Author's response to reviews

Title: Patient characteristics associated with hospitalisations for Ambulatory Care Sensitive Conditions in Victoria, Australia

Authors:

Mohammad Z Ansari (zahid.ansari@health.vic.gov.au)
Syed I Haider (Imran.Haider@health.vic.gov.au)
Humaira Ansari (hansari@student.unimelb.edu.au)
Tanyth deGooyer (Tanyth.deGooyer@health.vic.gov.au)
Colin Sindall (colin.sindall@health.vic.gov.au)

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Author's response to reviews: see over
Dear Madam

Thank you for the opportunity to respond to the reviewer’s comments on the paper referenced above.

REVIEWER: Sarah Purdy

General comments by the reviewer

Thank you for asking me to review this paper which is clearly written and well presented. The question posed is important but not original. There are a number of papers from the same team on similar issues plus a growing number of studies from other countries that are not cited e.g. from the UK Purdy et al 2010 and 2011, Baker et al 2011/12. The paper takes a wide view across all ACSCs which are interesting but means there is less detail about certain conditions and key messages are harder to extract. It is unclear what new information comes from this paper. More specific conclusions would help with this. The data appear to be robust and the methods appropriate. However, the data are now very old (2003/4) and findings may well no longer be relevant. Conclusions drawn from the study appear to be valid and result directly from the data shown. Results are well presented. However, the references mainly predate 2005 and need to be updated with more recent work. This is a cross sectional study and the limitations of this design should be acknowledged.

In response to the above, the following has been done:

References are updated - please see below under compulsory revisions the new references that have been added.

The following comments have been added on the age of the data (page 20):

The data for this study is from 2003/04. However, more recent ACSCs data from Victoria [69], as well as other jurisdictions [70] and overseas [30, 71], indicates that associations with demographic and socioeconomic factors are robust and persist across time. The findings from this study are likely to be still of relevance now, and elsewhere.
New conclusion has been written (on page 21 and Abstract):

Disadvantaged paediatric and adult population experience more need of hospital care for ACSCs. Access barriers to primary care are plausible causes for the observed disparities. Understanding the characteristics of individuals experiencing access barriers to primary care will be useful for developing targeted interventions meeting the unique ambulatory needs of the population.

Limitations of cross-sectional data have been added in the discussion section (page 21):

As the data are cross-sectional, the findings need to be interpreted with caution. The observed associations of socio-economic disadvantage, rurality and age with ACSCs admissions may not necessarily be causal. Although the Victorian ACSCs study has shown strong relationship of access with ACSCs, several other factors such as disease prevalence, co-morbidities, and physician practice patterns may also potentially explain observed differentials in this study [7, 8]. These factors can be further explored in the form of case control or prospective studies that can compare ambulatory care provided to the patients from high and low socio-economic status before admissions to hospitals.

Major compulsory revisions
1. Update references and discussion to reflect more recent research on definition of ACSCs and factors influencing rates of ACSCs.

In response to the above, I have added several new references including some of my own papers published:

Added references:


The following has been added to discuss coding and definitional issues (page 18 and 19):

The ACSCs in this study included conditions that can be prevented through vaccination e.g., measles, mumps, rubella, tetanus, influenza, and bacterial pneumonia (vaccine preventable ACSCs), acute conditions for which hospitalisations is commonly avoidable with medical interventions available in primary care or the use of antibiotics e.g. dehydration and gastroenteritis, kidney infection, cellulitis, perforated ulcer, ear, nose, and throat infections, pelvic inflammatory disease, and dental conditions (acute ACSCs), and selected chronic conditions that can be managed by life style factors, patient education and pharmaceuticals e.g., diabetes complications, angina, hypertension, asthma, COPD and CCF (chronic ACSCs). Most codes used in this study are available in earlier reports and papers published from the USA and England [4, 35, 44, 62, 63]. These codes of ACSCs have been validated as markers of access to primary health care in the USA and Australia [7, 8]. However, due to consistent variations in ACSCs definitions and codes, comparison across different datasets and geographic areas is a problem for informing policy and planning [44]. Caminal and Colleagues have recommended that choice of ACSCs should be country specific due to variations in health system between different countries [64].

