

# The excess cost of premature or low birthweight births and complicated deliveries to Medicaid



## Contents

02	Introduction
03	Methodology
03	Premature infant definition and exclusions
03	Maternal definition and exclusions
04	Findings
04	Healthcare utilization for premature or low birthweight newborn
05	Healthcare costs for maternity care
05	Healthcare utilization for maternity care
05	Conclusions
06	Study limitations

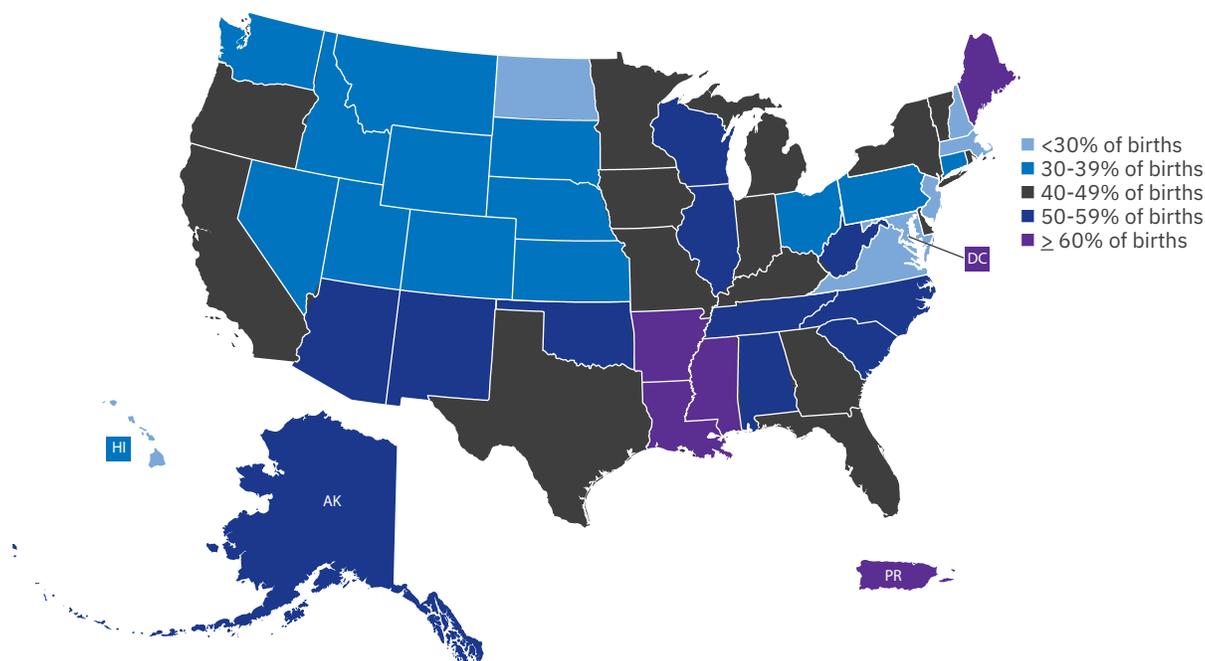
## Introduction

In the United States, one out of every nine newborns is considered premature—born before 37 weeks of gestation<sup>1</sup>. Preterm birth is associated with an increased probability of long-term digestive and respiratory problems, sight and hearing loss, cerebral palsy, developmental delays, intellectual disabilities, and infant mortality<sup>1</sup>.

While preterm birth rates in the US have declined in recent years, they still represented 11.5 percent of all deliveries in 2012<sup>2</sup>. Rates ranged from 8.8 percent in Vermont to 16.9 percent in Mississippi<sup>2</sup>. The US rate is well above the 7.1 percent average in European countries,<sup>3,4</sup> suggesting there is room for improvement.

Medicaid, a joint federal-state program, is a major source of public financing for the care of pregnant women and deliveries, accounting for roughly half of all deliveries<sup>2</sup>. States contribute a substantial portion of associated healthcare costs (Figure 1).

