

# **Ohio Medicaid**

**2009 Report on Mothers, Infants and Children**

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**Perinatal Experience**



## Key Findings:

- In recent years, Ohio Medicaid has paid for two out of every five births in the state. Medicaid covers one out of every three births to white mothers, three out of every five births to Hispanic mothers, and seven out of every ten births to black mothers in Ohio.
- Medicaid provided an important safety net to 72% of births to non-Hispanic black mothers and 62% of births to Hispanic mothers in 2005.
- Younger expecting mothers are more likely to be enrolled in Medicaid. For mothers with Medicaid delivery claims, the median age was 23.4, while women with non-Medicaid paid deliveries, the median age was 29.5.
- Risk factors for low birth weight and prematurity, such as smoking and having four or more deliveries, are more prevalent in the Medicaid population than the general population. Despite this, the birth outcomes are not reflective of this increased risk. Prematurity and low birth weight outcomes are not disproportionately represented in the Medicaid population. Much of this may be due to Medicaid functioning as an important source of care at a critical point to positively impact the health of the mother and child.
- After accounting for demographic differences, infants with Medicaid-paid births were 1/3 less likely to die in the first year of life as non-Medicaid infants.
- Only 43.3% of women with Medicaid paid births in 2007 were enrolled in the program during the month of conception. Opportunities for early intervention and prevention for women not enrolled early in their pregnancies are limited by late access to services provided under Medicaid coverage.
- The average total cost to the state for coverage of a woman during pregnancy (costs for all covered services for nine months prior to the delivery month to one month after the delivery month) in 2007 was \$6,518.26.

Note: Data from this report is from 2007 and earlier. The data used is from Ohio Medicaid administrative claims and Ohio Department of Health Vital Statistics birth records. The birth statistical file is not complete until after the births for the calendar year are compiled. The linkage to Medicaid administrative data occurs after the finalization of the birth files. This creates an unavoidable lag in reporting.

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# Profile of Ohio Births

## Demographics

Medicaid plays a significant role in access to health care for pregnant women and children in Ohio. In recent years, Ohio Medicaid has paid for two out of every five births in the state. The number of births paid for by Medicaid has shown an upward trend, while the total number of Ohio births has increased very slowly.

Ohio Births Paid by Medicaid, 2002-2007

	Medicaid Paid Births	Non-Medicaid Births	All Births	% Births Paid by Medicaid
2002	52,321	98,906	151,227	34.6%
2003	55,604	96,255	151,859	36.6%
2004	58,126	94,259	152,385	38.1%
2005	60,249	91,505	151,754	39.7%
2006	62,775	91,348	154,123	40.7%
2007	61,091	93,166	154,257	39.6%

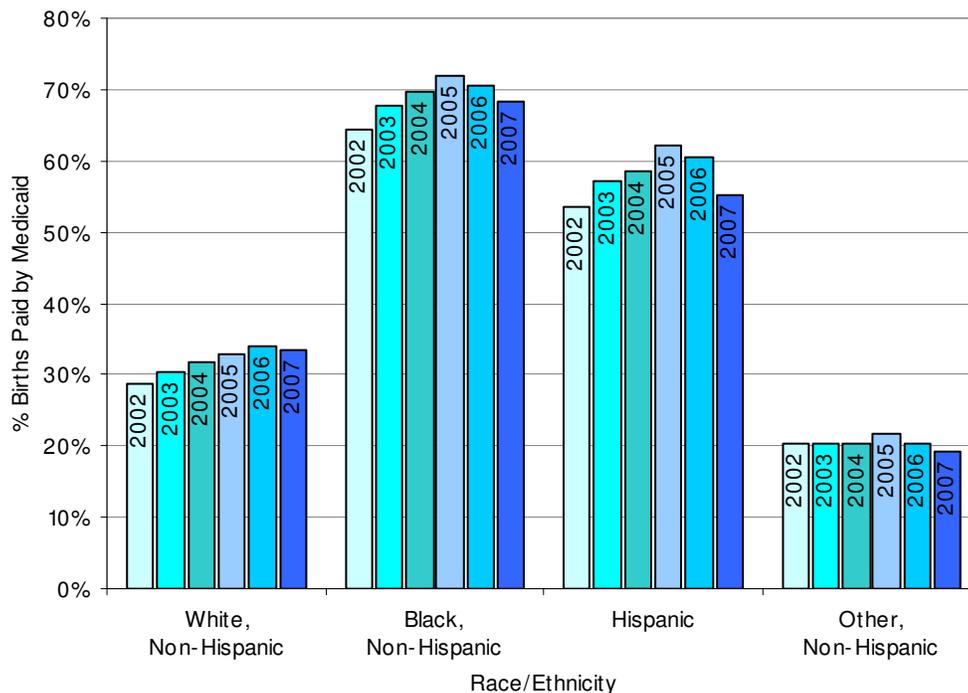
**Technical Note:** In the above table, and throughout this document, Medicaid paid births are those where a Medicaid delivery admission claim was linked to the birth certificate during the matching process (refer to the Methodological Notes section below). Non-Medicaid births are to mothers who have private insurance, other public insurance such as CHAMPUS-TriCare, or are uninsured. Women with Medicaid and another payer were included in the Medicaid counts.

## Race and Ethnicity

Medicaid eligibility is based predominantly on income. There are pronounced racial disparities apparent when examining poverty in Ohio. Medicaid provided an important safety net to 72% of births to non-Hispanic black mothers and 62% of births to Hispanic mothers in 2005. In all years of this study, non-Hispanic black mothers are more than twice as likely as non-Hispanic white mothers to be on Medicaid during delivery.

