# SPENDING FOR LOW-RISK DELIVERIES IN MASSACHUSETTS VARIES TWO-FOLD, WITH NO MEASURABLE QUALITY DIFFERENCE

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## INTRODUCTION

- The Health Policy Commission's (HPC) past work and the work of many other state agencies have consistently documented variation among Massachusetts providers in both prices and practice patterns. A body of academic research has shown[1] that price variation is typically not related to indicators of higher value, such as quality of care or patient acuity.[2]
- Variation in the amounts paid to different providers for the same service or set of services without measureable differences in quality indicates a potential opportunity to decrease health care spending. This can be done either by shifting care to more efficient settings or by increasing efficiency and decreasing payments within a given setting. Moreover, variation in practice patterns may highlight opportunities to improve quality.
- Continuing the HPC's work on hospital-level variation in spending for an episode of care, the Commission presents here an analysis of both price variation and practice-pattern variation in spending for episodes of care for a normal pregnancy and delivery.
- Maternal care is an important service area for study given its high volume (29,191 commercial discharges in MA in 2014, the most common commercial discharge in 2014, based on the DRGs for normal vaginal delivery and for C-section without complications). In addition, maternal care is among the most common conditions for which consumers research and select providers in advance, potentially incorporating information on price, quality and convenience.

## RESEARCH OBJECTIVES

HPC determined the extent of spending variation in normal deliveries in Massachusetts and relate spending variation to variation in price, utilization, and quality. HPC also identified attributes of high-performing hospitals, defined by low spending and high quality, and examined the relationship an attending nurse midwife has on the spending for an episode of care.

## STUDY DESIGN

HPC examined hospital-level variation in total spending per episode of care for commercial patients, and focused on two components: 1) average procedure prices for vaginal deliveries and Caesarian sections (C-sections), and 2) the rate of C-sections for pregnancies that were unlikely to need interventions (Nulliparous Term Singleton Vertex—NTSV rate).[3,4]

The analysis of spending is based on data from the All-Payer Claims Database (APCD) for the three largest commercial payers in Massachusetts in 2011 and 2012 and includes only low-risk pregnancies. Analyses of the numbers of discharges draw on Massachusetts hospital discharge data. The hospital sample included all Massachusetts hospitals with greater than 15 discharges in the APCD, covering 6,806 deliveries. To study the price aspect of episode costs for maternity care, HPC examined procedure prices for vaginal deliveries and C-sections. The procedure price was defined as all spending from the admit date to the discharge date for the delivery inpatient stay. Certified Nurse Midwives (CNM) attended births was obtained from 2014 birth certificate data from the Massachusetts Department of Public Health. NTSV C-Section rates were gathered by the Leapfrog Group for 2012-3.

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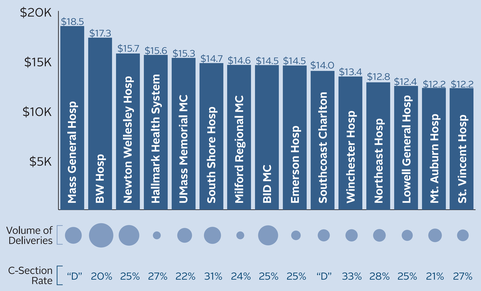
4. Molina G, Weiser TG, Lipsitz SR, et al. Relationship Between Cesarean Delivery Rate and Maternal and Neonatal Mortality. Jama 2015;314:2263-70.
5. Garvey M. The national birth center study II: Research confirms low Cesarean rates and health care costs at birth centers. Midwifery today with international midwife 2013:40, 68.
6. Kozhimannil KB, Hardeman RR, Attanasio LB, Blauer-Peterson C, O'Brien M. Doula Care, Birth Outcomes, and Costs Among Medicaid Beneficiaries. Am J Public Health 2013;103:e113-21.
7. Maternal, Infant, and Child Health | Healthy People 2020. 2016. at https://www.healthypeople.gov/2020/topics-objectives/topic/maternal-infant-and-child-health/objectives.)

## RESULTS

**EXHIBIT 1: Average spending for normal deliveries by hospital, selected hospitals, 2011-2012**

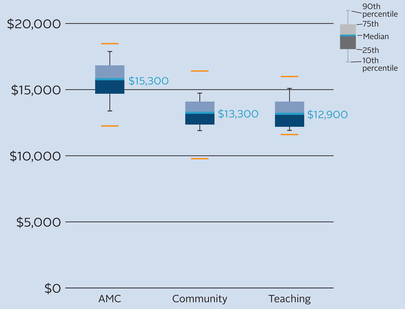



Note: This chart is limited to the 15 hospitals with the greatest number of normal deliveries paid by commercial payers in 2014. Both vaginal and C-section deliveries are included. "D" indicates that the hospital declined to voluntarily submit rates. C-section rate is the nulliparous term singleton vertex (NTSV) C-section rate.

