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## Avoidable hospitalization among migrants and ethnic minority groups: a systematic review

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**Background:** The numbers of migrants living in Europe are growing rapidly, and has become essential to assess their access to primary health care (PHC). Avoidable Hospitalization (AH) rates can reflect differences across migrant and ethnic minority groups in the performance of PHC. We aimed to conduct a systematic review of all published studies on AH comparing separately migrants with natives or different racial/ethnic groups, in Europe and elsewhere. **Methods:** We ran a systematic search for original articles indexed in primary electronic databases on AH among migrants or ethnic minorities. Studies presenting AH rates and/or rate ratios between at least two different ethnic minority groups or between migrants and natives were included. **Results:** Of the 35 papers considered in the review, 28 (80%) were conducted in the United States, 4 in New Zealand, 2 in Australia, 1 in Singapore, and none in Europe. Most of the studies (91%) used a cross-sectional design. The exposure variable was defined in almost all articles by ethnicity, race, or a combination of the two; country of birth was only used in one Australian study. Most of the studies found significant differences in overall AH rates, with minorities (mainly Black and Hispanics) showing higher rates than non-Hispanic Whites. **Conclusions:** AH has been used, mostly in the US, to compare different racial/ethnic groups, while it has never been used in Europe to assess migrants' access to PHC. Studies comparing AH rates between migrants and natives in European settings can be helpful in filling this lack of evidence.

## Introduction

Ambulatory Care Sensitive Conditions (ACSCs), also called Avoidable Hospital Conditions (AHCs), have been defined as conditions for which 'the provision of timely and effective outpatient care can help to reduce the risks of hospitalization by either preventing the onset of an illness or condition, controlling an acute episodic illness or condition, or managing a chronic disease or condition.'<sup>1</sup>

Such conditions include: acute conditions (bacterial pneumonia, appendicitis with complications, dehydration, urinary tract infections<sup>2</sup>); chronic conditions (angina, asthma, chronic obstructive pulmonary disease, hypertension, congestive heart failure, uncontrolled diabetes, and complications of diabetes<sup>2</sup>); and immunization-related and preventable conditions.<sup>3</sup>

After the first North American studies introduced the concept of ACSCs and developed their own list of conditions in the early 1990s (Billings,<sup>1</sup> Weissman<sup>3</sup>), many researchers have proposed their own definitions, mainly in the US (AHRQ<sup>2</sup>), but also in Europe.<sup>4–6</sup> The adaptations of the original list are important because the diseases or

conditions amenable to effective ambulatory care may change over time and across contexts,<sup>6</sup> because of differences among health systems.

Hospitalization for ACSCs, hereafter called Avoidable Hospitalization (AH), has been used extensively as an outcome measure of the accessibility and overall effectiveness of primary health care (PHC)<sup>7</sup> and has been widely used to evaluate and compare health services across different groups and contexts. Recent studies have for example shown rather dramatic differences across European countries and geographical variations within countries.<sup>8</sup> Many studies have shown that AH rates can be influenced by several factors. People with little formal education and low incomes are more likely to be hospitalized for an ACSC,<sup>1,9–12</sup> as are residents of rural areas,<sup>12,13</sup> and people without medical insurance.<sup>14,15</sup> Ethnic minorities and migrants are other groups that may have different patterns of AH compared to the majority of the population.<sup>16,17</sup>

Terms such as migration, ethnicity and race describe highly complex and often overlapping concepts. According to the

