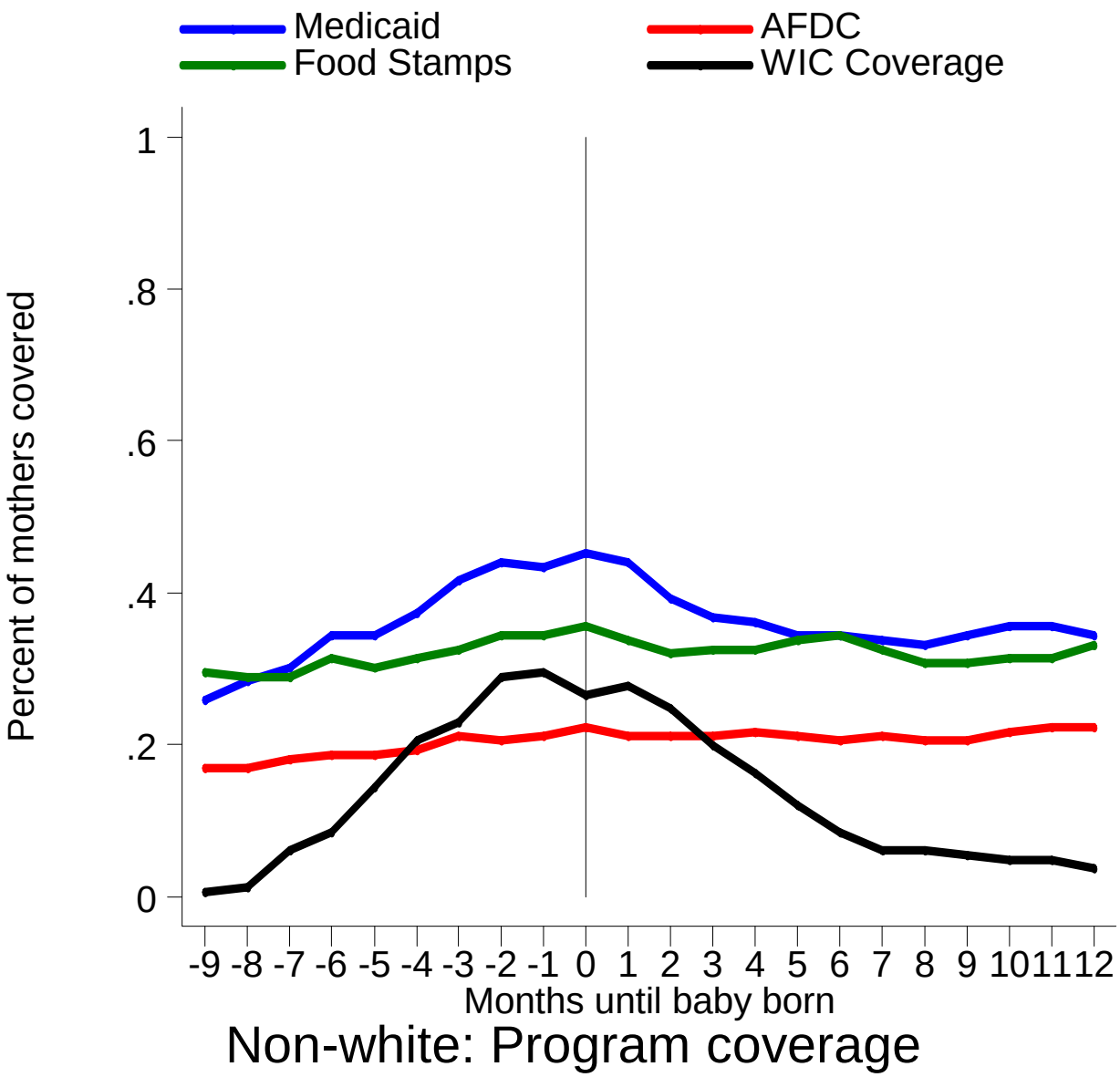


**Figure 25** 1990-1996 SIPP Panels, 166 pregnancies.

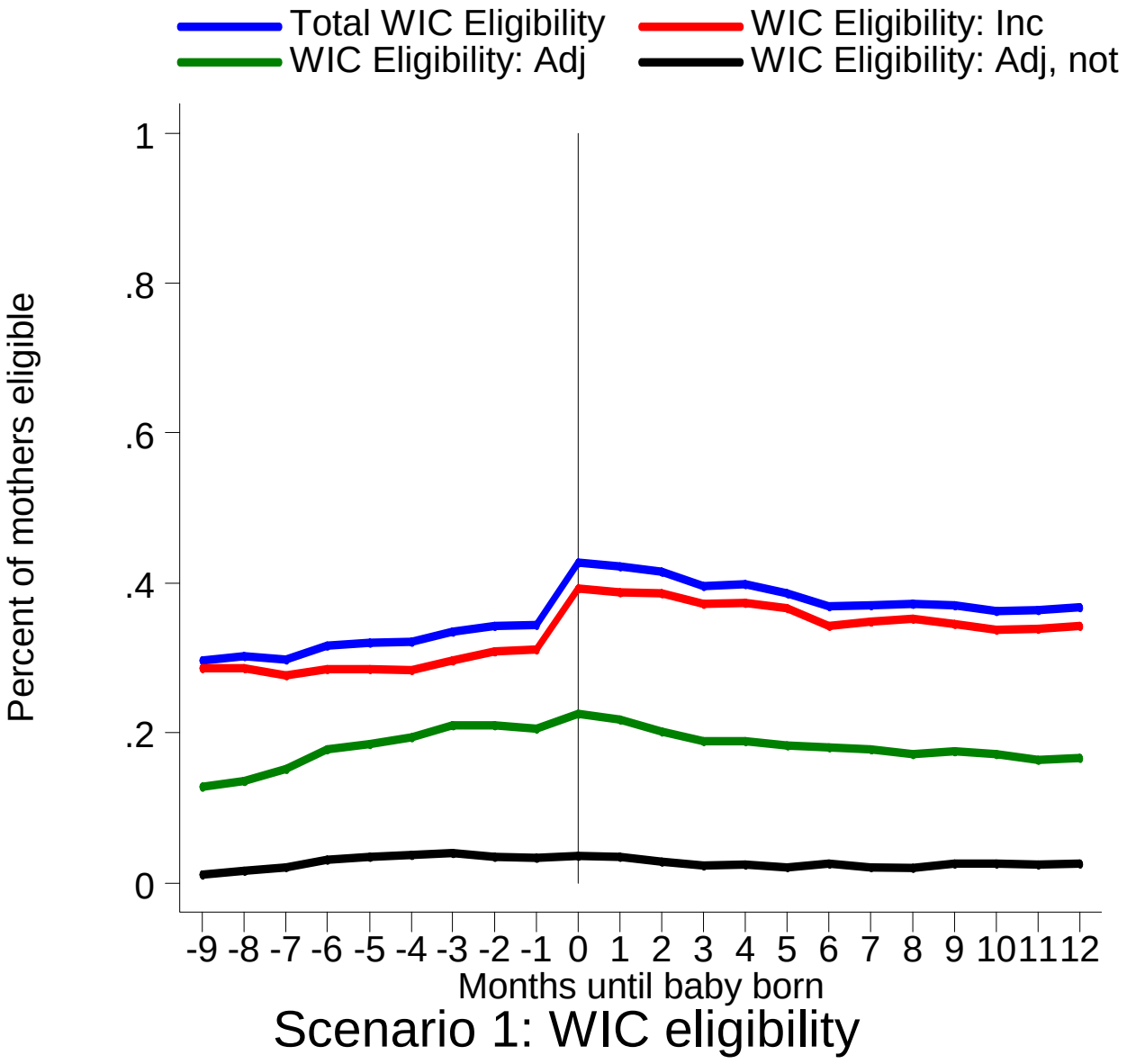


**Figure 26** 1990-1996 SIPP Panels, 1100 pregnancies, WIC income and adjunct eligibility evaluated at each point in time (e.g., assumes recertification each period), WIC family size does not include fetus in determining income eligibility.

