Author's response to reviews

Title: Pediatric High-impact Conditions in the United States: Retrospective Analysis of Hospitalizations and Associated Resource Use.

Authors:

Rebecca L Miller (rebmille@med.umich.edu)
Achamyeleh Gebremariam (agmariam@med.umich.edu)
Folafoluwa O Odetola (fodetola@med.umich.edu)

Version: 2 Date: 22 March 2012

Author's response to reviews: see over
Response to the Reviewers

Reviewer 1

Major Compulsory Revisions:

1) P-values should not be reported as p<0.05, and should instead be reported exactly to at least 3 digits after the decimal place unless <0.001.

The p values have been reported as suggested.

2) The 5th sentence of the results in the abstract should have an appropriate p-value. "Mean total hospital charges for the extremely ill were also significantly higher (p=?)...".

The p values have been reported as suggested.

3) As stated in the background section, the authors tested the hypothesis that the most severely ill children will be hospitalized more often at children's hospitals. More information is needed here on why this was hypothesized for high-impact conditions before the analysis was started.

The hypothesis, that the most severely ill children will be hospitalized more often at children’s hospitals and will accrue greater hospital resource use burden than less severely ill children, was based on the authors’ clinical experience and prior work (1). This alteration has been added to the Background section (Page 4, final paragraph).

4) The section on dependent variables in the methods is confusing. I believe the mean and cumulative variables are calculated in the analysis. This would indicate the dependent variables in the dataset are length of stay and total hospital charges, and the (weighted?) means were calculated using these dependent variables. Please clarify.

Clarification has been made to the definition of the dependent variables in the Methods section. The measures of hospital resource use within the dataset were: hospital length of stay and total hospital charges. Thereafter, other measures of resource use were calculated by the authors, namely, mean length of hospital stay and mean hospital charges; and cumulative hospital stay and cumulative hospital charges. This clarification has been added to the Methods section (Page 6, paragraph 1).

5) Mean values by hospital type should be added to table 4. It is difficult to assess the effect of hospital type using only aggregate counts.

Mean hospital length of stay and charges by hospital type and illness severity have been inserted to the manuscript as a separate Table (Table 5). This additional table makes it easier to appreciate the distinctive differences in length of stay and charges that are
apparent with increase in illness severity, and the variation in these measures of resource use across the various hospital types.

6) The type of significance tests used should be either stated in the methods, or as a footnote in the tables where p-values are listed.

The authors agree and have included the information in the Methods section (Page 8, paragraph 2).

7) 3rd paragraph of the discussion, last sentence. P-values are needed when describing these significantly longer hospital stays. I don't believe p-values for these comparisons are included elsewhere in the tables or text.

The authors agree and have included the information (Page 11, paragraph 1).

Minor Essential Revisions:
1) The first sentence of the methods in the abstract is not a complete sentence. It should read "We conducted a retrospective study ...".

The authors agree and have made the suggested change.

2) Table 5, characteristic column should state "Cumulative Hospital Stay".

The authors agree and have made the suggested change. As a result of the creation of a new table (inserted as Table 5), the former Table 5 is now Table 6.

Discretionary Revisions:
1) Since most of the hospitalizations were in infants, it would be helpful to know if these results differ in the older age categories. Is it possible to include a brief comparison to see if older children also similarly use children's hospitals most often for extreme diagnoses?

While the authors understand and appreciate the reviewer’s interest for further characterization of the findings according to patient age, such analysis is hampered by the sampling frame for the study population that results in the infant population being the predominant population. As depicted in Table 1, a significant proportion of the population had perinatal conditions which constitute a leading cause of child death. These conditions are therefore likely to manifest within the child’s first year of life, as shown in the preponderance of hospitalizations. Further analysis across age categories was reported in Tables 2 and 3, and reveals that for children older than 9 years; there was progressively higher frequency of hospitalizations with increased illness severity (Table 3). Because of the preponderance of children in the infant age group, further analysis within the older age categories alone will likely lead to generation of unstable statistical estimates, precluding the authors’ ability to generate any valid results from such analyses.

Reference
Reviewer 2

Comments, especially on the discussion and conclusions.
I believe that the conclusion could be more dense, based on data collected for the study and discussion, which is very appropriate.
In conclusion we could emphasize in the main data of the work the importance of the degree of the hospital hierarchy, fundamental to the type of hospital, teaching children’s hospitals with developing a more important role in disease severity.

Also worth noting the importance of the Medicaid program, which plays an important role for children with more severe disease. This is an important discussion, because this child will probably come later to the health system for their poor social conditions and without this program we could see a higher mortality of these diseases in children if they did not had access to this program and therefore not entitled to treatment in the health service. We could also see the comment of the difference in the proportion of patient days for children in Medicaid in relation to the percentage of children covered under the program with children who have access to HMO better placed in the discussion and especially in the conclusion.
The authors wholeheartedly agree with the reviewer’s astute insight as to the importance of the study finding as it relates to the crucial role played by specialized hospitals such as children’s and teaching hospitals, as reflected in their differential hospitalization of children with the greatest illness severity. Further, the reviewer’s comments on the vital role of the Medicaid program as a safety net for child health care delivery has been elaborated upon in the Discussion (Page 15, paragraph 1) and Conclusion (Page 16) sections.

As requested by the reviewer, we have calculated the mean length of hospital stay and hospital charges according to payer type, as depicted in the table below. It illustrates the per-patient resource burden as distributed across the payer types. As the insurance coverage borne by the various insurance types was not a primary objective of the study, it is not included in the manuscript.
<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Payer Type</th>
<th>Mean Hospital LOS, days (95% CI)</th>
<th>Mean Hospital Charges, 2006 US $ (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medicaid</td>
<td></td>
<td>5.6 (4.9-6.3)</td>
<td>22,013 (20,757-23,268)</td>
</tr>
<tr>
<td>Private/HMO</td>
<td></td>
<td>4.8 (4.7-4.9)</td>
<td>19,461 (18,356-20,567)</td>
</tr>
<tr>
<td>Self-Pay</td>
<td></td>
<td>3.7 (3.5-3.9)</td>
<td>12,594 (11,287-13,901)</td>
</tr>
<tr>
<td>Other</td>
<td></td>
<td>6.1 (5.6-6.6)</td>
<td>31,341 (27,449-35,234)</td>
</tr>
</tbody>
</table>