International Organization for Migration (IOM), immigrants can be defined as 'non-nationals who move into a country for the purpose of settlement.'<sup>18</sup> Country of birth, nationality and citizenship can be used as a proxy of migrant status. An 'ethnic group' has been defined as 'a named social category of people based on perceptions of shared social experience or ancestry.' Members of the ethnic group see themselves as sharing cultural traditions and history that distinguish them from other groups.<sup>19,20</sup> Race, instead, is defined as the geographic pattern of variation in some biological traits that distinguish different human populations.<sup>21</sup> Although the words race and ethnicity differ conceptually, they are often used synonymously, or combined in the compound word 'race/ethnicity.' This happens particularly in the US, where the Hispanic (Latino) ethnic group is often considered vis-à-vis White and Black race. The concepts of 'migrant group' and 'ethnic minority group' can only overlap in countries where the migration process is recent, and particularly in some European countries.<sup>22</sup> On the other hand, in countries where migration is well-established, as in the US, New Zealand, or Australia, 'migrant group' and 'ethnic minority group' cannot be considered synonymous.<sup>20</sup>

Although migration and multi-ethnic societies are on the rise in many industrialized countries, ethnic minorities and migrants face many barriers to their use of health services, starting with regulatory barriers. The US remains one of the few high income countries in the world that does not guarantee universal healthcare access, and this represents a substantial difference with the universal healthcare systems adopted in all European high income countries. Healthcare coverage, in general, is lower in the US, and PHC is not always the first point of access. Nevertheless, in most European countries the entitlement to benefit from the various healthcare services depends on the legal status of the immigrant; the access to health services by adult undocumented migrants does not include the whole set of PHC services, being limited to emergency services or care specified in terms such as 'immediate' or 'urgent.'<sup>23</sup> In the USA, undocumented migrants are not entitled to receive health care and other federally funded, public welfare programs or access to any insurance. The Center for Immigration Studies estimated that roughly 34% of all immigrants (legal and undocumented) in the United States lack health insurance coverage.<sup>24</sup> Along with regulatory barriers, migrants face numerous forms of barriers to PHC services regardless of their legal status; some of these are also related to the PHC provider or health care system, such as limited and inconvenient clinic hours.<sup>25</sup> Others relate to patients' characteristics, such as language or cultural issues (beliefs, attitudes and practices regarding their personal health, perceived health, socio-economic status). All these difficulties can hamper patient access and/or lower the quality of the healthcare provided.

Previous studies have confirmed disparities in access to health services for migrants and ethnic minorities compared to natives and major ethnic groups, though the evidence is still controversial. As concerns hospitalization, studies in the US have documented lower access rates among African Americans and other minorities,<sup>26</sup> while findings in the European setting vary.<sup>27</sup> Studies on emergency care have shown a slight tendency for higher usage rates among migrants than among natives,<sup>27,28</sup> and it has been demonstrated that migrants tend to use the emergency services when they first arrive, then with time they turn to other, more appropriate sources of care.<sup>29</sup> In the US, migrants use PHC services less than non-migrants,<sup>30</sup> whereas a review of European studies found that some authors reported migrants making more use of General Practitioners (GPs) than natives, possibly due to a worse health, or lower self-perceived health status among migrants.<sup>27</sup>

The number of migrants and ethnic minorities living in Europe is growing rapidly. GPs, and PHC services generally, are often the first point of contact that individuals have with the health services, and they may have a role in mitigating access barriers and meeting the needs of migrants and ethnic minority groups.<sup>31</sup> Comparing the

patterns of AH in migrants and ethnic minorities with those of natives can be a very useful contribution to assess the accessibility and quality of PHC. To the best of our knowledge, no reviews have been published on this topic. Our aim was therefore to systematically review all the studies published to date on AH, separately considering those focusing on ethnic minorities and migrant groups, in Europe and elsewhere.

## Methods

The literature search for our review included studies published up to July 2015. Publications on AH among populations of migrants or ethnic minorities were identified in three databases: PUBMED/MEDLINE, ISI WEB OF SCIENCE, and THE COCHRANE LIBRARY. Each electronic search was conducted using a combination of subject headings and free text words for the exposure (migrant/ethnic group) and for the outcome (AH). The Supplementary file S1 outlines the search strategy adopted for the Medline database, which was adapted as necessary for the other databases. The reference lists in the articles included in the review were also checked.

