

# The relationship between avoidable hospitalisation and primary care

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## Summary

Primary Care (PC) can be defined as generalist and ambulatory care being the first level of access to professional health care provision. PC is characterised by its accessibility for the population, irrespective of the nature of health problems, and is provided near the patients' homes. Besides providing curative care, PC also offers preventive care and health education. In many European countries, GPs or family physicians are the main providers of PC.

Avoidable hospital admissions are seen as an outcome measure of access and quality of PC. Despite a large amount of research in this area, there is still little clarity about the definition of the conditions for which hospitalisation can be considered avoidable and about the factors related to this phenomenon. This thesis aimed to gain insight into the concept of AH and the role PC plays and can play in reducing this phenomenon.

The major focus of this thesis was on: i) the factors influencing the relationship between PC provision and avoidable hospitalisation (AH); ii) the variability of the AH rates across geographic areas and over time in Italy; iii) the differences in the role of PC in two countries with different Health Care Systems (HCSs), the case of Italy and Germany; iv) the relationship between specific activities of GPs and AH rates.

In Chapter 1 we dealt with the conceptualisation of the problem and we posed the research problems and questions. The concept of AH came up in the USA's healthcare system in the 1970s. AH was generally intended as hospitalization for ambulatory care sensitive conditions (ACSC), that is a set of conditions for which the role of PC is crucial in preventing the recourse to hospital care, namely: acute conditions such as disorders of hydro-electrolyte metabolism, pneumonia, bleeding of perforating ulcers, appendicitis with complications, urinary tract infections, and pelvic inflammatory disease; chronic conditions such as diabetes, amputation of lower limbs in patients with diabetes, hypertension, angina pectoris, heart failure, asthma, and chronic obstructive pulmonary disease. AH is part of the prevention quality indicators designed by the Agency for Healthcare Research and Quality to measure hospitalisations that could have been prevented with appropriate community-based care. These measures enjoy wide support and have been adopted for use in several states in the USA. In order to transfer these findings to the Italian healthcare system we planned a set of empirical studies that form the core of this thesis.

In Chapter 2 we conducted a systematic literature review on the issues which allowed the identification of key factors influencing the relationship between AH and PC in different HCSs by answering the research question about the relationship between AH and measures of accessibility to PC, both over time and among different HCSs.

To measure the quality and accessibility of PC four types of indicators were the most frequently mentioned in the scientific literature: the number of GPs per 1,000 residents; presence of community health centres or number of primary healthcare centres in living areas; the number of GP or specialist visits; and the availability of enhanced primary healthcare programs. Socio-economic conditions are a recognised risk factor for AH, they were considered in many studies. Patients who have better schooling levels present lower chances of hospital admission due to avoidable causes.

Along with socio-economic conditions there are other contextual factors which may influence the relationship between the performance of PC and AH, such as the epidemiology of diseases, and the availability of acute hospital beds. These factors were evaluated in Chapters 5, and 6 at different area levels, using appropriate statistical models.

Primary care plays a different role in the prevention of hospitalisation for chronic and acute conditions. Acute conditions are supposed to be prevented through early diagnoses (and treatment) of the condition or its precursor; chronic conditions through good ongoing control and management. For this reason acute and chronic conditions had to be analysed separately.

In Chapter 3, we analysed the distribution of the rates of AH over time. In Italy, hospitalisation rates have steadily decreased over the last 20 years. Therefore, it is also likely that a decrease in hospitalisation due to ACSC will be observed. Here, we tried to answer the research question about the possible deviation of trends from the rates of AH in respect to general hospitalisation rates. We explored the trend in Italian regions over the years 2001 to 2008 and found that avoidable admission rates did not decrease more than the general hospital admission rate in the studied period. Looking at AH we observed that acute avoidable conditions and chronic conditions showed different patterns: slightly increasing in acute conditions; decreasing, even if not statistically significantly, in chronic conditions. However we found hospitalisation for ACSC to be more sensitive to changes in PC policy, such as the changes in the organisation of PC delivery due to the introduction of innovative forms of team practice among GPs, starting in the late 1990s and becoming increasingly common.

In any given geographic area, the expectation is that the rates of avoidable hospitalisations will be lower when people are receiving the PC they require. Conversely, in areas where access to medical care is more limited, rates of avoidable hospitalisations tend to be higher. In Chapter 4 we answered the research question about factors influencing the relationship between PC provision and AH and their variability among the Italian regions. The analyses were conducted separately for chronic and acute conditions and gender, considering as possible explanatory factors the propensity to hospitalisation, and the epidemiology of the selected conditions. In Italy AH accounts for 8% of total hospitalisation, out of which 35.7% for acute ACSC; 64.3% for chronic ACSC. We found distinct geographical patterns and relationships with the following explanatory factors: hospitalisation for acute ACSC showed higher rates in the regions of the north among the elderly and women in reproductive age; hospitalisation for chronic conditions showed lower rates in the regions of the north and higher rates in the regions of the south, particularly among women.

