

4 Delivering quality health services in rural communities

As costs, quality and access to healthcare are all affected by distance and density, reducing inequalities in quality healthcare provision requires a place-based dimension. This chapter compares evidence on structural trends affecting health systems across territories in OECD countries, including income and educational inequalities, exposure to risk factors, and ageing. It also discusses the organization and concentration of health services and the trade-offs between quality, access and cost of healthcare from a spatial point of view. The chapter looks at holistic and people-centred comprehensive strategies, including reinforcement of primary care and new models of care such as service integration, in order to reduce costs while increasing performance of healthcare provision in rural areas. Finally, the chapter examines innovative approaches to healthcare delivery including digital approaches and new forms of hospital and care organisation.

Introduction

Rural health is a key component of a high-performing health system. This is true not only because rural regions host around 30% of the OECD population but also because inequalities in provision are more likely to happen in rural places (OECD, 2020^[1]). Rural residents have shorter life spans, less healthy lifestyles and overall, live in worse health states due to a higher incidence of chronic disease. They also face a wide range of threats to health status and health performance challenges including increased poverty and joblessness. The provision of quality health services in rural areas is not only challenged by a larger share of ageing populations but also by poor social determinants of health, barriers to system access and issues finding and retaining qualified medical personnel. Rural healthcare facilities also face financial pressure from low economies of scope and scale, making the balance between access and efficiency particularly difficult.

The health status across OECD countries has improved significantly in recent decades due to advances in treating and preventing disease, reductions in health risks such as smoking and drinking, and effective legislation in other sectors such as road safety (OECD, 2004^[2]; 2019^[3]). However, a number of new and existing challenges must be managed to continue to deliver high performance and reduce spatial disparities in health access and outcomes. Health provision in many rural areas must find ways to increase scale and financial sustainability in a context of increasing health needs and population decline. Countries have a range of innovative ways to improve health services in rural areas, including telemedicine (discussed in more detailed in Chapter 5), increased co-operation across health providers through networks, changing incentives for health professionals, and modifying responsibilities and organisation of providers.

Implementing effective policy relies not only on understanding the health issues facing rural populations but also how rural health fits new health systems organisation and measurement trends. The trade-offs between quality, access and costs are inseparable from the spatial organisation of health systems and call for a territorial approach to the management of health care provision. Chapter 6 further elaborates on financial and governance aspects of healthcare provision with a focus on system decentralisation.

The next section discusses statistical evidence on structural trends in affecting health systems in OECD countries and how they play out in rural areas. The third section discusses the organisation of health systems and links this organisation to the relative concentration of health services. The fourth section introduces the trade-offs between quality, access and cost of health care in rural areas. The fifth section discusses comprehensive approaches to reduce costs while increasing the overall performance of healthcare provision in rural areas. Before the concluding remarks, the last section presents an overview of innovative approaches to healthcare delivery in rural areas.

Structural trends affecting health systems and their effect in rural areas

Identifying structural trends affecting health systems in OECD countries is the starting point to understand the present and future of health provision in rural communities. This section discusses three structural trends and their effects in rural areas: inter-personal and territorial inequalities and their effect on health outcomes; higher exposure to risk factors for chronic conditions; and ageing and its effect on rising costs of care. Rural areas host a disproportionate share of older, lower-income and lower-educated population, and show slower progress in unhealthy habits, and many have faced disinvestment in health infrastructure in the face of higher costs. The way in which these trends play out in local contexts depends not only on the demographic composition and territorial inequalities but also on the compound effect of multiple determinants on health outcomes and needs. The first part of this section discusses the three trends affecting health systems in OECD countries and the second evaluates these trends in rural areas based on existing statistical evidence.

Structural trends in affecting health systems

There are three structural trends affecting health systems in OECD countries that are relevant to rural areas: i) inequalities and their effect on health outcomes; ii) higher exposure to risk factors for chronic conditions and its link to inequalities; and iii) rising costs of care in the context of ageing.

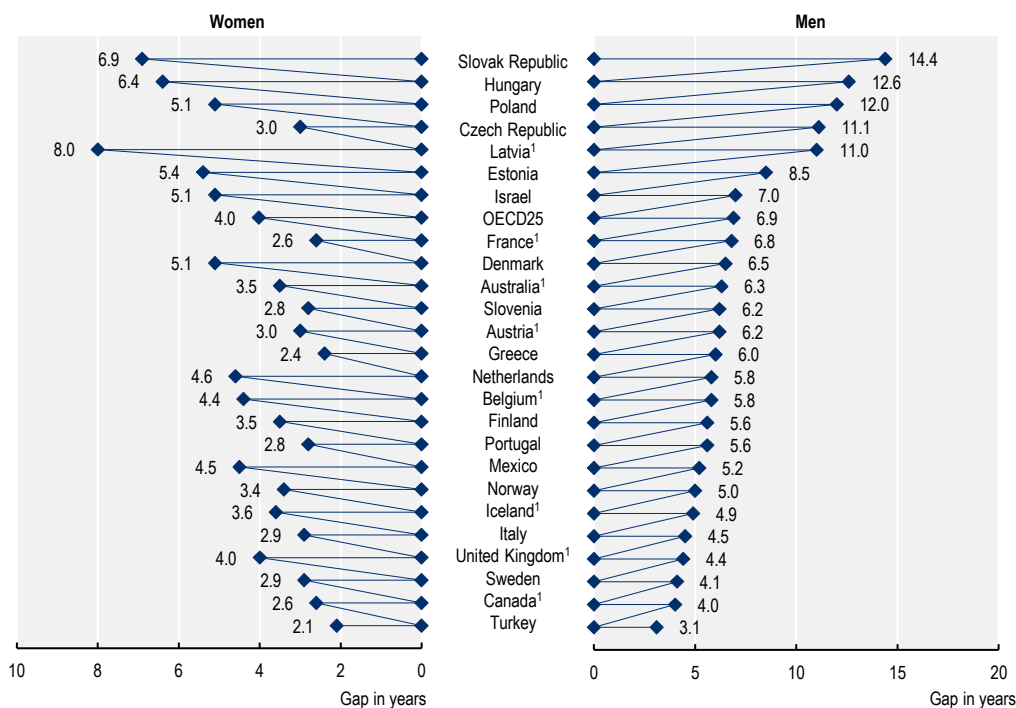
Lower income and education levels are linked to poorer health outcomes

Income levels relate to a great number of disparities in health in OECD countries, ranging from health literacy to access to the medical system and health outcomes. A person in the lowest income quintile is much less likely to see a doctor compared to those in the highest income quintile, including both general practitioners as well as specialists. Once this initial contact is made, however, all income groups have the same number of doctor's visits, highlighting the importance of reducing initial barriers (OECD, 2019^[41]). Use of preventive services such as cancer screening or dental care is also concentrated among higher income groups in the vast majority of European Union (EU) and OECD countries. For cervical cancer, the difference in screening rates reaches on average 17 percentage points across income groups (OECD, 2019^[41]).

Similarly, people in the lowest education category are twice as likely to view their health as poor compared to those with tertiary education in perception surveys (44% vs. 23%). The same applies to other variables of health status, such as limitations in daily activities and the prevalence of multiple chronic conditions. The average difference in life expectancy between the highest and lowest education levels across OECD countries was 4 years among women and nearly 7 years among men (Figure 4.1).

Figure 4.1. Gap in life expectancy at age 30 between the highest and lowest education level, by gender

2015-2017 or latest available year



Note: 1. 2010-12 data.

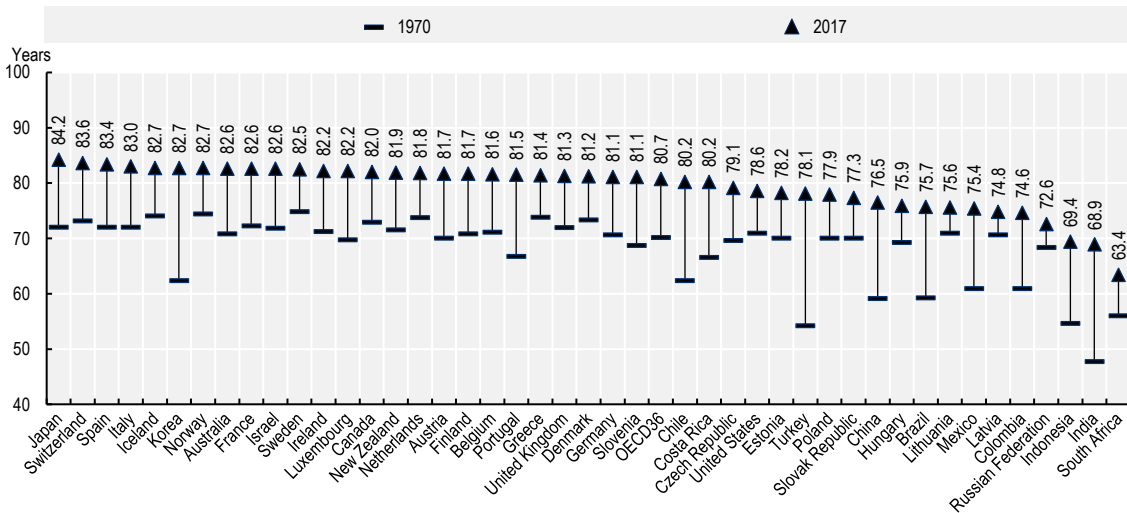
Source: OECD (2019^[31]), *Health at a Glance 2019: OECD Indicators*, <https://dx.doi.org/10.1787/4dd50c09-en>.

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Longer lives can raise health costs

Figure 4.2 shows life expectancy at birth across OECD countries in 1970 and 2017. On average life expectancy has increased over 10 years across OECD countries during this time as a result of stronger health systems offering more accessible and higher quality care. Determinants of health outside the health system have also played an important role in this increase include rising incomes, better education and improved living environments (James, Devaux and Sassi, 2017^[5]). Longer life expectancy on the country level is generally associated with higher health spending in OECD countries although this relationship is weaker at the highest spending levels highlight both the importance of both sufficient and well-targeted spending (OECD, 2019^[3]).

Figure 4.2. Life expectancy at birth, 1970 and 2017 (or nearest year)



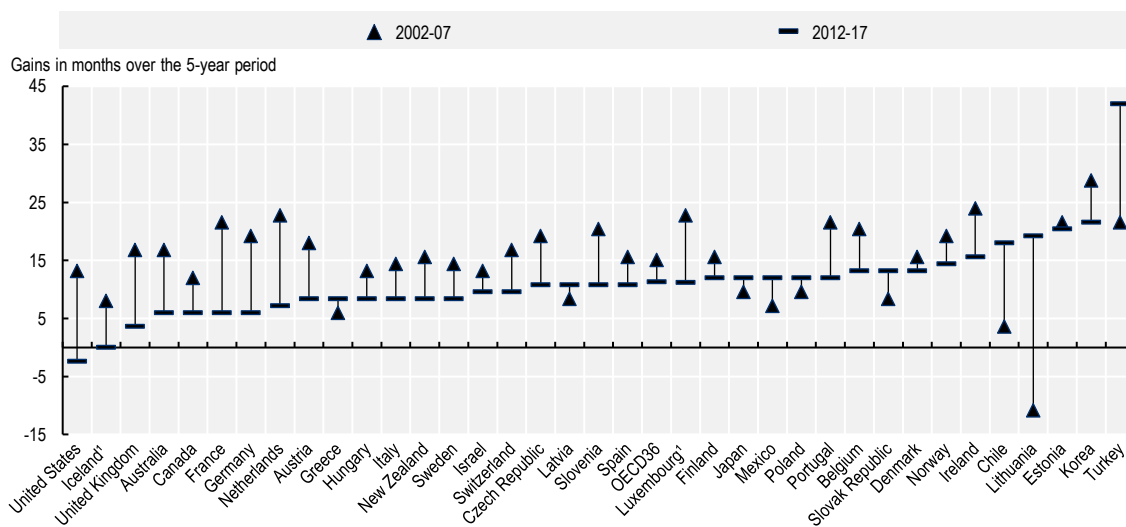
Source: OECD (2019^[3]), *Health at a Glance 2019: OECD Indicators*, <https://dx.doi.org/10.1787/4dd50c09-en>.

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While significant progress has been made in the overall health status in OECD countries, this progress is slowing. Improvements in life expectancy in recent years have been much slower and have even reversed course in certain countries highlighting current challenges facing health systems. Figure 4.3 shows the rate of slowdown in life expectancy. Comparing the last 5 years (2012-17) with a decade earlier (2002-07), 27 OECD countries experienced slower gains in life expectancy. These slowdowns were especially large in France, the Netherlands and the United States (US). In the US, life expectancy actually decreased during the period from 2012 to 2017. The reasons for the slowdown in life expectancy improvements include rising levels of certain health risk factors such as obesity and diabetes as well as the increased burden of respiratory diseases such as influenza and pneumonia among older people. A recent study examining these issues in OECD countries identified slower reductions in cardiovascular disease mortality as a key component (The King's Fund, 2020^[6]; OECD/The King's Fund, 2020^[7]).

The combination of longer lives with a decline in birth rates has led to an increase in the share of the elderly population across OECD countries. An older population implies greater health needs, as not all additional years from higher life expectancies will be lived in good health.

Figure 4.3. Slowdown in life expectancy gains, 2012-17 and 2002-07



Note: 1. 3-year average.

Source: OECD (2019^[3]), *Health at a Glance 2019: OECD Indicators*, <https://dx.doi.org/10.1787/4dd50c09-en>.

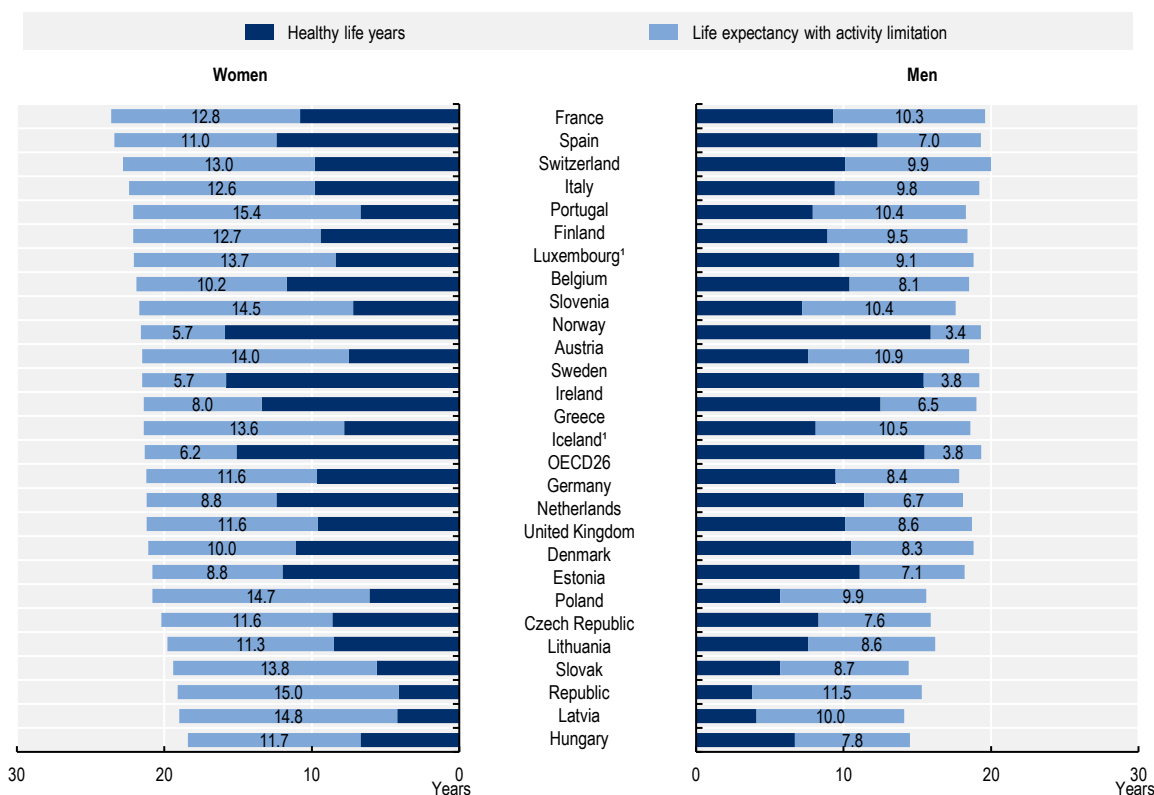
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Important disease categories such as cardiovascular disease, cancer and mental health become significantly more prevalent with increasing age. Figure 4.4 shows the number of healthy life years expected for those 65 and older, that is, the years of life expectancy that are likely to be free from major disability. Across the OECD, less than half of the expected years of life after 65 are expected to be healthy life years, indicating significant health burdens in these groups. For instance, in Latvia and the Slovak Republic, women spend nearly 80% of additional life years in poor health. To reduce the health burden of ageing, the World Health Organization (WHO) recommends so-called “healthy ageing” policies such as prevention of falls, promotion of physical activity or prevention of social isolation (WHO, 2005^[8]).

Along with rising health needs come rising health care costs. A study of health costs per age showed that patients aged 50 and over costs 4 to 5 times patients in their late teens. In the US, personal health expenditure also rises sharply with age within the Medicare population. Care for patients 85 years and older costs 3 times as much per person as those aged 65-74, and twice as much as those aged 75-84 (Alemayehu and Warner, 2004^[9]). Some of this cost can be avoided through health promotion policies which were predicted to reduce health spending as a percentage of gross domestic product (GDP) from a projected 10% in 2030 to 9.7% in a study across 26 OECD countries (Lorenzoni et al., 2018^[10]). Much of the additional cost with age occurs during the last year of life with high rates of medical interventions and hospital admissions (Rouzet et al., 2019^[11]).

