CASE STUDY

FIRST-YEAR RESULTS OF A PILOT EFFORT AT A NONPROFIT MEDICAID HMO IN TEXAS

François de Brantes, MS, MBA | Karen Love, MHA

INTRODUCTION

In the summer and fall of 2014, the Association for Community Affiliated Plans sponsored a Bundled Payment Learning Collaborative that was supported by Bailit Health Purchasing and the Health Care Incentives Improvement Institute (HCI3)[1]. Along with eight other plans, Community Health Choice (CHC), a nonprofit Medicaid HMO, participated in the learning collaborative, and as a result, included a maternity care bundled payment pilot in its 2015 strategic initiatives.

HCI^3 collaborated with CHC to design, implement, and measure the program, and the experience—both during the process of executing Year 1 of the pilot, and upon review of the first year's outcomes—yielded insights valuable to other health care leaders. The observations and recommendations detailed in this case study include:

- The challenge of formulating comprehensive maternity-episode budgets for patients whose claims history is short or absent, and how to proceed in the face of that challenge
- The significance of the C-section rate in driving financial outcomes for deliveries, and the budget methodology that can provide an explicit incentive to reduce unwarranted C-sections
- The enormous effect even a few high-need, high-cost infants can have on a provider's actual costs, and ways to fairly moderate the effect these costs can have on a provider's potential gain or loss sharing, especially considering the discretion a provider has in nursery-level classification for each infant

1 HCI3 is now Altarum's Center for Value in Health Care.

ALTARUM | PROMETHEUS ANALYTICS®

BACKGROUND

CHC is a nonprofit Medicaid HMO serving more than 350,000 low-income members in southeast Texas, with a network of 76 hospitals and over 10,000 providers. CHC chose to pilot a maternity care bundled payment program for the following reasons:

- CHC has a 50 percent market share of births in the Greater Houston area;
- Alternative Payment Models are being driven and supported by key regulators of CHC's lines of business – mainly CMS and CMS/Texas Health and Human Services Commission; and,
- The opportunity to improve health outcomes for mothers and babies, while reducing plan costs, supports CHC's overall mission.

Taken together, CHC decided to pursue a maternity pilot for its STAR[2] population with two of its largest provider systems in Houston (each with 36 percent of CHC's deliveries): University of Texas Health (UTHealth) and University of Texas Medical Branch (UTMB). Despite the fact that they share similar names, both are separate systems with separate contracts for CHC maternity care bundles. As an aside, CHC began conversations with HCI3 prior to the conclusion of the Learning Collaborative and consequently executed a contract with HCI3 to help support the implementation methods and analytics required for a two-year pilot. This case study explores first year results and will conclude with *Lessons Learned*.

MATERNITY CARE BUNDLING CONTRACTING PARAMETERS

The first step in a bundled payment implementation is to analyze a minimum of two years of the most recent data available. This historical analysis serves to establish a baseline for a bundled payment "case rate," a budget for an episode of care. The analysis also provides both the provider(s) and the health plan insights regarding opportunities for compressing episode-cost variation and improving care delivery. The historical analysis also enables the plan and provider to make informed decisions around any negotiable aspects of the implementation. Prior to the start of the pilots, HCI[3] ran two years of historical CHC claims data through our PROMETHEUS Analytics© software program. Several meetings with the plan and providers followed, to review the data and jointly arrive at the negotiable parameters for the pilot implementation. These included:

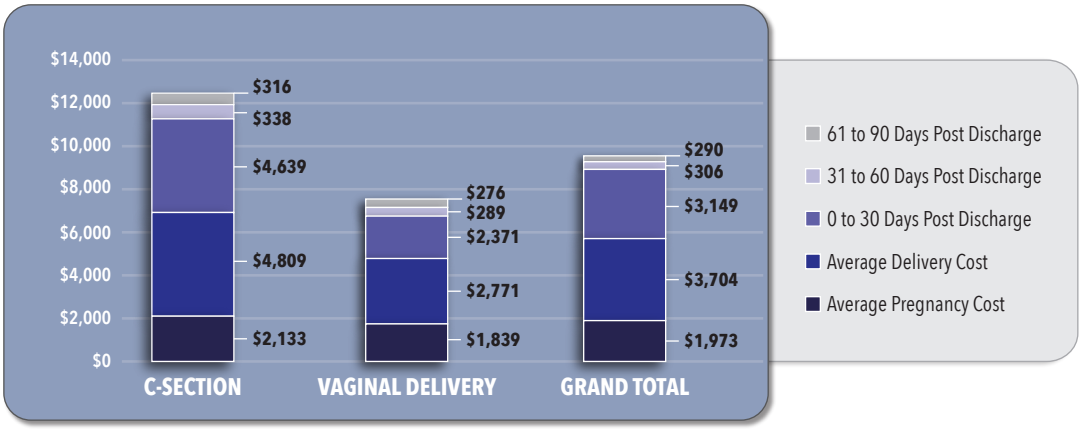
- Year 1 of the pilot would establish an upside only shared savings for the provider with a move in Year 2 to upside and downside risk
- Payments would continue to be made on a fee for service basis and a year-end reconciliation of expected (budget) to actual costs would reveal whether savings were achieved
- Shared savings would be split 50/50 in Year 1 between the plan and provider

2 STAR—Medicaid State of Texas Access Reform Program for low-income children and pregnant women.

- Quality measures would be collected for patients in Year 1 for setting a quality baseline but not used in the Year 1 shared savings determination
- Year 2 shared savings or losses would be determined based on a matrix that factors in change (improvement or decline) in quality outcome scores from Year 1 to Year 2
- The episode would consist of three components: prenatal care; delivery care; and the neonatal care. Episodes that resulted in nursery Level 4 NICU newborns would be excluded[3]
- The target budget for the delivery portion of the episode would be derived from a blended C-section and vaginal delivery rate based on the historical C-section rate
- The prenatal portion of the budget would be prorated to reflect the actual number of months of prenatal care provided from 0 to nine months
- Included episodes would be those where the provider practice was responsible for the delivery (regardless of whether prenatal care was provided by the delivering provider)

GRAPH 1: AVERAGE EPISODE COST PLAN-WIDE

EPISODE COST (All Providers, Nursery Levels 1, 2, 3)



Graph 1 shows the plan-wide historical analysis results for approximately 25,000 births in 2012 and 2013. The average episode cost for the prenatal, delivery and newborn segments using a blended section/vaginal delivery rate was $8,826 plan-wide.[4]This comprised an average cost of $1,973 for the prenatal segment, $3,704 for the delivery and $3,149 for the newborn.