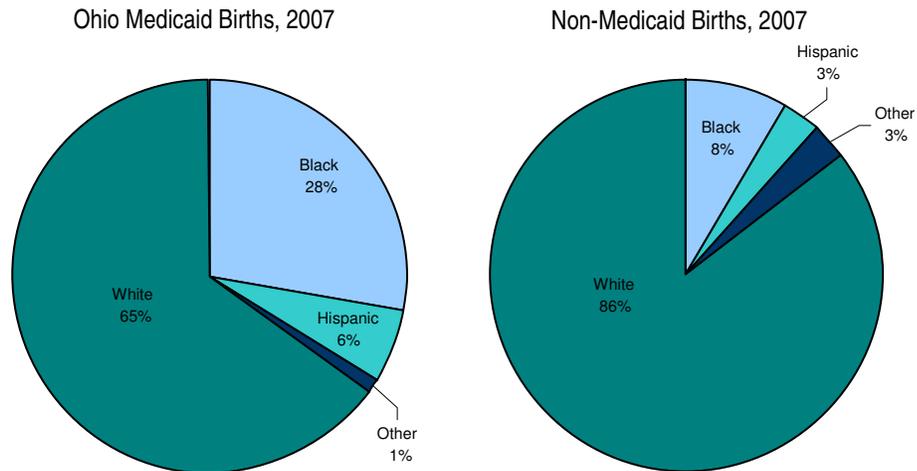
There are notable differences in the demographics of mothers with Medicaid-paid

Percent of Ohio Births Paid by Ohio Medicaid by race and ethnicity, 2002-2007



deliveries and those who did not have Medicaid delivery claims. Black and Hispanic mothers are represented more in the Medicaid delivery claims than the rest of the population, while other minorities are less likely to be Medicaid recipients at delivery. Adjusted rates are reported in this paper to allow for more appropriate comparison between the two populations.

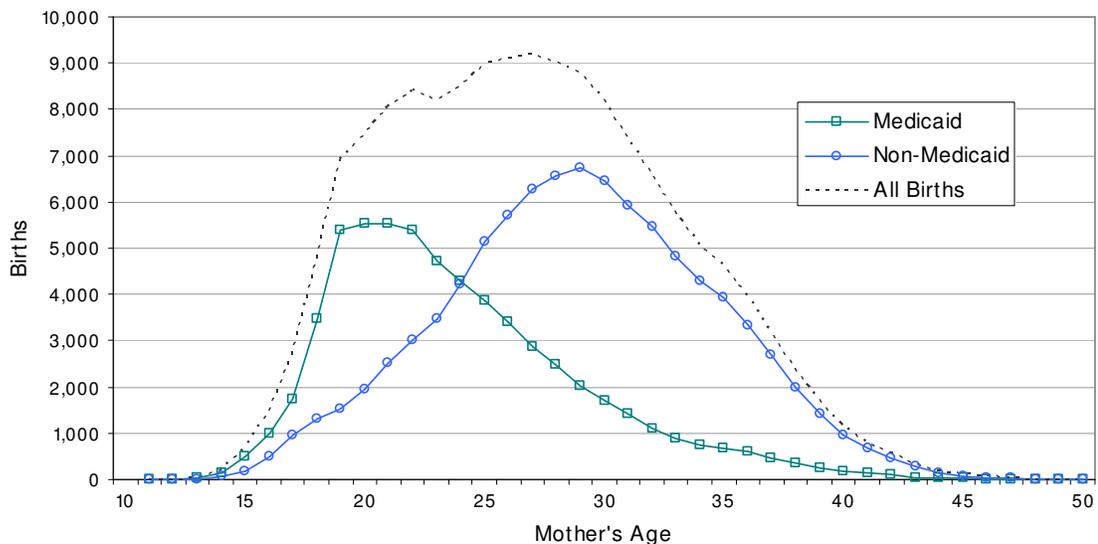
Births by Maternal Race/Ethnicity, 2007



### Mother's Age

The distribution of mother's age at delivery for Medicaid paid births and non-Medicaid births reveals a wide disparity in age. For mothers with Medicaid delivery claims, the median age was 23.4, while women with non-Medicaid paid deliveries, the median age was 29.5. When examining only those mothers delivering their first child the trend is consistent, with a mother's median age of 19.6 for Medicaid-paid births and 27.4 for non-Medicaid paid births.

Ohio Births by Mother's Age and Medicaid Status, 2007



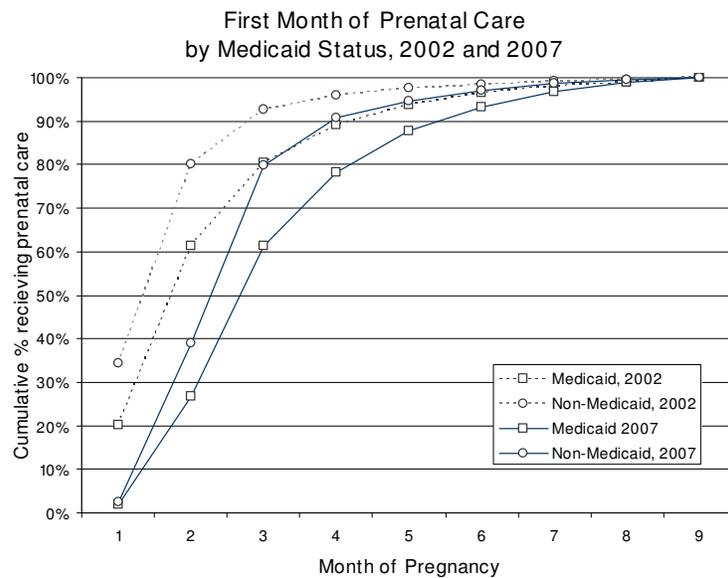
## Marital Status

Marital status differences are also apparent between the two populations. For mothers with Medicaid paid deliveries in 2007, 25.1% were married, compared to 80.2% of women with non-Medicaid paid deliveries. The effect of the age differences between the two groups explained some of the difference in marriage rates. When the data was standardized by age to the year 2000 births, the age-adjusted rates for 2007 were 31.4% of Medicaid births were to married women, while 70.8% of non-Medicaid births were to married women. Including race and ethnicity in the standardization resulted in an adjusted rate of 34.1% married in the Medicaid group, and 69.8% married in the non-Medicaid group.

