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Hospitals in rural or remote areas: An exploratory review of policies in 8 high-income countries☆

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ABSTRACT

Our study reviewed policies in 8 high-income countries (Australia, Canada, United States, Italy, Spain, United Kingdom, Croatia and Estonia) in Europe, Australasia and North America with regard to hospitals in rural or remote areas. We explored whether any specific policies on hospitals in rural or remote areas are in place, and, if not, how countries made sure that the population in remote or rural areas has access to acute inpatient services. We found that only one of the eight countries (Italy) had drawn up a national policy on hospitals in rural or remote areas. In the United States, although there is no singular comprehensive national plan or vision, federal levers have been used to promote access in rural or remote areas and provide context for state and local policy decisions. In Australia and Canada, intermittent policies have been developed at the sub-national level of states and provinces respectively. In those countries where access to hospital services in rural or remote areas is a concern, common challenges can be identified, including the financial sustainability of services, the importance of medical education and telemedicine and the provision of quick transport to more specialized services.

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1. Introduction

This article explores policies of 8 high-income countries (Australia, Canada, United States, Italy, Spain, United Kingdom, Croatia and Estonia) in Europe, Australasia and North America with regard to hospitals in rural or remote areas. This is a particular health policy problem in countries with vast geographical distances and low population density. Indeed, countries differ vastly in these respects. The population density of countries in Europe is shown in Fig. 1. It ranges widely, from 3 people per km^2 in Iceland in 2012 to 1327 people per km^2 in Malta. In comparison, Australia (3 inhabitants per km^2) and Canada (4 inhabitants per km^2) also have very low population densities, while the United States (35 inhabitants per km^2) is less densely populated than most European countries.

Where the population is more dispersed and distances are greater, access to hospital and emergency services may become problematic. Geographical distance could then lead to inequities in access and underutilization of emergency hospital services among populations in rural or remote areas [1]. Concern has therefore been raised about the existence of "medical deserts" even in more densely populated countries such as France [2].

At the same time, there have been pressures to downscale hospital infrastructure, centralize more specialized functions to ensure an appropriate volume of procedures and quality of care, and attempts to move services out of hospitals and into the community [3]. The financial sustainability of small hospitals in rural or remote areas has become a major concern in terms of both capital expenditure and running costs, while attracting highly skilled staff to rural or remote locations has posed a further challenge. Yet, the closure of hospitals is often highly politically charged and resisted by the local population. In these contexts, primary health care has gained in importance, either through preventing unnecessary hospitalizations or through providing basic emergency care, sometimes assisted by telemedicine [4].

Our study aimed to explore how the selected countries ensure that their population in rural or remote areas has access to acute inpatient services. It investigated whether there are national or sub-national policies on hospitals in rural or remote areas in place and, if yes, what they consist of. It also asked how emergency functions are divided between small hospitals in rural or remote areas and more specialized hospitals in more central locations.

2. Materials and methods

In order to review the policies of pertinent high-income countries with regard to hospitals in remote or rural areas, we contacted key experts in a selection of eight countries in Europe, North America and Australasia, drawing on the networks of the European Observatory on Health Systems and Policies, including the Health Systems and Policy Monitor [http://www.hspm.org/mainpage.aspx]. The experts were chosen on the basis of their previous experience and publication record with regard to health systems and policies in their countries, as well as their track record in responding quickly to requests for information and, where applicable, their proficiency in English. All experts we approached agreed to contribute to the study.

Countries were selected on the basis of geography, population density and the existence of ongoing reforms of hospital systems. We included the three Western high-income countries with the most pronounced challenges in terms of vast distances (Australia, Canada and the United States). We further added some conveniently sampled countries from different parts of Europe, including some of the major Western and Southern European countries (Italy, Spain and United Kingdom), a South-East European country that has a large number of islands (Croatia) and a post-Soviet country from Eastern Europe undergoing major hospital reforms (Estonia).

The country correspondents were asked to provide a description of their countries with regard to policies and practices on hospitals in rural or remote areas. They explored whether any national or sub-national policies on hospitals in rural or remote areas are in place, how countries made sure that the population in remote or rural areas has access to acute inpatient services, and how emergency functions are divided between different types of hospitals.

Information was collected in March 2015 and responses were received from all selected countries. The country reports were based on a review of national and sub-national policy and legislative documents, as well as the grey and academic literature on the respective country, using MEDLINE and Google Scholar and the search terms "remote" OR "rural" AND "hospital", in combination with the country names. Findings were summarized using a narrative synthesis approach. The reports provided the basis for a (selective) description of country-level policies and practices and a comparative analysis of cross-national differences and commonalities. The national and cross-national findings were validated by the country experts.

3. Results

We found that only one of the eight countries (Italy) had drawn up a national policy on hospitals in rural or remote areas (Table 1).

In the United States, although there is no singular comprehensive national plan, federal levers have been used to promote access in rural or remote areas and provide context for state and local policy decisions. In Australia and Canada, as in other areas of health care, policies have been developed at the sub-national level of states and provinces respectively.