Figure 1: Percentage of births covered by Medicaid, by state



Source<sup>2</sup>: March of Dimes research, as presented in Women's Health Issues 2013;23(5):e273-e280

In 2013 Truven Health Analytics®, acquired by IBM® in 2016 and now part of the IBM Watson Health™ business contracted with the March of Dimes® to quantify the costs of prematurity and complicated deliveries in the US. For this study, researchers reviewed paid claims from the MarketScan® Research Databases (now IBM® MarketScan® Research Databases), focusing on Medicaid-funded births in 2009.

To understand the comprehensive costs, analyses included not only the initial hospital delivery, but also the cost of medical care through one year after birth. Maternal costs refer to prenatal and postpartum care, including prescription drugs and inpatient and outpatient services. Costs for the baby covered the same range of services for all conditions, not limited to birth-related care.

The study documented the excess cost associated with preterm births among Medicaid participants. This report provides an overview of the study's methodology and findings.

## Methodology

Study researchers performed cross-sectional analyses of administrative claims using data from the 2008–10 MarketScan Multistate Medicaid Database. This database includes all types of Medicaid plans in a cross-section of states, encompassing approximately 6.7 million covered lives per year.

The study featured a retrospective claims analysis focusing on two analytic goals:

- Comparing the healthcare costs of uncomplicated newborns to those of preterm or low birthweight babies at delivery and in the year following birth.
- Comparing the prenatal, delivery and obstetric costs of mothers with uncomplicated versus complicated deliveries in the nine months prior and three months following birth.

Healthcare costs were the gross payments to providers by Medicaid. All costs were inflation-adjusted to 2011 dollars based on the Bureau of Labor Statistics Consumer Price Index<sup>5</sup>.

## Premature infant definition and exclusions

This study identified births between January 1 and December 31, 2009. Newborn births, regardless of how delivered, were classified using Diagnosis Related Groups (DRGs) and ICD-9-CM diagnosis codes as premature or low birthweight, complicated (significant complications, comorbidities, congenital defects) and uncomplicated.

Excluded from the study were newborns whose delivery records did not indicate a diagnosis code in the range of V30-V39, were greater than one year in age, had claims bundled with their mother's or who had multiple birthdates listed in the study year.

## Maternal definition and exclusions

The study identified mothers who gave birth between Jan. 1 and Dec. 31, 2009. A complicated delivery, as distinct from a complicated birth, was defined as any birth record coded with a DRG of 765 (cesarean section with complications or comorbidities) or 774 (vaginal delivery with complicating diagnoses).

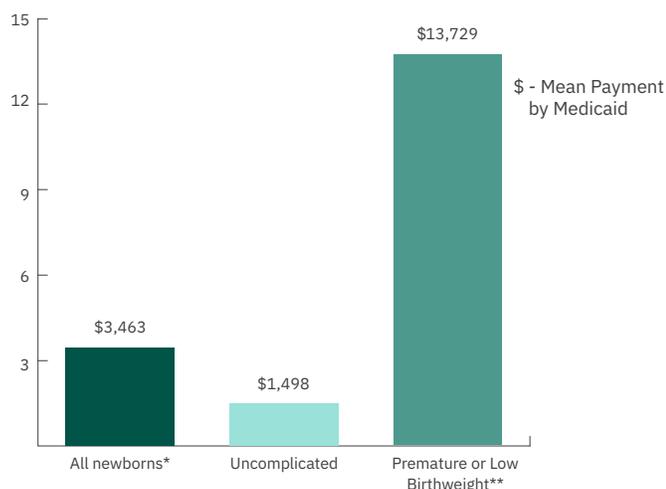
Individuals who were coded as male, women in families that appeared to have two birth mothers, women whose age was recorded as less than 15 years or more than 55 years, and mothers with more than one delivery within a year were excluded from the study.

# Findings

## Healthcare costs for premature or low birthweight newborns

As noted in Figure 2 below, in 2009, of the 198,841 newborns identified in this study, 12.6 percent were classified as premature or low birthweight (n=24,971). After adjusting for inflation, the average Medicaid payment for all newborns was \$3,463. In sharp contrast, Medicaid costs for premature or low birthweight infants were more than nine times as high as those for uncomplicated newborns (\$13,729 and \$1,498, respectively).