## Prenatal Care Initiation

Studies have established a link between the date of the first prenatal visit, the total number of prenatal visits, the length of pregnancy, and low birth weight. Prenatal care visits address modifiable behaviors such as smoking, alcohol abuse, and poor nutrition and also provide necessary medical care for pregnant women. For these reasons, it has been concluded that adequate prenatal care can prevent low birth weight regardless of possible confounding variables such as socioeconomic status.

In 2002, 80% of women delivering while on Medicaid had received a prenatal visit in the first trimester of pregnancy, compared to 93% of non-Medicaid pregnant women. There is a trend of lower initiation of prenatal visits in the first trimester each year. By 2005, these percentages had dropped to 75% of women on Medicaid, and 88% of women not on Medicaid. With the change to the new birth certificate format in 2006, the reported values changed considerably. by 2007, the percent of women receiving a prenatal visit in the first trimester of pregnancy was down to 44% for Medicaid recipients, and 61% for non-Medicaid recipients. it is very likely that this drop is attributable to changes in reporting, not actual changes in behavior and access.



Other investigations support the lower numbers as more likely to be correct. Another way to investigate prenatal care is through the use of the Healthcare Effectiveness Data and Information Set (HEDIS). HEDIS provides a standard set of metrics used by health insurers to track and compare performance. The measures are based on administrative claims data, not on vital statistics or medical records. One measure is the timeliness of prenatal care. This measure reports the percentage of women receiving a prenatal care visit in the first trimester or within 42 days of enrollment. For 2007, the HEDIS measure indicated that 69.2% of pregnant women who were enrolled in Medicaid at least 11 out of 12 months attained care in a timely manner. HEDIS is used to compare across insurance plans, and the calculations made to facilitate these comparisons generally overestimate the raw

percentages. With this in mind, the 2006 and 2007 data for prenatal care initiation from the vital statistics records is likely more accurate.

## Birth Outcomes

### Prematurity

Prematurity, defined as a birth prior to 37 weeks gestation, is associated with numerous negative outcomes. From 2002 to 2007, the prematurity rate in Ohio has been increasing. For Medicaid paid births, the rate has increased from 13.2% in 2002 to 14.5% in 2007. This is an actual increase of 1,926 more premature infants born to mothers in Medicaid in 2007 than were born in 2002. For Medicaid paid births, prematurity rates are typically two percent higher than non-Medicaid births. Adjusting for age, race, Hispanic ethnicity, and marital status explains much of the disparity between the two populations, and the adjusted relative risk of 1.09 shows little difference between the populations [*refer to Reporting of Rates in the methodological notes section for a discussion of relative risk interpretation*]. Prematurity is an issue that is not limited to the Medicaid population, but is a broader public health issue for all mothers and children in the state.

Prematurity by Medicaid Status, 2002-2007  
Births with Less Than 37 Weeks Gestation

Year	Crude Rates		Adjusted Rates		Adjusted Relative
	Medicaid	Non-Medicaid	Medicaid	Non-Medicaid	
2002	13.2%	11.3%	12.8%	12.1%	1.06
2003	13.5%	11.3%	13.3%	12.2%	1.09
2004	13.5%	11.7%	13.4%	12.6%	1.07
2005	14.3%	12.1%	14.3%	13.2%	1.09
2006	14.8%	12.2%	14.3%	13.0%	1.09
2007	14.5%	12.1%	14.0%	12.8%	1.10

### Low Birth Weight

Low birth weight (under 2,500 grams) is strongly correlated with prematurity. This relationship is reflected in the data. Incidence of low birth weight births shows slight upward trends for both populations. Adjusted relative risk scores are near one, showing little disparity between Medicaid-paid births and non-Medicaid births when controlling for demographic differences.

Low Birth Weight by Medicaid Status, 2002-2007  
Birthweight Less Than 2,500 grams

Year	Crude Rates		Adjusted Rates		Adjusted Relative Risk
	Medicaid	Non-Medicaid	Medicaid	Non-Medicaid	
2002	10.0%	7.6%	9.3%	8.5%	1.10
2003	9.9%	7.3%	9.3%	8.2%	1.13
2004	9.9%	7.8%	9.6%	9.0%	1.07
2005	10.5%	7.7%	10.0%	8.9%	1.13
2006	10.6%	7.8%	9.9%	8.8%	1.12
2007	10.5%	7.8%	10.0%	8.6%	1.17

## Risk Factors for Preterm Birth and Low Birth Weight

A comparison of the rates of occurrence of selected risk factors gives some insight into the disparities in risk between Medicaid paid births and non-Medicaid births. For all risk factors, expecting mothers on Medicaid had higher crude rates (with the exception of previous poor birth outcomes, which was similar to the non-Medicaid population). Adjusting for age, race, ethnicity, and marital status revealed little difference between the groups with respect to previous poor birth outcomes and short birth spacing, but large differences in smoking during pregnancy and having a fourth or more birth. Smaller differences were noted for other factors, including no prenatal care. Mothers delivering while on Medicaid are likely to be eligible for Medicaid during the pregnancy, and would have insurance coverage for prenatal visits. This disparity could be an issue of outreach, awareness, or access to care.