Our inclusion criteria were as follows: all publications had to be original articles, written in English or Italian, presenting results on hospitalization rates for a full list of ACSCs, or at least one group of ACSCs. Additional inclusion criteria were the availability of rates or rate ratios of AH comparing at least two different racial/ethnic groups, or natives and migrants. Articles were excluded if the ethnicity/migrant status variable was not considered, or if it was only considered as a confounder. Articles concerning very specific study populations (e.g. with a specific disease, or living in long-term facilities) that did not present the exposure variable at individual level, or those considering readmission rates as outcome were subsequently excluded.

No limits were imposed on the age or sex of the study populations.

The research was conducted in two steps. In the first, two authors independently screened the titles and abstracts of the articles identified, selecting only those that clearly analysed hospitalization for ACSCs. Articles on which they disagreed were discussed together to reach a consensus on whether or not to include them. Less than 5% of the studies needed this further discussion.

The second step involved retrieving the full text of the studies meeting the inclusion criteria at title/abstract screening level. These studies were reviewed separately by the two authors to ensure a full double review. Studies were included if both reviewers judged the article to be relevant. Here again, where they disagreed, they discussed the articles and jointly reclassified them. Information extracted from the selected studies included: first author and publication date, journal, setting, aim of the study, period of time during which the study was performed, population (size, age and characteristics), sample, study design, exposure (race, ethnicity, citizenship, country of birth, source of data), outcome (definition of AH and specific conditions considered, overall or disaggregated rates, source of data), adjustment variables, type of association measures, and a summary of the main results reported by the authors.

Study quality was assessed using a modified Newcastle Ottawa Scale for cross-sectional studies.<sup>32</sup>

Association measures were also extracted from papers presenting results for overall AH in order to summarize the range of the measures for each racial/ethnic group.

## Results

We identified 462 articles in the three databases that met our search criteria. After excluding duplicates, 357 titles remained. Then 24 studies were excluded because they were written in languages

