

# Potential Medicaid Cost Savings from Maternity Care Based at a Freestanding Birth Center

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## Abstract

## Objectives

Medicaid pays for about half the births in the United States, at very high cost. Compared to usual obstetrical care, care by midwives at a birth center could reduce costs to the Medicaid program. This study draws on information from a previous study of the outcomes of birth center care to determine whether such care reduces Medicaid costs for low income women.

## Methods

The study uses results from a study of maternal and infant outcomes at the Family Health and Birth Center in Washington, D.C. Costs to Medicaid are derived from birth center data and from other national sources of the cost of obstetrical care.

## Results

We estimate that birth center care could save an average of \$1,163 per birth (2008 constant dollars), or \$11.6 million per 10,000 births per year.

## Conclusions

Medicaid is the leading payer for maternity services. As Medicaid faces continuing cost increases and budget constraints, policy makers should consider a larger role for midwives and birth centers in maternity care for low-risk Medicaid pregnant women.

**Keywords:** Cost effectiveness analysis, cost, utility, benefit cost, maternal and perinatal care and outcomes, birth centers, obstetrical costs, midwifery, Medicaid

## Background

The Medicaid program is a crucial payer for prenatal care, delivery, and newborn services. In 2008, Medicaid paid for 40 percent of births nationwide, rising to 48 percent by 2010 (Markus, Andres, West, Garro, & Pellegrini, 2013). Yet states face an environment of rapidly increasing use of technology and escalating costs for obstetrical care. In particular, recent increases in Cesarean section and pre-term birth rates have contributed to higher costs for Medicaid and other payers (Martin *et al.*, 2010; Bettegowda *et al.*, 2008).

One option may be to provide midwifery care in freestanding birth centers for more Medicaid deliveries. Freestanding birth centers provide prenatal care and, when appropriate, delivery care at the birth center or at a hospital. There were 217 free-standing birth centers in 2011 in the U.S.<sup>1</sup> A recent study showed that 30 of 44 states responding to a survey covered deliveries at birth centers under Medicaid (Ranji, Salganicoff, Stewart, Cox, & Doamekpor, 2009). In addition to potentially improving care for low-income women, birth center care may reduce costs compared to usual care (Schroeder *et al.*, 2012). To date, the costs of birth center care for low-income women have not been rigorously evaluated in the United States.

Cost studies and comparative effectiveness research are becoming increasingly used for evaluating health services in the U.S. and

abroad (Rawlins, 2013; Garber & Sox, 2010; Russell, Gold, Siegel, Daniels, & Weinstein, 1996; Chalkidou & Anderson, 2009). Through such analyses, the outcomes and costs of alternative health services are compared in order to make a judgment about which is a better investment. However, both costs and effects are difficult to calculate accurately for a variety of reasons (Tan-Torres Edejer *et al.*, 2003).

The first and more difficult challenge is measuring the impact of birth center care relative to usual care on factors that drive costs, in a manner that controls for differences in social risk, medical risk, and other differences in the women who receive care in the two settings. Women served in birth centers are generally at lower medical risk, and it would be inappropriate to compare costs without controlling for differences in risk. The second challenge is measuring the relevant components of costs, particularly the individual components that vary according to the type of maternity care received.

This paper provides new evidence of the cost of birth center care relative to usual care for low-income women enrolled in Medicaid. It does this by estimating relevant cost components from a variety of data sources and applying the cost estimates to women receiving birth center care and women not receiving birth center care, but who have been reweighted to have nearly identical demographic characteristics and observed risk factors. The information in this paper is timely, because the Centers for Medicare & Medicaid Services (CMS) recently launched a new national demonstration initiative, called Strong Start, to reduce the rate of early elective deliveries and to test the effectiveness of specific enhanced prenatal care approaches.

## Methods

### Estimates of the Effect of Birth Center Care on Outcomes

In order to estimate the effects of birth center care compared to usual care, we use findings from a prior quantitative case study of maternal and infant health outcomes at the Family Health and Birth Center (FHBC) in Washington, D.C. More detail on the methods for the outcomes analysis is provided in another journal article (Benatar, Garrett, Howell, & Palmer, 2013). The FHBC study uses propensity score reweighting methods to create a comparison group that, when weighted, has nearly identical observed characteristics as the birth center group. The study found that the FHBC led to lower C-section rates and lower rates of pre-term delivery.

