Author's response to reviews

Title: Costs of hospital care for hypertension in an insured population without an outpatient medicines benefit: an observational study in the Philippines

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Version: 2 Date: 28 May 2008

Author's response to reviews: see over
May 28, 2008

Dr. Mark Todd  
Assistant Editor  
BMC-series journals  

Dear Dr. Todd,

We are pleased to submit a revised version of the manuscript entitled “Costs of hospital care for hypertension in an insured population without an outpatient medicines benefit: an observational study in the Philippines” for possible publication in *BMC Health Research Policy and Systems*.

The comments by Drs. Dylan Roby and Koshi Nakamura were very helpful. We addressed them as detailed below. Reviewer comments are printed in italics; our responses are printed in regular font.

**Reviewer: Dylan Roby**

**Major Compulsory Revisions**

1) *The authors should explain why secondary diagnosis codes were not used in the claims analysis.* They mention that one limitation is potential under counting of hospitalizations due to a limited number of ICD-10 codes. However, it would seem that some coders may have placed hypertension-based hospitalizations in the second diagnosis field on a claims entry, and my understanding is that the decision can be rather arbitrary at times, and not necessarily reliable.

We agree that secondary diagnoses on claims may be less reliable and, in addition, may not represent the reason for the admission. In the discussion on page 9, we added the following sentence: “While inclusion of hypertension diagnoses in secondary diagnosis fields may have reflected more correctly the prevalence of hypertension among the study population, it would likely have led to overestimation of costs of inpatient care for hypertension, by including costs for primary reasons of admission other than hypertension.”

2) *The authors should explain how denial of claims and claims that exceed the 45 covered inpatient days per year might affect their analysis. Do denied claims show up in the dataset at all (and do physicians submit them), and was there any analysis of the likelihood of hypertension hospitalizations not being paid or counted in this analysis due to the 45 day limit. In the same way, is it possible to track NDC codes for hypertension related medicines delivered in hospitals, and the denial of those claims?*
In the discussion on page 10, we now explicitly say that the difference between the amount billed to PhilHealth and the amount reimbursed by PhilHealth (34% of what was billed) includes denials of parts of or entire claims. It is possible that claims are not submitted when they are not expected to be paid but we have no way of knowing the extent of that. We therefore explain that our analyses only report, conservatively, what PhilHealth paid for inpatient care of patients treated for hypertension or related problems. Unfortunately, individual medicines do not appear in the electronic PhilHealth database, only aggregate amounts of charges and reimbursements for medicines used during a hospitalization in total.

Minor Essential Revisions

3) Table 6 - Is it assumed that the predictors listed in the table with odds ratios were those that were found to be significant in the logistic regression? If so, what variables were in the model that did not end up in the model due to non-significant results?

The predictors in Table 6 are all the predictors that were included in the model. Two predictors with non-significant odds ratios (retired and sponsored member status) are included in the Table.

4) Have the authors considering using a per member per month (PMPM) rate to measure costs, rather than an annual rate. If that is not possible, is the annual spending annualized? For example, do 2 people who were covered for 6 months end up counting together as one year of claims, or is the amount spent by each of them over that 6 month period considered their annual spending?

We agree that PMPM expenditures would be a more commonly used measure. However, PhilHealth does not maintain an electronic enrolment file to allow us to calculate a denominator for estimating PMPM inpatient expenses.

The analysis is a claims level analysis summing expenditures for claims incurred over the 3.5 year study period. So two members discharged once each within the same calendar year contribute two claims in that year.

5) On page 3, in the 3rd paragraph of the Background section, there is a sentence reading: "However, as other developing and transitional countries, the Philippines..." I think that "as" should be replaced with "as have" or "similarly to".

We replaced “as” with “similar to”.

Discretionary Revisions

6) How are ordinary, intensive, and catastrophic case severity indicators assigned?

On page 6, we have added that case types are classified by ICD-10 diagnosis codes and the service capability of the PhilHealth accredited provider and included a reference to Phil Health Circular No. 32, 2006.
7) The "Costs of Hospitalizations" section is difficult to read. Is the $56 million US 34% of the amount of inpatient billing for all hospitals, or all billing across the board including outpatient, etc. Also, the authors might clarify, when it is stated that "The largest part of the total reimbursement (34%) was spent on medicines", does it mean that 34% of the $56 million US spent on hypertension was spent on inpatient medicines?

We added to the methods section on page 6 that claims data also contain amounts billed by hospitals for each service. We changed the wording of the paragraph on page 7 to clarify that $56 million is reimbursement for 34% of what hospitals billed for the care of patients with hypertension as their primary discharge diagnosis. Since PhilHealth does not reimburse for outpatient care of chronic conditions, all expenses are for inpatient care.