In Chapter 5 we dealt with the differences in the role of PC between countries with different HCSs, analysing the case of Italy and Germany. Italy and Germany are countries with both similarities and differences in the organisation of HCSs; for this reason they were suitable for a comparative test about the role of PC. Comparisons among countries with different HCSs may be helpful to better understand the role of PC in relation to AH in countries adopting different models of PC, and to understand the relevance of hospitalisation for ACSCs to assess the influence of PC accessibility and quality. We have compared the geographic distribution of the rates of AH in the two countries in the years 2000 to 2008. We found a clear pattern in the geographic distribution of hospitalisation rates. The multilevel models adopted for the analyses, controlling for contextual socio-economic characteristics, showed that southern regions in Italy and in eastern regions in Germany have higher risk of AH for chronic diseases. Both areas not only have a lower GDP per capita but also suffer from lower levels of healthcare facility resources. For both countries the socio-economic conditions in deprived areas are still a serious policy challenge. Germany showed a risk as high as 40% compared to Italy to hospitalise for avoidable causes, although this was not found to be statistically significant. The findings support the hypothesis of a better performance of the Italian primary healthcare system.

The capacity of GPs to provide an early diagnosis (and treatment when possible) of acute conditions (or precursors) and the ongoing control and management of chronic conditions may play a role in preventing AH. Such capacities can be measured through specific indicators in the context of continuity of care, comprehensiveness, quality and efficiency of PC. In Chapter 6 we answered the research question about the role of GPs in AH through a study which made use of individual data from the Health Informative System of Latium region (Rome and surroundings) aiming at exploring the relationships between hospital admissions for ACSC and a specific set of indicators related to GP activities: the number of patients per GP, the adherence to team practice groups, the number of prescribed DDDs per patient, the number and type of prescribed diagnostic services per patient and the number of ED accesses. The positive effect of the organisation of GPs in collaborative groups (team practice) – in terms of reduction of AH - was clearly demonstrated, particularly when considering the association between AH and the access to ED with white codes (non-urgent patients) that can be considered as 'inappropriate' access. The study is a further piece of evidence in favour of the validity of AH as an outcome measure of quality and accessibility of PC.

Finally, in Chapter 7 the findings of all the studies are summarised and discussed, and some recommendations for research and (Italian) health policies are proposed. The main findings concerned: i) the validity of AH as an outcome measure of quality and accessibility of primary care; ii) the identification of the most relevant factors influencing the relationship between AH and PC; iii) the characteristic of the rates of AH to be more sensitive to changes in PC policy; iv) the distinctive pattern of acute and chronic ACSC, with chronic ones found as associated with socio-economic conditions and poverty and more difficult to attack than the admissions for acute ones; v) evidence about the better performance of primary healthcare in Italy, with its state-regulated HCSs, compared to Germany, which adopt a Bismarckian HCS; vi) the importance of team practice in reducing the risk of AH; vii) evidence about the capacity of GPs to prevent AH in their patients by providing specific assistance to control chronic diseases such as diabetes, heart failure, and COPD.

This study also permitted the estimation of the cost of avoidable admissions in Italy: it was about 480,000 admissions per year for an approximate cost of EUR 1.4 billion. When one considers the cost of these avoidable admissions, there is a clear need to better understand the factors that predict hospitalisation, especially in individuals with chronic disease.

Findings from this thesis provide clues to develop future initiatives that can address the multi-factorial nature of PC service utilisation and hospital admission, as well as to provide for the inclusion of ambulatory specialist care as a possible explanation of differences between HCSs. The strategies to reduce AH are multifaceted, all implying the adoption or the enhancement of public health policies. The main issues are continuity of care, failure to use ambulatory care services, help-seeking behaviour, non-compliance to treatment, fragmentation of health services, budget cuts and increases in chronic disease prevalence. Findings of the thesis support the idea that profound reflection is needed in order to revise and reorganise the Italian NHS, i.e. in the part that relates to PC. In the new model of PC it is mandatory to work in a multi-professional manner, with the use of new structures of reference for the provision of PC with

interdisciplinary integration. This was the approach adopted in Italy that inspired the recent law that has introduced a new model of primary healthcare.

In Europe, countries are looking for solutions to create more coherence and coordination in care to address the problem of a lack in responsiveness to the needs of populations. PC is seen as the part of the HCS where this problem can be tackled to a large extent. The problem is to find valid measures to compare the performance of PC within countries and across different countries. This is quite difficult because of the diversity of the structures and financing methods of PC across European HCSs. AH, as an outcome measure of the quality and accessibility of PC, is often easy to calculate, as hospital records are nowadays available in any developed country, reliable and amenable to be used for comparisons. With this study we provided further evidence about the validity of AH as a measure of PC performance. The role of GPs and the organisation of PC in this field are crucial. Findings were derived mostly from data from the Italian HCS, and could be tested in other contexts using the methodology presented here.