The FHBC study controls carefully for risk selection, which has been a problem in previous studies of birth center care. Risk selection can occur when women who choose to go to the birth center are at higher or lower risk for poor birth outcomes than the comparison group. Also, women may be transferred away from birth center care because they develop a health problem. Some previous studies have excluded such transfers from the birth center sample. In addition, some studies have included only women who deliver at the birth center, which excludes women with high-risk hospital deliveries. In this study, all women who delivered singleton births with a gestational age of at least 24 weeks and received a minimum of two prenatal visits at the birth center between 2005 and 2008 are included in the “birth center care” group (N=875).<sup>2</sup> The birth center group retains women ever followed at the birth center, regardless of where they delivered (hospital or birth center). Birth certificate data were matched to a list of birth center clients, providing data on outcomes.

A “usual care” comparison group was constructed using birth certificate data for other women who gave birth in the District of Columbia during the study period (2005–2008). Women who had fewer than two prenatal visits or who delivered at less than 24 weeks gestation were excluded from the comparison group, since there are no women with those characteristics in the birth center sample. The birth certificate variables used in the propensity score model include maternal education, race/ethnicity, maternal age, parity, zip code of residence, and medical risk factors prior to pregnancy. Propensity score reweighting was used to construct a weighted sample with nearly the same distribution of observable characteristics as the birth center group. To address potential selection related to unobserved differences between the two groups of women, we conducted sensitivity analysis using an

instrumental variables approach and found essentially the same impact of birth center care on outcomes as the propensity score analysis. More information about the methods and results from the FHBC study is contained in [Benatar et al., \(2013\)](#).

## Estimates of the Cost of Birth Center Care and Usual Care

We use the outcomes experience from the birth center group and the matched usual care comparison group, along with a variety of proxy measures of Medicaid costs nationally in 2008, to estimate what national Medicaid savings would be if low-risk Medicaid obstetrical care was provided with the midwifery model of care used at the FHBC. Costs are estimated from the Medicaid payer perspective and do not include all societal costs.

[Exhibit 1](#) shows the approach to estimating four types of cost, which are the major cost components for the obstetrical episode (which includes prenatal care, delivery, and postpartum care). These include physician costs, midwife costs, maternal and infant hospital costs, and birth center costs. Hospital costs include all hospital facility and personnel costs that are charged to Medicaid. Average hospital costs also include estimated neonatal intensive care unit (NICU) costs for both cohorts of women, using the infant gestational age at birth derived from birth certificate data.<sup>3</sup> National costs for birth center care are not available, so estimates come from the Family Health and Birth Center. This could lead to an overestimate of birth center costs nationally, since average health costs per capita in the District of Columbia were higher than all other states in 2009 ([Kaiser Family Foundation, 2013](#)).

Cost Category	Estimation Source	Estimation Approach
Physician	Medicaid average	Adjusted to reflect a 10% increase in Medicaid physician fees
Midwife	2008-2009 birth center data	Adjusted to reflect a 10% increase in Medicaid physician fees
Maternal and infant hospital	2008-2009 birth center data	Adjusted to reflect a 10% increase in Medicaid physician fees
Birth center	2008-2009 birth center data	Adjusted to reflect a 10% increase in Medicaid physician fees

**Exhibit 1**  
**Methods for Estimating 2008 Cost to Medicaid for Birth Center Care and Usual Care**

While these are the major components of the cost of care, there are other smaller cost components for which data are not available. For example, the hospital cost data do not detail transportation costs. Since inpatient care dominates the cost of the obstetrical episode, the effect of this exclusion is small.

For usual care, all women are assumed to be cared for by physicians throughout pregnancy and delivery. For birth center care, women delivering vaginally are assumed to be followed by midwives throughout pregnancy and delivery. Using the experience of the FHBC, 81.5 percent of them are assumed to deliver at a hospital, while the remainder deliver at the birth center. The costs of birth center women who deliver via Cesarean section are assumed to be the same as women who receive usual care.

When we have limited or no national data, we have taken an approach that minimizes differences between usual and birth center care. Therefore, the resulting estimate of the per-delivery cost differences between birth center and usual care is likely an underestimate.

## Findings

[Exhibit 2](#) compares differences in outcomes for birth center care and usual care, derived from propensity score reweighting. As shown, women receiving usual care are significantly more likely to have a Cesarean section (29.4 percent vs. 19.7 percent) and less likely to have a vaginal birth after Cesarean section (9.4 percent vs. 26.7 percent). Also, their lower rate of weekend delivery suggests that more usual care deliveries are scheduled (i.e., either induced or delivered by scheduled Cesarean section) than birth center births, which are almost evenly distributed across the days of the week. Women receiving usual care are significantly more likely to deliver preterm (11.0 vs. 7.9 percent) primarily due to a higher prevalence of late preterm delivery, and they have lower birth weight infants on average for all preterm births (3166 grams vs. 3245 grams) and for term births (3282 grams vs. 3325

grams).