2. Acknowledge age of the data - may well not reflect current picture. Can any more recent data be included to indicate trends/context?

The following has been written in the paper (page 21):

The data for this study is from 2003/04. However, more recent ACSCs data from Victoria [69], as well as other jurisdictions [70] and overseas [30, 71], indicates that associations with demographic and socioeconomic factors are robust and persist across time. The findings from this study are likely to be still of relevance now, and elsewhere.
3. Highlight what is new in this research - to aid policymakers and also to inform the international readership - currently very focused on Victoria.

In response to this, I have updated the literature in the discussion to reflect what is new both under Limitations of cross-sectional data, and under coding and definitional issues. I have also written the following to identify policy implications and how these results go beyond Victoria (page 19 and 20):

Access barriers identified in this study are not unique to Victoria. Several international studies have identified access barriers, especially in the disadvantaged populations [7, 34, 65, 66]. For policy makers across the world, the question of access is inextricably linked with equity, one of the key performance indicators of the health system [67]. Most health systems offer inequitable access, and deliver inequitable treatment and outcomes. The goal of equity has not been achieved as seen by significant health differentials between racial, ethnic and socio-economic groups; less than adequate health care provided to vulnerable groups; and policy makers steering away rather than tackling these issues with strong policies.

A recent international survey of individuals’ views of primary health care found that a majority of Australians had been with the same doctor or place of care for more than 5 years and received appointments the same day the last time they needed medical attention [68]. On the other hand, a majority also indicated that accessing primary care after hours was difficult, although the problem in Australia was less widespread than in the United States [68]. Seventeen percent of Australians reported that they did not get medical care because of the cost of a doctor’s visit in the previous 12 months, compared with 6 percent in Canada, 28 percent in New Zealand, 4 percent in the United Kingdom, and 29 percent in the United States [68]. Similar percentages were reported for having skipped a medical test, treatment, or follow-up because of cost [68]. Australians’ reported access barriers are notably greater than those of people in the United Kingdom but also notably less than those of people in the United States. Because of universal insurance in Australia, results of this study may not directly apply to the United States. However, about 43 million Americans are beneficiaries of Medicare, a universal insurance plan of long standing. The prevalence of ACSCs is much higher in the population age 65 and older than in younger populations, as is the occurrence of ACSCs. Thus, the results from Australia may be relevant to the United States’ Medicare system.

In a system that seeks to be egalitarian, equity is the most difficult criteria to operationalise [67]. In this context, it is important to understand that access is multifaceted, not only measuring characteristics of the health system but also characteristics of individuals and the areas it serves [67]. The multiple dimensions of access reflect the need for a new research agenda that includes an expanded primary care and health services research and policy agenda, with a focus on factors that lie outside the health system [67].
General comments
1. This manuscript analyzed hospitalizations from one state in Australia and looked at patient factors that were associated with preventable hospitalizations. The manuscript makes use of a comprehensive dataset of hospitalizations and indexes of socioeconomic status and rurality/remoteness. The study findings confirm results of previous research on the association between low socioeconomic status and rural residence with higher preventable hospitalizations.

Reviewer summarised the paper. Nothing from my end to respond.

2. There are methodological issues which are problematic. It was not clear which estimates presented were unadjusted and which were adjusted.

There is no confusion about this in the paper. Tables 2, 4, 5 and 6 report univariate (unadjusted) and Table 3 reports multivariate (adjusted) results.

3. Overall, the potential to contribute new information from this manuscript was minimal.

I have responded to this under specific comments.

Specific comments
4. The abstract did not contain any estimates of effect size of the significant predictors of ACSC admissions.

The following is added in the abstract (page 2):

Predictors were much more strongly associated with ACSC admissions compared to non-ACSC admissions in the adult group than for the paediatric group with the exception of rurality. Significant adjusted ORs in the adult group were 1.06, 1.15, 1.13, 1.06 and 1.11 for sex, rurality, age, IRSED and ARIA variables, and 1.34, 1.04 and 1.09 in the paediatric group for rurality, IRSED and ARIA, respectively.

5. The background section discusses previous work on ACSC hospitalizations, socioeconomics, and rural residence, and the unique contribution of this study is not clear other than the fact that the study looked at data from Victoria, Australia.