3 Notably, for the reasons cited in the "Lessons Learned and Year 2 Implementation" section below, this nursery Level 4 exclusion was eliminated and replaced with a stop loss cap for the Year 2 implementation.

4 This includes newborn costs for only 30 days. Average costs were $9421 when including up to 90 days of newborn costs.

The delivery portion is a weighted average of the C-section and vaginal delivery costs. The historical C-section rate (36 percent for both providers) was used for the weighting. The risk adjustment models to determine the base rates and risk profiles for each of the two providers participating in the pilot were done using a provider specific subset of the plan-wide data to reflect provider specific prices and case mix.

MATERNITY EPISODE DEFINITIONS

Maternity Episode: The maternity episode comprised three individual episodes: pregnancy, delivery (C-section or vaginal delivery) and the newborn episode. The definition for each separate episode is described below.

Episode Triggers: The delivery itself acts as the "trigger" to launch the pregnancy episode in the PROMETHEUS Analytics© program. Both vaginal delivery and C-section episodes can be triggered off of inpatient, outpatient or professional claims containing a procedure code indicating vaginal delivery or C-section. Once a delivery episode is triggered, a pregnancy episode automatically triggers. The newborn triggers from an inpatient or outpatient claim containing a diagnosis code indicating a birth.

Episode Duration: The pregnancy and delivery bundle duration includes the episode windows for both the pregnancy and the delivery. The pregnancy episode itself begins up to 270 days prior to the date of delivery and ends with the date of delivery. The delivery episode (whether C-section or vaginal delivery) begins three days prior to the date of delivery (date of admission for inpatient deliveries) and ends 60 days post discharge from the delivery. The newborn episode begins on the date of birth and extends 30 days post discharge.

Subtypes: The pregnancy and delivery subtypes identify different types of pregnancies and deliveries based on the procedure(s) performed as well as underlying conditions, indicating the severity of the episode. Newborn subtypes are identified through diagnosis and revenue codes (to indicate the nursery level) that similarly indicate the severity of the episode. These subtypes help to identify expected variation and are used to help severity adjust the expected costs or budget for each patient.

Relevant Services: Services and costs associated with a pregnancy and delivery episode are grouped together to include the index stay (the stay that triggers the episode) or outpatient visit during which the delivery was performed, services related to the delivery, and all prenatal and postnatal care. As part of the pregnancy and delivery episodes, we evaluate services that are both typical or routine and considered part of expected care for pregnancies and deliveries (e.g., ultrasound, anesthesia) and those that are related to complications associated with pregnancies and deliveries (e.g. obstetrical trauma, fetal distress). C-sections and their related services are also assigned as complication costs within the pregnancy episodes.

Finally, acute myocardial infarction, stroke, pneumonia, and hysterectomy—which trigger their own episodes—also are associated back to the pregnancy and delivery episodes as complications to assure that these procedures and/or conditions and their treatments are included as part of the complete pregnancy and delivery bundle. The newborn episode includes all services that are provided to the newborn during the initial inpatient stay and for 30 days post discharge including any subsequent office or hospital visits.

For detailed episode definitions for *C-section, vaginal delivery, pregnancy and newborn* including the services and procedure and diagnosis codes that are included as triggers, relevant services, complications, and episode subtypes, see footnote.[5]

BUDGET CREATION, RECONCILIATION AND REPORTING

Determining the Episode Target Budgets: The budget and risk adjustment models were run separately using historical data from each of the two OB/GYN practices to reflect that practice's prices and patient case mix. Maternity episode budgets for CHC members who had deliveries by each of the two practices consisted of three separate calculations: expected pregnancy costs, expected delivery costs and expected newborn costs.

Expected Pregnancy Costs: The expected pregnancy costs were determined using the average prenatal care costs derived from the historical data for each provider and pro-rating that according to when the mother began receiving care. Initially we pro-rated the prenatal costs based on the number of weeks of care received, however, we found this method was too sensitive and resulted in large swings in costs. It was decided to base the pro-ration on months of care rather than weeks. This is measured by determining the difference between the delivery date and the first date of service during the pregnancy period. Graph 2 shows that across all CHC pregnancy episodes, the majority of the Medicaid mothers begin to receive care between the second and fifth month of their pregnancy. A substantial number of patients in this population did not receive care until the last trimester and some not until the last month. Despite receiving fewer weeks of care, the patients receiving care beginning in the last trimester have similar pregnancy expenditures as those receiving care beginning in the second trimester.