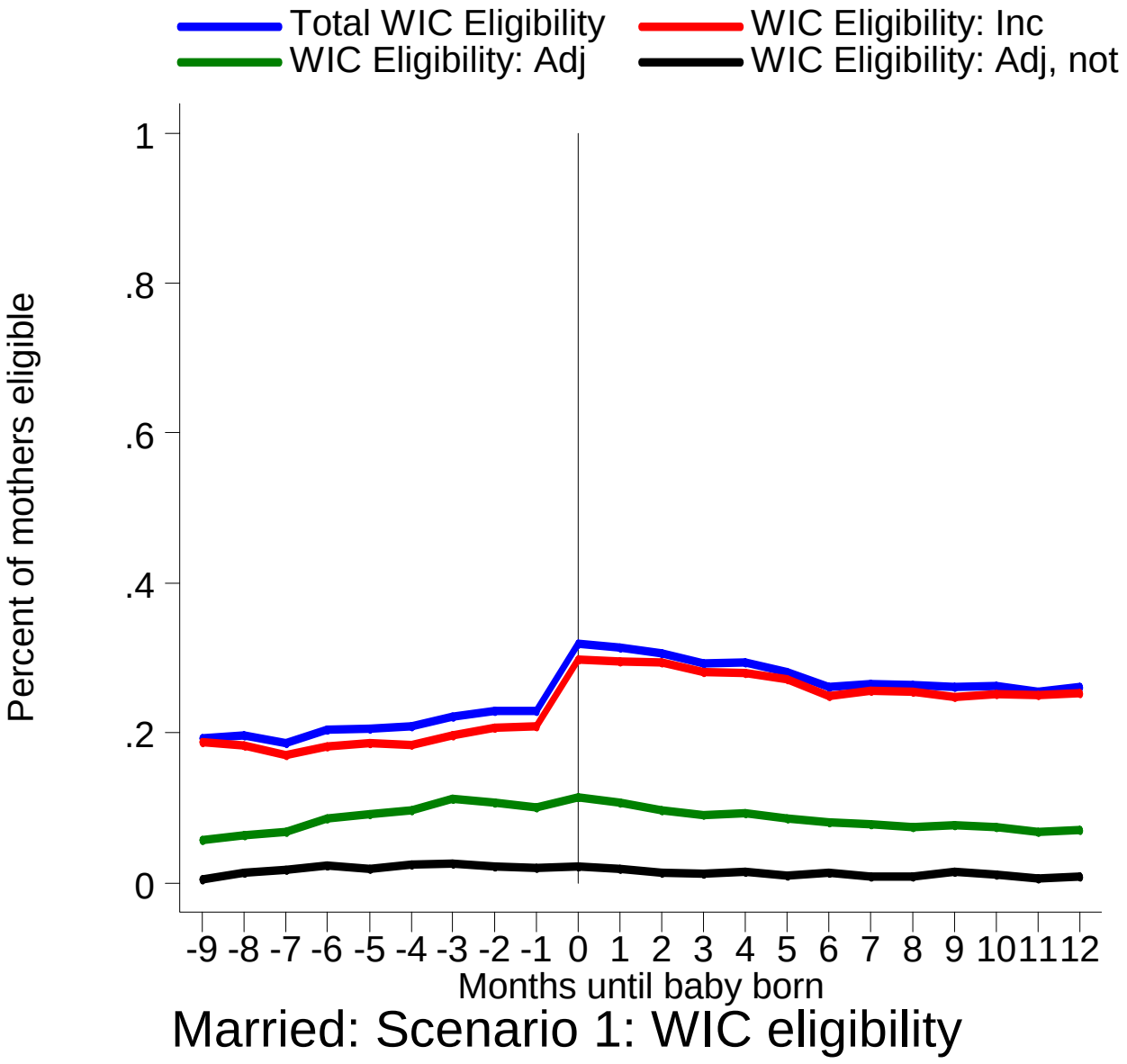


**Figure 27** 1990-1996 SIPP Panels, 862 pregnancies, WIC income and adjunct eligibility evaluated at each point in time (e.g., assumes recertification each period), WIC family size does not include fetus in determining income eligibility, Marital status evaluated at t=-9.

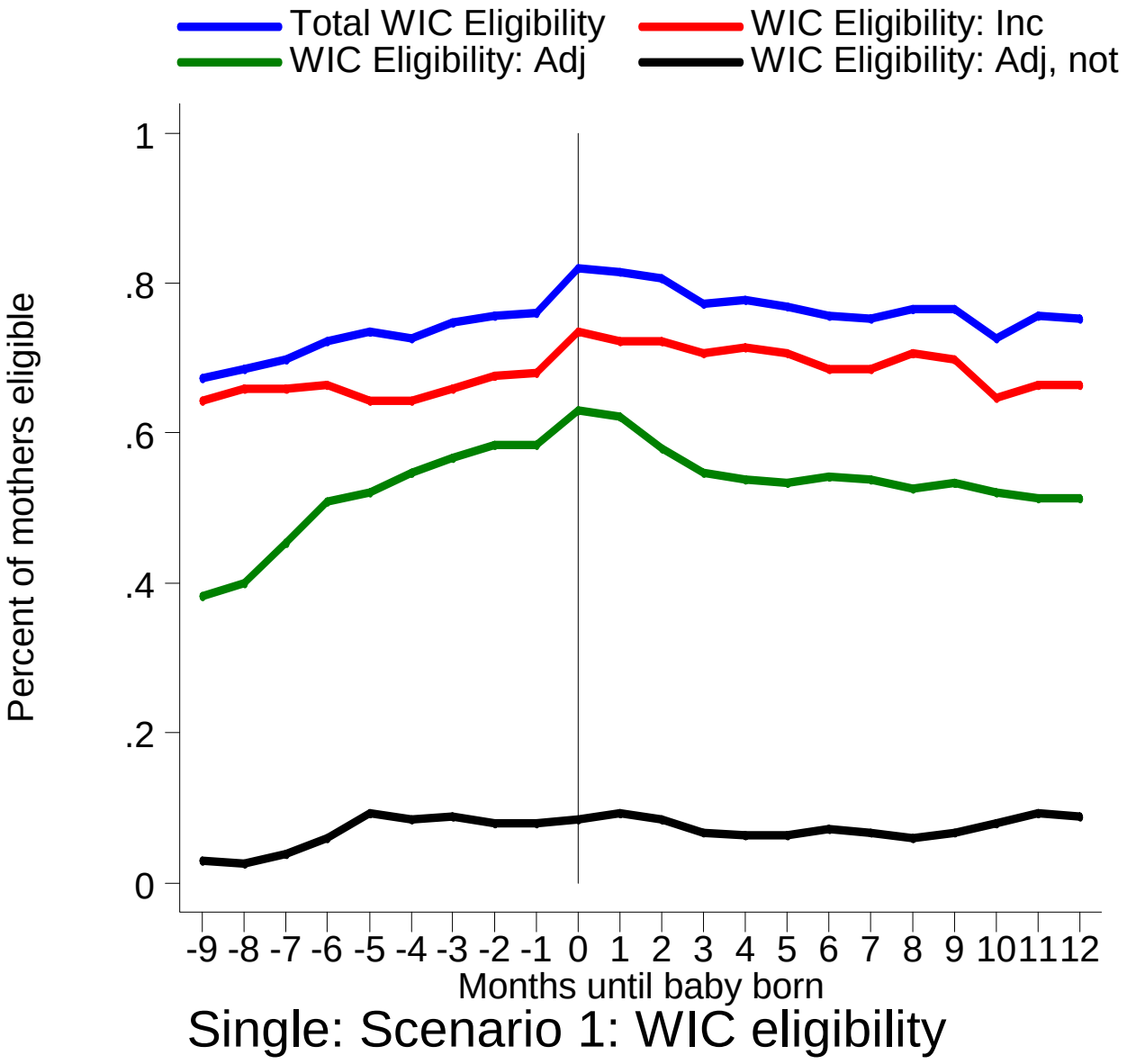


**Figure 28** 1990-1996 SIPP Panels, 238 pregnancies, WIC income and adjunct eligibility evaluated at each point in time (e.g., assumes recertification each period), WIC family size does not include fetus in determining income eligibility, Marital status evaluated at t=-9.