A number of OECD countries are exploring expanded palliative care options to better care for patients during this period and reduce potentially unnecessary and harmful care (Knaul and Bhadelia, 2017^[12]). Currently, public support for home health aides varies widely across OECD countries, from almost nothing in countries like Estonia and the US to nearly 100% coverage in countries like Finland, Iceland and the Netherlands (Oliveira Hashiguchi and Llana-Nozal, 2020^[13]).

Figure 4.4. Life expectancy and healthy life years at age 65, by gender, 2017 (or nearest year)



Note: Data comparability is limited because of cultural factors and different formulations of question in EU-SILC.

1. Three-year average (2015-17).

Source: OECD (2019^[3]), *Health at a Glance 2019: OECD Indicators*, <https://dx.doi.org/10.1787/4dd50c09-en>.

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Exposure to risk factors increases the risk of chronic conditions

Advances made with respect to health risk factors have played a large role in increasing life expectancies, although the picture is less clear in rural areas. Reductions in smoking rates are particularly important as smoking increases risk for cancers, cardiovascular disease and respiratory disease. Between 2007 and 2017, smoking rates decreased on average from 23% to 18% among OECD countries (Figure 4.5).

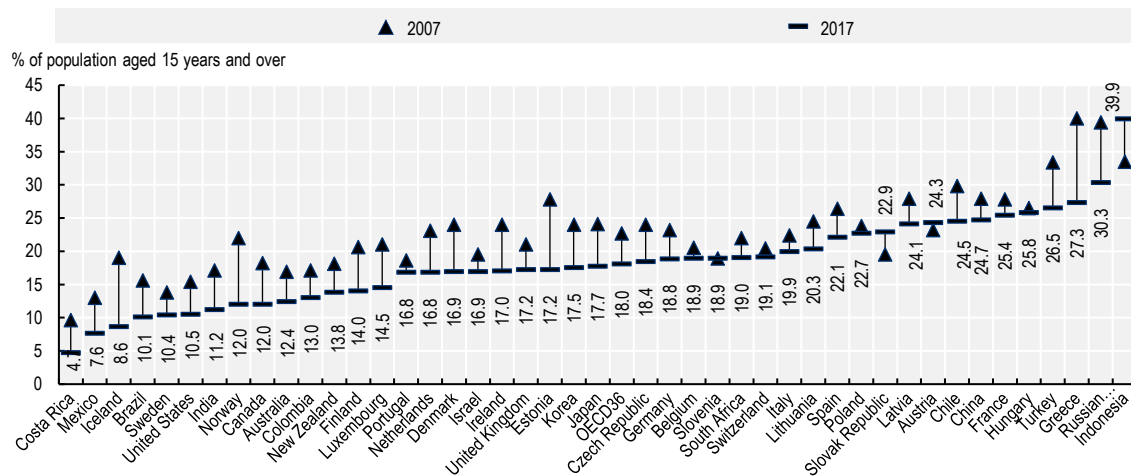
Reduction in alcohol consumption has also provided significant benefits to health over the past decade. Between 2007 and 2017, OECD countries reduced their per capita consumption of alcohol on average from 10.2 to 8.9 litres, reducing population risks of heart disease, stroke and some cancers.

Health systems in OECD countries also have to manage an increasingly overweight population. Being overweight or obese due to higher calorie intakes and sedentary lifestyles is linked with many of the highest-burden diseases, including cardiovascular disease, diabetes and cancer. Childhood obesity is particularly dangerous as the health impacts of extra weight can accumulate over years. Across 23 OECD countries, 58% of adults were overweight or obese in 2017 on average (Figure 4.6).

Older populations living unhealthier lifestyles are shifting the disease burden in OECD countries and a growing number of people are living with more chronic disease. As populations continue to age, this burden is expected to continue to grow. Chronic diseases such as cancer, heart attack and stroke, chronic respiratory problems and diabetes are the leading causes of death across OECD countries.

Chronic disease also represents a major disability burden amongst the living. Almost one-third of people aged 15 years and over report living with two or more chronic conditions (multi-morbidity), on average across 27 OECD countries (Figure 4.7). Almost half of the population in Germany and Finland are living with multi-morbidity which is far more common among older age groups. On average, 58% of adults aged 65 or over reported living with two or more chronic diseases (vs 24% of people aged less than 65). Socio-economic status is also related to living with chronic disease and 35% of people in the lowest income quintile report two or more chronic conditions, compared with 24% of people in the highest income quintile.

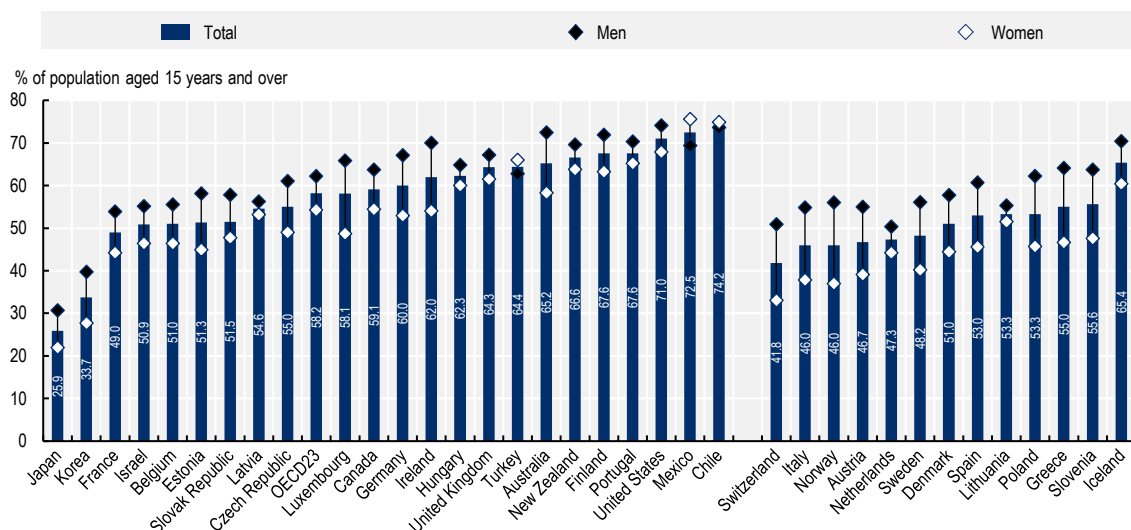
Figure 4.5. Adult population smoking daily, 2007 and 2017 (or nearest years)



Source: OECD (2019^[3]), *Health at a Glance 2019: OECD Indicators*, <https://dx.doi.org/10.1787/4dd50c09-en>.

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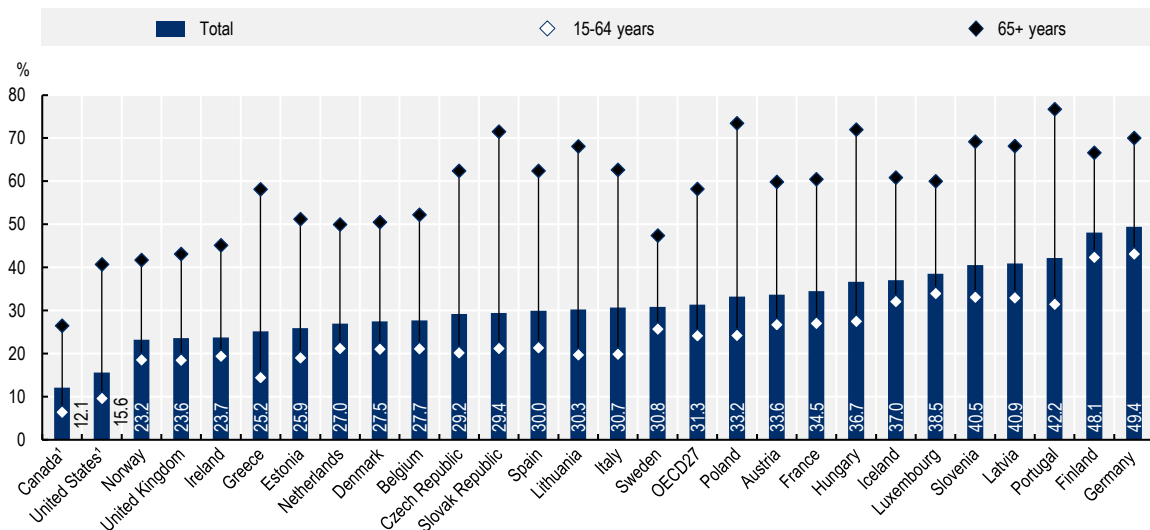
Figure 4.6. Overweight including obesity among adults by gender, measured and self-reported 2017 (or nearest year)



Note: Left- and right-hand side estimates utilised measured and self-reported data respectively.

Source: OECD (2019^[3]), *Health at a Glance 2019: OECD Indicators*, <https://dx.doi.org/10.1787/4dd50c09-en>.

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Figure 4.7. People living with two or more chronic disease, by age, 2014

Note: 1. The number of conditions included for Canada and the United States are lower than European countries (8 instead of 14), resulting in a downward bias. Data for these countries are thus not directly comparable with European ones.

Source: OECD (2019^[3]), *Health at a Glance 2019: OECD Indicators*, <https://dx.doi.org/10.1787/4dd50c09-en>.

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The burden of chronic disease represents an enormous expense for health systems. In 2016, the total costs in the US for direct healthcare treatment for chronic health conditions totalled USD 1.1 trillion, equivalent to nearly 6% of the nation's GDP (Waters and Graf, 2018^[14]).

Evidence of the effect of broad health system trends in rural areas

Rural regions in OECD countries have on average lower income per capita levels (OECD, 2020^[11]), lower educational levels, as evidenced for the case of tertiary education shares in European countries (see Chapter 2) and higher levels and rates of change in age dependency ratios compared to metropolitan regions (Figure 4.9). Consequently, rural OECD regions host a larger share of the population at risk of worse health outcomes. Moreover, factors such the lack of health insurance of poorer, rural populations as observed in the US (CDC, 2020^[15]) and long distances and more expensive commutes to healthcare facilities in rural areas compound the effect of inequality and ageing on health outcome territorial disparities.

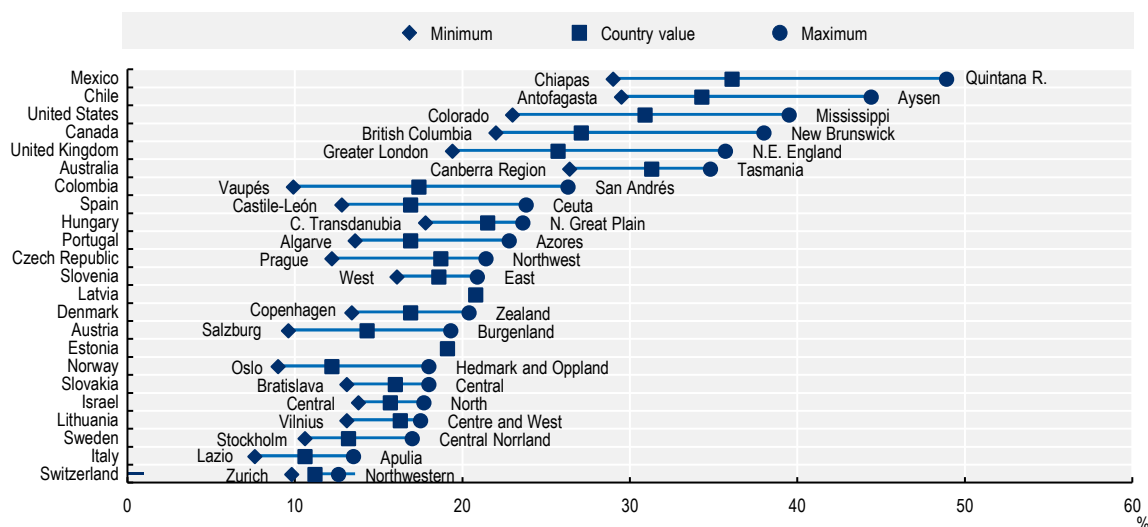
The burden on health systems of older populations living unhealthier lifestyles can be much larger in rural areas. Alcohol consumption remains higher in rural areas across OECD countries (Donath et al., 2011^[16]). In the US, measures of unhealthy lifestyles including smoking, alcohol consumption and less leisure-time physical activity are also higher in non-metropolitan areas compared to metropolitan areas (CDC, 2020^[15]). However, both smoking and alcohol drinking rates are lower in rural areas in Germany and Poland (Borders and Booth, 2007^[17]; Włodarczyk et al., 2013^[18]; Völzke et al., 2006^[19]). In Australia, the prevalence ratio of current daily smokers in outer regional and remote areas (19.6%) was larger than in major cities (12.8%) in 2017-18 (Australian Institute of Health and Welfare, 2020^[20]). Unhealthy lifestyle factors in rural populations have been associated with lower overall education levels and relatively fewer preventive services (Dixon and Chartier, 2016^[21]).

Rural populations across the OECD are also significantly more overweight and obese and show more risk factors for obesity than urban populations. A recent study reported that the global rise in obesity over the

past three decades was due in large part to rises in rural obesity. In high-income countries, the increase in obesity was particularly large for rural women (Bixby et al., 2019^[22]). In Chile, Mexico and the US, this figure exceeds 70% and these countries also exhibit the largest differences across TL2 regions in obesity rates (Figure 4.8). In contrast, in Japan and Korea, less than 35% of adults were overweight or obese.

Figure 4.8. Obesity rates by large (TL2) regions, 2018 or most recent year

Percentage of adult population, large (TL2) regions



Note: Obesity refers to the population aged 15 years old or more with a Body Mass Index above 30 kg/m².

Source: OECD (2020^[23]), *OECD Regions and Cities at a Glance 2020*, <https://doi.org/10.1787/26173212>.

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In rural areas, the older population and increased health risk factors result in higher levels of chronic disease and multi-morbidity. In the US, the percentage of the population with 2 to 3 chronic conditions was 18.9% in metropolitan regions and 22.6% in non-metropolitan regions. These numbers were 4.2% and 5.1% for those living with 4 or more chronic conditions (CDC, 2020^[15]).

In conclusion, in comparison to their urban counterparts, rural populations: i) have lower incomes and educational levels, both of which are linked to health outcomes; ii) are older and projected to become even more so; iii) lead less healthy lifestyles with higher rates of smoking, alcohol consumption, and obesity; iv) have more chronic diseases; and v) have higher rates of avoidable hospital admissions.

Geographical dimensions of health systems

The previous section outlined individual characteristics that are linked to worse health outcomes and higher provision costs that result in territorial disparities. This section shifts the focus to the organisation of health systems and its link to the concentration of different levels of care in space.

Health systems are a critical component of a functioning society because they improve well-being, keep workers healthy and help students learn better. They also represent a major economic sector accounting for nearly 10% of GDP spending in OECD countries (OECD, 2019^[3]). Creating and managing an effective health system is one of the most important responsibilities many governments have. Yet, the organisation of healthcare can be complex and quite diverse across countries or systems involving different health structures and types of health professionals. This section starts by outlining a definition of health systems

and its objectives, followed by a discussion of the organisation of healthcare in primary, specialist and acute levels and the different levels of spatial concentration of each level.

Objectives and organisation of health systems

The central objective of any health system is to improve the health and well-being of the population, in line with the concept of universal health coverage (see Box 4.1 for a definition of health systems). Universal health coverage, one of the Sustainable Development Goals (SDGs), means that individuals and communities receive the health services they need without suffering financial hardship. It also enables access to services that address the most significant causes of disease and death and ensures that the quality of those services is good enough to improve the health of the people who receive them.

Box 4.1. How are health systems defined?

The WHO defines the health systems as: i) all the activities whose primary purpose is to promote, restore and/or maintain health; and ii) the people, institutions and resources, arranged together in accordance with established policies, to improve the health of the population they serve, while responding to people's legitimate expectations and protecting them against the cost of ill-health through a variety of activities whose primary intent is to improve health. This definition encompasses all common health system elements such as health professionals (e.g. doctors and nurses), physical components such as hospitals, ambulances and medical equipment, as well as schools for educating medical staff and government bodies such as the health ministries that manage the system.

System organisation and spatial distribution of healthcare within countries

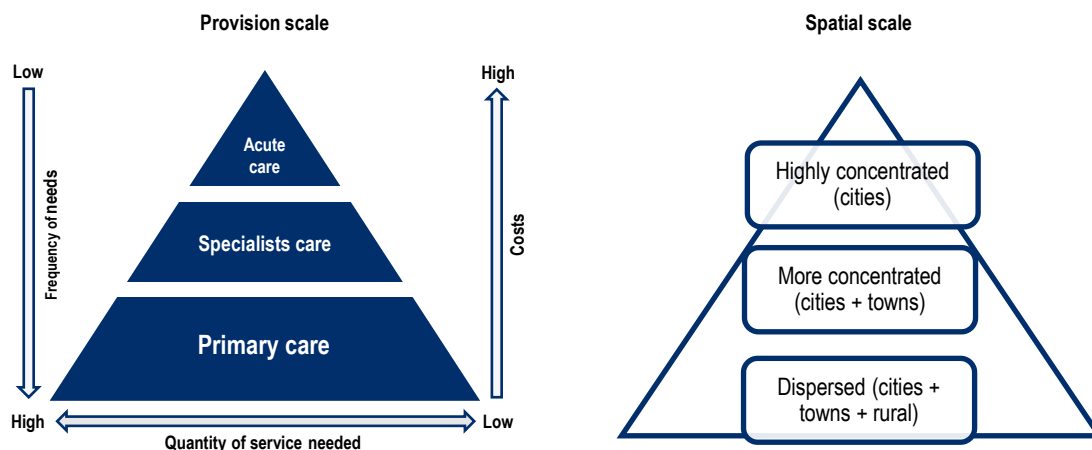
While the system organisation differs across countries and regions, the main components of health care provision can be described as having three main levels: primary care, specialist care and acute care. Each level aims to meet different health objectives and often involves different types of health personnel and physical resources. These levels also differ on population coverage, level of specialisation, resource intensity and cost among other aspects, resulting in the higher or lower spatial concentration of the services.