Unsurprisingly, the challenge posed to governments in terms of ensuring access to hospital services in rural or remote areas differs vastly across countries (Table 2). In the United Kingdom, very few hospitals could be genuinely considered as "remote". Similarly, geographical access to hospitals is not considered a problem in Estonia. In Croatia a new hospital plan is currently being discussed that aims to maintain hospitals in rural or remote areas. In Spain public debates have revolved around primary health care in rural areas, including the provision of emergency services, although access to hospitals also reaches front-page news occasionally. In view of the pronounced

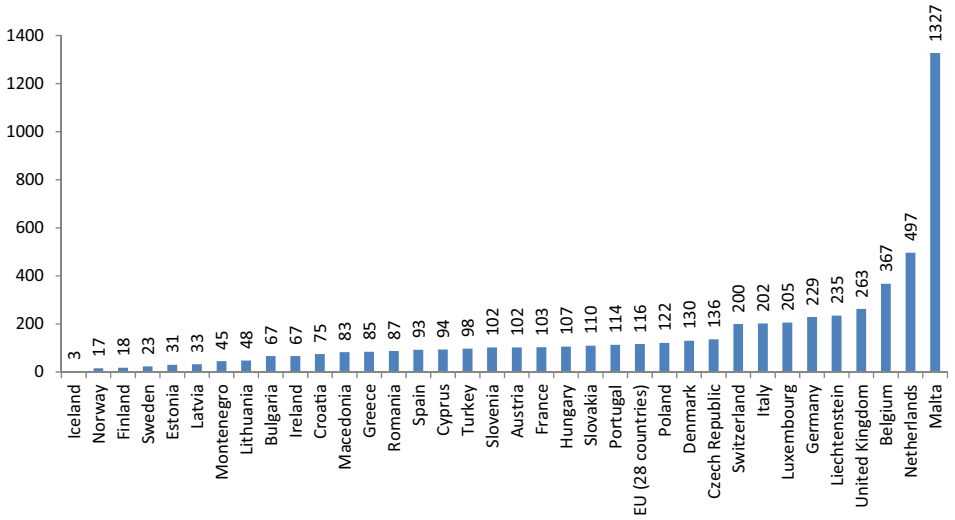

Fig. 1. Population density in Europe by country, 2012.

Source: [46]

Table 1
Existence of policies on hospitals in rural or remote areas.

	Is there a national policy on hospitals in rural or remote areas?	Comments
Australia	No	Every state has one (or several) policies on this issue.
Canada	No	A responsibility of the country's provinces, although there are few rural hospitals and few provincial governments with explicit policies.
United States	No	While there is no singular comprehensive national plan, federal levers have been used to promote access in rural or remote areas and provide context for state and local policy decisions.
Italy	Yes	Although the country's health system is decentralized, there are national standards on hospital networks.
Spain	No	There is no national policy regarding small hospitals and emergency services in rural areas. Hospitals are classified according to their clinical purpose, not their size or location.
United Kingdom	No	Very few hospitals could be genuinely considered as "remote" and catchment populations tend to be large.
Croatia	No	The issue of hospitals in rural or remote areas has so far not been a central concern of health reforms.
Estonia	No	A network approach is pursued to improve the sustainability of hospitals with small catchment areas.

differences between countries, we will now consider their particularities in turn, starting with the high-income countries that have the lowest population density (Australia, Canada and the United States) and then turning to those in Western (Italy, Spain and the United Kingdom) and then Eastern Europe (Croatia and Estonia).

3.1. Australia

Given Australia's geography and its population density, the provision of hospital and emergency services in rural or remote areas is an important challenge for the country. However, there is no national policy on rural or remote hospitals, as hospitals (and health services generally) are the responsibility of the country's six states. Every state might have one (or several) policies on this issue.

In New South Wales, for example, the role delineations of health and emergency services were clearly set out in 2002 [5] and 2014 [6]. Role delineation levels are determined for a range of services provided at a health facility, including emergency, medical, surgical, maternity, and community-based services. The role delineation level of a service describes the complexity of clinical activity undertaken by that service, and is significantly impacted by the presence of medical, nursing and other health care personnel who hold qualifications compatible with the defined level of service. Levels range from Level 1 (the lowest complexity level of care) to Level 6 (the most complex care). Additionally, a clinical service must be supported by the presence of the related and necessary support services.

While many initiatives have been implemented across Australia, those in New South Wales included:

- Closing the emergency department altogether and downgrading the acute inpatient services;
- Working with local general practitioners (GPs) to staff the emergency department and acute inpatient beds on a part-time basis;
- Closing the acute inpatient beds and using GPs to staff only the emergency department (part-time) with

Table 2
Summary of key issues.

	Main challenges	Main approaches
Australia	• Vast distances and low population density • Emergency care coverage • Medical training • Financial sustainability of small and remote hospitals	• Role delineations of health and emergency services set out at the level of the country's six states • Multi-purpose services (MPS) exist throughout the country, aiming to improve the provision of health services in small remote or rural areas, based on simplified financing • Use of telehealth • Common use of low-level weekend duties and being "on-call" from home • Medical training has embraced the issue of remote or rural training • Networks for emergency medicine
Canada	• Vast distances and low population density • Emergency care coverage • Medical training • Financial sustainability of small and remote hospitals	• Focus on transfer to hospitals when needed • Medical air transport • Lack of personnel • Rural Health Hubs providing emergency care
United States	• Vast distances and, in places, low population density • Concerns include financial instability of providers, relatively lower rates of health insurance among rural residents and shortages of health professionals • Rural is not a "monolithic" term nationwide – variety in geographic remoteness, population density, insurance markets, and socio-economic and demographic characteristics	• Illustrative federal-level policy levers include reimbursement policies, policies that seek to expand access to health insurance, and demonstration programmes to test new models of care and system development
Italy	• Few (4%) hospitals in remote rural areas meet the required minimum threshold of appropriate admissions	• National standards on hospitals in remote areas • Hospitals in remote areas are defined by distance to the referential hub or spoke centre
Spain	• Provision of emergency care	• No specific rural hospitals, as hospitals defined by their clinical purpose • Increasing provision of emergency care by primary health care
United Kingdom	• Few genuinely "remote" hospitals, but problems of staff recruitment and training in smaller hospitals	• Centralization of services • Support to smaller hospitals • Network arrangements
Croatia	• Financial pressures to reduce the current infrastructure of hospitals and the current level of services • Lack of cooperation and training	• Not a major challenge recognized in national policy documents
Estonia	• Some very small hospital catchment areas • Financial sustainability of small hospitals • Lack of personnel • Limited cooperation between primary care, hospital and ambulance care at local level	• Increased cooperation in hospital networks aims to enhance access to specialist care in smaller hospitals