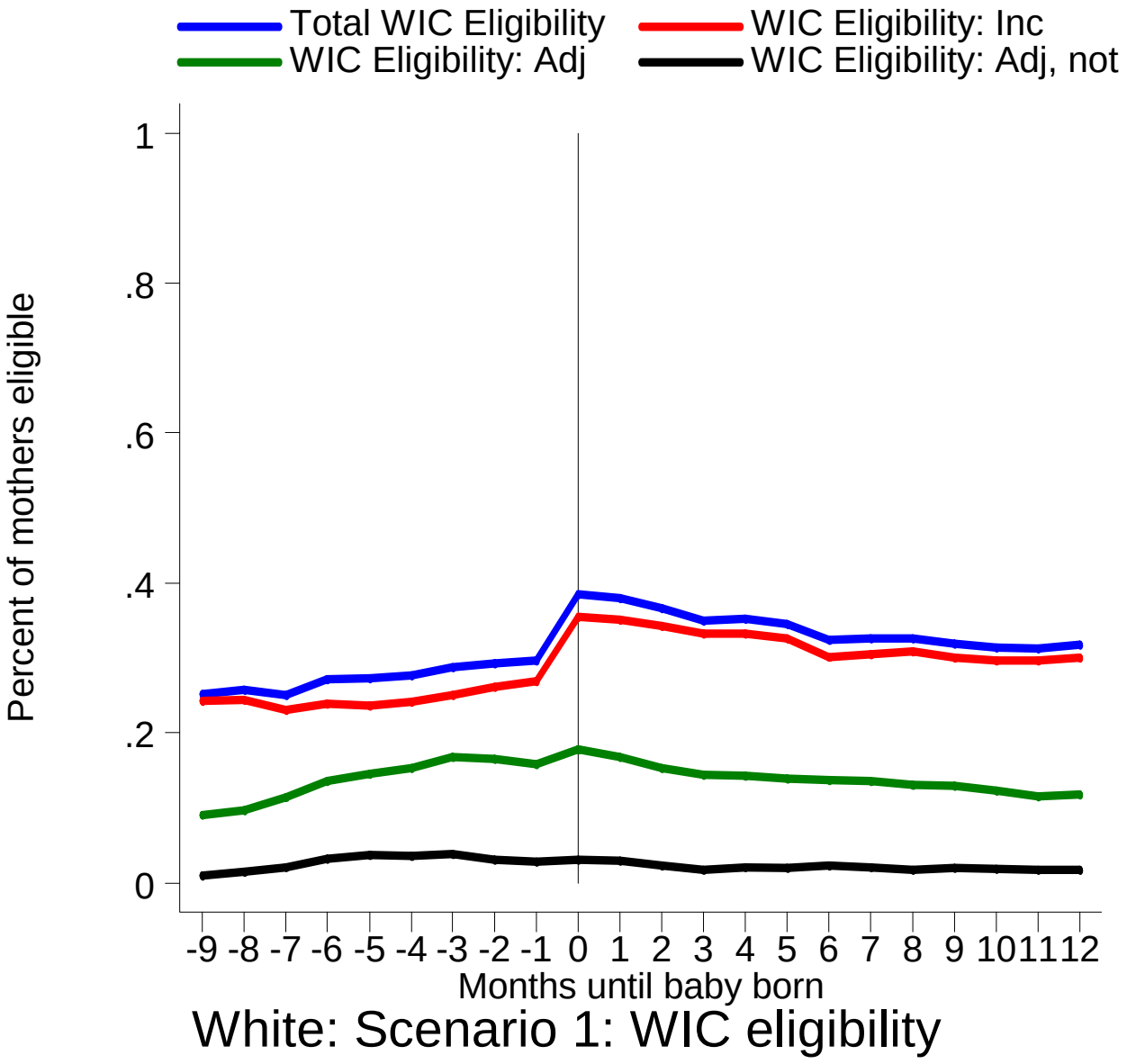


**Figure 29** 1990-1996 SIPP Panels, 934 pregnancies, WIC income and adjunct eligibility evaluated at each point in time (e.g., assumes recertification each period), WIC family size does not include fetus in determining income eligibility.

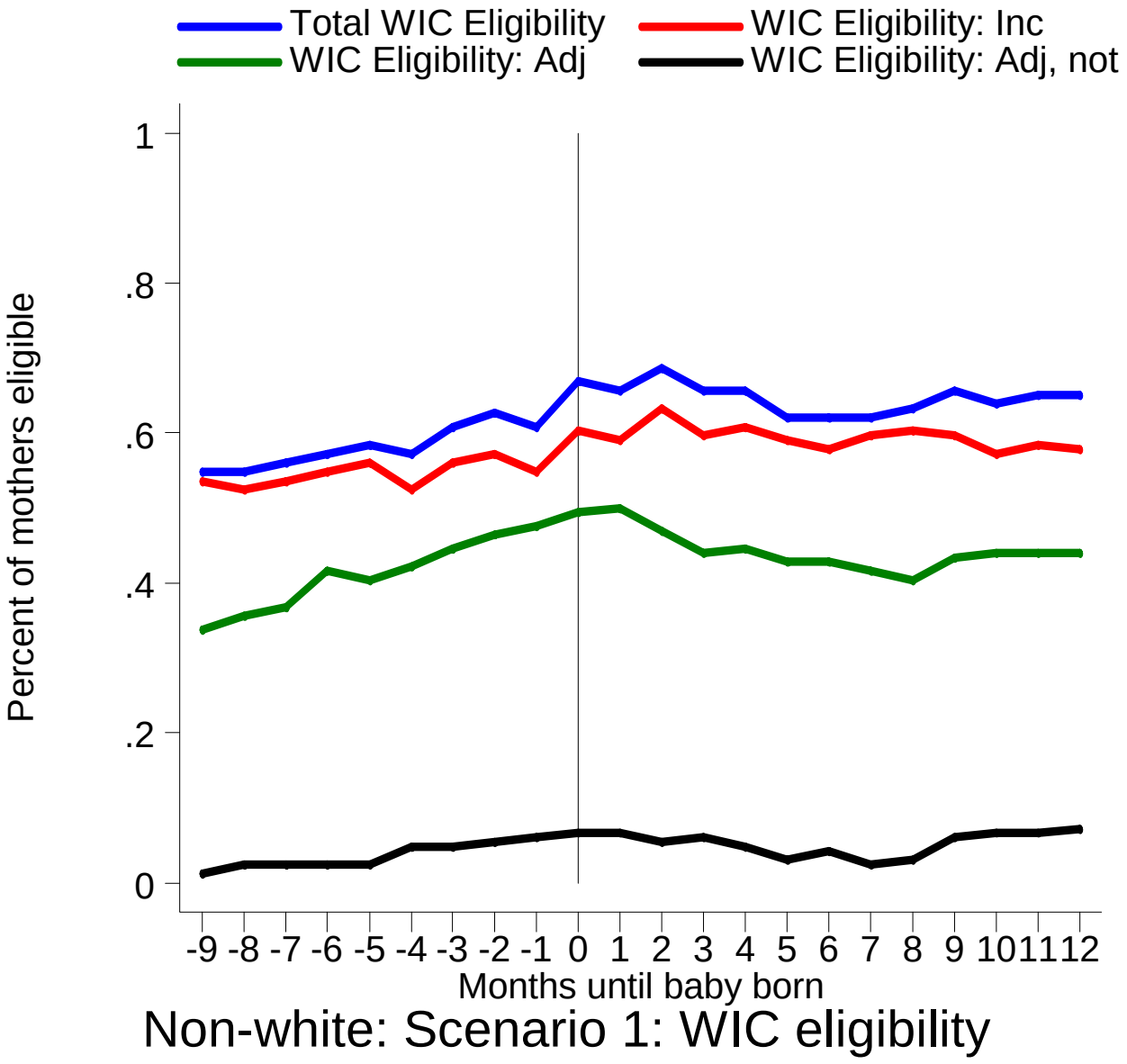


**Figure 30** 1990-1996 SIPP Panels, 166 pregnancies, WIC income and adjunct eligibility evaluated at each point in time (e.g., assumes recertification each period), WIC family size does not include fetus in determining income eligibility.