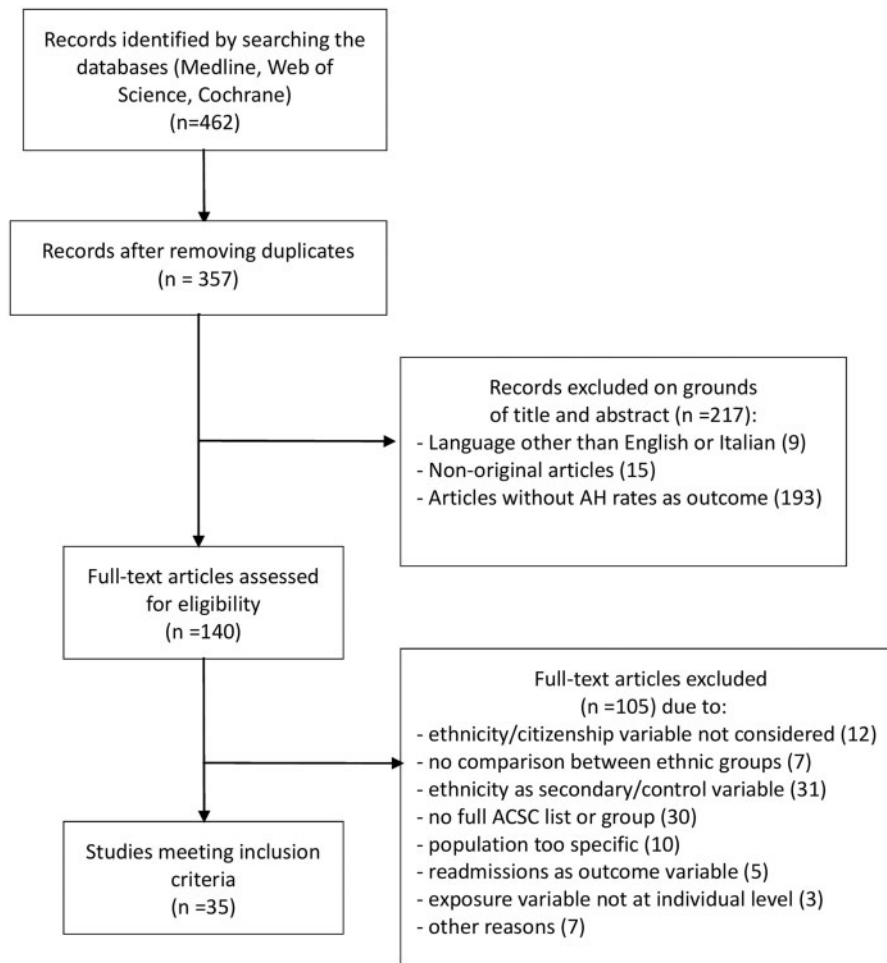


Figure 1 Selection process

other than English or Italian or because they were not original articles. Of the 9 articles written in languages other than English or Italian, 7 were set in Europe, but they would have been excluded in the first step, because they did not analyse hospitalization for ACSCs. After reviewing the abstracts, another 193 studies were rejected because they did not meet the inclusion criteria. The full texts of the remaining 140 articles were assessed for eligibility, and 105 were rejected because they did not meet the inclusion criteria. The articles that were rejected included 10 studies on populations that were too specific and not comparable with the general population,<sup>33–42</sup> 3 studies in which the exposure variable was not assessed at individual level,<sup>43–45</sup> and 5 in which the outcome variable was the readmission rate for a specific diagnosis (not the first admission).<sup>46–50</sup> A total of 35 studies, all written in English, were thus included in our systematic review (see figure 1 for the selection process). A manual search of the reference lists in the selected studies retrieved no further articles meeting our inclusion criteria.

A table with all the details of the selected studies is provided in Supplementary file S2.

### Characteristics of the studies

Table 1 lists the main characteristics of the studies. Among the 35 papers considered, 28 were conducted in the USA,<sup>11,12,14,16,17,51–73</sup> 4 in New Zealand,<sup>74–77</sup> 2 in Australia<sup>78,79</sup> and one in Singapore.<sup>80</sup> We found no articles on the situation in Europe that met our selection criteria.

Thirty-two studies had a cross-sectional design,<sup>11,12,14,16,17,51,52,54–56,58–63,65,66–80</sup> and only 3 had a longitudinal design.<sup>53,57,64</sup> Twelve studies only analysed a sample of the population,<sup>11,16,17,57,58,60,63,64,66,70–72</sup> while the others considered the whole population.<sup>12,14,51–56,59,61,62,65,67–69,73–80</sup> Five articles focused on paediatric populations (0–18 years),<sup>53,54,60,70,75</sup> 3 only analysed groups of working age (18–64)<sup>51,56,69</sup> and 7 only considered elderly people (65+).<sup>55,57,59,64,65,68,73</sup> The other articles<sup>11,12,14,16,17,52,58,61–63,66,67,71,72,74,76–80</sup> concerned combinations of the above age groups, or made no distinctions by age.

Twenty-six studies<sup>11,12,14,16,17,51,52,54,58–63,66–72,75–78,80</sup> analysed the general population, while the others focused on people included in the Medicare or Medicaid social health care programs,<sup>53,55,64,65,73</sup> people with no insurance coverage,<sup>56</sup> or people managed by a specific PHC organization.<sup>74</sup> One paper included only women in the studied population.<sup>57</sup> One Australian study compared Australian citizens with people coming from 8 refugee-source countries.<sup>79</sup>

A summary of the study quality assessment for the included studies is given in Supplementary file S4. Studies scored well on the group selection domain as they generally included large sample sizes that were highly representative of patients in the wider community. Score on the comparability domain were low in 4 studies, due to a failure to adjust for potentially important confounders (i.e. age). All studies assessed outcomes using hospital discharges records which were considered to be at low risk of bias and they were generally deemed to be adequate in the outcome domain. The most important problem regarded the lack of information about association measure or the absence of confidence intervals and p-values that was reported in 14 papers.

