Author's response to reviews

Title: Inpatient and Emergency Department Health Care Utilization among Patients Who Require Interpreter Services

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Author's response to reviews: see over
March 24th, 2015

Christopher Morrey, PhD,
Executive Editor, BMC Health Services Research

Dear Dr. Morrey,

RE: MS: 1758945821152400 - Inpatient and Emergency Department Health Care Utilization among Patients Who Require Interpreter Services

We appreciated the thoughtful suggestions from the reviewers and editor regarding our manuscript. We made revisions based on these suggestions and we believe the manuscript is now much improved.

Below you will find the reviewer comments followed by our responses.

Thank you for your time. We look forward to hearing from you.

Respectfully,

Janew

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Response to Reviewers

Editor's comments:
"- I don't really think it is appropriate to use chi-squared test or t-tests (lines 117-119 ) with the count variables that you are dealing with, i.e. number of outpatient/ED visits and hospitalizations. Please justify or correct.

We categorized the number (counts) of diagnoses (Charlson score), out-patient visits, hospitalizations and ED visits descriptively in Table 1 and therefore a chi-squared test is appropriate. This has been clarified in the text (lines 119 -121). Similar results were seen when comparing the rate of hospitalization and ED visits using Poisson and Negative Binomial models (data not shown).

- Please spell out confidence interval (CI) the first time it is used and add it to the list of abbreviations

We have spelled out confidence interval (CI) the first time it is used (line 123 - 124), and added it to the list of abbreviations (line 269).

- Please note when the Charlson comorbidity index was measured or put differently, what time horizon it covers

We used the time period of 5 years before baseline to identify diagnoses used for the Charlson comorbidity index. This has been clarified in the methods section (line 106 to 107).

- a definition of 'high utilizers' of inpatient services is provided but not mentioned again in the rest of the manuscript

We have removed this definition.

- line 133: please say "statistically significant" rather than just "significant"

We have changed this to read “statistically significant”

- line 160: p>0.05 so not statistically significant according to your previously defined criterion

We have adjusted this accordingly, and removed the non-significant results.

- It seems to me like the analysis would have greatly benefited from matching to more stringent criteria and the sample size + data completeness suggest that there was scope to do so but I guess you cannot easily do so at this stage because it would require you to review the charts again etc.

As noted this would require additional chart reviews, which is not easy to do at this stage. We did adjust for additional variables which could modify the association.
Reviewer 1

Major compulsory revisions
The authors have a lot of measures information mixed in the data collection section. You need to describe data collection in one section, then how you defined dependent and independent variables in a measures section. It's a bit confusing now.

We have revised the data collection section, and added a new measures section (lines 88 through 115)

Page 7, line 103, the definition of high utilizers should be in measures not data collection. But I guess the bigger question is why you define high utilizers when you don't use the measure in your analyses.

We have removed the entire line with the definition of high utilizers, since we did not use it subsequently in our manuscript.

How was language spoken by patient identified? Authors don't specify.

The language spoken by patients was identified from the registration information in the medical records. We have included this in the data collection section of the manuscript under measures, line 97 - 98, which reads “The language spoken by patients was identified from registration information”

Minor revision
Another limitation is lack of data on patients' mental health status. Some of the patients' may be refugees, if this is the case they may have trauma exposures and if undetected/untreated could have negative impacts on health. It also could impact patient trust of government and providers, although I acknowledge that's beyond the scope of your study.

We appreciate and agree with this observation. However this is beyond the scope of this study from the available data. As noted, undiagnosed mental health conditions may have negative effects on health, and lead to inefficient healthcare utilization. In a previous study, we found that IS patients, compared to non-IS patients, had higher utilization of outpatient and ED visits, as well as higher rates of mental health diagnoses and unexplained somatic symptoms. (Ref. Flynn PM, Ridgeway JL, et al. J Gen Intern Med 28(3):386-91)
Another limitation is lack of information on implementation of interpreter services. From the text it appears that all doctors and nurses use the interpreter services in a relatively uniform fashion. But is that really the case? Are providers and nurses and staff trained on how to use interpreter services? Just something to consider for future work

We agree with this observation. Although providers are trained in the use of interpreters and required to use an interpreter for all clinical encounters, we are not able to assess the penetrance of this policy in practice. We included this in our limitations section as follows: “In addition, we are not able to verify the percentage of eligible patients who received IS services during health care events, though institutional policy dictates that professional interpreters participate in every clinical encounter”.

On page 8, line 156 -- why do you report borderline significant results? You have a lot of power; I would not report borderline significant results.

We have removed these borderline results.

There are typos in the figures; also it might be clearer to read if you use one decimal place in all the tables.

We have made all corrections to all apparent typographical errors, and changed the numbers in the tables to one decimal place.
Reviewer 2
Major Compulsory Revisions
There are four major issues the authors need to address before moving forward with publication of this paper:

1. Authors should further justify (with citations) the use of interpreter service (IS) need as a proxy for limited English proficiency (LEP) status.

   The definition of LEP is commonly based upon a survey item that is not typically found in administrative databases. Therefore, a reasonable proxy for LEP is needed for health services research. One such reasonable proxy is the self-identified need for interpreter services for medical encounters. We have included a reference for this approach (Karliner et al Identification of limited English proficient patients in clinical care. J Gen Intern Med 2008, 23(10):1555-1560) while noting its limitations in the text, lines 243 - 245, as follows: “The use of IS need as a proxy for LEP is incomplete and represents only a subset of true LEP patients. Furthermore, the fact that IS status was assessed by self-report may have led to misclassification of patients”. We have also been careful to label our title to reflect this fact: “Emergency Department and Inpatient Health Care Utilization among Patients Who Require Interpreter Services”.