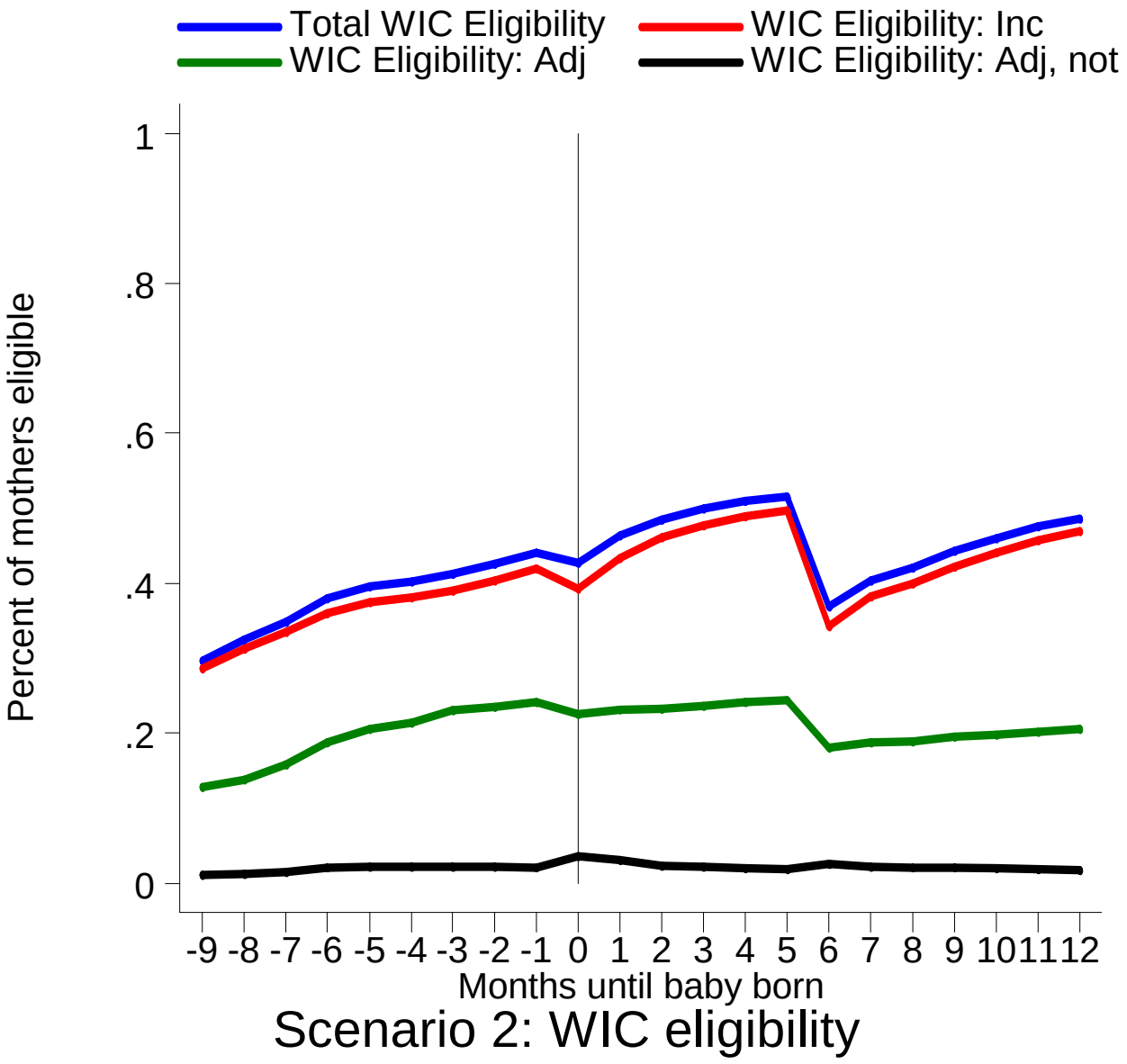


**Figure 31** 1990-1996 SIPP Panels, 1100 pregnancies, WIC income and adjunct eligibility evaluated at each point in time but once a woman is certified as eligible, she does not need to be recertified until t=0 or t=6, WIC family size does not include fetus in determining income eligibility.

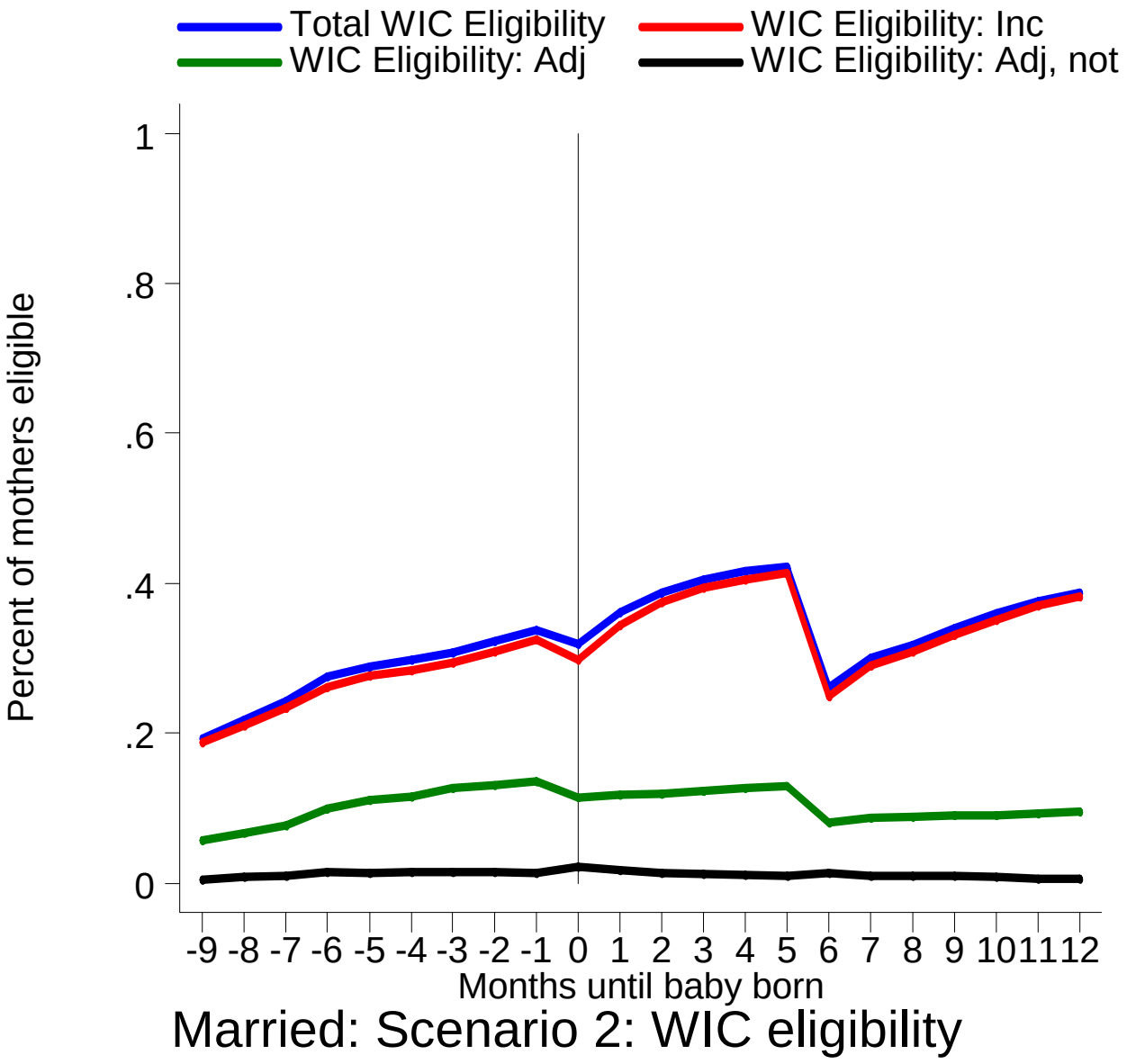


**Figure 32** 1990-1996 SIPP Panels, 862 pregnancies, WIC income and adjunct eligibility evaluated at each point in time but once a woman is certified as eligible, she does not need to be recertified until t=0 or t=6, WIC family size does not include fetus in determining income eligibility, Marital status evaluated at t=-9.

