**Partnership for Health System Sustainability and Resilience**

LSE

# Building Sustainable and Resilient Health Systems

## Authors

Daniel Gocke, Charlotte Johnston-Webber, Alistair McGuire, George Wharton,
Department of Health Policy, London School of Economics and Political Science

Design and editorial support by Sarah Moncrieff

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LSE Consulting
LSE Enterprise Ltd
London School of Economics and Political Science
Houghton Street, London, WC2A 2AE

(T) +44 (0)20 7106 1198
(E) consulting@lse.ac.uk
(W) lse.ac.uk/consultancy

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# Introduction

## Health system sustainability and resilience amid multiple crises

COVID-19 exposed vulnerabilities in health systems worldwide. Far from being a near miss for health systems, its impact has accelerated the development of accumulating stresses that are reaching crisis proportions in many countries. Health systems face multiple threats, including climate change, conflict, economic instability and emerging infectious diseases. Underlying challenges, such as the rise of non-communicable diseases, driven by socioeconomic, demographic and environmental factors, continually ratchet up the pressure on overstretched services and workforces. Much of the world's population still lacks routine access to essential medicines and health services.

Despite the experience gained, the investments made, and the countermeasures now in place, many health systems are now in a much more perilous state than they were before the pandemic began. Without corrective action we risk our health systems entering a protracted process of decline, leaving them less able to meet populations' needs, and more vulnerable to future crises. We cannot afford to delay the action needed to strengthen them.

## The Partnership for Health System Sustainability and Resilience

A dual focus is needed, emphasising both resilience in the face of shocks and stresses, and sustainability amid longer-term demographic, social, technological, economic and environmental changes. This conviction motivates the **Partnership for Health System Sustainability and Resilience (PHSSR)** a collaboration between AstraZeneca, KPMG, the London School of Economics and Political Science (LSE), Royal Philips, the World Economic Forum, the Center for Asia-Pacific Resilience & Innovation (CAPRI) and the WHO Foundation. Launched in 2020, the Partnership's goal is to improve global health by providing evidence to inform policy, leveraging the complementary strengths of the partners to promote dialogue and action to strengthen health systems.

**Table 1: PHSSR definitions of health system sustainability and resilience**

| Health system sustainability | A **sustainable** health system improves population health by continually delivering the key functions of providing services, generating resources, financing and stewardship, incorporating principles of financial fairness, equity in access, responsiveness and efficiency of care, and does so in an environmentally sustainable manner. |
|---|---|
| Heath system resilience | A **resilient** health system is able to prevent, respond to, manage the health system impact of, and recover and learn from, acute and chronic crises (including, but not limited to, pandemic threats, climate change and economic and technological shocks), minimising their short- and long-term impacts on health, social and economic wellbeing. |

Since its launch in 2020, PHSSR completed health system assessments in 16 countries and regions, with four further reports close to completion (Figure 1). The findings from these reports have contributed to this summary report, with the exception of the report on Abu Dhabi. A further seven country reports have been initiated in 2023. PHSSR has also driven engagements around health system strengthening in several other countries, reaching a total of over 30 countries worldwide. PHSSR is no longer active in Russia.

PHSSR's country reports are guided by a qualitative assessment framework developed by LSE and CAPRI. They offer a valuable contribution to the analysis of health systems across seven domains: governance, financing, workforce, medicines and technology, service delivery, population health, and environmental sustainability (Figure 2). In each country, the recommendations made in the reports inform sustained engagement with policymakers and health system stakeholders.

As PHSSR looks forward to growing the partnership, extending its geographic scope, and building on its programme of research and policy engagement, this report provides a synthesis of its findings to date.

**Figure 1: Geographical coverage of PHSSR country reports, 2020–2022**



Phase 1 countries    Phase 2 countries
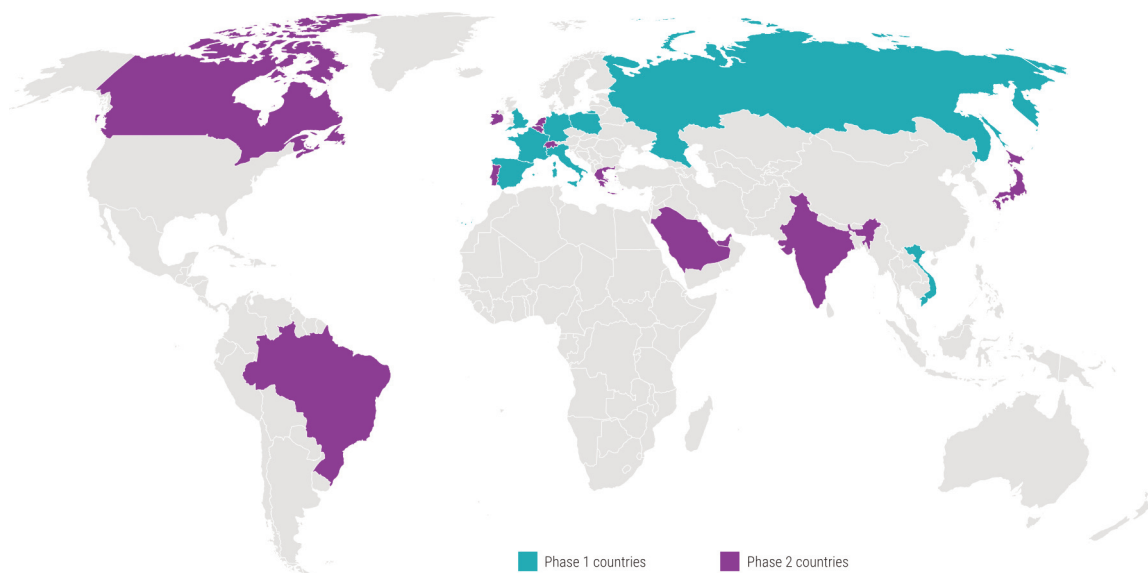
Note: PHSSR published reports on England, France, Germany, Italy, Poland, Russia, Spain, and Vietnam in its pilot phase 1 (2020–2021). In its second phase (2022–2023), it has published reports on Belgium, Canada, Greece, Ireland, Japan, the Netherlands, Portugal and Switzerland, with reports forthcoming focussing on Abu Dhabi, Brazil, India and Saudi Arabia. For its third phase (2023–2024), PHSSR has initiated a further seven country reports in Egypt, Malaysia, the Pacific Islands, Singapore, South Korea, Taiwan and the USA.

The country reports are available at phssr.org/findings.

## Table 1: countries and research teams

| Country | Research Lead |
|---------|---------------|
| **PHASE 1 (2020–2021)** | |
| England | Mr Nigel Edwards, Chief Executive, Nuffield Trust, London |
| France | Dr Zeynep Or, Research Director, Institute for Research and Information in Health Economics (IRDES), Paris |
| Germany | Dr Wolfgang Greiner, Professor of Health Economics and Healthcare Management, University of Bielefeld |
| Italy | Dr Americo Cicchetti, Professor of Healthcare Management, Catholic University of the Sacred Heart, Milan |
| Poland | Dr Iwona Kowalska-Bobko, Director of the Institute of Public Health, Professor of Health Sciences, Jagiellonian University, Kraków<br><br>Dr Małgorzata Gałązka, Director, Institute of Management in Health Care and the Centre of Value-Based Healthcare, Lakarski University, Kraków |
| Russia | Dr Elena Aksenova, Director, Institute for Healthcare Organisation and Medical Management, Moscow |
| Spain | Dr Guillem López Casasnovas, Professor of Economics, Universitat Pompeu Fabra, Barcelona<br><br>Mr Jesús María Fernández Díaz, Founder and CEO, HIRIS |
| Vietnam | Dr Tran Thi Mai Oanh, Director, Health Strategy and Policy Institute (HSPI), Hanoi |
| **PHASE 2 (2022–2023)** | |
| Belgium | Professor Lieven Annemans, Ghent University |
| Brazil | Professor Adriano Massuda, Getulio Vargas Foundation, Rio de Janeiro |
| Canada | Dr Sara Allin, University of Toronto |
| Greece | Dr Kostas Athanasakis, University of West Attica, Athens |
| India | Dr Oommen Kurian, Observer Research Foundation, Delhi |
| Ireland | Professor Steve Thomas, Trinity College, Dublin |
| Japan | Professor Hiroaki Miyata, Keio University, Tokyo |
| Netherlands | Professor Eric Schut and Professor Marco Varkevisser, Erasmus University, Rotterdam |
| Portugal | Professor Mónica Duarte Oliveira, Instituto Superior Técnico Lisboa |
| Saudi Arabia | Dr Hisham Badreldin, King Saud bin Abdulaziz University for Health Science, Riyadh |
| Switzerland | Professor Simon Wieser, Zurich University of Applied Sciences |
| Abu Dhabi | Dr Juan Acuna, Khalifa University, Abu Dhabi |

**Figure 2: PHSSR framework domains**



## The contribution of this report

Recent reports from the World Bank, the OECD, the European Observatory on Health Systems and Policies, and others have made a major contribution to our understanding of what makes health systems sustainable and resilient, and there is a growing body of academic literature on the subject of health system resilience in particular, including studies into it can be measured and incorporated into health system performance assessment frameworks (World Bank, 2022a; OECD, 2023a; Thomas S, 2020; Fleming P, 2022).

PHSSR's country reports offer qualitative analyses of health systems' strengths and weaknesses in relation to sustainability and resilience. While their primary purpose is to provide an in-depth analysis of each country's health system, they each offer insights which are of broader relevance. By synthesising the findings from these country reports, this overarching report aims to facilitate a deeper understanding of the challenges faced by a diverse group of health systems, identifying strategies and recommendations for health system strengthening relevant beyond the countries studied. The report does not aim to provide a comprehensive summary, but rather to highlight the most prominent themes and recommendations across the country reports.

The report is organised into chapters by domain, with each chapter first reviewing challenges identified in the reports, before moving onto strategies and recommendations for strengthening sustainability and resilience. However, recognising the interconnected nature of the domains, we emphasise the importance of a holistic approach to health system strengthening. Tackling challenges in one domain often impacts the others, and coordinated action across all domains is crucial for building resilient and sustainable health systems. Thus, common themes, such as the need to make better use of data, foster inter-sectoral collaboration, and strengthen prevention, are identified across multiple domains.

However, it is also vital to recognise that health system reform is only one part of the puzzle. Healthcare is one of a spectrum of social and environmental protections that are needed for a healthy population, society and economy. Nonetheless, we hope that these findings can contribute to collaborative learning processes to help inform policy and decision-making, allowing for more effective and efficient strategies for health system strengthening. In doing so, PHSSR aims to contribute to a healthier, more resilient, and prosperous future for all.

# Executive summary

Key messages and recommendations by domain

The following summaries are based on a synthesis of the findings of PHSSR's individual country reports. For each domain, we provide a brief summary of key messages, followed by a series of recommendations drawn from across the country reports. The body of this report provides a more detailed exploration of each theme.

# Governance

## Overview

Health system governance encompasses a broad range of steering and rule-making functions carried out by governments and decision makers to achieve national health policy objectives. Far from being a mere administrative function, governance is a critical determinant of health system performance and health outcomes, with a profound influence across each of the other domains, and thus on a health system's overall sustainability and resilience.

PHSSR's country reports assess health system governance, focusing on governance structure, leadership, multilevel governance, accountability, integrity and trust, pandemic preparedness, and policy evaluation and learning. The reports examine the roles and responsibilities of key health system actors, the quality of decision making, effectiveness of public health agencies, and the impact of societal factors on health governance. The reports also assess the devolution of governance to local levels, the inclusivity and transparency of decision-making, and the system's adaptability based on lessons learned from prior crises.

## Key messages

- Effective leadership with a long-term perspective is crucial for sustainable and resilient health systems, but weaknesses in strategic direction hinder progress in many countries. Political and budgetary cycles impact policy planning, and high turnover rates in leadership positions disrupt health system reforms.

- Governance effectiveness is often limited by short-termism, bureaucratic politics and downstream barriers to implementation. Clarity of purpose in health policy, such as legislation enshrining principles of solidarity and equity, can underpin progress in addressing health challenges.

- There are issues of coordination in almost all PHSSR countries between institutions in central government, between central, regional and municipal governments, between levels of the health system, and between the public and private sectors.

- Striking the right balance between centralisation and decentralisation is a challenge, with advantages and complications observed in different countries. Collaboration between sectors, including public-private partnerships, enhances health system resilience and response to crises.

- Deficits in transparency, public engagement, and accountability remain widespread, eroding the trust in health systems that is so vital for their functioning and their ability to respond to crises.

- Use of data and evidence is crucial for informed decision-making, but despite significant progress during COVID-19, operational barriers and deficits in data quality and analysis pose continuing challenges.

- Policy evaluation is essential for continuous improvement, but systems for evaluation are often inadequate, with inconsistent, ad-hoc approaches prevalent.

## Governance recommendations

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| **Develop long-term strategies and policy continuity** | ■ Ensure stable, visionary leadership to steer healthcare systems towards long-term goals: reduce ministerial turnover and promote merit-based appointments to create an environment that fosters continuity and progress.<br><br>■ Implement formal mechanisms to establish a whole-of-government approach, in which health is taken into account in all policies.<br><br>■ Develop coherent, long-term strategies that secure political commitment and resources to address current and future health challenges, prioritising continuity in policy implementation.<br><br>■ Establish plans informed by socioeconomic, demographic and epidemiological trends, focussing on a broad array of diseases and associated health and care needs. |
| **Address fragmentation and coordination challenges** | ■ Streamline governance structures to minimise overlaps and redundancies, and ensure clear roles and responsibilities for each level of government in terms of healthcare delivery.<br><br>■ Find the optimal balance between centralisation and decentralisation to ensure efficient allocation of resources, equitable access to healthcare, and effective coordination between central and regional authorities.<br><br>■ Foster collaboration between primary care, hospital care, and social services at the local level to enhance the integration of care and improve the efficiency of healthcare delivery.<br><br>■ Build and nurture successful public-private partnerships to mobilise resources, expertise and innovation to address complex health challenges. |
| **Promote transparency and public engagement** | ■ Promote transparency to improve accountability and ensure that health policies and programmes are responsive to the needs and preferences of the population.<br><br>■ Encourage social participation and incorporate patients' voices in health policy development and implementation to enhance the legitimacy and effectiveness of health policies and programmes.<br><br>■ Establish formal channels for public and patient feedback at the provider level, to ensure that healthcare decisions are informed by the experiences and perspectives of those directly affected. |
| **Harness data and evidence** | ■ Establish national strategies for digitalisation and data-driven decision-making to improve the overall performance of health systems.<br><br>■ Collect and analyse data for policy evaluation and redesign, and harness the power of data to inform evidence-based decisions.<br><br>■ Regularly monitor and evaluate health policies and programmes, and use evidence-informed policymaking to identify areas for improvement and facilitate evidence-based course corrections. |

# Financing

## Overview

Financing healthcare is of paramount importance to ensure the resilience and sustainability of health systems, shaping the health system's ability to sustainably provide comprehensive, quality care, provide financial protection and demonstrate resilience in the face of health crises and changing population needs. Financing mechanisms should provide universal coverage, protecting populations from the financial risks of ill health while ensuring that scare resources are deployed equitably and to best effect, and that provider incentives are aligned with health system goals.

PHSSR's country reports evaluate health system financing, investigating fiscal sustainability, revenue generation, spending, coverage, resource allocation, and provider payments and crisis preparedness. They scrutinise the balance between healthcare demands and financial resources, the fairness and efficiency of health expenditure, and the adequacy of emergency financing. Additionally, the reports evaluate payment methods for providers and the implementation of value-based payment models. Each of these elements is pivotal for ensuring the system's resilience and sustainability in providing quality care amidst evolving population needs and health crises.

## Key messages

- Adequate public funding is crucial for achieving financial security and universal health coverage, but disparities exist in public spending on health among countries.

- Austerity policies have slowed spending growth and undermined health system capacity in many countries, leading to reduced access to essential services and eroding resilience.

- Even in countries with a commitment to universality, out-of-pocket payments and coverage exclusions create inequities in access to needed care. Progressively financed, targeted reforms are needed to ensure sustainable financing and alleviate financial barriers to access.

- In many countries, payment and resource allocation mechanisms remain misaligned with health system objectives. Value-based care remains an aspiration rather than a reality where systems rely upon crude budgets and activity-based payment models.

- Aligning financial incentives for cooperation between providers, with shared accountability for outcomes, can help to improve efficiency, quality and responsiveness of care.

- Across our sample of countries, health systems rely heavily on expensive secondary care. Addressing this will require a greater emphasis on certain services that are often underfunded relative to the hospital sector, for example public health, primary care and mental health.

- As the population of patients with complex needs increases, ensuring coordination of care becomes ever more important to its quality and efficiency. Although there are positive examples among our sample of countries, progress overall has been slow.

- Making additional resources available was critical to the COVID-19 pandemic response but relied largely on ad-hoc approaches. Defined systems for emergency financing will provide confidence that health systems will be adequately resourced to respond to future crises.

## Financing recommendations

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| **Financial sufficiency, stability and progressivity** | ■ Implement solidaristic financing mechanisms and increase progressivity of revenue collection, with a focus on reducing out-of-pocket costs, particularly for primary and preventative services.<br><br>■ Secure public financial resources in social health insurance systems by diversifying financing, including through consumption taxes on health-damaging products.<br><br>■ Adopt multi-annual budgets based on long-term projections of population health needs, and periodically reassess health benefits. |
| **Financing and resource allocation** | ■ Ensure resource allocation criteria take into account the need to eliminate disparities in access to care, considering geography, demography, socioeconomic factors, epidemiological trends and healthcare infrastructure.<br><br>■ Maximise allocative efficiency through explicit priority-setting, utilising health technology assessment to define a health benefits package that is reflective of population health needs and preferences, and available resources.<br><br>■ Improve risk equalisation mechanisms between insurers to reduce incentives for risk selection and ensure equitability. |
| **Payment systems and incentives** | ■ Reduce reliance on crude budgets and fee-for-service payments, expanding outcome- and value-based financing mechanisms to align provider incentives with broader health system goals.<br><br>■ Encourage integrated and bundled payment methods to promote providers' shared accountability for patients' long-term outcomes.<br><br>■ Enable local flexibility in provider payment mechanisms to encourage responsiveness to population needs.<br><br>■ Encourage collaboration among providers and insurers while counteracting strategic anticompetitive agreements. |
| **Address specific areas of underfunding** | ■ Centralise patient access to benefits and harmonise coverage across different diseases.<br><br>■ Promote access to healthcare for socially vulnerable populations by eliminating financial barriers to access, particularly for preventative and primary health care services.<br><br>■ Expand access to underfunded services such as long-term care, preventative dental care and mental health. |
| **Emergency financing** | ■ Perform budget prognoses based on diverse crisis scenarios and adapt planning accordingly.<br><br>■ Establish resources and risk evaluation methods for emerging infectious diseases.<br><br>■ Evaluate and reconsider financial risk sharing during pandemics.<br><br>■ Create specific mechanisms, such as reserve funds, for public health emergencies. |

# Workforce

## Overview

Healthcare provision is labour-intensive and having sufficient numbers of highly trained and motivated healthcare professionals is vital to the resilience and sustainability of a health system. Healthcare systems which are adequately staffed will be much better placed to absorb the impact of a crisis, and respond to surges in demand.

PHSSR's country reports emphasise the importance of a robust healthcare workforce for health system sustainability and resilience. They examine both long-term planning and emergency preparedness, ensuring sufficient numbers and a balanced mix of specialists and generalists. Attention is given to task shifting for flexibility and the provision of adequate resources and support to all healthcare workers. Prioritising the safety and wellbeing of healthcare personnel, particularly during crises, and retaining beneficial practices from crisis responses are key considerations. These elements are integral for creating a resilient and adaptable health workforce.

## Key messages

- Many PHSSR countries reported that a lack of comprehensive workforce data and integrated, long-term workforce planning has been detrimental to health system sustainability and resilience.

- Workforce imbalances were reported across almost all countries, undermining equity of service provision, disproportionately affecting vulnerable and socio-economically deprived populations.

- There is an urgent need to improve the working conditions of healthcare staff. Demanding workloads, poor job security, and limited career prospects are leading to low motivation, burnout, high turnover rates and attrition of staff. Rising rates of anxiety and depression were reported by several PHSSR countries.

- Limited interprofessional collaboration and a siloed approach to healthcare is reported as an impediment to service efficiency and effectiveness.

- Most countries are not harnessing the full potential of health technology to free up clinical time from routine tasks, thus reducing workload and improving job satisfaction.

- Digital health and new delivery models are bringing changes to the roles of healthcare workers. Training and continuing professional development should prepare staff for the adaptations needed.

- The COVID-19 pandemic stimulated efforts to facilitate task-shifting. However, in many countries rigid competencies hinder professional flexibility, impeding the resilience of the workforce.

- Multiple country reports highlight that addressing the workforce crisis will require long-term investments in medical education and training programmes.

## Workforce recommendations

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| **Improve workforce planning and data infrastructure** | ■ Develop a comprehensive national health workforce database to track workforce trends, skills, and capacity.<br><br>■ Implement data-driven workforce planning tools to predict future healthcare demands and workforce requirements.<br><br>■ Conduct regular assessments of healthcare workforce competencies and skill gaps to inform training programmes.<br><br>■ Establish a national health workforce planning and coordination body to oversee and harmonise human resources strategies across the health sector. |
| **Prioritise workforce planning for specific care settings and models** | ■ Develop targeted workforce strategies for primary and community care settings, addressing staffing levels, skills mix, compensation and professional development opportunities.<br><br>■ Implement policies and incentives to encourage healthcare professionals to pursue careers in underserved areas, including loan forgiveness, housing assistance, and enhanced professional development opportunities. |
| **Enhance working conditions and compensation** | ■ Implement evidence-based, performance-driven compensation models to reward healthcare workers fairly and incentivise quality.<br><br>■ Create comprehensive healthcare worker retention strategies, addressing workload, work-life balance, and career progression.<br><br>■ Develop standardised, competency-based job descriptions and career ladders to facilitate professional development. |
| **Support healthcare worker well-being** | ■ Create comprehensive workplace wellness programmes, including mental health support services, stress management resources, and access to counselling for healthcare workers.<br><br>■ Develop and implement evidence-based interventions to mitigate workplace stressors, improve work environments, and reduce burnout among healthcare professionals.<br><br>■ Provide basic amenities at work, like affordable food and rest areas for those working long shifts. |
| **Expand and optimise scope of practice** | ■ Implement policy and regulatory changes to enable task shifting and expanded scopes of practice for healthcare professionals such as nurse practitioners and physician assistants.<br><br>■ Invest in the development and integration of new healthcare roles, such as community health workers and digital health navigators.<br><br>■ Give healthcare workers a stronger voice in decision making, to foster a sense of ownership and commitment to the healthcare system. |

## Workforce recommendations (continued)

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| **Invest in education and training** | ■ Expand funding for access to medical education and training programmes, including scholarships, loan forgiveness, and grants.<br>■ Develop targeted initiatives to increase access to medical education for underrepresented and disadvantaged communities.<br>■ Enhance training in telemedicine, interprofessional collaboration, and chronic disease management to better prepare healthcare professionals for emerging challenges. |
| **Promote innovative solutions and technology** | ■ Implement telemedicine and digital health solutions to support healthcare workers in delivering care efficiently and effectively.<br>■ Invest in development and adoption of labour-saving technologies, such as robotics, remote monitoring devices, and electronic health records.<br>■ Foster a culture of innovation and continuous learning to encourage adoption of advanced technologies into care delivery. |
| **Enhance collaboration and integration within healthcare teams** | ■ Develop interprofessional education and training programmes to foster collaboration and teamwork among healthcare professionals from diverse disciplines.<br>■ Implement policies and regulations that facilitate the integration of diverse healthcare professionals into teams, ensuring a patient-centred, coordinated approach to care. |

# Medicines and technology

## Overview

Medicines and technologies are central to the sustainability and resilience of health systems, playing a pivotal role in both routine healthcare and crisis response. They serve as vital tools in preventing, detecting and treating disease, enabling early intervention and preventing complications. Digital health technologies can enhance process efficiency, data collection, remote care provision, and crisis responses. Nevertheless, medicines and technology also introduce challenges including high costs, infrastructure and training needs, and data security issues, necessitating a balanced approach for sustainable health systems.