The triangle on the left of Figure 4.9 presents the three levels of care as a pyramid with cheaper and more available primary care treating the great majority of needs and supporting the relatively less frequent and more expensive specialist and acute care levels. The triangle on the right presents the spatial scale at which these levels are more likely to occur. The relationship between levels and the relative resources dedicated to each level vary across countries and even regions, depending on care needs, population preferences or system organisation. For this reason, the discussion in this section provides a general discussion without specifically referring to any particular context.

Primary care covers the vast majority of health needs of a population and is the first level of contact with the health care system. Primary health can be defined as “a whole-of-society approach to health...focusing on people's needs and preferences...as early as possible along the continuum from health promotion and disease prevention to treatment, rehabilitation and palliative care, and as close as feasible to people's everyday environment” (OECD, 2020^[24]). Common primary care providers include primary care physicians, nurses, pharmacists, auxiliaries and community health workers. Activities of primary care include health promotion, disease prevention, health maintenance, counselling, patient education, diagnosis and treatment of acute and chronic illnesses. Along with providing care, primary care also seeks to ensure that patients receive comprehensive care within the system by co-ordinating care with other health providers

and other care levels, such as social services. Because of its role in care co-ordination and disease prevention, strong primary care is essential to building and maintaining health across the population.

Figure 4.9. Levels of health care provision



The costs per head of primary care are relatively lower than both specialist and acute care, as it needs fewer resources and less specialised health workers can provide care and co-ordination. WHO data show that a visit to the hospital for ambulatory care in Europe was approximately six times more expensive than a visit to a primary care setting (WHO, 2020^[25]). Primary care can be provided in a wide range of settings from primary care clinics, to hospitals, solo-practitioner offices and a patient's home. Primary care is not necessarily attached to a health facility and its provision is usually spread out within countries so that it is within short distances from users. This means that primary care facilities and professionals can be found at all spatial scales – cities, towns and rural areas – and local units such as municipalities can play a role in its provision.

Strong primary care can also help prevent chronic disease and reduce mortality. A recent study across 18 OECD countries showed that the stronger the primary care orientation of a health system, the lower the mortality rates across a wide range of causes (OECD, 2020^[24]). The role in prevention, from encouraging people to stop smoking to early detection of cancers, is also critical in overall health system performance. Primary care can also greatly improve patient experiences through better co-ordination of the health system and help ensure health access to vulnerable populations that otherwise can struggle to access medical services. Lastly, strong primary care can present savings for health systems by preventing costly hospital admission through better disease management and disease prevention roles (Kravet et al., 2008^[26]).

Specialist care taking place in secondary level health units is generally reserved for health problems that cannot be handled in the primary care sector. It is provided by specialist doctors such as urologists, dermatologists or cardiologists, either in hospitals or as ambulatory care. Specialist care is more expensive and resource-intensive than primary care because it often requires more intense technology and expertise, including testing capacity, pharmaceuticals and smaller interventions. Because of the higher requirements in terms of medical expertise and equipment, specialist care is more spatially concentrated than primary care and it is usually located in cities and towns with relatively high populations that also provide access to surrounding rural areas. The travel times of rural users to secondary health facilities vary greatly across countries depending on population settlements and general accessibility conditions.

In general terms, access to specialist care varies greatly across OECD countries depending on the rules regulating access, with access ranging from free for anyone covered by the health system to available only

upon referral from a primary care provider. For instance, the organisation of healthcare around the functioning of hospitals allows more access to specialist care in France and Germany (where access to specialist care is nearly free). Meanwhile, the Netherlands and the UK have a strict gatekeeping policy requiring a referral from a primary care provider.

Acute care is the most specialised type of care and is very often reserved for patients with a referral from primary or specialist care settings or emergencies. Some examples of acute care include: major plastic surgery, burn treatment, cardiac surgery, advanced cancer management, neurosurgery, as well as complex medical and surgical interventions. Acute care is meant to treat the most difficult and urgent cases including life-threatening issues such as heart attacks and usually takes place in large hospitals with specialised equipment and staff with significant expertise. Acute care is also often provided by teams dedicated to specific treatments such as surgeries or treatment of stroke. The costs of acute care can be quite high as this care can be extremely resource-intensive requiring specialised machines, significant hospital stays, drugs and care from multiple, highly specialised personnel. This means that provision is highly concentrated in space, with large hospitals located in cities with sizeable populations. Acute care usage also varies across countries depending on their health system organisation. For instance, in Germany, a strong system focus on patient choice and willingness to admit patients into acute care has led to a very high proportion of tertiary care resources.

Balancing quality, access and cost of health care in rural areas

Three major criteria for determining health performance found nearly universally in health care frameworks are quality, access and cost (Carinci et al., 2015^[27]). Although achieving all three objectives is desirable, often improving one dimension means worsening another. One example is the case of treatment for acute myocardial infarction (heart attack), where patients treated in hospitals that treat more cases have better outcomes (i.e., higher survival rates), as found in a study across 10 OECD countries (Lalloué et al., 2019^[28]). As most hospitals with large case numbers are in cities, improving quality by centralising treatment in larger hospitals may imply a reduction in physical access and an increase in waiting times. On the other hand, policy interventions undertaken locally such as vaccination can provide benefits across all three criteria as they can improve health outcomes not only at the primary care level but also at higher levels, while being low-cost and high-access. This highlights the inter-connections between the three levels of care and the importance of place-based policies in influencing the performance of health systems.

Table 4.1 summarises the care provision levels and objectives and their relationship with a performance by health care level. Each of the levels of care discussed before can have direct or indirect impacts on the others. Proper treatment of certain chronic conditions such as asthma in primary care for example can reduce the need for emergency treatment for this condition in tertiary care. On the other hand, free access to specialist doctors providing specialist care may lead to patients consulting with specialist doctors for issues that could have been dealt with in primary care (Pichlhofer and Maier, 2015^[29]). For example, measures to lower the number of specialist visits will be different in the UK where a strict gatekeeping system regulates access to specialists compared to Japan, where patients have more independence in accessing specialist care. Using this framework, this section discusses the trade-off between quality, access and costs in rural areas, discussing, in turn, the roles of primary, specialist and acute care and the appropriate measures to monitor their quality.

Quality health care in rural areas

The quality of health care is fundamental to a high performing health system and a major focus of OECD health systems. Quality care can be defined as providing care that is:

- Effective: achieving desirable outcomes, given the correct provision of evidence-based health care services to all who could benefit, but not to those who would not benefit.
- Safe: reducing harm caused in the delivery of health care processes.
- Patient-centred: placing the patient/user at the centre of its delivery of health care.

People-centredness, a notion that has gained momentum recently, is defined as a system's capacity to take into account an individual's specific health needs and desired health outcomes (OECD, 2019^[30]). A people-centred approach treats patients as partners with their health care providers and providers treat patients not only from a clinical perspective but also from an emotional, mental, social and financial perspective. It can be measured through patient-reported measures such as the proportion of patients who felt the doctor spent adequate time with them explaining their problem and the treatment.

There are currently a number of validated indicators for measuring the three components of quality of health systems, namely effectiveness, safety and patient-centredness. While life expectancy is the main measure of health care quality that reflects the overall performance of a health system, indicators such as vaccination rates or cancer survival rates can be used to measure effectiveness. To measure so-called "patient safety" issues, indicators such as hospital-acquired infection rates or adverse events in hip and knee surgeries can be used (OECD, 2019^[31]).

Table 4.1. Care provision levels, objectives and relationship to performance

Level	Providers	Objectives	Quality measure examples	Other performance notes
Primary care	General practitioner, nurses, pharmacists	Health promotion, disease prevention, health maintenance, counselling, patient education, diagnosis and treatment of acute and chronic illnesses	Appropriateness of drugs (antibiotics, opioids) prescribed, avoidable hospital admission rates (chronic obstructive pulmonary disease [COPD], asthma, and other chronic conditions), immunisation and screening rates	Lowest cost care, easiest to access, closest to people's needs and expectations
Specialist care	Specialist doctors (dermatologist, urologist, oncologist)	Complementary disease management requiring organ- or condition-specific expertise about their diagnosis, treatment and prognosis	Cancer survival rates (shared responsibility with primary and acute care)	Higher cost, access depends on system (some require and/or encourage referral)
Acute care	Hospital care, specialised teams	Treat the patients in need of most specific in-hospital expertise and urgent care including life-threatening issues such as heart attacks	Stroke, heart attack survival rates	Highest cost, access can vary with system arrangements (mostly on referral)

Life expectancy is lower and mortality is higher in rural areas

Some factors specific to rural areas contribute to lower life expectancy than would be expected from the broad trends outlined in the second section. In North America, the opioids crisis with its strong rural component has also played a large role in life expectancy slowdowns in these countries. In the US, the opioid crisis has caused approximately 400 000 deaths (CDC, 2020^[31]). The toll on the rural population is particularly high particularly for deaths from natural and semi-synthetic opioids. Opioid-related deaths are also relatively high in Canada, Estonia and Sweden (OECD, 2019^[32]). Mortality rates from major diseases are higher in rural areas of the US, where rural residents are more likely to die from heart disease, cancer,

unintentional injury, chronic lower respiratory disease and stroke than non-rural residents. Accidental deaths from motor vehicles crashes and drug overdoses are also significantly higher in rural areas (CDC, 2020_[31]). Table 4.2 shows age-adjusted death rates for urban and non-urban areas in the US.

Table 4.2. Age-adjusted death rates per 100 000 inhabitants, by metropolitan area in the US, 2014

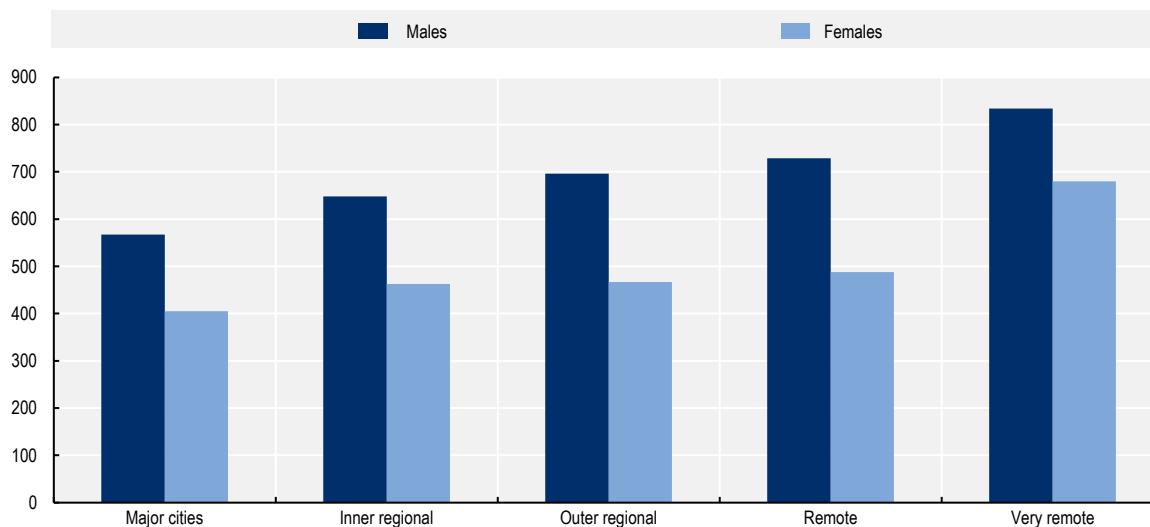
Cause of death	Non-metropolitan areas	Metropolitan areas
Heart disease	193.5	161.7
Cancer	176.2	158.3
Unintentional injury	54.3	38.2
Chronic lower respiratory disease	54.3	38.0
Stroke	41.5	35.4

Source: Rural Health Information Hub (2020_[33]), *Rural Health Disparities Introduction*, <https://www.ruralhealthinfo.org/topics/rural-health-disparities> (accessed on 23 July 2020).

Similar regional differences in mortality are also seen in other countries. In Portugal, large disparities in life expectancy exist between urban-coastal regions and rural-interior regions (Barros, Machado and Simões, 2011_[34]). In Australia, a clear gradient between death rates and urbanisation is evident with larger mortality rates seen in more remote regions. The clear jump in very remote areas (especially for females) is linked to higher mortality rates among Indigenous populations due predominantly to coronary heart disease, diabetes, chronic obstructive pulmonary disease (COPD), lung cancer and suicide (Figure 4.10) (Australian Institute of Health and Welfare, 2020_[20]).

Figure 4.10. Mortality rates by remoteness and gender in Australia

Deaths per 100 000 inhabitants, 2018 values



Note: Age-standardised rate to the 2001 Australian population.

Source: Australian Institute of Health and Welfare (2020_[20]), *Rural and Remote Health - Health Status and Outcomes*, <https://www.aihw.gov.au/reports/rural-remote-australians/rural-remote-health/contents/health-status-and-outcomes> (accessed on 23 July 2020).

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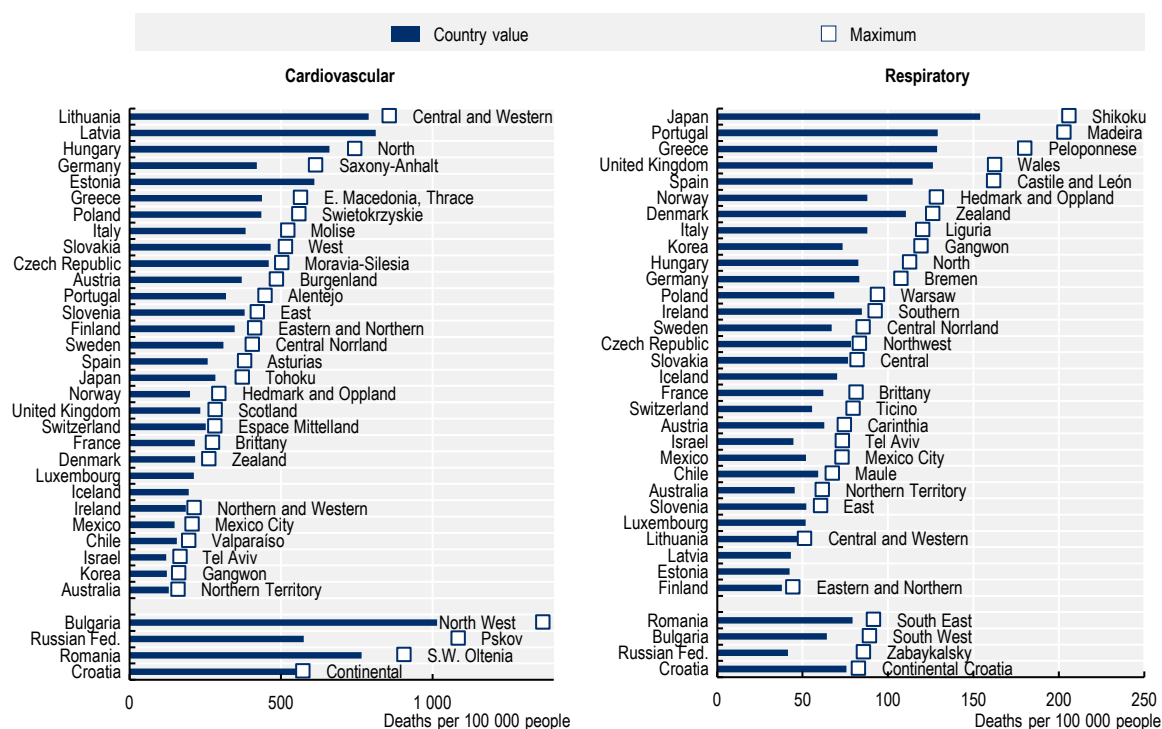
Survival rates to major causes of death are lower in rural areas

While survival rates to major causes of death like cancer are improving across OECD countries, progress in rural areas where mortality rates are higher is slower. Survival rates for a range of cancers are rising thanks to both improved prevention and curative care, contributing to overall higher survival rates because cancer accounts for roughly 25% of all deaths in OECD countries. For instance, across OECD countries, women diagnosed early for breast cancer have over a 90% probability of surviving their cancer for at least 5 years, up from just over 80% in the early 2000s. Some of these improvements have been slower in rural areas, however. In the US, cancer death rates in rural areas declined 1% a year vs 1.6% annually in urban areas (CDC, 2020^[35]).

Acute myocardial infarction (AMI) is another major cause of death across OECD countries. Thirty-day mortality rates for AMI have also decreased significantly in the last decade thanks to technological advances, better care co-ordination and better pre- and post-hospital care. Figure 4.12 shows the 30-day mortality rate after admission to the hospital for an AMI including death both inside and outside the hospital. These mortality rates dropped from 12.5% to 9.1% on average across OECD countries between 2007 and 2017. Mortality rates due to respiratory and cardiovascular diseases show large variation across regions in most OECD countries. The regional differences in deaths due to respiratory diseases are largest in Greece, Portugal and Japan, where the region of Shikoku records 50 additional deaths per 10 000 people compared to the national average (Figure 4.11). Mortality rates from cardiovascular diseases are much larger and can vary as much as over 500 additional deaths per 10 000 inhabitants in Russia.

Figure 4.11. Mortality rate due to respiratory and cardiovascular diseases, 2018 or most recent

Deaths per 100 000 people, large (TL2) regions



Note: Respiratory mortality corresponds to the number of deaths from diseases of the respiratory system (categories J00 to J99 in the International Classification of Diseases). Circulatory (cardiovascular) mortality corresponds to the number of deaths from diseases of the circulatory system (categories I00 to I99 in the International Classification of Diseases).