Figure 2: Average newborn healthcare costs to Medicaid, uncomplicated versus premature or low birthweight

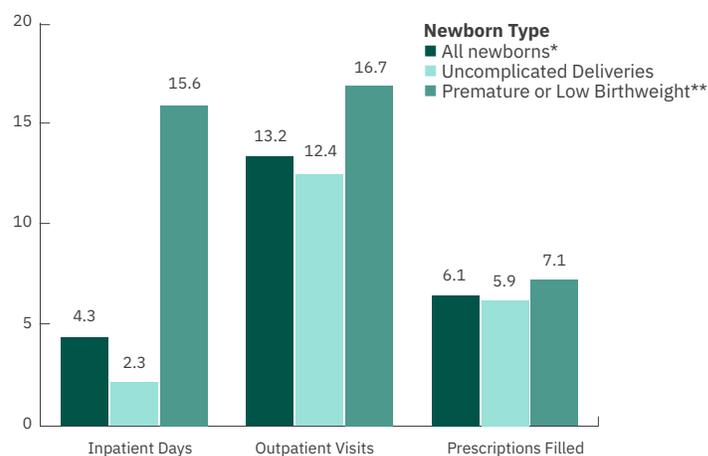


Source: MarketScan Database 2008–2010 Medicaid  
 \* Includes complications, comorbidities, congenital defects.  
 \*\* Premature, low birthweight or both.  
 Excludes complications, comorbidities and congenital defects.

## Healthcare utilization for premature or low birthweight newborns

Under Medicaid, healthcare utilization was far greater among premature or low birthweight newborns than for uncomplicated newborns (Figure 3). On average, premature or low birthweight infants spent 15.6 days in the hospital during the first year of life versus 2.3 days for uncomplicated newborns. Premature or low birthweight infants also had 4.3 more outpatient visits and 1.2 more prescriptions filled, on average.

Figure 3: Average healthcare utilization for Medicaid newborns, uncomplicated births versus premature or low birthweight

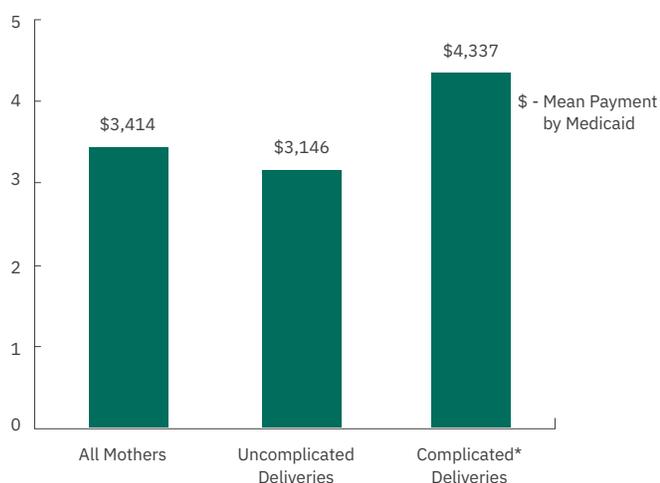


Source: MarketScan Database, 2008–2010 Medicaid.  
 \* Includes complications, comorbidities, congenital defects.  
 \*\* Premature, low birthweight or both.  
 Excludes complications, comorbidities and congenital defects.

## Healthcare costs for maternity care

Healthcare costs to Medicaid for term- and preterm-delivery maternity care (including delivery costs, prenatal care during the 9 months prior to birth and postpartum care for the 3 months following delivery) averaged \$3,414 for all mothers in the sample, regardless of the complication status of their deliveries (Figure 4). The Medicaid-paid healthcare costs for mothers associated with complicated deliveries were substantially higher (\$1,191 in additional costs) than uncomplicated deliveries.

Figure 4: Average maternal costs to Medicaid, uncomplicated versus complicated delivery



Source: MarketScan Database, 2008–2010 Medicaid.