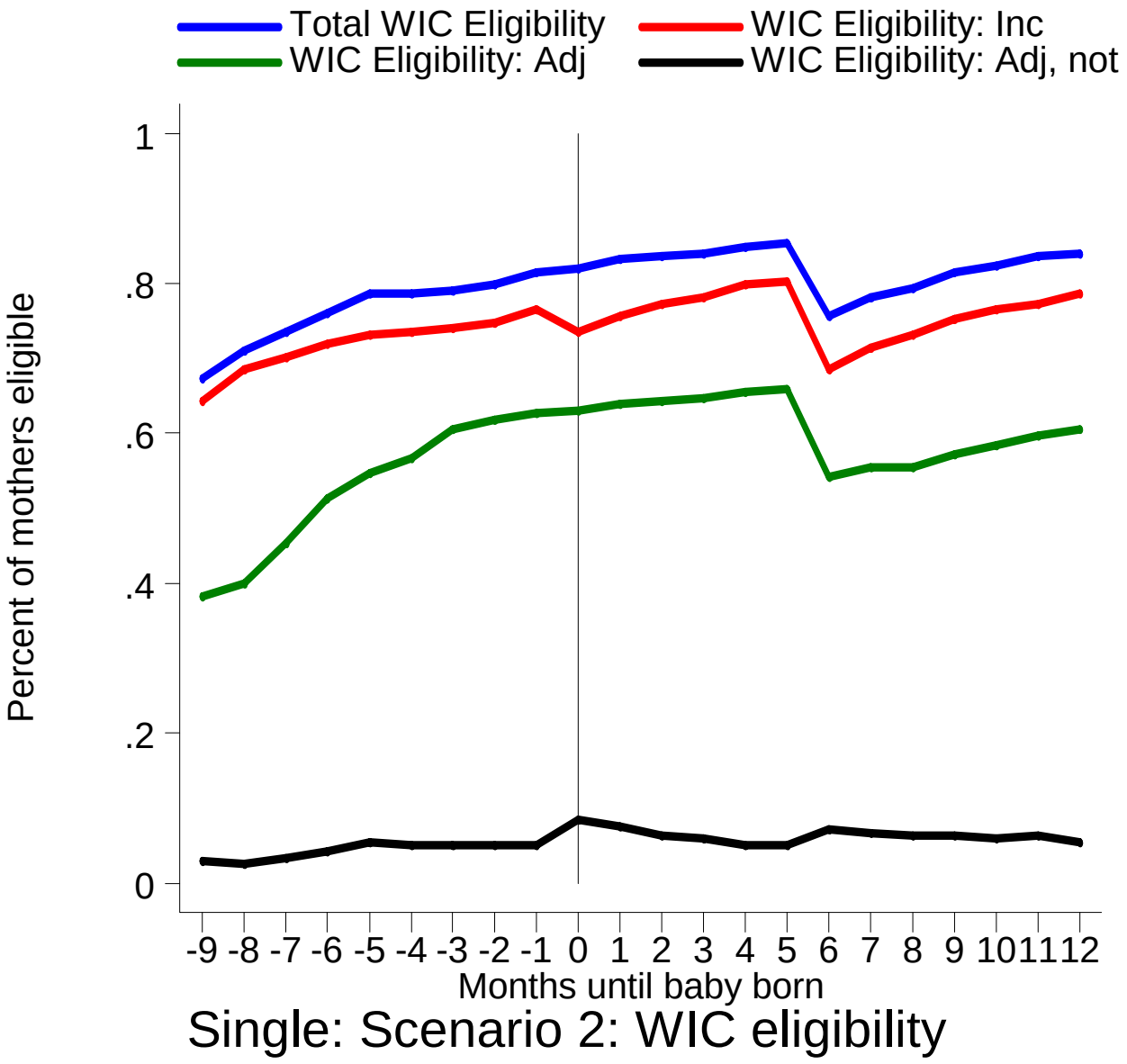


**Figure 33** 1990-1996 SIPP Panels, 238 pregnancies, WIC income and adjunct eligibility evaluated at each point in time but once a woman is certified as eligible, she does not need to be recertified until t=0 or t=6, WIC family size does not include fetus in determining income eligibility, Marital status evaluated at t=-9.

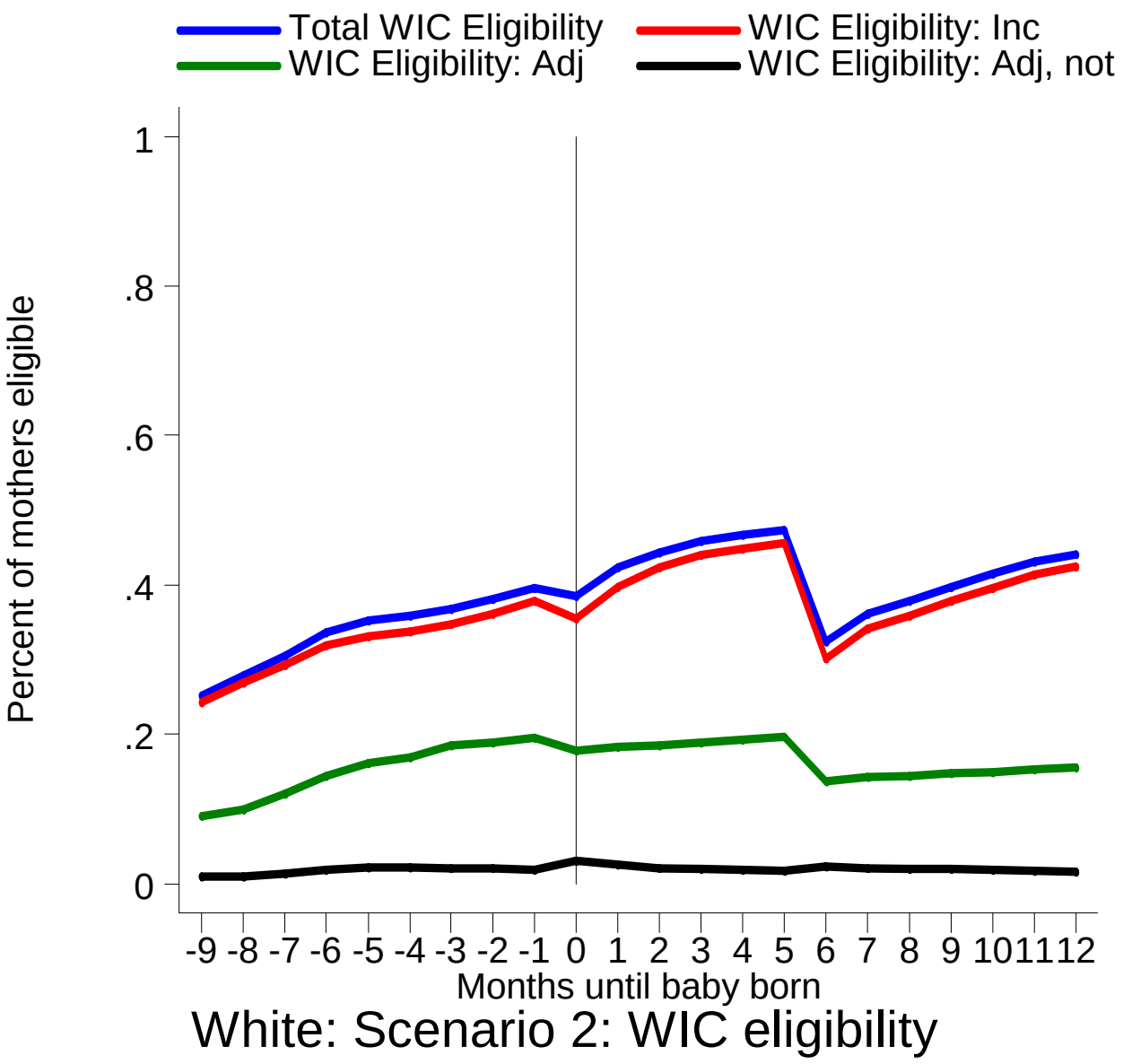


**Figure 34** 1990-1996 SIPP Panels, 934 pregnancies, WIC income and adjunct eligibility evaluated at each point in time but once a woman is certified as eligible, she does not need to be recertified until t=0 or t=6, WIC family size does not include fetus in determining income eligibility.