Selected Risk Factors for Prematurity and Low Birth Weight, 2007

Risk Factor	Crude Rates		Adjusted Rates		Adjusted Relative Risk
	Medicaid	Non-Medicaid	Medicaid	Non-Medicaid	
Previous Preterm Birth	5.6%	4.0%	6.0%	4.1%	1.44
Low Maternal Weight Gain ( $\leq 22$ lb)	29.0%	24.2%	30.8%	24.5%	1.26
Smoking During Pregnancy	33.7%	10.2%	32.6%	13.2%	2.46
Previous Poor Outcomes	4.9%	4.9%	5.2%	4.8%	1.07
Fourth or More Birth	23.0%	18.7%	33.7%	16.0%	2.11
Short Birth Spacing (<12 months)	4.9%	4.2%	5.4%	5.8%	0.92
No Prenatal Care	4.1%	2.3%	3.7%	3.0%	1.24

## Outcomes for Women with Risk Factors for Prematurity and Low Birth Weight

Having a risk factor for preterm or low birth weight delivery does not itself determine preterm, low birth weight, or other poor outcomes. For the groups of women with these risk factors, the percentage having infants prematurely or with low birth weight is higher than those mothers without the risk factors in all cases. With the exception of short birth spacing and lack of prenatal care, women delivering on Medicaid had higher proportions of premature births and low birth weight infants than women not on Medicaid. Adjusting for population differences reduced but did not eliminate the disparities. Some notable findings regarding these issues are included below.

### Previous Preterm Birth

Women who have delivered a pre-term infant have a greatly increased risk of another pre-term delivery of a low birth weight infant. For women with Medicaid paid deliveries who had a previous preterm infant, the incidence of preterm birth was 36.5%, and the incidence of low birth weight was 28.7%. This is more than 2.5 times the incidence of preterm or low birth weight delivery in mothers who have had previous deliveries that were not pre-term. These outcomes are independent of Medicaid status. The adjusted relative risk of preterm

delivery for women having a prior preterm delivery on Medicaid compared to those women with preterm delivery not on Medicaid was 1.00, and the adjusted relative risk of low birth weight delivery for this group compared to non-Medicaid births was 0.96.

**Low Maternal Weight Gain**

Compared to women who reported weight gain above 22 lbs. during pregnancy, women who gained less than 22 lbs. (or who lost weight) showed an increased likelihood to deliver preterm (relative risk of 1.32 within Medicaid, 1.49 for non-Medicaid) and were nearly twice as likely to deliver a low birth weight infant (relative risk of 1.71 for Medicaid paid births, 1.83 for non-Medicaid births). There were no differences between the populations for the adjusted risk for preterm deliveries, and only a slightly higher risk of low birth weight for Medicaid-paid births (adjusted relative risk of 1.11). The rates for premature delivery in overweight and obese women with low maternal weight gain were slightly lower than for non-overweight mothers with low maternal weight gain for the Medicaid population, but similar for the non-Medicaid population. When examining low birth weight, the adjusted rates for overweight or obese women with Medicaid paid births who gained less than 22 lbs. compared favorably with non-Medicaid paid births (Adjusted LBW rate of 8.2% compared to 8.6% LBW rate for non-Medicaid paid births, and 10% LBW rate for all Medicaid paid births).

**Smoking During Pregnancy**

Women with Medicaid paid births were 2.5 times more likely to report smoking during pregnancy than mothers not on Medicaid. This had only a slight impact on preterm birth rates (adjusted relative risk of 1.13 for Medicaid paid births) but a greater impact on low birth weight. Mothers who smoked were half again as likely to deliver a low birth weight infant compared to mothers who did not smoke (adjusted relative risk of 1.51 for Medicaid paid births, and 1.57 for non-Medicaid births). The large number of women in Medicaid who smoked during pregnancy makes this risk factor notable.

Percentage of women delivering in 2007 who reported smoking

Payer	3 Months Prior	First Trimester	Second Trimester	Third Trimester
Medicaid	39%	32%	28%	27%
Non-Medicaid	15%	10%	8%	8%

Prior to pregnancy, 39% of women with Medicaid-paid births reported smoking, compared to 15% of the women with non-Medicaid deliveries. During pregnancy, smoking cessation was less likely in the Medicaid group. Half of mothers who smoked in the non-Medicaid group reported not smoking by the third trimester, while only 30% of women with Medicaid-paid deliveries who smoked prior to pregnancy had stopped by the third trimester.

**Short Birth Spacing**

Mothers who had a delivery less than 12 months prior to the current delivery had a much higher proportion of premature and low birth weight infants than mothers who had birth spacing of one year or more. For women with Medicaid paid births and short birth spacing, 37% gave birth prematurely, and 32% had low birth weight infants. This is a prematurity rate 2.6 times higher and a low birth weight rate 3.4 times higher than women on Medicaid who had birth spacing of one year or more.

This was the one risk factor where low birth weight and prematurity within Medicaid paid births was considerably lower than within the non-Medicaid population. The adjusted

relative risk for Medicaid paid births compared to non-Medicaid births was 0.76 for prematurity, and 0.73 for low birth weight.