\* Any delivery coded with a DRG of 765 (cesarean section with complications or comorbidities) or DRG of 774 (vaginal delivery with complicating diagnoses)

## Healthcare utilization for maternity care

Under Medicaid, mothers with complicated deliveries had higher average numbers of inpatient days, outpatient visits and prescription drug utilization than mothers with uncomplicated deliveries. Complicated deliveries were associated with an additional 1.4 days of hospitalization, 2.4 additional outpatient visits and 3.5 additional drugs filled in the 9 months preceding and 3 months following delivery (Figure 5).

Figure 5: Average maternal utilization under Medicaid, uncomplicated versus complicated delivery



Source: MarketScan Database, 2008–2010 Medicaid.

\* Any delivery coded with a DRG of 765 (cesarean section with complications or comorbidities) or DRG of 774 (vaginal delivery with complicating diagnoses)

## Conclusions

Newborns and mothers incur high healthcare costs for premature or low birthweight births and for complicated deliveries. In a subset of matched mothers and babies, total Medicaid payments were \$19,971 if the baby was premature or of low birthweight. That is nearly \$14,000 above the average cost for the pair when the baby was born at term with a healthy weight and without other complications, comorbidities or congenital defects.

Extrapolating the difference in Medicaid payments from the matched sample of mothers and babies to all premature or low birthweight births funded by Medicaid yields a rough estimate of more than \$3 billion in excess payments. Public health efforts to reduce prematurity will be important to curbing these costs. As states continue to increase their focus on prematurity prevention, reductions in premature births could yield substantial savings to the Medicaid programs and other payers.

## Study limitations

In this study, we acknowledge two limitations concerning the data. First, the study population represents a convenience sample. Although the sample is large, convenience sampling inevitably carries some error. Secondly, administrative claims data are subject to inaccuracies in coding and may be based on incorrectly documented care.

Some women whose births are covered by Medicaid enroll in the program only after several months of pregnancy. We therefore included women who had as little as 6 months of continuous enrollment in Medicaid prior to birth. Our figures will understate total maternity costs if the women received prenatal care prior to enrollment.

We found an average rate of preterm birth of 12.6 percent in our sample, somewhat greater than the national average of 11.7 percent. The sampled states may have unusually high rates, or mothers with Medicaid may have higher rates than privately insured or uninsured mothers. Additional research would be needed to determine the impact of these factors.

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## Footnotes

1 Preterm Birth, Centers for Disease Control and Prevention (CDC). [www.cdc.gov/reproductivehealth/MaternalInfantHealth/PretermBirth.htm](http://www.cdc.gov/reproductivehealth/MaternalInfantHealth/PretermBirth.htm) (accessed Feb. 10, 2014).

2 Markus AR, Andres E, West KD, Garro N, Pellegrini C. Medicaid covered births, 2008 through 2010, in the context of the implementation of health reform. *Women's Health Issues* 2013;23(5):e273-e280. [http://www.whjournal.com/article/S1049-3867\(13\)00055-8/fulltext](http://www.whjournal.com/article/S1049-3867(13)00055-8/fulltext) (accessed Sept. 19, 2013).

3 European Foundation for the Care of Newborn Infants. European benchmarking report. [http://www.efcni.org/fileadmin/Daten/Web/Brochures\\_Reports\\_Factsheets\\_Position\\_Papers/benchmarking\\_report/EFcni\\_report\\_light\\_copyright.pdf](http://www.efcni.org/fileadmin/Daten/Web/Brochures_Reports_Factsheets_Position_Papers/benchmarking_report/EFcni_report_light_copyright.pdf) (accessed Sept. 19, 2013).

4 Born Too Soon Executive Summary Group. Executive summary for Born Too Soon: The global action report on preterm birth. March of Dimes, PMNCH, Save the Children, World Health Organization. 2012. [http://www.who.int/pmnch/media/news/2012/preterm\\_birth\\_report/en/](http://www.who.int/pmnch/media/news/2012/preterm_birth_report/en/)

5 US Department of Labor, Bureau of Labor Statistics, <https://www.bls.gov/cpi/>

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