Reviewer's report

Title: The Relationship between Body System-Based Chronic Conditions and Dental Utilization for Medicaid-Enrolled Children: A Retrospective Cohort Study

Version: 1 Date: 5 March 2012

Reviewer: Gary Slade

Reviewer's report:

Overview
This paper uses Medicare administrative data to describe patterns dental care provided to Medicaid-enrolled Iowan children who had chronic medical conditions, ranging in severity from mild to catastrophic. The stated goals of the study were to evaluate dental care use by these children and to identify subgroups of chronic conditions that are associated with low levels of dental care. Contingency tables and logistic regression used five measures of dental care as dependent variables, testing for associations with each of ten subgroups of medical condition, adjusting for a dozen covariates. The main findings were that neurological conditions were associated with lower likelihood of dental care, whereas respiratory, musculoskeletal, or ear/nose/throat conditions were associated with higher likelihood of dental care.

Critique
This study uses conventional statistical methods to examine associations between dental care and chronic medical conditions using a subset of Medicare enrollees. Potentially, these datasets provide useful evidence of associations in the Medicaid-eligible population. However, this study obscures the evidence for three main reasons:

1) The study sample is limited to 25,993 children who had CHSG categories 3-9, thereby excluding children who were healthy or who had acute medical conditions. The paper does not state what proportion of Medicaid-eligible children was excluded in this way. More importantly, the restriction makes it impossible to document the extent to which ANY type of chronic medical condition is associated with dental care. This severely hampers interpretation: for example, the reportedly large difference in dental utilization between children with catastrophic neurological conditions (44%) and those without (59%) would be interpreted in three very different ways if utilization among healthy children was: a) 30%; b) 50%; c) 70%. Instead, this study effectively has no control group. As a consequence, the authors' conventional inferences ascribed to reference groups (for example, when describing odds ratios) are tenuous at least, and invalid at worst. For example, at p11, the authors report "children with catastrophic neurological conditions were significantly less likely (OR: 0.44-0.63) to use most types of dental care THAN CHILDREN WITHOUT." (my emphasis) In fact, the contrast is "than children without chronic medical conditions that were not
classified as catastrophic neurological conditions”. While this turgid text is accurate, it is of questionable public health relevance: the important questions are whether any dental care for children with any single chronic condition occurs more or less frequently that dental care for otherwise-healthy children. Then, the magnitude of those differences can sensibly be contrasted according to the type of medical condition.

2) Tables correctly reported probability of dental care, whereas adjusted estimates are reported only as relative odds of dental care, computed from multivariable logistic regression models. Given that the primary outcome measure has a probability of 0.58, while secondary outcome measures have probabilities as low as 9%, odds ratios are extremely poor measures of effect. For example, based on Table 3, the percentage with any dental attendance was 59.1% for children with respiratory conditions to children compared to 54.3% for children without respiratory conditions, an absolute difference of 4.8% and an odds ratio of 1.21. Meanwhile, complex restorative care was provided to 9.4% and 7.6% (respectively), an absolute difference of only 1.8%, but an odds ratio of 1.25. From a public health perspective, a difference of 9.4% versus 7.6% in the rate of dental care is meaningless, yet the odds ratio of 1.25 gives the impression of an effect that is at least as great as the 4.8% difference seen for any dental visit. These limitations of odds ratios are widely known, and can easily be avoided by modeling the probability of dental care, rather than the odds of dental care.

Probably both of these methodological limitations contribute to a third major shortcoming of this paper, namely its discussion of interpretation and implications. The fact is, all of these groups have levels of dental care that are MUCH lower than desired when considering their medical conditions and low socioeconomic status. Arguably, all of these children should have at least one dental visit per annum; to show that the percentage is a few points either side of 55% for subgroups of them is mere statistical minutia.

**Level of interest:** An article of limited interest

**Quality of written English:** Acceptable

**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