8) The 252 days to 321 day re-admission rate range seems rather long. I often see 30 day and 180 day readmission rates, which make this finding difficult to understand. It might be helpful to give some context to this statement by mentioning readmission rates in other settings (private insurance in the US, etc) and the mean number of days to readmission in other settings.

We now represent time to readmission in Table 5 as percentiles, rather than mean values, to avoid influence of extreme values. Half of all PhilHealth members originally admitted for essential hypertension in the first 18 months of the study and who were readmitted were readmitted between 178 and 250 days, depending on the cause for readmission. Shorter times to re-admission cited by the reviewer have been reported in the literature for patients admitted with congestive heart failure (Krumholz HM et al, Arch Intern Med 1991; Vinson JM et al. J Am Geriatric Soc 1991). It is unclear what readmission times based on claims data should be expected for patients following admission for care of essential hypertension, in a system that limits reimbursed inpatient days per year, and given that untreated hypertension may progress relatively slowly to cardiovascular and renal diseases. In a study of 113 poor adults who were discharged from a U.S. hospital with a primary or secondary diagnosis of hypertension, 28 (25%) were readmitted within one year and underutilization of antihypertensive medicines was thought to be associated with rehospitalization (Maronde RF et al. Med Care 1989; 27:1159-1166). In light of the second reviewer’s suggestion to shorten the discussion, we did not add a discussion of times to readmission to our manuscript at this time. We would be happy to do so if BMC editors felt this was desirable.

9) Has any thought been put into using a grouper or ICD-10 plus CPT code hierarchy to develop a way in which to identify hypertension cases. That may help to deal with the limitations issues.

We agree that it would be ideal to create an algorithm that include procedures (CPT coded or otherwise) and prescribed medicines in the definition of a diagnosis of hypertension. Unfortunately, neither procedures not medicines are individually captured in the electronic PhilHealth claims database.

10) There is only one policy recommendation furnished by the authors. It seems like other proposals could also work, besides an outpatient medicines benefit. Is there any way that
hypertension patients could obtain the necessary drugs without expanding the benefit to all PhilHealth enrollees?

On page 12, we added a sentence acknowledging the importance of diet and exercise in ambulatory care of patients with hypertension. The question of whether a benefit needs to be expanded to all PhilHealth question is very important and the subject of ongoing research. We added this comment on page 13.

Reviewer: Koshi Nakamura

The authors examined whether hypertension has a large impact on the Philippine Health Insurance Corporation (PhilHealth) that is only for inpatient medical services. The present study demonstrated that hypertension (and its sequelae) was a burden of hospitalization medical expenditures in detail. The findings of the present study are of importance.

However, PhilHealth does not cover outpatient medical services. This is a sad limitation, because I think that long-term blood pressure control with medication in outpatient also has a negligible impact on medical economics despite its definite need for preventing cardiovascular disease. Thus, I don’t think that the authors can conclude that “an outpatient medicines benefit may be one cost-effective policy option for PhilHealth” directly from the results of the present study.

We agree that not providing an outpatient benefit is problematic. We also cite recent data that show that pharmacotherapy for secondary prevention after a myocardial infarction among U.S. patients suggest that providing the medications free (without co-payments) would reduce mortality and reinfarction rates and save $5,974 per patient, a substantial economic impact.

We had phrased the statement cited as a question, rather than a conclusion, in our final paragraph, as follows: “Our study raises questions as to whether PhilHealth members have access to appropriate outpatient treatment of hypertension, and whether an outpatient medicines benefit may be one policy option for PhilHealth to decrease inpatient admissions and costs.”

In addition, I would suggest that the authors shorten the Background and Discussion sections, removing statements that are not directly associated with the aim and results of the present study, respectively.

The background briefly outlines hypertension as a global problem and a problem in the Philippines and then describes PhilHealth and its reimbursement for care. The discussion summarizes the study results, details the limitations, and then develops arguments, based on published evidence, for the public health implications of and recommendations based on our results. We deleted from the discussion eight lines of text that referred to the “polypill” which may be considered not directly related to our study.

In summary, to our knowledge, this manuscript constitutes the first analysis of costs of inpatient care reimbursed for a chronic condition by the Philippine Health Insurance Corporation. We
believe this work is highly important, for several reasons: Chronic conditions in general and hypertension in particular are increasingly prevalent causes of morbidity and mortality across the world; in countries like the Philippines, lack of affordable access to effective outpatient care including medicines leads to costly inpatient care for chronic diseases; routine data, like the ones used in our study, exist in emerging and expanding health insurance systems and allow us to ask and answer policy-relevant questions about costs and quality of care; and, using this information, health insurance systems can intervene on their defined member populations to improve care. BMC Health Research Policy and Systems is an open access, peer-reviewed journal focusing broadly on health services research; we believe this paper would be of great interest to BMC’s global readership.

We thank the Drs. Roby and Nakamura and the BMC-series editors for their review of the manuscript and look forward to hearing from you soon.

Sincerely,

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