PHSSR's country reports emphasise a holistic approach to the adoption of medicines and health technologies, incorporating economic evaluations and considering the timeline for adoption. The framework also highlights the importance of effective regulation and reimbursement of digital services and the use of digital tools and data for disease prevention and policy formulation, as well as its ability to leverage digital health services during crises. They acknowledge the need for a robust research and development ecosystem, and the necessity of a secure supply chain, including emergency stockpiles and collective purchasing agreements. Assessments of past responses to supply shortages during crises like the COVID-19 pandemic are also explored.

## Key messages

■ Across the PHSSR sample of countries there was significant variation in the availability and adoption new medicines and technologies leading to inequities within and between countries.

■ Health technology assessment (HTA) provides vital evidence for clinical benefits and cost-effectiveness, enabling prioritisation and adoption of new technologies, but is not without challenges. These include inconsistent application, potential bias and delays in products to become available post marketing approval.

■ The introduction of more flexible approaches is suggested to facilitate rapid access to new treatment options, which de-risk investment without compromising on evidentiary standards.

■ Medicines and technologies constitute a considerable proportion of total health expenditure. Balancing cost containment and innovation is crucial for sustainability, requiring cost-control strategies that do not stifle innovation or compromise patient access to necessary treatments.

■ There is significant variation in the availability, completeness, and utilisation of health data across countries. Interoperability of digital systems, which is vital for improving coordination across different health sectors, remains a significant challenge.

■ A lack of digital skills among both patients and healthcare workers were reported as a hindrance to the optimal use of health data systems and digital health technologies.

■ The capacity for vital research and development of innovative medical and technical solutions is variable between the PHSSR countries, with some reporting a recent reduction in such activities.

■ Security of supply of medicines and essential medical equipment is highly variable. The COVID-19 pandemic revealed inadequacies in supply chains, emphasising the need for robust crisis preparedness plans and international collaboration.

## Medicines and technology recommendations

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| **Improving access to medicines and technologies** | ■ Develop a national pharmaceutical policy with broad stakeholder input, addressing pricing, reimbursement, and access to medicines.<br><br>■ Establish a centralised framework and mechanism for analysing health technology utilisation, outcomes data, and cost-effectiveness.<br><br>■ Establish an independent and autonomous national agency for health technology assessment (HTA) to conduct evidence-based evaluations.<br><br>■ Improve HTA processes to ensure timely, evidence-based decision-making, balancing cost control with provisions to enable rapid access to beneficial innovations.<br><br>■ Review and reform medicine and technology co-payment policies to reduce out-of-pocket expenses. |
| **Addressing gaps in digital health and systems gaps** | ■ Improve patient and provider access to electronic health records (EHRs) and unique patient identifiers.<br><br>■ Create clear regulations on the interoperability of digital systems across healthcare providers and government systems.<br><br>■ Implement a nationwide data integration system across healthcare providers, including nursing homes.<br><br>■ Develop automated data extraction tools from health records and hospital systems for surveillance purposes. |
| **Strengthening digital governance and infrastructure** | ■ Establish a central organisation responsible for overall governance of digital health programmes.<br><br>■ Develop a roadmap for increasing technical and operational readiness for a universal EHR system.<br><br>■ Create comprehensive privacy and security guidelines for digital health systems such as EHRs, including user access controls.<br><br>■ Develop a national strategy for telemedicine and virtual care services implementation, including reimbursement models and quality standards. |
| **Boosting digital skills and technology adoption** | ■ Design targeted digital skills training programmes for patients and healthcare workers.<br><br>■ Allocate specific budget for IT support specialists and data scientists in hospitals.<br><br>■ Identify and promote digital health technologies that provide value for the public based on robust evidence. |

## Medicines and technology recommendations (continued)

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| **Supporting innovation and research & development** | ■ Increase funding for academic incubators and support the translation of health research into real-world applications.<br><br>■ Address barriers to the access and utilisation of health data for R&D within a clear regulatory framework.<br><br>■ Prioritise R&D investments in pharmaceuticals and health technologies on areas of greatest need. |
| **Ensuring security of supply** | ■ Implement a unified procurement services platform accessible to both public and private healthcare sectors.<br><br>■ Develop a national strategy to address gaps in prescription drug coverage and support alignment of public drug formularies across regions.<br><br>■ Create a secure and efficient system for patients to access hospital medicines through home delivery or nearby pharmacies.<br><br>■ improve security of supply by establishing strong, diversified supply chains for essential medicines and medical technologies.<br><br>■ Establish minimum stock requirements for essential medicines and medical supplies to ensure availability during emergencies, integrating stockpiles with national supply chains to reduce waste. |
| **Fostering international cooperation** | ■ Develop partnerships with international organisations to share best practices, gather evidence on cost-effectiveness, and support R&D investments.<br><br>■ Promote international cooperation and joint procurement initiatives to increase negotiating power and lower costs of essential medicines and health technologies.<br><br>■ Create a national-level crisis-coordination mechanism between the industry and public authorities to ensure timely response during health emergencies. |

# Service delivery

## Overview

Health service delivery refers to the provision of medical care to individuals and communities by healthcare professionals. It encompasses a wide range of services, from preventive and curative treatments to rehabilitation and palliative care, as well as allied services such as laboratories and pharmacies. The efficiency, accessibility, and quality of these services directly impact health outcomes and patient satisfaction. For health system sustainability and resilience, effective and efficient service delivery is crucial. It ensures that health services are responsive to changing health needs, can provide high quality care without compromising financial sustainability, and can adapt to shocks such as pandemics.

PHSSR's country reports critically evaluate the quality of care, the role of primary care, coordination of care and new care models, distribution and access to services, focus on prevention and chronic diseases, maintaining services during a crisis, and indicators of efficiency. They analyse the impact of the COVID-19 pandemic on these aspects, including disruptions to care, the capacity of the healthcare system, and the success of preventative measures. The reports provide valuable insights into the strengths, weaknesses, and changes in health service delivery, offering a holistic understanding of the challenges faced and the strategies employed to ensure effective and accessible healthcare.

## Key messages

- PHSSR's country reports show the need for better care coordination around the patient. Many health systems concentrate activity and spending in hospitals, limiting the role of community-based services. Structural factors like poor digital infrastructure and payment models hinder improvement.

- In many countries, the pandemic exposed gaps in primary care services. Strengthening primary care is crucial for improved coordination, with patients registering with a single GP for continuity of care.

- Compensation models in many countries primarily reward individual providers, hindering coordinated care provision. Funding should support networked models of care to incentivise follow-up and comprehensive care.

- Electronic record system disunity between care sectors is a significant challenge in many countries. PHSSR's country reports highlight the need for digital interoperability and single patient digital identities to facilitate integrated health systems.

- Long-term care is a key challenge in many countries, especially with an ageing population. PHSSR's country reports reveal longstanding issues with the quality and safety of long-term care, necessitating reforms to care organisation and delivery, increased funding, improved infection prevention, and greater accountability.

- Incentives to improve healthcare quality are lacking in many countries. Measurement, monitoring of quality indicators, and outcome-based payment models are needed to incentivise quality improvement and address variations in care.

- Prevention and early detection of non-communicable diseases require increased investment. PHSSR's country reports highlight the low allocation of health expenditure to preventative care. Investing in primary care, health promotion, and collaborative efforts can alleviate the growing burden of chronic diseases.

## Service delivery recommendations

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| **Address and improve the supporting infrastructure for coordination of care** | ■ Adjust payment models to reward multidisciplinary care. Possibilities exist in rewarding providers collectively for establishing and managing joined-up care pathways.<br><br>■ Establish, finance and reimburse long-term care services provided by multi-disciplinary teams of health professionals, including home care, and improve integration with adjacent services.<br><br>■ Strengthen the role of primary care, through encouraging the role of a registered GP for individual patients, and develop it as the main access hub for preventive, diagnostic, treatment and palliative services in the community.<br><br>■ Develop networked models of healthcare provision, with inter- and intra-regional mobility for patients seeking care.<br><br>■ Digitally interconnect primary care, public health, social care, mental health, hospital care. |
| **Measure and incentivise quality improvement in care delivery** | ■ Ensure core indicators of quality are assessed: hospitals and providers should measure, monitor and publish indicators on quality of care and healthcare outcomes.<br><br>■ Improve public availability of reliable and comprehensible data on health care quality and consider centralised reporting of patient reported healthcare outcomes.<br><br>■ Make use of outcomes-based financing models to incentivise quality improvement. |
| **Review crisis planning and response for critical and routine services** | ■ Re-evaluate appropriate levels of ICU capacity and target occupancy rates.<br><br>■ Develop national strategy to improve health service delivery and its coordination in a crisis, particularly processes for critical care escalation.<br><br>■ Establish clear roles for different sectors of the health service and between clinicians and other care workers during health crises, and provide GPs with guidelines on the prevention and early treatment of infectious disease.<br><br>■ Improve distribution of clinical pharmacologists and infectious disease specialists in hospitals.<br><br>■ Where possible, develop contingency plans for critical screening services for non-communicable diseases. |
| **Support and accelerate innovations in care models and delivery** | ■ Review local and regional innovations in service models developed as part of the pandemic response, and capture best practices.<br><br>■ Develop incentives and funding for scaling up innovative models of care, particularly where these better integrate services.<br><br>■ Ensure that the health system is fit for the future, with a particular focus on establishing regulatory frameworks and reimbursement mechanisms for digital health services. |

# Population health

## Overview

The relationship between population health and the sustainability and resilience of health systems is reciprocal and intertwined. A healthy population places less strain on resources, lowers healthcare costs, and bolsters system sustainability. Simultaneously, sustainable and resilient health systems, which provide adequate resources and adapt to challenges, significantly contribute to improved population health outcomes. This reciprocal relationship emphasises the need to address both population health and health system resilience in tandem to achieve lasting improvements.

PHSSR's country reports analyse the strategies and policies implemented to ensure the sustainability and resilience of population health, with a particular focus on major initiatives aimed at addressing social determinants of health and the successful integration of health programs within other areas of social policy. The reports critically evaluate the effectiveness of community and public health measures, paying special attention to the responses and outcomes observed during the challenging COVID-19 pandemic. This includes a careful analysis of the deployment and impact of non-pharmaceutical interventions, as well as the level of community engagement and support towards these crucial public health measures. Moreover, the reports investigate the degree of integration between public health services and healthcare systems at the community level, aiming to identify opportunities for collaboration and areas for improvement.

## Key messages

- Persistent and deepening socioeconomic inequalities are a significant and widespread problem which was reported across the PHSSR sample. In many cases it was noted that the COVID-19 pandemic had exacerbated these inequalities.

- Although most PHSSR countries have made progress with reducing rates of smoking and alcohol consumption, other challenges such as rising obesity, unhealthy diets, sedentary lifestyles and poor health literacy are problematic.

- The PHSSR reports provide numerous examples of programs in place to promote and protect the health of the most vulnerable groups in society. However, significant disparities in health outcomes demonstrate that much work remains to be done in this area.

- Despite the fact that all clinicians have a role to play in promotion of health literacy and healthy lifestyles, public and community health is not a core component of all clinical training programs.

- Almost all countries in the PHSSR sample reported that there was a lack of comprehensive and consistent data to facilitate the optimal planning and implementation of population health initiatives.

- Many different policy areas, social, economic, and environmental, have an impact on population health. However, a 'health in all policies' approach involving collaboration between various sectors is lacking in most countries.

## Population health recommendations

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| **Addressing social determinants of health** | ■ Create an action plan to reduce health inequalities, including setting measurable indicators, objectives, actions, and periodic progress reports.<br>■ Develop and implement a national policy framework to target and eliminate child poverty.<br>■ Establish environmental health policies focusing on housing, transport infrastructure, and air quality improvement. |
| **Promoting healthy lifestyles** | ■ Launch comprehensive, cross-sectoral campaigns that cover nutrition, physical activity, sexual health, smoking cessation, and responsible alcohol consumption.<br>■ Integrate health education and prevention of non-communicable diseases into school curricula from primary school onwards.<br>■ Introduce a sugar tax and enforce regulations on advertising and access to harmful products, such as tobacco and unhealthy foods. |
| **Focussing on vulnerable populations** | ■ Develop targeted preventive health policies and interventions for children, older people, women, and indigenous communities.<br>■ Implement evidence-based programmes to reduce smoking rates and promote healthy diets among vulnerable populations.<br>■ Design comprehensive strategies addressing health determinants for these populations, including access to healthcare, education, and employment opportunities. |
| **Enhancing health system capacity and quality** | ■ Incorporate public health and community health training modules into healthcare workers' continuous education programmes.<br>■ Improve the communication strategies of healthcare providers for individuals with lower health literacy and ensure translation services are covered by health insurance. |
| **Leveraging data and technology for health improvement** | ■ Invest in large-scale cohort studies, data linkage, and integration of various data sources, including genomic and environmental data.<br>■ Create a national system for real-time mortality data reporting, analysis, and feedback at the local level.<br>■ Develop risk stratification tools for primary healthcare providers to enable proactive interventions targeted at different population groups.<br>■ Enhance health system management by optimising data utilisation and strengthening infectious disease surveillance policies. |
| **Collaborative and cross-sectoral approaches** | ■ Encourage collaboration between health, education, social, and environmental sectors to address social determinants of health.<br>■ Foster partnerships among hospitals, health funds, patient organisations, and other stakeholders to better guide patients in their healthcare journey.<br>■ Develop a coordinated, public health-led response plan for health emergencies and crises, involving all relevant stakeholders. |

# Environmental sustainability

## Overview

The relationship between environmental sustainability and health systems is intricately linked. Health systems, through their operations, infrastructure, and resource utilisation, contribute to environmental degradation, including energy consumption, waste generation, and emissions. These activities have far-reaching implications for air and water quality, climate change, and biodiversity loss, all of which impact human health. At the same time, environmental factors such as air pollution, water contamination, and climate change pose significant risks to human health, leading to various diseases and health conditions.

PHSSR's country reports assess the strengths, weaknesses, and threats to health systems in relation to environmental sustainability. They examine various aspects such as the environmental impact of health system activities, waste management, policies to reduce the carbon footprint, and the impact of emergency measures during the COVID-19 pandemic. The reports also explore the environmental risks to physical and mental health, including air, water, and soil quality, extreme heat, and hazardous waste, and examine the presence of targets and regulations to mitigate these risks. Emphasising the importance of a 'one health' perspective, some of the reports also examine the availability of funding and national plans to address antimicrobial resistance.

## Key messages

- The relationship between the environment and health systems is complex and intertwined. However, this relationship is often overlooked in policy making, leading to insufficient infrastructure to address both aspects.

- Better population health, a function of socioeconomic and environmental factors as well as a health system's ability to prevent and treat illness, is key to both reducing the environmental impact of health systems and increasing populations' resilience to environmental health threats.

- Emissions from most health systems represent around 4–5% of total national emissions, so health systems must play a role in wider national decarbonisation strategies. However, most countries in our sample do not have mechanisms for routinely capturing emissions and other environmental impacts.

- Several countries have implemented national policy approaches to reduce emissions, which often include responsibilities for the health sector, particularly major hospitals. However, policies and targets specifically tailored to the health sector are scarce.

- The health risks associated with climate change and rising temperatures vary between countries. These include increased incidence of heatstroke and mortality during heatwaves, and risks associated with air pollution and poor air quality.

- Some countries are implementing adaptation measures to mitigate the health impacts of rising temperatures, but there is room for improvement in their governance and coordination. Comprehensive risk assessment and mitigation strategies are required, and must be considered for national funding.

- Health systems should collaborate with medicines and technology supply chains to reduce carbon consumption and waste. Initiatives can include reprocessing medical devices, and extending medicine shelf-life.

## Environmental sustainability recommendations

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| **Data collection, reporting and awareness** | ■ Produce and report consistent, actionable baseline data on health systems' environmental impacts.<br><br>■ Map and measure the carbon footprint of health system activities and identify reduction opportunities.<br><br>■ Raise public and workforce awareness on environmental risk factors, healthcare waste, and best practices.<br><br>■ Foster healthcare sector participation in environmental agendas and collaborate with national and international jurisdictions.<br><br>■ Support efforts to build knowledge, capacity, and networks for climate resilience and sustainability in health systems. |
| **Capacity building and mobilisation, and international cooperation** | ■ Train healthcare workforce on best practices to reduce waste, resource consumption, and environmental impact.<br><br>■ Develop a methodology to evaluate the environmental and societal impacts of health interventions alongside health effects and costs.<br><br>■ Invest in studies on the effects of environmental factors on health, considering social determinants of health.<br><br>■ Enhance international cooperation for the sustainable use of genetic resources and the integration of regional sustainability efforts. |
| **Regulation, and enforcement** | ■ Establish a centralised authority to ensure progress towards reducing environmental impact.<br><br>■ Adopt WHO air quality standards and mitigation measures against climate and environmental degradation.<br><br>■ Implement incentives and obligations for sustainability in public contracting mechanisms.<br><br>■ Increase penalties for environmental crimes that cause damage to public health and take a stronger stance on illegal activities. |
| **Resource management, waste reduction and recycling** | ■ Develop medical device reprocessing initiatives and reduce equipment obsolescence.<br><br>■ Create incentives for healthcare facilities to be more sustainable, sort and recycle waste, and exchange best practices.<br><br>■ Reduce the use of single-use items and promote sterilisation and reuse of medical items.<br><br>■ Reduce unnecessary medicine supply and promote appropriate responses to environmental costs.<br><br>■ Invest in alternatives to incineration of hazardous healthcare waste and increase circularity of waste resources. |

## Environmental sustainability recommendations (continued)

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| **Energy efficiency, low-carbon infrastructure, and climate resilience** | ■ Invest in zero-emission hospital buildings and enhance energy efficiency in public hospitals.<br><br>■ Develop and implement a plan to reduce carbon emissions throughout the health system, including the supply chain.<br><br>■ Commit to transitioning to green and secure energy sources in healthcare systems.<br><br>■ Assess future climate change effects on the health system and prepare relevant actions, including emergency plans.<br><br>■ Develop long-term climate resilience action plans for healthcare infrastructure, with targets, indicators, and monitoring. |

# Review

Outline of challenges identified in each domain, with strategies and recommendations for strengthening sustainability and resilience

1. Governance

2. Financing

3. Workforce

4. Medicines and technology

5. Service delivery

6. Population health

7. Environmental sustainability

# 1. Governance

## Introduction

The capacity of a health system to deliver on its functions and achieve its goals is largely driven by its governance – the wide range of steering and rule-making responsibilities carried out by government and decision-making bodies, aiming to fulfil national health policy objectives. Health system governance is complex, requiring leadership, policy making and coordination across the multiple levels and sectors of the health system, underpinned by high levels of transparency, accountability and inclusivity. In this chapter, we draw on the PHSSR country reports to explore the role of health system governance, its challenges, and its opportunities, particularly in light of the recent global pandemic.

The reports explore the wide-ranging aspects of health system governance, including the interplay between government levels, the role of non-state actors, the impact of transparency and accountability on health outcomes, and the importance of robust legislation and policy framework. They underscore the significance of leadership and strategic vision in shaping the health system, as well as the role of decentralisation in enhancing responsiveness to local health needs. The reports further illuminate the effects of regulatory frameworks on service delivery and health system efficiency. Moreover, they underline the value of multi-sectoral collaboration in addressing health determinants and inequalities, and the necessity for preparedness and crisis management in the face of pandemics and other health emergencies.

## Key messages

- Effective leadership with a long-term perspective is crucial for sustainable and resilient health systems, but weaknesses in strategic direction hinder progress in many countries. Political and budgetary cycles impact policy planning, and high turnover rates in leadership positions disrupt health system reforms.

- Governance effectiveness is often limited by short-termism, bureaucratic politics and downstream barriers to implementation. Clarity of purpose in health policy, such as legislation enshrining principles of solidarity and equity, can drive progress in addressing health challenges.

- There are issues of coordination in almost all PHSSR countries between institutions in central government, between central, regional and municipal governments, between levels of the health system, and between the public and private sectors.

- Striking the right balance between centralisation and decentralisation is a challenge, with advantages and complications observed in different countries. Collaboration between sectors, including public–private partnerships, enhances health system resilience and response to crises.

- Deficits in transparency, public engagement, and accountability remain widespread, eroding the trust in health systems that is so vital for their functioning and their ability to respond to crises.

- Use of data and evidence is crucial for informed decision-making, but despite significant progress during COVID-19, operational barriers and deficits in data quality and analysis pose continuing challenges.

- Policy evaluation is essential for continuous improvement, but systems for evaluation are often inadequate, with inconsistent, ad-hoc approaches prevalent.

## Leadership and strategic direction

Sustainable and resilient health systems require effective leadership with a visionary, long-term perspective and which is simultaneously responsive to change. Although PHSSR's country reports do not offer a political assessment, they do emphasise weaknesses related to strategic direction, leading to fragmented health reforms and limited progress in addressing health challenges. The impact of political and budgetary cycles on policy planning is significant, and inadequate stability in leadership is identified as a key issue in numerous countries, notably in **Brazil**, **Ireland** and **England**, where high ministerial turnover rates have hindered progress in the formulation and execution of health system reforms. The **England** country report also raises concerns about the disruption caused by successive, sweeping reorganisations of the NHS. The report on **Poland,** meanwhile, highlights the problems caused when there is a lack of policy continuity even under successive governments within the same political coalition.