support from a nurse practitioner (sometimes called advanced nurse practitioner);
- Staffing a stand-alone acute service with nurse practitioners and other support services (but without doctors).

However, most attempts to re-design the role of small hospitals have been resisted by the local population, at least initially.

All states have implemented a version of multi-purpose services (MPS) which are small rural health services that operate under a special payment agreement and aim to improve the provision of health services in small remote or rural areas. The multi-purpose services in the state of Victoria, for example, are based on comprehensive service plans for durations of 3–5 years. The aim is to use simplified funding and accountability mechanisms to provide a more flexible, co-ordinated and cost-effective framework for service delivery. The concept involves the pooling of national and state funds for health and long-term care (while health care is the responsibility of the states, long-term care is overseen by the national government). This allows the reconfiguration of health services to better meet local health needs and to provide staff with flexible options for work settings across a range of services [7]. The emergence of telehealth has also increased the options for rural residents to access specialist services. People in telehealth-eligible areas of Australia have access to specialist video consultations paid for by Medicare, Australia's universal insurance scheme, and eligible telehealth services are reimbursed at a higher rate compared to the equivalent face-to-face service [8].

The provision of health and emergency services in remote and rural areas of Australia differs in several important respects from the situation in Europe. In contrast to European Union (EU) member states, health workers in Australia do not face working time restrictions, so low-level weekend duties are more common, as is being "on-call" from home, with additional payment for call-ins. Consequently, fewer staff are needed to run a service. In medium-sized hospitals, there are often only 2–4 consultants for a specific service, as opposed to a minimum of 8 in Europe. Support medical staff tends to comprise

doctors-in-training from teaching hospitals, staff grades and local GPs (who might either do the obstetrics or the anaesthetics).

Medical training in Australia (including medical schools, the training of junior doctors, and postgraduate training) has clearly recognized the issue of remote or rural training; it has also been formalized through the establishment of a whole medical school (the James Cook University School of Medicine and Dentistry in Queensland) and a College (the Australian College of Rural and Remote Medicine based in Brisbane). Both organizations place special emphasis on rural and indigenous health. There is an expectation that all junior doctors will participate in rural or remote working, with an emphasis throughout their whole training on identification and management of risk. Furthermore, there are programmes of bonded scholarships for medical students, based on the agreement that each year of funding is paid back by a year of working in a "hospital in need", plus one additional year. The rotations at all big teaching hospitals include 6–12 weeks per year for all junior staff (interns excepted) up to senior registrar level. At the level of Specialist Registrar, there is still the expectation of going to provincial centres during the training (which might involve a rotation of 3 months each year for 3 years or 1 year out of 3 years, depending on the programme). For this reason, internship programmes have an emphasis on experience in emergency departments and there is a higher level of exposure to anaesthetics than in most of Europe (6–12 weeks per year of anaesthetic experience is the norm as a senior house officer). The Australasian College of Physicians and the Australasian College of Surgeons place emphasis on generalism and the need for a workforce skilled to meet the needs of provincial or rural areas [9].

Networks for emergency medicine are also more developed than in European countries. In Australia, they are in place at almost every level for both training and service provision. They tend to aim to stabilize and transfer patients, rather than following a hub-and-spoke model. Services are set up to support this, such as through air ambulance and long-range road transport. However, there is also the delivery of doctors to patients, such as in the outreach component of the Flying Doctor Service or the Flying Doctor obstetric service [10]. The training of junior doctors also brings a networking aspect with it, as smaller hospitals are tied both formally and informally to larger hospitals.

3.2. Canada

Similarly, Canada does not have a national policy on the role of hospitals in rural and remote areas. The Canadian constitution stipulates that hospitals are within provincial rather than federal jurisdiction [11,12]. There are over 330 hospitals located in the country's sparsely populated rural and remote regions, providing 24/7 emergency care to the 20% of Canadians who live in these areas. Most are small hospitals (the Canadian Institute for Health Information defines small hospitals on the basis of the intensity of resources) and have on average 18 beds (personal communication from the Canadian Institute for Health Information).

Furthermore, provincial and territorial governments generally arrange for patients to be transported to urban areas for tertiary care while providing primary and very basic secondary care services in smaller communities. Cost-cutting by provincial governments in the early to mid-1990s in response to growing levels of public debt and economic slowdown led to the closure of a number of smaller hospitals in rural and remote areas. This was accompanied by the introduction of geographically based regional health authorities in most provinces and a Health Services Restructuring Commission in Ontario which in turn accelerated the tendency to concentrate hospital and emergency department resources in larger hospitals outside of sparsely populated rural and remote communities [13,14]. After these changes were introduced, 22.5% of Canadian live more than one hour driving distance by road from either a level I or level II trauma centre [13].

