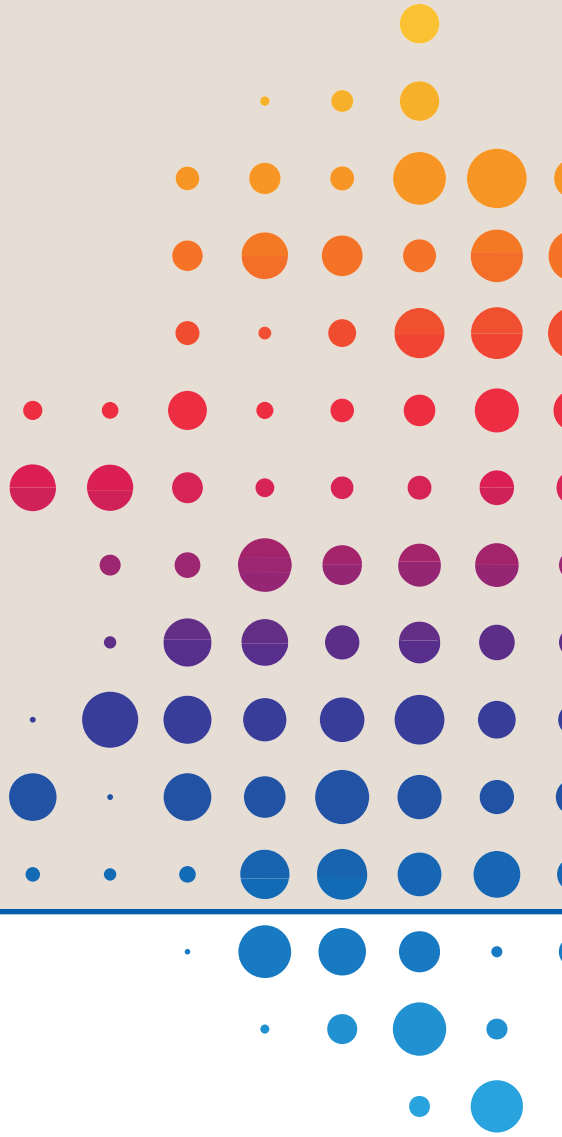
White paper

Decentralized care

Transforming Healthcare: Implementing Decentralized Care To Enhance Outcomes And Efficiency In Four Benchmark Countries



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Executive Summary

This white paper presents a comprehensive framework for the implementation of decentralized healthcare models, informed by the experiences of four benchmark countries: the United Kingdom (UK), Singapore, the Netherlands, and Belgium. One of the objectives of decentralized care is to enhance patient outcomes by increasing access to services and reducing the need for frequent or long-distance travel. By shifting care delivery from more complex hospital environments to less complex settings whenever applicable, decentralized care optimizes resource utilization and alleviates the burden on hospital systems. This approach is applied whenever patient conditions allow, ensuring that appropriate levels of care are provided based on patient needs.

What motivated these countries to change their approach towards decentralized care?

UK: Reducing hospital strain and improving integration across care systems in response to aging populations, chronic diseases, cost-efficiency needs, and enhancing the patient experience through care closer to home.

Singapore: Facilitating long-term, community-based care for an aging population amid rising healthcare costs and improving health outcomes through preventive care and strong government support for healthcare innovation.

Netherlands: Empowering patients, improving efficiency to reduce pressure on hospital capacity, and addressing chronic disease burden with sustainable care solutions.

Belgium: Controlling rising healthcare costs while maintaining quality, improving rural access, leveraging telemedicine and digital health advancements, and enhancing patient outcomes through better care coordination.

What key insights are driving decentralized care success?

Policy and regulation: Adequate policy enablers and legal framework are crucial. The UK's Integrated Care Systems (ICSs) and Singapore's regional health systems exemplify the effectiveness of tailored government policies.

Technology and data: Investment in digital health infrastructure, such as electronic health records (EHRs), interoperability frameworks, and telemedicine platforms, is essential. All four countries leveraged these technologies to enhance coordination and patient care.

Infrastructure and framework: Developing community care, and whenever possible, at-home care frameworks, supported by sustainable funding models, is vital for scaling decentralized care. Belgium's eHealth platform and Singapore's Primary Care Networks (PCNs) demonstrate the effectiveness of prioritizing infrastructure development.

Training: Continuous professional development is critical to equip healthcare professionals with the necessary skills for new technologies and care models.

What results have these countries achieved with decentralized care?

UK: Hospital admissions decreased by 800,000 (12%) in 2022 compared to 2019, while elective admissions fell by 21% and emergency admissions by 9%.

Singapore: The MIC@Home (Mobile Inpatient Care @ Home) program saved 7,000 bed days by mid-2023, with teleconsultations rising by 40% in 2022. As of 2023, the NCIS (National University Cancer Institute)-on-the-Go program has successfully provided care to over 2,000 cancer patients, allowing them to receive treatment at home or at nearby community clinics.

Netherlands: The Better@ Home program saved €2 million annually, while telemedicine increased healthcare access by 20% in remote areas.

Belgium: A pilot program in Flanders for heart failure patients reduced hospital readmissions by 15%, while overall rural healthcare travel times in Belgium have decreased by over 60%, from an average of 30–45 minutes to just 10–15 minutes.

What actions are recommended to enhance decentralized care implementation?

Develop policy: Secure government support and develop policies that promote regional health systems and patient-centered care.

Invest in technology: Establish interoperable digital health infrastructure, including EHRs and telemedicine, to enhance care coordination.

Build infrastructure: Develop regional healthcare hubs and/or at-home-care programs to facilitate the transition from hospital-based to community-based care.

Create training and pilot programs: Invest in comprehensive training for healthcare professionals to ensure effective use of new technologies and care models; launch pilot initiatives to gather data and adjust decentralized care models based on real-world outcomes.

Introduction

National healthcare systems are grappling with several challenges, including rising healthcare costs, aging populations[1], an increase in chronic diseases[2], and difficulties in accessing healthcare services in rural and underserved areas[3].