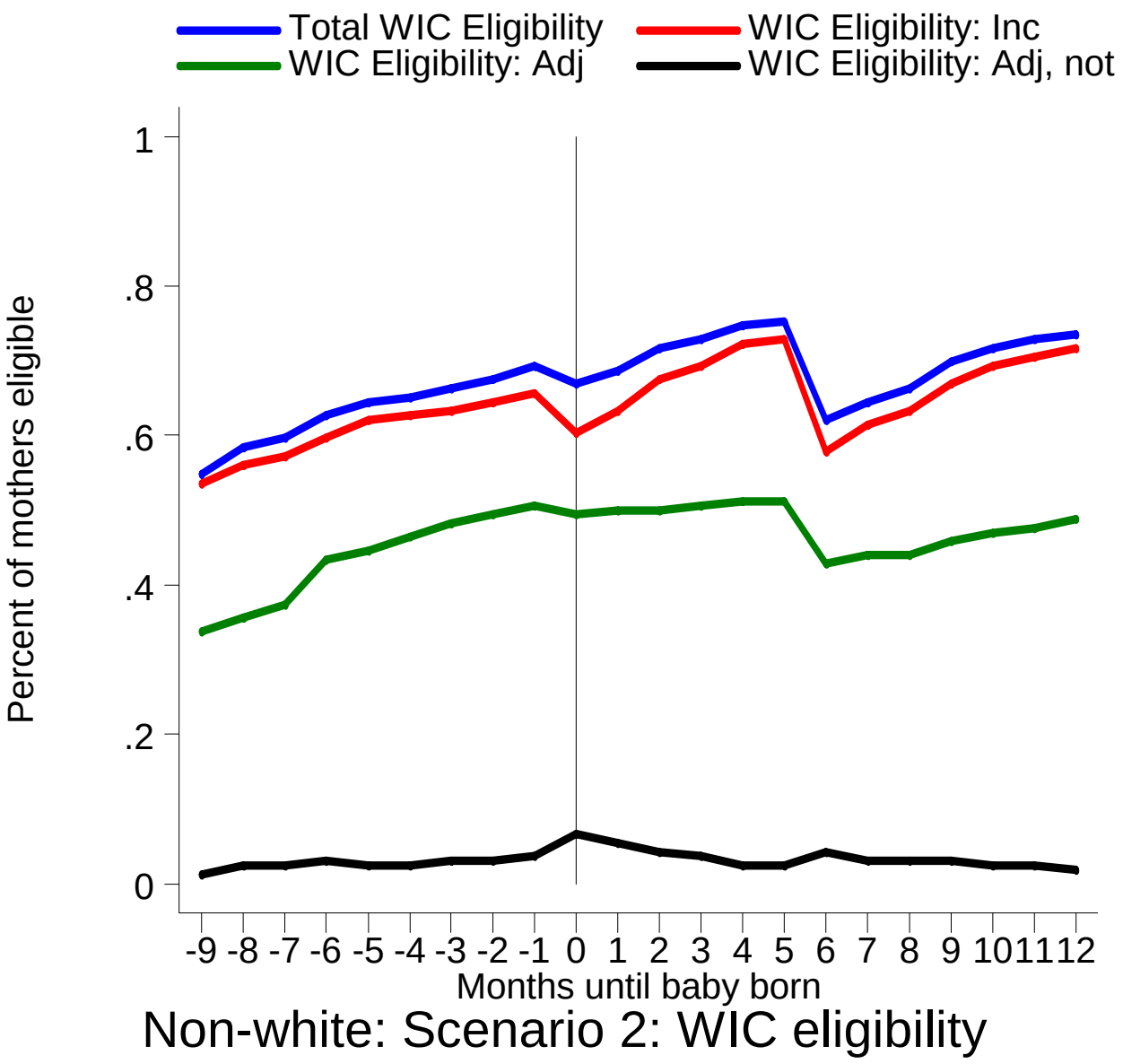


**Figure 35** 1990-1996 SIPP Panels, 166 pregnancies, WIC income and adjunct eligibility evaluated at each point in time but once a woman is certified as eligible, she does not need to be recertified until t=0 or t=6, WIC family size does not include fetus in determining income eligibility.

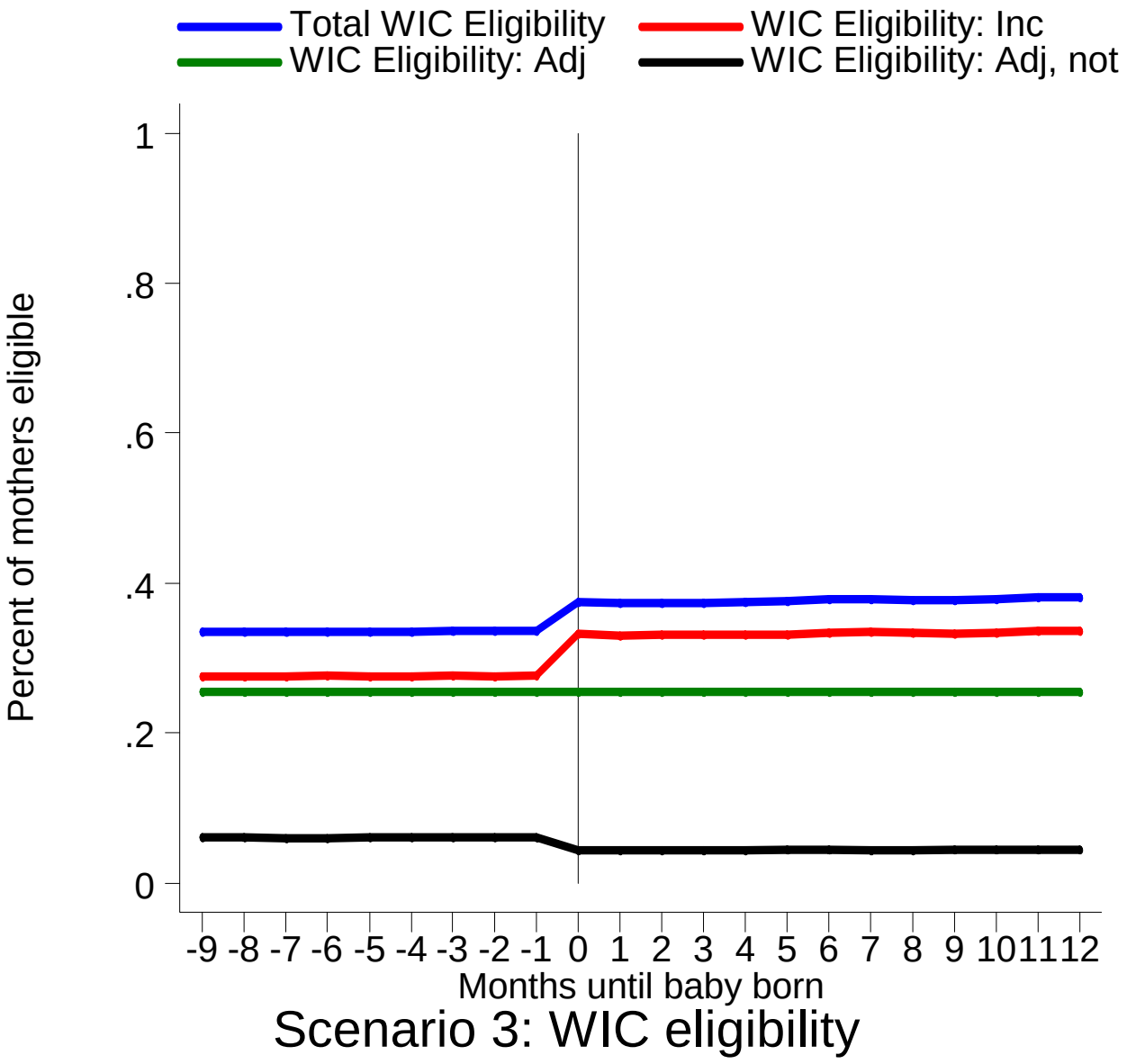


**Figure 36** 1990-1996 SIPP Panels, 1100 pregnancies, CPS-style imputation – income is taken from the calendar year preceding the March interview in which the infant is born and is assumed constant throughout the 22 months, adjunct eligibility is determined from ever participating in Medicaid, food stamps, or AFDC in that calendar year, WIC family size does not include fetus in determining income eligibility.