The provision for access in the Canada Health Act, setting out the national standards for universal health coverage, has been interpreted to mean that there should be no financial barriers to access (meaning no over-billing or co-payments) rather than no geographical barriers. Instead, this provision has come to be interpreted as access to necessary hospital, diagnostic and medical services "where and as available" [13]. There is a general acceptance among patients and providers that tertiary care and more specialized care cannot be provided locally to patients from rural and remote areas, and patients in such regions will have to travel to urban centres [15], the only possible exception being deliveries of First Nations pregnant women [16].

Medical air transport is critical in providing hospital care for rural and remote residents in all ten of Canada's provinces. However, the "lack of alignment between and within federal and provincial ministries and municipal governments continues to be a barrier to integration and coordination of services, as it impedes health and social service organizations from achieving funding efficiencies" [17].

The goal in most provinces is to provide ready access to most emergency and secondary care: for instance, British Columbia set as a target that all residents of rural areas should be able to access emergency care in less than 60 min and secondary care in less than 2 h [18]. In Ontario, 93% of hospital-based services are provided locally (within the Local Health Integrated Network) in Northwest Ontario, which covers almost half of Ontario's landmass but is inhabited by only 2% of the population in this province [19]. However, 67% of rural women deliver in urban hospitals: 17% are more than 120 min driving distance from their hospital of birth [20]. It must also be noted that even when hospital emergency departments exist in rural and remote locations, they do not always provide the whole range of services and do not always have the same wealth of resources and equipment as urban emergency departments [21].

It is important to note that some provinces (e.g. Ontario) make a distinction between rural non-remote areas (typically non-urban regions in the southern part of the province) and rural remote areas in the north. These jurisdictions tend to have two sets of policies, one for rural

non-remote areas and one for remote areas. They rely on sub-provincial administrative entities (Local Health Integration Networks in Ontario and regional health authorities in the rest of Canada) to define policies that will address the specific issues of remote areas.

A major issue is human resources: hospitals in remote areas are not accessible 24/7 due to lack of personnel, in particular doctors and surgeons. Ontario has been experimenting with allowing doctors practicing in urban centres to undertake shifts in rural hospitals and this has been deemed successful. Also, coordination of care in ambulatory settings is challenged by the lack of primary care providers in remote areas. This is why regional health authorities have been creative and fostered innovation in care delivery.

One illustration is the creation of Rural Health Hubs in Ontario. Rural Health Hubs are comprised of a 24/7 emergency department, complex continuing care beds, rehabilitation services, outpatient clinics, primary care, home and community long-term care, mental health and addiction care. Inpatient care is provided in some localities, for instance Manitouwadge, or Espanola and Dryden, which provide acute care for communities of 1200, 14,000 and 15,000 people respectively [17]. The goal of these hubs is to create a network of integrated care providers (including electronic health records). Some, but not all, rural emergency and/or primary care providers have established transfer agreements with larger providers in urban centres. Some physicians from urban centres do limited time consulting in remote areas (e.g. on a part time basis, one day a week or one week a month), which is far from ideal. The Ontario Hospital Association promotes Rural Health Hubs with inpatient care for a catchment population of 10,000–40,000 people in Southern Ontario [17]. Other innovations in Ontario centre around information technology: all hospitals in the North-West region share a common health information system and are connected to primary care practitioners, the Local Health Integrated Network invests in telehomecare, to prevent patients diagnosed with congestive heart failure and chronic obstructive pulmonary disease from needing hospitalization (emergency department visits are expected to drop 20%), and in telemedicine and virtual care [22,23].

Governments in other provinces and territories also provide services that attempt to compensate for the absence of rural and remote hospitals. However, there is no single law or policy determining catchment area or size for the establishment or maintenance of a hospital. While some provincial governments (e.g. Saskatchewan) have encouraged the growth of specialized surgical facilities separated from hospitals in urban centres, there has been no policy or direction on this issue for hospitals located in more rural and remote regions.

While hospital arrangements differ significantly throughout Canada, all provincial and territorial policies are designed to ensure access to hospital care–care that under the Canada Health Act must be provided without financial barriers and on uniform terms and conditions. The last clause has not been interpreted to mean that rural and remote residents have an immediate right to hospital care but a reasonable right to access hospital care located in larger centres [24].

3.3. United States

In the United States, health policy decisions are made and resource and planning responsibilities are shared across federal, state and local levels. Furthermore, the United States health care marketplace hosts a broad range of public (Medicaid, the joint federal and state programme that helps eligible low-income individuals or families, and Medicare, the federal health insurance programme that provides health care for people over 65 years of age) and private insurance options, as well as non-profit, for-profit, and publically-owned health care facilities. Given this level of devolution and the large role of the private sector within a complex health system, it is difficult to generalize with regard to policies and experiences in the United States in terms of the role of small hospitals in remote or rural areas. Health policy, resource and planning decisions are made at national, state, and local levels, translating into variety across states and across communities within states and precluding a comprehensive overview in the scope of this article.