Source: HPC analysis of the Massachusetts All-Payer Claims Database. 2011-2012, HPC analysis of Center for Health Information and Analysis Hospital Inpatient Discharge Database, 2014; Leapfrog Group 2012-2013

- Across the 43 hospitals in our sample, the average spending per episode ranged from $9,722 at the least expensive hospital to $18,475 at the most expensive hospital. Among the episodes examined, the average episode-level spending, including both vaginal births and C-sections, was $14,686, including an average $2,747 for prenatal care, $11,851 for delivery, and $88 following birth. The cost of the delivery itself constituted 80 percent of the episode-level cost, and drove 85-90 percent of variation in the cost of the episode.
- HPC also found that C-Sections were, on average, more expensive than vaginal deliveries. Episode-level spending for C-Sections was $17,054 per delivery, and vaginal births were $14,178 per delivery.
- High priced hospitals also had the most deliveries. In 2014, six hospitals accounted for 50 percent of births, and five of them had above-average episode costs for the commercial payers in our study. The two hospitals in the state with the highest costs per episode and together accounted for 23 percent of all births. Higher episode spending was not correlated with better quality outcomes, as measured by the neonatal injury rate and the obstetrical trauma rate.

**EXHIBIT 2: Average payments for normal deliveries by hospital type, all hospitals 2011-2012**

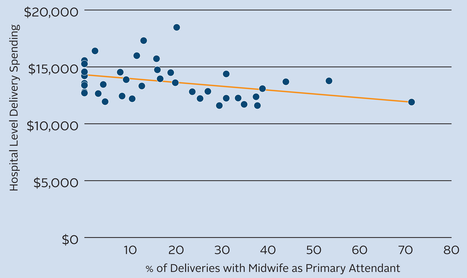



Note: Both vaginal and C-section deliveries are included in episode spending

Source: HPC analysis of the Massachusetts All-Payer Claims Database, 2011-2012

- When hospitals were grouped by type, episode costs were higher at academic medical centers (AMCs) than at major teaching or community hospitals. The average cost at an AMC, $16,359, was 27 percent higher than the average cost at major teaching hospitals and 16 percent higher than the average cost at community hospitals.

**EXHIBIT 3: Average payments and proportion of midwifery utilization, all hospitals 2011-2012**




Note: Both vaginal and C-section deliveries are included in hospital level delivery spending.

Source: HPC analysis of the Massachusetts All-Payer Claims Database, 2011-2012, Massachusetts Department of Public Health-Birth Certificate Data, 2014

- HPC also looked at hospital-level data to determine whether the utilization of Certified Nurse Midwives as the primary attendant was associated with spending. Hospitals with higher spending, on average, had lower rates of midwifery use during the delivery (r=-.313). However, impact was limited. A bivariate analysis showed that, on average, a 30 percentage point increase in midwifery utilization is correlated with a decline in hospital-level spending per delivery of approximately $1,000. While the analysis was unable to determine the effect of midwifery on quality, past research has shown that midwifery is associated with lower complication rate and C-section rate among delivering mothers, particularly in low income populations.[5,6]

**PRACTICE VARIATION IN C-SECTION**

- C-section rates varied among hospitals from a high of 42.7 percent to a low of 14.3 percent, with most hospitals above the federal target of 24 percent.[7]

## CONCLUSIONS

- For maternity care in Massachusetts, spending for low-risk births varies by a factor of two, and price variation is the primary driver of spending variation.
- There is no evidence that higher prices are offset by lower utilization or better quality.
- Despite payment reform efforts to date, volume continues to be concentrated in high-cost hospitals.
- The statewide NTSV C-section rate is higher than optimal. Hospital-level variation in C-section rates is substantial, but is not responsible for most spending variation.
- C-Sections are reimbursed at a higher rate compared to vaginal deliveries, and therefore incentives for providers appear to be misaligned. If payments for vaginal deliveries and C-Sections were equal, providers with low NTSV C-section rates would be rewarded for higher quality care.
- Preliminary analysis suggests that the use of midwives may be associated with better performance on cost and quality metrics. Future work will test this hypothesis more rigorously, drawing upon hospital-level variables regarding the rate at which midwives are used.

## POLICY IMPLICATIONS

- With over seven million discharges per year, maternal care represents one of the largest diagnostic groups in volume within the United States as a whole. Within Massachusetts maternal care represents the second largest share of spending in the commonwealth ($442 million).
- Healthcare policies that incentivize the utilization of lower cost providers– including both supply-side (global payment) and demand-side (reference pricing) policies – could result in substantial savings without offsetting effects on quality.
- A single blended payment for maternity care (covering both vaginal and Caesarian deliveries) could lower spending and create incentives for hospitals to reduce C-section rates.
- More research is necessary to determine the impact of midwifery care on cost and quality for a pregnancy episode.

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