Author’s response to reviews

Title: Hospital admissions in Alicante (Spain): A comparative analysis of foreign citizens from high-income countries, immigrants from low-income countries, and Spanish citizens

Authors:

José M Ramos (jramosrincon@yahoo.es)
Eva M Navarrete-Muñoz (enavarrete@umh.es)
Hector Pínargote (hectorpinargote@gmail.com)
Jaume Sastre (sastre_jau@gva.es)
José M Seguí (jsegui@umh.es)
María J Rugero (ruguero_mar@gva.es)

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Author’s response to reviews: see over
Title: Hospital admissions in Alicante (Spain): A comparative analysis of foreign citizens from high-income countries, immigrants from low-income countries, and Spanish citizens

Dear Prof.,

We have carefully checked the manuscript and attended to the reviewers’ suggestions. We include a letter detailing the revisions and the revised manuscript.

We would like to thank the reviewers for their comments and suggestions, which have allowed us to improve the quality of the manuscript. We hope our paper will be of interest to be published in BMC Health Services Research.

Our results differ from prior literature because we compare hospital admission rates, diagnoses at hospital discharge, service of admission at hospital discharge, and mortality during hospital admission between autochthonous citizens and foreign citizens from high-income countries and foreign citizens from low-income countries in order to assess their needs and the impact on their health. The previous studies only compare ACs with foreign citizens.

We look forward to hearing from you

Sincerely yours,

José M. Ramos.

Department of Internal Medicine,

Hospital General Universitario de Alicante, Alicante, Spain
Reviewer: Ugo Fedeli

Reviewer's report:

MAJOR COMPULSORY REVISIONS

1. I’m not a native English speaker, but the manuscript requires an extensive re-writing (not simple editing). Many sentences are really difficult to understand, and the paper will require further re-review for contents after the latter will be made clear in a new manuscript.

We have reviewed the English in order to be clearer in the manuscript.

2. Authors do not provide enough evidence to consider their data as a population-based study. Analyzed hospital discharges include only those from the two described hospitals? In this case, is the number of patients seeking hospital care outside the study area negligible? Are discharges restricted to those of legal residents (the denominator of study rates)? If these conditions do not apply, utilization rates and rate ratios cannot be computed.

The two hospitals are public hospitals in the city of Alicante and its surroundings. There are several private hospitals in the city. During the period of study, all the patients registered in a city had medical assistance allowed. The denominator of the study was the total patients registered in the city. The numerator and denominator were the same category of persons. We have included this explanation in several parts of the material and methods section of the manuscript.

3. Standardized as well as crude rate ratios should be provided (denominator data by age for FCs as a whole seem to be available).

According to the reviewer, we have included in Table 2 the denominator date with the total population, ACs and FCs; .male, female, and 15-64 and >64 years.

4. Demographics of foreign citizens must be more extensively described. If total numbers of residents are available separately for FCHIC and FCLIC, they should be reported.

According the reviewer, we have given more details about FCs.

So the new paragraph is the following: The denominators of the rates for immigrants were based on data issued by the National Statistics Institute (Spanish Statistical Office) as of January 1, 2011. They include information on age, gender, and nationality, and the two group of age (15-64 and >= 65 years). This database included all of FCs and not separate FCHICs and FCLICs. For instance, Crude utilization rates (cR) were calculated from patient origin (ACs or FCs) by age and sex as the number of hospitalizations from the defined group divided by the total residents of that group. The utilization rate was
expressed as hospitalizations per 1,000 inhabitants per year. The crude rate ratios (cRR) of foreign citizens compared with ACs were calculated.

5. The different distribution of ICD-9 categories reported in Table 3 and extensively described in the text is interesting but biased by differences in overall hospitalization rates between population subgroups (although rates are available for foreign citizens as a whole, and not separately by FCHIC and FCLIC). This should be addressed in Discussion. Moreover, in the text of Results a long list of hospitalization categories less represented in FCLIC than in AC is provided; however for many of these categories differences are no more significant after adjustment for age and gender.

According the reviewer, we have removed from the text the list of these categories only significant in univariate analysis before adjusting by age and sex. We have eliminated the following sentences:

1) FCHICs had greater risk of being diagnosed at discharge for the circulatory system, neoplasms, and injury and poisoning compared with ACs. Hospitalization for pregnancy, childbirth & puerperium, respiratory system diseases, musculoskeletal system & connective tissue diseases, and endocrine & metabolic disorders were lower in FCHICs than ACs.