5 Pregnancy: http://www.hci3.org/ecr_descriptions/ecr_description php ?version=5.3.004&name=PREGN&submit= Submit;

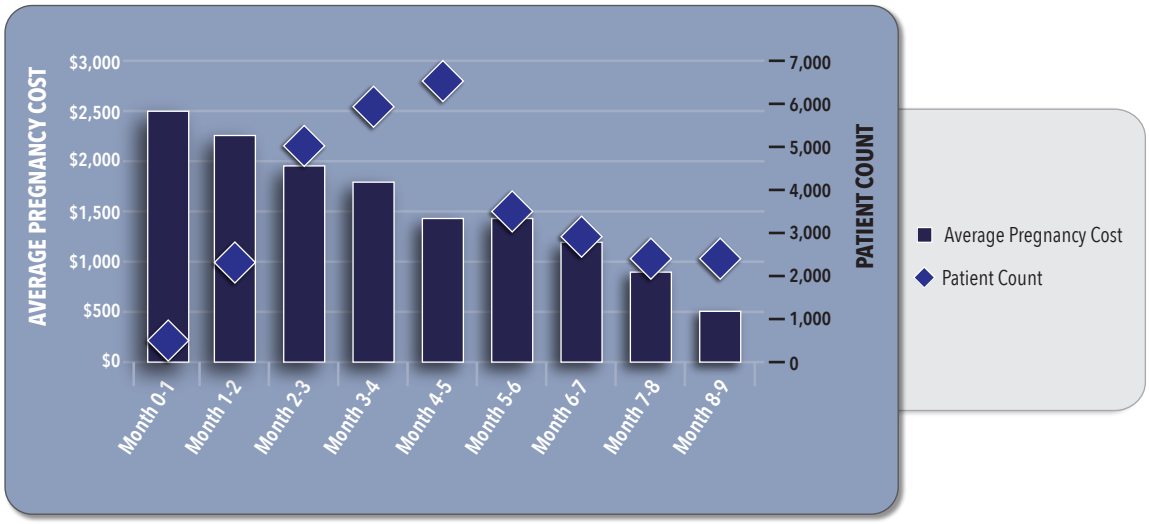
C-Section: http://www.hci3.org/ecr_descriptions/ecr_description.php?version=5.3.004&name=CSECT&submit=Submit;

Vaginal Delivery: http://www.hci3.org/ecr_descriptions/ecr_descriptionphp?version=5.3.004 &name=VAGDEL& submit= Submit;

Newborn: http://www.hci3.org/ecr_descriptions/ecr_description.php?version=5.3.006&name=NBORN&submit=Submit

GRAPH 2. PREGNANCY COSTS AND VOLUME BY MONTHS OF PRENATAL CARE

ALL PROVIDERS PREGNANCY COSTS



Expected Delivery Costs: The delivery budget for a patient was derived using coefficients from the logistic regression modeling of the historical data. A risk factor profile is created for each identified patient. That risk profile was plugged into the historical risk adjustment model to create separate risk-adjusted C-section and vaginal delivery budgets that are then brought together to create a weighted, blended single delivery budget using the provider's historical C-section rate. The risk factors that are part of the model include:

- ***Patient Demographics:*** These include age and an indicator of whether a member has enrolled within the previous six months. The latter risk factor is intended to account for the patient's lack of claims history, which limits the number of potential comorbidities that can be identified for the patient.
- ***Comorbidities:*** These are conditions or events that occurred prior to the start of the delivery episode that can have an impact on the patient's risk of having a potentially avoidable complication, and on the volume of expected typical services.
- ***Episode Subtypes or Severity Markers:*** These are markers that distinguish an episode as being more severe than another. They indicate specific patient comorbidities that are known to make the procedure or condition more difficult to treat (e.g., obesity, multiple gestation, etc.),

Expected Newborn Costs: The newborn budgets were derived by using the average of the historical costs for newborns that were coded as nursery levels 1, 2, and 3, excluding Level 4.[6] Table 1 shows the distribution of infants and nursery level coding across all CHC deliveries in the historical dataset. As can be seen, although Level 4 nursery placement is relatively rare, costs are high and have a significant impact on the average. Less than 4 percent of babies were coded as Level 4 nursery but at an average cost of $129,000, they increase the average episode costs nearly $4,000 (a 43 percent increase in average costs). For this reason, it was determined that Level 4 newborns should be excluded from the pilot for determining budgets and excluded from the actual costs for reconciliation.

TABLE 1. NURSERY LEVEL COUNTS AND COSTS

	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4	LEVELS 1, 2 AND 3	ALL LEVELS
AVERAGE EPISODE COST	$7,439	$19,007	$26,075	$129,000	$9,286	$13,269
BABY LOS	2	9	12	38	3	5
NUMBER OF DELIVERIES	21,996	1,315	1,845	985	25,156	26,141
% OF DELIVERIES	84%	5%	8%	4%	96%	100%

Reconciliation and Reporting Processes: The Year 1 pilot included deliveries from March 1, 2015, through February 29, 2016. Beginning in August 2015 and continuing quarterly, CHC submitted cumulative claims data to be run through the PROMETHEUS Analytics© software. These data were used to produce quarterly reports that were delivered to and reviewed with each provider. These reports showed a comparison of the risk adjusted maternity episode budgets to the actual claims costs for each identified patient, separately by episode segment (pregnancy, delivery and newborn). The initial report, delivered in September 2015, contained information on patients who delivered in March through May of 2015. This allowed for the two-month post-discharge time period for deliveries and one month of claims run-out to pass. The reports generated by the Analytics allowed providers and the plan to see an aggregate comparison of budget to actual to assess whether they were under or over budget on a cumulative basis. The report also allowed the plan and providers to drilldown into individual patient results and to identify potential causes for going over budget.

6 The newborn nursery levels are as defined by the American Academy of Pediatrics.

QUALITY SCORECARD PARAMETERS AND PROCESS

Quality Scorecard Development: HCI[3] facilitated several meetings between CHC, UTHealth and UTMB to propose and finalize a quality scorecard that would be used for reporting and tracking purposes in Year 1 of the pilot. The final measures included in the quality scorecard differed between the providers with one being a subset of the other. The reasons for the different scorecards is attributed to the removal of measures where the provider felt they were not important or meaningful quality metrics, or were too burdensome to collect. Since the finalization of the quality scorecards took several weeks, quality measure data collection initially lagged behind the claims data collection and reporting. Ultimately the quality measure data collection caught up to the claims data and reporting and quality scores were included in the regular quarterly reports.

An example of the scorecards is presented in Appendix 1. Because the nature of the quality measures is different, there is a separate scorecard for full-term deliveries versus pre-term deliveries. The quality measures included pertain to each segment or domain of the episode (prenatal, delivery, postpartum and newborn). The scorecard example shows the measure, domain, threshold (whether there is a maximum or minimum that must be reached before points can be achieved), allocated points and a description of the numerator and denominator used to derive each measure and how the measure score is calculated.