Rather than reflecting a singular comprehensive national plan or strategic vision, current rural health policy debates and interventions in the United States can be viewed as ad hoc responses to persistent trends [25–27], including:

- the financial instability of rural hospitals (with a substantial increase in rural hospital closures over the last five years, amounting to 48);
- overarching concerns about access to care for the disproportionately large number of rural residents who lack health insurance coverage;
- health professional shortages including challenges related to rural clinical training and provider recruitment and retention.

While policy levers exist at both national and subnational level, three illustrative federal policy levers that have been used since the late 1990s to support and sustain access to care for rural residents are discussed here, although the relative successes of these levers remain debatable. These are:

- reimbursement policies that incentivize the provision of an “appropriate” arrangement of services given local need/demands, cost and financial resources;
- policies that seek to expand access to health insurance and coverage;
- demonstration programmes to devise and test new models of care and system development.

Reimbursement policy has been an important means of restructuring or maintaining rural health systems. Through the Critical Access Hospital Program (CAH) [28,29] and the Rural Hospital Flexibility Program, both adopted in 1997, the federal government has leveraged its role as

a payor/insurer for Medicare beneficiaries (who constitute a substantial proportion of the rural population) to incentivize existing rural hospitals to alter their scope of services in return for cost-based reimbursement. For Medicare patients, CAHs are paid at a rate of 101% of reasonable cost for most inpatient and outpatient services and are not subject to Prospective Payment System requirements. Conditions of participation include:

- rural designation based on federal standards,
- maintenance of no more than 25 inpatient beds (that may also be used for swing beds),
- provision of 24-h emergency care services 7 days a week,
- and an annual average length of stay of 96 h.

Additional requirements involve the development of formal partnerships with tertiary care centres for issues such as patient transfer, quality assurance, and emergency coverage. Eligibility for the CAH designation is also based on being located more than 35 miles from any hospital or other CAH (or more than 15 miles in regions of the country with difficult terrain). Through the Rural Health Flexibility Program, states have been provided resources to support facilities in examining the potential impact of CAH status on their financial viability and allowed to establish their own criteria for CAH designation if it was determined that the 35 mile requirement was deleterious for rural populations and the states' overall healthcare infrastructure [28].

According to a report from the Flex Monitoring Team funded by the Health Services and Resources Administration, 1300 rural hospitals have converted to CAHs, "most of whom have reported improved financial status while also expanding the array of services offered to their communities." Efforts linked to the CAH programme have evolved to include a focus on performance reporting and measurement as well as quality improvement.

It is difficult at this point to reconcile the relative progress reported by the CAH programme with the abovementioned 5-year trend of 48 rural hospital closures across the country. As a result, many states are considering a broad range of additional policies and regulatory changes to remedy the challenges that persist – either by further subsidizing hospitals or by finding ways to ensure integrated systems of care are in place to meet escalating needs or gaps in service.

The designation as Rural Health Clinic is an additional example of federal reimbursement incentives that have been used to leverage changes in rural services to enhance care while also managing costs [30,31]. The Rural Health Clinics programme is intended to increase access to primary care services for Medicaid and Medicare patients in rural communities. Rural Health Clinics can be public, private or non-profit. The main advantage of Rural Health Clinic status is enhanced reimbursement rates for providing Medicaid and Medicare services in rural areas. Rural Health Clinics must be located in rural, under-served areas and must use one or more physician assistants or nurse practitioners.

Insurance coverage expansion is a second federal policy lever with the potential to improve access to care and provider sustainability in rural and remote areas. The Affordable Care Act (2010) is expected to improve access to rural health services, including and in addition to those provided in hospital settings, by virtue of its impact on insurance coverage (public and private). While reports show that overall coverage rates for Americans have improved significantly as a result of the Affordable Care Act, it is difficult to predict how changes in coverage might ultimately impact access to care in rural communities, given other challenges such as workforce shortages and inherent tendencies towards outmigration for services.

A third, more exploratory, policy lever has been federal support for demonstration projects to develop and test new models of rural health care delivery. As one might imagine, "rural" is not a monolithic term in the United States. While rural communities do possess some cross-cutting traits, such as challenges in recruiting and retaining providers and high rates of poverty, there is an ongoing effort to experiment with new models of care and payment structures in a variety of settings to address differences in need, geography, culture, and health care "systemness". The Health Resources and Services Administrations' Office of Rural Health Policy invests substantially in the ability of rural communities to plan and implement their own tailored approaches to strengthening local systems of care, developing their own workforce, and improving health outcomes. One common denominator across many demonstration interventions is the need for community-level partnerships and system integration efforts. Examples include the Rural Health Outreach Program, the Rural Health Network Development Programs (including cohorts that focus specifically on Workforce Development and Health Information Technology), the Frontier Extended Stay Models and the Frontier Health Integration Program. The Office of Rural Health Policy also supports intensive technical assistance and evaluation to capture and re-use lessons across sites, thus maximizing the impact and creating opportunities to inform policy in the future.

3.4. Italy

Compared with the European Union (EU) average, Italy is a densely-populated country (Fig. 1). However, population density in Italy varies greatly across regions, ranging from 39 inhabitants per km^2 in the alpine region of Valle d'Aosta to 426 inhabitants per km^2 in the mainly flat, urbanized region of Campania. Other mountainous areas, such as Trento or Bozen, as well as internal southern regions, such as Molise and Basilicata, and the island of Sardinia have a population density below 100 per km^2.