A lack of stability is a major roadblock to building resilience and the ability to respond to changing health needs, with significant implications for population health outcomes. However, our country reports also highlight some more positive examples. The reports on **France** and the **Netherlands** emphasise the countries' clarity of purpose in health policy, highlighting the benefits of legislation

### Figure 3: Creating an enabling system of governance



**A system of governance**
An enabling system with improved health and well-being integrated as an expected outcome of the system

**Whole-of-society approach**
Government working together with other stakeholders for a common goal

**Whole-of-government approach**
The government working together for a common goal

**Multisectoral governance**
Multiple sectors working independently for a common goal

**Intersectoral governance**
One or more sectors working together for a common goal

**Intrasectoral governance**
Governance for health and well-being within a single sector

Source: Adapted from WHO Regional Office for Europe (2019).

enshrining principles of solidarity and equity in access to high-quality care. The report on **Saudi Arabia** underlines the strides the country has made in strengthening its health system via major reforms as part of its Saudi Vision 2030 initiative. The report on **Vietnam** also praises the government's strong political commitment to health, with national plans and strategies underpinned by strong legal and regulatory frameworks. Meanwhile, the report on **Switzerland** highlights how a long history of social partnership has built consensus around significant policy decisions and promoted stability over time.

Seeing a policy vision through to implementation requires constructive intra-government relations, but PHSSR's country reports highlight how national health policy initiatives can falter due to misaligned incentives and negotiation failures. These may arise from a professional culture of hard bargaining and limited know-how in coalition-building, as described in the report on **Poland**. Several reports note the importance of whole-of-government approach, in which health is embedded as a priority across policy areas and interests are aligned, with several countries having introduced specific initiatives to uphold this principle. **Saudi Arabia**, for example, has established a cross government, ministerial committee to ensure that public health is prioritised across policy areas. However, 'health in all policies' remains an aspiration rather than a reality in most countries.

As well as bureaucratic efficiency, effective policy implementation also requires that adequate resources are available, and this is as much a question of governance as of financing. This is highlighted as a challenge for **India** in particular, where attainment of ambitious targets for universal health coverage has been stifled by insufficient funding, workforce, and infrastructure. This may recommend a more incremental approach to achieving population health goals, such that ambitions can be met with the necessary resources for progress to be sustained.

## Multi-level governance: overcoming fragmentation

Health systems are inherently complex and necessitate effective multi-level governance (Figure 3). Effective leadership, clear chains of command and accountability, and mechanisms to promote communication and collaboration within and between levels of government – from central to local – are critical for seamless functioning. Coordination across public health, primary care, hospital care, and social services at the local level is also essential for meeting the needs and expectations of populations, whose participation in policy and decision making is vital for fostering responsiveness and trust. PHSSR's country reports reveal that these are common challenges brought to the fore by COVID-19, although they manifest very differently across countries.

Striking the right balance between centralisation and decentralisation is a key challenge for countries, regardless of their scale, and one for which there is no universal solution. PHSSR's country reports indicate that decentralised policy making and management have been advantageous in countries as diverse as **Brazil**, **Vietnam** and **Switzerland**, resulting in more tailored and locally appropriate health interventions, increasing accountability and cross-functional collaboration. Decentralised governance and provider autonomy have been helpful in enabling innovation and experimentation in healthcare delivery in some countries, notably the **Netherlands**.

However, in both **Switzerland** and the **Netherlands**, decentralised governance has also been found to simultaneously complicate coordination. In **Switzerland**, the report notes that the complicated setup of governance mechanisms comes at the expense of leadership, transparency, coherence, and most of all, speed of decision making. The **Netherlands** report recommends that the national government take responsibility for ensuring that conflicting stakeholder interests do not hinder efforts to improve sustainability, noting both the opportunities and challenges that accompany efforts to foster collaboration among insurers and providers in a competitive market. Similar issues are underscored in the reports on **Italy** and **Spain**, where regional autonomy has brought with it complexity, conflictual central-regional relations, and disparities in healthcare access and quality between regions, with real implications for patients.

The governance of **India**'s health system, meanwhile, underscores particular challenges of coordination that arise from a complex, and sometimes overlapping mix of competencies at national and state levels. The report describes how top-down policy making and decentralised implementation have led to planning and management issues and perceived deficits in accountability. Although the central government transfers considerable funding to prioritise specific programmes and promote equity among states in service provision, significant variation remains between states regarding roles, responsibilities, and local decision-making power. The report also suggests that better integration of large government initiatives with similar or overlapping objectives is required to underpin the sustainability and resilience of the system.

Fostering collaboration between sectors of the health system can also be a formidable challenge, with multiple country reports highlighting disjointed management of primary, hospital, and long-term care, and little flexibility for adapting national policies to local needs. The **France** report makes recommendations which are characteristic, suggesting improving communication channels between central government agencies and local actors, including care providers, local authorities, and patient representatives. The report recommends prioritising health decision-making at the local level, involving healthcare professionals and patients, and reinforcing local piloting of health policy with healthcare quality and efficiency targets based on regional and local needs.

Challenges in coordination become particularly prominent in a crisis, when communication between the central government, regional and local government is critical. A more centralised approach coordinating the pandemic response was identified as a strength in **Greece**, **Portugal** and **Saudi Arabia**, but centralising authority does not provide a guarantee of success, particularly if delivery capacity is lacking at a local level. Accordingly, the coordination challenges facing **India**'s rather centralised response to COVID-19 were exacerbated by long-standing underinvestment in public health infrastructure. Well-established local public health capabilities were the backbone of successful responses across multiple countries, but are identified as a common area of underinvestment.

## Fostering collaboration

Successful public-private partnerships, as evidenced in **Brazil**, **Ireland**, **Greece** and **Saudi Arabia**'s COVID-19 responses, showcase the potential for collaboration between sectors to enhance health system resilience. In our sample of countries, the **Swiss** health system provides perhaps the strongest examples of public-private collaboration. Switzerland's corporatist approach and openness to cooperative solutions with private partners facilitate the inclusion of experts and key interest groups in designing and implementing emergency measures. These partnerships can mobilise resources, expertise, and innovation to tackle complex health challenges. Public-private collaboration was also identified as a critical factor in facilitating the rapid roll-out of COVID-19 vaccines in multiple countries.

Finally, the **Belgium** report also identifies cross-border collaboration as a constructive development, identifying the creation of task forces to coordinate COVID-19 actions between **Belgian**, **Dutch**, **French**, and **German** regions as setting a strong precedent for future cross-border health emergencies. In **Brazil**, because of testing resource constraints prompted by rapid international demand for materials, and inconsistent federal government leadership, the Brazilian health system worked directly with major research centres and international agencies to equip and train regional capacity for rapid testing in the country and neighbouring states. Despite such positive examples, international coordination of the COVID-19 response was undoubtedly lacking, particularly in terms of harmonising responses and ensuring vaccine equity between countries. While such issues are beyond the scope of this report, change is needed to ensure that the architecture of global health governance is better able to support joined-up international responses to crises.

## Accountability, transparency and inclusivity

Public involvement is crucial in health policymaking as it increases legitimacy and accountability and can contribute to better implementation. Policymakers who actively seek input and feedback from the public are more likely to develop effective policies that have the support of the people who will be affected by them. Social participation in policy making and monitoring has proven valuable in several countries. Direct democracy in the **Swiss** system is seen overall as a strength, providing a platform for citizens and interest groups to intervene in decision-making at all state levels, fostering trust and cooperation between citizens and government institutions. **Greece** has also taken positive steps towards incorporating patients' voices in healthcare decisions through new legislation. While the report on **India** highlights shortcomings of formal accountability mechanisms, it also points to progress in involving local communities and institutions in democratic decision-making in several states.

Despite these positive examples, mechanisms for public involvement in decision-making are undeveloped in the majority of countries in our sample. Particular issues are highlighted in **Poland**, where *ad hoc* consultation mechanisms and unresponsive legislative processes have led to stakeholders' input and front-line feedback not being systematically included in decision-making. The report recommends the adoption of a deliberative approach to policymaking, engaging a diverse group of stakeholders (including patients, healthcare providers and policymakers) in structured dialogue to develop policies that reflect their values and preferences.

Deficits in accountability were identified as arising from a wide variety of causes. For example, in Germany, the transfer of power to non-state entities was found to be a driver. Interestingly, the Germany report also recommends depoliticising hospital planning by limiting state governments' role, highlighting a tension between democratic accountability and politicisation of management. Finally, in Canada, the report particularly emphasises the inadequate engagement of Indigenous peoples in policy formulation and health sector decision-making, which has resulted in mistrust and poorer health outcomes for Indigenous populations. It is vital that particular effort is spent incorporating the views and perspectives of marginalised groups in decisions that affect them.

## Use of data and evidence

The use of data and evidence is key to informing decision-making, identifying areas of need, and enabling the policy evaluation, fostering a learning environment for continual improvement. It emerges as a significant theme in several reports, with issues including operational barriers, data quality and deficits in managerial and analytical capacity. Several country reports recommend the development of national health data strategies and infrastructure, including **Canada** and **Greece**. In the latter, a particular deficit is the lack of a systematic process for utilising user satisfaction data, contributing to the report's overarching conclusion that health policy in Greece is heavily driven by the supply-side. Similarly, in **India**, the government struggles to collect data from the private sector and use it effectively in policymaking, a major issue considering the major role that the private hospital sector plays in the Indian health system.

Several country reports note the challenges. countries' faced in collecting and making available data on COVID-19 case numbers, hospitalisations and deaths during the pandemic, although here are some striking examples of success in this regard. Several country reports note the indispensable role played by expert committees and task forces in reviewing evidence and advising on public policies and communication strategies during the pandemic, as highlighted in the reports on Portugal, Switzerland, England, Greece, and Ireland. The report on Brazil describes how regional governments collaborated with national media to produce credible and reliable information and reporting during the pandemic when federal authorities lost grip of accuracy and transparency (**Case Study 1**).

**CASE STUDY 1: SOCIAL PARTICIPATION MECHANISMS AND COMMUNICATION IN BRAZIL**

In the Brazilian Unified Health System (SUS), the decentralised structure allows shared responsibilities among federal, state, and municipal governments. However, during the COVID-19 pandemic, this structure was disrupted by political disagreements, leading to inconsistent health communication from the federal government.

The Ministry of Health initially disseminated daily COVID-19 updates, but political interference led to the removal of the health minister and subsequent resignation of his successor. This upheaval culminated in a non-technical political appointee taking charge, undermining the technical reporting around COVID-19 and obstructing national coordination.

In response, a national press consortium was established, comprising the Brazilian press, the National Council of State Health Secretaries (CONASS), and various research institutions and universities. This consortium would acquire daily COVID-19 data directly from State Health Secretaries, bypassing the compromised federal structure.

With the federal government releasing COVID-19 data late and hiding accumulated case and death information, public trust dwindled. The press consortium, launched in June 2020, started providing reliable COVID-19 reports daily, contributing to restoring public trust and enabling informed decision-making. CONASS facilitated the acquisition of correct COVID-19 data from state health secretaries, ensuring scientific accuracy. The press consortium effectively communicated this information to the public, demonstrating the resilience of the SUS despite the lack of federal support.

This case study underscores the importance of having diverse sources of authority within a health system, reinforcing its resilience during health crises. The Brazilian press consortium serves as an example for other decentralised health systems globally, showcasing the potential for social participation mechanisms and social communication to enhance public health response in the face of misinformation or inaction.

Adapted from Brazil country report.

Policy evaluation is another critical component of effective policy-making that emerges in the reports, providing valuable insights into what is working well and what needs to be improved. However, systems for policy evaluation are often inadequate. For example, in **Japan**, limited access to health-related data has hindered evidence-based health policymaking decisions and policy evaluations. Similarly, in **India**, policy evaluation has been perceived as an external requirement rather than an integral part of programme development, and there are no minimum evaluation standards for public programmes. The report on **Ireland** suggests that a broader range of indicators should be used to assess performance, including patient outcomes, patient experience, and population health outcomes. Learning the lessons from previous crises also emerges as a prominent theme, with the reports on **England**, **France** and **Italy** calling for transparent public inquiries into the responses to COVID-19 in those countries.

## Strategies for strengthening health system governance

In the intricate realm of health systems, challenges are context- and path-dependent. Diverse political cultures and administrative structures make it impossible to provide universal recommendations. The experiences of different countries documented in the PHSSR reports accentuate the need for context-specific strategies, tailored to the distinct requirements and conditions of each health system. However, it is clear that health system stewards must master significant complexity in order to be fully effective. They should pay attention to tackling coordination challenges from the top-down, the bottom-up and horizontally, seeking to harmonise policy, planning and reporting across levels of the health system. Policymakers should also focus on

reinforcing accountability and public engagement, and increasing transparency in the use of data and evidence in decision-making. This endeavour will necessitate strong leadership and openness to collaboration with a constructive approach to overcoming conflict and disagreement, and a commitment to identifying and learning from both successes and setbacks.

Finally, while PHSSR reports may not focus political on political factors, their significance in shaping the governance of health systems must not be downplayed. Building effective coalitions across and beyond government is essential for making the case for health in budgetary allocations, and developing and implementing policy. Widespread political polarisation diminishes the likelihood of achieving the consensus needed for long-lasting improvements to health system sustainability and resilience. Numerous PHSSR country reports suggest that the COVID-19 pandemic has invigorated political discourse on health, creating a fleeting window of opportunity for building consensus-based reforms.

## Recommendations

The governance recommendations from various country reports can be summarised into the following key themes:

### Developing coherent long-term strategies and policy continuity

- Ensure stable, visionary leadership to steer healthcare systems towards long-term goals: reduce ministerial turnover and promote merit-based appointments to create an environment that fosters continuity and progress.

- Establish formal mechanisms to ensure a whole-of-government approach to health policy, and to ensure that health is taken into account in all policies.

- Develop coherent long-term strategies that secure political commitment and resources to address current and future health challenges, prioritising continuity in policy implementation.

- Establish plans informed by socioeconomic, demographic and epidemiological trends, focusing on a broad array of diseases and associated health and care needs.

### Addressing fragmentation

- Streamline governance structures to minimise overlaps and redundancies, and ensure clear roles and responsibilities for each level of government in terms of healthcare delivery.

- Find the optimal balance between centralisation and decentralisation to ensure efficient allocation of resources, equitable access to healthcare, and effective coordination between central and regional authorities.

- Foster collaboration between primary care, hospital care, and social services at the local level to enhance the integration of care and improve the efficiency of healthcare delivery.

- Build and nurture successful public-private partnerships to mobilise resources, expertise, and innovation to address complex health challenges.

### Promoting transparency and public engagement

- Promote transparency to improve accountability and ensure that health policies and programmes are responsive to the needs and preferences of the population.

- Encourage social participation and incorporate patients' voices in health policy development and implementation to enhance the legitimacy and effectiveness of health policies and programmes.

- Establish formal channels for public and patient feedback at the provider level, to ensure that healthcare decisions are informed by the experiences and perspectives of those directly affected.

## Harnessing data and evidence

- Establish national strategies for digitalisation and data-driven decision making to improve the overall performance of health systems.

- Collect and analyse data for policy evaluation and redesign, and harness the power of data to inform evidence-based decisions.

- Regularly monitor and evaluate health policies and programmes, and use evidence-informed policy making to identify areas for improvement and facilitate evidence-based course corrections.

# 2. Financing
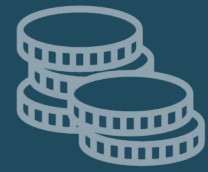
## Introduction

Financing healthcare is of paramount importance for the pursuit of universal health coverage, and for the resilience and sustainability of health systems. Maximising the sustainability of health system financing requires action in several areas. In terms of revenue generation, financing should be progressive, reflecting ability to pay, rather than the risk of ill health, and with financial risks pooled as broadly as possible. Resources should be allocated so as to deliver maximum benefits to population health while ensuring equity, and provider payment mechanisms should be aligned with health system goals such as efficiency, quality and coordination of care, and cost control.

PHSSR's country reports highlight significant challenges in each of these areas. They reveal how different countries project and tackle disease burdens and economic impacts in their health budget planning, as well as how they manage financial risks during crises. The reports further highlight the balance between general taxation and payroll taxes in health funding, and discuss the progressivity or regressivity of healthcare financing in different contexts. They also delve into the intricacies of coverage and resource allocation, considering the distribution of spending across various care sectors and the extent of catastrophic healthcare expenditure. Lastly, the reports evaluate the methodologies for paying providers and the key trends in health system financing.

## Key messages

- Adequate public funding is crucial for achieving financial security and universal health coverage. Austerity policies have slowed spending growth and undermined health system capacity in many countries, leading to reduced access to essential services and eroding resilience. There are huge disparities in public spending on health among countries – in absolute and relative terms.

- Even in countries with a commitment to universality, out-of-pocket payments and coverage exclusions create inequities in access to needed care. Progressively financed, targeted reforms are needed to ensure sustainable financing and alleviate financial barriers to access.

- In many countries, payment and resource allocation mechanisms remain misaligned with health system objectives. Value-based care remains an aspiration rather than a reality where systems rely upon crude budgets and activity-based payment models.

- Aligning financial incentives for cooperation between providers, with shared accountability for outcomes, can help to improve efficiency, quality and responsiveness of care.

- Across our sample of countries, health systems rely heavily on expensive secondary care. Addressing this will require a greater emphasis on certain services that are often underfunded relative to the hospital sector, for example public health, primary care and mental health.

- As the population of patients with complex needs increases, ensuring coordination of care becomes ever more important to its quality and efficiency. Although there are positive examples among our sample of countries, progress overall has been slow.

- Making additional resources available was critical to the COVID-19 pandemic response but relied largely on ad-hoc approaches. Defined systems for emergency financing will provide confidence that health systems will be adequately resourced to respond to future crises.

## Figure 4: Current health expenditure as percentage of gross domestic product



**Countries ranked by expenditure in 2019**

India · United Arab Emirates · Vietnam · Russia · Saudi Arabia · Poland · Ireland · Greece · Italy · Spain · Portugal · Brazil · Netherlands · United Kingdom · Belgium · Japan · Canada · France · Switzerland · Germany

2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019
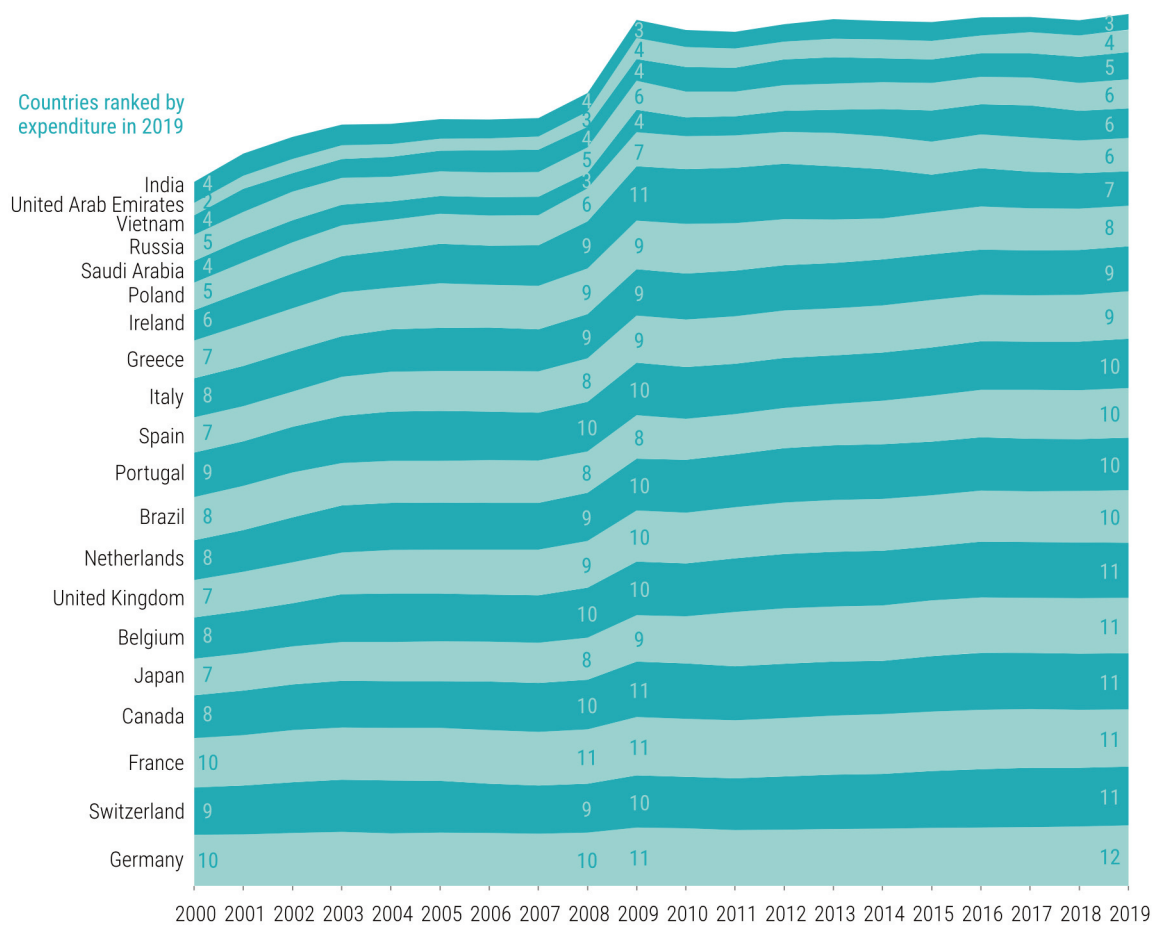
Source: World Bank (2022b).

## Inadequate public funding and increasing private expenditure

The financial security that comes with universal health coverage can only readily be achieved through financing mechanisms that pool contributions and risks over the whole population, which implies a significant role for public financing. Decisions on the proportion of public finances dedicated to health systems should optimally reflect the full value of health – in humanistic, economic, and ecological terms – and consider the cost of disease. The optimal financing mix for a given country will be closely bound to the economic and social context, including attitudes to the role of government.

As Figure 4 illustrates, across the countries studied, public spending on health as a proportion of GDP rose gradually in the 2000s before increasing more rapidly as economies shrank during the economic crisis of the late 2000s. However, in the decade that followed, spending growth slowed in many countries as a result of austerity policies that followed the crisis. There are stark disparities in levels of spending between countries in our sample, with public spending on health accounting for only 1% of GDP in India, and almost 10% in Germany, which constitutes a vast difference in funding per person in absolute terms. However, even for wealthier countries with nominally universal health coverage, significant gaps remain, and a recent levelling off of gains, or even decreases in life expectancy in some countries acts as a reminder that continual progress is not assured.

**Figure 5: Out-of-pocket expenditure (% of current health expenditure)**

| | 2009 | 2014 | 2019 |
|---|---|---|---|
| Netherlands | 9.1 | 11.6 | 10.6 |
| France | 10.2 | 9.9 | 9.3 |
| Ireland | 12.7 | 14.3 | 11.7 |
| United Kingdom | 12.9 | 15.9 | 17.1 |
| Germany | 13.9 | 13.0 | 12.8 |
| Canada | 15.2 | 14.6 | 14.9 |
| Japan | 15.2 | 12.9 | 12.9 |
| United Arab Emirates | 16.1 | 17.8 | 12.5 |
| Saudi Arabia | 18.4 | 13.1 | 16.5 |
| Spain | 19.0 | 23.1 | 21.8 |
| Belgium | 19.9 | 19.3 | 18.2 |
| Italy | 20.7 | 22.5 | 23.3 |
| Poland | 24.5 | 23.0 | 20.4 |
| Portugal | 25.1 | 29.3 | 30.5 |
| Switzerland | 26.2 | 26.0 | 25.3 |
| Greece | 29.5 | 37.1 | 35.2 |
| Brazil | 31.2 | 28.2 | 24.9 |
| Russia | 34.6 | 35.8 | 36.6 |
| Vietnam | 37.3 | 41.7 | 43.0 |
| India | 66.8 | 67.0 | 54.8 |

Source: World Bank (2022b).