Amid this backdrop, this study examines the ways in which governments can improve clinical outcomes in population health and healthcare; enhance patient access and convenience; optimize costs, resource efficiency, productivity, and "value for money" in healthcare systems; and increase patient and caregiver satisfaction. Of particular interest were "decentralized care," defined here as healthcare services offered in the least complex environment possible, enabling rational use of the structure and care network, whenever possible according to clinical conditions, and reducing the need or frequency for patients to travel long distances, providing a more patient centric approach.

To explore the principles and practice of decentralized care, the healthcare systems of the UK, Singapore, the Netherlands, and Belgium were assessed, considering:

- Government policies, hospital guidelines, and protocols supporting decentralized care.
- How health technology assessment (HTA) bodies shape policies that enable decentralized care.
- The influence of incentives and reimbursements on decentralized care implementation.
- Lessons in organizing, enabling, and achieving results with decentralized care that may inform approaches for other countries.

This white paper aims to detail the thinking and strategies behind decentralized care and results observed by these countries.

Methodology

This research analyzed publicly available information on healthcare systems in the UK, Singapore, the Netherlands, and Belgium—countries selected for their strong policies and initiatives supporting decentralized care, with motivations centered on managing rising healthcare costs, optimizing resources, and addressing aging populations and chronic disease prevalence. Technological advancements also significantly influenced each country's approach.

The study began with a review of government documents and reports, followed by interviews with senior stakeholders from hospital systems and government bodies. These interviews explored key performance indicators (KPIs), successes, and ongoing challenges in implementation.

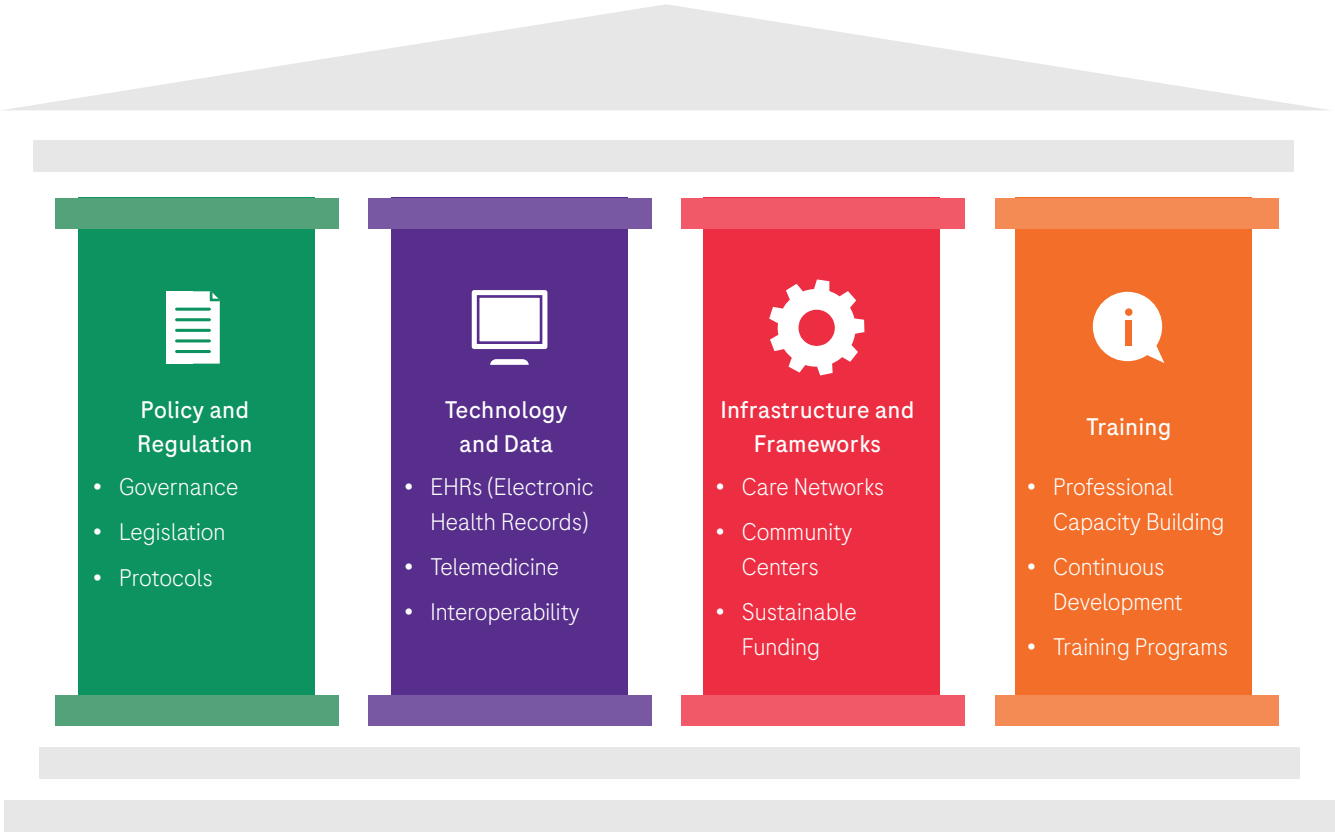
1 *OECD (2023), "Demographic trends", in Health at a Glance 2023: OECD Indicators, OECD Publishing, Paris.*
2 *OECD (2023), "Chronic conditions", in Health at a Glance 2023: OECD Indicators, OECD Publishing, Paris.*
3 *OECD (2023), "Indicator overview: Country dashboards and major trends", in Health at a Glance 2023: OECD Indicators, OECD Publishing, Paris.*

Pillars of decentralized healthcare

Before diving into the essential pillars for decentralized care, it's important to understand the common motivations behind this shift in the UK, Singapore, the Netherlands, and Belgium.

In the UK, decentralization was driven by the need to improve healthcare efficiency, reduce bureaucracy, and offer personalized care while managing costs through better resource allocation. Singapore faced similar drivers, focusing on an aging population and rising healthcare costs, with an emphasis on patient convenience and preventive measures. Likewise, the Netherlands and Belgium sought cost-effective solutions to enhance local healthcare responsiveness, empowering local authorities to address community-specific needs. Across all four countries, decentralization aimed at increasing efficiency, reducing hospital admissions, and creating patient-centered systems that adapt to local demands, emphasizing integration, collaboration, and cost control.