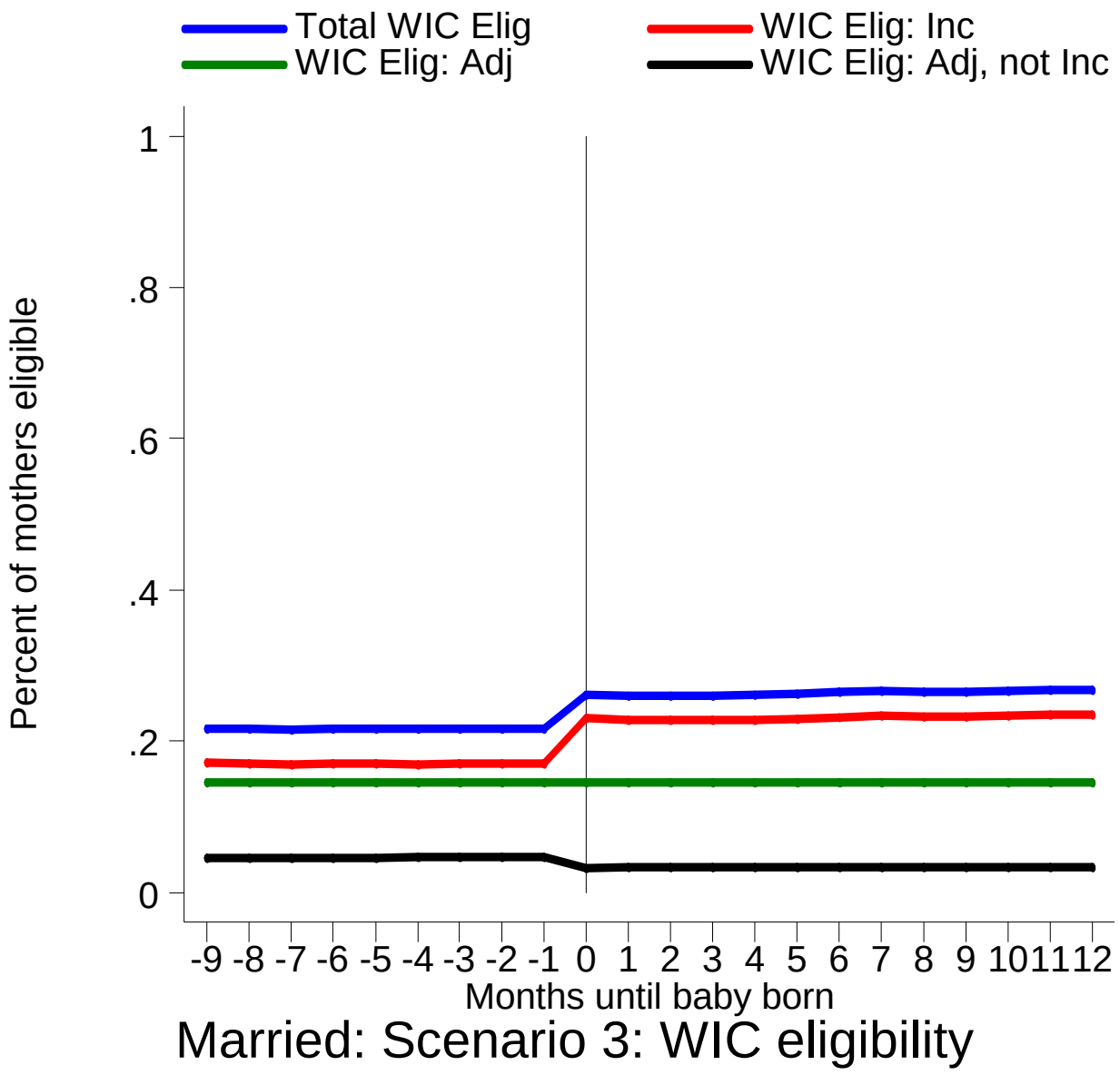


**Figure 37** 1990-1996 SIPP Panels, 862 pregnancies, CPS-style imputation – income is taken from the calendar year preceding the March interview in which the infant is born and is assumed constant throughout the 22 months, adjunct eligibility is determined from ever participating in Medicaid, food stamps, or AFDC in that calendar year, WIC family size does not include fetus in computing income eligibility, Marital status is evaluated at t=-9.

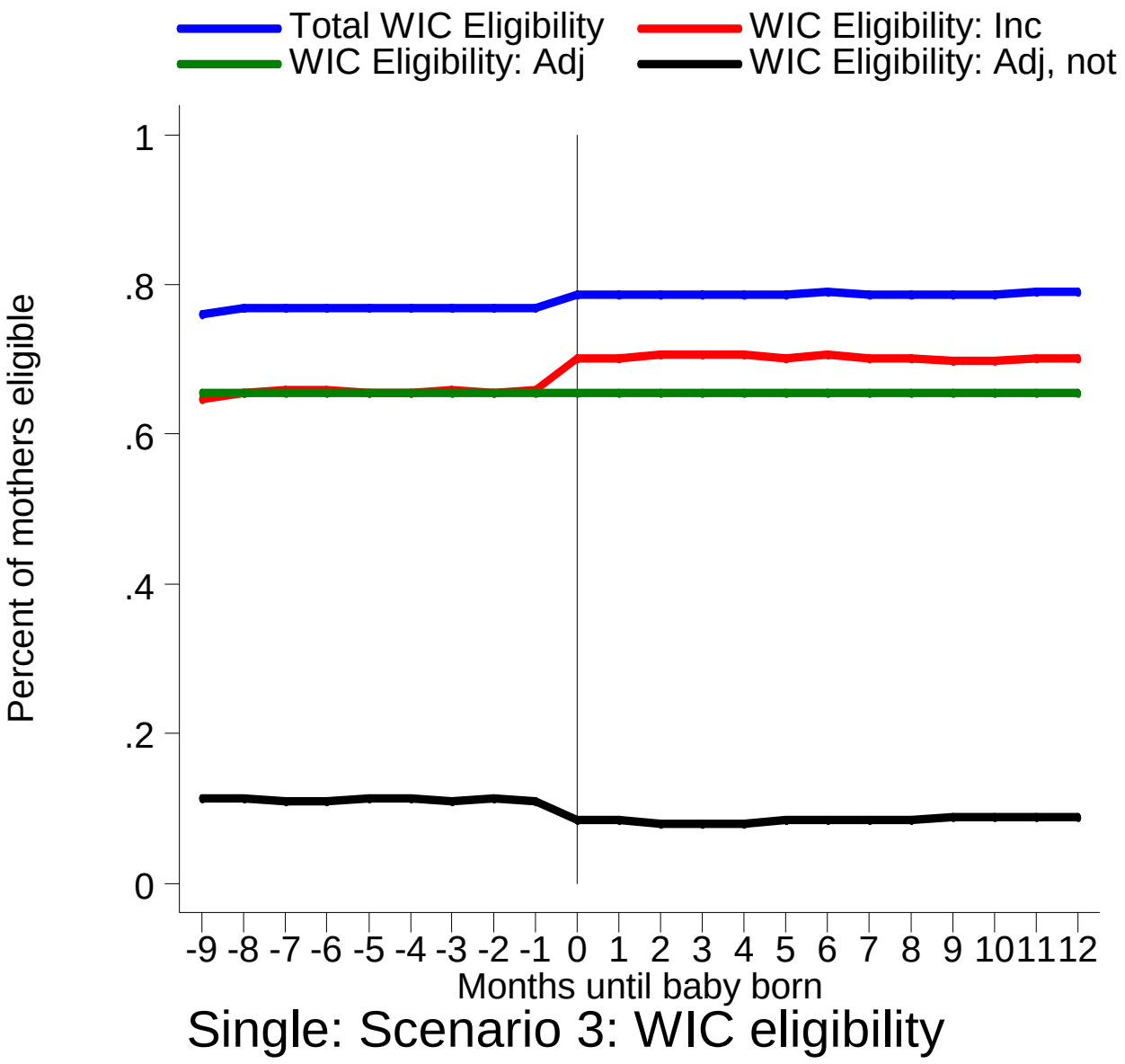


**Figure 38** 1990-1996 SIPP Panels, 238 pregnancies, CPS-style imputation – income is taken from the calendar year preceding the March interview in which the infant is born and is assumed constant throughout the 22 months, adjunct eligibility is determined from ever participating in Medicaid, food stamps, or AFDC in that calendar year, WIC family size does not include fetus in determining income eligibility, Marital status evaluated at t=-9.