**Exposure (race, ethnicity, migrant status), outcome (AH rates) and adjustment variables**

Results concerning exposure and outcome are presented in table 2.

In most of the studies the exposure data were retrieved from hospital discharge databases relating to the population as a

**Table 1** Characteristics of the studies and study populations

Study characteristics	N of studies (%)
Setting	
USA	28 (80)
New Zealand	4 (11)
Australia	2 (6)
Singapore	1 (3)
Methodologies	
Study design	
Cross-sectional	32 (91)
Longitudinal	3 (9)
Sample/Whole population	
Samples	12 (34)
Whole populations	23 (66)
Population characteristics	
Ages included	
Only children (0–18)	5 (14)
Children and adults	1 (3)
Only adults (18–64)	3 (9)
Adults and elderly	8 (23)
Only elderly (65+)	7 (20)
All ages	11 (31)
Population representativeness	
General population	26 (74)
Medicare/Medicaid members	5 (14)
Only women	1 (3)
No health insurance	1 (3)
Specific health care organization	1 (3)
Australians and migrants from 8 refugee-source countries	1 (3)

**Table 2** Definition and source of data for exposure (race, ethnicity, migrant status), outcome (AH rates) and other measures considered in the studies

{C1}Exposure	Number (%)
{C2}Source of data	{C2}
Inpatient database	27 (77)
Health insurance/Health care organization databases	6 (17)
Survey on the population considered	1 (3)
National health service data system	1 (3)
{C1}Kind and categories of the exposure variable by different setting	{C1}
{C2}Exposure variable	{C2}Setting
Race	USA
Race/Ethnicity	USA
Race/Ethnicity	USA
Ethnicity	NEW ZEALAND SINGAPORE
Indigenous status	AUSTRALIA
Country of birth	AUSTRALIA
{C1}Outcome	
{C2}Definition of AH	
AHRQ	17 (48)
Billings	7 (20)
Weissman and other authors	6 (17)
List drawn up by the Ministry of Health	2 (6)
Study authors' own list	2 (6)
Not reported	1 (3)
{C1}Adjustment variables	{C1}
None/not reported	4 (11)
Only age (or other variables not including socio-economic status)	17 (49)
Age and other covariates including socio-economic status	14 (40)
{C2}Reported rates	
Overall	15 (43)
Overall and disaggregated	6 (17)
Only disaggregated	7 (20)
Only one condition	7 (20)

whole,<sup>12,14,17,51,52,54,56,61,62,67–69,75,77–80</sup> while in 10 cases only a sample of the population was considered.<sup>11,16,17,58,60,63,66,70–72</sup> In seven studies, the exposure data were obtained from the databases of insurance programs<sup>53,55,64,65,73</sup> (Medicaid or Medicare), or specific health care organizations.<sup>74</sup> One study collected information on exposure directly from the study population.<sup>57</sup> In another, the exposure data were drawn from the national health system's demographic data.<sup>76</sup>

Thirty-four out of the 35 studies used 'race,' 'ethnicity' or the two terms combined as the exposure variable, while only one considered country of birth as a proxy of migrant status.<sup>79</sup> The exposure variable categories depended largely on the setting. Papers concerning the US usually used the terms 'White/Black race,' with or without 'Hispanic ethnicity,' and sometimes mentioned other ethnic minorities (Asian, Pacific Islander, Filipino, Native Hawaiians). In articles set in New Zealand and Singapore, the exposure variable was based on ethnicity: EU, Maori, Pacific and Others in the former case, and Chinese, Indian and Malaysian in the latter. One Australian study considered indigenous and non-indigenous populations,<sup>78</sup> the other 'country of birth.'<sup>79</sup>

Most of the studies (17, 49%)<sup>11,14,16,58,59,61–63,66,71–74,77–80</sup> adjusted only for age (alone or in combination with gender and area of residence), but not for socio economic status.