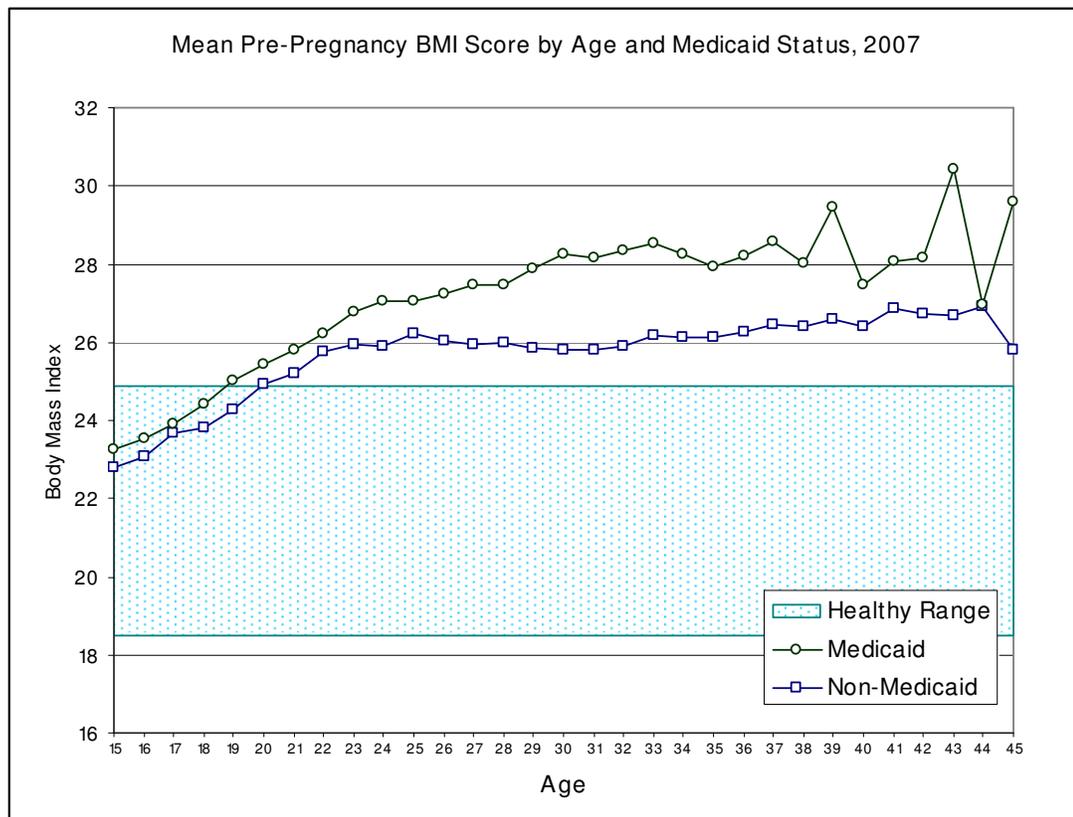
### Teen Pregnancy

Ohio Medicaid provides payment for medical care, including prenatal care, to women with low incomes. Most teens who become pregnant do not have insurance and have incomes low enough to qualify for Medicaid coverage. 73% of all pregnancies to teen mothers (age 15 to 19) in 2007 were covered by Medicaid.

Within Medicaid, the proportion of preterm and low birth weight deliveries for teen mothers was similar to the proportion for mothers age 20 and older. Teen mothers not on Medicaid had prematurity and low birth weight proportions similar to the Medicaid population. Mothers age 20 and older in the non-Medicaid population had rates of preterm birth and low birth weight that were 2-3% lower than the other groups.

### Obesity

Obesity during pregnancy has been linked to several co-morbidities and complications of the perinatal period, and with increased risk of obesity for the child. Obesity during pregnancy also increases the risk of stillbirth. There is a general trend of pre-pregnancy overweight in all mothers in the state. Normal weight corresponds to a BMI score of 18.5 to 24.9. Overweight scores are between 25 and 29.9, and obesity is any score of 30 or higher. Women with Medicaid paid birth claims have a higher average pre-pregnancy Body mass Index (BMI) than women with non-Medicaid paid births. This difference becomes greater as the age of the mother increases. Women in the Medicaid group also had a higher incidence of obesity, 25% compared to 21% in the non-Medicaid group.



### Late Pre-term Deliveries

Late pre-term birth (delivery at 36 to 38 weeks gestational age) and scheduled delivery have received recent attention as a preventable risk factors for overall immaturity and increased infant morbidity and mortality. For Medicaid paid births, the crude rate of late pre-term delivery was 33.8%, compared to 34.3% for non-Medicaid births. Induction occurred in 26.0% of late pre-term births in Medicaid, and in 28.3% of non-Medicaid births. It is estimated from unpublished data that in roughly 10-15% of these cases there is no documented indication for the induction.

The crude rate of Cesarean deliveries for late pre-term births in the two groups were 29.9% for the Medicaid births, and 34.3% for non-Medicaid births. The small differences were explained by population factors, as adjusted rates of Cesarean delivery were the same for both groups (adjusted relative risk of 1.03). Within Medicaid, rates for cesarean deliveries were similar for managed care and fee for service delivery systems in 2007 (28.4% FFS, 28.8% MCP).

## Infant Mortality

Information on infant mortality used in this report is from the linked infant death and birth files from the Ohio Department of Health Bureau of Vital Statistics. Release of this data necessarily lags behind birth data. As reported by the Ohio Department of Health, the 2005 infant mortality rate (infant deaths in 2005 per 1,000 live births in 2005) for Ohio was 8.3. For 2006, the infant mortality rate was 7.8. The information presented in this section is for year 2005 births, and represents the proportion of the children born in 2005 who have died before their first birthday. This cohort approach is different than the traditional measure of infant mortality and should not be compared directly to infant mortality rates. The measure is useful for comparing the birth outcomes of births in the study year, and when comparing births covered by Medicaid and those that were not.