In the discussion section, the following has been added (page 14 and 15):

The study adds to knowledge of how ACSC admission rates vary with demographic and socio-economic characteristics in several ways:

1. Unlike previous studies, adult (age > 65) and paediatric (age ≤ 18) admissions are analysed separately. A completely different set of Top 5 (by number of admissions) ACSCs are reported for each age cohort and the associations with demographic and socioeconomic characteristics reported (adjusted and unadjusted for covariates) are also somewhat different.
2. The strength of the associations (adjusted and unadjusted ORs) with demographic and socioeconomic characteristics are reported for ten separate ACSC diagnostic groups (the Top 5 conditions for each of the Adult and Paediatric cohorts). These results show interesting variations between the individual conditions and with total ACSCs.

3. The approaches to data analysis:
   i. A random sample of non-ACSC admissions was extracted from the VAED data set and compared to the ACSC admissions to provide estimates of the extent of the associations of ACSC hospitalisations with demographic and socioeconomic characteristics. The sample size for the non-ACSC admissions was chosen to be equal to the number of ACSC admissions. Such a 1:1 ratio is the most efficient for statistical hypothesis testing (narrowest width confidence intervals) relative to the total number of admissions to be analysed. The reason for choosing the non-ACSC admissions as the reference group for OR calculations was to control for any possible “accessibility to hospital” and/or “propensity to admit” effects likely to be associated with many of the demographic and socioeconomic characteristics used in the study. This technique allowed the ORs in Table 3 to be purer indicators of “access to primary care” alone, without possible contamination by variations in “access to hospital care” per se, since non-ACSCs are not thought to be significantly influenced by access to primary care issues, while ACSCs are.
   ii. Individual and contextual variables analysed for the paediatric and adult population using multi-level models.

6. The methods section does not cite which conditions and which diagnosis fields were used to code ACSC hospitalizations. The admitting/primary diagnosis is usually the only diagnosis used to measure ACSC hospitalizations. The authors also selected a random set of non-ACSC hospitalizations for comparison. It was not clear why this was done or why there needed to be an equal number. Was this limited set of hospitalizations the denominator used for the analyses? This seems problematic, as it’s not clear why all hospitalizations or a set of tracer conditions weren’t used. The authors also coded ACSCs as yes/no when there could have been multiple hospitalizations for the same individual yet they are treated as independent observations.

My responses are as follows:

1. The definitions of the ACSC diagnostic categories used in this study are set out in Table 1. Most of the 19 ACSCs are based on principal diagnosis, while 3 (influenza/pneumonia, other vaccine preventable and diabetes complications) may based on any diagnosis field (not necessarily the reason for admission). The argument for this is that any instance of, for example, vaccine preventable conditions or diabetes complications clearly indicates a failure to access timely primary care, irrespective of reason for admission. This is because the occurrence of even a single such case, even in the
community, should not happen given the ideal functioning of the primary care system (in the delivery of immunisation services and diabetes management services in these cases) and the existence of such cases can be useful as indicators of lack of optimal primary care. These conditions stand in contrast to the others, for example asthma, where clearly a secondary (not principal) diagnosis of asthma (perhaps mild and well-managed) in no way can be seen as reflecting adversely on the primary care system, whereas a case of asthma causing an admission can be seen as an indicator of failure of primary care to manage the condition satisfactorily. All these definitions and codes have been part of the Victorian ACSC study and widely published in Australia and Internationally. {This has been added in the methods section (page 6)}

2. The point why 1:1 ACSCs are chosen, etc, has been explained above under approaches to data analysis. I am cutting and pasting again for your convenience.

