Author’s response to reviews

Title: HOSPITAL PHARMACY WORKFORCE IN BRAZIL

Authors:

Thiago Santos (interferonfar@gmail.com)
Jonathan Penm (jonathan.penm@sydney.edu.au)
André Baldoni (andrebalponi@ufsj.edu.br)
Lorena Ayres (lorenaayres@hotmail.com)
Rebekah Moles (rebekah.moles@sydney.edu.au)
Cristina Sanches (csanches@ufsj.edu.br)

Version: 1 Date: 24 Aug 2017

Author’s response to reviews:

Dear Editor,

I appreciate the interest of your remarkable journal on our manuscript and the reviewers’ valuable comments and considerations that were important for manuscript improvement.

We provided all the recommended changes. Please, you will find attached the Reviewers’ consideration answers and revised version of the manuscript.

We are looking forward to hearing from you soon.

Kind regards,

Prof. Cristina Sanches
- **Reviewer #1:**

Reviewer: I think this paper is a well written, interesting analysis that I would assume is of interest to policy makers in Brazil. All my comments are fairly minor except that I would suggest switching to (parametric) regressions to investigate the association between a hospital having a pharmacist and hospital characteristics (as well as state/municipality-level GDP). While I do believe this would make the analysis better, I don't think publication should be contingent on making this (relatively major) change.

Answer:

Dear Reviewer,

We, the authors, appreciated your comments and considerations. They contributed manuscript improvement.

Please, find our comments below. Changes were provided and highlighted in yellow along the text.

Abstract

Please state why it was important to do the analysis you did in the background section.

Introduction:

"Have" should be changed to "has" in this sentence: "low compliance with these legal requirements and standards have been observed [17]."

Answer: The change was provided in the manuscript.

Methods:

Please clarify whether the database from which you extracted your variables contains data on all hospitals in Brazil or only a subset. In addition, please clarify how hospital was defined (e.g., does it include nursing homes?).

Answer: CNES contain all hospitals in Brazil. Additionally, nursing homes are not part of health system facilities therefore they were not included.
In methods:

‘According to Brazilian classification, medium complexity hospitals are those with availability of specialized professionals and technological resources aimed at resolving major health issues of the local population, and high complexity those with high technology resources and costs, aiming to provide qualified services to the population, integrating those services to the other levels of health assistance, as primary care and medium complexity [19].’

In discussion:

“However, CNES was the only source available for such data in Brazil. It was established by law, being mandatory the registry of all Brazilian health care facilities in CNES and data are validated through an unplaced visit [38].”

I believe 'crossover' should be spelt in one word in this sentence: "Medical laboratory scientists were not counted as hospital pharmacists despite some cross over in roles in the country."

Answer: The change was provided in the manuscript.

"States Gross Domestic Product (GDP) obtained at IBGE [01] were correlated to the 16 total number of pharmaceutical professional in each of the 27 Brazilian states, by 17 Spearman correlation." I think it would be good if you could justify here why you ran a Spearman correlation rather than a simple regression of the number of pharmaceutical professionals (possibly log-transformed) on state GDP.

Answer: This analysis aimed to compare Brazilian economic distribution with the study published by Bate and colleagues, 2016 that compared Gross national income and pharmacist density with correlation.


Results:

I would separate "hence these were excluded" into a stand-alone sentence in this sentence: "From a total of 6,385 registries of hospitals in the National Database of Healthcare
3 Facilities, 908 (13.8%) were duplicates and 687 (10.8%) were missing all data hence 4 these were excluded."

Answer: The change was provided in the manuscript.

I feel Figure 1 is superfluous given that you have already stated these exclusions in the text.

Answer: We consider this figure important to the manuscript and would like to maintain it since it facilitates comprehension.

I have several comments on the analysis presented in Table 4:

- I think the analysis presented in Table 4 would be better shown as a simple logistic regression (regressing 'having a pharmacist (yes/no)' onto each of the hospital characteristics both as uni- and multivariable regressions).

- Should the outcome variable for Table 4 be 'having a pharmacist yes/no' or rather 'having a pharmacist per 50 hospital beds' which I understand is the policy plan in Brazil? If the authors choose to switch to a parametric regression for Table 4, then I would also think about running a regression with the number of pharmacists per 50 hospital beds as the outcome variable (this could be run as an OLS regression, possibly with a log-transformed outcome variable).

- If the authors keep Table 4 as it is, then my comment would be that it is currently not clear to me which numbers/proportions the p-values are comparing. In addition, instead of showing n (%) in the table, I would show % (95% confidence interval).