14 studies (40%)<sup>12,17,51–53,56,57,60,64,65,67–70</sup> reported an adjustment for age and other covariates, including socioeconomic status. 4 studies (11%),<sup>54,55,75,76</sup> did not adjust for any variable. As regards the list of ACSCs considered, 17 studies applied the definition of by the American Agency of Healthcare Research and Quality (AHRQ),<sup>14,17,54,55,59,61–65,66–69,71–73</sup> while 7 adopted the list proposed by Billings.<sup>12,16,56–58,60,70</sup> The others chose their published lists of ACSCs,<sup>11,51,53,74,75,78–80</sup> or drew up their own list.<sup>52,52,77</sup> Fifteen studies only presented overall rates,<sup>11,12,52,53,56,57,60,61,63,70,74–77,80</sup> while 13 also included some disaggregated rates.<sup>14,16,17,51,54,55,58,62,64,65,66,78,79</sup> Seven studies presented findings for only one condition.<sup>59,67–69,71–73</sup>

**Table 3** Results of 21 studies presenting overall AH rates, showing the range of the rate ratios for each racial/ethnic group stratified by geographical setting

USA (to Whites/EU)	Black	1.02-2.4														
	Hispanic	1.08-1.37							1.08	0.68						
	Others	1.11-1.13														
	Asian	1.31	0.91-0.65													
	Filipino	1.6														
	Native Hawaiian	1.4														
	Japanese	0.6														
	Chinese	0.7														
	Other Asian	2														
	Other Pacific	3.5														
New Zealand (to Whites/ EU)	Maori	1.60-1.69														
	Pacific	1.5-2.4														
	Asian	1.02	0.69													
Australia (to EU- Austr.citizens)	Migrants	0.82														
	Indigenous	2.16														
Singapore (to Chinese)	Indian	1.7														
	Malaysian	1.8														
		1	2	3	4	5	6	7	8	9	10	11	12	13		

N° of studies

	= significantly higher rates
	= no significant difference
	= significantly lower rates

### Summary of the main results

Table 3 shows the results of 21 papers presenting overall AH rates, stratified by exposure variable and setting.<sup>11,12,16,17,52,53,55–57,60–63,70,74–80</sup>

Among these studies, 20 (95%) had a good quality assessment score (at least 4–5 points). Therefore, we did not exclude any study on the basis of the quality assessment.

In the North American papers, Black race,<sup>11,12,14,16,52,53,55–57,60,61,63,70</sup> Hispanic ethnicity<sup>17,52,53,56–58,60,61,63</sup> and some ethnic groups from Hawaii (Filipino, native Hawaiians, other Asian, and other Pacific Islanders)<sup>62</sup> generally had higher AH rates than their White/EU counterparts. The highest AH rate ratio was seen for the Black race or African American group, with rates up to 140% higher than for the White/EU group.<sup>16</sup> The Asian group,<sup>53,63,70</sup> and the Chinese and Japanese in Hawaii<sup>62</sup> had largely similar or lower rates than the White/European group, with rates even 35% lower than the latter.<sup>53</sup>

In New Zealand, the Maori, and especially the Pacific Islanders ethnic groups had higher AH rates than the European group in all studies,<sup>74–77</sup> while the Asian group, where analysed, had rates lower than or similar to the latter.<sup>74,75</sup>

In one Australian study,<sup>78</sup> the indigenous group had significantly higher AH rates than the non-indigenous group, otherwise in the other study, which compared Australians and migrants from refugee-source countries, the AH rates were lower for this latter group.<sup>79</sup>