For countries across the range, the high cost of healthcare is a significant concern, with an increasing burden of disease, the cost of medicines and technologies and health system inefficiencies identified as the principal drivers. However, while higher expenditure is not in and of itself a good thing, several reports note that an over-emphasis on cost containment preceding the pandemic had eroded health systems' capacity to absorb shocks.

The impact of fiscal austerity on healthcare systems can be severe, reducing quality of care, decreasing access to essential services, and leading to under-capacity which undermines resilience to crises and ultimately population health. Multiple country reports highlight these challenges. For example, the report on **Brazil** describes how long-term fiscal austerity policies have decreased federal government health expenditures, resulting in chronic underfunding of the Sistema Único de Saúde (SUS). Similarly, **Greece, Italy** and **Poland** each saw public expenditure on health targeted during the economic crisis.

A side effect of austerity in some countries has been an underinvestment in the workforce, and in technology and infrastructure are essential to keep pace with needs. The reports on **England** and **Portugal** highlight how systematic budget deficits have driven chronic low investment in buildings, equipment and the workforce, with capital budgets being used to fill shortfalls in operational funding in the former. Health systems stretched to capacity going into a crisis such as a pandemic are

unlikely to fare well, and the knock-on effects in terms of cancellations and delays to routine services have a significant impact on patients.

Notably, the health systems in these countries are heavily reliant on financing through taxation, which ensures that risks are pooled as widely as possible, but increases their susceptibility to politically-imposed constraints on resources. In such systems, mechanisms for financial planning that include long-term projections based on epidemiological and demographic trends can help to ensure that funding keeps pace with increasing needs. However, such mechanisms appear limited in our sample of countries. Ultimately, the allocation of pubic funding to healthcare is a political question, closely tied to a country's broader economic policies and performance. Health system stewards need to be skilful in demonstrating the value of and making the case for spending on health, promoting a perspective that views it as an investment rather than a straightforward cost.

In countries financed primarily by social health insurance, moving towards diversified sources of finance might offer a source of stability, improving health systems' resilience to economic shocks, with several country reports recommending the introduction of consumption taxes. The reports on France, Belgium and Switzerland highlight diversified financing as a strength: in these countries, healthcare is financed through a combination of taxes, social health insurance contributions, voluntary health insurance, and, less constructively, through out-of-pocket payments. The Swiss report notes that diversified financing contributes to its sustainability in economic (i.e., its ability to generate funding) and social (i.e., the acceptance of funding within the population) terms.

When public expenditure decreases without commensurate increases in efficiency, private expenditure tends to increase, and out-of-pocket payments stand out as particularly pervasive and detrimental. As Figure 5 shows, they are a particular problem in Brazil, India, Russia, and Vietnam, but also emerge as an issue in Canada and several European countries. While out-of-pocket expenditure is highest in India, it has reduced significantly in the past decade with the expansion of social health insurance schemes. The implications of high out-of-pocket expenses are profound and undermine financial security. When confronted with high out-of-pocket costs, individuals may delay or avoid seeking medical care, potentially leading to deteriorating health conditions and more expensive treatments down the line.

Moreover, out-of-pocket costs disproportionately impact low-income and underinsured individuals, contributing to health disparities - for example, the report on Saudi Arabia highlights the particular challenges faced by undocumented migrants and non-citizens who lack private, employer-based coverage. Across countries, those with low incomes often must choose between healthcare and basic needs like food and shelter, further widening the health gap between different socioeconomic groups. Ultimately, extending coverage via public and insurance-based financing is the key, but where user charges are in place, careful targeting avoiding imposing barriers for primary and preventative services, price transparency, caps on out-of-pocket costs, and means-tested exemptions can mitigate their impact somewhat, as can user charges that explicitly target waste.

COVID-19 has demonstrated that emergency financing is a critical aspect to consider. For example, the report on Japan points to insufficient efforts to predict exposure risks from epidemics or pandemics and no defined rules for emergency fund provision. The Netherlands needed to resort to complex and market-distorting measures to absorb financial shock from the COVID-19 pandemic. Short-termism and underinvestment in capital were also found to have affected the health systems' response to COVID-19 in multiple other countries, including the UK, France, Germany, and Italy. Nonetheless, many of the reports identify emergency financing as a strength, highlighting the significant funds released to support health systems during the pandemic. Others, including Saudi Arabia, provided state subsidies to enable free access to services normally subject to user charges, including for those without insurance coverage, such as undocumented migrants. These mechanisms should be established and tested preemptively to provide assurance financing will be available when a crisis hits.

## Inefficient resource allocation and lack of transparency

There is strong evidence that the return on investment on health expenditure is significant, with wide-ranging economic and social benefits (WHO Regional Office for Europe, 2014; Cylus J *et al*., 2020; WHO, 2012). However, these benefits will only be realised if spending is allocated so as to match needs, and in a way that promotes efficiency.

To maximise sustainability, health systems must prioritise funding allocation to reflect population health needs and preferences, seeking to achieve both horizontal and vertical equity in access to care. PHSSR's country reports highlight significant challenges in this area, which manifest in different ways. Siloed budgetary allocations, and a lack of connection between expenditure and health care outcomes are highlighted as a problem in **Belgium**. In **England**, **Spain**, **Switzerland** and **Poland**, there is a lack of transparency in healthcare funding allocation decisions, with a lack of explicit decision-making criteria. The report on **Greece** described how the lack of a systematic procedure for setting resource allocation priorities has resulted in an inefficient distribution of resources.

These challenges can result in inadequate funding for specific geographic areas and types of services. The allocation of funding often does not take account of local needs, as seen in **Italy**, **France**, and **Germany**. **Belgium** has areas of specific underinvestment in prevention and mental health care. The report on **Canada** also highlights that there is a need for greater investment in primary care, with greater attention to social determinants of health in financing models. Similarly, **Japan** has inadequate access to healthcare services for socially vulnerable populations. More positively, the reports on **France** and the **Netherlands** highlight their health systems' particular emphasis on ensuring that solidarity and redistribution (i.e., from healthy to sick, young to old and rich to poor) is built into the financing of healthcare.

## Provider payments misaligned with health system goals

In many countries, it appears that these issues are underpinned by payment schemes and incentives that are misaligned with healthcare goals. Across our sample of countries, activity-based, fee-for-service payments are identified as acting variously as a barrier to integrated care provision, incentivising volume over efficiency and quality, and contributing to overmedication, polypharmacy, and prolonged hospital stays. Similarly, crude budgets may create incentives to shift costs and skimp on quality. Inflexibility of provider payment methods impede innovation and adaptation to changing needs, and inadequate risk adjustment can contribute to risk selection and an underemphasis on meeting the needs of patients with complex needs.

Introducing provider payment mechanisms that incentivise efficiency and quality over sheer volume are a near-universal recommendation in our sample of countries. Such mechanisms can include blended payment methods that combine incentives for activity with some degree of cost-control or risk sharing between providers and payers, bundled payments which encourage providers to focus on coordination of care, and incentives for quality and outcomes. Limited progress towards value-based financing across the countries in our sample underlines the technical and political challenges of implementing such solutions, but there are promising examples to be found in the country reports, some of which are detailed in **Case Study 2**. While these initiatives provide a positive example, there is no one-size-fits-all solution. Each country must navigate its unique political, economic, and cultural landscape to devise and implement effective strategies.

**CASE STUDY 2: ALIGNING FINANCING WITH HEALTH SYSTEM GOALS – BELGIUM, ENGLAND, FRANCE AND THE NETHERLANDS**

■ **Belgium**

In 2018, a voluntary payment-for-performance scheme was introduced for general hospitals, incentivising them to meet certain quality targets, such as reducing hospital readmissions or improving patient satisfaction. This linkage of payment to performance encourages healthcare providers to prioritise both quality and efficiency.

Personal assistance budgets are available in Flanders, offering users the ability to purchase a range of services and supports, enabling greater flexibility and autonomy in care provision.

■ **England**

Risk-adjusted capitation payments incentivise healthcare providers to deliver high-quality care at lower costs. Healthcare providers are paid based on the expected cost of caring for a particular patient population, taking into account factors such as age, sex, and medical history. This results in a focus on preventive care and better management of chronic conditions, consequently leading to improved health outcomes.

■ **France**

Legal and financial mechanisms are in place to facilitate local innovation in healthcare delivery and financing. One key development is the creation of Regional Health Agencies (ARS) that plan and coordinate healthcare services in their respective regions. The ARS are empowered to authorise and fund local experiments and pilot projects in healthcare delivery and financing, stimulating innovation and enhancing care quality.

■ **The Netherlands**

Bundled payments for certain healthcare services incentivise healthcare providers to work together to deliver more efficient and effective care. A particular case is a hip replacement surgery where a single payment is made for all related services, instead of paying separately for each individual service.

Adapted from Belgium, England, France and Netherlands country reports.

## Recommendations

The financing recommendations from PHSSR's country reports can be summarised into the following key themes (some example recommendations accompany each theme):

### Financing sufficiency, stability and progressivity

- Implement solidaristic financing mechanisms and increase progressivity of revenue collection, with a focus on reducing out-of-pocket costs.
- Secure public financial resources by diversifying tax financing, including through consumption taxes on health-damaging products.
- Adopt multi-annual budgets based on long-term projections of population health needs, and periodically reassess health benefits.

### Resource allocation

- Ensure resource allocation criteria take into account demography, socioeconomic factors, epidemiological trends and healthcare infrastructure.

- Maximise allocative efficiency through explicit priority-setting, utilising health technology assessment to define a health benefits package that is reflective of population health needs and available resources.

- Improve risk equalisation mechanisms between insurers to reduce incentives for risk selection and ensure equitability.

### Payment systems and incentives

- Reduce reliance on crude budgets and fee-for-service payments, expanding outcome- and value-based financing mechanisms to align provider incentives with broader health system goals.

- Encourage integrated and bundled payment methods to encourage shared provider accountability for patients' long-term outcomes.

- Enable local flexibility in provider payment mechanisms to encourage responsiveness to population needs.

- Encourage collaboration among providers and insurers while counteracting strategic anticompetitive agreements.

### Address specific areas of underfunding

- Centralise patient access to benefits and harmonise coverage across different diseases.

- Promote access to healthcare for socially vulnerable populations by eliminating financial barriers to access, particularly for preventative and primary health care services.

- Expand access to underfunded services such as long-term care, preventative dental care and mental health.

### Emergency financing

- Perform budget prognoses based on diverse crisis scenarios and adapt planning accordingly.

- Establish resources and risk evaluation methods for emerging infectious diseases.

- Evaluate and reconsider financial risk sharing during pandemics.

- Create specific mechanisms, such as reserve funds, for public health emergencies.
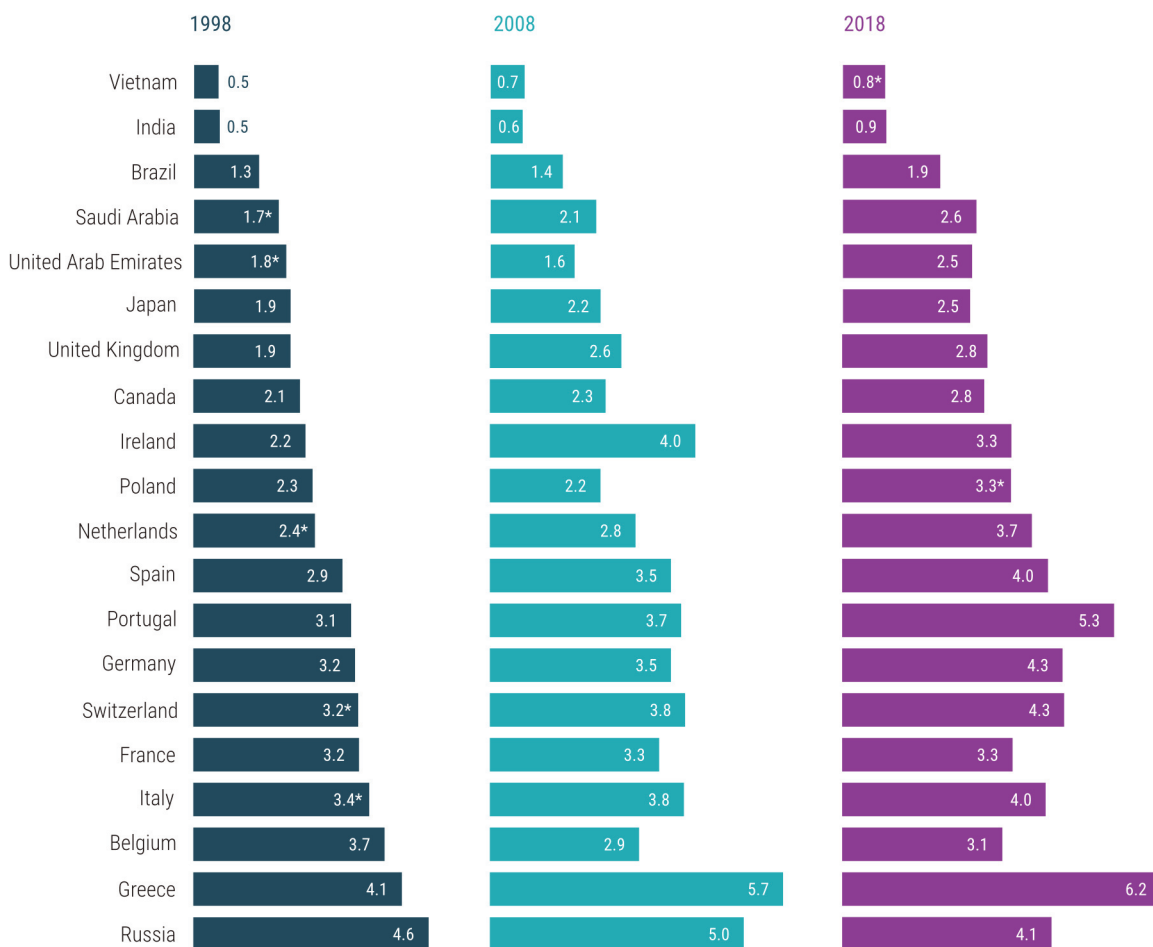
# 3. Workforce

## Introduction

The healthcare workforce is essential to the sustainability and resilience of health systems. The provision of healthcare is labour intensive, and having adequate levels of highly trained healthcare professionals that are well motivated and supported is crucial. Without a workforce that is sufficient in numbers (Figures 6 and 7), geographically equitable in its distribution, highly motivated, with the appropriate skills and remunerated accordingly, a health system will not be sustainable or resilient. As healthcare needs evolve due to factors such as ageing populations and the rising burden of non-communicable diseases, the demand for a robust healthcare workforce increases.

The PHSSR country reports highlight how maintenance of long-term staffing levels requires careful planning and incentives to enhance training, recruitment, and retention of professionals at all levels. The establishment of staff support mechanisms and an appropriate working environment is essential to maintain morale and job satisfaction levels, positively impacting sustainability by reducing turnover rates and the associated loss of institutional knowledge. During a crisis, countries with appropriate staffing levels before the crisis will be in a better position to respond to surges in demand (Fridell M *et al.*, 2019). Well-motivated and supported staff are more likely to be willing and able to temporarily take on extra burdens during a crisis, increasing the health system's resilience (Thomas S *et al.*, 2020).

## Key messages

- Many PHSSR countries reported that a lack of comprehensive workforce data and integrated, long-term workforce planning has been detrimental to health system sustainability and resilience.

- Workforce imbalances were reported across almost all countries, undermining equity of service provision, disproportionately affecting vulnerable and socio-economically deprived populations.

- There is an urgent need to improve the working conditions of healthcare staff. Demanding workloads, poor job security, and limited career prospects are leading to low motivation, burnout, high turnover rates and attrition of staff. Rising rates of anxiety and depression were reported by several PHSSR countries.

- Poor inter-professional collaboration and a siloed approach to healthcare is reported as an impediment to service efficiency and effectiveness.

- Most countries are not harnessing the full potential of health technology to free up clinical time from routine tasks, thus reducing workload and improving job satisfaction.

- Digital health and new delivery models are bringing changes to the roles of healthcare workers. Training and continuing professional development should prepare staff for the adaptations needed.

- The COVID-19 stimulated efforts to facilitate task-shifting. However, in many countries rigid competencies hinder professional flexibility, impeding the resilience of the workforce.

- Multiple country reports highlight that addressing the workforce crisis will require long-term investments in medical education and training programmes.

## Figure 6: Medical doctors per 1,000 people

| | 1998 | 2008 | 2018 |
|---|---|---|---|
| Vietnam | 0.5 | 0.7 | 0.8* |
| India | 0.5 | 0.6 | 0.9 |
| Brazil | 1.3 | 1.4 | 1.9 |
| Saudi Arabia | 1.7* | 2.1 | 2.6 |
| United Arab Emirates | 1.8* | 1.6 | 2.5 |
| Japan | 1.9 | 2.2 | 2.5 |
| United Kingdom | 1.9 | 2.6 | 2.8 |
| Canada | 2.1 | 2.3 | 2.8 |
| Ireland | 2.2 | 4.0 | 3.3 |
| Poland | 2.3 | 2.2 | 3.3* |
| Netherlands | 2.4* | 2.8 | 3.7 |
| Spain | 2.9 | 3.5 | 4.0 |
| Portugal | 3.1 | 3.7 | 5.3 |
| Germany | 3.2 | 3.5 | 4.3 |
| Switzerland | 3.2* | 3.8 | 4.3 |
| France | 3.2 | 3.3 | 3.3 |
| Italy | 3.4* | 3.8 | 4.0 |
| Belgium | 3.7 | 2.9 | 3.1 |
| Greece | 4.1 | 5.7 | 6.2 |
| Russia | 4.6 | 5.0 | 4.1 |

Note: * closest available year.

Sources: OECD (2023b); World Bank (2022c).

## A global workforce facing diminished resilience

Warnings over an incipient crisis in the global health care workforce have sounded for many years; in 2008, the OECD found that increasing dependence on foreign-trained clinicians in OECD countries, existing shortages of health professionals, and projected deficiencies in training numbers against projected health service demand were each challenging health systems (OECD, 2008). Fifteen years on, the PHSSR reports find much the same problems persist. Even before the COVID-19 pandemic, heavy workloads, low pay, poor job security, and limited career prospects contributed to burnout and low motivation. High turnover rates in many countries hampered service delivery and care quality. The pandemic brought additional challenges, such as increased demand for healthcare services, PPE shortages, and heightened risk of infection for healthcare workers.

In doing so, it exposed the vulnerabilities of the already overstretched healthcare workforces, pushing their resilience to the breaking point. The underlying causes include underinvestment in healthcare workforce development, insufficient attention to staff wellbeing, and policies that have not adequately addressed evolving healthcare needs. The net result of these challenges is that in recent years, the mental health of healthcare workers has significantly declined with high rates of anxiety, depression, and other common mental health conditions. Many of our participating

**Figure 7: Nurses and midwives per 1,000 people**

| | 1998 | 2008 | 2018 |
|---|---|---|---|
| India | 0.7* | 0.8 | 1.6 |
| Vietnam | 0.7* | 1.0 | 1.4* |
| Saudi Arabia | 1.8* | 3.9 | 5.5 |
| Brazil | 2.3 | 0.6 | 1.2 |
| Greece | 2.6* | 3.3 | 3.4 |
| Spain | 3.3 | 4.8 | 5.9 |
| Portugal | 4.0* | 5.2 | 6.9 |
| United Arab Emirates | 4.4 | 2.8 | 5.7 |
| Poland | 5.5 | 5.2 | 6.9 |
| Italy | 5.8* | 5.5 | 6.7 |
| France | 6.2 | 7.9 | 10.8 |
| Russia | 6.5 | 7.3 | 8.5 |
| United Kingdom | 8.2* | 8.7 | 8.1 |
| Japan | 8.2 | 9.6 | 11.8 |
| Germany | 8.6* | 9.6 | 11.5 |
| Belgium | 8.8* | 9.3 | 11.1 |
| Netherlands | 10.2* | 11.7 | 11.5 |
| Canada | 10.2 | 9.2 | 10.0 |
| Switzerland | 11.6* | 13.6 | 17.6 |
| Ireland | 14.0* | 13.6 | 12.9 |
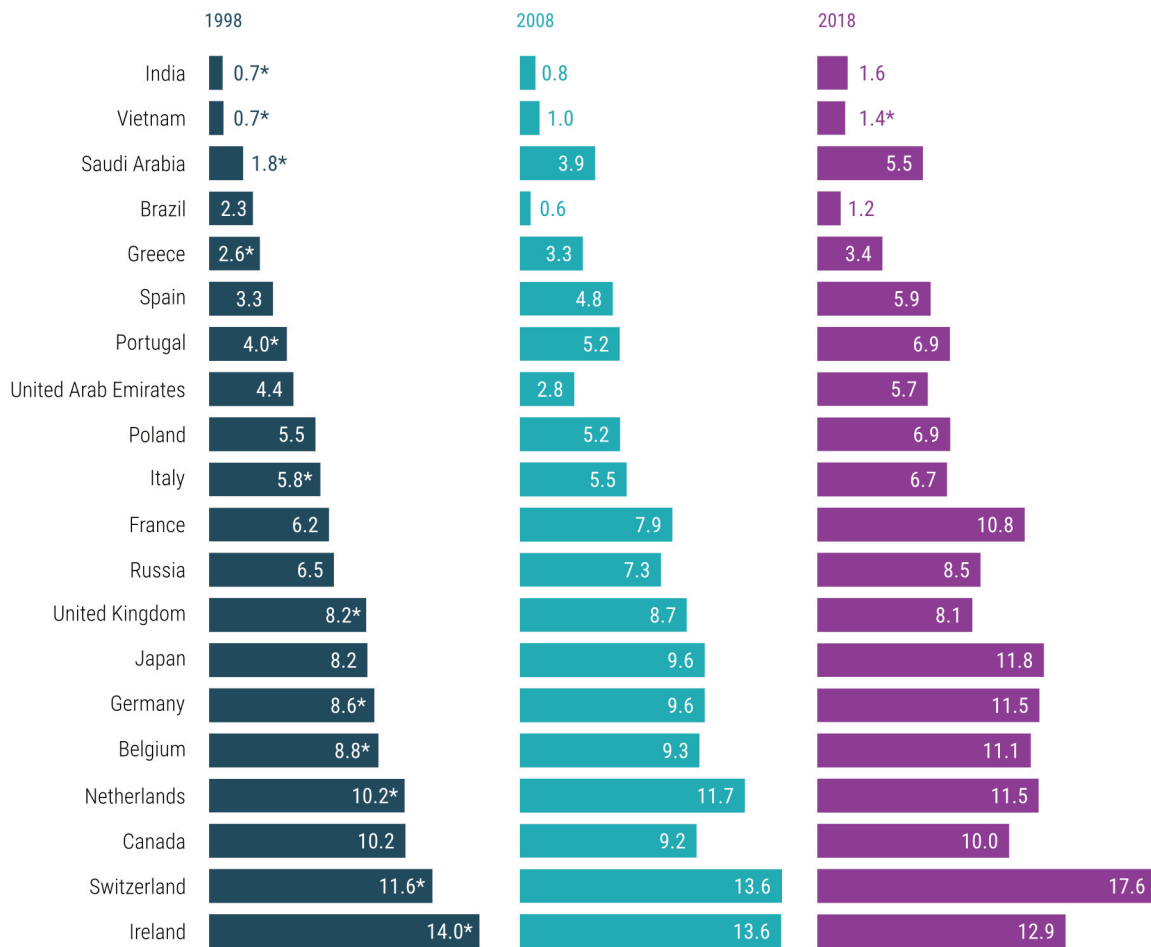
Note: * closest available year.
Sources: OECD (2023c); World Bank (2022c).

countries, including Belgium, **Brazil**, **Canada** and **Ireland**, reported concerns around the mental health of their healthcare workforce. Furthermore, inadequate attention to healthcare staff's mental health needs and working conditions leads to low morale, dissatisfaction, and feelings of being undervalued. This perpetuates the vicious cycle of staff shortages, excessive workloads, stress, burnout, poor retention, and recruitment difficulties. All clinical roles are impacted, but country reports such as those for **Belgium**, **France**, **Germany, India** and **Switzerland** reported that nursing and caregiving staff, who form the backbone of clinical services, seem to be the most severely affected.