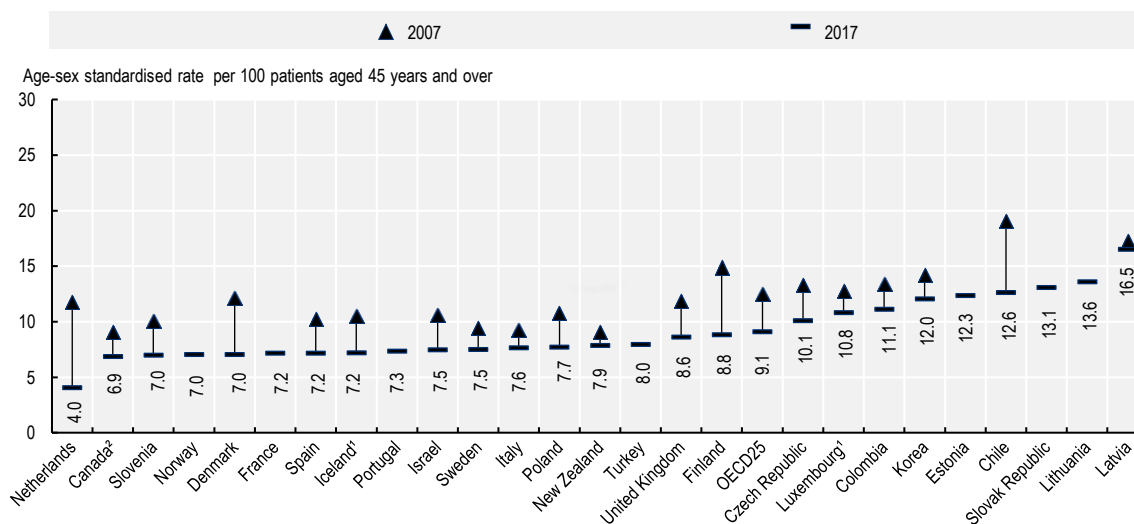
Source: OECD (2020^[23]), *OECD Regions and Cities at a Glance 2020*, <https://doi.org/10.1787/959d5ba0-en>.

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Rural areas perform worse on key health quality indicators such as mortality rates for AMI. In Australia, many of the excess deaths in rural regions are considered as “potentially avoidable” through proper primary care or individualised care. These include deaths due to certain cancers, diabetes or cardiovascular diseases such as COPD or asthma (Australian Institute of Health and Welfare, 2020^[20]).

The quality of rural hospitals is generally lower than larger hospitals as measured by key measures such as mortality after a heart attack (Lalloué et al., 2019^[28]). These poorer outcomes could be due to the relative inexperience of staff or skills mismatch due to workforce recruitment difficulties. On the other hand, some rural hospitals in the US have been found to provide superior quality for measures such as: safety, person and community engagement, and efficiency and cost reduction (Rural Health Information Hub, 2020^[33]). It is important to note that comparing the quality of care in rural hospitals to larger hospitals is difficult because of insufficient numbers of cases.¹

Figure 4.12. Thirty-day mortality after admission to hospital for AMI based on linked data, 2007 and 2017 or nearest year



Note: 1. Three-year average. 2. Results for Canada do not include deaths outside of acute care hospitals.

Source: OECD (2019^[3]), *Health at a Glance 2019: OECD Indicators*, <https://dx.doi.org/10.1787/4dd50c09-en>.

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Avoidable admissions are higher and disease prevention is lower in rural areas

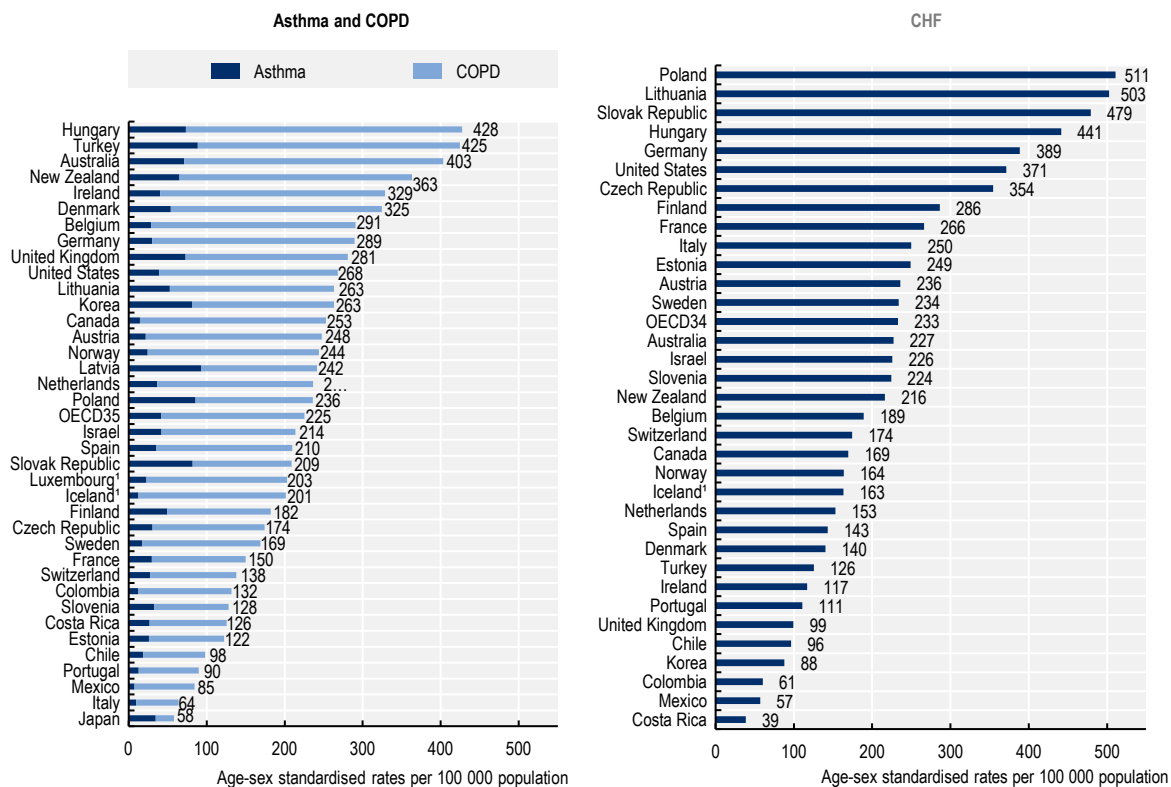
Rural areas have higher rates of avoidable hospital admissions that arise from weak primary care provision, lack of treatment alternatives and low access to emergency services. A study for 13 OECD countries found that medical hospitals admission rates of hysterectomies and caesarean sections were significantly higher in rural areas, while rates for revascularisation procedures were low (OECD, 2014^[36]). High rates of hysterectomies were found to be correlated with a lack of access to alternative treatments in some rural areas, while the high rates of caesarean sections were linked to small and rural hospitals without the emergency services necessary to deal with birth complications programming caesarean sections. Lastly, low rates for revascularisation procedures suggest a suboptimal use of these treatments likely due to issues of access or local capacity to perform such procedures.

Diseases such as asthma, COPD and congestive heart failure (CHF) are considered to be treatable through proper primary care, so that hospital admissions for these causes indicate weak primary care systems (OECD, 2020^[24]). Figure 4.13 shows the rates of hospital admissions for asthma, COPD and CHF.

Some progress has been made on these measures in recent years but recent analysis suggests that these improvements are not happening fast enough (OECD, 2017^[37]). Importantly, these so-called “avoidable” hospital admissions are not homogenous across countries with rural areas showing significantly higher rates. In 2017-18, potentially preventable hospitalisation rates in very remote areas in Australia were 2.5 times higher than in major cities (Australian Institute of Health and Welfare, 2020^[20]).

Figure 4.13. Asthma, COPD and CHF hospital admissions

Hospital admission in adults, 2017 (or nearest year)



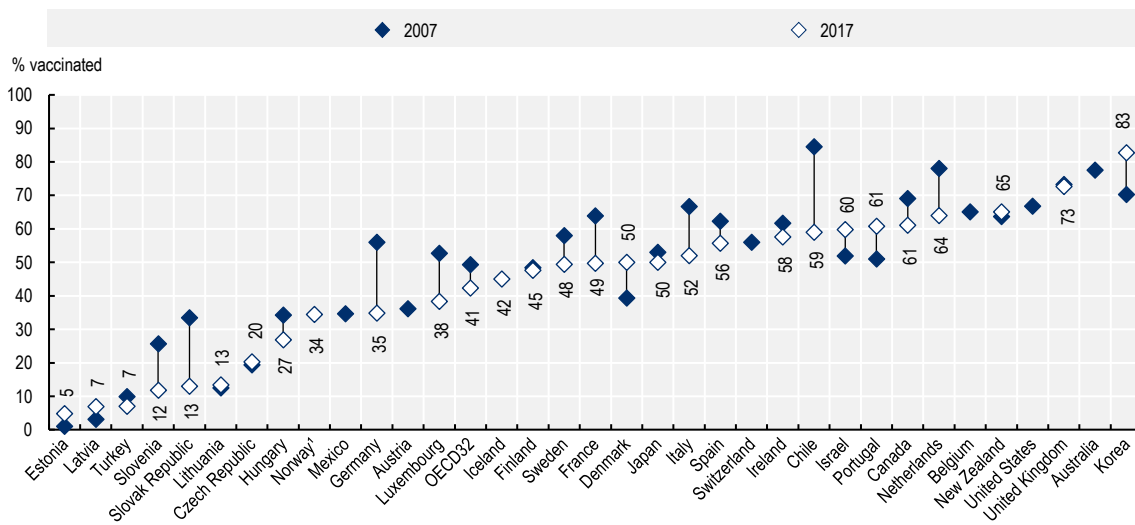
Note: 1. Three-year average. COPD= Chronic Obstructive Pulmonary Disease; CHF= Congestive Health Failure.

Source: OECD (2019^[38]), *Health Statistics 2020 (database)*, <http://www.oecd.org/health/health-data.htm>.

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Disease prevention, another measure of the quality of health that has become increasingly relevant in the context of COVID-19, is also lower in rural areas in countries with the available evidence. This happens in a context of overall lower-than-recommended vaccination rates. While in 2003 member of the WHO World Health Assembly sought to increase vaccination for flu among those over 65 years of age to 75% annually, on average across OECD countries, vaccination rates stood at 41% in 2017. In rural areas, vaccination levels across a range of vaccines rest significantly below national averages in some European countries due in part to issues of access (WHO Europe, 2015^[39]). Numerous strategies from various forms of rural-specific education to delivery mechanisms have been developed to help improve these rural rates such as pharmacy-based programmes allowing pharmacists to administer vaccines, school-based programmes or mobile immunisation clinics (Vanderpool, Stradtman and Brandt, 2019^[40]).

Figure 4.14. Percentage of population aged 65 and over vaccinated for influenza, 2007 and 2017



Note: 1. 2017 data estimated.

Source: OECD (2019^[3]), *Health at a Glance 2019: OECD Indicators*, <https://dx.doi.org/10.1787/4dd50c09-en>.

StatLink  <https://doi.org/10.1787/88aec836-en>

Generally, while some differences in practice variation reflect normal patient choice and population needs, some variations are unwarranted and may represent over- or underuse. A number of strategies have shown to be effective in reducing geographic variations including: public reporting of rates; target settings; creating and monitoring clinical guidelines; provider-level reporting and feedback, and financial incentives (OECD, 2014^[36]).

Equitable access to health care in rural areas

Ensuring equitable access to health care is another key component of a high-performing health system. Access can be defined as “the timely use of personal health services to achieve the best health outcomes” (Millman, 1993^[41]). Good doctors and well-organised hospitals will not have the desired impacts on population health and advance societies toward universal health coverage if the population cannot access these services. A high performing health system depends on both good care as well as access to this care.

Ensuring access means removing barriers including financial, physical or cultural factors. Low rates of health insurance coverage and high costs of services can prevent people from receiving the health care they need due to financial concerns. Long distances between patients and doctors or long-waiting times due to the insufficient supply of health personnel can also prevent equitable and timely access. A sparser population in rural areas directly affects access because of larger travel distances. More importantly, the obstacles to meeting workforce demands in the health sector, including a lack of properly trained workforce for both doctors and nurses and an older workforce, are particularly challenging in rural areas because of demographic factors and depopulation.

Higher unmet medical needs in rural areas

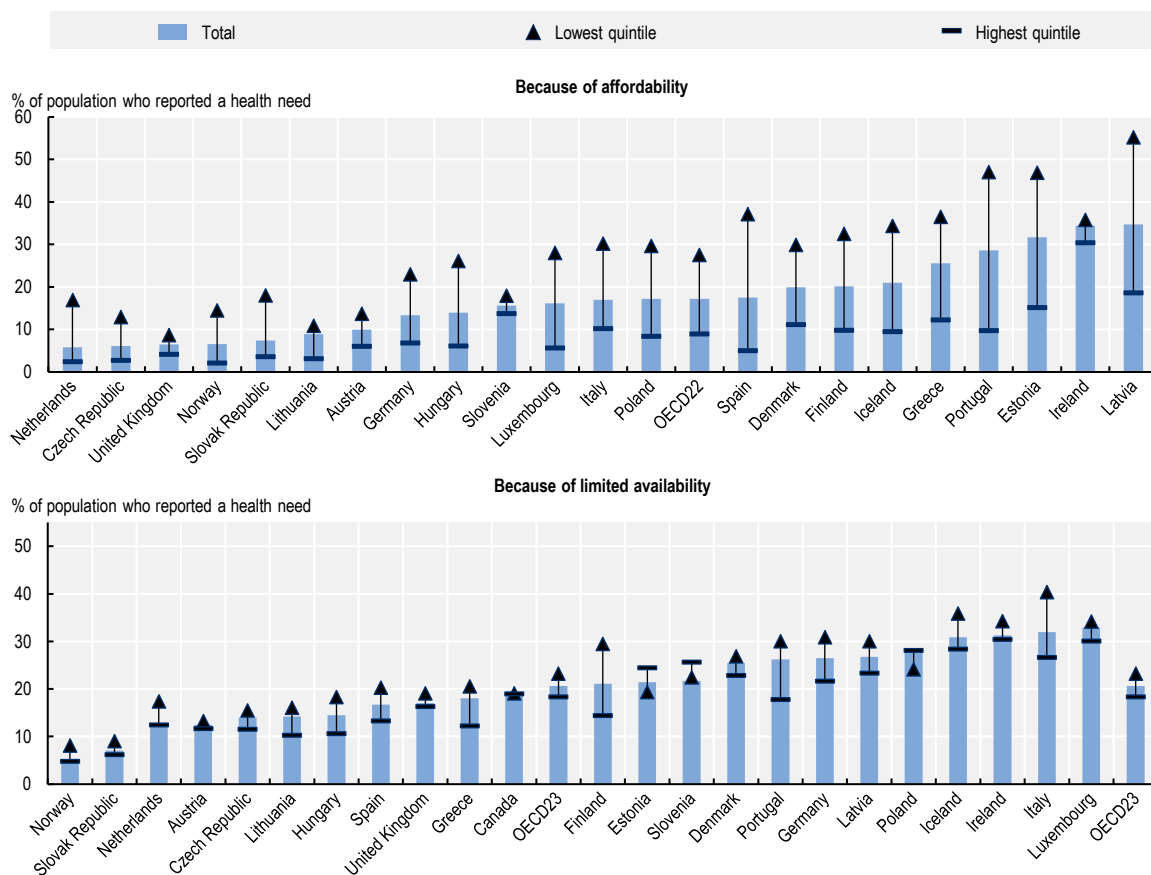
Across OECD countries health coverage across the population for a set of core health services is at or near 100% with some notable exceptions including the US at just over 90% and Mexico at just under 90%. The government and compulsory insurance schemes covered over 77% of all spending on average across OECD countries.

Across European countries, rural residents reported significantly higher unmet needs for health (4.2% in rural areas versus 3.8% in towns and suburbs and 3.5% in cities) resulting from problems in accessing care such as distance from providers or financial barriers. These disparities were higher among newer European Union (EU) countries including Bulgaria, Croatia and Romania (Eurostat, 2020^[42]). The Netherlands has actively implemented policies to remove physical and financial barriers and records one of the lowest levels of unmet health needs (OECD, 2019^[3]).

Despite high health coverage, many people report unmet health needs either due to limited availability of services because of waiting times or transportation difficulties (over 20% across OECD countries) or because of financial constraints (over 17% across the OECD) (OECD, 2019^[3]). The differences between the highest and lowest income quintiles were also significant in reporting forgoing care due to affordability issues. On average, 28% of people in the lowest income quintile forgo care for financial reasons compared with 9% for richer individuals (Figure 4.15). A recent survey across 23 OECD countries showed that between 11% and 65% of people reported unmet medical needs in 2015/16 due to barriers in access to care including waiting times, distance and transportation concerns (OECD, 2019^[4]). Large inequalities in access linked to income differences were also reported for access to screening tests.

Figure 4.15. Population forgoing or postponing care because of limited affordability or availability, by income

2014 values



Source: OECD (2019^[3]), *Health at a Glance 2019: OECD Indicators*, <https://dx.doi.org/10.1787/4dd50c09-en>; OECD (2019^[38]), *Health Statistics 2020 (database)*, <http://www.oecd.org/health/health-data.htm>.