For all infants born to Ohio mothers in 2005, the first-year mortality rate was 7.68 per 1,000 births. The disparities in the Medicaid and non-Medicaid populations are evident. For children with Medicaid-paid births, the first year mortality rate was 8.60 compared to a rate of 7.08 for non-Medicaid births. Adjusting for demographic differences, the risk of death for infants born on Medicaid is actually lower than those not born on Medicaid. The adjusted relative risk of death in the first year of life for the 2005 cohort of births on Medicaid compared to non-Medicaid was 0.76. After accounting for demographic differences, infants with Medicaid-paid birth claims were 1/3 less likely to die in the first year of life as non-Medicaid infants.

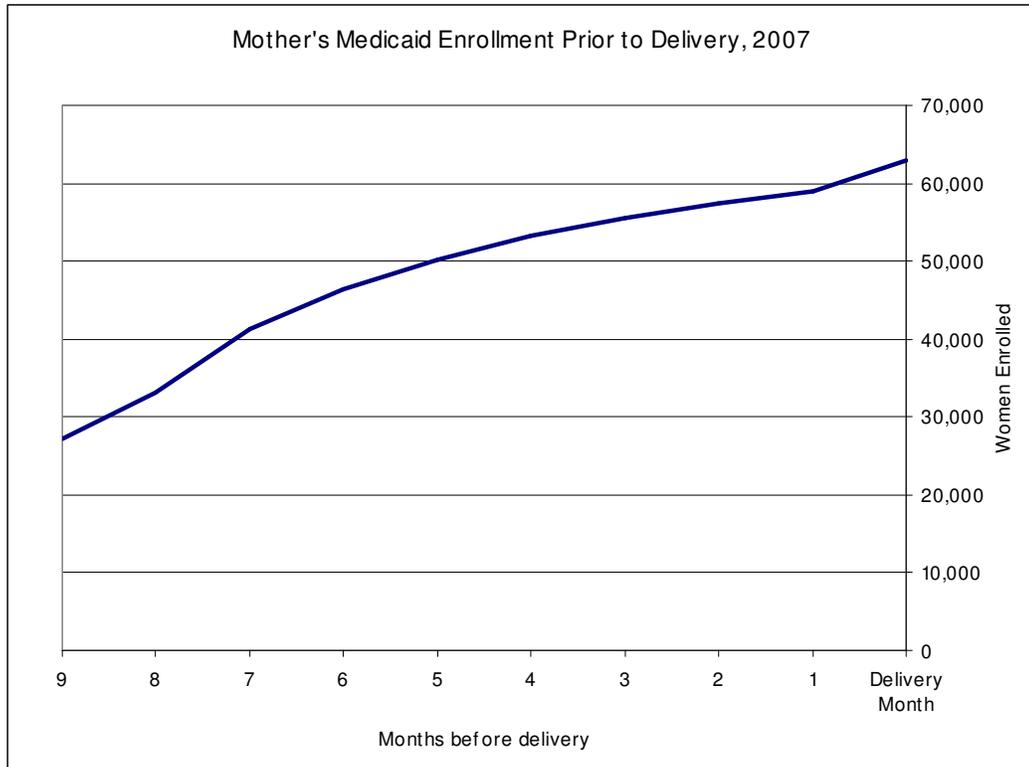
	Medicaid	Non-Medicaid
Black	13.90	23.36
White	6.40	4.24
Hispanic	6.90	5.82
Other Non-Hispanic	3.42	8.16

Premature and low birth weight infants are at a much higher risk of death in the first year of life than full term infants and normal birth weight infants. In the non-Medicaid group, prematurity increased the risk of infant death by more than 25 times, and low birth weight increased the risk of infant death by more than 31 times. Within the group of infants with births paid by Medicaid, the risk was lower, but still notable. Premature infants were more than eight times more likely to die in the first year of life, and low birth weight increased the risk of infant death by nearly 14 times.

## Service Utilization and Costs

### Pregnant Women

Only 43.3% of women with Medicaid paid births in 2007 were enrolled in the program during the month of conception. At the end of the first trimester, 65.6% of women who will have given birth on the program were enrolled. Opportunities for early intervention and prevention for women not enrolled early in their pregnancies are limited by late access to services provided under Medicaid coverage.



### Pregnancy and Delivery

The average total cost to the state for coverage of a woman during pregnancy (costs for all covered services for nine months prior to the delivery month to one month after the delivery month) in 2007 was \$6,518.26. This is similar to the average cost in 2006 of \$6,520.64. Costs include direct fee-for-service payments to service providers, and capitation and birth premium payments to managed care providers for women enrolled in managed care. In 2007, \$229,956,708.64 was paid to managed care as delivery premiums for 49,760 births covered by managed care. The average delivery premium paid to managed care providers was \$4,621.32.

### Infants

Most children in Medicaid in 2007 were enrolled in capitated managed health care plans. For children born in 2007 and ever on Medicaid as infants, 89.2% of the member months in the first year of life were in managed care. The cost to the state for Medicaid recipients enrolled in managed care is the contracted actuarial rate for each person each month.

Of all infants born in 2007, less than 4% were not enrolled in managed care at any time. They had a median time of eight months in fee-for-service Medicaid in the first year of life.

To attempt to capture the fiscal impact associated with specific risk factors, 12,088 fee-for-service inpatient admissions for infant births were identified, with transfers to other facilities combined into a single admission event. Information on the net payments made for these admissions are presented by risk factor present on the birth certificate. Note that pricing policies have effects that are not captured in this analysis, and enrollment policies bias the population of fee-for-service recipients towards higher-risk mothers and infants. This data also captures only the cost for the initial hospital stay for the infant, not any additional costs after discharge, and not the costs for the mother.