Growing and ageing populations, as well as projected increases in dependency ratios in most high-income countries, add to the challenge. The health sector competes with other industries for staff, who may offer better pay, conditions, and job prospects. In many countries, years of inadequate national workforce planning led to underestimations of required workforce numbers (e.g., **Greece**, **England**). Several country reports also describe an over-reliance on foreign-trained staff (e.g., **Ireland**, **Saudi Arabia**, **UK**), draining resources from their countries of origin and leading to high attrition rates. The **Saudi Arabian** government is one example of a country having set ambitious targets for training more healthcare workers domestically in response to this.

Moreover, countries such as **Belgium**, **Canada**, **Greece** and **Japan** reported that rigid professional competences and a 'siloed' approach to healthcare impede the delivery of high-quality healthcare to ageing populations with higher rates of multiple chronic conditions, and hinder task shifting and redeployment which are essential to a workforce's flexibility during a crisis.

## Persistent workforce imbalances reflecting societal inequities

Many PHSSR country reports (e.g. **Brazil**, **Canada**, **France**, **Germany**, **Greece**, **India**, **Italy**, **Poland**, **Portugal**, **Russia**, **Switzerland** and **Vietnam**) emphasise long-recognised yet poorly addressed workforce imbalances. Uneven distribution of healthcare workforces creates gaps in services, leaves vulnerable groups underserved, and stretches some specialties to breaking point. Unwarranted variations in capacity disproportionately affect rural, geographically remote and underprivileged areas and often have the most significant impact on women and vulnerable older people with chronic conditions.

These imbalances have serious implications for equity in health provision and health outcomes in most PHSSR sample countries. In many cases, years of inadequate workforce planning have resulted in some geographic areas being more resilient than others and poor incentives to attract staff to certain specialties, particularly primary care, mental health and long-term care. Addressing these problems requires creative and thoughtful solutions that will take years to come to fruition.

## Strategies for strengthening sustainability and resilience of the healthcare workforce

Despite these challenges, there remains great commitment among healthcare workers, and intrinsic motivation remains a crucial driver for people to enter into, and remain within, health and care professions. Many reports highlight the extraordinary commitment, solidarity, and flexibility of the workforce during the pandemic (e.g., **Brazil**, **Portugal**, **Belgium**, **Ireland**, and others), with countries such as **England**, **France**, **Japan**, **Poland** and **Spain** reporting rapid responses to expand staff numbers in critical areas through strategies such as re-mobilising retired individuals and task-shifting. **Belgium** reported increased flexibility in task allocation during the pandemic, while **Portugal** noted high adaptability among health workers through redeployment and resource sharing. The report on **India** highlights the need to establish a clear regulatory framework, including incentives, to make the most of the benefits this can provide.

However, it is important to note that during the peak of the COVID-19 pandemic, countries such as **England**, **Italy**, **Spain**, **France**, and **Poland** had to implement policy and regulatory changes to achieve their strategies to bolster the clinical workforce (e.g., recognising international qualifications, employing medical graduates, and mobilising retired professionals). Although interim measures such as these can temporarily alleviate acute pressures, the lengthy training period for most clinical staff means that long-term solutions to addressing the healthcare workforce crisis will require careful, long-term planning with matching investment beyond a single budgetary cycle.

Improving workforce planning is high on the agenda in many jurisdictions (e.g., **Netherlands**, **Greece**). **Brazil**, **India** and **Ireland** have reported increasing numbers of health professionals in recent years, and **Brazil** has seen some successful initiatives addressing vacancies and shortages in vulnerable regions. The report on **India** identifies emigration of healthcare professionals as a key challenge, and recommends measures to reintegrate health workers and graduates returning from abroad. Additionally, there is growing recognition of the need to lift morale; for example, **Switzerland** recently approved several initiatives to improve working conditions for nursing staff through a referendum. **Belgium** and the **Netherlands** have proposed measures to improve recruitment, incentivise staff retention, and take advantage of the potential for digital health technologies to alleviate workloads.

These examples show that, with sufficient resources and investment, positive change in the healthcare workforce is achievable. However, it will take years of careful planning to transform workforce numbers, composition, and distribution, requiring sustained commitment from all key stakeholders, lasting beyond an individual political cycle. In the interim, there are measures which could significantly enhance healthcare staff's working lives that are identified in PHSSR's reports. Such measures should address the specific needs of different groups within the healthcare workforce, and particularly those of underrepresented communities.

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**CASE STUDY 3: ADDRESSING THE SHORTAGE OF NURSING STAFF IN BELGIUM**

For many years prior to the COVID-19 pandemic, Belgium has been experiencing significant shortages in the healthcare workforce. This shortage has been particularly acute in the nursing sector and undermined the resilience of the healthcare system in Belgium during the COVID-19 pandemic. It has been demonstrated that high turnover rates among Belgian nurses are related to poor working conditions and low job satisfaction. Before the pandemic, 10% of Belgian nurses were already considering leaving their jobs and 27% reported low job satisfaction. Following the pandemic these numbers have risen to 43.9% and 39% respectively. In recognition of this problem, the Belgian federal government has instigated a range of measures to tackle the shortage of staff in the healthcare sector:

- Encouraging part-time employees to work full-time via strategies such as being given priority to fill vacancies and offering extra hours via part-time contracts rather than agency contracts.

- Offering tax incentives to nurses and other healthcare staff to work overtime.

- Implementing leadership coaching targeted at HR services to improve work organisation and task delegation.

- Providing additional budget for equipment to facilitate nursing tasks.

- Recruiting more support staff to be able to provide administrative and logistical support for healthcare personnel.

- Investment in training programmes for nurses and carers, with income protection during training and employment guarantees.

Adapted from Belgium country report.

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## Recommendations

The workforce recommendations from PHSSR's country reports can be summarised into the following key themes (some example recommendations accompany each theme):

### Improve workforce planning and data infrastructure

- Develop a comprehensive national health workforce database to track workforce trends, skills, and capacity.

- Implement data-driven workforce planning tools to predict future healthcare demands and workforce requirements.

- Conduct regular assessments of healthcare workforce competencies and skill gaps to inform training programmes.

- Establish a national health workforce planning and coordination body to oversee and harmonise human resources strategies across the health sector.

### Prioritise specific care settings and models

- Develop targeted workforce strategies for primary and community care settings, addressing staffing levels, skills mix, compensation and professional development opportunities.
- Implement policies and incentives to encourage healthcare professionals to pursue careers in underserved areas, particularly in nursing, primary and community care, including loan forgiveness, housing assistance, and enhanced professional development opportunities.

### Enhance working conditions and compensation

- Implement evidence-based, performance-driven compensation models to reward healthcare workers fairly and incentivise quality.
- Create comprehensive healthcare worker retention strategies, addressing workload, work-life balance, and career progression.
- Develop standardised, competency-based job descriptions and career ladders to facilitate professional development.

### Support healthcare worker well-being

- Create comprehensive workplace wellness programmes, including mental health support services, stress management resources, and access to counselling for healthcare workers.
- Develop and implement evidence-based interventions to mitigate workplace stressors, improve work environments, and reduce burnout among healthcare professionals.
- Provide basic amenities at work, like affordable food and rest areas for those working long shifts.

### Expand roles and optimise scope of practice

- Implement policy and regulatory changes to enable task-shifting and expanded scopes of practice for healthcare professionals such as nurse practitioners and physician assistants.
- Invest in the development and integration of new healthcare roles, such as community health workers and digital health navigators.
- Give healthcare workers a stronger voice in decision-making, to foster a sense of ownership and commitment to the healthcare system.

### Invest in education and training

- Expand funding for access to medical education and training programmes, including scholarships, loan forgiveness, and grants.
- Develop targeted initiatives to increase access to medical education for underrepresented and disadvantaged communities.
- Enhance training in telemedicine, interprofessional collaboration, and chronic disease management to better prepare healthcare professionals for emerging challenges.

### Promote innovative solutions and technology

- Implement telemedicine and digital health solutions to support healthcare workers in delivering care efficiently and effectively.
- Invest in development and adoption of labour-saving technologies, such as robotics, remote monitoring devices, and electronic health records.
- Foster a culture of innovation and continuous learning to encourage adoption of advanced technologies into care delivery.

**Enhance collaboration and integration within healthcare teams**

- Develop interprofessional education and training programmes to foster collaboration and teamwork among healthcare professionals from diverse disciplines.

- Implement policies and regulations that facilitate the integration of diverse healthcare professionals into teams, ensuring a patient-centred, coordinated approach to care.
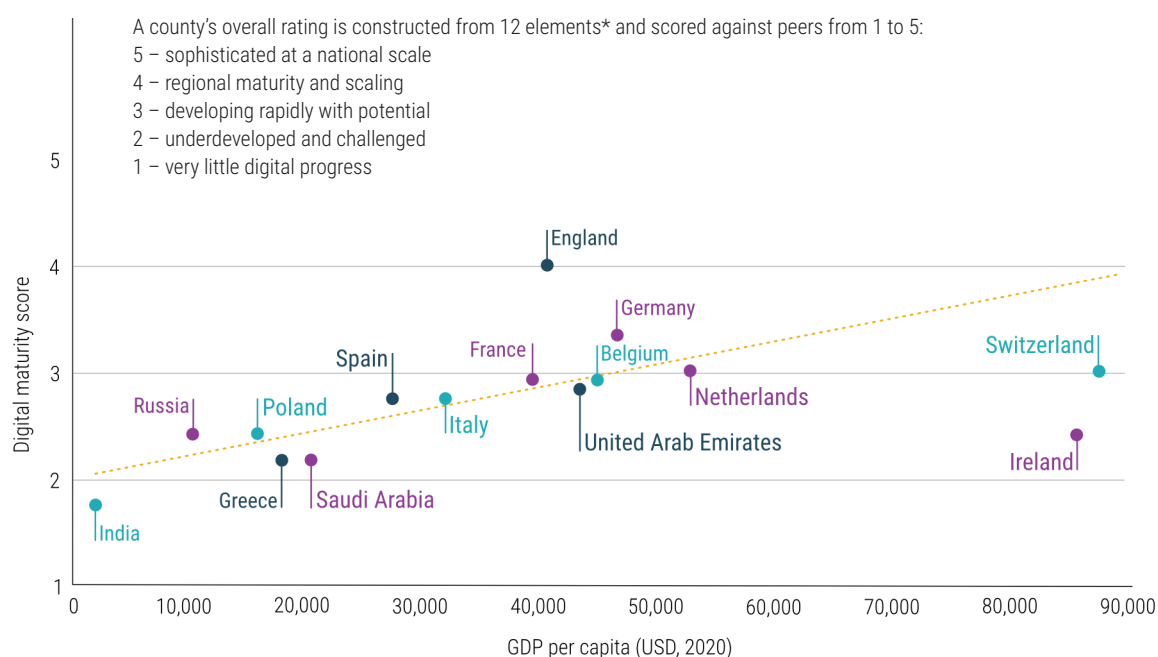
# 4. Medicines and technology

## Introduction

Medicines and technologies are central to the sustainability and resilience of health systems, playing a pivotal role in both routine healthcare and crisis response. They serve as vital tools in preventing, detecting and treating disease, enabling early intervention, and preventing complications. Further, technologies, particularly digital health solutions, enhance process efficiency, data collection, remote care provision, and crisis responses. Nevertheless, they also introduce challenges including high costs, infrastructure and training needs, and data security issues, necessitating a balanced approach for sustainable health systems.

PHSSR's country reports explore the adoption of novel drugs and technologies, the role of health technology assessment (HTA), and the challenges and benefits of its application in different countries. The chapter also investigates strategies for balancing cost control and innovation, and the critical importance of comprehensive health data systems. It brings to light the issue of supply security for medicines and essential medical equipment during emergencies, emphasising the need for robust crisis preparedness plans and international collaboration. Overall, the reports suggest a multifaceted approach to improve access to medicines and technologies, combining rapid access, affordability, and the integration of digital health technologies, advocating for policies that ensure equitable access to innovations while considering budgetary impact.

## Key messages

- Across the PHSSR sample of countries there was significant variation in the availability and adoption new medicines and technologies leading to inequities within and between countries.

- Health technology assessment (HTA) provides vital evidence for clinical benefits and cost-effectiveness, enabling prioritisation and adoption of new technologies, but is not without challenges. These include inconsistency, potential bias and delays in access following marketing approval.

- The introduction of more flexible approaches is suggested to facilitate rapid access to new treatment options, which de-risk investment without compromising on evidentiary standards.

- Medicines and technologies constitute a considerable proportion of total health expenditure. Balancing cost containment and innovation is crucial for sustainability, requiring cost-control strategies that do not stifle innovation or compromise patient access to necessary treatments.

- There is significant variation in the availability, completeness, and utilisation of health data across countries. Interoperability of digital systems, vital for improving coordination across different health sectors, remains a significant challenge, as does access to data for research.

- A lack of digital skills among both patients and healthcare workers were reported as a hindrance to the optimal use of health data systems and digital health technologies.

- The capacity for vital research and development of innovative medical and technical solutions is variable between the PHSSR countries, with some reporting a recent reduction in such activities.

- Security of supply of medicines and essential medical equipment is highly variable. The COVID-19 pandemic revealed inadequacies in supply chains, emphasising the need for robust crisis preparedness plans and international collaboration.

**Figure 8: Digital health care system maturity scores**



A county's overall rating is constructed from 12 elements* and scored against peers from 1 to 5:
5 – sophisticated at a national scale
4 – regional maturity and scaling
3 – developing rapidly with potential
2 – underdeveloped and challenged
1 – very little digital progress

Notes: * Elements are categorised as:
   Initiatives: policy, funding, data governance, institutions;
   Infrastructure: electronic health records, data standards, OMICS, interoperability;
   Implementation: telehealth, AI, information use, virtual studies.
GDP per capita data from World Bank Open Data; framework scores based on interviews and surveys with internal IQVIA experts.
Source: adapted from Arias and Wright (2022).

## Access to medicines and technologies remains a challenge in many countries

Given resource constraints, competing demands, and the increasing cost of medical innovation, a key question for health systems is how they make decisions on the adoption of novel drugs and technologies, and there are contrasting approaches in the PHSSR sample of countries. In high-income countries, hospitals are the primary avenue for introducing new healthcare technology, and health technology assessment (HTA) plays a crucial role in ensuring that the fixed pricing structure in many countries does not hinder the adoption and spread of these technologies. HTA achieves this by providing evidence to support necessary price increases for hospital reimbursements, which may be required for many new technologies.

HTAs are commonly utilised for the efficiency of new technologies, and has potential advantages for increasing sustainability as only technologies with sufficient evidence of positive clinical benefit and cost-effectiveness will receive a positive appraisal. HTA can also be highly beneficial in enabling prioritisation of healthcare interventions in low- and middle-income countries (LMICs). On the other hand, it is not always employed successfully, and potential pitfalls of HTA include potential bias or inaccuracies in the assessment process, bureaucratic delays, flawed evidentiary standards or decision-making criteria, and unwarranted variation if it is not applied consistently.

Approaches across countries are highly variable, with some having rigorously implemented national processes, others having inconsistently applied processes with significant regional variation, and others having no formal HTA processes in place. A drawback of many HTA systems appears to be the length of time it takes for products to become available to patients following marketing approval, and the variation between countries is significant, suggesting opportunities for improvement. Lengthy processes for market authorisation and reimbursement of new medicines and technologies were reported in countries such as **England**, **France**, **Italy**, **the Netherlands**, **Poland**, **Portugal** and

**Spain**. These were also described as rigid and opaque in **Belgium**, and duplicative and inefficient in **Canada**. Gaining access to treatments undergoing assessment was reported as burdensome and inequitable in **Switzerland**. Meanwhile, in the case of **Brazil**, instances of patients suing the health system for a lack of provision of specialist drugs were reported, with substantial impact on the health budget.

Such delays can have severe consequences for patients with conditions requiring time-critical treatment. This highlights the need for streamlining and harmonising HTA processes across countries to reduce delays. It also indicates a need to explore the potential for more flexible approaches to facilitate rapid access to new treatment options, which de-risk investment without compromising on evidentiary standards in terms of clinical effectiveness and safety. In this regard, **France** has mechanisms in place to ensure quick access to innovative drugs which have not yet been authorised on the market. However, this process has been identified as a potential source of inequity in access to innovative drugs. Such rapid access mechanisms should be coupled with measures that ensure equitable access to all patients, regardless of their socioeconomic status.

By comparison, the report on the **Netherlands** describes how the country's health system guarantees universal and relatively fast access to new in-patient drugs and innovative health technologies through the open system basic benefit package of the social health care insurance scheme which ensures almost automatic eligibility for reimbursement. Similarly, in **Germany**, manufacturers may take new medicines to market immediately upon regulatory approval at a freely chosen price. This allows rapid access to new treatments without access limitations based on economic decisions. However, the **Netherlands** report also cautions of the risk to financial sustainability that the open system poses. **Germany** has also introduced regulations for the adoption of digital health applications, which can be prescribed by physicians and are reimbursed by statutory health insurance providers. With lower evidentiary standards and a 3-month fast-track approval process, gaining approval for digital health applications is less strictly regulated than approval for pharmaceuticals. Such approaches offer the opportunity for innovative and flexible responses to patient needs, but it is important that they are paired with mechanisms to ensure patient benefit and cost-effectiveness. Where these are lacking, price can come to be treated as a proxy for quality, as described in the report on **India**.

## Balancing cost containment and innovation

Medicines and technologies constitute a considerable proportion of total health expenditure across countries, and the need to ensure access to new and often costly innovative treatments was raised as a challenge to sustainability in several countries. Particularly since the 2008 financial crisis, many systems have focused on cost-containment, which may have led to a systematic under-valuation of health interventions, and decisions not to fund medicines even where societal benefits outweigh costs. For example, the reports on **Belgium**, **England** and **Japan** highlight an overemphasis on the budget implications of innovative therapies and an inadequate focus on value-based care and the benefits to wider society of adoption. Moving forward after the pandemic, health systems are likely to be faced with greater budgetary constraints and austerity measures, which could pose challenges to the adoption of medicines and medical technology (especially for health systems which have been historically underfunded). Some country reports, including **Brazil**, **Canada**, **Portugal**, and **Japan**, have also reported decreases or a slowing in R&D investment as a negative implication of fiscal restraint.

There is a clear need for cost-control strategies that do not stifle innovation or compromise patient access to necessary treatments. Generic prescribing can be an effective strategy, but PHSSR's country reports highlight significant variation here: for example, the report on **France** highlights how generics represent only 30% of the market volume in France, against 81% in Germany and 85% in Britain. In the **Netherlands**, effective price regulation and tendering for low-priced preferential generic drugs by health care insurers together with reluctant prescription behaviour by physicians make pharmaceutical spending in the **Netherlands** among the lowest within the OECD. In **Germany**,

new and innovative non-pharmaceutical treatments and operating procedures may be adopted by hospitals without an HTA process, which the report suggests may encourage cost-effective innovation, as these new procedures are reimbursed according to existing diagnosis-related groups (DRGs). Another mechanism for harnessing expenditure, that of clawbacks and rebates, were criticised as undermining the sustainability of the **Greek** health system.

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**CASE STUDY 4: THE TAWAKKALNA APPLICATION – AN INNOVATIVE APPROACH TO COVID-19 MANAGEMENT IN SAUDI ARABIA**

The COVID-19 pandemic has underscored the need for innovative digital solutions in managing public health crises. One prominent example is the Tawakkalna mobile application, launched by the Saudi Data and AI Authority (SDAIA) in May 2020. The application was developed with a primary goal: to effectively manage and monitor the spread of COVID-19 in Saudi Arabia.

■ **Implementation and features**

Tawakkalna enables users to access their health status, report symptoms, book vaccination appointments, and acquire movement permits during lockdowns. Its user-friendly design is available on both Android and iOS devices with multilingual support, making it accessible to non-Arabic speakers. Despite some early challenges in the registration process and occasional performance issues, the app has continually improved through updates, addressing user feedback and enhancing its overall performance.

■ **Impact and recognition**

The application's contact tracing capabilities have been instrumental in identifying and isolating exposed individuals, limiting further virus transmission. As a result, the app likely decreased the burden on healthcare facilities and may have indirectly contributed to reducing COVID-19-related deaths. Tawakkalna has acquired an impressive user base, reaching approximately 77% of the Saudi Arabian population, with 27 million users. For its significant contributions during the COVID-19 pandemic, Tawakkalna received the United Nations Public Service Award in 2022.

■ **Future plans**

The SDAIA has future plans to enhance the Tawakkalna app further. These include expanding the scope of services, improving user experience, integrating with international health platforms, preparing for future health crises, collaborating with the private sector, and employing data analysis for research purposes. By constantly innovating and refining its features, Tawakkalna aims to remain a vital tool in Saudi Arabia's health management landscape.

Adapted from Saudi Arabia country report

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## Significant gaps in health data systems and persistent problems with Interoperability and linkage to other related sectors

The establishment of truly interoperable, comprehensive, and user-friendly clinical databases and electronic health records is a goal of the utmost importance for all health systems. Such systems have the potential to greatly improve the everyday care of patients and create a rich and complete source of population-wide data to aid with planning and implementation of services, as well as research and development of new technologies, including artificial intelligence. These systems should operate in real-time to facilitate the gathering and analysis of data in times of crisis.