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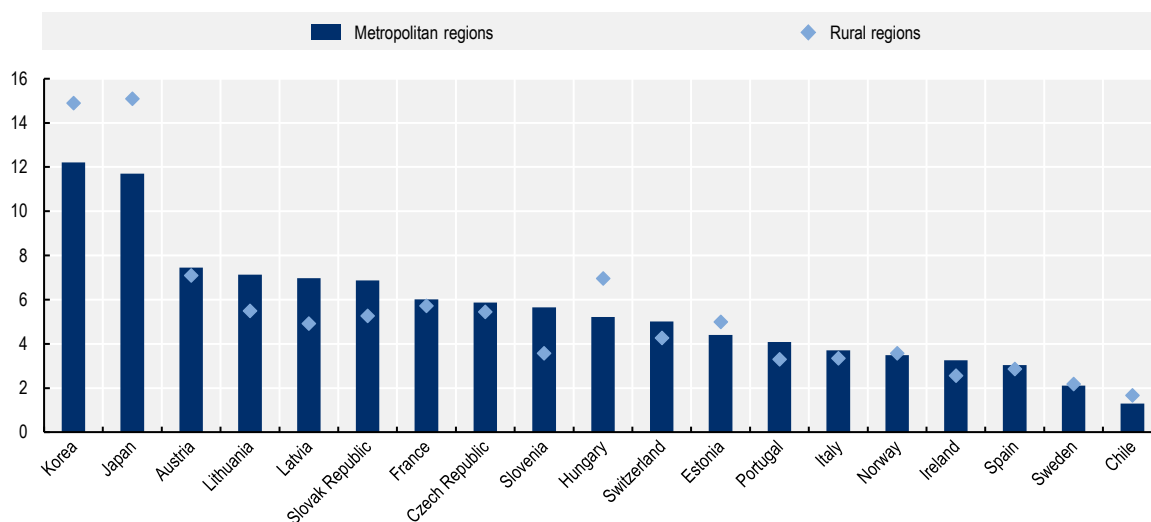
Lower access to facilities and medical professionals

Rural hospitals are critical for the provision of care in rural regions and are indispensable to maintain sufficient care access in many areas. These hospitals provide care for large proportions of the populations in many OECD countries. In the UK, nearly half of the population is served by “small” hospitals (Vaughan and Edwards, 2020^[43]). Rural hospitals also provide a wide continuum of care from primary care to long-term care and are important safety nets. In the US per capita, non-metropolitan emergency departments have higher visit rates than metropolitan emergency departments due in part to substandard primary care access (Rural Health Information Hub, 2020^[33]).

Still, access to hospital services, as approximated by hospital rates beds, varies widely not only across but also within countries. While Japan and Korea have over 11 beds per 1 000 inhabitants, Chile only has 1.5 (Figure 4.16). In 11 out of 19 countries with available data, hospital bed rates are lower in rural regions compared to metropolitan regions, with the largest gaps observed in small OECD countries (Latvia, Lithuania and Slovenia), and countries badly hit by the 2008 global financial crisis (Ireland and Portugal). In contrast Hungary, Japan and Korea have significantly higher hospital beds rates in rural regions compared to metropolitan regions.

Figure 4.16. Hospital beds rate by type of TL3 region

Number of hospital beds by 1 000 inhabitants, 2018 (or latest year available)



Note: 2017 values for Chile, Estonia, Italy, Latvia and Lithuania.

Source: OECD (2020^[44]), *OECD Regional Statistics*, <https://doi.org/10.1787/region-data-en> (accessed on 15 May 2020).

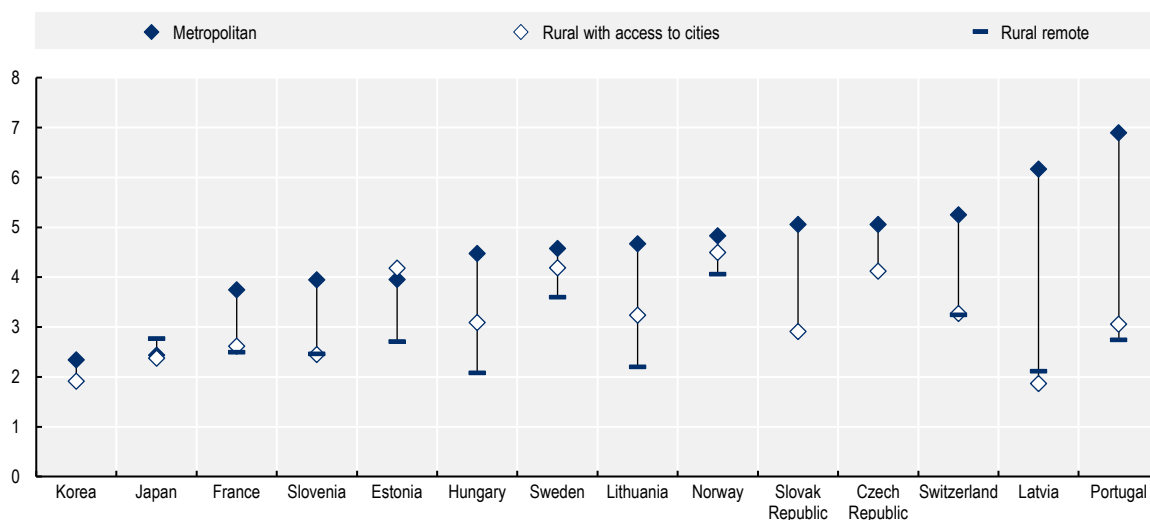
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Rural areas have less access to mental health services, which are disproportionately concentrated in urban areas (Gruebner et al., 2017^[45]). Still, there is no evidence of significant differences in the prevalence of mental illness between people living in rural and urban areas. Good mental health is vital for people to be able to lead healthy, productive lives but an estimated one in two people experience a mental health problem in their lifetime (Hewlett and Moran, 2014^[46]). People who reported mental health problems were significantly more likely to say that their health had a negative impact on their daily life. In France and Norway, more than 50% of respondents who had been told by a doctor that they had a mental health problem felt that their ability to work or carry out daily activities were limited.

In addition to gaps in access to hospital infrastructure, considerable disparities exist in workforce coverage across territories. The distribution of doctors across regions varies widely between metropolitan and rural regions. The number of active physicians per 1 000 inhabitants was lower in rural regions than metropolitan regions in 12 out of 14 OECD countries with available data in 2016 (Figure 4.17). The gap is as large as 3 times more physicians per 1 000 inhabitants in metropolitan regions compared to rural regions in Latvia and Portugal. The difference in access to doctors between rural regions with access to regions and rural remote regions is largest in Estonia, Hungary and Sweden.

Figure 4.17. Active physicians rate by TL3 region type

Active physicians per 1 000 inhabitants in 2016



Source: OECD (2020_[44]), *OECD Regional Statistics*, <https://doi.org/10.1787/region-data-en> (accessed on 15 May 2020).

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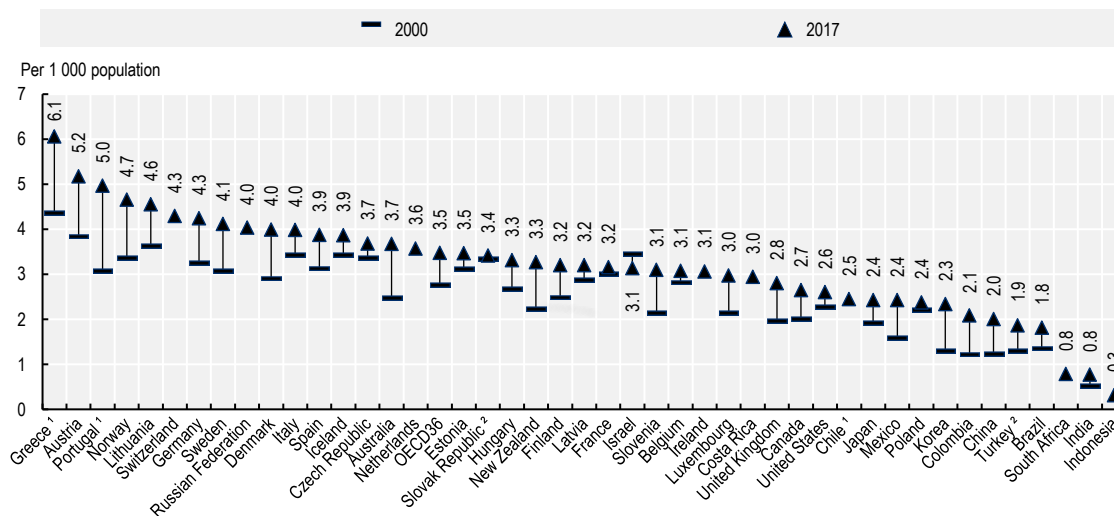
The number of doctors per population served in OECD countries and a decrease in the proportion of primary care physicians across OECD countries has fallen in recent years. On average, across OECD countries, generalists accounted for less than three out of ten physicians in 2017 (Figure 4.18). Furthermore, this share is falling. In Australia, Denmark, Estonia, Ireland, Israel and the UK, the share of generalist medical practitioners decreased by more than 20% between 2000 and 2017 (OECD, 2020_[24]). These reductions have resulted in increasing dissatisfaction with care co-ordination and increasing the workload of existing primary care physicians. The current workload for primary healthcare physicians was found to be unreasonable and unsustainable over the longer term in 14 European countries with potential adverse impacts on the quality of patient care (Fisher et al., 2017_[47]). The lack of health personnel has been particularly problematic in long-term care as these positions are difficult and relatively poorly paid. This lack of long-term personnel becomes more critical each year and the proportion of elderly in the population grows.

Health workforce issues are amplified in rural areas because jobs in these areas are less attractive and harder to fill to start with. Finding qualified staff is particularly problematic for rural hospitals. Lower salaries, unappealing professional prospects, concerns about prestige or urban-centric medical education can make recruitment for workforce difficult for rural hospitals. Along with short-handed and overburdened staff, this can mean that skill mismatches may occur. For example, emergency departments in rural hospitals in the US are less likely to be staffed by emergency medicine physicians and more likely to be staffed by

non-emergency medicine physicians, such as family medicine or internal medicine physicians (Hall et al., 2018^[48]).

Figure 4.18. Practising doctors per 1 000 population

2000 and 2017 (or nearest year)



Note: 1. Data refer to all doctors licensed to practice, resulting in a large overestimation of the number of practising doctors (e.g. of around 30% in Portugal). 2. Data include not only doctors providing direct care to patients but also those working in the health sector as managers, educators, researchers, etc. (adding another 5-10% of doctors). The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

Source: OECD (2019^[3]), *Health at a Glance 2019: OECD Indicators*, <https://dx.doi.org/10.1787/4dd50c09-en>; OECD (2019^[38]), *Health Statistics 2020 (database)*, <http://www.oecd.org/health/health-data.htm>.

The difference in densities of health practitioners can, in extreme cases, lead to so-called medical deserts where the availability of health care is significantly lower than in the general population. These medical deserts are growing in rural areas across a number of OECD countries. In France, for instance, the percentage of the population living with access to less than 2.5 medical visits a year grew from 3.8% in 2015 to 5.7% in 2018.

The differences in workforce densities can have measurable impacts on population health. A recent study in the US showed that an increase of 10 primary care physicians per 100 000 population was associated with a 51.5-day increase in life expectancy across the same population. An increase in primary care physicians was also related to decreases in cardiovascular, cancer and respiratory mortality. Specialist doctors also had a positive but weaker impact and a similar rise in the density of specialist doctors was associated with an increase of 19.2 days of life expectancy (Basu et al., 2019^[49]).

Sustainable health costs in rural areas

Constitutional mandates to provide health care to all implies that health systems must take eventual additional costs of providing health care in rural areas into account. The cost of rural health depends firstly on cost drivers of national systems, including increasing technology use, drugs prices, financial incentives and changing disease burdens. Several factors can add to the cost of health care in rural areas, including low population density and more dispersed settlements leading to lower economies of scale, longer ambulance transportation times and financial incentives used to attract health workers to rural areas.

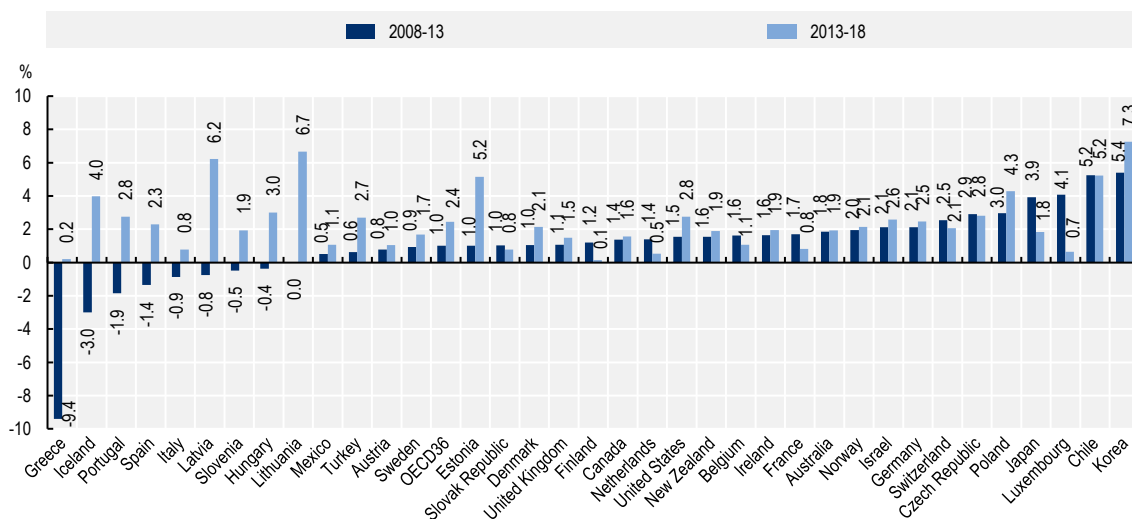
While spending more money for rural care can help increase the equity of the system and ensure the entire population has equal access and quality, it may challenge spending efficiency. The extra costs incurred by rural health make these investments relatively less efficient than those in more urban settings (Palmer, Appleby and Spencer, 2019^[50]). On the other hand, underspending on health can have clear impacts on access and performance as the resources necessary to provide good care cost money. The relationship between spending and quality is not always straightforward, however. The US spends more than twice as much on health per capita than the OECD average but life expectancy is below the OECD average and the population coverage for a core set of health services is among the lowest in the OECD (OECD, 2019^[3]).

Health expenditures and the impact of austerity measures on rural health

Common measures for assessing the cost of health systems include health spending per capita, health spending as a share of GDP and the number of practising health workers. Health spending can vary greatly across countries and finding the right amount of health spending, and the most efficient areas for this spending, is constantly being assessed (OECD, 2017^[51]). Health expenditure accounts for nearly 9% of GDP on average and is projected to increase steadily as populations continue to age and more people live with chronic disease and multi-morbidity. Between 2015 and 2030, health spending across OECD countries is predicted to grow at a pace of 2.7% annually (OECD, 2019^[3]). Per capita healthcare spending has increased in all OECD countries between 2013 and 2018, after decreases in 2008-13 in countries badly hit by the 2008 financial crisis including Greece, Italy and Portugal (Figure 4.19).

Figure 4.19. Annual growth in health expenditure per capita (real terms)

2008 to 2018 (or nearest year)



Source: OECD (2019^[3]), *Health at a Glance 2019: OECD Indicators*, <https://dx.doi.org/10.1787/4dd50c09-en>; OECD (2019^[38]), *Health Statistics 2020 (database)*, <http://www.oecd.org/health/health-data.htm>.

Reducing or containing health costs has been a priority for OECD countries and a wide range of strategies to reduce public health expenditure have been implemented across OECD countries (see Box 4.2 for a review of general cost-saving strategies). Reducing health coverage is a relatively straightforward method for cutting health spending. Nevertheless, it can increase inequalities when it targets the most vulnerable population groups. An example are measures to reduce public health care coverage for undocumented foreign nationals that the Czech Republic and Spain introduced following the financial crisis. Reducing the size of the health workforce including providers and administrative personnel can also lower public health

spending. These policies include fixed objectives for staff reductions, non-replacement policies for staff on leave, ending temporary contracts and voluntary redundancies. Finally, reducing hospital capacity including the number of beds also leads to cost reductions. Hospital capacity has been a policy target with cuts to the number of beds in Greece, Ireland, Italy, Portugal and Spain (Mladovsky et al., 2012^[52]; Gené-Badia et al., 2012^[53]).

Evidence shows that cost-cutting strategies greatly reduced rising health care spending in many countries, including a reduction in total health care expenditure in some (Morgan and Astolfi, 2014^[54]). However, they also brought measurable negative impacts on health access, usage and outcomes in many cases. An international survey of 11 OECD countries showed that, on average, around 15% of respondents said that costs stopped them from visiting their doctor, filling a script and/or undertaking a medical test at least once during the 12 months after the crisis unfolded (Schoen et al., 2010^[55]). In OECD countries, preventive services are used much less frequently during economic downturns. Unmet health needs are a particularly large problem during times of health cuts, most notably among lower socio-economic groups (van Gool and Pearson, 2014^[56]).² In the Navarre region of Spain, access was one of the top issue reported by health professionals following austerity measures (Tolosana, 2018^[57]). Austerity measures also led to an overall decline in hospital admissions in OECD countries (van Gool and Pearson, 2014^[56]).

Austerity can have direct impacts on mortality. Research for Spain suggests that medical staff and hospital bed reductions accounted for a significant increase in mortality rates from circulatory diseases and external causes (Borra, Pons-Pons and Vilar-Rodríguez, 2020^[58]). Countries that enacted high health spending cuts also showed significantly higher rates of obstetric trauma with rising unemployment compared to those countries with relatively less spending cuts.

Box 4.2. Direct health cost reduction strategies and their consequences

Direct cost reduction measures focus on maintaining financial sustainability by reducing the public resources available for the system. Strategies to reduce or contain spending have been a focus across OECD countries particularly since the economic crisis of 2008. These include initiatives to pay providers differently, to reduce expensive hospital care, to reduce unnecessary or defensive care, or to negotiate pharmaceutical prices. The years following the 2008 financial crisis also saw a number of measures focusing on reduced health spending through direct measures such as cuts to health budgets or increased cost-sharing.

The most common direct cost-cutting strategy used by governments in OECD countries following the financial crisis was to negotiate reduced prices paid for healthcare goods and services. This strategy was used most heavily for pharmaceuticals. In the years following 2008, Spain reduced prices paid for generic drugs by 30%, Italy reduced these prices by 12.5% and Ireland by 20% to 30%. Ireland also cut prices by 40% for 300 common off-patent drugs (van Gool and Pearson, 2014^[56]). Other countries including Greece, Portugal and Switzerland initiated routine reviews to investigate the prices paid for pharmaceuticals.

