Reviewer’s report

Title: Pediatric Complex Chronic Conditions Classification System Version 2: Updated for ICD-10 and Complex Medical Technology Dependence and Transplantation

Version: 1
Date: 28 February 2014

Reviewer: David Rappaport

Reviewer’s report:

Thank you for the opportunity to review the paper by Feutdner et al, “Pediatric Complex Chronic Conditions Classification System Version 2: Updated for ICD-10 and Complex Medical Technology Dependence and Transplantation.” Overall this is a very interesting paper and is especially germane to practicing pediatric practitioners now because of the upcoming transition to ICD-10. I do think, however, that there are several aspects of the paper which can be improved.

Major Revisions: First, a general comment: the subject of the paper is quite technical and perhaps not terribly accessible for some readers. Therefore I encourage the authors to streamline the paper as much as possible and use clear and consistent terminology (for instance explaining the difference between “CCC categories” and “CCC subcategories”). The paper can also likely be shortened by a fair amount without significant loss of content.

Minor Revisions:
ABSTRACT: This can probably be shortened and clarified significantly. The methods section was especially difficult to understand. For example, under methods, when you say “codes” for the first time, are you referring to diagnosis codes, procedural codes, or both? Also the reader is not able to put into context CCC categories “originating in the neonatal period” at this point, so perhaps you delete this or clarify it earlier. I would suggest you add a few clarifiers here “We then applied this provisional CC version 2 (v2) to the national dataset of death…and two databases of healthcare utilization, the Kids’ Inpatient Database (KID) and the Nationwide Emergency Department Sample (NEDS).” The next sentence perhaps you could say, “the 1996 national death certification dataset which included both ICD-9 codes (before 1999) and ICD-10 codes (after 1999).” Under Results, the first sentence seems to be missing a word, ie, “with a new neonatal CCC category, and domains…”

BACKGROUND: Again this can be streamlined significantly. For example, if a patient is now able to survive, it is self-evident that the condition would have once been fatal.

Again in using the term “codes,” I suggest you clarify if this refers to diagnostic codes, procedure codes, or both.
The final sentence of the third paragraph is not clear and seems to suggest that there is antibiotic resistance to thrombosis treatment. I suggest you delete that sentence and move your references 3-27 to second sentence of that paragraph.

The next paragraph could also be clarified that the CDC began using ICD-10 in 1999.

The final paragraph could be clarified somewhat. When you use the term “comparability,” it seems as though you are using this in a statistical sense and perhaps could define what this means. I suggest you delete “of” after “classification across of CCC”. The three ways of evaluation of CCC v2 should also be meticulously clarified.

METHODS:
The IRB section is generally clear but could be streamlined.

Regarding identification of neonatal codes which would have a more than 50% likelihood of resulting in CCC status, this is not terribly clear. Would chronic lung disease of prematurity fall into this category? Are there any data to suggest that a certain code would be associated with CCC status more than half the time? Also would use consistent terminology throughout (“ICD-10” vs “ICD-10-CM”—or at least define what “CM” refers to).

Evaluation of the V2 scheme is also generally clear but a few points of clarification: is the “1996 data year multiple-cause of death file” the same as the Compressed Mortality File or different? I think it is different and you used data from a particular year (1996) but this should be clearer.

Also perhaps explaining comparability ratio this way might be clearer “This refers to the ratio of the number of deaths coded to a cause in ICD-10 to the number coded to the equivalent cause in ICD-9.”

The next to last paragraph could be clarified, specifically the sentence, “We classified the data into CCC categories using both the ICD-9 based v1 and v2 classification systems.”

RESULTS:
Updated CCC V2: Again this can be clarified somewhat. What do you mean by “attributes of complexity associated specific conditions”? The final sentence of this section is probably too long and difficult to follow.

Comparability of CCCV2: By “fewer numbers” and “more numbers,” do you mean more patients falling into this category and fewer patients falling into this category? Also were there really 0 patients captured in the transplantation category as suggested by Table 1?

Temporal trends of CCC: By “overall CCC proportions” in the last sentence, do
you mean “proportion of the overall population with one or more CCC”?

Percentage of patients identified in CCC categories between CCCv2 and CCCv1: Again please clarify. You indicate in absolute terms a difference of 2.5 % in KID and 0.7% in NEDS. I assume you mean 0.7% more in NEDS. Also Table2 suggests an absolute increase of 12.61-10.56 = 2.05% (not 2.5%) and 2.44-1.83 = 0.61% (not 0.7%). Please also clarify why the discrepancy exists between 23% change in KID (vs 19.41% in the table) and 36% change in NEDS (when the table says 33.33%). Also, what do you mean by “benign cancers”? Does this mean “benign tumors”?

DISCUSSION

I suggest you delete the first sentence as it is self evident. The first paragraph is in general wordy and not terribly clear. The second sentence reads awkwardly; I would suggest you say something like “Children with chronic conditions present challenges and opportunities in delivering healthcare.” Also what is a “spectrum of pediatric health state”? Also is a “health vector” a well accepted term? If not, I suggest you cite a reference for this term.

In the second paragraph, what do you mean by “open source coding”? Are you using this in the computer programming sense of the term? The last sentence of the second paragraph is particularly unclear, especially in terms of what you mean by “modular.”

The fourth paragraph is particularly unclear. I think perhaps you are suggesting that totaling the number of CCC categories a particular patient falls into results in a numerical value which has been associated with increased rates of hospitalization, readmission, etc. Is this correct?

The sixth paragraph could probably be developed somewhat. If including technology dependence is so important, why are only 6 additional patients captured in Table 1 by adding this category?

In the seventh paragraph, “abrupt changes” in “long-term time trends” seems to be a contradiction in terms.

In the eighth paragraph, please be clear what you are referring to when you say “declines in the cardiovascular and respiratory CCC categories.” I think what you mean is as cause of death using the CDC Multiple Cause of Death data (my copy is in black/white so I cannot see the categories clearly on the graph). Also clarify that congenital and genetic CCCs were in one group—would say “patients in the congenital/genetic CCC category.” Add “as” after “such as improved detection.”

The final paragraph is also wordy and difficult to understand. Please consider streamlining it.

Thank you again for the opportunity to review this paper.

Level of interest: An article of importance in its field
Quality of written English: Needs some language corrections before being published

Statistical review: No, the manuscript does not need to be seen by a statistician.

Declaration of competing interests:
I declare that I have no competing interests