### **Prematurity**

The prematurity rate in the fee-for-service admissions population was 16.7% (2,025 premature births), this is higher than the premature rate for all births in Medicaid (14.5%). The median net payment for the first admission for premature infants was \$1,778, compared to \$979 for infants born at 37 weeks gestational age or older. Total net payments for birth admissions were \$20,006,404 for 10,063 full-term births, and \$40,578,255 for 2,025 premature births. The risk of low birth weight for premature infants was predictably high, given the correlation of prematurity with low birth weight.

### **Teen Mothers**

Ohio Medicaid provided coverage to 73% of all teen mothers giving birth in 2007. In the admissions population, 20.6% of fee-for-service birth admits were to teen mothers. Children born to teen mothers had costs for delivery admissions similar to those born to older mothers. The median net payment for delivery for a teen mother was \$1,014 compared to \$1,064 for older mothers, but this was not a statistically significant difference. The 2,492 teen women in the admissions population accounted for 20.6% of the group and their children accounted for 19.4% of the birth admission costs.

### **Race and Ethnicity**

Within all of Ohio Medicaid, non-white and Hispanic women represent 35% of the women giving birth. In the fee-for-service admissions population, 40.4% of the women were non-white or Hispanic. Net payments for the children of these women were 47.4% of the total costs for birth admissions. Median costs for the children of white non-Hispanic women were \$928, while median costs for the children of non-white and Hispanic women were \$1,299.

### **Mother's Education**

While teen mothers are likely to not have completed high school simply because of age, most teen mothers in the fee-for-service population were 18 or 19 years old. For all teen mothers in the fee-for-service population, 58.5% have completed high school. An examination of costs for their children's initial hospital admissions revealed no statistically significant differences.

### **Short Birth Spacing**

Low birth weight and prematurity were less prevalent for women with short birth spacing in Medicaid compared to women not covered by Medicaid. The net payments for the initial hospital stays for their children were still slightly higher than women who had more than 12 months between deliveries, but the differences were not significant.

## **Smoking**

Smoking is linked with an increased risk of low birth weight in the Medicaid population. For women in the fee-for-service population who smoked at any time during their pregnancy (29.9%) there was a 25% increase in the risk of low birth weight. There was not a significant difference in cost for the infants' initial admissions. Smoking status in this population is closely related to race (84% of smokers are white non-Hispanic).

## **Low Birth Weight**

Low birth weight infants are at high risk for health problems. The incidence of low birth weight births in the fee-for-service admissions population, 12.9%, is higher than the overall Medicaid rate (10.5%) and the rate for non-Medicaid births (7.8%). 45% of low birth weight infants were admitted to a neonatal intensive care unit. 65% of low birth weight infants were premature. The median cost for low birth weight infants was \$3,140, compared to \$988 for normal birth weight infants.

## **NICU Admissions**

For children with admissions to neonatal intensive care units, costs were predictably high. Median costs for children admitted to a NICU were \$9,942 for the initial admission, while those without a NICU admission had a median of \$992. (Note that information on NICU admissions was taken from the birth certificate, not from the admissions claim data.)

## **Obesity**

Obesity in the fee-for-service admissions population was 21%. This was lower than in the total Medicaid population (25%). There was not a significant difference in the initial admission costs for children born to obese mothers.

## **Previous Preterm Birth**

Women with previous preterm births were 3.8% of the women in the fee-for-service admissions population, but their children's initial admissions accounted for 9.7% of costs. With a median cost of \$1,356, compared to \$1,045 for children of women without previous preterm births, the costs were significantly higher. 52% of the women with previous preterm births were delivering their fourth or more child, and 41% smoked, compared to a smoking rate of 29% in the mothers without a preterm birth.

## Source Data

Data for this paper comes from the Ohio Medicaid Decision Support System analytical database of Medicaid claims and eligibility, and natality datasets provided by the Ohio Department of Health, Bureau of Vital Statistics. Where information is reported for Medicaid enrollees and Non-Medicaid populations, unless otherwise referenced, it is taken from vital statistics sources. Where the data is specific to the Medicaid population and not available in the vital statistics records, the information is taken from the Ohio Medicaid Decision Support System.

## Birth Certificate Format Change

In 2006, Ohio began using an updated national birth certificate format. Most information in this report has been collected consistently across the years. Where differences exist that affect the results, they are noted in the text. For more information about the change in birth certificate formats, please refer to the Ohio Department of Health, Bureau of Vital Statistics.

## Reporting of Rates

This paper reports two types of rates, crude rates (also called specific rates) and adjusted rates (or directly standardized rates). Crude rates are the number of events divided by the number of people who could have had the event in the study year. For example, the crude rate of premature delivery is the actual number of premature births divided by the actual number of total births in the year. Adjusted rates are calculated numbers to allow comparisons of two different populations or times. Calculations of adjusted rates noted in the text and tables were made by taking a weighted average of women in each age, race, ethnicity, and marital status category, based on the proportions of these women represented in the year 2000 Ohio natality statistical file. The adjusted rate answers the question, “what would the rate be if the women giving birth in the groups under study had the same demographic characteristics as the women giving birth in 2000?” This can be useful in comparing populations across years, or when comparing two populations that have different demographic characteristics, such as Medicaid recipients and those not receiving Medicaid.

**Technical note:** Standardized rates in this report, unless stated otherwise, are based on four-year age brackets, three race categories (black, white, other), Hispanic ethnicity, and marital status as reported in the vital statistics 2000 Ohio natality statistical file. Demographic categories not represented in year 2000 births were assigned an infinitesimal proportion ( $1^{-15}$ ) to ensure propagation through database queries during analysis. This does not impact reported adjusted rates at any reported level of significance.