Finally, in the only study conducted in Singapore, the Indian and Malaysian groups were compared with the Chinese majority group, and the AH rates were higher for the ethnic minorities.<sup>80</sup>

Most of the studies providing disaggregated rates for ‘acute’ and ‘chronic’ conditions found that AH rates were higher for chronic than for acute conditions.<sup>16,17,62,78</sup>

### Discussion

The aim of this study was to systematically review the available evidence on AH in ethnic minorities or migrant groups in European and non-European setting. Our search strategy identified 35 studies, most of them conducted in the US (80%) and none in Europe. We initially aimed to identify differences in terms of AH rates separately considering studies focusing on ethnic minorities and migrant groups, but this proved impossible because all but one of the papers identified considered race/ethnicity as the exposure variable.

We tried to analyse the main evidence concerning AH rates and association measures for the various racial/ethnic groups considered, bearing in mind the marked heterogeneity of the samples, especially in terms of the categories of the exposure variable. Migrants or ethnic minorities cannot be considered as homogeneous groups because they each have their own cultural backgrounds, historical roots, and ethnic features,<sup>81</sup> so we tried to summarize the available evidence separately by geographical setting and main exposure variable. Most minority groups in the US (Black/African

Americans, Hispanic, others) and New Zealand (Maori, Pacific Islanders) had AH higher rates than White/European groups.

These results may be explained by issues of PHC accessibility, like the persistence of barriers in front of different cultural attitudes,<sup>52</sup> a different quality of PHC services provided, as well as the lack of adjustments, in particular for socioeconomic factors.<sup>82</sup> There may be other factors that influence AH and partly explain different rates. AH can reflect a different hospital admission policies, or different levels of hospital service availability in a given catchment area.<sup>10</sup> Different prevalence or severity of the studied conditions or the presence of multiple comorbidities could also affect the results. Only few studies included in our review adjusted for comorbidities,<sup>17,52,56,57,60</sup> that can account for the underlying health care needs of individual patients and alter primary care use and hospitalization risks, but their results were in line with other studies, with minority groups generally showing higher AH rates than whites/Caucasians, especially for chronic conditions.

Several studies support the validity of AH as an outcome measure of access barriers and of PHC service quality, since the medical conditions associated with AH can be managed with timely and effective treatment provided by PHC services.<sup>5,6,83</sup> A recent review on the relationship between AH and PHC accessibility (measured in terms of the presence of centres providing PHC, the number of GPs, or of GP visits, or enhanced PHC programmes) found that most of the studies examined supported such a relationship.<sup>82</sup>

Some exceptions to the trend for higher AH rates among migrants and ethnic minorities came to light. Asian people had AH rates that were generally comparable or lower than in any other ethnic group considered, both in the US and in New Zealand; studies conducted elsewhere that examined access to healthcare by Asian people or Chinese migrants found similar results. Their lower rates of hospitalization for ACSCs would seem to be part of a generally lower usage of the health care services offered by the host country,<sup>84–86</sup> and one explanation for this lies in that they may prefer other medical practices (e.g. traditional Chinese medicine for the Chinese community) to ‘Western’ health care.<sup>84</sup>

Another exception emerged from the only study that used country of birth as the exposure variable, which identified lower AH rates among people coming from 8 refugee-source countries than in the Australian-born population.<sup>79</sup> The authors of the study hypothesized that this finding may be due to a time lag in the build-up of relevant risk factors for some chronic ACSCs. For the time being, there is a paucity of evidence on this issue and no comparisons can be drawn with other results to test this or other hypotheses.<sup>79</sup>

Studies analysing differences between acute and chronic conditions identified higher AH rates for chronic conditions among ethnic minorities. This might happen because the management of chronic conditions is more difficult for people with less ready access to PHC, so they go unmanaged for longer, until their worsening health condition obliges these people to go to the hospital.