Governments also reduced wages paid to the health workforce including administrative staff. Several countries including Estonia, Greece, Iceland and Ireland reduced both nurse and salaried general practitioner (GP) wages. In Portugal, rates paid for overtime were cut in half while in Greece, salaries and benefits of health workers were cut by EUR 568 million. In Ireland, professional fees were reduced by 8% in 2009 and a further 5% in 2010 and 2011. In Spain, salaries were cut by 5%-7% for all civil servants, including most healthcare personnel in 2010 (van Gool and Pearson, 2014^[56]). While cutting wages and prices for goods allows the maintenance of volume while reducing spending, it created significant unrest in the health workforce and industry in the countries where it was enacted. Furthermore, the long-term impacts may include workforce or supply shortages.

A number of countries re-examined the benefit basket of health goods and services covered by public funding and excluded certain products and services. For example, Estonia ended cash benefits for dental check-ups for adults (van Ginneken et al., 2012^[59]). Pharmaceutical reimbursement was also targeted and Portugal delisted some over-the-counter drugs while Greece re-introduced a positive list for pharmaceutical coverage. The Czech Republic also began a review of all medicines covered (Vogler et al., 2011^[60]).

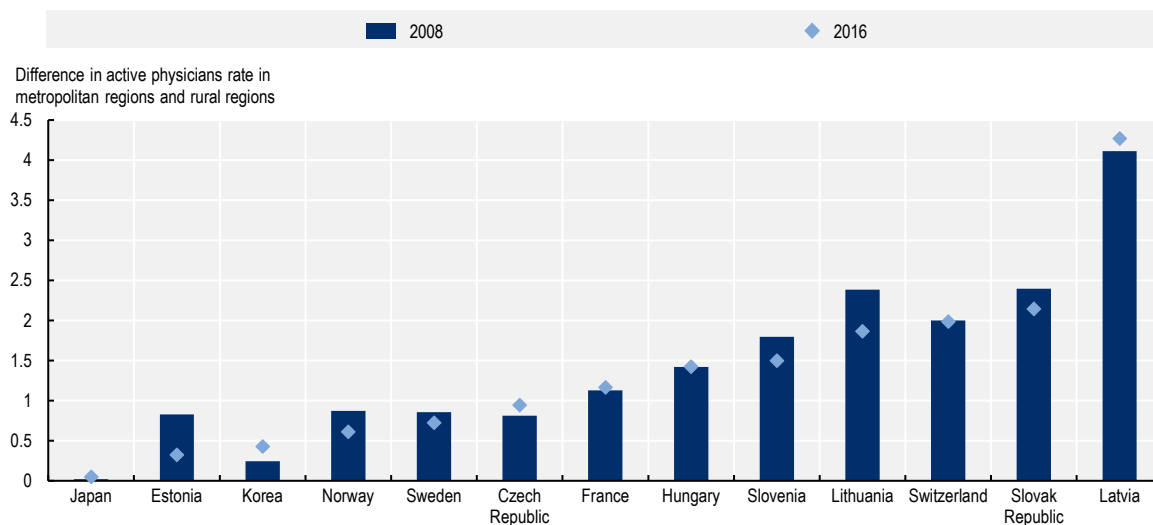
Increased cost-sharing is another form of coverage reduction and one that was very popular following the crisis: Austria and Belgium introduced automatic annual increases in co-payments for pharmaceuticals; France decreased their 35% reimbursement level to 30% in 2011 and Denmark increased co-payments for fertility drugs. Iceland also increased co-payments for prescription drugs in 2010 and again in 2011 (Vogler et al., 2011^[60]).

Source: van Gool, K. and M. Pearson (2014^[56]), "Health, Austerity and Economic Crisis: Assessing the Short-term Impact in OECD countries", <https://dx.doi.org/10.1787/5jxx71t1zg6-en>; van Ginneken, E. et al. (2012^[59]), "The Baltic states: Building on 20 years of health reforms", <http://dx.doi.org/10.1136/bmj.e7348>; Vogler, S. et al. (2011^[60]), "Pharmaceutical policies in European countries in response to the global financial crisis", <http://dx.doi.org/10.5655/smr.v4i2.1004>.

Cost reduction strategies that disproportionately affect the quality of and access to medical professionals and facilities in rural regions contribute to increasing territorial inequalities. Cost-cutting measures had a significant negative impact on health access in many rural regions. Available evidence from European countries shows that austerity measures in health are regressive, as they impact the poor and deprived regions the most (Stuckler et al., 2017^[61]) (see Box 4.4 for a discussion of the case of Greece). Policies to reduce the size of the health workforce in Greece, Ireland and Spain led to significant reductions in workforce growth or reductions in absolute numbers (Gené-Badia et al., 2012^[53]). Trends for other OECD countries suggest that the gap in access to doctors between metropolitan and rural regions has been persistent since the crisis, especially in countries with significant territorial differences in access such as Latvia, the Slovak Republic and Switzerland (Figure 4.20).

Figure 4.20. Gap in active physicians rate between metropolitan and rural TL3 regions

Active physicians per 1 000 inhabitants. 2008 and 2016



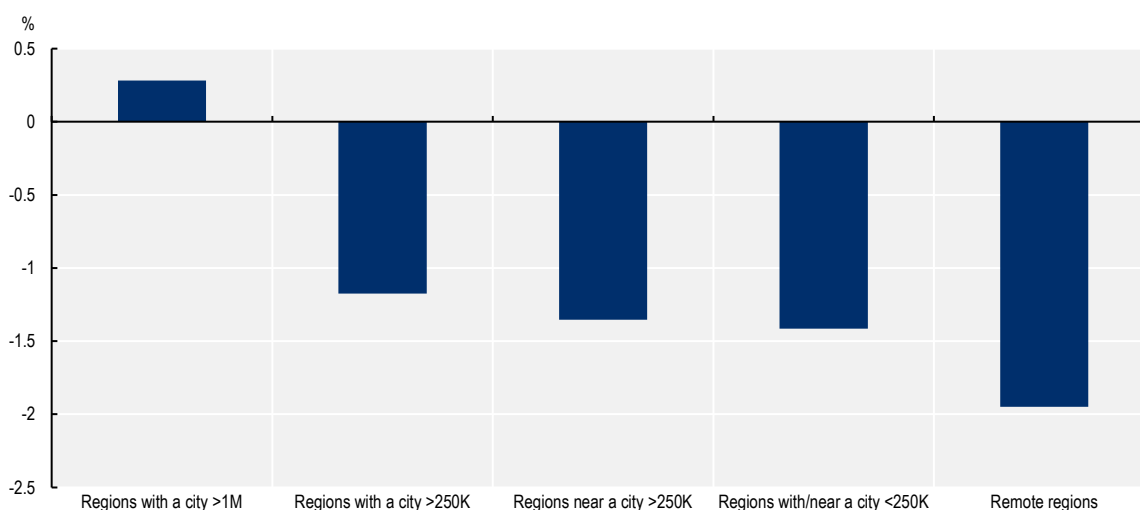
Source: OECD (2020^[44]), *OECD Regional Statistics*, <https://doi.org/10.1787/region-data-en> (accessed on 15 May 2020)

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While strategies to reduce capacity have proven to be effective in reducing spending, their negative impacts on access have been felt disproportionately by rural regions. Hospital beds rates decreased in all types of rural regions since the 2008 global financial crisis at an average rate of -0.7% per year, while they slightly increased in metropolitan regions (Figure 4.21). The decrease was largest in rural regions far from large cities (between -1.5% and -2% per year). The reduction in capacity happens in a context of higher workloads of the remaining staff. This has gained meaning with the saturation of hospitals in several regions during the COVID-19 pandemic.

Figure 4.21. Yearly percentage change in hospital beds rate by type of region after the global financial crisis

Beds per 1 000 inhabitants. Yearly change over 2008-18



Source: OECD (2020^[23]), *OECD Regions and Cities at a Glance 2020*, <https://doi.org/10.1787/959d5ba0-en>.

Given the possible effect of direct cost-cutting strategies in augmenting territorial inequalities, countries can also consider other strategies are less impactful in the short term but have the benefit of having a neutral effect on inequality and positive effects on the environment (see Box 4.3).

Box 4.3. Increasing taxation and reducing wasteful spending can reduce health costs

While not a strategy to reduce spending, increasing taxation was also an often-used policy solution to increase the revenue base following the crisis. In 2011, Ireland introduced the universal social charge, a progressive tax of annual earnings to generate more money for health. In Slovenia, measures to improve revenue collection and broaden income categories were introduced to create additional funds. In Portugal, pensioner's tax contributions were increased while Estonia and Greece increased revenue through higher general taxes. Along with general taxes, some specific "vice" taxes on items like cigarettes or alcohol were implemented in countries like France and Hungary. From a health perspective, such taxes can not only raise revenue but reduce expenditure by preventing healthcare costs through reductions of risk behaviours (Sassi, Belloni and Capobianco, 2013^[62]).

Finally, reducing "wasteful" spending is a viable alternative to reduce health expenditures with no negative impacts on health access or quality. Wasteful spending is money spent either unnecessarily

or for services and procedures with little to no benefit. This can include a range of categories including unnecessary prescriptions such as antibiotics for viral infections, low-value use of diagnostic equipment such as imaging for lower-back pain, or avoidable care such as healthcare-acquired infections. Wasteful spending makes up a significant proportion of all health spending including an estimated 10% of all hospital spending. Cutting out wasteful spending can be more complicated than direct spending cuts, however, requiring a range of different targets and interventions such as clinical guidelines for medicine and diagnostic use, or procedures for avoidance of patient safety events in hospitals (OECD, 2017^[51]).

Source: OECD (2017^[51]), *Tackling Wasteful Spending on Health*, <https://dx.doi.org/10.1787/9789264266414-en>; Sassi, F., A. Belloni and C. Capobianco (2013^[62]), "The Role of Fiscal Policies in Health Promotion", <https://dx.doi.org/10.1787/5k3twr94kvzx-en>.

Financial sustainability of rural hospitals

Two factors drive financial pressures on rural hospitals: the relatively low volumes of patients resulting from low and declining rural populations, and pressures to provide care outside of hospitals arising from the health system. These low volumes mean that the fixed costs of running a hospital make up a greater share of overall costs and that efficiency is lower than in a higher volume hospital. In recent years, these financial pressures have increased with low care reimbursement rates, increased regulation and uncompensated care (Vaughan and Edwards, 2020^[43]). The increasing use of diagnostic related groups (DRGs), a system that classifies patients into predefined categories based on their health profiles and pays hospitals according to these categories, has contributed to this financial pressure. Reimbursement rates for DRG classifications do not account for these higher fixed costs inherent in rural care.

Financial pressures, a push to centralise services and minimum quality requirements have led to an acceleration in the closing of numerous rural hospitals that combine high relative costs, low volumes, poorer overall quality and workforce issues. A recent report in Germany has proposed closing half of all hospitals, while in France medical staff are protesting rural hospital closures. In the US, a number of rural hospitals were forced to close in the late 1980s and early 1990s because of insufficient Medicare reimbursement, as the Medicare's Prospective Payment system relied on costs calculated from larger, urban hospitals (Williams and Holmes, 2018^[63]). In fact, in the US, more hospitals have closed than opened since 2011, and most closures have concentrated in rural areas. In addition to hospitals closing, rural hospitals are losing services including imaging, obstetric and primary care services in countries such as Australia, Canada and the US (Vaughan and Edwards, 2020^[43]). In the UK, the National Health Service (NHS) adjusts payments based on income levels and location, with higher payments made for increasing rurality to help ensure equal access.

Unlike urban areas where the closing of inefficient hospitals may increase patient welfare and result in overall cost savings, the negative impacts on the distance to care, and treatment delays for patients due to hospital closures in rural areas can offset any cost gains (Hsia et al., 2012^[64]; McNamara, 1999^[65]). Studies on competition also show that rural hospital closings can have negative impacts on the quality of surrounding hospitals through a decrease in competitors (Gaynor, Moreno-Serra and Propper, 2013^[66]).

The impact of hospital closures also goes beyond simply providing health care, as rural hospitals are often large local employers and source of community pride. On average, the health sector constitutes 14% of total employment in rural communities, with rural hospitals typically being one of the largest employers in the area. A study in the US showed that the closure of the sole hospital in a community reduces per capita income by 4% and increases the unemployment rate by 1.6 percentage points in the area (Holmes et al., 2006^[67]).

The ongoing COVID-19 pandemic has also hastened the closure of many rural hospitals which were already on unsteady financial ground before the pandemic and were unable to sustain the financial shock and even lower volumes due to quarantine periods and patients choosing to delay or forgo care (Fried,

Liebers and Roberts, 2020^[68]). Recent research for the US has shown that more than half of rural residents are at high risk of serious illness if infected with SARS-CoV-2, potentially leading to 10% more hospitalisations for COVID-19 per capita compared to urban residents (Kaufman et al., 2020^[69]).

Box 4.4. Cost reductions: The Greek case

Greece was one of the countries hit hardest by the 2008 financial crisis and provides evidence of the impact of direct price-cutting measures in health as part of austerity plans.

With public debt exploding in the years following the crisis, Greece agreed to a series of loans from international bodies along with stipulations on reaching fiscal targets. To meet these targets, Greece began implementing extensive public austerity measures including in the health sector.

Between 2009 and 2012, the total health expenditure in Greece decreased by EUR 5.4 billion (23.7%). Major cuts were made to hospital and pharmaceutical spending as well as to salaries and benefits to health personnel. Salary cuts of 12% in January 2010 with a further 8% cut in June 2010 were applied to all public healthcare staff, including administrative personnel, doctors, nurses, pharmacists and paramedical staff.

Other workforce measures aimed at reducing costs include the non-renewal of contracts for temporary staff employed under fixed-term contracts and a reduction in the replacement levels of retiring staff with only one appointment for every five retirees. At the same time, out-of-pocket payments for patients also increased from 27.6% in 2009 to 28.8% in 2012 due to increased cost-sharing measures.

Many of the policy measures introduced under pressure from bailout conditions made health sector financing more inequitable. Public health spending was restricted to no more than 6% GDP with negative impacts on middle- and low-income households. Private health insurance necessary to cover the growing gaps in public coverage were only affordable by certain people creating additional inequalities.

Access became a major concern because of these reforms. Nearly 20% of survey respondents in 2011 reported major problems in accessing public hospitals because of waiting list issues and 28% reported that they could not buy their medicines because of continuing pharmacists' strikes. Measures such as self-reported health, mental health and infectious diseases all worsened during austerity as did reports of unmet medical and dental needs.

Source: Simou, E. and E. Koutsogeorgou (2014^[70]), "Effects of the economic crisis on health and healthcare in Greece in the literature from 2009 to 2013: A systematic review", <http://dx.doi.org/10.1016/j.healthpol.2014.02.002>.

Comprehensive measures to save costs and improve performance in rural areas

While cost-saving strategies are relatively straightforward from a policy side and can be effective in reducing public health spending, they often come at a cost and have led to protest in many communities and professions. In order to maintain high system performance, any possible cost savings of these measures must be balanced with improvements in quality, access and people-centredness.

More recently, reforms focused on strengthening primary healthcare, or increasing care integration have sought to affect not only cost but also improve access and quality. A number of recent reforms in OECD countries are taking this more general approach to fiscal sustainability in an effort to reduce costs while maintaining or increasing overall performance. These reforms include reinforcement of primary care and new models of care such as service integration. Each of these strategies has the potential to improve all

aspects of health systems performance and can be implemented into rural contexts without obvious negative impacts on performance. Some evidence shows that these more holistic and people-centred strategies can result in improvements across all aspects of performance.

Reinforcing primary care

Primary care has become a focus of policy reforms in recent years as it can be cost-saving and responds well to a number of the growing health needs in OECD countries. For instance, access to effective primary care is the backbone of healthy ageing policies, as health promotion and disease prevention services are critical to maintaining the well-being functional abilities in older populations.

Despite the many advantages of strong primary care systems, their potential is not being realised in many OECD countries and their rural areas. In rural areas, reinforcing primary care could be particularly beneficial given the most important health needs in these areas. For example, high-performing primary care can help co-ordinate and manage the growing number of patients with multi-morbidity as well as save costs by reducing unnecessary hospital admissions. A number of OECD countries have recognised the importance of reinforcing primary care and have implemented a wide range of strategies to do this.

Reducing financial barriers and increasing financial incentives for primary care professionals

A direct strategy to reinforce primary care is to reduce financial barriers to its access and spend more on it. Several OECD countries are taking steps to remove financial barriers that impede access to primary health care. These strategies range from making primary health care free at the point of care (as seen in Greece in 2016), to reducing the amount of out-of-pocket payments or setting a ceiling (as seen in Belgium and Iceland in 2017).

A complementary strategy is increasing the incentives for primary health care workers. This may include either better remuneration for those working in the sector or economic incentives based on performance. Economic incentives for performance can take the form of add-on payments where physicians receive additional money for achieving certain targets such as the management of chronic disease, care-co-ordination or early discharge from hospitals. In 2018, 11 OECD countries, reported using specific add-on payments to incentivise care co-ordination, prevention activities or active management of chronic disease. Other countries, such as Chile and the Netherlands, reported using pay-for-performance mechanisms in primary health care.

Patient involvement

Patient involvement is critical to a high-performing and people-centred health system and providing a broader role to patients in primary care is central to many of the current system reforms. Studies have shown that patients who are more involved in their care show better outcomes and experiences (Hibbard and Greene, 2013^[71]). Health coaching or counselling is often included in combined lifestyle interventions and give patients the tools to take an active role in managing a chronic condition. Evidence from these interventions shows they can be effective in making important and lasting changes in behaviour including nutrition, physical activity and medication adherence (DeJesus et al., 2018^[72]).

Several OECD countries are also turning toward digital tools to help with patient involvement in care. Canada and Finland for example use patient-provider portals to increase communication and allow patient access to their own data and other relevant health data. Such digital tools have the significant advantage of being potentially accessible even in rural or remote areas. Chapter 5 discusses policies for next generation technologies in rural areas in the context of telemedicine.