A structured approach to decentralized care emerged, with four pillars central to each country's strategy: policy and regulation, technology and data, infrastructure, and training. Policy, in particular, serves as an overarching influence, shaping the implementation of the other pillars. For instance, technological and infrastructure advancements often stem from regulatory decisions, and training initiatives align with these broader policy frameworks. Each pillar is distinct yet interconnected, with policy guiding the execution of technology, infrastructure, and training initiatives.



Pillar 1: Policy and regulation

What is the pillar?

When it comes to decentralized care, policy and regulation refer to the establishment of a clear legal and regulatory framework that enables the successful implementation and sustainability of decentralized healthcare. This involves developing specific policies, creating supportive regulatory environments, using HTA to guide the integration and regionalization of care, and establishing standards for interoperability to ensure that health technologies, such as EHR and telemedicine platforms, can function cohesively within an interoperable network. Effective policy and regulation ensure that decentralized care aligns with national health priorities while remaining flexible to address the specific needs of different regions and local populations.

Why is it important for decentralized care?

Government policy and regulations are key for the success of decentralized care, as they provide the framework to guide the development and implementation of technologies and care models that enable decentralization. Without robust policies and regulations, efforts to decentralize care could lead to fragmented systems, inequities in care delivery, and inefficiencies.

Benchmarking examples

In-depth country information can be found in the Appendix.

Implementation framework

The key actions the benchmark countries applied were to design policies to help implement and integrate decentralized care, move to regionalization of care, and create pilot programs for community and homecare.

Design policies to help implement and integrate decentralized care.

- Countries have focused policies on regional health systems, investment in digital health solutions, data integration, and patient-centered care. By establishing clear frameworks and regulations, governments enabled seamless information sharing across public and private healthcare systems, created programs that aligned with local health needs, and broadened access to decentralized care.
- Supportive regulatory frameworks included a national strategic plan (e.g., Singapore's Healthcare 2020 Masterplan), regional bodies for coordinated action (e.g., the UK's Integrated Care Systems), and policies for building digital infrastructure alongside primary care networks.
- Health Technology Assessment (HTA) bodies, such as National Institute for Health and Care Excellence (NICE) in the UK, Agency for Care Effectiveness (ACE) in Singapore, Zorginstituut Nederland (ZIN) in the Netherlands, and Belgian Health Care Knowledge Centre (KCE) in Belgium, were central to this process. These bodies evaluated the clinical and cost-effectiveness of health technologies—including medicines, telehealth, remote monitoring, and home-based care—ensuring they met safety and efficacy standards aligned with national healthcare goals. For instance, NICE in the UK provided guidance to effectively integrate approved technologies into the healthcare system.
- Establishing a strong HTA framework proved essential for countries pursuing decentralized care by ensuring that technologies offered clinical and economic value, directing resource allocation, and providing a centralized authority to set national standards while incorporating regional healthcare needs.

Move to regionalization of care.

- Countries introduced regional health systems to manage and coordinate care within specific regions; for example, Singapore has three Regional Health Systems (RHSs), each responsible for the health outcomes of its population through integrated care models. RHSs conduct health needs assessments to identify priority areas and allocate resources accordingly.
- Regionalization promotes local decision-making and tailored service delivery, with targeted programs based on regional health profiles.

Create pilot programs for community and homecare.

- Pilot programs are crucial for gathering the data and insights necessary for informed decision-making in the broader implementation of decentralized care. The data collected from these programs helps policymakers understand the effectiveness of different care models, identify areas for improvement, and ensure that the broader rollout of these models is successful.

Pillar 2: Data and technology

What is the pillar?

Digital health infrastructure in decentralized care refers to the development and maintenance of essential technologies that enable efficient and coordinated healthcare delivery across different settings. This includes systems such as EHRs, telemedicine platforms, and home-care technologies, as well as ways to ensure interoperability between various healthcare providers.

Why is it important for decentralized care?

Data and technology enable the distribution of healthcare services beyond traditional hospital settings. Healthcare providers can access and share patient information across various care settings, reducing the need for in-person visits, and making healthcare more accessible and convenient, especially for patients in remote or underserved areas. Additionally, they empower patients to take an active role in managing their health, leading to better health outcomes and a more personalized care experience.

Benchmarking Examples

In-depth country information can be found in the Appendix.

Implementation framework

The key actions the benchmark countries implemented were to enable, apply, and enhance digitization and data integration for the use of delivering care; creating and implementing digital platforms and electronic patient records; ensuring interoperability and security of sensitive data.

Leverage policy frameworks and technology for data integration in decentralized care.

- A strong policy and regulatory framework prioritizing data integration and technology adoption is essential for successful decentralized care. Standardized data policies ensure that both public and private healthcare providers align with unified integration standards.
- For example, in the UK, the England's National Health Service (NHS) mandates the use of EHRs across providers, enhancing data accessibility. The NHS Long Term Plan and the Health and Care Act (2022) further solidify data integration efforts by merging NHS Digital into NHS England and expanding ICSs' digital responsibilities.
- Similarly, Singapore's National Electronic Health Record (NEHR) system unites public healthcare records and actively engages private providers. This centralized platform supports data sharing and enables decentralized care models through integrated services and telemedicine solutions.

Create and implement digital platforms and electronic patient records.

- Integrating Electronic Patient Records (EPRs) across healthcare levels is crucial for enabling patient data accessibility across locations, supporting coordinated and continuous care. A national digital health platform with integrated EPRs should prioritize secure, user-friendly, real-time data sharing.
- In the UK, EPRs are integral to the functioning of Primary Care Networks (PCNs) and decentralized healthcare models, allowing seamless sharing of patient histories and ongoing health monitoring across providers and regions.
- Similarly, in the Netherlands, early EPR adoption and expanded telehealth services during the COVID-19 pandemic advanced healthcare integration. The country's standardized EPR systems facilitate data sharing and coordination, essential for effective decentralized care.