Quality Reporting Processes: A data collection template was created based on the data elements needed to construct the numerators and denominators for the quality measures. The template was modified several times over the course of the pilot in consultation with each provider to assure the required data elements were being captured in the most efficient way possible. This data collection effort proved to be more difficult and burdensome for one provider that needed to rely more heavily on a manual review of health record information, while another provider was able to largely automate the collection from their electronic medical record system.

Application of the Quality Scorecard in Bundled Payment: In Year 1 of the pilot, quality measures were collected, refined and summarized and reported back to the plan and providers but were not directly applied to the bundled payment arrangement. In Year 2 of the pilot the quality measures will continue to be collected and scorecards will continue to be calculated and reported back to the plan and providers on a quarterly basis. At the end of Year 2, which includes an upside and downside shared savings or loss, quality scores will be compared quarter to quarter over the year and will be compared to scores achieved in the second half of Year 1 to determine improvement or decline in quality outcomes. The proportion of shared savings or loss for the provider will be dependent on changes in quality scores.

PILOT FINANCIAL RESULTS

There were 1,246 completed episodes between the two providers during the Year 1 pilot (March 1, 2015, through February 29, 2016). Table 2 shows that the two providers had very different results when comparing their patient budgets to the actual costs. One provider was 34 percent over budget while the other was 4 percent under budget.

TABLE 2. PERCENTAGE OVER/UNDER BUDGET

	% OVER(+)/UNDER (-)BUDGET	
MATERNITY SEGMENT	PROVIDER A	PROVIDER B
PREGNANCY	-1%	+7%
DELIVERY	+13%	-7%
NEWBORN	+100%	-10%
TOTAL	+34%	-4%

A significant driver of the financial outcomes for the deliveries was a change in the rate of C-sections compared to the historical rate upon which the budgets were based. For both providers, the historical C-section rate was 36 percent. For provider A, the C-section rate for the group of pilot patients was higher (38 percent) compared to the historical rate. For Provider B, the C-section rate for the pilot patients was lower (33 percent) compared with their historical average.

Notably, provider A was significantly over budget for their newborns. This result was due to a handful of unusually high cost newborns that were not designated as being in a nursery Level 4, and therefore not excluded. There were eight newborns with costs over $150,000. These newborns had significant birth defects, but were coded as being treated in a nursery Level 3. As described below, this result was the driver behind the change made for Year 2 that will implement the use of a stop-loss rather than an exclusion based on nursery level designation alone.

LESSONS LEARNED

There were several lessons learned over the course of the pilot that caused midcourse modifications and/or that resulted in changes applicable to Year 2 of the implementation.

Unique Medicaid Population Challenges: The Medicaid population presented unique challenges due to the transitory nature of the membership. First, little claims history was available to accurately produce risk adjustment models for the pregnancy. The risk adjustment models depend on identification of historical risk factors for patients. For this reason, the pregnancy budgets did not use the formal risk adjustment models, but rather relied on the historical average costs for prenatal care delivered by each provider, which accounts for historical patient mix and characteristics and assumes, given the significant sample size, that the characteristics of patients during the performance year would be similar.

The costs were based on an average of 4 to 5 months of prenatal care depending on the provider. Each patient's pregnancy budget was prorated from the average based on whether they had more of fewer months of prenatal care than the average. In addition, there were several deliveries (between 2 percent and 12 percent depending on provider) where the patient did not receive any prenatal care paid by Medicaid. These "delivery-only" patients remained in the pilot but were given a $0 budget for the pregnancy portion. The delivery-only patients tended to have higher delivery and newborn costs (25 percent to 55 percent higher depending on provider). For this reason, if the pilot were to exclude "delivery-only" patients, they would need to be symmetrically excluded from the historical data that derives the budgets.

Blended Delivery Budget: The methodology for creating the expected delivery costs by blending together the C-section costs and vaginal delivery costs weighted by the historical C-section rates creates a situation in which the budget will always be exceeded for C-section deliveries and never for the vaginal deliveries. As such, there's an explicit incentive to reduce unwarranted C-sections, which is an important national population health goal.6[7] The effect of this incentive seems to have played out, with one provider lowering the C-section rate and getting a positive financial outcome, and the reverse for the other.

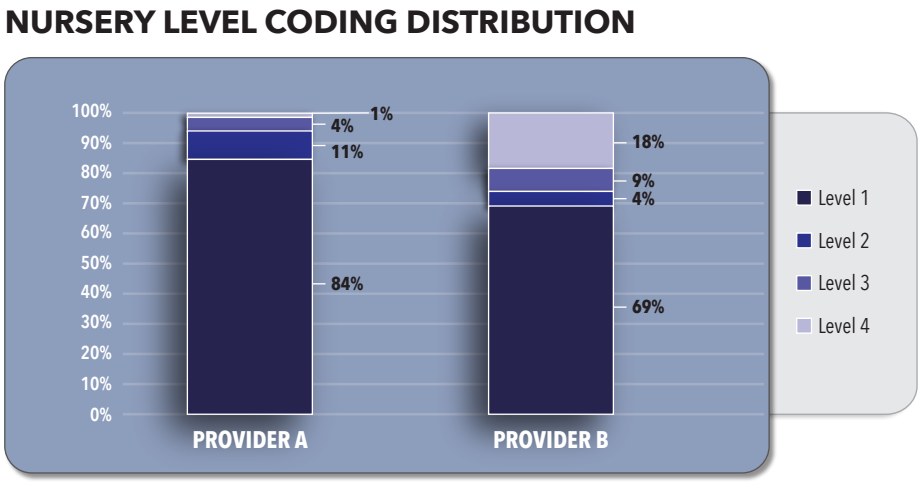
Linking Mothers and Babies: To link a newborn to the mother requires mapping documentation from the health plan. In this case, a newborn is first given an ID that includes the mother's member ID. Subsequently the newborn is then assigned his or her own unique member number. CHC retrospectively modified the newborn member ID so that all costs are allocated to the newborn. It was critical that CHC was able to provide a mapping document that linked the mother's member ID and the newborn's ID for the pilot patients so that the accumulated costs for the newborn were combined with the appropriate prenatal and delivery costs of the mother to complete the patient specific episode. Some states, including New York, have statewide delivery and newborn reporting and surveillance systems that enable such a link between mother and child in order to better monitor population health outcomes. For managed care organizations to implement a comprehensive maternity bundled payment program, such a link is essential and where states don't have processes to link mothers with babies on a common identifier, the health plans will have to develop one.