Shifting responsibilities across health care professionals

Another strategy to improve the performance of primary care is through the shifting of responsibilities. Across OECD countries, there is a mismatch of skills and tasks within primary health care teams to population and patient needs (Frenk et al., 2010^[73]). More than three-quarters of doctors and nurses report being overqualified for some of the tasks they have to do in their day-to-day work. Shifting some of these lower-qualification or non-medical responsibilities to other health professionals may provide more time for physicians or highly skilled nurses to devote to more complex medical issues.

A number of OECD countries are trying this strategy by introducing new care co-ordinator roles to focus on providing continuous care across different specialities. These can include co-ordination not only with other parts of the health systems but in a larger well-being sense including with social services or long-term care. In Canada, registered nurses and nurse navigators have an important role in improving co-ordination and continuity of care in the MyHealthTeam model of primary health care. Australia, Estonia, Ireland, Latvia, Mexico, Sweden and the UK are also increasing the role of nurses in primary health care while in Belgium, England (United Kingdom), Finland, Italy and Switzerland, community pharmacists are taking a greater role in health promotion and prevention. During the COVID-19 pandemic, the expansion of pharmacist duties was particularly important in authorising pharmacists to extend prescriptions without a doctor's prescription.

These shifting roles in primary care also include new trends targeted at better serving rural and remote areas to reduce inequalities and increase access. Notably, many OECD countries are increasing the role of nurse practitioners, community pharmacists and community health workers to make up for the lack of doctors in rural regions. In France, the *Ma santé 2022* national plan extends the roles of nurses and pharmacists to improve access in underserved areas. It also includes a new profession, Advanced Nurse Practitioner, to work within a primary health care team and manage patients with chronic conditions.

Pharmacists have also been given expanded roles to help with lack of access. In Switzerland, the Swiss Pharmacist's Association (pharmaSuisse) has developed the Netcare programme to face a relative shortage of GPs. Participant community pharmacists provide primary triage using a structure decision tree for 24 common conditions and may manage care in certain circumstances. Recent evaluation shows positive results (Erni et al., 2016^[74]), with pharmacists able to resolve around three-quarters of the cases presented to them.

Increase care co-ordination through integrated care

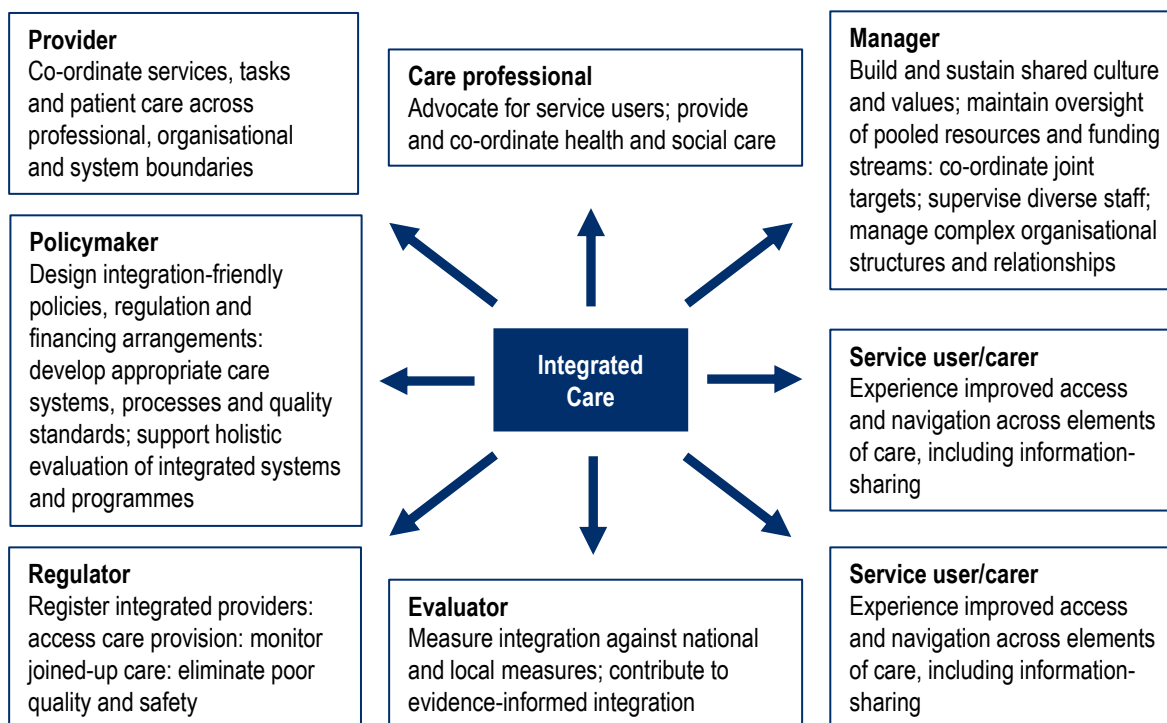
With the rise in multi-morbidity and chronic disease, patient needs and expectations of the health system are changing. Integrated care is a potential policy response to meet these changing needs by increasing care co-ordination while producing cost savings from better health outcomes and increased patient participation.

While no single definition exists, integrated care is an approach focused on filling gaps in care and improving care co-ordination. It seeks to connect services and providers and facilitate movement and communication between them and with the patient. Integrated care is most often used for patients with chronic disease or multi-morbidity who have frequent contact with the health system including different providers. In recent years, a number of different approaches to care integration have arisen in different contexts such as clinical care, disease management and long-term care including home care in OECD countries.

The definition of integrated care can change depending on the perspective within the system. A key component is that the patient remains at the centre of this perspective. Figure 4.22 provides some examples of these changing perspectives. Integrated care is most commonly used with older, sicker populations and the most commonly cited benefits were increased health access. Given the relatively older

and sicker populations in rural areas along with the relatively lower levels of access, integrated care as the potential to be effective in these areas.

Figure 4.22. Perspectives of integrated care



Source: Adapted from WHO Europe (2016^[75]), "The Veneto model – A regional approach to tackling global and European health challenges", World Health Organization Europe.

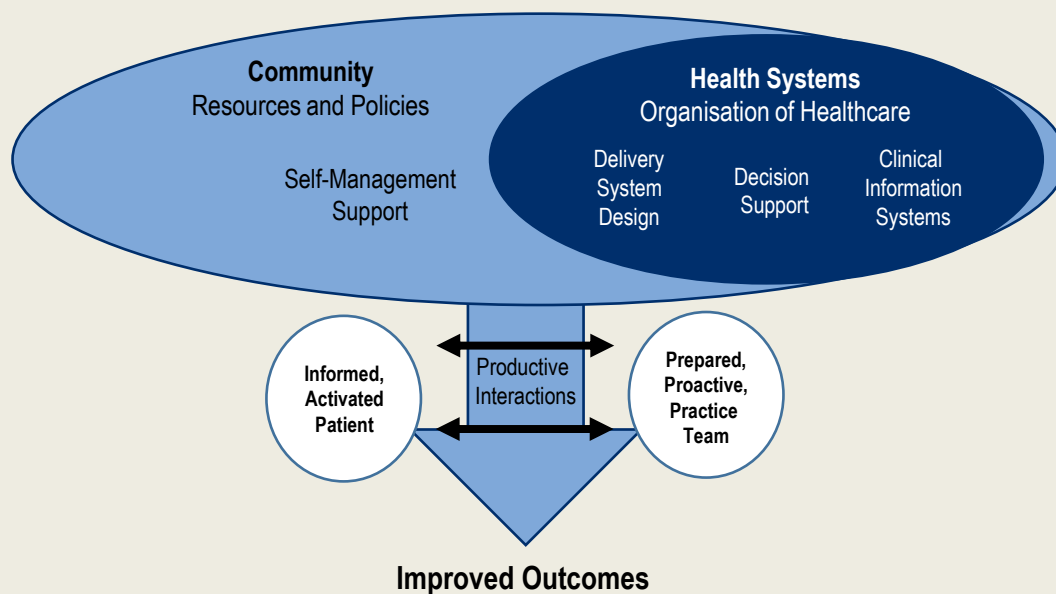
The integration in integrated care can happen in a variety of different ways and on a variety of different levels. Four common classifications include organisational, functional, service and clinical integration. The World Health Organization (WHO, 2016^[76]) provides a useful definition of these classifications. Organisation integration can be defined as "bringing together several organisations through co-ordinated provider networks and mergers" while functional integration means "integration of non-clinical and back-office functions through, for example, shared electronic patient records", service integration "integration of different clinical services at an organisational level by, for example, establishing multidisciplinary teams" and clinical integration is defined as "integration of care into a single and coherent process within/or across professions by means of, among others, using shared guidelines and protocols" (WHO Europe, 2016^[75]).

Integrated care can also be broken down by model type including the individual, disease-specific and population-based models. See Box 4.5 for more information on disease-specific models. Individual models of integrated care are focused on co-ordination of the care for the individual patient to facilitate appropriate delivery across the system. This usually focuses on high-risk patients with multiple conditions who need care from multiple health actors. Examples of this can include creating an individualised care plan with a care co-ordinator or assigning patients to case managers who manage a patient's care in the system and monitor progress. People-centred medical homes are another example. These organisations combine expertise from a range of health disciplines to provide comprehensive care to patients.

Box 4.5. Disease-specific care models

Among disease-specific models, the most well-known is that of the chronic care model (Figure 4.23). This model focuses on long-term preventive care rather than acute curative care for chronic disease. Within the model are six domains which should work together to support better outcomes including the community, the health system, self-management support, delivery system design, decision support and clinical information systems. Interactions between these domains work together to create a healthy environment and empowered patients.

Figure 4.23. The Chronic Care Model



Source: Adapted from Heerman, W. and M. Wills (2011^[77]), "Adapting models of chronic care to provide effective diabetes care for refugees", <http://dx.doi.org/10.2337/diaclin.29.3.90>.

Disease-specific models of care also exist which integrate care for the elderly and frail or specific diseases such as diabetes. Lastly, a number of population-based models integrating care exist such as that used by Kaiser Permanente, an integrated managed care consortium in the US. This model is based on providing services to the population covered by Kaiser through the use of risk stratification. Patients that fall into different risk categories based on patient characteristics and each category received specific support for health promotion, disease management or care co-ordination. A key to this model is an extensive information system that allows patients and providers to access information to manage care.

Many countries or regions are using integrated care strategies and case managers including the Program on Research for Integrating Services for the Maintenance of Autonomy (PRISMA) model in Canada for community-living individuals with impairment, or for older people living in the communities in regions of England (UK) and Italy. In Sweden, integrated pathways including all levels of healthcare are organised for specific diseases.

The Basque Country in Spain has implemented a number of integrated care principles for care co-ordination and structural integration, including merging hospitals and primary care structures into

Integrated Healthcare Organisations. New roles were also created such as liaison nurses and referral internists to co-ordinate and organise care and follow-up, and a tool has been developed to help chronic disease patients manage their own symptoms. The region in Veneto is also an example of a number of the principles of integrated care (see Box 4.6).

Box 4.6. The Veneto model of health care

The north-eastern Italian region of Veneto has been successful in responding to local health needs through a combination of strengthening primary care, integrating care, increased use of health technology, and increasing patient participation.

The regional health system in Veneto serves 5 million people and like many other OECD regions faces an ageing population and high rates of chronic disease. Roughly 20% of the population in the region is over 65 and 25% of the population lives with a chronic health problem. Despite these pressures, health spending in the region is lower than the Italian and OECD average, the incidence of cancer is decreasing and hospitalisation rates are also lower than average.

These positive results are due to a strong health system based on the principles of participation, healthy financing, integration of health and environment, inter-sectoral strategies and health promotion. In recent years, specific areas for action include primary care, integrating care using information-based assessments and team-based services.

Patient participation is one of the key principals of the system not only in caring for themselves but also in organising the system. The Veneto region organises open meetings with the public to receive ideas to integrate into health plans.

The primary care model is another key to Veneto's success. This model was developed through a participatory process including professionals, voluntary groups and citizens and is organised into GP groups designed to serve around 15 000 people, each providing a medical team with 24-hour support. Linking primary care to hospitals and co-ordinating care is facilitated by the use of local communication points (*centrale operativa territoriale*) which use a single information technology (IT) infrastructure to facilitate professional communication. To provide additional co-ordination and facilitate a people-centred approach are care managers which determine patients' needs and preferences and create care guides and actions plans with the patient and GP. Patient satisfaction with the care manager programme was extremely high with nearly 100% of patients noting that they were moderately or highly satisfied with the programme.

System flexibility is another key component of this health system and the needs and resources are constantly monitored and adjusted as health needs change. The region uses the Johns Hopkins adjusted clinical groups system which includes analysing disease, services and cost data to determine the most effective system responses in a timely manner.

Source: Based on WHO Europe (2016^[75]), "The Veneto model – A regional approach to tackling global and European health challenges", World Health Organization Europe.

Establishing integrated care is a multifaceted and long-term process. It is therefore difficult to provide systematic evidence of its effectiveness. Furthermore, some objectives of integrated care are not easily measurable and comparison cases are rare. There does exist however some examples of the effectiveness of integrated care in specific situations.

A review of the effectiveness of integrated care across OECD countries concluded that integrated care leads to an increase in patient satisfaction, increased perceived quality of care and increased or improved

patient access (Baxter et al., 2018^[78]). Other studies from North America found evidence that case-management and people-centred medical homes can reduce the number of hospital admissions and readmissions and case-management can improve patient satisfaction (Curry and Ham, 2010^[79]; Schram, 2010^[80]). A recent review of patient quality showed mixed results from integrated care interventions internationally. In general, interventions were typically found to be more effective in improving condition-specific quality of life scores rather than the global quality of life scores (Flanagan, Damery and Combes, 2017^[81]). Despite some positive indications on patient-reported measures, the evidence on the impact of care integration on cost and care outcomes remains inconclusive (Marino et al., 2018^[82]).

While the impacts of care integration continue to be studied, the WHO recommends the following aspects for successful integration: i) having a regulatory framework that encourages integration and integrated care; ii) having a financial framework that encourages integrated care; iii) providing support to innovative approaches to commissioning integrated services; iv) applying national outcome measures that encourage integrated service provision; and v) investing in continuous quality improvement including publishing the use of outcome data for peer review and public scrutiny (WHO Europe, 2016^[75]).

Innovative approaches for sustainable rural health care provision

Policies should focus on reinforcing primary and integrated care, ensuring access to quality health care and requiring the integration of innovative approaches to health care provision. More extensive use of telemedicine and mobile clinics, as well as new forms of hospital and care organisation, such as clinical networks and multi-disciplinary teams, are key to the sustainability of rural health care provision. These strategies have to be complemented with policies for workforce attraction that combine multiple ingredients including financial incentives, multi-disciplinary medical homes and sharing of responsibilities. This section discusses these approaches, while the next chapter goes deeper into how telemedicine services can benefit rural populations.

Exploiting the power of networks to expand and co-ordinate rural care

A number of OECD countries are working to reorganise care and care structures to ensure access to emergency services and prevent further hospital closings. A recent review of eight countries (Australia, Canada, Croatia, Estonia, Italy, Spain, the UK and the US) identified a range of policies in place to ensure rural emergency and hospital care (Rechel et al., 2016^[83]). Interestingly, only Italy had a national policy on hospitals in rural or remote areas while the rest either had no specific policy or left these decisions to subnational governments.

The use of rural-specific health centres was noted in both Australia and Canada. These centres provide a wide range of services including emergency services that are lacking in these areas. In the US, smaller rural centres providing emergency care are eligible for specific funding from Medicare. Besides these strategies, the most popular mechanisms for managing hospitals in rural regions involved organising hospitals into networks including the use of a hub-and-spoke model.

Clinical networks

A rural health care network can be defined as a group of three or more rural health providers and/or other stakeholders that join forces to address mutually agreed-upon needs in the community (Rural Health Information Hub, 2020^[33]). Clinical networks can be organised for any type of service from primary care to emergency or disease-specific care. The purpose is much like that of integrated care in that it seeks to improve outcomes for complex patient pathways by using an integrated, whole-system approach.

In rural areas, these networks can be useful by combining the resources of several hospitals in order to provide a range of services to the population while seeking cost savings from resource efficiencies in areas such as purchasing or administrative costs. Australia has established emergency medicine networks at

almost all levels. The NHS in the UK also sees hospital networks as a potential solution to the “small hospital problem” while hospital networks are growing in Estonia in order to share resources in a more organised way (Rechel et al., 2016^[83]).

Important ingredients for successful clinical networks include visionary and strategic leadership with strong links to external stakeholders and having formal infrastructure and processes to enable the development and management of work plans aligned with health priorities (McInnes et al., 2015^[84]).

Hub-and-spoke model

One of the most popular models of clinical network organisation and one perhaps most appropriate to rural care is that of the hub-and-spoke model. This model arranges care into a central “hub” hospital with a wide range of services and skills and small “spoke” hospitals with more limited services that provide basic care when necessary and refer more complex patients to the hub hospital. The advantage of this organisation is to retain the benefits of centralisation in the quality and efficiency of the hub without losing population coverage. Using this model, geographic access can be addressed by adding an additional “spoke” or “hub” hospital in underserved regions depending on the needs. However, the risks of implementing a hub-and-spoke model include: congestion at hubs; overextension of spokes; staff dissatisfaction at spokes; and transportation disruptions (Elrod and Fortenberry, 2017^[85]).

As one of the few countries with national legislation on hospital care in rural regions, Italy has established hub-and-spoke models for hospital care. These include four levels of hospitals, each with different capacities and built around a hub hospital with emergency and urgent care departments. Australia has also adopted this model for emergency care as patients are stabilised in smaller hospitals and transferred for more intensive care to larger central hospitals.

The theoretical benefits of hospital networks are many but the literature on the effectiveness and cost-effectiveness of these strategies remains inconclusive. The performance of these strategies is difficult to assess as they apply across a wide range of settings and different outcomes. Some success has been seen however with stroke care using hub-and-spoke models. Models of the financial impact of a hub-and-spoke network using data for the US found that a telestroke network with 1 hub and 7 spokes was associated with annual savings of USD 358 435 or almost USD 45 000 per hospital a year (Switzer et al., 2013^[86]).