Ensure interoperability in data sharing and security of sensitive data.

- Ensuring interoperability is crucial to prevent fragmentation in healthcare delivery. Interoperability standards that are established and enforced allow seamless data exchange between different healthcare systems and providers.
- Blockchain technology can enhance data security, privacy, and interoperability. For instance, Belgium combines blockchain with federated learning, allowing AI models to be trained locally while maintaining data privacy—used effectively for COVID-19 detection and decentralized patient data management.
- In the UK, NICE has set patient data-sharing standards that support a secure digital health ecosystem. By ensuring interoperability, NICE enables smooth data access across systems while protecting patient information from breaches, building trust and regulatory compliance.
- Similarly, the Netherlands' Nictiz promotes digital standardization, supporting EHR integration in primary, hospital, and specialist care to encourage broad interoperability across healthcare settings.

Pillar 3: Infrastructure and framework

What is the pillar?

In decentralized healthcare, infrastructure encompasses the physical, digital, and organizational assets necessary for delivering services outside traditional hospitals. This includes regional healthcare hubs, home-based and community care facilities, and the integration of digital health technologies. Sustainable funding, adequate incentives, and reimbursement models are critical for maintaining this infrastructure's long-term viability. As the backbone of decentralized care, robust infrastructure, supported by these models, enables accessible, efficient healthcare that meets diverse population needs.

Why is it important for decentralized care?

The right infrastructure reduces health inequalities and improves access to care across different demographics. Some regions may face more infrastructure limitations than others; additional funding and resources may be required to advance physical and/or digital infrastructure to improve the equity of healthcare access and services in these areas.

Benchmarking examples

In-depth country information can be found in the Appendix.

Implementation framework

The main key actions for implementation are assessing infrastructure and partnership needs, implementing out-of-hospital and closer-to-home programs, and ensuring value for money.

Consider what infrastructure and partnerships are needed to move to regional delivery and access of care.

- To support regional healthcare, countries assessed existing facilities to upgrade their capacity for a broader range of services. Enhancing regional hospitals to manage routine and specialized care improves access and ensures a more balanced distribution of healthcare, easing the strain on central hospitals.
- Public-private partnerships are crucial for expanding healthcare infrastructure. In Belgium, government, academia, and private sector collaborations drive healthcare innovation and technology development. The UK similarly benefits from private sector partnerships, providing additional resources and technologies to supplement public healthcare and expand access to advanced practices.
- Regional healthcare hubs also play a key role. In the UK, Integrated Care Partnerships (ICPs) unite representatives from Integrated Care Boards (ICBs), local authorities, and other stakeholders, like NHS providers and community organizations, to develop integrated care strategies that address local health needs comprehensively.

Implement new infrastructure programs for out-of-hospital care.

- As healthcare moves toward decentralized models, investing in infrastructure that supports out-of-hospital care is essential. This includes facilities and systems for home-based and community care, such as mobile health units, remote monitoring, and at-home care programs. Establishing community health centers offering services from preventive care to chronic disease management ensures care is both accessible and comprehensive.
- Robust logistics and supply chain systems are also necessary to deliver medical supplies and medications to patients at home, supporting the success of these care models.
- In Singapore, PCNs and Regional Health Systems (RHSs) integrate primary and community care for coordinated services. Similarly, Regional Collaborative Networks (RCNs) and Integrated Care Organizations (ICOs) in the Netherlands play a key role in decentralizing healthcare, improving access, reducing travel distances, and decreasing wait times—enhancing healthcare efficiency and quality.

Ensure "value for money," a point reiterated by key stakeholders in this research process.

- Decentralized care should provide strong value for money. While initial investments in infrastructure, training, and technology for community care and homecare services are high, operational costs are often lower than hospital-based care. This reduction comes from less need for extensive hospital infrastructure, lower administrative expenses, and reduced overhead costs, such as multiple shifts and facility upkeep. A focus on productivity—through efficient resource management and workforce optimization—can further enhance these cost-saving benefits while maintaining quality outcomes.
- The profitability of homecare programs depends on factors like reimbursement rates, service efficiency, and cost management. However, the overall cost of delivering home care is lower, which can help maintain or even improve profit margins through more efficient resource utilization.

Pillar 4: Training

What is the pillar?

Training in the context of decentralized healthcare refers to the comprehensive education and continuous development of healthcare professionals to equip them with the necessary skills and knowledge to effectively deliver decentralized care. This pillar encompasses training on the use of digital health technologies, adaptation to new organizational structures, and the implementation of community and home-based care programs. The training pillar is essential for ensuring that the workforce is not only competent in traditional healthcare delivery but also adept at utilizing innovative tools and approaches required for decentralized care.

Why is it important for decentralized care?

As healthcare delivery shifts from centralized hospital-based systems to more localized, community-based settings, healthcare workers need to be proficient in new technologies and care protocols that are fundamental to decentralized care.

Benchmarking examples

In-depth country information can be found in the Appendix.

Implementation framework

The main key actions for implementation are transferring knowledge on the use of digital tools and technology, restructuring frameworks and employee knowhow based on new roles and structures, and training workforce on shifting care to non-hospital settings.

Learn how to use technology and digital health tools.

- Countries implementing decentralized care invested significantly in technology and infrastructure. This approach required healthcare professionals to undergo extensive training and receive support to adapt to new technologies, tools, and care models.
- Training programs focused on technical skills and on understanding how these technologies could enhance patient engagement, improve care coordination, and enable data-driven decision-making. For instance, telemedicine training covered not only the technical aspects of virtual consultations but also best practices for maintaining patient rapport and ensuring care quality. Similarly, EHRs training emphasized effective documentation, data accuracy, and leveraging data analytics to inform care plans.

Deliver training on new structural frameworks and the new/changing roles they create.

