Reviewer’s report

Title: Determining initial and follow-up costs of cardiovascular events in a US managed care population

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Reviewer: Harindra Wijeysundera

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In their paper, Chapman and colleagues aim to evaluate the initial and follow-up costs of CV events in a US managed care population.

In the introduction, the justification for this study is the ‘lack of up to date cost estimates for specific CV events’. The stated objectives were

1. Determine overall costs of initial and subsequent CV events
2. Examine costs of 1, 2 and 3 year follow-up care in patients with CV event
3. Compare total costs of follow-up care for patients with CV events compared to typical patient, with similar demographics.

MAJOR COMPULSORY REVISIONS

A major concern I have is that the stated justification and the subsequent objectives are not in line. If cost estimates for specific CV events are not available, should this not be the focus of the study, rather than objectives 2 & 3? There is not attempt to look at downstream costs, based on the initial CV event type, which would appear to be the more rational follow-up to objective 1. Please comment

I do not understand why one would look at objective 3…this seems to be obvious that CV patients would have greater costs, especially as there was no requirement that the control patients have had a hospitalization...hence they are almost certainly a healthier group. As the authors themselves state, it is know that patients with CV disease have 3-4 times the downstream cost. What novel insight do the authors believe one gets from this analysis? Would it not be better to look at the drivers of cost within the CV group, in regards to the initial event, as stated as the primary justification for the study?

Specific concerns:

METHODS

1. Patient selection: Exclusions included “patients > 65 years whose insurance was not ‘Medicare Risk’ at any time during study period”. Please elaborate why this is a necessary exclusion

2. Authors comment on covariates that they are adjusting for, prior to a comment on the model they are using and why. I would suggest they reorder this.

3. “A generalized linear model was used to account for remaining differences in
variables used to match patients”: Was a matched regression analysis done? Appears to me that all subjects (CV and control) were entered into a typical GLM model...ie was special methods used for matched-data.

4. For the GLM model, what distributional family was used and what link function? The authors need to specify this and why a particular choice was made. Moreover, guidance as to the interpretation of the B-coefficients in Table 4 requires this. It seems that a log link was used, in which case the exponential of the coefficients should be presented and explicitly stated that these are ratio of the means.

5. How did the authors deal with the fact that they use a naïve estimator of mean cost, by only including noncensored cases. From figure 1, it appears that only 40% of the total patient sample was continuously enrolled for 1 year. The 80% of patients excluded were presumably loss to follow-up (b/c patients who died were included as complete cases). The authors must comment on the bias that this will introduce into their estimates. Almost certainly this will bias mean costs towards patients with shorter follow-up (ie who died soon after hospitalization), and therefore I believe towards sicker patients, with inflated costs.

Results

1. Some comment on the fact that of the almost 200,000 patient initial identified, only 29,863 were studied.

2. In paragraph 2, initial CV-specific costs are given. I believe it would be of interest to know follow-up costs, stratified by these initial event types.

3. The differences between CV and controlled patients is obvious...again, I am not sure of any new insight from this.

4. The multivariable model should be better explained, especially the interpretation of the beta-coefficients (are these log of the ratio of means etc)

5. The results of the multivariable model are not that insightful, as no attempt is made to control for co-morbidities outside of DM, HTN and Hyperlipidemia. A more interesting model would be to look at just CV patients, and after controlling for co-morbidities, understand the impact of the initial CV event on downstream costs.

Level of interest: An article of limited interest

Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:

'I declare that I have no competing interests