Across the sample of PHSSR countries, there is a wide variation in the timely availability, completeness, and crucially the utilisation of health data. Despite the huge potential sophisticated IT systems hold, such comprehensive, functional systems appear to be a rarity. Interoperability of digital systems – vital for improving coordination between primary care, public health, social care, mental health, and hospital care – appears to be a particular challenge.

The majority of participating countries reported persistent difficulties with health data systems and problems with establishing an IT infrastructure which is fit for purpose. Slow progress with developing digital health platforms and electronic health records were reported (**Canada**, **Japan**, **Brazil**, **Vietnam**, **England**), and problems with fragmentation and poor interoperability were common (**Brazil**, **Canada**, **Japan**, **Belgium**, **Vietnam**, **England**, **Germany**). Poor pooling and use of data for monitoring, policy development, and research were noted in several jurisdictions (**Brazil**, **Japan**, **Switzerland**), and complex or inadequate governance structures around health data were a barrier in others (**Brazil**). Addressing these issues will be key to unlocking the benefits of rapid advancements in digital health and warrant a particular focus from policy makers.

However, many countries are making steps in the right direction. A positive example comes from **France**, where all healthcare services reimbursed by the SHI fund are integrated with a unique patient identifier. This national electronic health database is used by the SHI fund to closely monitor healthcare utilisation and expenditures and to make annual recommendations for improving the healthcare system. A health data hub was recently set-up to serve as a one-stop shop for health data, and to allow linking administrative data with other data sources including clinical data and results of laboratory tests. However, access to these data remains a challenge for researchers because of legal and technical barriers. Similarly, in **Germany**, while electronic patient records were previously only in use only by individual insurance providers, this changed in 2021. Due to new legislation, all statutory insurance providers are now required to offer electronic patient records and pharmacies, hospitals, and outpatient physicians are required to connect to the new digital healthcare infrastructure, with other care providers able to connect voluntarily.

Several country reports also noted that the COVID-19 pandemic had helped speed up innovation around digital health and its uptake, particularly in terms of remote consultations (**India**, **Ireland**, **Japan**, **UK**, **Germany**, **France**, **Russia** and **Saudi Arabia**). The report on **England** describes how, in a matter of weeks, NHS England successfully fulfilled a long-term objective to provide a 'digital first' offer for primary care services, noting how the imperative to protect patients and staff secured high levels of engagement which if sustained, could lead to long-term change. In contrast to previous centrally coordinated digital health initiatives, a concerted effort from national stakeholders drove change. Importantly recommends a systematic approach to evaluating the benefits and potential unintended consequences of such innovations in order to provide an evidence base supporting their longer-term implementation.

## Security of supply of medicines and essential medical equipment is highly variable

Emergencies place new demands on the supply of medicines and technologies, and the COVID-19 pandemic revealed insufficient supplies of medicines and equipment for an emergency. This led to shortages and difficulties in providing necessary care during the crisis.

Almost all countries in the sample, including **Belgium**, **Brazil**, **Germany**, **Spain**, **France**, **Italy**, **Poland**, and the **UK**, had inadequate or poorly coordinated stockpiles of essential medicines and medical technologies during the COVID-19 pandemic, and significant risks to the medical supply chain were identified, with several countries emphasising their reliance on international markets for essential supplies and ingredients for the manufacture of pharmaceuticals (**Japan**, **Portugal**). **Saudi Arabia** is one of several exceptions to this, with the report highlighting the governments success in securing and managing stockpiles of essential medical supplies, with an emphasis on inventory management and collective purchasing agreements with international partners.

Countries with significant pharmaceutical R&D and manufacturing capabilities, such as **India, Italy**, **Germany** and the **UK**, made a significant contribution to the global response, but reliance on international supply chains is identified as a potential weak link in countries' crisis response. Greater international collaboration is undoubtedly key, but several country reports also make

recommendations to support the diversification of supply chains for essential medicines and technologies, including increasing domestic production, and develop minimum stock requirements (with stockpiles integrated with national supply chains to reduce waste) to enhance resilience in future emergencies. Furthermore, ensuring the quality of supplies of medicines is identified as a critical priority in **India**, requiring significant regulatory reform.

It is possible that some of the difficulties could have been mitigated by the maintenance of comprehensive, regularly reviewed and updated emergency responsiveness plans. Many of the PHSSR countries including **Canada**, **England**, **France**, **Italy**, **Portugal** and **Spain** reported that their crisis preparedness plans had been shown to be outdated and inadequate during the COVID-19 pandemic. Collaboration between countries and regions, as well as public-private partnerships, can also help to ensure a more resilient and secure supply chain for medicines and essential medical equipment, as evidenced by the rapid development and roll-out of COVID-19 vaccines. This should be underpinned by international agreements to ensure equity in the global availability of vaccines, which is a major focus of current efforts at reform in global health governance and financing.

## Strategies for strengthening sustainability and resilience

It is vital that the health sector harnesses the extraordinary technological advancements that have been achieved over the past few decades. Technology has the potential to revolutionise healthcare, and although investment in this area has significant implications for health budgets, the rewards can be very significant. Advancements in medicines and medical technologies are rapidly changing the possibilities available to clinicians and their patients and radically altering the prognosis for certain diseases. These changes are likely to accelerate over the coming decades, and it is crucial that the regulatory and legislative landscape, and training for healthcare professionals, keep up with the pace of change.

Circumstances vary widely between countries, however, the PHSSR reports highlight positive efforts to improve processes and speed up access to important new treatments while also ensuring adequate assessment of efficacy and consideration of health system budgets. Taken together, PHSSR's county reports suggest a multi-faceted approach to improving access to medicines and technologies that strikes a balance between ensuring swift access to innovations, and ensuring their affordability. This can be achieved through a combination of effective health technology assessment processes, strategies for ensuring cost-effectiveness, and specific mechanisms for rapid and equitable access to novel treatments. The reports also highlight the need for health systems to embrace digital health technologies and address disparities in their adoption and use.

## Recommendations

The medicines and technology recommendations from PHSSR's country reports can be summarised into the following key themes (some example recommendations accompany each theme):

### Improving access to medicines and technologies

- Develop a national pharmaceutical policy with broad stakeholder input, addressing pricing, reimbursement, and access to medicines.

- Establish a centralised framework and mechanism for analysing health technology utilisation, outcomes data, and cost-effectiveness.

- Establish an independent and autonomous national agency for health technology assessment (HTA) to conduct evidence-based evaluations.

- Improve HTA processes to ensure timely, evidence-based decision-making, balancing cost control with provisions to enable rapid access to beneficial innovations.

- Review and reform medicine and technology co-payment policies to reduce out-of-pocket expenses.

## Address health system data gaps

- Improve patient and provider access to electronic health records (EHRs) and unique patient identifiers.
- Implement a nationwide data integration system across healthcare providers, including nursing homes.
- Develop automated data extraction tools from health records and hospital systems for surveillance purposes.

## Strengthening digital governance and infrastructure

- Establish a central organisation responsible for overall governance of digital health programmes.
- Create clear regulations on the interoperability of digital health systems, including EHRs, across healthcare providers and government systems.
- Develop a road map for increasing technical and operational readiness for a universal electronic health record system.
- Create comprehensive privacy and security guidelines for electronic health record systems, including user access controls.
- Develop a national strategy for telemedicine and virtual care services implementation, including reimbursement models and quality standards.

## Boosting digital skills and technology adoption

- Design targeted digital skills training programmes for patients and healthcare workers.
- Allocate specific budget for IT support specialists and data scientists in hospitals.
- Identify and promote digital health technologies that provide value for the public based on evidence.
- Foster an innovation ecosystem for healthcare by supporting startups, research centres, and international collaborations.

## Supporting innovation and research & development

- Increase funding for academic incubators and support the translation of health research into real-world applications.
- Address barriers in access to and utilisation of health data for R&D within a clear regulatory framework.
- Prioritise R&D investments in pharmaceuticals and health technologies with a focus on areas of greatest need.

## Ensuring security of supply

- Implement a unified procurement services platform accessible to both public and private healthcare sectors.
- Develop a national strategy to address gaps in prescription drug coverage and support alignment of public drug formularies across regions.

- Create a secure and efficient system for patients to access hospital medicines through home delivery or nearby pharmacies.

- Improve security of supply by establishing strong, diversified supply chains for essential medicines and medical technologies.

- Establish minimum stock requirements for essential medicines and medical supplies to ensure availability during emergencies, integrating stockpiles with national supply chains to reduce waste.

### Fostering international cooperation and collaboration

- Develop partnerships with international organisations to share best practices, gather evidence on cost-effectiveness, and support R&D investments.

- Promote international cooperation and joint procurement initiatives to increase negotiating power and lower costs of essential medicines and health technologies.

- Create a national-level crisis coordination mechanism between the industry and public authorities to ensure timely response during health emergencies.

# 5. Service delivery

## Introduction

Health service delivery refers to the provision of medical care to individuals and communities by healthcare professionals. It encompasses a wide range of services, from preventive and curative treatments to rehabilitation and palliative care. The efficiency, accessibility, and quality of these services directly impact health outcomes and patient satisfaction. For health system sustainability and resilience, effective service delivery is crucial. Health services must be responsive to changing population needs, provide high quality, universally accessible care without compromising financial sustainability, be able to adapt to shocks such as pandemics.

PHSSR's reports reveal the high degree of overlap in the areas that represent the greatest challenges to sustainability across countries. The most commonly cited problem area relates to the lack of continuity of care and poor co-ordination of care between different parts of the system. However, most countries in our sample are experimenting with new care models in an attempt to improve the co-ordination of care, with variable degrees of success. A large subset of countries concludes that their systems are hospital-centric, a feature that negatively impacts on overall sustainability. Another problem area flagged by most of the countries are insufficiencies in the funding and provision of preventative medicine, with most systems emphasising curative care. Quality of care is monitored and assessed to varying degrees in the different country settings, but in a majority of the countries studied there are no enforceable measures or financial incentives to improve patient outcomes.

The reports also examined the extent to which countries were able to respond to the extraordinary challenges posed by the pandemic. In particular, their ability to reconfigure services and increase capacity to deal with surges in demand while maintaining the quality, safety and availability of routine services were analysed through the lens of COVID-19. In particular, almost all countries in the sample had to scale down routine services to a greater or lesser extent in order to free up capacity for dealing with COVID-19 patients. Coupled with that, most countries actively increased capacity – in particular ICU capacity – as well as implementing remote consultations and reconfiguring services to relieve pressure on inpatient facilities.

## Key messages

- PHSSR's country reports show the need for better care coordination around the patient. Many health systems concentrate activity and spending in hospitals, limiting the role of primary care and long-term care services. Structural factors like poor digital infrastructure and payment models hinder improvement.

- In many countries, the pandemic exposed gaps in primary care services. Strengthening primary care is crucial for improved coordination, with patients registering with a single family doctor for continuity of care.

- Compensation models in many countries primarily reward individual providers, hindering coordinated care provision. Funding should support networked models of care to incentivise follow-up and continuity and comprehensiveness of care.

- Electronic record system disunity between care sectors is a significant challenge in many countries. PHSSR's country reports highlight the need for digital interoperability and single patient digital identities to facilitate integrated health systems.

- Long-term care is a key challenge in many countries, especially those with an ageing population. PHSSR's country reports reveal longstanding issues with the quality and safety of long-term care, necessitating reforms to care organisation and delivery, increased funding and greater accountability.

- Incentives to improve healthcare quality are lacking in many countries. Measurement and monitoring of quality indicators, and outcome-based payment models are needed to incentivise quality improvement and address unwarranted variations in care.

- Prevention and early detection of non-communicable diseases require increased investment. PHSSR's country reports highlight the low allocation of health expenditure to preventive care. Investing in primary care, health promotion, and collaborative efforts at population health management can alleviate the burden of chronic diseases.

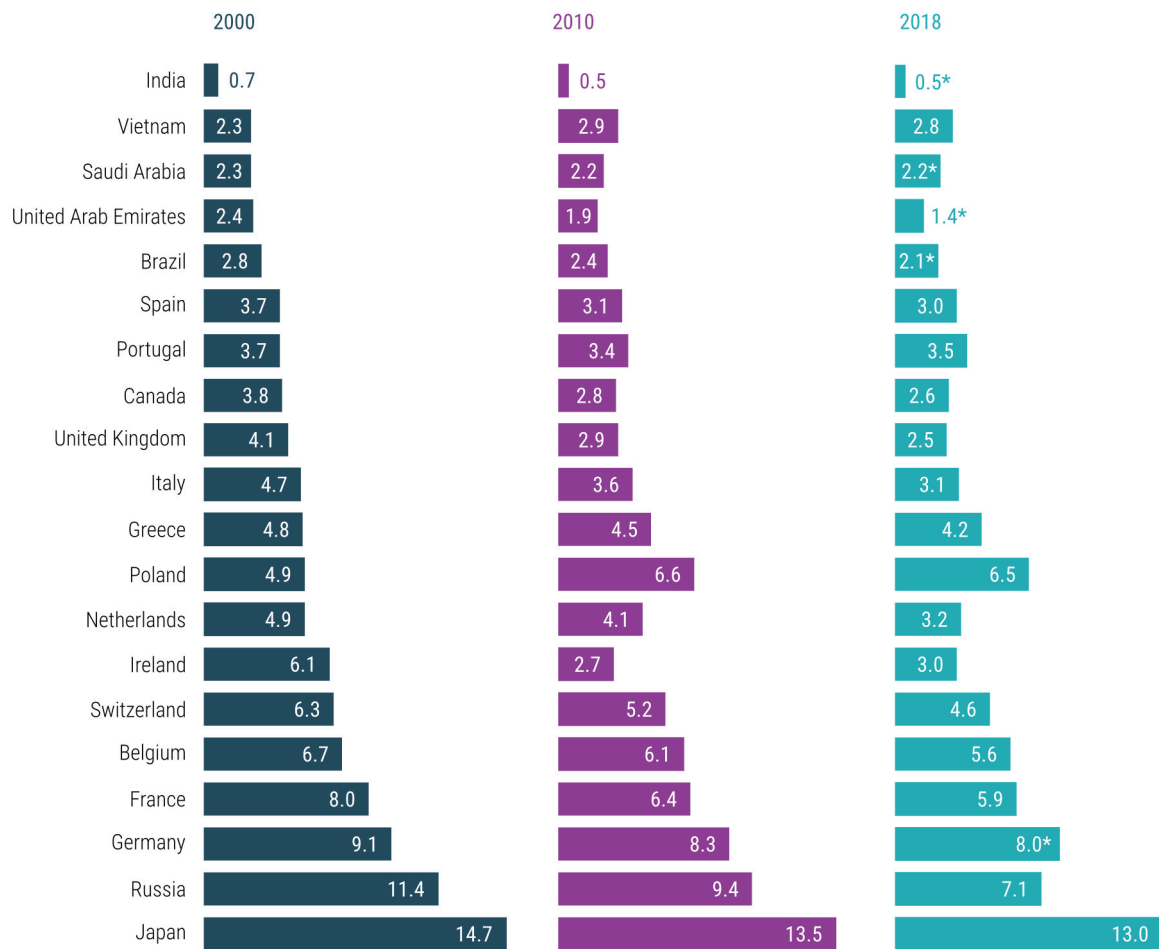## Care could be better coordinated around the patient, but critical levers for change are underdeveloped

In many health systems, an excessive amount of activity and expenditure continues to be concentrated within the hospital sector. While hospital care is often well-suited to acute care needs, patient-centred, long-term management of conditions should involve a much greater role for services such as primary care, domiciliary nursing and long-term-care homes. The potential role of these services is often limited by their relative underdevelopment and by poor coordination. The analyses recurrently point to structural factors, such as poor digital infrastructure and payment models that disincentivise collaborative pathways or integrated service models, as key barriers to improvement.

Resourced properly, primary care can play a much more significant role in the coordination of care than it is in many countries currently, with patients registering with a single family doctor or general practitioner to manage their care rather than being required to seek support from a range of different services, reducing continuity of care and impeding efficiency. For example, the report on Vietnam notes a wide quality and accessibility gap between hospitals services in major cities and primary care facilities at the grassroots level. Many patients are thus inclined to self-refer to hospitals, resulting in an overstretched public hospital system and high out-of-pocket spending.

Many reports recommended strengthening the roles of the GP and wider primary care to better coordinate services for patients, **Saudi Arabia** is among several countries in our sample focusing on expanding the role of primary care, with provider integration being pursued by grouping providers across primary, secondary and tertiary care into Accountable Care Organisations (ACOs), albeit the impact of this initiative is difficult to evaluate at this stage. While noting the challenges of coordination of care across the system, the report on **England** highlights the already extensive current practice of multi-disciplinary GP practices working together with community services such as mental health, voluntary services and others, as a key strength of the system. In **Italy**, the report notes that coordination of care is not sufficiently developed, but also notes that there are some positive examples of new care models being implemented in some of the regions: the report includes a case study on the management of patients with multiple chronic conditions through multi-disciplinary primary care centres, emphasising the potential benefits of this approach. Likewise, since 2015, **Poland** has implemented several coordinated care programmes for specific disease areas and multi-disciplinary primary health care hubs coordinating care pathways.

In many countries, care is still primarily compensated for individual providers, rather than in support of networked models of care provision. With funding following individual patients to single providers, there is little incentive for providers to ensure adequate follow-up or ongoing care from other sectors. The **Netherlands** report cites a lack of integrated and outcome-based (as opposed to

**Figure 9: Hospital beds per 1,000 people**

| | 2000 | 2010 | 2018 |
|---|---|---|---|
| India | 0.7 | 0.5 | 0.5* |
| Vietnam | 2.3 | 2.9 | 2.8 |
| Saudi Arabia | 2.3 | 2.2 | 2.2* |
| United Arab Emirates | 2.4 | 1.9 | 1.4* |
| Brazil | 2.8 | 2.4 | 2.1* |
| Spain | 3.7 | 3.1 | 3.0 |
| Portugal | 3.7 | 3.4 | 3.5 |
| Canada | 3.8 | 2.8 | 2.6 |
| United Kingdom | 4.1 | 2.9 | 2.5 |
| Italy | 4.7 | 3.6 | 3.1 |
| Greece | 4.8 | 4.5 | 4.2 |
| Poland | 4.9 | 6.6 | 6.5 |
| Netherlands | 4.9 | 4.1 | 3.2 |
| Ireland | 6.1 | 2.7 | 3.0 |
| Switzerland | 6.3 | 5.2 | 4.6 |
| Belgium | 6.7 | 6.1 | 5.6 |
| France | 8.0 | 6.4 | 5.9 |
| Germany | 9.1 | 8.3 | 8.0* |
| Russia | 11.4 | 9.4 | 7.1 |
| Japan | 14.7 | 13.5 | 13.0 |

Notes:
* closest available year.
Hospital beds include inpatient beds available in public, private, general and specialised hospitals and rehabilitation centres. In most cases beds for both acute and chronic care are included.

Source: World Bank (2022b).

activity-based) payments as a limiting factor on the system's ability to shift care from hospitals to GPs. In **Japan**, where roles and competencies of primary care and generalist physicians are evolving with service models, the payment system is yet to recognise new aspects of their work and is therefore not supportive of innovations. Fragmentation of services is also a key issue in India's health system, and the India report highlights a need to strengthen referral across primary secondary-tertiary and general-specialist facilities.

Digital interoperability between care sectors is a key enabler in care coordination. Both the **Greece** and **Portugal** reports emphasise the disunity of electronic record systems between different care sectors as a significant challenge, but it is a theme common across several of the reports. Single patient digital identities, where records can be viewed by professionals from different services that the patient encounters, should be the ambition for integrated health systems.

A key challenge highlighted in several countries relates to long-term care (LTC). As populations age, having strong LTC systems in place will be essential to meeting needs, avoiding health system inefficiencies, and thus the health system's sustainability. In many countries, notably **England** and **Canada**, the COVID-19 pandemic highlighted longstanding issues with the quality and safety of LTC.

**Figure 10: Healthcare access and quality by level of healthcare spending, 2015**
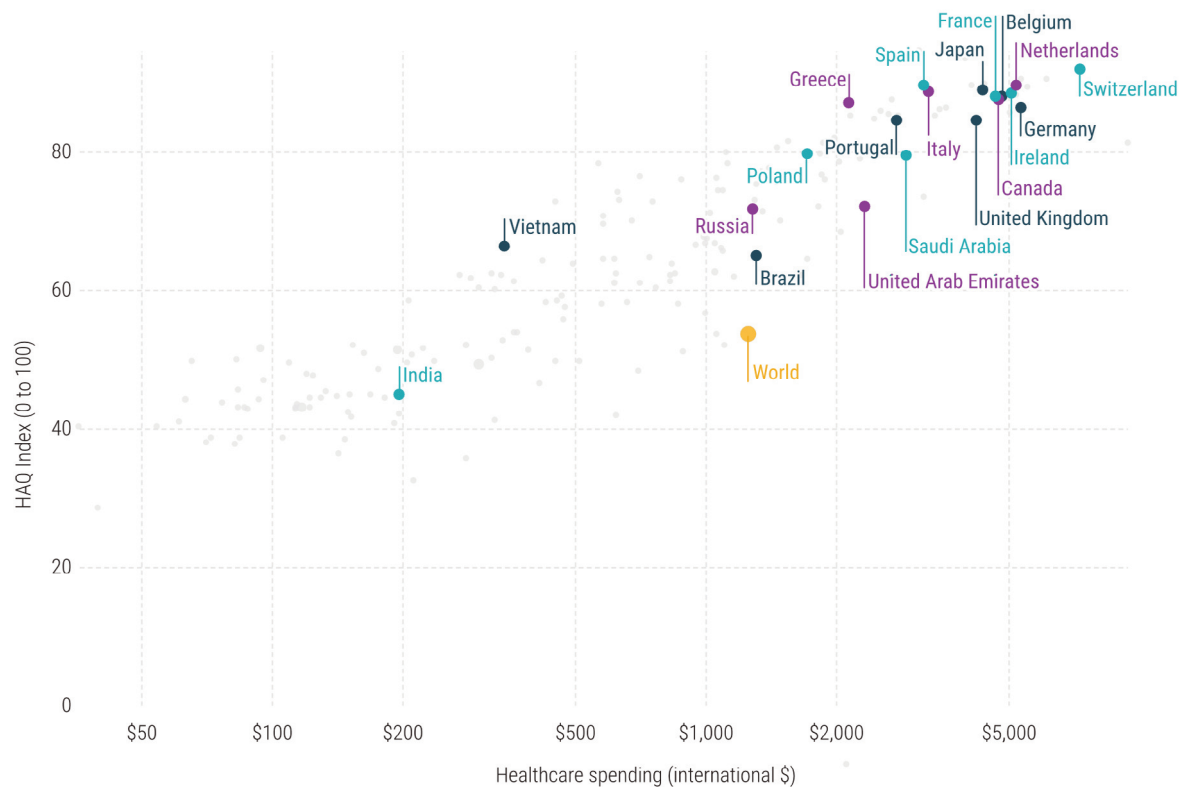


Note: Healthcare access and quality are measured by the Institute for Health Metrics and Evaluation HAQ Index.
Source: IHME (2015).