- Training focuses on the roles and responsibilities within new structures, emphasizing the importance of integrated care and collaborative practices. Healthcare providers need to understand how their roles fit within the broader system and how they can work effectively with other providers, both within their immediate teams and across different levels of care.
- Training also addresses leadership and change management skills, particularly for those in supervisory or managerial positions. As healthcare systems decentralize, leaders must be capable of guiding their teams through the transition, fostering a culture of collaboration and continuous improvement. This includes training on how to manage resources efficiently, coordinate care across different settings, and ensure that patient care remains seamless and high quality despite the shift to decentralized models.

Launch community and at-home care programs and pilot program training.

- With the expansion of home- and community-based healthcare programs, it is essential to implement targeted training programs for healthcare professionals involved in these areas. This training covers the specific skills required for home-based care, such as patient assessment, care planning, and the use of mobile health technologies for remote monitoring. It also includes strategies for working effectively within community settings, where healthcare providers may need to collaborate closely with other community resources, such as social services and local health organizations.
- Pilot programs are used to test and refine training methodologies and approaches, with a view to identifying and addressing gaps in knowledge and/or delivery.

Decentralized care: Outcomes, KPIs, and lessons learned

All four benchmark countries evaluate patient satisfaction and health outcomes to assess the impact of decentralized care, using KPIs like hospital admissions, readmissions, and emergency visits to measure the reduction in hospital strain.

- UK: Prioritizes KPIs on hospital admission rates, waiting time, and care coordination.
- Singapore: Focuses on primary care utilization, patient engagement, and chronic disease management.
- Netherlands: Measures patient and staff satisfaction, healthcare costs, and preventive care outcomes.
- Belgium: Tracks access to care, telemedicine use, and the effectiveness of integrated care programs.

Outcomes and lessons

In-depth country information can be found in the Appendix.

- **UK:** Decentralized care reduced hospital admissions by 12% in 2022, increased General Practitioners (GPs) appointment efficiency, optimized NHS budget with a 1.6% annual decrease, and showed mixed patient satisfaction, with high approval of digital services but concerns over in-person access.
- **Singapore:** MIC@Home and telemedicine expansion cut hospital wait times and saved 7,000 bed days by mid-2023, with high patient satisfaction in telehealth and successful programs like NCIS-On-The-Go for cancer patients.
- **Netherlands:** Decentralized care saved €2 million annually through Better@Home, expanded remote access by 20%, achieved high satisfaction with personalized home care, and enhanced continuity and efficiency in care delivery by up to 25%.
- **Belgium:** Decentralization reduced heart failure readmissions by 15% in Flanders, improved rural access with shorter travel times, and boosted appointment scheduling satisfaction by 7% through an e-health platform.

How a country implementing decentralized care measure success

More in-depth information can be found in the Appendix.

- **Hospital Admission/Readmission Rates:** Lower admissions and readmissions indicate effective, local chronic care. Track regionally for effectiveness.
- **Patient Satisfaction:** High scores reflect quality and patient-centered care. Regular surveys can highlight improvement areas.
- **Healthcare Costs:** Compare costs with traditional hospital care to assess cost-effectiveness and sustainability.
- **Productivity:** Evaluate the ratio of healthcare outputs (e.g., procedures, consultations) to inputs (e.g., staff, equipment), with a focus on shifting care delivery to less intensive settings (e.g., outpatient instead of inpatient care) where appropriate.
- **Access to Care:** Track usage rates, telemedicine, travel times, and wait periods, especially in underserved areas.
- **Preventive Care:** Monitor vaccination, screenings, and check-ups to assess public health benefits.
- **Health Equity:** Measure outcomes across demographics to gauge reduction in disparities.
- **Integration and Coordination:** Measure shared care plans, team meetings, and patient feedback, ensuring interoperable patient records for seamless data sharing and informed, coordinated care.

Conclusion

Decentralized care is a pivotal and transformative approach that can simultaneously enhance the patient care journey and ensure the sustainability of health systems.. However, for new adopters, it brings its own set of challenges. Success in decentralized care requires strong policies, adaptable regulations, infrastructure, and training. Through flexible regulatory frameworks that support regional needs and adaptations while upholding national standards, especially in underserved areas, the systems can unlock the potential of decentralized care and create a more equitable and resilient healthcare system.

Investment in physical and digital infrastructure—such as regional hubs, home-based facilities, and EHRs—comes with high initial costs but leads to long-term savings and improved access. Collaboration between the Ministry of Health (MoH), local governments, regulatory bodies, and the private sector is crucial for building supportive frameworks and funding.

Strategic, phased implementation allows testing and refinement, focusing on patient outcomes and ensuring a sustainable, gradual rollout of decentralized care.

References

Country	Secondary Research Sources	Stakeholders
United Kingdom	NHS, NICE, British Medical Journal, British Medical Association, The Kings Fund	• C-Suite at NHS • Researcher at NHS • Director at NICE
Singapore	Ministry of Health, MOH Office for Healthcare Transformation, Agency for Care Effectiveness, NCIS, NCCS, SingHealth	• Senior Consultant at NCCS • Manager at MIC@HOME • Specialist at NCCS
Netherlands	Zorginstituut Nederland, Ministerie van Volksgezondheid Welzijn en Sport, International Journal of Integrated Care, Patientenfederatie Nederland, National Library of Medicine	• Policy Advisor at Zorginstituut Nederland • Professor at UMCG • Professor of Surgical Oncology at Leiden University Medical Center
Belgium	KCE, Federal Public Service (FPS) Health, Food Chain Safety and Environment, National Library of Medicine, International Journal of Health Policy and Management	• Health Economist at KCE • Professor at Ghent University • Professor at KU Leuven

Appendix

Pillar 1: Policy and regulation

What is the pillar?

When it comes to decentralized care, policy and regulation refer to the establishment of a clear legal and regulatory framework that enables the successful implementation and sustainability of decentralized healthcare. This involves developing specific policies, creating supportive regulatory environments, using health technology assessments (HTA) to guide the integration and regionalization of care, and establishing standards for interoperability to ensure that health technologies, such as EHR (Electronic Health Records) and telemedicine platforms, can function cohesively within an interoperable network. Effective policy and regulation ensure that decentralized care aligns with national health priorities while remaining flexible to address the specific needs of different regions and local populations.