Italy's health system is decentralized. Nowadays, regions have the power to design and organize the network of outpatient and inpatient services. However, national laws and regulations still set general standards regarding hospital networks, in order to secure standards of minimum access to the whole population and to avoid inefficiencies (i.e. service duplications within and across regional boundaries).

In August 2014, the Ministry of Health updated the national standards on hospital networks. The document aims to complete the restructuring of hospital services by establishing well-functioning hub & spoke networks. The

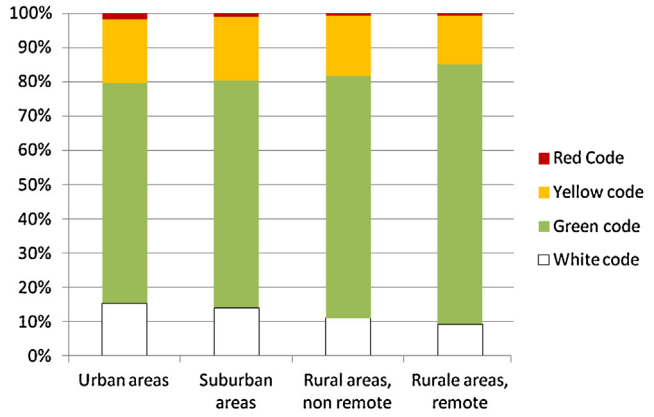

Fig. 2. Admissions to emergency departments/first aid in Italy in 2013 by location of hospital.
Authors' analysis of AGENAS data.

new national standards particularly target the problem of inpatient acute services in remote areas, with an in-depth focus on emergency services that are considered as inseparable from some elective activity [32].

The emergency care hospital network is constituted by structures of different complexity that engage with each other according to the "hub and spoke" model. Different structures respond differently to emergencies, depending on their complexity, personnel abilities and available resources. The regional (or inter-regional) inpatient network consists of four different operational levels: hospital centres in remote areas, hospitals equipped with emergency care, hospitals with emergency and urgent care department (level 1 – spoke), and hospitals with emergency and urgent care department (level 2 – hub).

Hospital centres in remote areas provide basic emergency care. These hospitals include facilities in remote areas (such as on islands or in mountainous areas), even with a catchment area lower than 80,000 people (and yearly admissions below 20,000). Hospital facilities can be localized in particularly troubled areas that are certified, through objective measurement techniques and official technical records, to be more than 90 min away from the referential hub or spoke centre (60 min from first aid facilities), thus making an effective emergency care service not possible.

According to the Italian Agency on the Regional Healthcare System (AGENAS), 661 acute hospitals with emergency services were operating in Italy in 2013 [33]. According to Eurostat's degree of urbanization [34], 192 of them (29%) were located in urban areas, 339 (51%) in suburban areas, and 130 (20%) in rural areas. Since rural areas are not per se remote, we divided rural hospitals into "remote" and "non remote" locations. The former included small islands and mountainous territory (the Italian Institute for Statistics classifies as "mountainous municipality" a territory with a maximum height over 600 m above sea level): 49 hospitals (7.4%) were located there. Sicily and Emilia Romagna recorded the highest number of hospitals in rural areas (18 and 16 respectively) and, together with Lombardy, of hospitals in rural and remote areas [33].

Full information about admissions to emergency departments in 2013 was available for 637 hospitals (96.4%). Almost half of them (305) did not reach the above-mentioned minimum threshold of 20,000 appropriate admissions per year (triage's "green", "yellow" or "red" codes; while "white codes" are linked with non-serious, non-urgent cases). However, some doctors tend to code inappropriate admissions as green in order to avoid patients having to pay a surcharge of €25. The percentage of hospitals reaching the minimum threshold volume decreases sharply when moving from urban areas (77%) to suburban (52%), rural (21%) and remote rural areas (4%).

Concerning the classification of admissions (Fig. 2), the percentage of "green" codes increases as we move from urban areas (64%) towards suburban (66%), rural (71%) and remote rural areas (76%). Except the white codes, these data appear congruent with the above-mentioned "hub and spoke" model of the emergency network, in which hospitals in rural and remote areas have a smaller share of severe cases, as these are directed to larger and better equipped hospitals.

3.5. Spain

Similarly to Italy, Spain has a highly decentralized health system. However, in contrast to Italy, there is no explicit national policy regarding small hospitals and emergency services in rural areas, mostly due to the complex arrangements between the Spanish state and the country's 17 autonomous communities (regions).

For a start, there are no specific rural hospitals in Spain. According to the Spanish Catalogue of Hospitals [35], hospitals are classified according to their clinical purpose, not their size or location. General hospitals provide consultations and surgery for several medical specialties, as well as obstetric, gynaecologic and paediatric services. Other hospitals concentrate activities on the single specialty indicated by their names.

According to the basket of services covered by the National Health System [36], published by the Ministry of Health in 2009 and still in force, patients are entitled to free emergency services in any clinical situation requiring immediate health care, in the understanding that in case of need, referral to the nearest hospital will be included. Emergency services are provided by doctors and nurses

in hospitals, at the primary care level, through specialized emergency services or even at home.

Hospital emergency units are open 24 h a day. Ideally, patients have a referral from a general practitioner or a specialized physician, although in case of severe risk they are also allowed to attend the hospital directly and in practice this is the most common way of accessing hospital emergency services. When emergency services are needed at home, well known hot-lines (e.g. 112 and/or 061) coordinate available resources: activated by a phone call, specifically trained and skilled staff assess the case and decide on the course of action, ranging from providing health advice to sending a doctor and nurse team to the patient's home, or even sending an ambulance to transport the patient to a hospital.

