Background

- The Centers for Disease Control and Prevention have adopted days of antimicrobial therapy as a metric for healthcare facilities to benchmark antimicrobial use.
- Hospital billing data are often used as a proxy for medication administration, which is a convenient method to study antimicrobial prescribing practices using large administrative datasets.
- We sought to evaluate the accuracy of institutional billing data compared to medication administration data.

Methods

Institutional Data Comparison

- This study compared medication billing data from the Pediatric Health Information System (PHIS) with aggregate electronic medical record (eMAR) data from 5 freestanding children’s hospitals between January 1st, 2010 through June 30th, 2013.
- A de-identified aggregate dataset of eMAR days of therapy for targeted systemic antimicrobials was generated from each institution.
- Billing data for the same time period were extracted from the PHIS database.
- Each site also provided information on its current pharmacy billing practices and how they have changed over time (Figure 1).
- A linear regression and scatterplot were performed to compare the PHIS and eMAR datasets.

Pediatric Hospital Pharmacy Billing Practices Survey

- A survey was conducted to assess current pharmacy billing practices and how they have changed over time (Figure 1).
- The survey was sent via email to 30 recipients with instructions to forward to the pharmacy director if the recipient was unsure of pharmacy billing practices.
- Results were graphed as a survival curve to explore changes in billing practices over time.

Results

Institutional Data Comparison

- A total of 897,187 days of therapy were included in the datasets from the five participating institutions.
- Only 2 of 5 institutions utilized dispense-based pharmacy billing during the study period; both converted to administration-based billing prior to July 1, 2012.
- The derived linear regression models (Figure 2) indicated that PHIS data may better predict eMAR charge data than dispense charge data, when compared to an ideal reference line (PHIS=eMAR).
- The linear model for administration data also had a better fit than that for dispense (r²=0.98 and r²=0.46).

Pediatric Hospital Pharmacy Billing Practices Survey

- Responses were received from 63% (19 of 30) of invited institutions.
- The proportion of institutions billing upon administration has increased from 10.5% (2 of 19) in 2006 to 79.0% (15 of 19) in 2016. (Figure 3)

Discussion and Conclusions

- In these hospitals, antimicrobial charge data derived from bill upon administration accurately reflects the source eMAR data.
- Some caution may be needed when using data from hospitals that bill upon dispense.
- This study compared medication billing data from the Pediatric Hospital Pharmacy Billing Practices Survey.
- This may result in an overestimate of drug utilization by the institutions that continue to bill upon dispense.
- As these are aggregate data, they may not reflect variation among different medications and routes of administration.
- The increasing proportion of institutions that bill upon administration would be expected to enhance the accuracy of PHIS data over time.

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Affiliations and Disclosures

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