Key elements of policy and regulation for decentralized care include:

- Conducting comprehensive needs assessments to identify gaps in healthcare access and services, helping tailor decentralized care to specific population needs and geographic disparities.
- Securing government support and developing clear policies that shift healthcare closer to patients, reduce hospital strain, and promote the use of technologies like remote monitoring and telehealth. These policies should also include funding mechanisms for community-based and home-care programs.
- Establishing regional health systems that coordinate care within defined areas while adhering to standardized national healthcare guidelines and protocols, ensuring consistency across regions.
- Implementing patient-centered care models that focus on making healthcare services more accessible, convenient, and tailored to individual patient preferences.
- Promoting home-based and community care initiatives, such as home healthcare services, outpatient treatments, and community health programs that shift the focus away from hospitals and into local settings.
- Addressing regulatory and financial barriers, streamlining regulations and providing financial incentives to support the growth and sustainability of decentralized care initiatives.
- Ensuring sustainable funding models by creating flexible and stable financial structures that allow decentralized healthcare systems to thrive in the long term.

These policy and regulatory measures form the backbone of decentralized care implementation, ensuring that the system is both responsive to immediate needs and adaptable to future healthcare developments.

Benchmarking examples

United Kingdom (UK)

The UK healthcare system has undergone significant transformation towards decentralized care, driven by government policies and digital initiatives over the past few decades. Policies like devolution in Scotland, Wales and Northern Ireland allow regional governments to tailor healthcare services to local needs. England's National Health Service (NHS) operates through a decentralized structure with regional NHS Trusts and Integrated Care Systems (ICSs) responsible for delivering healthcare services.

United Kingdom Framework Overview

Key policies and frameworks: Historic approach	The NHS Five Year Forward View (2014) emphasized new care models like Multispecialty community providers (MCPs) and integrated primary and acute care systems. (PACSs) to integrate care and improve efficiency. The NHS Long Term Plan (2019) and the Health and Social Care Act 2022 continued these efforts by prioritizing digital health, data interoperability, and formalizing Integrated Care Systems (ICSs) to enhance care coordination.
The role of HTA in the UK	NICE evaluates the clinical and cost-effectiveness of medicines and technologies for the NHS, ensuring equitable access to effective treatments. Decisions are based on clinical outcomes and cost-effectiveness, often measured through Quality-Adjusted Life Years (QALY), to ensure the best value for the healthcare system.
Regionalization	ICSs divide the UK into regions to deliver integrated care and improve population health by focusing on local needs. Each ICS is broken down into smaller "places" and "neighborhoods" to better address regional priorities, especially for key areas like maternity, cancer, and mental health

NHS: England's National Health Service; NICE: National Institute for Health and Care Excellence; HTA: Health Technology Assessment; UK: United Kingdom

Key policies and frameworks: Historic approach

The NHS Five Year Forward View (2014) was a strategic vision for the future of the NHS. It was published by NHS England in October 2014 and outlined how the NHS needed to change in order to meet growing demands and financial challenges, while improving the quality of care and maintaining universal healthcare. The key goals were to prevent illness, integrate care services, and improve efficiency to secure the NHS's future sustainability. It called for new models of care that break down the barriers between primary care, hospital care, and social care, fostering greater collaboration and integration. The plan introduced the concept of Multispecialty Community Providers (MCPs) and Primary and Acute Care Systems (PACS), aimed at providing more personalized and efficient care closer to patients' homes.

This was followed by the NHS Long Term Plan (2019), which set priorities from 2021 to 2029, focusing on improving service integration, expanding digital health initiatives, and enhancing primary and community care. A key emphasis of the plan is on advancing data integration and interoperability, ensuring seamless sharing of information across healthcare providers. Building on these efforts, the Health and Social Care Act 2022 introduced further reforms, formalizing Integrated Care Systems (ICSs) and granting them statutory powers and responsibilities. These reforms also emphasize leveling up digital maturity, advancing the use of electronic health records, and supporting secure data environments to enhance care coordination and research capabilities.

ICSs, in collaboration with the NHS, identify strategies and plans to deliver care to local populations based on the biggest health needs of different regions. This restructuring of healthcare delivery helps address healthcare inequalities while ensuring individuals across populations can access the care they need closer to home. ICSs allow for more efficient resource allocation, better integration of services, and improved access to specialized and routine care.

The role of HTA in the UK

The UK's National Institute for Health and Care Excellence (NICE) plays a crucial role in determining which medicines and technologies the NHS should adopt by evaluating their clinical and cost-effectiveness. NICE provides detailed implementation guidance, including necessary training and infrastructure, to ensure these technologies are integrated into care pathways effectively. By doing so, NICE promotes equitable access to effective treatments and technologies across the healthcare system. Evaluations are based on two main criteria: clinical outcomes, assessed through study evidence and real-world performance, and cost-effectiveness, measured using metrics like Quality-Adjusted Life Year (QALYs), which quantifies improvements in a patient's condition and quality of life. This ensures that adopted technologies deliver both clinical benefits and value for money.

Regionalization

The 2022 Health and Care Act established Integrated Care Systems (ICSs) as legal entities with statutory powers. These systems are composed of two key components: Integrated Care Boards (ICBs), which are responsible for funding and planning NHS services, and Integrated Care Partnerships (ICPs), which are committees bringing together a diverse range of system partners—including local government, VCSE (voluntary, community, and social enterprise) organizations, and NHS bodies—to develop regional health strategies.

In 2023, 42 ICSs released their first Integrated Care Strategies and Joint Forward Plans (JFPs) for the next five years, focusing on:

- Preventive care and early intervention to reduce chronic disease and improve long-term outcomes.
- Addressing health disparities, especially for vulnerable populations.
- Using data analytics to monitor health trends, assess service effectiveness, and guide resource allocation.