Emergency care functions are not separated between small and big hospitals, but rather between levels of care, i.e. mainly between primary health care and hospitals. In practice, patients living far from hospitals and requiring emergency services have to use the emergency services at the level of primary health care. Developments in primary health care are therefore also of relevance to the provision of emergency services in rural and remote areas in Spain. They are expected to provide exhaustive emergency care for low-complexity cases (without referral to hospitals), but also to assess and stabilize more severe cases, as well as to ensure that patients are transferred to hospitals in the best possible condition. Virtually all centres acting as "primary health care leads" in the respective area have ambulances with qualified staff on a 24 h a day basis.

Lists detailing which emergency situations should be treated outside the hospital and which diagnostic and treatment technologies would be required have been discussed in recent years, before, during and after the economic crisis, but none has been formally adopted and implemented so far. Primary health care centres provide emergency care while they are opened ("regular" centres are operative from Monday to Friday, from 8 to 17; after that, specific emergency services are available through the above-mentioned phone call system. In big centres primary health care emergency services remain operative 24 h a day).

3.6. United Kingdom

Given the high population density of the United Kingdom, very few hospitals could be genuinely considered as "remote". Only 19 National Health Service (NHS) hospitals are more than 30 km from the next provider with an emergency department, with the average distance being 83.5 km. The average catchment area for these 19 hospitals is still 236,050 people (which is approximately the same as for smaller urban hospitals). Yet, geography is a problem, with smaller hospitals facing problems recruiting staff. Exposure of junior doctors to working in rural or remote areas is also limited, as specialty training is regionally based.

Overall, the trend, particularly with regard to surgical and specialist services, has been towards centralization of services, accompanied frequently by the merger or closure of hospitals [37–39]. There is some evidence to suggest that the mergers in the English NHS were not very effective in improving financial performance, productivity, waiting times and clinical quality [40]. Recent policy from NHS England reflects a shift in focus, with more support for the role of smaller hospitals, although coupled with a desire to envelope them in "network" arrangements [41]. Yet, the reconfiguration of services remains a major problem for both large and small hospitals.

There is no stated minimum catchment area or population size for hospitals as a whole. There are recommendations by Royal Colleges for particular conditions or specialties but these are not linked to high-quality evidence and largely driven by the need to construct viable staffing rotas, which in turn is contingent on the particular way that hospitals in the United Kingdom are staffed and so has limited generalizability.

There is some innovation around service reconfiguration, such as the merger of medical and surgical services in the Belfort Hospital, Fort William, Scotland [42]. The Fort William team combined medical and surgical units into a single unit. Daily week-day ward rounds are conducted with all senior medical staff, including surgeons, medics and anaesthetists. Weekend cover is shared among all senior staff (to circumvent working time restrictions), with others available for phone advice or to come in. Fort William also has good links with Edinburgh, with senior staff doing regular clinics and surgical lists in Edinburgh Royal Infirmary and seasonal rotations of junior staff, due to the higher work load in summer resulting from tourism [42].

3.7. Croatia

In Croatia, the specific challenges of small hospitals in rural or remote areas have not played a major role in hospital reform plans. Since 2014 hospital reforms in Croatia have been supported financially by the World Bank within the framework of the "Programme for results". However, this did not include any specific development goals for small hospitals [43].

In February 2015 the parliament voted for a new national hospital plan. The plan covered anticipated changes in the hospital sector in 2015–2016 and emphasized "functional integration" (reducing organizational complexity, fixed and variable costs) and "subsidiarity" (shifting services from hospital to outpatient facilities) as key reform values [44]. Reflecting pressures arising from the financial crisis, increasing effectiveness and efficiency are key priorities, with concerns how to maintain the current infrastructure of hospitals and the current level of services. Resource allocation is anticipated to be based on the "four region model", aiming to achieve functional hospital integration around four clinical centres (Zagreb, Rijeka, Split and Osijek) [45].

Although some issues regarding small or rural hospitals were recognized in the national plan, its initial implementation did not address the appropriate allocation of tasks between different levels of hospitals, horizontal or vertical integration with other health care providers, or intersectoral cooperation with providers of social care, education and other public services.

One of the key directions anticipated in the hospital plan was to build capacity and improve collaboration between general and university hospitals. This might provide an opportunity to make small local hospitals more attractive to both patients and staff. However, other key issues for small hospitals in rural or remote areas have not been recognized in the national hospital plan. These include basic emergency care, stationary capacities for chronic patients during short hospital stays, outpatient services (such as home visits to palliative care patients) or regular professional links to bigger hospitals (such as through telemedicine or the exchange of data).

3.8. Estonia

While geographical distances in Estonia are comparatively small (the country being comparable in size with Denmark or the Netherlands), it shares the problem of small hospital catchment areas with large countries that have dispersed populations. Hospital catchment areas in Estonia range from as little as 8600 people in Hiiu county (the second biggest island in Estonia) to 576,000 people in Harju county, and hospitals in 10 of the country's 15 counties have catchment areas of less than 50,000 people. These small catchment areas are a threat to their long-term sustainability as the population in most of the counties is expected to decrease during the next decades. There is still the requirement for each county-level hospital to provide 24/7 general surgery, internal medicine and emergency care (which also means anaesthesiology, laboratory services and radiology). In most of the county hospitals birthing services are also available, even when the number of deliveries is small (e.g. in Hiiumaa hospital around 50 deliveries annually). This is a challenge for smaller hospitals, as patients have free choice and tend to increasingly utilize hospital services in Tallinn (the capital) and Tartu (the second largest city). It is also difficult to hire full-time doctors to work outside bigger centres and short-term, locum work is commonplace, with higher costs for affected hospitals.