7 Cesarean Delivery Rates: Revisiting a 3-Decades-Old Dogma, Mary E. D'Alton, MD; Mark P. Hehir, MD; JAMA. 2015;314(21):2238-2240.

Nursery Level 4 Designation as an Indicator of Severity/Cost:[8] Perhaps the biggest lesson learned from this pilot was that the Level 4 nursery designation was not an objective indicator of severity and therefore costs. While there are guidelines for which nursery level a baby should be placed in (and therefore coded on the inpatient stay claim), these guidelines are subject to interpretation. This pilot experience suggests that some providers may take a liberal approach to that interpretation and others may take a more conservative approach. On average, across all providers in the historical data, 3 percent of newborns were coded as Level 4 nurseries. Between the two pilot providers, however, one had as much as 16 percent of newborns coded in a Level 4 nursery while the other had only 2 percent coded as Level 4.

During the pilot phase, the percentage of newborns designated as Level 4 for provider A increased to 19 percent while provider B experienced a decrease to just 1 percent. Graph 3 shows that 84 percent of newborns were designated as Level 1 nursery for provider A compared to 69 percent for provider B. For provider A, the majority of babies not designated as Level 1 were instead designated as Level 2 while the majority of babies that were not Level 1 for provider B were instead designated as Level 4.

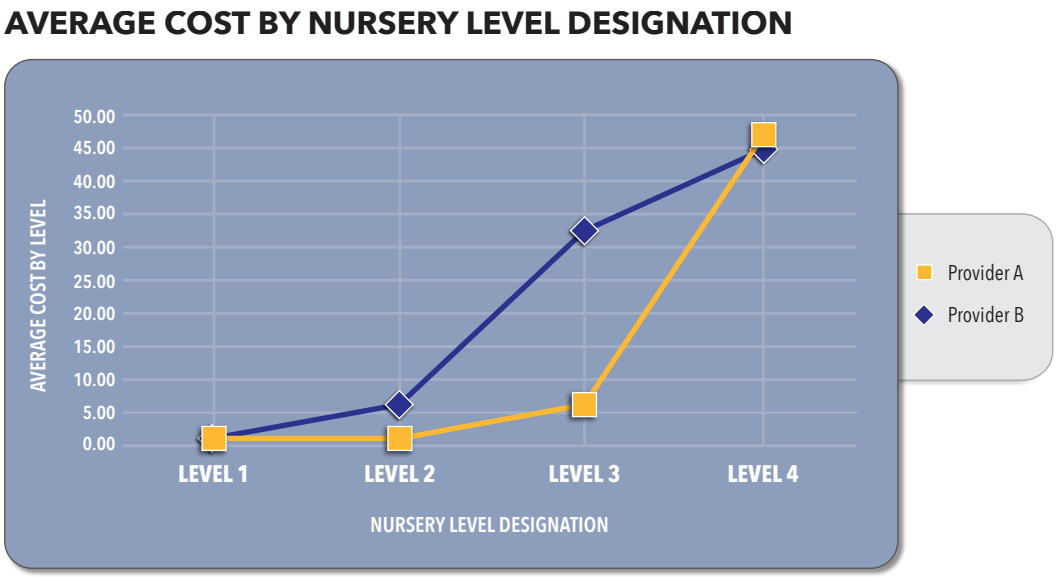
GRAPH 3. NURSERY LEVEL CODING DISTRIBUTION



8 For examples of official guidance on coding nursery levels, see: Guidelines for Perinatal Care, American Academy of Pediatrics, The American College of Obstetricians and Gynecologist, Sixth Edition, 2007; and, Committee on Fetus and Newborn, Levels of Neonatal Care. Pediatrics Vol.114 No. 5 November 2004, pp. 1341-1347. http://www.pediatrics.org/cgi/content/full/114/5/1341

Table 3 shows the incremental increase in average cost of newborns in the four nursery level categories. For both providers the nursery Level 4 costs were about 45 times higher than nursery Level 1 costs. However for provider A there is a relatively steady increase in average costs when moving from one level to the next. On the other hand, for provider B, the average cost for newborns in levels 1, 2 and 3 are relatively close with a substantial increase in average costs for Level 4 newborns.

TABLE 3. AVERAGE COST BY NURSERY LEVEL DESIGNATION



Perhaps most importantly, as described above under the Pilot Financial Results, for Provider A, several very high cost newborns with significant birth defects were coded into Level 2 and in particular, Level 3 nurseries. In order to protect both the provider from substantial losses associated with high-risk newborns that may not necessitate the Level 4 nursery designation, and to protect the plan from potential arbitrary newborn nursery level placement or coding, the Year 2 implementation will include all nursery level newborns but instead institute a stop loss aimed at protecting the providers against excessive newborn costs, irrespective of the nursery level in which the newborn was placed.

Stop-Loss Effect on Year 1 Results and Year 2 Budgets: In the hypothetical example below, Table 4 shows that including all nursery level patients and then setting a stop-loss cap at between $30,000 to $60,000 affects between five percent and eight percent of patients. Under no stop-loss the budget would be $12,610. A stop loss set at $60,000 would reduce that budget by 42 percent overall. Where the stop loss cap is set lower, a greater number of episodes will be capped and the resulting budget is lower. For example, a $50,000 stop-loss cap affects 6 percent of patients and the adjusted budget is $7,264 compared to 8 percent of patients and an adjusted budget of $5,323 for a $30,000 stop-loss cap.