Exhibit 2		Differences in Outcomes Between Usual Care and Birth Center Care	
	Usual Care (N=42,087)	Birth Center Care	
<b>Maternal Outcomes</b>			
Cesarean Section	25.7%	15.8%	
% Vaginal Birth after Cesarean <sup>†</sup>	5.9%	26.7%	
Maternal Mortality	20.9%	20.6%	
<b>Infant Outcomes</b>			
Weight	11.0%	7.3%	
Average Birth Weight (lb) (mean)	10.0%	10.1%	
Average Birth Weight at Term (mean) <sup>††</sup>	7.2%	7.2%	

**Exhibit 2**  
Differences in Outcomes Between Usual Care and Birth Center Care

Exhibit 3 shows the resulting cost estimates for each study group under usual care and birth center care. Estimated costs are shown separately for vaginal and Cesarean deliveries under either form of care and vaginal delivery cost estimates are separated by location—hospital or birth center—within the birth center care group only. Cost components include: maternal facility costs, infant facility costs, and physician or mid-wife costs (for the entire obstetrical episode, including prenatal, delivery, and post-partum care). NICU costs are included, as estimated from the gestational age distribution for each study group (see Appendix Exhibit A1).

Exhibit 3		Estimated Cost to Medicaid for Prenatal and Delivery Care for Women Served at Usual Care (Average Cost per Delivery), 2008	
Study Group	Usual Facility Costs	Maternal Facility Costs	Infant Facility Costs
<b>Usual Care (N=42,087)</b>			
Vaginal Birth (21,762)	\$2,100	\$2,000	\$1,150
Cesarean Birth (20,325)	\$2,200	\$5,150	\$1,450
Average Usual Medicaid Cost			
<b>Birth Center Care (N=4,000)</b>			
Vaginal Birth at Hospital (1,762)	\$2,100	\$2,000	\$1,150
Vaginal Birth at Birth Center (2,238)	\$2,000	\$1,000	\$1,000
Average Birth Center Medicaid Cost			

**Exhibit 3**  
Estimated Cost to Medicaid for Prenatal and Delivery Care for Women Served at Birth Centers and for Usual Care (Average Cost per Delivery), 2008

Exhibit A1		NICU Costs by Gestational Age, 2008	
Gestational Age	Average Charge	Proportion in Group with Special Care Discharge	
32	\$75,000	10.2%	
34	\$22,000	10.0%	
36	\$12,000	10.0%	
38	\$10,000	10.0%	
40	\$10,000	10.0%	
42	\$10,000	10.0%	
44	\$10,000	10.0%	
46	\$10,000	10.0%	
48	\$10,000	10.0%	
50	\$10,000	10.0%	

**Exhibit A1**  
NICU Costs by Gestational Age, 2008

The most expensive cost component is the maternal facility cost, whether the birth is at a birth center or a hospital. This varies from \$2,007 for a vaginal birth at the birth center to \$5,331 for a Cesarean delivery at a hospital under either form of care. Infant facility costs do not vary a great deal for within-hospital births under either form of care, but are much less for an infant born vaginally in a birth center, where the infant and mother do not stay overnight. Another important variation is the difference for vaginal delivery between usual care (\$1,331) and birth center care (\$930).

The result is an average cost estimate for a Medicaid delivery nationally in 2008 at \$7,218, while the average for a woman followed at a birth center is estimated to be \$6,055. This leads to an estimated average Medicaid cost-saving of \$1,163 per delivery, a 16 percent reduction when compared to usual care.

It is important to investigate what drives these savings in order to understand how policies could be changed to reduce costs and improve outcomes. There are four components of the cost difference between usual and birth center care: (1) differences in Cesarean section rates; (2) differences in the gestational age distribution of late pre-term and early term births and their associated NICU costs; (3) lower payments to midwives than to physicians; and (4) the cost of delivery at a birth center compared to a hospital delivery. Estimates of the savings from each component are derived from holding other differences constant and assuming no difference between the study and comparison group for the component being measured. For example, for the first cost component, Cesarean section rates are assumed to be identical between the two study groups, and the resulting cost saving is subtracted from \$1,163 in order to estimate the savings from differences in Cesarean section rates.