A review of the literature on clinical networks more generally also found some evidence of effectiveness. Evidence indicated that these networks can be effective in improving quality of service delivery but some studies were limited by poor study design, making it difficult to implement network-wide changes to more complex processes such as care pathways. Qualitative studies also showed some positive impacts of networks provided that they were designed and managed effectively (Brown et al., 2016^[87]).

Reorganisation into multi-disciplinary teams

Many OECD countries are reorganising primary care around multi-disciplinary teams. These teams include not only general medical practitioners but may also include family physicians, registered and advanced nurses, community pharmacists, psychologists, nutritionists, health counsellors and non-clinical support staff. This mix of expertise includes access to social services and is particularly important to patients dealing with multi-morbidity.

Common elements of these multi-disciplinary teams are the focus on patient engagement in decision-making and the common use of sophisticated IT systems for risk stratification. The use of multi-disciplinary teams can have significant population health and system performance advantages. In the US, primary care medical homes have been found to improve care quality for a number of chronic conditions (Friedberg et al., 2015^[88]; Schuchman, Fain and Cornwell, 2018^[89]; Bates and Bitton, 2010^[90]), improved patient experience and increased staff satisfaction. See Box 4.7 for an overview of the multi-professional health centres in France.

Box 4.7. Better co-ordination of care: the case of multi-professional health centres in France

In France, Multi-professional Health Houses (*maisons de santé pluriprofessionnelles*, MSP) are multi-disciplinary structures where doctors and medical auxiliaries work in a co-ordinated manner. The idea is to create a space dedicated to the co-ordination of care as close as possible to the population through the sharing of skills. They allow better management of professionals' time, mutualisation of operating costs, greater attractiveness of under-endowed areas and maintenance of local public services. The Health Houses, which are financed from public funds, sign a multi-year contract with the Regional Health Agency (*Agence Régionale de Santé* in French) setting out their objectives and resources before any financial aid is paid out by the agency.

The Health Houses, together with the health centres (*centres de santé*), are a lever for improving access to care, particularly in rural areas and in priority urban policy neighbourhoods, and help to resolve the isolation of certain territories. They are above all local initiatives led by health professionals in conjunction with local elected representatives.

The Health Houses have legal personality and are made up of medical professionals, medical assistants and pharmacists (at least two general practitioners – or one on a temporary basis – and a medical assistant). These health professionals must draw up a health project attesting to the co-ordination of their practice, which must be submitted to the Regional Health Agency.

In 2017, France had approximately 910 Health Houses on its territory. In 2018, 3.2 million patients were treated in Health Houses, an increase of 33% compared to 2017, and 13 096 healthcare professionals were practising in a Health House, an increase of 34% compared to 2017. The enthusiasm for Health Houses should therefore be confirmed in the coming years with the government's objective of doubling their number by the end of 2022. Moreover, this determination has been shown in the "Strategy for the transformation of the health system" announced in February 2018, which clearly gives priority to the exercise of networks and co-ordinated care structures.

Source: Ministère de la Santé (2018^[91]), *Les chiffres clés de l'offre de soins*, https://solidarites-sante.gouv.fr/IMG/pdf/dqos_cc_2018_02_16_a_web_pages_hd.pdf.

Multi-disciplinary teams may also have significant scale advantages from lower transition costs, shared inputs such as equipment and human resources or communication technologies, and avoiding the duplication of services (Mousquès, 2011^[92]). They have also been linked to lower rates of emergency department visits and fewer hospitalisations for patients with chronic conditions (Schuchman, Fain and Cornwell, 2018^[89]; Bates and Bitton, 2010^[90]).

Finally, the exchange of information across rural health care actors and providers also needs to be fostered. Strategies such as the establishment of information networks can bring high returns for low investments and, besides increasing co-ordination, can increase the sense of ownership of rural health care actors. Box 4.8 discusses a related initiative in the US.

Box 4.8. Rural Health Information Hub (RHlhub)

The Rural Health Information Hub (RHlhub) is an information centre managed by the Center for Rural Health at the University of North Dakota covering rural health and related issues that have been in operation in the US since 2002. The goal of the hub is to help rural communities access the full range of programmes, funding, research and model programmes that can enable them to provide quality healthcare and promote the health of rural populations. RHlhub's audience includes anyone seeking to improve or maintain healthcare or promote population health in rural areas, including local-level healthcare and public health personnel, along with people working in state and national organisations, and government officials at all levels.

RHlhub provides a rich website of rural information – which can be found at ruralhealthinfo.org – along with a weekly email newsletter and a resource and referral service whereby it assists individuals with finding information and experts to answer their questions on rural health matters. In addition to providing information to rural stakeholders, RHlhub offers an online news magazine covering rural issues, models of what has worked in rural communities, evidence-based toolkits on implementing different types of rural projects, topic guides which serve as primers and bring information together from across the site on a variety of rural health issues, as well as data visualisations, and more. The website is widely used in the US rural health community, receiving over 2 million visits per year in recent years.

RHlhub works closely with a wide network of agencies, experts and rural health practitioners to ensure that the information presented on its site is accurate and as complete as possible. An example is the inclusion of timely information related to opioid use in rural areas, farmers' mental health and most recently, the COVID-19 pandemic.

Source: Presentation of Kristine Sande, associate director at the Center for Rural Health (CRH) at the University of North Dakota (UND) School of Medicine & Health Sciences in Grand Forks at the 24th WPRUR meetings, October 2020; personal communication.

Increasing access in rural areas with telemedicine and mobile clinics

Telemedicine, including teleconsultations, can also improve access by making health care services available to patients closer to their home or work. Available evidence associates telemedicine with improvements in access to care, reduced travelling costs and better equity for rural and Indigenous populations (Caffery, Farjian and Smith, 2016^[93]; Atherton et al., 2018^[94]; Oliveira Hashiguchi, 2020^[95]). Telehealth technologies can provide links between rural hospital and specialist doctors located in other areas thus allowing for high-quality specialist consultations for rural residents closer to home.

These advantages may be particularly beneficial to rural areas with low access and an older and poorer population requiring more co-ordination of multi-morbid conditions. The cost savings of telemedicine can also be substantial. A study for the rural region of North Karelia in Finland finds that increasing self-monitoring and remote consultancy in the treatment of type 2 diabetes (T2D) can reduce health care and travel costs from EUR 2.5 million to 1.1 million (a 56.3% reduction) (Leminen, Tykkyläinen and Laatikainen, 2018^[96]).

Telehealth can not only provide greater access to additional services but also greatly increase safe access to quality specialist doctors. This can also have benefits on rural health workers who may experience fewer demands and skill mismatches. Along with specialists, telehealth can be useful in providing diagnostic services or for emergencies such as stroke and in extraneous circumstances on rural hospitals like the ones brought by the COVID-19 pandemic. Chapter 5 discusses telemedicine in the context of digital service provision.

Mobile clinics can also provide services and increase primary care access particular among high-risk or rural populations (OECD, 2019^[4]). Mobile health clinics provide a wide range of primary care services (including preventive care, mental health or dental services) from a bus or a van equipped with all of the necessary technology to provide clinical services in underserved or disadvantaged areas. Increased screening, management of chronic diseases and access have already been noted by countries such as France, Latvia, Mexico and the US, which already use mobile clinics. Some rural areas in Germany and Portugal have implemented mobile health clinics to guarantee adequate primary care and help alleviate workforce shortages.

Overcoming workforce shortages

Initiatives to increase the performance of health systems including integrated care, primary care or even increased use of telemedicine cannot be effective without an adequate health workforce. Finding the right numbers of health workers with the right skills for current and future challenges has been difficult for many OECD countries facing an ageing health workforce, increased demands and changing skillsets. A wide range of strategies has been put in place to help improve this situation particularly in rural areas where workforce numbers are low.

Foreign recruitment

As the need for health providers rises, many OECD countries have turned heavily toward foreign recruitment as a tool to fill open positions. This strategy has proven to be effective and among the 18 OECD countries for which data are available from 2010/11 to 2015/16, the number of foreign-born doctors rose by over 20% or twice as much as the general growth rate in the number of doctors. As a result, the proportion of foreign-born doctors across these OECD countries rose by 3 percentage points to 27% in 2016. A similar trend can be seen for nurses with the number of foreign-born nurses increasing by 20% over the same period, bringing their share of the total nurse population to 16% (OECD, 2019^[97]).

While foreign recruitment has helped to meet the rising demand for doctors in many OECD countries, others are on the opposite end of this migration including many in Eastern Europe. Countries such as Estonia or Lithuania with high rates of migration face shortages due to this migration and are working to prevent uncontrolled migration (WHO, 2006^[98]).

Educational reforms

Along with foreign recruitment, education reforms are some of the most commonly used strategies to respond to the need for health workers, particularly in rural regions. A number of OECD countries have included provisions to admit medical students from rural regions. The expectation is that these students will be more likely to return to practice in rural regions following graduation. Australia and Japan, for example, have fixed minimum quotas for students with a rural background, sometimes accompanied by financial support provided to these students.

Often medical schools are located in urban centres and new doctors remain in these areas after graduation (OECD, 2016^[99]). In Canada, Japan and Norway, medical schools have established medical schools in rural or remote regions, with the expectation that more students graduating from these schools would remain in these regions afterwards. Additional education strategies to encourage rural medical practice can include clinical rotations, placements in rural regions, coaching or mentoring of students, and adaptation of curricula for rural health workers (EC, 2015^[100]).

Financial incentives

Providing financial incentives for practising in rural regions is another popular strategy to improve recruitment and retention. This can include lump-sum payments to facilitate installation and/or recurrent payments or bonuses such as general salary increases. In Germany, most states offer financial incentives for GPs who are opening their practice for the first time, with GPs eligible to a higher payment if they choose to locate in underserved areas. In Australia, the recent Workforce Incentive Program provides financial support for both individual doctors practising in rural or remote regions as well as general practices operating in these areas. These incentives grow as population density decreases and as the number of years of practice in these areas goes up. Box 4.9 discusses details on policies to attract doctors to rural areas in Germany and Australia.

Box 4.9. Incentives for rural doctors in Germany and Australia

The Care Provision Strengthening Act in Germany

Launched by the German federal government, the Act to Strengthen Care Provision in the Statutory Health Insurance System (Care Provision Strengthening Act) came into force in July 2015 and took effect at the beginning of 2017 with the aim of establishing integrated care programmes and providing easily accessible, universal and needs-based medical care.

The main objective of this act is to ensure an adequate supply of doctors in both urban and rural areas. More specifically, it seeks to strengthen the role of family doctors and reduce the pressure on doctors by delegating certain medical services to qualified non-physician professionals as practice assistants. In addition, hospitals in underserved areas have been able to assume more responsibility for medical care. An innovation fund has been put in place at the Federal Joint Committee, endowed with EUR 300 million annually (initially from 2016 to 2019), with the aim of promoting innovative care structures, facilitating inter-sectoral co-operation among care providers, reducing administrative barriers for integrated care programmes (ICPs) and stimulating evaluation and research in the delivery of healthcare services such as telemedicine or the provision of care in rural areas (EUR 75 million have been reserved for this section) (EC, 2016_[101]).

The act includes two measures to encourage physicians to settle in rural areas. First, German social health insurance (SHI)-accredited doctors' associations are implementing a series of measures to promote settlement in under-endowed areas or areas threatened by underuse. These measures include the organisation of counselling services and business start-up seminars, the introduction of security allowances, investment cost allowances and settlement allowances for the establishment or takeover of practices and branches, as well as turnover guarantees. Second, it includes measures to strengthen the training of physicians in rural areas. SHI doctors' associations have supported the implementation of clinical internships as well as residency periods in rural areas. The same associations have also granted scholarships to medical students who have undertaken to work in rural areas with the support of local and state governments and introduced a "rural doctor quota" linking the allocation of study places to future employment in rural areas (a commitment of 10 years after their studies is required at the risk of paying a fine of EUR 250 000) (Milstein and Blankart, 2016_[102]; *Ärzteblatt.de*, 2020_[103]).

Providing financial incentives for rural doctors in Australia

Implemented in early 2020, the Workforce Incentive Program (WIP) provides targeted financial incentives to both doctors and general practices to encourage service delivery in rural and remote areas. The WIP seeks to address workforce maldistribution and give patients in rural and remote areas improved access to quality medical, nursing and eligible allied health service.

Financial incentives are based on both the level of rural/remoteness and the number of years providing service with increasing years and remoteness leading to higher payments. Doctors providing care in the most remote areas are eligible to receive an annual payment of up to AUD 60 000. Eligible medical practices can receive incentives of up to AUD 125 000 per year depending on the practice size and hours worked by professionals in the practice. In addition to the WIP, a rural loading between 20% and 50% is applied to incentive payments to practices depending on the level of remoteness. A special focus of the WIP is strengthening team-based and multi-disciplinary models of care enabling collaborative arrangements to better support community needs.

Source: EC (2016_[101]), *Germany: Health Care & Long-Term Care Systems*, https://ec.europa.eu/info/sites/info/files/file_import/joint-report_de_en_2.pdf (accessed on May 2020); Milstein, R. and C. Blankart (2016_[102]), "The Health Care Strengthening Act: The next level of integrated care in Germany", <https://doi.org/10.1016/j.healthpol.2016.04.006> (accessed on 15 May 2020); Ärzteblatt.de (2020_[103]), "Landarztquote in Baden-Württemberg wird konkret", <https://www.aerzteblatt.de/nachrichten/116826/Landarztquote-in-Baden-Wuerttemberg-wird-konkret>.

Shifting responsibilities

Shifting responsibilities for medical professionals is another way to overcome workforce shortages. Expanding the responsibilities of local nurses and other local health workers can alleviate a shortage of doctors in rural areas. This approach is referred to in the Care Provision Strengthening Act in Germany law, discussed in Box 4.9. Along with increasing the professional health workforce, some countries are recognising and encouraging the contributions of informal caregivers such as family members. In Australia, Germany and the UK, financial incentives for these informal caregivers are in place.

Combining strategies

Rather than individual strategies, evidence shows that the most effective approach to the issues of rural workforce shortages is to combine strategies (EC, 2015_[100]). For instance, in 2012, the French Ministry of Health and Social Affairs launched the Health Territory Pact to promote the recruitment and retention of doctors in underserved areas. This pact includes a wide mix of measures to encourage the establishment of young doctors in underserved regions including financial incentives, the creation of new multi-disciplinary medical homes allowing physicians and other health professionals to work in the same location, the promotion of telemedicine and a sharing of responsibilities with other local health care providers (OECD, 2016_[99]).

Conclusion

This chapter outlined a number of potential strategies to bring a place-based approach to improving the performance of the health system and adapt to the higher and increasing demand for health care in rural communities. Place-based policies focusing for instance on improving primary care in areas with low accessibility can have positive trickle down effects on the health system through reduced needs for more complex and costly interventions. From a national perspective, while investments in rural health must be aligned with potentially competing health system goals, place-based policies can not only help reducing inequalities, but can also represent cost savings for the health system at large.

The majority of OECD countries include the idea of equity in their guiding principles for constructing health systems. This idea is also included in the majority of evaluation frameworks for the performance of health systems as well as integrated into the idea of universal health coverage. Equity in health is the idea that the entire population should have a fair opportunity to be healthy regardless of factors such as income or gender. Efficiency is also a guiding principle of health system performance that supports health systems

providing the maximum amount of health goods or maximising good outcomes. In rural areas, these two principles can come into conflict. Following the principle of equity would mean providing health resources close to patient homes even in the most remote areas. The principle of efficiency would deem this health provision inefficient due to the fundamental inefficiencies of providing healthcare in these areas.

Countries have adopted different approaches to this dilemma. The Australian government has spent considerable resources toward maintaining a basic level of medical care in remote regions from financial incentive to special training programmes. In other countries such as Spain where rural and non-rural health disparities are less pronounced, the density of the population is not even considered in the hospital classification systems. In Canada, stipulations that hospital care must be provided without financial barriers and on uniform terms and conditions has been interpreted to mean that rural and remote residents do not have a right to immediate local access but reasonable access to hospital care located elsewhere. In the UK, the NHS recognised the fundamental inefficiencies of rural care and has developed a financial system to maintain access despite this extra cost.

A direct approach to increase the efficiency of health care provision is to reduce expenditures by cutting coverage and workforce. The available evidence suggests that the measures introduced as part of reforms following the global financial crisis of 2008 led to increases in inequality in the provision and worsening of health care outcomes in rural areas. A more nuanced approach would combine direct cost-saving strategies with multiple strategies to increase the scale and scope of healthcare provision in rural areas, such as the introduction of clinical networks and hub-and-spoke models of provision. These strategies will be in vain without active and continuous efforts to overcome workforce shortages in rural areas that combine multiple strategies including financial incentives, educational reforms and rethinking health care provision and the organisation of medical teams.

Finally, the geographically disaggregated data needed to do a proper evaluation of the provision of quality health care in rural areas is currently not complete. While this chapter tried to combine national data with available statistical evidence for regions and rural areas, it also identified the need for better territorial statistics on all aspects of health care: quality, cost and access.

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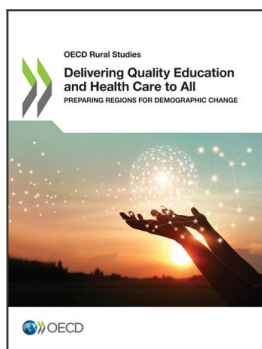
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Notes

¹ In a recent review of the impact of hospital size on quality outcomes in OECD countries, authors removed over 40% of hospitals from the analysis because the case numbers were insufficient to merit comparison (Lalloué et al., 2019^[28]).

² Unemployment had a variable impact on hospital admission depending on the severity of austerity measures: countries with moderate cuts were still able to provide care to those who needed it (the unemployed) while those with higher cuts lacked this capacity countries (van Gool and Pearson, 2014^[56]).



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