2. Authors should include a third outcome in their analysis: use of outpatient services. They mention that this information was collected (see page 6), but was not included as an outcome. The issue of differential use of ED and hospitalization visits should be contrasted with outpatient visits to highlight the role of need for IS services as a proxy for LEP status.

   We have previously reported on out-patient utilization among patients who require interpreter services (Flynn PM, Ridgeway JL, et al. J Gen Intern Med 28(3):386-91). The aim of this paper was to focus on ED and hospital utilization; therefore we did not add out-patient visits as a primary outcome. However, we do report outpatient utilization in this paper (Table 1), and adjust for it in our models (Table 2).

3. Given their use of electronic records, it would be relevant if authors are able to include other variables such as: employment status, type of job, immigration status (e.g., foreign-born vs. US-born), years in the US.

   Medical records at these institutions do not accurately capture data for any of these domains, though the use of medical interpreters implies that all included patients were foreign-born. We can only crudely report socioeconomic variables as insurance type (Table 1), which was adjusted for in our models (Table 2). The lack of access to other socioeconomic variables is noted as a limitation to the study (lines 241 - 243).
4. A related issue of including/excluding variables is the lack of a theoretical framework to guide the authors on this process. The widely known Andersen model of health care utilization behavior should be a good place to start.

We have included utilization-related variables that are typical for health services research from administrative datasets. These include many variables in the Anderson model of healthcare utilization: predisposing factors (age, sex, ethnicity, marital status); enabling factors (health insurance status, empanelment into primary care); and need factors (medical complexity). We recognize that there are other factors in this model not assessed directly in our study, including education, social composition of communities, individual wealth status, community resources and perceived need for health services. Assessment of these variables is beyond the scope of this clinical cohort. However, we have noted the study limitation regarding social and economic variables.

I have included other comments/edits directly into the pdf of their article

**Outlined below are the responses to the comments and edits within the paper:**

1. Line 2: Edit accepted. Deleted: “More than 9% of the US population has limited English proficiency”
2. Line 6: Edit accepted. Deleted “who therefore required interpreters”
4. Line 46: Comment: “Expand on this issue. Since you focus on ED and hospitalizations, the issue of more outpatient visits would seem to contradict your findings. Are there other studies you can draw from?”
   As noted in response to comment #2 above, we have found higher outpatient utilization for this population in this study and in a previous study ( Flynn PM, Ridgeway JL, et al. J Gen Intern Med 28(3):386-91). We interpret this as a very interesting and important finding. It implies that the higher ED and hospital utilization cannot be explained simply by insufficient access to or utilization of outpatient care.
5. Line 58: Edit accepted. Removed “the efficiency and efficacy of”
6. Line 61: Comment “This is a vague statement of your research question. The literature review you included distinguishes between uses of outpatient or inpatient health care services, including ED visits. From an economic perspective, we would want these patients to come to outpatient services rather than ED or hospitalizations”
   We have clarified the statement to further demonstrate our focus on utilization of ED and inpatient services: “We hypothesized that patients who require
interpreters would have higher health care utilization of ED visits and hospitalization”.

7. Line 95: Comment “Create a separate subsection titled "Measures" where you explain in more detail each of the outcomes and predictors included in the study (e.g., expand on the description of the variable "residency" here instead of the reader learning in the analysis subsection that it refers to urban/rural)”.

   We have created a subsection: measures listing, and including a description of each measure.

8. Line 194: Comment “Discuss here issues related to immigration/documentation status that can likely lead to delay in care and increased use of ED. On the other hand, recent research suggest that, for example, undocumented immigrants in the US have similar levels of ED use as other immigrant and non-immigrant groups (e.g. Pourat et al, 2014. Health Affairs)”.

   We agree with this observation, and have added this to our discussion. “Our study lacks data on immigration status, which has been postulated to impact utilization of healthcare services, leading to delay in seeking care and recourse to ED visits (Berk et al: Health care use among undocumented Latino immigrants. Health Aff (Millwood) 2000, 19(4):51-64). However, other work suggests that undocumented immigrants in the US have similar levels of ED use to other immigrant and non-immigrant groups (Pourat et al: Assessing health care services used by California's undocumented immigrant population in 2010. Health Aff (Millwood) 2014, 33(5):840-847.)”

9. Line 206: Comment “Provide citations that support this statement”

   We have added the following citation: Wilson et al, Effects of limited English proficiency and physician language on health care comprehension. J Gen Intern Med 2005, 20(9):800-806.

10. Line 223: Comment “This is a good point. Why did authors not include outpatient visits as another outcome in their research? That would allow us to compare outpatient care use with ED and hospitalizations, making your findings more comprehensive”

   Please see our response to #6 above.

11. Line 226: Comment “This is very concerning. It would make more sense in a context where there is no interpreter. But in this case, you had interpreters who could help communication between patient and provider. It calls at least for a review of the role and training of the interpreters in this particular setting”
We agree that this is a concerning and important finding. Interpreters are highly trained and providers are also trained on interactions with interpreters. As discussed, it appears that barriers exhibited go beyond effective interpreter services and even beyond communication in general, and as we have noted in our discussion, “The decision to order extra tests or more aggressive therapy by ED providers may be influenced by a need to compensate for communication barriers, and this approach may then extend to the decision about whether a patient should be hospitalized. One study of pediatric patients showed higher admission rates among patients with LEP compared with English-proficient patients, even where acuity was similar at presentation” (lines 231 - 236).

12. Line 237: Edit accepted. Added “several” to limitations.

13. Line 246: Comment “Cite here previous studies that have used IS need as a proxy for LEP status”

We have included the following citation: Karliner et al, Identification of limited English proficient patients in clinical care. J Gen Intern Med 2008, 23(10):1555-1560.

14. Line 249: Edit accepted “replaced ‘IS’ with ‘LEP’”