The **Canada** report suggests that significant reforms are needed to improve the quality and safety of LTC, including increased funding for staffing and infrastructure, improved infection prevention and control measures, and stronger accountability mechanisms. The report on **France** also highlights challenges in coordinating between primary care, hospital care, and long-term care services. In many countries, significant reforms and increased funding will be needed to ensure that LTC systems are able to play an increased role in reducing pressure on acute care services in future.

## Incentives to improve quality of healthcare and invest in prevention are lacking

There is significant room to further incentivise improvement in quality of services. Where care can be delivered more safely and effectively, health systems have opportunities to improve outcomes for patients and to reduce inefficiencies of often avoidable and expensive further hospital treatment. However, policy to stimulate quality improvement is relatively less advanced than that focusing around the narrower objective of access, and consequently many countries lack infrastructure for using data to track and incentivise quality of care.

Many countries do not have sufficient scope for monitoring quality at a national level, making it challenging to benchmark between providers and to enable improvements (**Canada**, **Greece**, **Switzerland** and others). This lack of measurement has an impact on service provision – for example, poor transparency on overall quality and a lack of real-time monitoring of quality indicators are contributing factors to large variations in quality between medical practices in countries as diverse as **Belgium** and **India**. Notably, in **Spain**, the report highlights that there is currently no formal reporting, publication, and evaluation of health system performance and outcome measures, quality is not measured and evaluated systematically. Where this does exist, it can be regionally

imbalanced: for example, in **Brazil**, the Brazilian Health Surveillance agency (ANVISA) sets quality protocols, but implementation and control is widely variable across the country.

Beyond just measuring quality, health systems should enhance the infrastructure around quality improvement too – particularly in relation to financing and incentives. In most countries, there is a general lack of integrated and outcome-based payment models or performance incentives for individual clinicians (e.g. **Brazil**, **Germany** and others). Where these are introduced, there are some indicators of positive effect. For example, in the **Netherlands**, among several value-based financing initiatives, incentives to reduce readmission rates by not compensating new hospital episodes recurring within 42 days of an earlier discharge were reported as being successful at reducing avoidable readmissions.

Overall however the evidence remains mixed on whether outright financial performance incentives improve quality, and care must be taken in their design. In **Canada**, the report notes that the use of financial incentives has been limited in primary or secondary care for meeting quality standards. Where such incentives have been used, the intended effects were not realised as might be expected. For example, in Ontario, bonus payments are given physicians to provide preventive services such as immunisations and cancer screening, but evidence of any effects is limited. Similarly, financial incentives for hospitals to reduce emergency department length of stay have had only marginal effects. Performance incentives need to be carefully calibrated in order to avoid unintended effects, such as inducing tunnel-vision or crowding out intrinsic motivation.

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**CASE STUDIES 5: INCENTIVISING INNOVATION IN IRELAND, THE NETHERLANDS AND FRANCE**

There are examples of success in incentivising and developing new service models that addressed some of the challenges above. Typically, these emerge from national funding for local initiatives that offer solutions to relocating care from hospitals, rather than major top-down reorganisations. Three examples, from Ireland, the Netherlands and France are below:

■ **Sláintecare Integration Fund, Ireland**
The Sláintecare Integration Fund is part of a wider reform programme that aims to strengthen primary care and address hospital capacity issues. The Integration Fund resources pilot projects for healthcare integration projects, and substantial innovations in care models have emerged from the programme, particularly between statutory health services and NGOs. Successful projects will be scaled and mainstreamed through the annual budget estimates process.

■ **Right Care at the Right Place (JZOJP), Netherlands**
The goals of this programme are to prevent more expensive hospital care where this can be better centred around the patient in other settings, with a particular focus on promoting e-health or "smart care". Health insurers in the Netherlands have made earmarked funding available to health care providers to relocate care from medical specialists to primary care providers where they can be delivered better or more efficiently. Despite some operational complexities in the programme, a few examples of success emerged where hospitals were able to shift care to other services while decreasing volume and maintaining quality.

■ **NEPHROLOR, France**
France has dedicated funding to support regional quality improvement initiatives through its regional health agencies. One such example is NEPHROLOR, a regional network in the Lorraine area, which has developed a comprehensive chronic kidney disease prevention strategy involving patients, medical community, primary care providers, and nephrologists. NEPHROLOR's innovative features include a patient-centred approach, early diagnosis and treatment, an integrated IT system, tele-monitoring, and quality evaluation. The network contributes to the sustainability of the healthcare system by emphasising prevention and patient education, and played an important role in managing chronic diseases during the COVID-19 pandemic.

Adapted from Ireland, Netherlands and France country reports.

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Finally, quality improvement should be broad in its conception. Several reports (**Belgium**, **Japan**, **Canada**) emphasised the need for health services to adopt more of a life-course or holistic approach to healthcare, which was ineffectively catered for within existing structures. The **Belgium** report also proposes a broader range of strategies for promoting patient-centred care, including shared decision-making between patients and healthcare providers, patient education and empowerment, and the use of health IT to facilitate communication between patients and providers.

## Prevention and early detection of non-communicable diseases

The importance of primary, secondary and tertiary prevention emerges as a prominent theme in many of the reports. For example, the report on **Italy** highlights that only 4% of health expenditure is allocated to prevention, despite the fact that chronic diseases are prevalent in the population, with approximately €67 billion spent every year on their management. In **Greece**, meanwhile, only 1.4% of total health expenditure is allocated to preventive care, among the lowest in the EU (average 2.9%). Similarly, in **Canada**, while system managers and providers are aware of the importance of focusing on prevention and health promotion, these broad goals have not translated to dedicated funding or specific targets to alleviate the burden of chronic diseases. A different set of issues arise in **Germany**, again bringing the question of coordination to the fore. Here, chronic disease prevention involves a wide array of actors at federal, regional and local levels, leading to an uncoordinated patchwork of preventive services provided by hundreds of organisations and institutions.

Several reports note the need to ensure that programmes for better prevention and detection of chronic conditions are a focus of investment, given clear operating targets, and that they are adequately protected from future crises (**Netherlands, Portugal**, **Poland, Greece**, **Belgium**). Across multiple countries, recommendations include investing significantly in primary care and health promotion activities, increasing the uptake of secondary prevention programs such as improved and broadened cancer screening, greater access to diagnostics, and increasing collaboration between hospitals, health funds, and patient organisations to better guide patients in taking care of their health. Better prevention also requires action to address social determinants of health, and this is explored in the section of this report on Population health.

## Crisis response: critical care, national strategy, telehealth and routine services

During the pandemic, increasing capacity rapidly in critical and acute care required the introduction of alternative care pathways and the cessation of many other essential services. Many countries had limited pre-existing national strategies for the various roles and responsibilities of different sectors of the health system (**Netherlands**, **Switzerland**), and as such coordination of different services was extremely challenging. Several countries described lack of clarity around the different roles of health sectors, and described this as an area for review (**Japan**, **Belgium**).

In order to generate and protect capacity across health service sectors, almost all countries made rapid adaptations to models of service, an in many cases cancelled routine services to put the service on an emergency footing and reduce infection spread. In **Vietnam**, the regular drug prescription period. was increased from one month to three months to lessen the contact required to renew prescriptions. All countries in our sample countries rapidly adopted telemedicine services as a means to provide care to patients away from hospitals and primary care, and protect staff and patients from further infection. These services have offered some efficiencies which could be embedded within the system through effective contracting and payment systems – many were financed during the pandemic with one-off payments, but mitigations will need to be in place to prevent the opening up of a digital divide in healthcare everywhere, and particularly in countries such as **India** and **Vietnam** where access to the internet is far from universal. Routine services that were interrupted included various screening programmes (**Canada**, **Ireland**, **Portugal**, **Belgium** and others), and the reports of **Ireland** and **Portugal** point to the cost of vastly reduced cancer diagnoses and a link to a growing backlog of cancer care.

## Recommendations

The service delivery recommendations from PHSSR's country reports can be summarised into the following key themes (some example recommendations accompany each theme):

### Address and improve the supporting infrastructure for coordination of care

- Adjust payment models to reward multidisciplinary care. Possibilities exist in rewarding providers collectively for establishing and managing joined-up care pathways.

- Establish, finance and reimburse long-term care services provided by multi-disciplinary teams of health professionals, including home care, and improve integration between the health and social care sectors.

- Strengthen the role of primary care, through encouraging the role of a registered GP for individual patients, and develop it as the main access hub for preventive, diagnostic, treatment and palliative services in the community.

- Develop networked models of healthcare provision, with inter and intra-regional mobility for patients seeking care.

- Digitally interconnect primary care, public health, social care, mental health, hospital care.

### Measure and incentivise quality improvement in care delivery

- Ensure core indicators of quality are assessed: hospitals and providers should measure, monitor and publish indicators on quality of care and healthcare outcomes.

- Improve public availability of reliable and comprehensible data on health care quality and consider centralised reporting of patient reported healthcare outcomes.

- Make use of outcomes-based financing models to incentivise quality improvement.

### Review crisis planning and response for routine services and critical care

- Re-evaluate appropriate levels of ICU capacity and target occupancy rates.

- Develop national strategy to improve health service delivery and its coordination in a crisis, particularly processes for critical care escalation.

- Establish clear roles for different sectors of the health service and between clinicians and other care workers during health crises, and provide GPs with guidelines on the prevention and early treatment of infectious disease.

- Improve distribution of clinical pharmacologists and infectious disease specialists in hospitals

- Where possible, develop contingency plans for critical screening services including cancers.

### Support and accelerate innovations in care models and delivery

- Review local and regional innovations in service models developed as part of the pandemic response, and capture best practices.

- Develop incentives and funding for the sustenance and scaling up of innovative models of care, particularly where these better integrate services.

- Ensure that health system regulation facilitates innovation, with a particular focus on establishing regulatory frameworks and reimbursement mechanisms for digital health services.

# 6. Population health

## Introduction

The relationship between population health and the sustainability and resilience of health systems is reciprocal and intertwined. A healthy population places less strain on resources, lowers healthcare costs, and bolsters system sustainability. Simultaneously, sustainable and resilient health systems, which provide adequate resources and adapt to challenges, significantly contribute to improved population health outcomes. This reciprocal relationship emphasises the need to address both population health and health system resilience in tandem to achieve lasting improvements.

PHSSR's country reports highlight the persistent issue of health inequalities driven by socioeconomic disparities across many countries. They emphasises the need for comprehensive policies that address the social determinants of health and extend beyond the health system. The reports from various countries participating in the PHSSR reveal the link between low socioeconomic status and poor health outcomes, exacerbated by the COVID-19 pandemic. They also emphasise the importance of investment in health promotion and preventative healthcare, as well as the challenges posed by fragmented and poorly coordinated health prevention and promotion services. Data fragmentation and lack of interoperability are identified as key impediments to population health planning and equitable policy interventions.

## Key messages

- Persistent and deepening socioeconomic inequalities are a significant and widespread problem which was reported across the PHSSR sample. In many cases it was noted that the COVID-19 pandemic had exacerbated these inequalities.

- Although most PHSSR countries have made progress with reducing rates of smoking and alcohol consumption, other challenges such as rising obesity, unhealthy diets, sedentary lifestyles and poor health literacy are problematic.

- The PHSSR reports provide numerous examples of programs in place to promote and protect the health of the most vulnerable groups in society. However, significant disparities in health outcomes demonstrate that much work remains to be done in this area.

- Despite the fact that all clinicians have a role to play in promotion of health literacy and healthy lifestyles, public and community health is not a core component of all clinical training programmes.

- Almost all countries in the PHSSR sample reported that there was a lack of comprehensive and consistent data to facilitate the optimal planning and implementation of population health initiatives.

- Many different policy areas, social, economic, and environmental, have an impact on population health. However, a 'health in all policies' approach involving collaboration between various sectors is lacking in most countries.

## Across many countries health inequalities driven by socioeconomic inequality remain a persistent problem

Health inequalities are pervasive but remain under-emphasised in national policy. While health systems must do more to meet needs of under-served groups, addressing the structural causes of health inequalities requires attention to the social determinants of health and action beyond the health system. Many different policy areas – social, economic, and environmental – have an impact on population health and investment in population health has repeatedly been shown to be cost-effective with many short and long-term benefits not just to health, but also to social, economic and environmental concerns (WHO Regional Office for Europe, 2014). However, 'health in all policies' remains an aspiration rather than a realised strategy in most countries.

The PHSSR reports from all participating countries highlighted the fact that persistent socio-economic disparities continue to cause significant health inequalities (e.g., **Ireland**, **Netherlands**, **Portugal**, **Switzerland** and others). The link between low socioeconomic status and poor health is indisputable, and in many jurisdictions such as Ireland the COVID-19 pandemic further entrenched
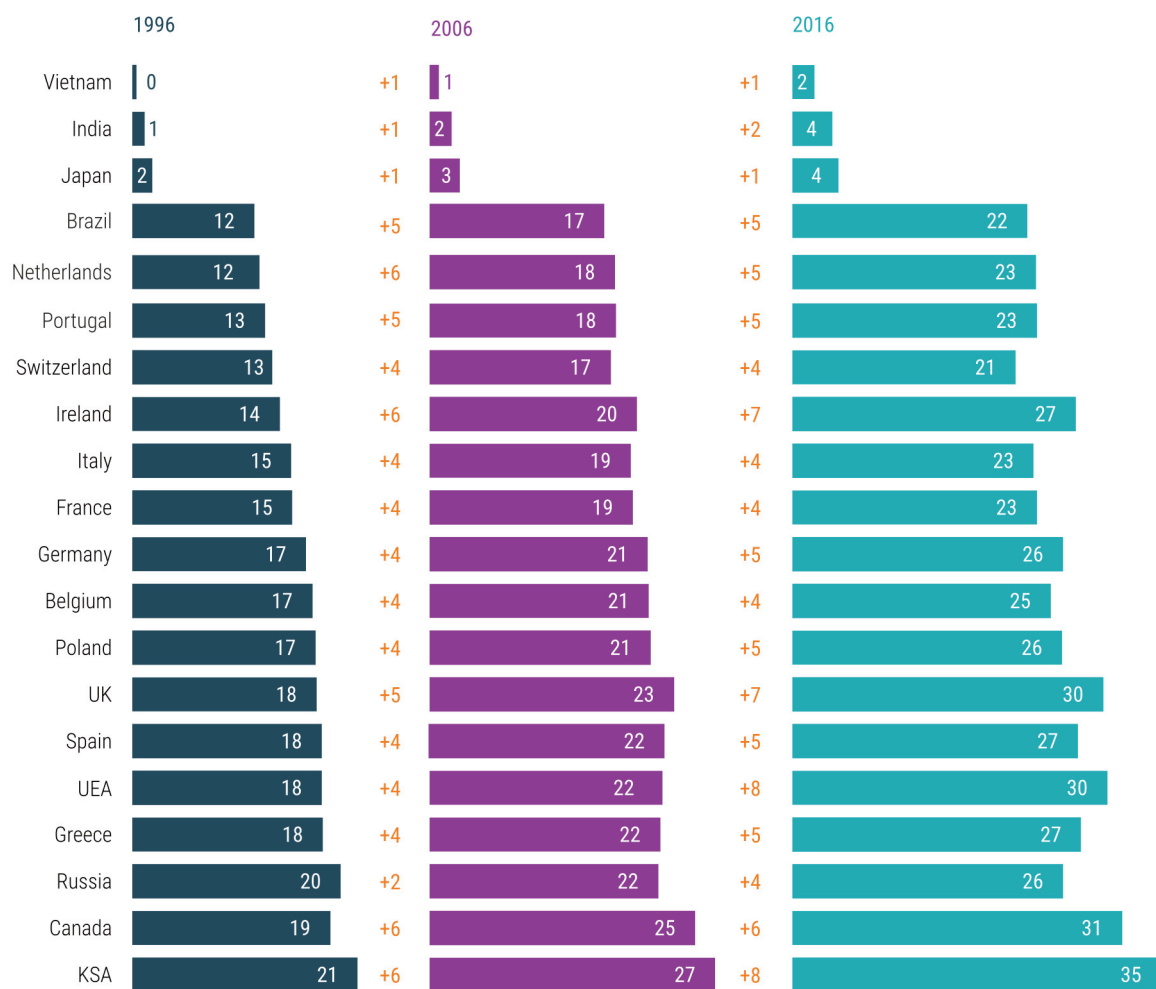
**Figure 11: Smoking death rate in 1990 vs. 2019**
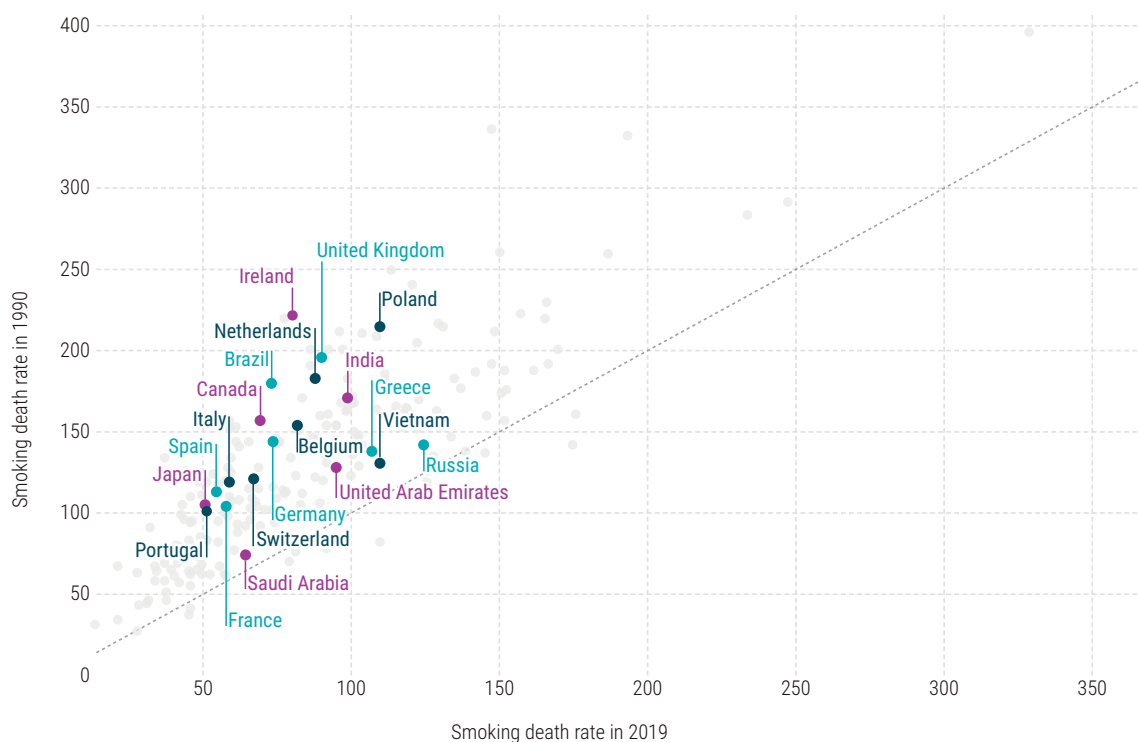


Notes: Premature deaths attributed to smoking per 100,000 individuals. To allow comparisons between countries and over time this metric is age-standardized.

Source: IHME (2020).

**Figure 12: Obesity – percentage of adults with BMI of 30 or over, showing percentage point increases 1996–2006–2016**

| | 1996 | | 2006 | | 2016 |
|---|---|---|---|---|---|
| Vietnam | 0 | +1 | 1 | +1 | 2 |
| India | 1 | +1 | 2 | +2 | 4 |
| Japan | 2 | +1 | 3 | +1 | 4 |
| Brazil | 12 | +5 | 17 | +5 | 22 |
| Netherlands | 12 | +6 | 18 | +5 | 23 |
| Portugal | 13 | +5 | 18 | +5 | 23 |
| Switzerland | 13 | +4 | 17 | +4 | 21 |
| Ireland | 14 | +6 | 20 | +7 | 27 |
| Italy | 15 | +4 | 19 | +4 | 23 |
| France | 15 | +4 | 19 | +4 | 23 |
| Germany | 17 | +4 | 21 | +5 | 26 |
| Belgium | 17 | +4 | 21 | +4 | 25 |
| Poland | 17 | +4 | 21 | +5 | 26 |
| UK | 18 | +5 | 23 | +7 | 30 |
| Spain | 18 | +4 | 22 | +5 | 27 |
| UEA | 18 | +4 | 22 | +8 | 30 |
| Greece | 18 | +4 | 22 | +5 | 27 |
| Russia | 20 | +2 | 22 | +4 | 26 |
| Canada | 19 | +6 | 25 | +6 | 31 |
| KSA | 21 | +6 | 27 | +8 | 35 |

Source: Adapted from WHO Global Health Observatory (2022).

existing socioeconomic inequalities. Many countries reported insufficient investment in health promotion and preventative healthcare and slow progress on preventative policy measures (e.g, **Japan**, **Belgium**). Meanwhile, the report on **Canada** highlights that there has been insufficient attention to equity considerations in policy development and implementation, and in particular the needs of Indigenous people. This includes addressing social determinants of health, such as income, education, housing, and employment, which can have a significant impact on health outcomes.

The competition for funding between preventative and curative services consistently favours the latter, and even in countries with a relatively high per-capita spend on health prevention, such as the Netherlands, the spend as a percentage of total health expenditure has dropped over the past 10 years. In most participating countries factors such as smoking and alcohol consumption remain problematic. Although smoking related deaths have fallen across the countries in the PHSSR sample (Figure 11) this remains a concerning issue for many. Furthermore, rising rates of obesity (Figure 12), unhealthy diets and sedentary lifestyles add to the challenge of maintaining a healthy population.

Additionally, it is evident that the provision of health prevention and health promotion is often fragmented and poorly coordinated. In many countries these functions are delegated to local level, and countries such as **Belgium** and **Switzerland** reported a lack of central coordination or national legally binding targets. Many reports also commented on poor health literacy, predominantly affecting the most vulnerable groups in society, and a need to prioritise preventative health policies for these populations which include young people, the elderly, women and marginalised groups (e.g., **Brazil**, **Canada** and **Ireland**).

## Better data is fundamental to remedying health inequalities but data on population health remains fragmented and piecemeal in many jurisdictions

Better understanding the depth of the challenge and how to target interventions will depend on availability of more complete data, disaggregated in a way that reveals the gaps in population health along lines of gender, race, and socioeconomic and immigration status, which exist to different extents in all countries. An integrated, interoperable IT infrastructure should be in place across the health system to facilitate the collection of consistent, relevant data, and this must be complemented by data analytics capacity to make appropriate use of it. These data should be monitored, analysed, publicly reported, and used to develop targeted policies to reduce inequalities in access to care and health outcomes. Linkage to other relevant agencies which also have a role to play in the promotion of population health is of great importance.