2) Hospitalization for pregnancy, childbirth & puerperium, and congenital anomalies & conditions in the perinatal period was higher in FCLICs than ACs. Hospitalization for circulatory system diseases, neoplasms, respiratory system diseases, nervous system diseases, musculoskeletal system diseases, symptoms, signs & ill-defined conditions, endocrine & metabolic disorders, mental disorders, and skin and subcutaneous tissue diseases was lower in FCLICs than ACs.

3) FCHICs had higher risks for discharge from medical specialties and surgery compared with ACs and a lower risk from gynecology and traumatology.

4) Hospital discharges from gynecology were higher in FCLICs than ACs, and hospital discharges from medicine and traumatology were lower than native residents.

MINOR COMPULSORY REVISIONS

1. Findings of the study are compared with literature data as regards the proportion of total hospital admissions accounted by immigrants. However, to compare this finding between different countries and time periods does not seem so interesting. Authors should find contemporary data from Spain (also by searching in the grey literature).

We agree with the reviewer, in our discussion we compared with the literature data as regards to the proportion of total hospital admissions accounted for by immigrants. We know the limitations of these comparisons. We have searched in the grey literature, and we have not found recent data out of Spain. We have included in the discussion section the following sentence that refers to the limitation of the comparison.

Although the comparison of our finding with others from different countries and time
periods might be bias, it might watched interesting.

2. The lower proportion of discharges for mental disorders should be more properly commented. Are there barriers to the use of hospital resources for mental disorders (knowledge of disease, stigma, lack of referral from primary care, etc.)?

According to the reviewer, we have included a sentence commenting about the low proportion of discharges for mental disorders. “Maybe, there are barriers to the use of hospital resources for mental disorders in FCLIHs as less knowledge of disease, stigma of mental disorder, or lack of referral from primary care to the hospital.”

3. The higher proportion of emergency admissions among FCLIC should be commented in Discussion.

According to the suggestion of the reviewer, we have included two sentences about these items. “First of all, we have found a higher proportion of emergency admissions among FCLICs than in ACs. The FCLICs have a lower utilization of the OPDs. For instance, the had a less proportions of OPD admission”

DISCRETIONARY REVISIONS

1. Authors could consider to restrict their study to younger age classes (e.g. <65 years; they already include only subjects>15 years). This could allow a more useful comparison between AC and FCLIC.

We considered the reviewer’s idea interesting; however, we considered it is not necessary to do so because we have adjusted the results by age and sex.

2. When comparing the different distribution of main disease categories by population groups, authors could use a slightly different measure, e.g. the proportional morbidity ratio instead of the odds ratio

We agree with the reviewer, we could have calculated the proportional morbidity ratio instead of the odds ratio; however, the odds ratio allows comparing our results with the results of other studies. We have added the proportional morbidity ratio in Table 4, but we don’t show this measure in the paper. Besides, we think this measure could have a difficult interpretation.

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<th>Medicine</th>
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<table>
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<td>(0.93-1.16)</td>
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</table>
Reviewer: Luis Andrés Gimeno-Feliu  
Reviewer's report: ☐ •

Major Compulsory Revisions

1. The use of data issued by the National Statistics Institute as the denominator for the calculation of rates for immigrants is an important limitation since the variable “nationality” is not disaggregated by age and sex which impedes an adequate fit for the different variables. In other studies carried out in Spain this data was obtained from the medical databases of the public healthcare system. This article would be more valuable if these calculations were properly performed. Should it not be possible, this issue should be better clarified in the Methods.

We agree with the reviewer that the National Statistics Institute, as the denominator for the calculation of rates for immigrant is a limitation. We have included this statement in the limitation of our manuscript: Among the limitations of this study was the impossibility of analyzing the utilization rates adjusted for age and sex of FCLICs and FCHICs. This is because the data at the National Statistics Institute (Spanish Statistical Office) for registered patients separated by age and sex are not available by their country of origin.

We have written a sentence in the Methods section explaining this. Moreover, the other reviewer asks us about “Demographics of foreign citizens must be more extensively described. If total numbers of residents are available separately for FCHIC and FCLIC, they should be reported”.

2. The Crude utilization rates (cR) do not seem to have been adjusted for age, sex and foreign status. It would be important to do so.