The strategic government document "Estonian Health Care Development Directions until 2020" has outlined hospital networking as one priority. This cooperation between hospitals is aimed to enhance access to specialist care in smaller hospitals by sharing available resources (in terms of health professionals and technologies) in a more coordinated manner. By 2015, three general hospitals participated in hospital networks, but their number is expected to increase further.

4. Discussion

Unsurprisingly, the countries covered in this study demonstrate significant variability in whether small hospitals in rural or remote areas have been recognized as a major challenge and whether they have dedicated policies to address this issue. The countries differ widely in terms of size, geography, population density, wealth and the governance and administration of their health systems. It is clear that these characteristics shape their approach towards small hospitals in rural or remote areas; other issues might have emerged in a different sample of countries. Furthermore, different national experts might have identified different challenges for the same set of countries. Even the concepts of what constitutes a "small hospital" in a "rural or remote area" are likely to differ from country to country, as does the concept of "hospital" itself.

Yet, it is clear that for some countries, the provision of hospital and emergency services in rural or remote areas is of greater concern than for others. While this exploratory study mapped approaches in vastly differing high-income countries, a more systematic study would be needed of approaches in countries with similar size, geography and population density, although the influence of socio-economic, cultural and historical factors would also need to be considered. From the sample we studied, this could in particular include Australia, Canada and the United States.

Canada has some very large and sparsely populated territories. Air transport is important and there are efforts to establish rural health hubs that allow integrated care and meet the expectation of universal access to hospital services. However, due to the country's decentralized health system, there is no national policy on this issue. In Australia, the challenge of providing hospital and emergency services in rural or remote areas has been well recognized, and particular efforts have been undertaken to ensure that the population has access to these services, such as through a clear delineation of services, innovative financing approaches, the specific inclusion of rural placements in medical training and internships, and the establishment of networks including both metropolitan and rural services. In the United States, there is no one national policy on small hospitals in rural or remote areas, but different policy levers can be identified that have been used to support and sustain access to care for rural residents. They include reimbursement policies for health care providers, policies that seek to expand access to health insurance and coverage, and demonstration programmes to devise and test new models of care.

While the issue of small hospitals in rural or remote areas is a lesser concern for the other countries, they still offer some lessons that might be useful. Croatia attempts to maintain its small and smallest hospitals through redefining the services they deliver and building local capacity. Estonia has some hospitals with very small catchment areas and aims to improve service delivery through a networking approach, with regional hospitals taking on a leading role in governing general hospitals. In Italy's decentralized health system there are national guidelines that particularly target the problem of inpatient acute services in remote areas. The main issue in Italy is to close small hospitals, strengthen emergency transport services and develop sub-acute residential care in rural and mountain areas. In contrast, in Spain's decentralized system, there are no national policies regarding small hospitals and emergency services in rural areas. Emergency functions are not separated between small and big hospitals, but rather between levels of care, i.e. mainly between primary health care and hospitals, and primary health services play an important role in providing basic emergency care in rural areas. In

the United Kingdom population density is high and very few hospitals could be genuinely considered as "remote". There are no defined minimum catchment areas, but they tend to be large. Hospital services have been reconfigured in recent years, with many mergers and the centralization of services.

5. Conclusion

A number of avenues for health policy action emerge from our review on small hospitals in rural or remote areas. The first is the drawing up of appropriate national or sub-national policies. These policies can define the role delineation between different types of hospitals and targets for access to emergency inpatient services. They will have to be in line with the administrative set-up of their health systems. Where these are decentralized, responsibility for health policy making might have been devolved to the countries' regions or states, so that there will be a need for sub-national policies.

Ensuring the financial sustainability of small hospitals in rural or remote areas is a second policy avenue. The upkeep of hospitals in rural or remote areas is a financing challenge, as running costs of hospital care usually far exceed those of primary health care services and the size of the covered population tends to be small. Several countries have thus tried to step up the provision of emergency services at the primary care level, although this is clearly not always possible or practical.

Recruiting and retaining health workers in rural or remote hospitals emerged as another common challenge. Some countries have aimed to counter this, such as in Australia through the provision of scholarships for medical education or the allocation of internships in rural or remote areas by ballot.

Including the specific challenges in rural or remote areas in medical education can be identified as another key avenue for policy action, complemented by appropriate continuous medical education for those working in rural or remote areas. In Australia, a whole medical school (the James Cook University School of Medicine and Dentistry in Queensland) and a College (the Australian College of Rural and Remote Medicine in Brisbane) place special emphasis on rural and indigenous health.

Transport to more specialized services is also key in countries with dispersed populations. Medical air transport has become an important plank of health service provision in Australia and Canada. They need to strike a difficult balance between delivering patients to hospitals and bringing health workers to patients. Finally, the development of telemedicine promises to enhance access to care and prevent unnecessary hospitalizations and a number of countries are investing efforts to develop this.

Conflict of interest statement

The authors declare that they have no conflict of interest.

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