As shown in [Exhibit 4](#), the largest component of the cost difference (45.8 percent) comes from a small group of deliveries, those delivered at the birth center. Women and their infants do not stay overnight at the birth center. Rather they go home soon after delivery. Referring back to [Exhibit 3](#), it is evident that the majority of the cost difference for this component comes from the much lower maternal and infant facility costs for such births.

Source	Medicaid Cost Savings (\$/birth)	Total Cost Savings per 100 Births (\$/100)
Difference in Cesarean Section Rates	\$147	(25.7%)
Difference in Cesarean Section Rates	\$147	(25.7%)
Midwifery	\$163	(27.7%)
Lower Payments to Midwives	\$163	(27.7%)
Delivery at Birth Center Facility vs Hospital	\$163	(27.7%)
Total	\$474	(81.1%)

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The next two important components of the cost difference are lower payments to midwives vs. physicians (27.7 percent of the difference) and lower rates of Cesarean section for birth center births (21.0 percent of the cost difference). Only a small percent of the cost savings (5.6 percent) is due to the lower rate of late prematurity and early term birth in the birth center group (leading to lower NICU costs for births after 32 weeks gestation).

## Discussion

This study has compared the outcomes and Medicaid costs for prenatal and delivery care provided at a freestanding birth center to those of usual obstetrical care for a carefully matched comparison group. We find that the outcomes (prematurity, birth weight, and rates of Cesarean section) were better on average for the birth center group and that average costs were lower by \$1,163 per delivery.

Because of the large volume of Medicaid-funded births nationally, a per-delivery savings of just over a thousand dollars is a large total potential savings to the program, should all low-risk births be shifted into an alternative prenatal care and delivery setting that achieves a similar level of savings. The sources of the cost difference between usual and birth center care have implications for the types of interventions that could lead to similar (or higher) savings among Medicaid births nationally. To achieve the full savings, it would be necessary to: (1) reduce Cesarean section rates among Medicaid births; (2) pay delivery providers at the rate of midwives and/or increase the proportion of deliveries by midwives; (3) shift more deliveries to a setting where mothers and their infants do not remain overnight; and (4) reduce late preterm and early term delivery.

## Reducing Cesarean Section Rates

Rates of Cesarean section in the United States are higher than most other developed countries ([Organization for Economic Cooperation and Development, 2013](#)) and have risen since 2000 ([Menacker & Hamilton, 2010](#)). States have documented a similar trend for Medicaid births ([California Department of Health Care Services, Research and Analytic Studies Section 2010](#)). This rise in the Cesarean section rate has led to a Healthy People 2020 goal of reducing Cesarean births among low-risk women ([Healthy People, 2013](#)). Some past efforts to reduce the rate have been successful ([Flamm, Berwick, & Kabcenell, 1998](#); [Chaillet & Dumont, 2007](#)), but the rate continues to rise. Professional standards have changed, and babies that might have previously been delivered vaginally are now delivered by Cesarean section ([Declercq, Menacker, & MacDorman, 2006](#)). Several experts have noted a shift in norms towards higher use of technology at birth ([McCourt et al., 2007](#); [MacDonald, 2011](#)). Cesarean section is generally safe, although not as safe as vaginal delivery unless indicated by complications ([Declercq et al., 2007](#)). A scheduled Cesarean section can be convenient for obstetricians, other hospital personnel, and the family, yet the cost is about 50 percent higher for Medicaid than for a vaginal birth (see [Exhibit 3](#)).

It is evident from the results of the FHBC study that deliveries managed by midwives practicing in a birth center have lower rates

of Cesarean section, even when the large majority of the infants are delivered in a hospital rather than a freestanding birth center. Replicating these findings requires that the prenatal and delivery care providers for Medicaid women adopt norms for managing a low-risk delivery that are similar to those used by FHBC midwives—i.e., a lower technology model of care. Expanding the rate of midwifery care, either inside or outside birth centers, is an important potential policy initiative for Medicaid, although many barriers exist (Goodman, 2007).

### Shifting the Gestational Age Distribution Through Reduced Scheduling of Delivery

Reducing the rate of induction and scheduled Cesarean section is a goal of the March of Dimes (2011) as a means of reducing late prematurity. While only a small portion of the cost differences between birth center care and usual care are due to reduced NICU costs for birth center deliveries, improvements in the gestational age distribution are worthwhile for other reasons. One component of the federal Strong Start initiative is to reduce unnecessary inductions for Medicaid women.