Answer: The change was provided in the manuscript.

"Finally, a positive correlation was obtained between GDP and the total number of 2 pharmaceutical professional in each of the 27 Brazilian states (r2: 0.958; p<0.0001)." I believe this would also be more appropriately tested with a parametric regression (you could add GDP as a x-variable in the regressions for Table 4). In fact, this might actually best be modelled as a multi-level model with level 2 being the state and GDP being a state-level predictor. If you had GDP at the municipality rather than the state-level, this would make your analysis more powerful.

Answer: We agree with the statement, but obtaining the GDP of all municipalities is not viable and not justified, since the policies of the pharmaceutical profession are nationally centralized;
therefore, a country's regions overview is sufficient to discuss strategies addressing these inequalities.

Figure 2 is nice but a bit blurry.

Answer: The change was provided in the manuscript.

Discussion - limitations paragraph:

To what degree is it a limitation that you were not able to capture lab personnel and pharmaceutical technicians, which may adopt the role of pharmacists (is this 'task-shifting' intended by the system or not?)?

Answer: Since they perform different role, to capture their field of practice is important since our focus was pharmacists that have clinical functions.

Conclusion:

I'm not in any way an expert in the Brazilian health system but I wonder to what degree this conclusion applies: "Law enforcement 1 should be performed to 2 ensure all hospitals have, at least, one pharmacist for each 50 beds, assuring quality 3 in the healthcare process and more success in clinical outcomes". Maybe hospitals/municipalities made the conscious decision to invest limited resources into other hospital components (e.g., equipment, non-pharmacist staff, etc.) or non-hospital expenses in the health system, which they felt would better serve the population's health? If that is the case, should municipalities really be forced to hire pharmacists?

We understand your position, but we find it important to keep the text for two main reasons:

A) According to Brazilian legislation, It is mandatory the presence of the pharmacist where there is drugs’ dispensing;

B) The pharmacist generates savings for health services, preventing problems related to drugs and managing pharmaceutical services.

- Revisor #2:

1) Os argumentos que indicam a relevância do estudo são apresentados na Introdução. Seria oportuno verificar se o texto estaria provocando reducionismos ao nomear exclusivamente as
demandas relacionadas ao processo envelhecimento. Afinal, tratamento medicamentoso abrange usuários independente da faixa etária, ainda que a ênfase recaia sobre os adultos e os mais velhos.

Resposta ao revisor: Agradecemos as considerações. O texto foi modificado e encontra-se destacado em VERDE no manuscrito.

2) Está claro que os autores abordam a força de trabalho farmacêutico hospitalar, mas seria o caso de mencionar, ainda que não seja o objetivo do estudo, os demais níveis da atenção à saúde. Esse contingente de profissionais não cumpre papel na atenção primária?

Resposta ao revisor: Agradecemos as considerações. O texto foi modificado e encontra-se destacado em VERDE no manuscrito.

3) Não foram encontrados resultados de pesquisa no Brasil ou allures atinentes à necessidade de adequação da força de trabalho atuante no cuidado farmacêutico? Seria adequado informar o leitor sobre a carência de estudos, ou citar a literatura especializada.

Resposta ao revisor: Agradecemos as considerações. O texto foi modificado e encontra-se destacado em VERDE no manuscrito.

4) O tópico Discussão articula os argumentos interpretativos de maneira satisfatória. Verificou-se fraqueza na abordagem das disparidades regionais identificadas quando se descreve a concentração regional da força de trabalho. Não foram mencionados autores que trazem elementos consistentes para explicar as iniquidades de acesso, que têm relação nítida com os polos de formação, com as disparidades socioeconômicas, nível tecnológico regional, etc. Embora esses aspectos tenham sido citados, ressentem-se da ausência de autores que problematizaram essa realidade quando analisaram aspectos relacionados ao acesso ao tratamento, diagnóstico, precoce, taxa de internação etc.

Resposta ao revisor: Concordamos e agradecemos as sugestões. Ressaltamos que a discussão foi melhorada e os seguintes trabalhos foram citados:

A metodologia é suficientemente descrita, adequada à problemática e atende aos objetivos dos autores. Os resultados são esclarecedores. Contudo, o texto ganharia em força depois de ajustados os argumentos sobre a relevância da problemática (na Introdução) e incluídos na Discussão argumentos explicativos sobre as iniquidades regionais de acesso aos serviços de saúde baseados na ampla produção divulgada no Brasil sobre o tema.

Agradecemos e comunicamos que todas estas alterações foram realizadas para que o texto se tornasse mais robusto.

Cordialmente,

Os autores.