In Table 2, the crude utilization rates for the total population and for different population groups have not been adjusted for age and sex. We think that the adjustment for age and sex does not show the differences between stratus and this is important information that should be shown. The denominator of rates in Table 2 could be interpreted more easily.

3. When calculating average length of hospitalization and mortality, it would have been very interesting to adjust for complexity by means of a risk-adjustment system such as DRGs. Alternatively; the average length of hospitalization could be described separately for the most frequent reasons for discharge. The authors should explain the reason why they used medians instead of means when describing length of
hospitalization.

According the reviewer’s suggestion, we have taken two attitudes:

1) Explain in methods because we have use medians instead of means. The new sentence in Methods section is “The distribution of age have no a normality (Kolmogorov Smirnov tests with p<0.05), for that with shows the measure of age and length of hospitalization by median and interquartile range (IQR).”

2) A new table has been made with medians and IQR of length of hospitalization for the most frequent reasons for discharge. The new table is Table 4. We had several sentences in the text of the manuscript.

4. References 39 and 40 are not correct in this case because they are articles on global mortality of the population, not hospital mortality.

According to the reviewer’s opinion, we have eliminated references 39 and 40 because these are not correct in this case for doing global mortality. We have had one reference that does reference hospital mortality in a Spanish study.

We have removed “…. USA [39]. Reduced mortality risks were especially pronounced for younger immigrants. A recent study that analyzed all-cause and cause-specific mortality in the immigrant and native-born populations in Andalusia (Spain) found higher mortality among elderly native-born residents due to chronic degenerative diseases, while the high mortality in the Sub-Saharan population at younger ages was due to accidents [40].”

We have added the next sentence: ACs. Mortality was less in FCLICs, similar results have been reported in the Spanish’s study of Clots et al. However in our study after adjusting for age and sex, the risks disappeared.


• Minor Essential Revisions

1. The sentence “Admission from the emergency department was lower in FCHICs (58.9%) versus ACs (63.9%) (AOR: 0.84; 95% CI: 0.74-0.94) and higher in FCLICs (67.2%) (AOR: 1.22; 95% CI: 1.18-1.33)” refers to results in Table 5, but was written before results in Table 3.

We agree with the reviewer, and we have moved this sentence to the paragraph referring to Table 5. So the new sentences are the following: “Table 5 shows the absolute and relative numbers of admission from the emergency department, and discharges grouped by hospitalization outcome in ACs, FCHICs, and FCLICs. Admission from the emergency department was lower in FCHICs (58.9%) versus ACs (63.9%) (AOR: 0.84; 95% CI: 0.74-0.94) and higher in FCLICs (67.2%) (AOR: 1.22; 95% CI: 1.18-1.33).”
2. The sentence “The length of hospitalization was lower in FCLICs (median: 3; IQR: 2-6) than ACs (median: 4; IQR: 2-8) and FCHICs (median: 4; IQR: 2-8) (p<0.001)” does not refer to any table. Therefore, it should be written in a separate paragraph from the comments on Table 5.

We agree with the referee and we have separated this sentence in a different paragraph.

3. In line 5 of the third paragraph on page 9, the meaning of the word “Notwithstanding” is unclear.

We agree with the reviewer and the word notwithstanding is unclear. We have changed the word notwithstanding to thereby.

- Discretionary Revisions

1. The Results section contains too much text. It would be desirable to shorten the number of words to the most relevant aspects.

According to the two reviewers, I have shortened the results. We have eliminated the following sentences:

1) FCHICs had greater risk of being diagnosed at discharge for the circulatory system, neoplasms, and injury and poisoning compared with ACs. Hospitalization for pregnancy, childbirth & puerperium, respiratory system diseases, musculoskeletal system & connective tissue diseases, and endocrine & metabolic disorders were lower in FCHICs than ACs.

2) Hospitalization for pregnancy, childbirth & puerperium, and congenital anomalies & conditions in the perinatal period was higher in FCLICs than ACs. Hospitalization for circulatory system diseases, neoplasms, respiratory system diseases, nervous system diseases, musculoskeletal system diseases, symptoms, signs & ill-defined conditions, endocrine & metabolic disorders, mental disorders, and skin and subcutaneous tissue diseases was lower in FCLICs than ACs.

3) FCHICs had higher risks for discharge from medical specialties and surgery compared with ACs and a lower risk from gynecology and traumatology.

4) Hospital discharges from gynecology were higher in FCLICs than ACs, and hospital discharges from medicine and traumatology were lower than native residents.