However, the PHSSR country reports demonstrate that data is fragmented between different parts of health systems, and that interoperability between sectors (both within health, and with external

### CASE STUDY 6: THE HEALTH OF THE TRAVELLER POPULATION IN IRELAND

Ireland is home to a small indigenous minority group of Irish Travellers. This marginalised group, which are less than 1% of the Irish population, experience high socioeconomic disadvantage, and, when compared to the general population, have very poor health outcomes. Life expectancy is 11.5 and 15 years less than women and men in the general population respectively, infant mortality is 3.5 times higher, and the rate of suicide is six times higher. Improvements in the health of the general population over recent years do not tend to be reflected in the Traveller population. Many factors contribute to this situation including high rates of alcohol consumption, poor diet, low rates of competed education, low literacy levels and high rates of unemployment.

Ireland has employed various strategies over recent years to try to improve and promote the health of the Irish Traveller community, however austerity cuts following the 2008 crisis had a significant impact on these programs, and thus on health.

During the COVID-19 pandemic special measures were put in place to try to protect and support the Traveller community. The Irish government worked with community-based stakeholders to devise strategies to enhance community understanding of measures around hygiene, social distancing, restricted movement and overcrowding. As the Traveller group were identified to be at increased risk of infection and severe illness, they were prioritised for vaccination.

The measures put in place were generally well received by the Traveller community. However, they were disproportionately affected by COVID-19, and 2.6 times more likely to contract the virus than the White Irish population. A possible interpretation of this is that the emergency measures put in place were insufficient to compensate for the severe and long-term socioeconomic disadvantage borne by the Irish Traveller population. It is clear that achieving lasting improvements in the health of this marginalised and vulnerable group will require ongoing multi-sectoral interventions with regular evaluation and update.

Adapted from Ireland country report

agencies) is lacking. Poorly linked data is emphasised as a key impediment to population health planning and to facilitating 'Health in all Policies' responses. Additionally, countries such as **Canada** and **Ireland** reported that, where data is available, it is often not disaggregated according to gender, ethnicity or other important factors, with the result that it is of insufficient quality to identify variations and guide appropriate interventions. **Switzerland** reported that absent or poor diagnostic coding sometimes leads to a critical lack of data on health outcomes affecting the population, and **Greece** reported that a lack of locally collected epidemiological data has led to data from comparable countries being used as a proxy. Timeliness has also been a challenge, a factor highlighted by the COVID-19 pandemic, with countries such as Japan finding themselves unable to produce rapid updates on infection rates or mortality.

## Positive messages and proposed solutions

Governments must come to recognise that although initiatives to improve population health require initial investment, they are well recognised to be highly cost-effective and have many positive repercussions for the welfare of society (Masters R *et al.*, 2017). Improving population health requires a comprehensive and interconnected approach that encompasses a range of strategies. Many countries participating in the PHSSR, such as **Brazil**, **Canada**, **Japan**, **Portugal**, **Netherlands**, **Switzerland**, and **Ireland**, have reported improvements in health indicators over the past decade, demonstrating the effectiveness of such approaches.

One foundational element of this comprehensive approach is the establishment of regularly reviewed national policy frameworks for population health, including legally binding targets. These frameworks serve as a guide for health initiatives, ensuring that policies are up-to-date and aligned with the latest evidence and best practices.

A key aspect of improving population health is addressing the socioeconomic inequalities that drive health inequities. This necessitates a cross-sectoral 'Health in all Policies' approach, reported by countries such as **Belgium**, **Brazil** and **Japan**. By involving collaboration between various sectors, such as education, housing, and employment, these countries create policies that prioritise health and well-being, addressing the root causes of health disparities. Particular attention should be paid to the most vulnerable groups in society, including infants and children, the elderly, and marginalised populations. Health status in infancy and childhood has a lasting impact throughout the life-course, and policies and interventions to support parents, families and children should be in place. To ensure unbiased policy development, the food and beverage industry should not unduly influence or stifle the formulation and implementation of effective population health policies.

To further support population health, cross-sectoral campaigns promoting healthy lifestyles and health literacy should be implemented. Countries like **Belgium**, **Japan** and **Portugal** have reported healthy lifestyle initiatives and programmes to improve health literacy and physical activity starting at school age. These campaigns should cover topics such as diet, exercise, sexual health, smoking and drug and alcohol use and should begin at an early age, preferably in primary school, and be designed to reach a wide range of individuals.

Consistent, high-quality data collection and analysis is essential for planning, implementing, and evaluating population health initiatives. The interoperability of IT systems and linkage of data enable policymakers and health professionals to make informed decisions, track progress, and adapt strategies as needed. By integrating strategies, countries can create a holistic approach to improving population health that addresses the needs of all individuals, regardless of their background or circumstances.

The COVID-19 pandemic has afforded a unique opportunity for improvements in digital healthcare. It is crucial that these advances are retained and built on. Ireland, for example, has seen the rapid adoption of digital technologies and improvements in reporting and timeliness. Efforts to improve data collection and the interoperability of IT systems are being made in various countries (e.g., **Belgium**, **Brazil**, **Canada**, **Portugal, Saudi Arabia**) although further investment is needed.

## Recommendations

The population health recommendations from PHSSR's country reports can be summarised into the following key themes (some example recommendations accompany each theme):

### Addressing social determinants of health

- Create an action plan to reduce health inequalities, including setting measurable indicators, objectives, actions, and periodic progress reports.
- Develop and implement a national policy framework to target and eliminate child poverty.
- Establish environmental health policies focusing on housing, transport infrastructure, and air quality improvement.

### Promoting healthy lifestyles

- Launch comprehensive, cross-sectoral campaigns that cover nutrition, physical activity, sexual health, smoking cessation, and responsible alcohol consumption.
- Integrate health education and prevention of non-communicable diseases into school curricula from primary school onwards.
- Introduce a sugar tax and enforce regulations on advertising and access to harmful products, such as tobacco and unhealthy foods.

### Focusing on vulnerable populations

- Develop targeted preventive health policies and interventions for children, older people, women, and indigenous communities.
- Implement evidence-based programmes to reduce smoking rates and promote healthy diets among vulnerable populations.
- Design comprehensive strategies addressing health determinants for these populations, including access to healthcare, education, and employment opportunities.

### Enhancing health system capacity and quality

- Incorporate public health and community health training modules into healthcare workers' continuous education programmes.
- Improve the communication strategies of healthcare providers for individuals with lower health literacy and ensure translation services are covered by health insurance.

### Leveraging data and technology for health improvement

- Invest in large-scale cohort studies, data linkage, and integration of various data sources, including genomic and environmental data.
- Create a national system for real-time mortality data reporting, analysis, and feedback at the local level.
- Develop risk stratification tools for primary healthcare providers to enable proactive interventions targeted at different population groups.
- Enhance health system management by optimising data utilisation and strengthening infectious disease surveillance policies.

### Collaborative and cross-sectoral approaches

- Encourage collaboration between health, education, social, and environmental sectors to address social determinants of health.

- Foster partnerships among hospitals, health funds, patient organisations, and other stakeholders to better guide patients in their healthcare journey.

- Develop a coordinated, public health-led response plan for health emergencies and crises, involving all relevant stakeholders.

# 7. Environmental sustainability

## Introduction

The relationship between environmental sustainability and health systems is intricately linked. Health systems, through their operations, infrastructure, and resource utilisation, contribute to environmental degradation, including energy consumption, waste generation, and emissions. These activities have far-reaching implications for air and water quality, climate change, and biodiversity loss, all of which impact human health. These impacts include but are not limited to food insecurity, labour-hours lost, and the spread of infectious disease, and the health system is increasingly operating as the first line of defence (Romanello M *et al.*, 2022).

The PHSSR reports depict varying national responses to these interlinked problems. The reports assess the emissions and waste management practices of health systems, with some countries demonstrating proactive measures to reduce their environmental impact. They highlight the risks posed by climate change, including heat-related illnesses and increased mortality rates. Air pollution is a particular concern, affecting respiratory health in several countries. The reports emphasise the need for data collection, reporting, and awareness to drive environmental sustainability efforts. All countries in some way are addressing the challenges, particularly the acute consequences of environmental risks on health, but there is in many cases a lack of overarching policy infrastructure for health systems to play their part in overall emissions reduction.

## Key messages

- The relationship between the environment and health systems is complex and intertwined. However, this relationship is often overlooked in policy-making, leading to insufficient infrastructure to address both aspects.

- Better population health, a function of socioeconomic and environmental factors as well as a health system's ability to prevent and treat illness, is key to both reducing the environmental impact of health systems and increasing populations' resilience to environmental health threats.

- Emissions from most health systems represent around 4–5% of total national emissions, so health systems must play a role in wider national decarbonisation strategies. However, most countries in our sample do not have mechanisms for routinely capturing emissions and other environmental impacts.

- Several countries have implemented national policy approaches to reduce emissions, which often include responsibilities for the health sector, particularly major hospitals. However, policies and targets specifically tailored to the health sector are scarce.

- The health risks associated with climate change and rising temperatures vary between countries. These include increased incidence of heatstroke and mortality during heatwaves, and risks associated with air pollution and poor air quality.

- Some countries are implementing adaptation measures to mitigate the health impacts of rising temperatures, but there is room for improvement in their governance and coordination. Comprehensive risk assessment and mitigation strategies are required, and must be considered for national funding.

- Health systems should collaborate with medicines and technology supply chains to reduce carbon consumption and waste. Initiatives that include both can include reprocessing medical devices, and extending medicine shelf-life.

**Figure 13: Health system emissions v. all national emissions**
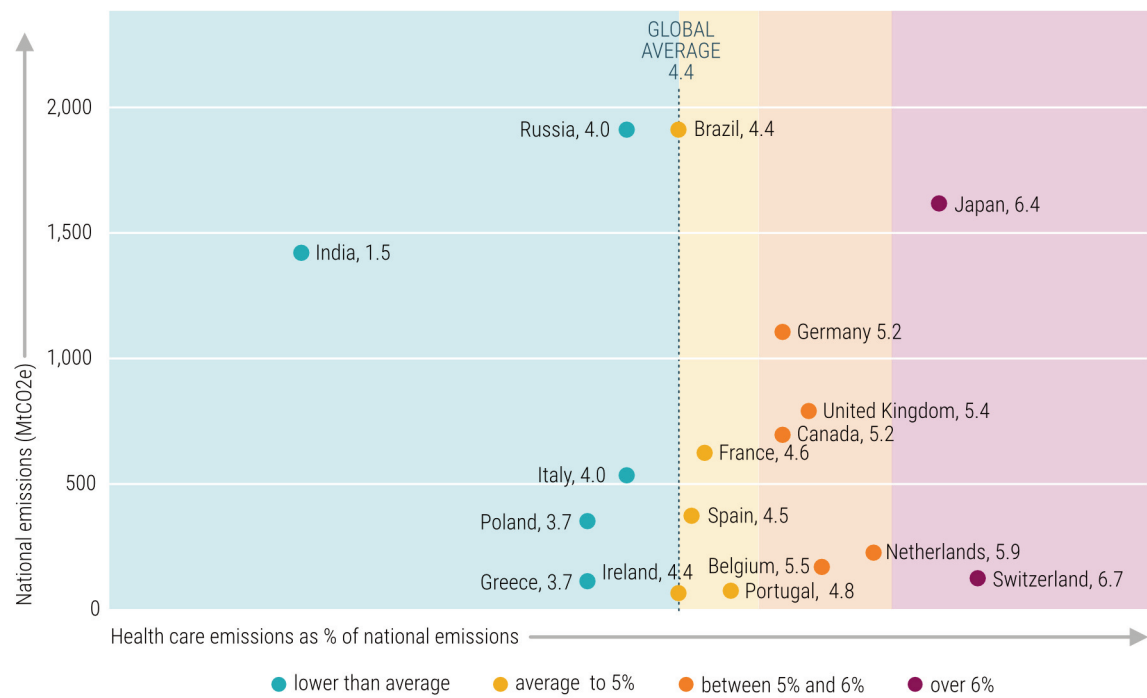


Note: Data not available for Saudi Arabia, United Arab Emirates and Vietnam.
Source: adapted from Karliner et al. (2019).

**Figure 14: Health system emissions – total for each country and per capita**
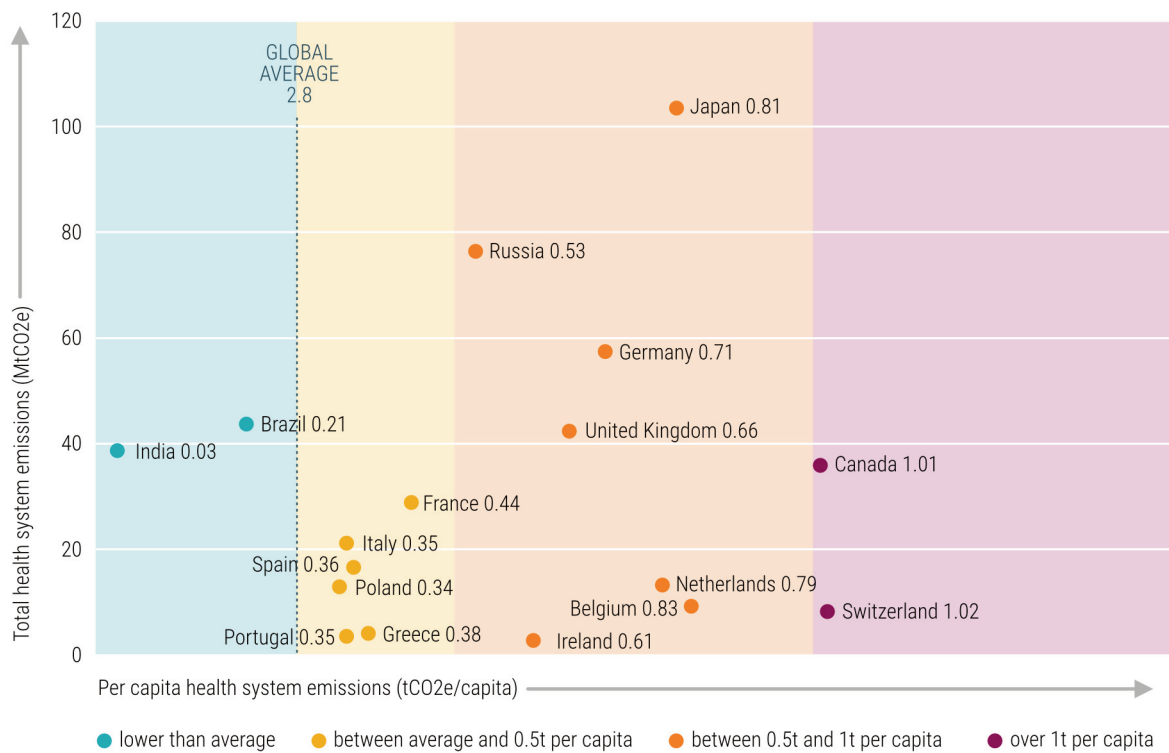


Note: Data not available for Saudi Arabia, United Arab Emirates and Vietnam.
Source: adapted from Karliner et al. (2019).

## Understanding and addressing the impact of the health system on the environment through policy

Health systems are responsible for around 4.4% of global net emissions, but in some countries the relative share is much higher. Put another way, if the global health care sector were a country, it would be the fifth-largest greenhouse gas emitter on the planet (Karliner J *et al.*, 2020). Significant gains can be made to reduce both emissions and waste from hospitals.

The reports presented varying levels of health system emissions as a proportion of total national emissions (Figure 13), with most falling around 5% with outliers at the top end (Switzerland, 6.7%; Japan, 6.4%) and lower end India, 1.6%). However, looking at emissions from health systems using per capita data a more nuanced view of the situation is revealed, with Canada joining Switzerland as an outlier at the top, and Brazil joining India at the lower end (Figure 14). Without more detailed review against the wider industrial emissions contexts for these economies it is difficult to draw firm conclusions about relative policy successes in improving the top-line emissions rate for health systems, however what is obvious is a general absence of national infrastructure to monitor health system emissions. Most reports relied on climate-oriented NGO policy reports or academic research for information on health system emissions, rather than from any systematic governmental process for health system emissions monitoring. This in itself poses a challenge for effective performance management and evaluation of specific health systems policy on reducing emissions.

Many reports nevertheless described national policy approaches to reducing emissions which implied responsibilities for the health sector, particularly for major hospitals. The majority of countries had overarching emissions reductions targets set at national level and applicable across industrial sectors, with a few exceptions where countries lacked any comprehensive national policy to address climate change (e.g. Brazil). In most countries the policy for emissions reduction was primarily that of overarching public and industrial policy – for example in Portugal where the National Energy and Climate Plan 2030 was cited as the primary instrument for controlling emissions.

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### CASE STUDY 7: CONNECTION BETWEEN THE HEALTH SYSTEM AND ENVIRONMENTAL SURVEILLANCE IN BRAZIL

There can be poor connection between environmental agencies and healthcare systems, but in Brazil, the unified health system has historically had a key role in managing environmental health, in recognition of the co-dependency between environment and health.

The Brazilian national health system (SUS: Sistema Único de Saúde) was founded and developed in the 1980s, when basic sanitation was unreliable. In parallel with the founding of SUS, the Brazilian government expanded a range of rights to the Brazilian public: the right to treated water and waste, to housing and to optimum living conditions. These went hand-in-hand with SUS expansion, with both established through the 1988 Brazilian Federal Constitution. The SUS has therefore had a long-standing interconnection with policy and management around environmental risks to health.

A unified health system, with a strong primary health care network throughout Brazilian municipalities, the SUS now plays an important role in environmental sustainability through its intersectoral capacity. The SUS has adopted responsibilities linked to sanitary surveillance, with respect to environmental hazards, quality of food circulation and other concerns for public health. Family Health Services (FHS) work directly with social work teams to communicate with families and governments.

Adapted from Brazil country report

Many countries had developed specific health system emissions reduction policies. The Netherlands showed perhaps some of the most advanced policy initiatives. Following two Green Deals with specific focuses for health care, a third Green Deal was signed in the Netherlands in 2022 which included specific goals across a comprehensive range of factors influencing environmental degradation – from reducing $CO_2$ emissions to pharmaceutical residues in water. Meanwhile, the Greek report described the development of an action plan to reduce the energy footprint of health institutions, which aligns with the overarching National Energy and Climate Plan. In Belgium, the Flemish government agreed 13 climate commitments for healthcare facilities in 2017, including energy and $CO_2$ reductions by 2030.

Some countries have demonstrated positive results. Though maintaining comparatively high emissions in the healthcare system as a proportion of national emissions, Japan's Ministry of Health, Labour and Welfare agreed annual reductions target with the Japanese Medical Association, and has been successful in reducing healthcare emissions by 22.9% in 2018 compared to 2006 through energy transition and improved heat-insulation, and through procurement of high-efficiency equipment.

## Understanding and addressing the impact of the environment on health

The health impact of climate change will place increasing strains on health systems around the world in years to come, testing both their sustainability and resilience. Its impacts are already being strongly felt (Romanello M *et al.*, 2022). Several countries in our sample have taken action to address vulnerabilities and improve their resilience to the impacts of climate change, identify the adaptations needed in the health system and implement surveillance systems that effectively support health system leaders with timely forecasting and alerts.

The country reports described varying risks to health related to climate change, and warmer temperatures in particular. Many reports described the impact of heatwaves on heatstroke and on mortality (Japan, Belgium, Switzerland, Portugal). In Switzerland, a study estimated a 7% rise in additional deaths during a heatwave, while the report for Portugal highlighted particular risk in densely populated areas like the capital Lisbon.

The Japan report describes an increasing range of climate adaptation measures in place to mitigate the impact of rising temperatures, including heatstroke alerts and demand forecasting. While these measures are in place in Belgium too, poor translation of these between government health authorities and meteorological forecasters means these could be made more effective through improved governance.

Air quality and pollution is a particular risk factor for respiratory conditions. The Greek population, in particular in the major cities, are severely affected by air pollution – with Athens and Thessaloniki among the top 20% of polluted metropolitan areas in OECD countries. Consequently it sees high rates of mortality attributable to outdoor air pollution (556 per million, against the OECD average of 326). In response to its own issues with air quality, Japan's government introduced environmental standards that include accurate forecasts and alerts where these will be breached.

Naturally many of the recommendations for each country were relatively specific to policy requirements in that country. In Brazil, authors recommended policies to increase penalties for environmental crimes, including illegal mining and malpractice in the wood industry in the Amazon. In the Netherlands, where environmental policy in healthcare is relatively advanced, there were specific recommendations to incorporate the WHO's clean air standards into the most recent Green Deal. However, several key policy developments were common across countries, suggesting their potential utility beyond the scope of the PHSSR countries.

## Recommendations

The environmental sustainability recommendations from PHSSR's country reports can be summarised into the following key themes (some example recommendations accompany each theme):

### Data collection, reporting and awareness

- Produce and report consistent, actionable baseline data on health systems' environmental impacts.
- Map and measure the carbon footprint of health system activities and identify reduction opportunities.
- Raise public and workforce awareness on environmental risk factors, healthcare waste, and best practices.
- Foster healthcare sector participation in environmental agendas and collaborate with national and international jurisdictions.
- Support efforts to build knowledge, capacity, and networks for climate resilience and sustainability in health systems.

### Capacity building, knowledge mobilisation, and international cooperation

- Train healthcare workforce on best practices to reduce waste, resource consumption, and environmental impact.
- Develop a methodology to evaluate the environmental and societal impacts of health interventions alongside health effects and costs.
- Invest in studies on the effects of multiple environment factors on health, considering social determinants of health.
- Enhance international cooperation for the sustainable use of genetic resources and the integration of regional sustainability efforts.

### Regulation, and enforcement

- Establish a centralised authority to ensure progress towards reducing environmental impact.
- Adopt WHO air quality standards and mitigation measures against climate and environmental degradation.
- Implement incentives and obligations for sustainability in public contracting mechanisms.
- Increase penalties for environmental crimes that cause damage to public health and take a stronger stance on illegal activities.

### Resource management, waste reduction and recycling

- Develop medical device reprocessing initiatives and reduce equipment obsolescence.
- Create incentives for healthcare facilities to be more sustainable, sort and recycle waste, and exchange best practices.
- Reduce the use of single-use items and promote sterilisation and reuse of medical items.
- Reduce unnecessary medicine supply and promote appropriate responses to environmental costs.
- Invest in alternatives to incineration of hazardous healthcare waste and increase circularity of waste-resources.

**Energy efficiency, low-carbon infrastructure, and climate resilience**

- Invest in zero-emission hospital buildings and enhance energy efficiency in public hospitals.

- Develop and implement a plan to reduce carbon emissions throughout the health system, including supply chain.

- Commit to transitioning to green and secure energy sources in healthcare systems.

- Assess future climate change effects on the health system and prepare relevant actions, including emergency plans.

- Develop long-term climate resilience action plans for healthcare infrastructure, with targets, indicators, and monitoring.

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