TABLE 4. STOP-LOSS CAP SIMULATIONS

HYPOTHETICAL PROVIDER	NO STOP-LOSS CAP	$60,000	$50,000	$40,000	$30,000
ADJUSTED BUDGET	$12,610	$7,264	$6,716	$6,062	$5,323
COUNT OF PATIENTS AFFECTED BY CAP	-	45	51	61	71
% OF PATIENTS AFFECTED	-	5%	6%	7%	8%

The stop loss cap will affect both the budget and the accumulation of actual costs. The stop-loss will be applied to the historical averages that will provide the basis for the budgets for Year 2. During reconciliation, patients with newborn costs that exceed the chosen stop-loss will have their newborn costs capped at the stop-loss amount. For provider A that had fewer than 1 percent of patients designated as nursery Level 4 during the pilot, the new stop-loss cap will affect a greater number of patients and will significantly close the gap in the comparison between the newborn costs and budget caused by outlier episodes.

To determine the effect of a stop loss in lieu of excluding newborn stays coded as Level 4 nurseries, we revised the budget and actual costs for Provider A. Table 5 shows that with a stop-loss set at $50,000 Provider A would have been under budget by 4 percent rather than over by 100 percent on the newborn portion of the total maternity bundle. This would have resulted in the provider being over budget overall by just 4 percent, reflecting the higher than baseline C-section rate, rather than the combination of excessive newborn costs and the higher C-section rate.

TABLE 5. PROVIDER A: ADJUSTED BUDGET AND COSTS BASED ON STOP LOSS METHODOLOGY

	% OVER(+)/UNDER (-)BUDGET	
MATERNITY EPISODE SEGMENT	PROVIDER A PRE-STOP LOSS	PROVIDER B POST-STOP LOSS
PREGNANCY	-2%	-2%
DELIVERY	+13%	+13%
NEWBORN	+100%	-4%
TOTAL	+33%	-4%

Quality Scorecard Development and Process: Both providers were very passionate about which quality measures were appropriate and how they should be defined. The final quality scorecard for each provider was arrived at after several meetings during which the proposed measures were refined, eliminated or supplemented. Although the quality measures generally overlap between the two providers, a different scorecard was negotiated for each.

The collection of the data to support the quality scorecard measures was complicated and the template used to extract the data required several iterations and clarifications to assure that the information was being collected in a systematic way. Once one-half of the pilot patients' quality data was collected and reviewed, it became apparent that clarifications on the numerator and denominator definitions and data pull instructions were needed. Both provider groups met with each other to share information on the data collection process to align the measures. The quality data collected for patients in the second half of the pilot year represent the steady state definitions that will be continued into Year 2. Therefore the Year 2 quality results will be compared to the second half of the pilot year.

Application of Quality Scorecard in Shared Savings Determination: During the course of the pilot, it was determined that the shared savings formula should reflect the fact that there is a disproportionate distribution of the risk between the payer and provider due to a potentially high ceiling for maternity episodes with a set floor (i.e. the maternity episode has a minimum base cost). This was amply demonstrated above in the financial results section and the decision to institute a stop loss. For Provider A, a small number of high cost cases completely wiped out the gains on all other newborns and every other costs associated to the maternity episode. The asymmetrical risk profile of the episode suggests that the risk sharing should also be asymmetrical, with the provider potentially having the opportunity to receive a higher share of upside and a lower share of downside. The quality scorecard results can add a additional potential to boost the upside or dampen the downside. Therefore, the allocation of shared savings proposed for Year 2 will allow for a greater potential share of savings and smaller potential share of losses for any given quality score. For example, with no change in quality score, it may be determined the provider may share in 50 percent of the gains but is subject to only 40 percent of any losses. This asymmetrical distribution can be applied along the continuum of quality score changes (see Appendix 2 for example).

CONCLUSION

Medicaid pays for approximately 50 percent of all births in the US, a fact that has important policy implications.[9] Above sheer numbers, the long-term effect of these births is substantial since these children will compose a majority of the workforce in decades to come. Harm to mother and child due to unwarranted C-sections, premature births, and other reasons for low-birth weight babies have the potential to reduce the productivity of these citizens over the course of their lifetimes. As was stated in the recently released *Health Care Payment Learning and Action Network (LAN)* whitepaper:

"Often prenatal care, labor and birth, and postpartum care are viewed and delivered as three distinct periods. However, by viewing them as three phases within one episode, there is a potential for incentivizing the types of interactions and care delivery that support positive outcomes. Positive outcomes for maternity care can be defined and achieved in a variety of ways, such as: 1) a greater percentage of appropriate vaginal births, 2) a greater percentage of full-term babies born at healthy weights, 3) strong recoveries for women, and 4) healthy starts for the babies."[10]