A core principle of ICS policy is localized collaboration within 'places' and 'neighborhoods.' Serving populations from 500,000 to 3 million, ICSs break down into 'places' (250,000–500,000) and 'neighborhoods' (30,000–50,000) to better target community needs. This enables ICSs to tailor services to regional needs, while maintaining a national focus on maternity, cancer, mental health, and cardiovascular care.

UK's HTA, NHS, ICS Overview

NICE	NHS	
National Institute for Health and Care Excellence (NICE): Provides the HTA and recommends what medicine and tools the NHS should use.	**National Health Service (NHS):** Provides infrastructure, workforce, and funds.	**Integrated Care System (ICS):** Regional and local coalitions made up of boards and partnerships with NHS providers to bring access of care to the local population.

Singapore

Decentralized care in Singapore is driven by government policies and regulations from the Ministry of Health (MoH) and its Office for Healthcare Transformation (MOHT). Key initiatives like MIC@Home and Primary Care Networks (PCNs) aim to bring healthcare services closer to patients, reducing hospital strain. Regulatory sandboxes and Singapore's HTA body, which is managed by the Agency for Care Effectiveness (ACE), support the adoption of technologies for remote monitoring and telehealth.

Key policies and frameworks: Historic Approach	The Healthcare 2020 Masterplan aimed to enhance accessibility, quality, and affordability of public healthcare, addressing the needs of an aging population. From 2017-2021, pilot programs like home-based care and the LEAP regulatory sandbox for telemedicine advanced decentralized care through remote monitoring and digital health services.
The role of HTA in Singapore	The Agency for Care Effectiveness (ACE) leads HTA in Singapore, evaluating clinical effectiveness of healthcare drugs and technologies through rigorous evidence reviews. The Ministry of Health (MOH) uses ACE's findings to guide policy decisions on adopting health technologies in public healthcare.
Regionalization	Singapore's healthcare is organized into three Regional Health Systems (RHSs), each responsible for managing care in a geographical region, serving 1.1 to 2.5 million residents. RHSs integrate hospitals, polyclinics, and community care to improve regional healthcare coordination.

LEAP: Licensing Experimentation and Adaptation Programme; HTA: Health Technology Assessment.

Key policies and frameworks

The Healthcare 2020 Masterplan (2012) was brought in to improve the accessibility, quality, and affordability of public healthcare services to address the needs of an aging population and longer life expectancies.

From 2017 to 2021, the Ministry of Health's Office for Healthcare Transformation (MOHT) initiated pilot programs focusing on home-based care. These utilized remote monitoring devices and digital tools to provide care for patients who would otherwise need hospitalization, resulting in both better patient-centered care and increased hospital bed capacity.

In 2018, the MoH launched the Licensing Experimentation and Adaptation Programme (LEAP), for telemedicine and mobile medicine, a regulatory sandbox to experiment with new healthcare services in a controlled environment. Although the LEAP sandbox concluded in February 2021, its results continue to influence decentralized care, serving as a foundational element.

The role of HTA in Singapore

ACE manages the HTA in Singapore, evaluating and approving new healthcare drugs and technologies by rigorously assessing their clinical effectiveness through reviews of clinical trials, real-world evidence, and other scientific studies. The MOH uses ACE's findings to create evidence-based healthcare policies that guide the adoption and use of health technologies in the public healthcare system.

Regionalization

Singapore is divided into three Regional Health Systems (RHSs), each corresponding to a major geographical region – the central, eastern, and western parts of the island – to improve coordination. Each cluster serves a population of approximately 1.1 to 2.5 million residents. Hospitals, polyclinics, and community care are aligned under RHSs, giving them control over regional healthcare management.

Singapore's HTA, MOH, Care Programs Overview

ACE agency for care effectiveness **Agency for Care Effectiveness (ACE):** Provides the HTA and establishes medical guidelines and ensures consistency of care.	MINISTRY OF HEALTH SINGAPORE **Ministry of Health (MOH):** Provides infrastructure, workforce, and funds. Uses ACE's recommendations to develop national guidelines and policies.	**Community and Home Care Programs:** Institutions from the MoH transformation to the National Cancer Institute of Singapore have launched programs to bring access to patients closer to home.

Netherlands

Decentralized care strategies in the Netherlands aim to enhance patient access, improve care coordination and reduce healthcare costs. Key initiatives include community-based programs and home-care efforts like Better@Home, which delivers care closer to patients' homes, and SAHH, which fosters regional collaboration among healthcare providers.

Netherlands Framework Overview

Key policies and frameworks: Historic Approach	The Health Insurance Act (2000) established mandatory health insurance, ensuring equal access and a competitive market, while the Social Support Act (2006) and Long-Term Care Act (2013) decentralized care to municipalities, promoting local decision-making. Recent initiatives like Regional Collaborative Networks (2017) and the National Prevention Agreement (2023) focus on collaboration, digital integration, and preventive care to strengthen decentralized healthcare.

The role of HTA in the Netherlands	The National Health Care Institute (ZIN) leads HTA in the Netherlands, evaluating healthcare interventions for clinical and economic value. While ZIN's recommendations are advisory, the Ministry of Health, Welfare, and Sport uses them to decide on coverage within the basic health-insurance package.
Regionalization	Regional Care Networks and Integrated Care Organizations (ICOs) coordinate care across primary, secondary, and tertiary levels to ensure comprehensive service delivery. Decentralized care, driven by ICOs, addresses rising healthcare costs and system burdens while offering more personalized care.

HTA: Health Technology Assessment.

Key policies and frameworks

The Health Insurance Act (2000) introduced mandatory health insurance, ensuring equal access to healthcare and fostering a competitive market. The Social Support Act (2006) and the Long-Term Care Act (2013) decentralized social and community care to municipalities, promoting local decision-making and home-based care.

Initiatives like Regional Collaborative Networks (2017) and Digital Health Initiatives (2020) encouraged collaboration among healthcare providers and integrated digital tools to enhance service delivery. The National Prevention Agreement (2023) emphasized preventive and community-based programs, further solidifying the decentralized care framework.