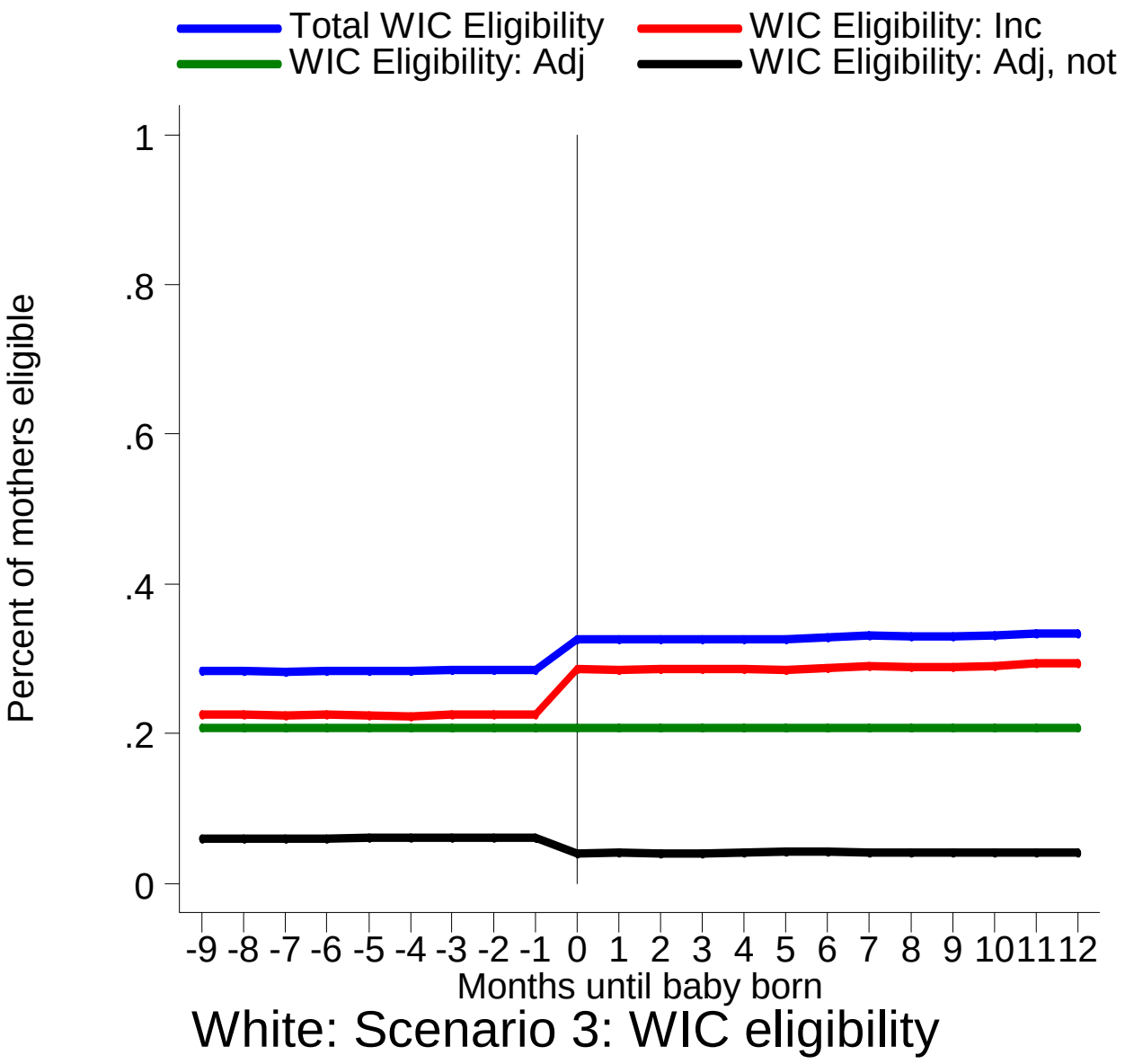


**Figure 39** 1990-1996 SIPP Panels, 934 pregnancies, CPS-style imputation – income is taken from the calendar year preceding the March interview in which the infant is born and is assumed constant throughout the 22 months, adjunct eligibility is determined from ever participating in Medicaid, food stamps, or AFDC in that calendar year, WIC family size does not include fetus in determining income eligibility.

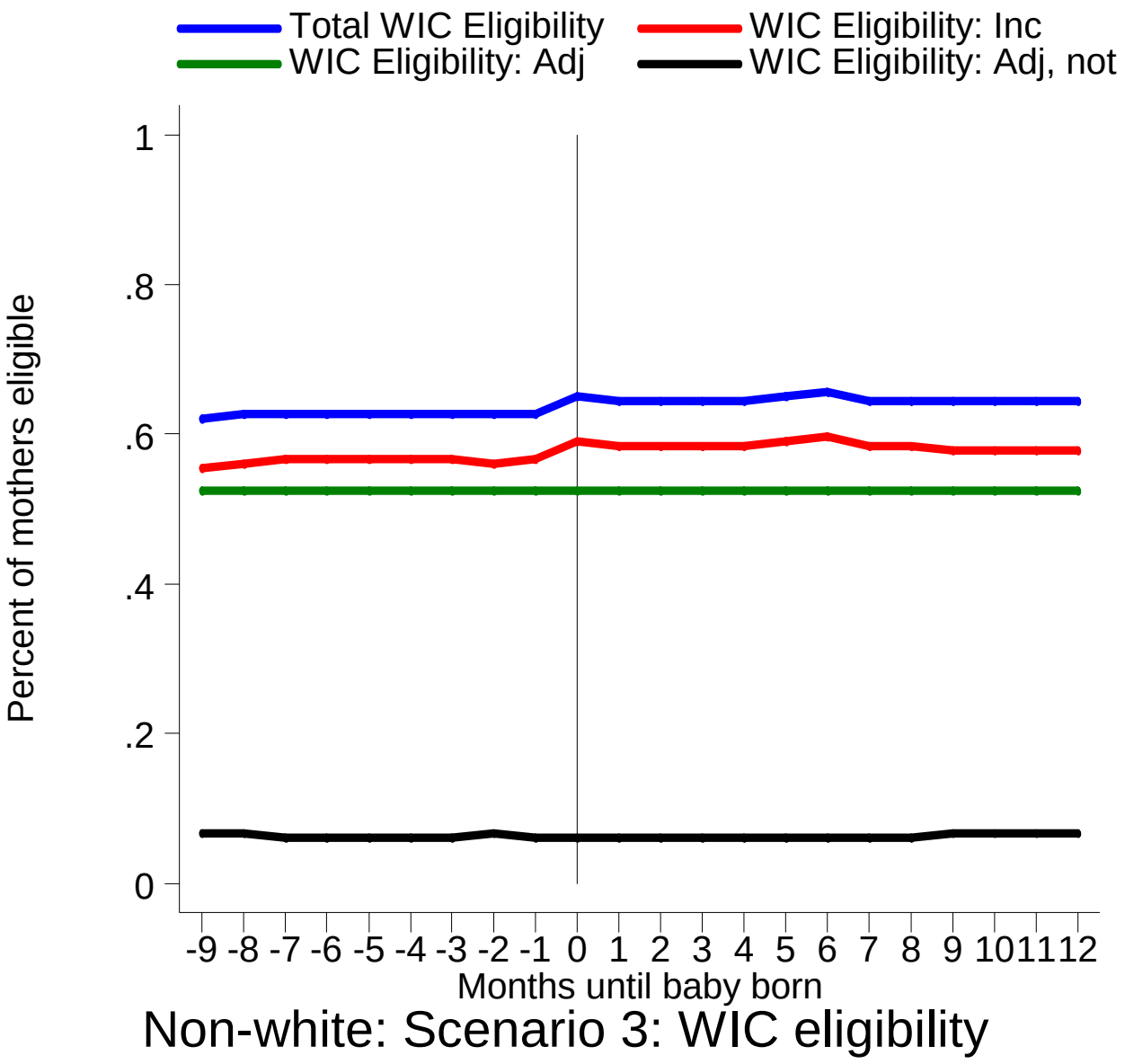


**Figure 40** 1990-1996 SIPP Panels, 166 pregnancies, CPS-style imputation – income is taken from the calendar year preceding the March interview in which the infant is born and is assumed constant throughout the 22 months, adjunct eligibility is determined from ever participating in Medicaid, food stamps, or AFDC in that calendar year, WIC family size does not include fetus in determining income eligibility.