### Lowering the Rate Paid to Obstetrical Providers

Lowering provider payments is a common policy alternative for Medicaid programs. However, this alternative will likely meet with stiff opposition from both midwives (who would like to be paid on par with obstetricians) and physicians. Indeed, increased Medicaid reimbursement to physicians has been used as a policy to improve provider participation, increasing access to prenatal care for Medicaid women. Thus, achieving substantial savings through reduced obstetrical provider fees is an unlikely policy alternative except as combined with expanded use of midwifery for normal pregnancies and deliveries.

### Delivery in a Birth Center Where Women and Infants Go Home on the Day of Delivery

Exhibit 4 shows that the most important component of cost savings derives from differential facility fees. These fees are substantially lower for birth center vaginal deliveries, where mothers and infants are discharged in less than 24 hours. Only 18.6 percent of women who receive some prenatal care at the FHBC elect to deliver at the birth center, but this group is responsible for almost half the overall cost savings. For those women who receive prenatal care at the birth center, but deliver (with birth center midwives) at the hospital, the cost impact is smaller, primarily attributed to different Cesarean section rates. Not all costs at the FHBC are covered by Medicaid fees (some are covered by grants and donations). Consequently, had Medicaid covered all birth center costs, the total Medicaid cost for birth center women would be somewhat higher.

While the first three policy alternatives (reduced rates of Cesarean section, reduced scheduling of deliveries, and reduced provider payments) could possibly be achieved without expanding birth centers, it is unlikely that the major savings from birth centers (reduced facility fees) would be achieved without a shift to birth center deliveries. A previous initiative to reduce the length of the delivery hospital stay quickly became politically contentious (Declercq & Simmes, 1997). Thus, an expansion of birth center care should be carefully considered and done through demonstrations that examine maternal and infant outcomes and costs. This is currently underway through the national evaluation of the CMS-funded Strong Start demonstration program.

### Financial Sustainability of Birth Centers

The Medicaid program could consider how to subsidize freestanding birth centers in order to achieve the improved outcomes of reduced Cesarean sections and reduced scheduled deliveries. This could include, for example, some form of cost-based reimbursement, such as for federally qualified health centers (FQHCs). On the other hand, such subsidies would reduce the savings to the Medicaid program.

### Limitations

There are several important limitations to this study. Most importantly, the data are based on results from a single observational study and should be replicated. In addition, while propensity score reweighting is used to develop the comparison group, and instrumental variable analysis is used as a sensitivity analysis, it is certainly possible that we do not control adequately for differences in risk. If the comparison group is at higher risk, our estimated cost differences are biased. For example, some women choose to have an elective Cesarean section and, thus, would not go to the birth center for prenatal care. They elevate the rate of Cesarean section deliveries in the comparison group to an unknown degree. The propensity score reweighting process is designed to produce a weighted comparison group of women at similarly low risk, but the method can only make the treatment and comparison groups similar on the limited number of clinical outcomes and other factors included in the birth certificate data. Finally, the cost data may be biased to an unknown degree. Some costs were excluded due to lack of data, such as transportation costs from the birth center to the hospital in the case of a complication. However, transportation costs are not high compared to the costs of hospitalization, which is included. Also, we did not have follow-up data to track outcomes and costs after delivery, such as the cost of readmission shortly after birth, for neither the study nor comparison group. Costs were estimated as described above using national averages rather than the specific costs for individual women.

## Conclusion

In summary, should the outcomes from the Family Health and Birth Center be replicable nationally, the birth center model of care could have a substantial impact on the cost of the Medicaid obstetrical episode, achieving on average a 16 percent reduction in costs for every pregnancy followed at a birth center (when compared to usual care), or \$11.64 million for every 10,000 Medicaid deliveries. However, an analysis of the components of this cost savings shows that achieving such a substantial savings is fraught with challenges. In addition, it will be important to replicate these findings through the expansion of the study to the evaluation of the cost of care in the large number of birth centers around the country that are participating in the Strong Start initiative.

## Disclaimer

The authors have no conflicts of interest related to this analysis. The content of this article is solely the responsibility of the authors and does not necessarily reflect the views of the Department of Health and Human Services.

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## Footnotes

<sup>1</sup>Personal communication with K. Bauer, American Association of Birth Centers, 2011.

<sup>2</sup>We include all who had two visits, since the first visit is usually not a visit for prenatal care, but rather an information session.

<sup>3</sup>We did not consider the higher costs for babies born before 33 weeks of age, since it is less likely that birth center care could impact delivery in that early pre-term period. More detail on cost-estimation is available from authors on request.

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