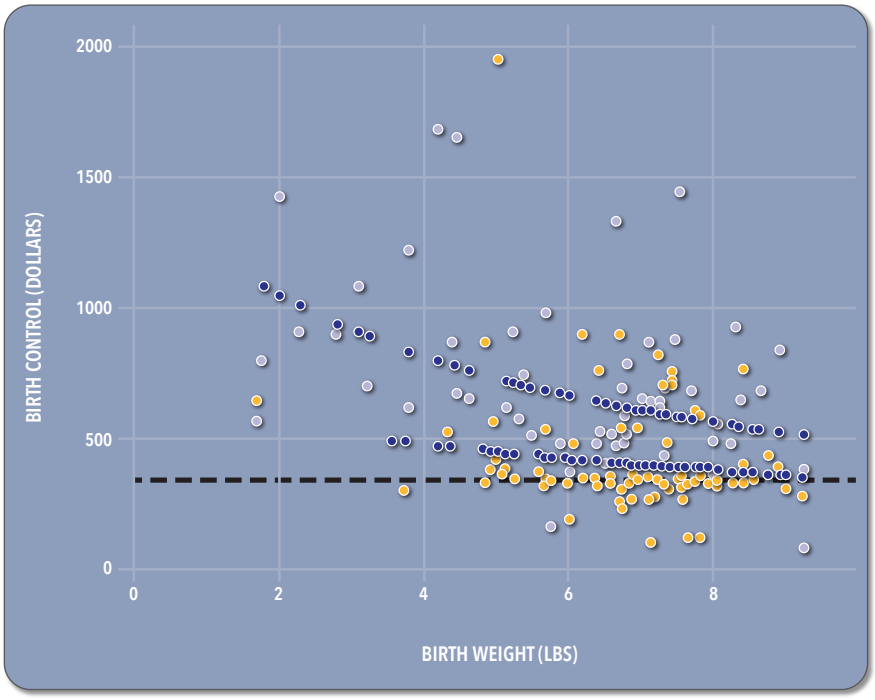
This pilot—which informed both the LAN whitepaper and the New York State Value-Based Payment Roadmap[11] on maternity bundles—serves as an example of how a Medicaid payer and its affiliated providers are working collaboratively to integrate these phases, to encourage greater prenatal care, discourage C-sections, and reduce premature or other low-birth weight babies. The bundled payment process they have embraced takes the emphasis off of high payments for L2, L3 and L4 nursery babies, and weights payment incentives towards proactive, integrated care. In terms of larger Medicare bundled payment policies, the manner in which CHC structured stop-loss, risk corridors in lieu of risk-adjustment is notable. CMS is foregoing any real risk-adjustment in its mandatory and voluntary bundled payment programs, which will most certainly lead to adverse risk selection for Medicare patients. A simple stop-loss corridor where either risk adjustment is not feasible (as in this case) or not chosen (as with Medicare) has the ability to attenuate patient cherry picking by affected providers.[12]

This case study, though in an early stage, attempts to show that the systematic collection of quality data—which had not been instituted in these facilities prior to the CHC pilot—coupled to bundled payment, addresses important structural issues related to maternity care and can lead to improved outcomes. As our final graph drawn from CHC data demonstrates, the costs of maternity and delivery are closely tied to the birth weight of the baby, further buttressing the idea that bundled payment for maternity care should incorporate the costs and outcomes of pregnancy, delivery, newborn and postpartum care to help ensure babies come into this world happy, healthy and hale.

9 http://publichealth.gwu.edu/content/medicaid-pays-nearly-half-all-births-united-states
10 http://hcp-lan.org/workproducts/cep-whitepaper-final.pdf
11 https://www.health.ny.gov/health_care/medicaid/redesign/dsrip/docs/vbp_roadmap_final.pdf
12 http://altarum.org/health-policy-blog/leveling-the-playing-field-in-risk-arrangements

GRAPH 4. RELATIONSHIP BETWEEN BIRTH WEIGHT, MODE, AND TOTAL COST

BIRTH WEIGHT, DELIVERY MODE, AND BIRTH COST



This graph shows an inverse relationship between the birth weight of the baby (x-axis) and pregnancy and delivery costs (y-axis) for vaginal deliveries (yellow dots) and cesarian sections (light blue dots). The two lines of dark blue dots show, for each delivery mode (cesarian [upper] or vaginal [lower]), the overall trend in the relationship between birth weight and cost.

APPENDIX 1: FULL-TERM AND PRE-TERM SCORECARD ELEMENTS

FULL-TERM SCORECARD

MEASURE	DOMAIN			NUMERATOR DESCRIPTION	DENOMINATOR DESCRIPTION	SCORE CALCULATIONS
Prenatal Gestational Diabetes Screening	Prenatal		10	Patient had a resulted procedure/ test between 16-28 weeks gestation	All patients that were not delivery only (as submitted by provider) or were not seen prior to 28 weeks gestation	Points awarded according to ratio (ratio x points)
% Elective Deliveries	Delivery	0.10	15	Patients with elective induction between 1 day prior to admit and delivery date and/or elective C-section not marked as "medical" reason	Patients with newborn age >=37 and < 39 weeks	Points awarded according to inverse ration (1-ratio) x points, on a scale within the threshold of 0% = 15 points and >10% = 0 points
Primary C-section Rate	Delivery	0.18	13	Nulliparous Patients with C-section delivery mode	Nulliparous Patients (those with first time pregnancies)	Points awarded according to inverse ratio (1-ratio) x points, on a scale within the threshold of 0% = 13 points and >18% = 0 points
Patients Receiving Antibiotic Prophylaxis During Delivery Encounter	Delivery		5	Administration of IV antibiotic during the delivery encounter prior to delivery	Vaginal delivery Patients with positive or no results from most GBS lab test within 7 weeks prior to delivery	Points awarded according to ratio (ratio x points)
Obstetric Trauma with Instrument	Delivery	0.10	5	Vaginal deliveries with instrument with OB trauma indicated	Vaginal deliveries with instrument	Points awarded according to inverse ratio (1-ratio) x points, on a scale within the threshold of 0% = 5 points and >10% = 0 points
Obstetric Trauma with Instrument	Delivery	0.10	7	Vaginal deliveries with instrument with OB trauma indicated	Vaginal deliveries with instrument	Points awarded according to inverse ratio (1-ratio) x points, on a scale within the threshold of 0% = 7 points and >10% = 0 points
Vaginal Deliveries with Episiotomy	Delivery		5	Patient with episiotomy procedure coded on hospital record	Vaginal deliveries (excluding those with shoulder dystocia coded on record)	Points awarded according to inverse ratio (1-ratio) x points
Was this a Post-Partum Visit	Post-Partum		12.5	Patients with a post-partum visit between 1 day after discharge and 8 weeks post-partum	All delivery patients excluding those with documented post-partum visit to another provider	Points awarded according to ratio (ratio x points)
Post-Partum BP Monitoring	Post-Partum		2.5	Outpatient blood pressure was recorded for the patient between 1 day after discharge and 8 weeks post-partum	All delivery patients that had a post-partum visit recorded	Points awarded according to ratio (ratio x points)
Post-Partum Depression Screening	Post-Partum		2.5	Patients with a recorded score for post-partum screen on an outpatient visit that was recorded between 1 day after discharge and 8 weeks port-partum	All delivery patients that had a post-partum visit recorded	Points awarded according to ratio (ratio x points)