## Interpreting Relative Risk

Adjusted relative risk measures presented in this paper, except when noted, are calculated as the adjusted proportion of occurrence in the Medicaid paid-birth population divided by the adjusted proportion of occurrence in the non-Medicaid birth population. A relative risk near one indicates that the likelihood of occurrence is the same for both populations. An adjusted relative risk score greater than one reflects a greater likelihood of occurrence in Medicaid paid births, less than one reflects a lower likelihood of occurrence in the Medicaid population. For example, a relative risk of 2.00 indicates that the outcome is twice as likely in the Medicaid population. A relative risk of 0.33 implies that the outcome is one-third as likely in the Medicaid population. Taking the inverse of the relative risk will change the meaning such that for the previous example of 0.33,  $1/0.33 = 3.00$ , and the interpretation

would be that the outcome is three times as likely in the non-Medicaid population. The two statements are equivalent.

### **Record Linkage**

Birth certificates are linked to Ohio Medicaid claims for birth admissions through probabilistic record linkage with LinkPlus software available from the CDC (<http://www.cdc.gov/cancer/npcr/tools/registryplus/lp.htm>) Multiple linkages are conducted on numerous demographic variables, with manual review.

For each year reported in this study, birth certificates are identified and linked for 96-98% of birth admission claims. The record linkage for 2002 and 2003 births was updated using the methodology above, yielding increased linkage rates (the prior 2002 linkage rate was 77.5%). This explains discrepancies between this report and earlier reports.

As record linkage still does not find all birth certificates associated with Medicaid birth admission claims, there is slight under-reporting for Medicaid births from the birth certificate files. Unpublished work by Donald Reed of the Ohio Department of Health identifies a bias against identifying mothers with certain bad outcomes of pregnancy during record linkage. This would imply that the under-reporting slightly reduces the reported rates of bad outcomes for Medicaid recipients.

Infant death certificates are linked to birth certificates by the Ohio Department of Health, Bureau of Vital Statistics. Details of that linkage can be obtained by contacting the bureau.

## **Appendix II: Eligibility Categories**

Medicaid eligibility can be grouped into two general categories: Covered Families and Children (CFC) and coverage for people who are Aged, Blind, or Disabled (ABD). When a family is determined to be eligible for cash assistance in Ohio, members of the family also receive Medicaid coverage. Many other families, pregnant women, and children can receive Medicaid coverage even if they are not receiving cash assistance. Eligibility for these consumers depends on their family composition and income. Descriptions of the two CFC Medicaid eligibility groups (Healthy Families and Related and Healthy Start) as well as the ABD eligibility group appear below.

### **Healthy Families and Related (HFM)**

HF and Related is largely comprised of single-parent families, but also includes some two-parent families and some children with independent eligibility. This sub-group includes Healthy Families, Transitional Medicaid, and Other Related Groups.

#### **Healthy Families**

Previously known as Low Income Families (LIF), provides health care coverage to families (parents and children). The majority of families receiving Healthy Families coverage are working families. A smaller group receives Ohio Works First (OWF) cash assistance. On July 1, 2000, Healthy Families coverage was expanded to families earning up to 100% of the Federal Poverty Level (FPL).

#### **Transitional Medicaid**

Transitional Medicaid provides Medicaid coverage for families who have received Healthy Families coverage (with or without associated OWF cash assistance) in at least three months of the prior six month period, and who have lost coverage due to: an increase in hours of employment or income from employment; or loss of time-limited income disregards. Transitional Medicaid is offered as an incentive for parents to return to or continue work. Under this program Medicaid eligibility is guaranteed for six months, and can be extended an additional six months if monthly income is less than or equal to 185% FPL.

#### **Other Related Groups**

Includes children who receive Foster Care Maintenance or Adoption Assistance under federal Title IV-E provisions. These children automatically receive Medicaid coverage. Also covered are state-subsidized adoptive children who have special medical needs and foster care children. Individuals aged 19 and 20 whose family income does not exceed the OWF income standard and who would qualify for an OWF payment, except they are over age 18 and do not meet the definition of a dependent child, are also covered.

### **Healthy Start**

The second sub-group of the CFC category, Healthy Start, consists of pregnant women and children who are not eligible for Medicaid through the Healthy Families assistance categories.

### **Pregnant Women**

Provides time-limited coverage to low-income pregnant women with family incomes at or below 150% of poverty. Coverage begins following confirmation of pregnancy and ends 2 months following birth. In determining financial eligibility, the number of babies expected as a result of the pregnancy is included in the calculation of the woman's family size.

### **Infants and Children**

Healthy Start provides health care coverage for children from birth through age 18 in families with incomes up to 200% FPL. Children in families with incomes at 151-200% FPL are eligible only if they do not have creditable health coverage. Children in families with incomes at or below 150% FPL are eligible regardless of other health coverage. Newborns are deemed eligible for 12 months if the mother was eligible for Medicaid at the time of birth, regardless of subsequent changes in the mother's income.

### **Ohio's State Health Insurance Plan for Children (SCHIP)**

As part of the Medicaid expansion of the Healthy Start program, Medicaid eligibility was increased for children up to 150% of FPL on January 1, 1998. In July 2000, Ohio further expanded Healthy Start under SCHIP. This expansion raised the income limit for eligibility up to 200% FPL. For this second SCHIP expansion, there was no complementary Medicaid expansion for the under-insured children, so children in this income range (151-200% FPL) are only eligible if they are uninsured.

### **Aged, Blind, and Disabled (ABD)**

This category includes persons, including children, with a wide variety of disabilities, such as blindness or mental retardation or mental illness, and includes certain physical disabilities. Not all Medicaid-covered persons with disabilities become eligible through the ABD category. Some individuals with disabilities are not substantially impaired by their conditions and do not qualify through this category, but instead qualify because of limited income through Healthy Families or Healthy Start.