COMMONWEALTH OF MASSACHUSETTS
HEALTH POLICY COMMISSION

TECHNICAL APPENDIX B3
HOSPITAL-LEVEL VARIATION IN SPENDING PER EPISODE OF CARE: NORMAL PREGNANCY AND DELIVERY

ADDENDUM TO 2015 COST TRENDS REPORT

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1 Summary

This technical appendix lays out the Health Policy Commission's (HPC) approach for examining hospital level variation for a pregnancy episode.

2 Sample

We used Massachusetts' All Payer Claims Database for the calendar year 2012 for our analysis. Our sample included commercially-insured Massachusetts residents enrolled in a comprehensive individual or group medical plan offered by one the three major commercial payers, Blue Cross Blue Shield, Harvard Pilgrim Health Plan, and Tufts Health Plan. Expenditures do not capture pharmacy costs or payments outside the claims system. For a description of the HPC's APCD analytic file and methods, please see:
http://www.mass.gov/anf/docs/hpc/apcd-almanac-technical-notes.pdf

2.1 Episodes of care

We used the Optum Symmetry Episode Treatment Grouper to group claims into unique episodes of care. Episode Treatment Groups (ETGs) are medically meaningful statistical units representing complete episodes of care. These episodes describe a recipient's observed mix of diseases and conditions, and any underlying co-morbidities and complications.

The following ETGs were used in our study:
- Episode Treatment Group 601100: Pregnancy, with delivery

2.2 Patient population and risk adjustments

The study sample was defined according to the following criteria:
- Only patients with a commercial payer
- Only complete episodes
- Only patients who are between 18 and 35
- Only patients who are classified as low severity (level 1) by the Optum ETG grouper
- Only patients whose delivery was during their first hospital stay for the episode
- Excludes outliers (all episodes in the top and bottom 2.5% of payments were cut out of the sample)

2.3 Attribution of patients to hospitals and hospital sample

To attribute an acute hospital to each episode, we created an anchor claim within an episode, which assigned all associated related claims to a certain facility.

For pregnancies, the anchor claim was first facility claim that indicated an overnight stay

The assigned hospital was the national provider identification on the anchor claim.

Only acute care facilities with greater than fifteen discharges were used in our analysis. We used a fifteen discharge threshold because we wanted to be consistent with prior hospital level spending variation analyses.

Hospitals were categorized by hospital cohort as defined by the Center for Health Information and Analysis.

For hospital cohort definitions—AMC vs. community vs. teaching—and system affiliation please see Technical Appendix A provided as part of this report.

2.4 Resulting dataset

The final sample consisted of 6,840 deliveries; 1,171 caesarian Sections, and 5,669 vaginal deliveries.

3 Payment variation calculation

3.1 Hospital Level Variation

We calculated two different average payments. One was the average payment for the procedure, and the other was the average payment for the episode.
1. The procedural payments were defined as all payments that occurred between the admit date and the discharge date.
2. The episode payments were defined as all payments before and after the procedure. This could include any readmissions, any post-acute care, and any pre-surgical consultations.

3.2 Cohort Level Variation

We further grouped hospitals in two different ways. We grouped hospitals into three different cohorts, AMC vs. community vs. teaching, using definitions constructed by the Center for Health Information and Analysis.

We also grouped hospitals into system affiliations based on their corporate affiliations in 2014 using the Registry of Provider Organizations.

For a detailed list on how hospitals were grouped, please refer Technical Appendix A.

3.3 Analysis of Variation

The estimate of the percentage of hospital-level variation in the cost of the episode resulting from hospital-level variation in the price of the procedure was created using hospital-level data on 1) mean price of the inpatient stay for vaginal delivery, 2) mean other spending for vaginal delivery, 3) mean price of the inpatient stay for C-section delivery, 4) mean other spending for C-section delivery, and 5) C-section rate, all from the 2011/2012 APCD with the study exclusions applied. We simulated the variation in episode-spending that would occur if 1 and 3 varied but 2, 4, 5 were at the state mean and compared this result to the observed episode-level variation.

3.4 Reference Price Simulation

To calculate savings from using a reference price, we pegged a reference price to the price of a normal delivery at Mount Auburn Hospital and assumed that all higher price hospitals would drop their price to the level of Mount Auburn. We used this to get our upper bound estimate. For our lower bound estimate, we assumed that a third of all deliveries would migrate to Mount Auburn Hospital.