Spring 2019

Measuring Birth Trauma Rates in Maine Using Public Data

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INTRODUCTION

An increasing number of states are creating databases that collect and organize health insurance claims from public and private health care payers. Since December 2016, at least 18 states have these all-payer claims databases (APCDs), including Maine. APCDs are intended to inform health care cost containment and quality improvement by increasing transparency and informing consumer choice.

For this project, we assessed how Maine's APCD data might be used to measure a birth outcome quality measure developed by the Agency for Healthcare Research and Quality (AHRQ) -- Birth Trauma – Injury to Neonate (PSI 17), which measures the proportion of all births within a facility that experienced a defined birth trauma. Birth traumas include facial nerve injury, spinal cord injury, and a hemorrhage below the scalp, which can cause serious impairment to the infant's body and may even cause neonatal death.

AHRQ provides statistical analysis software (AHRQ Toolkit) to calculate this measure using uniform hospital discharge data (UHDDS) collected by all states and submitted to a national database. We tested how this coding could be adapted to Maine's APCD data and compared results with rates calculated on Maine's UHDDS data.

OBJECTIVES

1. Test AHRQ's Birth trauma – Injury to Neonate measure in two publicly available health datasets;
2. Compare results between datasets for CY 2016;
3. Discuss challenges in using AHRQ programs with APCD data relative to UHDSS.

METHODS

- Data sources: Maine APCD and Maine UHDDS, 2016
- For UHDSS data, we mapped variables required by the AHRQ program for this specific measure and created a single record per discharge using a file flattening technique from the relational database tables.
- For APCD, we adapted AHRQ coding to Maine's APCD data cross-walking data fields from the claims format and created an APCD discharge file.
- Based on this mapping, we ran the Birth Trauma measure using the free statistical analysis software provided by AHRQ, which calculates birth trauma rates per thousand newborn discharges (excluding low birth weight babies), and compared the results using Maine APCD and UHDDS data.

RESULTS

Table 1: Comparison of Total Discharges in Maine APCD and UHDDS (CY 2016)

	APCD	Hospital Data (UHDDS)
Discharges (Total)	106,870	142,696
Commercial	37,514	40,938
Medicaid	18,981	22,523
Medicare	50,375	67,201
Other		12,034

- As shown in Table 1, total hospital discharges reported in the two data sources differed because UHDDS data includes discharges from all Maine hospitals during the year, regardless of payer and APCD data only includes discharges for Mainers who are insured.
- The total number of unduplicated discharges reported in UHDSS was 142,696 and 106, 870 in the APCD in in 2016.
- Payer source also differed between the two datasets as UHDSS includes self-pay/uninsured and reports "expected" source of payment for insured persons, while the APCD identifies the insurer that paid the claim. When a discharge was reimbursed by more than one payer in the APCD, a single discharge was created for the primary payer.

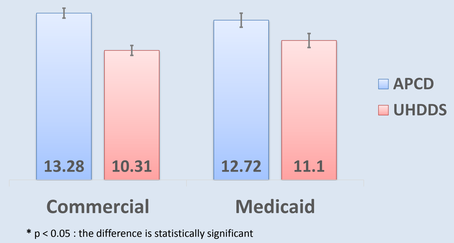
- Similar to total discharges, more newborns were reported in the UHDDS (11,735) than in the APCD (6,883) in 2016 (Table 2).
- Per AHRQ measure specifications, after excluding newborns with low birth weight (less than 2000 grams) or with osteogenesis imperfect, total newborns used for the birth trauma measure denominator were 6,744 for APCD and 10,433 for UHDDS.
- Variation in both datasets were known to exist in advance of this analysis. When this data was provided, the issue was further complicated by a Supreme Court Ruling that resulted in some commercial payers not submitting claims to Maine's APCD[2]. Since that time several of these payers have begun voluntarily submitting data to Maine's APCD, but these data do not include that data.
- There were a total of 86 births with trauma in the APCD for a birth trauma rate of 12.75 per thousand births and 112 birth traumas identified in the UHDDS for a rate of 11.65.

Table 2: Variation in Birth Trauma Results Using the Maine APCD and UHDDS (CY 2016)

	APCD	Hospital Data (UHDDS)
Newborns	6,883	11,735
Excluded for Low Birth Weight	139	228
Total Births	6,744	*10,433
Birth Trauma Total	86	**112
Birth Trauma	12.75 [CI:11.23-14.27]	11.65 [CI:10.13-13.17]

* Excludes Medicare (18) and Other (1,056) newborn birth discharges.
** Excludes Medicare(1) and other(21) birth trauma events.
CI : 95% Confidence Interval

Figure 1: Maine Birth Trauma Rates per 1,000 Births by Payer and Expected Source of Payment



* $p < 0.05$: the difference is statistically significant

- The birth trauma rates were significantly different by payer categories the two datasets (Figure 1).
- Both the commercial (13.28 versus 10.31) and Medicaid (12.72 versus 11.1) birth trauma rates were significantly higher in the APCD datasets.

CONCLUSIONS

- Depending on the data source, the incidence of birth trauma in Maine is between 11.65 (UHDDS) and 12.75 per 1000 births (APCD).
- Given the different rates between payers identified in these two datasets, further research is needed to assess the reasons for these differences, particularly by payer source. It may be beneficial to update this analysis when more commercial data are in the APCD .
- Since the UHDDS includes all discharges regardless of payer, it may be a more useful data source for calculating birth trauma rates than the APCD, which may over-state the incidence of birth trauma relative to UHDDS.

LESSONS LEARNED

One goal of this project was to test whether free AHRQ toolkit software can be adapted to produce quality measures using APCD data. We found the following challenges needed to be overcome:

- In claims data, hospital discharges may have multiple claim lines for one hospital stay. This may be due to interim bills to the insurer or to multiple payers paying for the same discharge.
- Claims for one discharge can have different DRGs or diagnosis codes. This presented challenges when attempting to create one record for each discharge to use the AHRQ toolkit program.
- Payer and diagnosis codes must be included in each discharge record in order to run the AHRQ measure but different payers for the same stay often have different diagnoses codes in the diagnosis field.
- Given these differences in file structure, researchers need to develop a method to adjust for these issues in order to create a single discharge in their analytic file.

ACKNOWLEDGEMENTS

This work was funded by the Maine Economic Improvement Fund and completed under a Memorandum of Understanding with the Maine Health Data Organization (MHDO) and the University of Southern Maine to support workforce training in health care data analyses and research.
The Muskie School of Public Service at the University of Southern Maine, under contract with the Maine Quality Forum, is testing, producing, and providing technical assistance to report selected quality measures using APCD and hospital discharge data. The Muskie School is providing guidance to Maine Quality Forum on integrating quality measures into CompareMaine.org.

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