Limitations of this study may stem primarily from the specificity of our search strategy: although it was thorough, some articles providing hospitalization rates for specific diseases included on the list of ACSCs relating to AH may have been overlooked if the authors did not describe the conditions as ‘avoidable.’ It was not the aim of this review to focus on specific ACSCs or single diseases, however, though this may be an interesting aspect to consider in further analyses. Other limitations may depend on the heterogeneous characteristics of the studies under review, in terms of their aims, study populations, study design, exposures and outcomes. The exposure variable considered in this review (race/ethnicity, migrant status) was rarely the only or even the principal exposure variable studied (Supplementary file S2). Such diversity may lead to spurious summary findings and misleading conclusions. For this reason, as mentioned previously, we paid particular attention to avoid

comparing studies with different exposures and geographical settings. Another limitation may relate to the design of the studies under review, which were almost all cross-sectional, and can only provide snapshots of differences in AH rates between different ethnic groups in a given period. Time is a useful variable in studies on minority groups, as an indicator of integration or assimilation of local habits, and prospective cohort studies could generate valuable information on the influence of the migration experience or integration on health service usage over time.<sup>27</sup> The use of a longitudinal design could account also for the length of stay of migrants in hosting countries, which strongly correlates with an improvement of access to health care services.<sup>87</sup>

The study aimed to focus on disparities of AH rates in migrant and ethnic minorities in European and non-European setting. None of the included studies was set in Europe, and therefore we cannot really give an answer about AH in Europe. The little relevance of our results for the European context is probably the main limitation of the study.

Notwithstanding this and all the above-mentioned limitations, to our knowledge, this is the first attempt to systematically review the published evidence on AH among migrant/ethnic minorities.

It is essential to study the quality of health care services, and patterns of access to care by migrant and ethnic minority groups in order to better assess needs, combat inequalities, and improve health care plans and resource allocation. In the present case, to reduce the higher AH rates among ethnic minorities, it is very important to eliminate any barriers that such patients might encounter when seeking PHC, which should be the first point of contact for their health needs.

As the existing evidence on AH involving migrants or ethnic groups mainly concerns the US (and Australia and New Zealand to some degree), and has been collected considering heterogeneous purposes, exposures and outcomes, it is difficult to draw any generalizable conclusions from our review, even though most ethnic minority groups tended to have higher AH rates than White/European groups. Producing more evidence on this issue in European countries could be particularly important because the concept of AH is not the same in different health care systems. In the US, AH was originally used as a measure reflecting ease of access to primary care. In countries with a universal health care coverage, where access to PHC is free at the point of delivery for citizens and regular migrants alike, access to GP and primary care may be higher for migrants,<sup>27</sup> and AH has been seen as a measure of the quality of care delivered.<sup>4</sup> Furthermore, the evidence produced in the US and other contexts where migration is well established, can not be so easily applied to countries with a more recent history of immigration, since the utilization of health care system may still be lower because of the ‘healthy migrant effect’<sup>88</sup> and for factors, in particular cultural barriers, that could limit access to health care.<sup>89</sup> Although validated definitions of AH and lists of associated ACSCs are available for the European setting,<sup>4–6</sup> none of the studies identified by our literature search were conducted in Europe. As at 1 January 2015, there were 34.3 million people born outside the European Union living in one or other of its Member States,<sup>90</sup> so studies set in Europe and comparing migrants and natives, preferably with a longitudinal design, are essential in order to identify disparities in their access to PHC.

## Supplementary data

Supplementary data are available at *EURPUB* online.

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## Key points

- Avoidable Hospitalization (AH) is an outcome measure of the performance of Primary Health Care, and it has been widely used to underline disparities in primary health care performance among different racial/ethnic groups, especially in the US.
- There are very few studies on AH comparing migrants to natives, and none has been conducted in a European setting.
- Although the heterogeneity of the studies does not allow any generalizable conclusion, most racial/ethnic minorities (Black/African Americans, Hispanics, Maori, Pacific Islanders) showed AH higher rates than White/European groups.

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