Post-Partum Fasting Glucose Testing	Post-Partum		2.5	Patients had a resulted procedure recorded between 1 day after discharge and 8 weeks post-partum	Patients with a diagnosis of gestational diabetes documented between gestational age of 16 weeks and delivery date that also had post-partum visit	Points awarded according to ratio (ratio x points)
Exclusively Breastfed			10	Newborns that had no formula documented and that had breastmilk intake or time recorded	All newborns except gestational age <37 weeks; liveborn babies; or no flowsheets documented	Points awarded according to ratio (ratio x points)
Babies receiving HEP B Vaccine			10	Newborns with HEPB vaccine administered between birth date and discharge date	All newborns excluding stillborns	Points awarded according to ratio (ratio x points)
TOTAL SCORE			**100**			

APPENDIX 1: FULL-TERM AND PRE-TERM SCORECARD ELEMENTS

PRE-TERM SCORECARD

MEASURE	DOMAIN			NUMERATOR DESCRIPTION	DENOMINATOR DESCRIPTION	SCORE CALCULATIONS
Prenatal Gestational Diabetes Screening	Prenatal		10	Patient had a resulted procedure/ test between 16-28 weeks gestation	All patients that were not delivery only (as submitted by provider) or were not seen prior to 28 weeks gestation	Points awarded according to ratio (ratio x points)
Antenatal Steroids	Prenatal		10	Patients with administration of steroids within 10 weeks prior to delivery date	Patients with newborn gestational age between >=24 weeks and < 34 weeks	Points awarded according to ratio (ratio x points)
Patients Receiving Antibiotic Prophylaxis During Delivery Encounter	Delivery		20	Administration of IV antibiotic during the delivery encounter prior to delivery	Vaginal delivery Patients with positive or no results from most GBS lab test within 7 weeks prior to delivery	Points awarded according to ratio (ratio x points)
Obstetric Trauma with Instrument	Delivery	0.10	10	Vaginal deliveries with instrument with OB trauma indicated	Vaginal deliveries with instrument	Points awarded according to inverse ratio (1-ratio) x points, on a scale within the threshold of 0% = 5 points and >10% = 0 points
Obstetric Trauma with Instrument	Delivery	0.10	10	Vaginal deliveries with instrument with OB trauma indicated	Vaginal deliveries with instrument	Points awarded according to inverse ratio (1-ratio) x points, on a scale within the threshold of 0% = 7 points and >10% = 0 points
Vaginal Deliveries with Episiotomy	Delivery		5	Patient with episiotomy procedure coded on hospital record	Vaginal deliveries (excluding those with shoulder dystocia coded on record)	Points awarded according to ratio (ratio x points)
Was this a Post-Partum Visit	Post-Partum		12.5	Patients with a post-partum visit between 1 day after discharge and 8 weeks post-partum	All delivery patients excluding those with documented post-partum visit to another provider	Points awarded according to inverse ratio (1-ratio) x points
Post-Partum BP Monitoring	Post-Partum		2.5	Outpatient blood pressure was recorded for the patient between 1 day after discharge and 8 weeks post-partum	All delivery patients that had a post-partum visit recorded	Points awarded according to ratio (ratio x points)
Post-Partum Depression Screening	Post-Partum		2.5	Patients with a recorded score for post-partum screen on an outpatient visit that was recorded between 1 day after discharge and 8 weeks port-partum	All delivery patients that had a post-partum visit recorded	Points awarded according to ratio (ratio x points)
Post-Partum Fasting Glucose Testing	Post-Partum		2.5	Patients had a resulted procedure recorded between 1 day after discharge and 8 weeks post-partum	Patients with a diagnosis of gestational diabetes documented between gestational age of 16 weeks and delivery date that also had post-partum visit	Points awarded according to ratio (ratio x points)
Babies receiving HEP B Vaccine			5	Newborns with HEPB vaccine administered between birth date and discharge date	All newborns excluding stillborns	Points awarded according to ratio (ratio x points)
Blood Stream Infection Prior to Discharge			5	Newborns with a secondary diagnosis of sepsis or bacteremia	All live newborns with birth weight >=500 and 1500g; LOS >7 days; gestational age >=24 weeks or <=30 weeks; Exclude newborns with primary diagnosis of sepsis or bacteremia	Points awarded according to inverse of ratio (1-ratio) x points

Newborn Sepsis or Meningitis			5	Newborns wirh diagnosis or sepsis, regardless of age	All live newborns with birth weight <=1500g or GA<=29 weeks and LOS >3 days	Points awarded according to inverse of ratio (1-ratio) x points
Newborns Screened for Retinopathy of Prematurity		1.0	5	Consult for pediatric opthalmology ordered	All live newborns with LOS >3 days and gestational age <=29 weeks	Receive all points for ratio of 1 and 0 points for ratio less than 1
TOTAL SCORE			**100**			

APPENDIX 2: APPLICATION OF QUALITY SCORES TO SHARED SAVINGS/LOSS

PERCENTAGE POINT CHANGE IN QUALITY SCORE	% SHARE IN LOSS	% SHARE IN GAIN
etc	0.5	0.0
-0.11	0.5	0.0
-0.1	0.5	0.0
-0.09	0.49	0.25
-0.08	0.48	0.27
-0.07	0.47	0.29
-0.06	0.46	0.31
-0.05	0.45	0.33
-0.04	0.44	0.35
-0.03	0.43	0.37
-0.02	0.42	0.39
-0.01	0.41	0.41
0.0	0.40	0.43
0.01	0.39	0.45
0.02	0.38	0.47
0.03	0.37	0.49
0.04	0.36	0.51
0.05	0.35	0.53
0.06	0.34	0.55
0.07	0.33	0.57
0.08	0.32	0.59
0.09	0.31	0.61
0.10	0.30	0.63
0.11	0.29	0.65
0.12	0.28	0.67
0.13	0.27	0.69
0.14	0.26	0.71
0.15	0.25	0.75
etc	0.25	0.75