- A random sample of non-ACSC admissions was extracted from the VAED data set and compared to the ACSC admissions to provide estimates of the extent of the associations of ACSC hospitalisations with demographic and socioeconomic characteristics. The sample size for the non-ACSC admissions was chosen to be equal to the number of ACSC admissions. Such a 1:1 ratio is the most efficient for statistical hypothesis testing (narrowest width confidence intervals) relative to the total number of admissions to be analysed. The reason for choosing the non-ACSC admissions as the reference group for OR calculations was to control for any possible “accessibility to hospital” and/or “propensity to admit” effects likely to be associated with many of the demographic and socioeconomic characteristics used in the study. This technique allowed the ORs in Table 3 to be purer indicators of “access to primary care” alone, without possible contamination by variations in “access to hospital care” per se, since non-ACSCs are not thought to be significantly influenced by access to primary care issues, while ACSCs are. In addition, there are no issues with multiple admissions. The numbers have been so small that in the Victorian ACSC study, we have consistently used the methodologic approach as described above.

7. In the results section, there is no overall description of the study cohort. I found the main results difficult to read the way it was presented by condition.

The following description of study cohort is now been added (page 10 and 11):

The study cohort consisted of all individuals admitted as inpatients to any hospital (public or private) in the state of Victoria, Australia and discharged in the period 1 July 2003 to 30 June 2004 who had one of the ACSC conditions listed in Table 1. In addition, a contrast group was assembled consisting of a random sample of patients who did not have an ACSC. 47.9% of the patients were males and 52.1% were females. 11.0% of patients were paediatric patients. A lower proportion (29.6%) of patients lived in rural areas compared to metropolitan areas. 3.3% of patients lived in ARIA 3 (lowest accessibility) and 19.6% of patients belonged to Q1 (highest socioeconomic disadvantage). Details of crude (unadjusted) hospitalisation rates by age-groups and sex are reported in Table 2. The paediatric group of patients had
admission rates tracking a similar age profile between the ACSC and non-ACSC cohorts, while the adult ACSC cohort had lower rates than the non-ACSCs for ages 18-64, and higher rates for age 65+.

8. In the discussion it wasn’t clear what the generalizability and relevance of this research was to those outside of Victoria, Australia.

I have written the following on this issue in the discussion section (page 19 and 20):

Access barriers identified in this study are not unique to Victoria. Several international studies have identified access barriers, especially in the disadvantaged populations [7, 34, 65, 66]. For policy makers across the world, the question of access is inextricably linked with equity, one of the key performance indicators of the health system [67]. Most health systems offer inequitable access, and deliver inequitable treatment and outcomes. The goal of equity has not been achieved as seen by significant health differentials between racial, ethnic and socio-economic groups; less than adequate health care provided to vulnerable groups; and policy makers steering away rather than tackling these issues with strong policies.

A recent international survey of individuals’ views of primary health care found that a majority of Australians had been with the same doctor or place of care for more than 5 years and received appointments the same day the last time they needed medical attention [68]. On the other hand, a majority also indicated that accessing primary care after hours was difficult, although the problem in Australia was less widespread than in the United States [68]. Seventeen percent of Australians reported that they did not get medical care because of the cost of a doctor’s visit in the previous 12 months, compared with 6 percent in Canada, 28 percent in New Zealand, 4 percent in the United Kingdom, and 29 percent in the United States [68]. Similar percentages were reported for having skipped a medical test, treatment, or follow-up because of cost [68]. Australians’ reported access barriers are notably greater than those of people in the United Kingdom but also notably less than those of people in the United States. Because of universal insurance in Australia, results of this study may not directly apply to the United States. However, about 43 million Americans are beneficiaries of Medicare, a universal insurance plan of long standing. The prevalence of ACSCs is much higher in the population age 65 and older than in younger populations, as is the occurrence of ACSCs. Thus, the results from Australia may be relevant to the United States’ Medicare system.

In a system that seeks to be egalitarian, equity is the most difficult criteria to operationalise [67]. In this context, it is important to understand that access is multifaceted, not only measuring characteristics of the health system but also characteristics of individuals and the areas it serves [67]. The multiple dimensions of access reflect the need for a new research agenda that includes an expanded primary care and health services research and policy agenda, with a focus on factors that lie outside the health system [67].
Please note that in following most of the recommendations of the two reviewers this has resulted in considerably increasing the word count and references. Thank you for reviewing my paper and I look forward to hearing from you in the near future.

Yours sincerely

Zahid Ansari
Adjunct Clinical Associate Professor (Monash)
Manager Health Intelligence Unit
Department of Health
50 Lonsdale Street
Melbourne, Victoria 3000
Australia