The role of HTA in the Netherland

The Netherlands' HTA is managed by the National Health Care Institute (Zorginstituut Nederland, ZIN). ZIN independently evaluates healthcare interventions, including medications, medical devices, and surgical procedures, and publishes reports on their clinical and economic value. Although ZIN's recommendations are advisory, the Ministry of Health, Welfare, and Sport (VWS) considers them when deciding on the inclusion of healthcare interventions in the basic health-insurance package.

Regionalization

Regional Care Networks integrate care across primary, secondary, and tertiary levels and ensure coordinated services across regions, while Integrated Care Organizations (ICOs) are structured entities designed to integrate various healthcare services and providers to deliver coordinated and comprehensive care. The push for decentralized care, including the formation of ICOs, was driven by the increasing burden on the healthcare system, rising costs, and the demand for more personalized care.

Netherland's HTA, MOH, ICO Overview

Zorginstituut Nederland **National Health Care Institute (ZIN):** Provides research and advice on healthcare policy and monitors the effectiveness of decentralized care models.	Ministerie van Volksgezondheid, Welzijn en Sport **Ministry of Health, Welfare and Sport (VWS):** Sets national healthcare policy direction, allocates funding, and establishes regulations for decentralized care models.	**RCNs and ICOs:** Implement integrated and patient-centered care using resources and guidelines provided by the Ministry, ensuring the adoption of innovative health technologies evaluated by ZIN HTA.

RCN: Regional Collaborative Networks; HTA: Health Technology Assessment.

Belgium

Belgium's decentralized healthcare strategies aim to enhance accessibility, quality, and efficiency of care while promoting preventive health and encouraging innovation. The federal and regional governments collaborate to ensure equitable access to healthcare, utilizing national policies and tailored regional programs.

Initiatives include outpatient parenteral antimicrobial therapy (OPAT), home hemodialysis, and widespread use of telemedicine. In addition, the integration of electronic health records (EHRs) ensures seamless communication and coordination among healthcare providers, facilitating patient-centered care.

Belgium's Framework Overview

Key policies and frameworks: Historic Approach	Belgium's healthcare policies focus on improving care through technology, data integration, and secure information sharing, with initiatives like the eHealth Platform (2008) enabling seamless electronic sharing of patient data and supporting telemedicine. The Integrated Care for Better Health Plan (2015) promoted digital tools, multidisciplinary collaboration, and improved data sharing to enhance chronic disease management and patient engagement.
The role of HTA in Belgium	The Federal Knowledge Center for Health Care (KCE) conducts HTA in Belgium, evaluating healthcare drugs, technologies, and practices for clinical and cost-effectiveness. KCE's recommendations help guide healthcare decision-making, though regional autonomy and funding can influence their implementation.
Regionalization	Belgium's healthcare is divided into three regions—Flanders, Wallonia, and Brussels—each with its own health agency responsible for tailoring services to local needs. These regions operate within a federal framework, ensuring collaboration with the Ministry of Health and other institutions for cohesive healthcare delivery.

HTA: Health Technology Assessment.

Key policies and frameworks

Early government policies in Belgium focused on improving healthcare through the use of technology, enhancing data integration, and ensuring secure and seamless care coordination. These policies empowered patients, enabled healthcare providers to share information efficiently, and fostered integrated approaches to managing chronic diseases.

- eHealth Platform (2008) was a key initiative aimed at improving data interoperability and quality of care by enabling secure electronic sharing of patient health information across providers. This platform facilitated the integration of electronic health records (EHRs), allowing healthcare professionals to access and update patient data in real-time, while ensuring compliance with GDPR regulations. It has been instrumental in enabling telemedicine and remote care, reducing hospital admissions, and improving the continuity of care for chronic patients.
- Integrated Care for Better Health Plan (2015) emphasized the integration of healthcare services, particularly for chronic disease management, by leveraging digital tools and multidisciplinary collaboration. The plan promoted the use of digital care pathways, patient portals, and telemedicine to enhance care coordination and improve patient engagement. The plan also pushed for increased data sharing between healthcare providers, improving overall system efficiency and patient outcomes while fostering decentralized care.
- Fast Healthcare Interoperability Resources or "FHIR" and Vitalink established frameworks for medical data exchange, supporting interoperability between healthcare providers. By adopting standardized formats for medical records, Belgium improved the ability of different systems to share information, enabling more effective coordination between healthcare teams.

The role of HTA in Belgium

Belgium's HTA is primarily conducted by the Federal Knowledge Center for Health Care (KCE). The KCE evaluates new healthcare drugs, technologies and practices to guide decision-making and prioritize care. This includes assessing clinical effectiveness, cost-effectiveness, and broader impact on the healthcare system. Recommendations by KCE are based on evidence-based research and are designed to ensure that healthcare resources are used efficiently, although implementation can be influenced by regional autonomy and funding considerations.

Regionalization

Belgium's healthcare system is divided into three regions: Flanders, Wallonia, and Brussels. Each has its own health agency responsible for organizing and delivering healthcare services tailored to the specific needs of its local population. They operate under the broader framework set by the federal government and collaborate closely with the MOH and other institutions to ensure cohesive and effective healthcare delivery.

Belgium's HTA, MOH, Regionalization Overview

KCE	Santé publique Sécurité de la Chaîne alimentaire Environnement	
KCE: Provides evidence-based evaluations and recommendations for new technologies and care practices.	**The MOH:** The Ministry of Health and health providers are responsible for allocating resources and funding to support integrated care systems and regional initiatives, optimizing the distribution of healthcare services.	**Regional governments:** Flanders, Wallonia, and Brussels-Capital are responsible for the actual delivery of healthcare services, including primary care, hospital services, and long-term care.

Among the countries evaluated, some ley benchmark projects were identified:

UK – CORE20PLUS5: The CORE20PLUS5 program was launched by NHS England and NHS Improvement to reduce disparities in healthcare outcomes among various populations, particularly focusing on the most deprived 20% of the population. It focuses on five clinical areas where health disparities are most prominent: maternity; severe mental illness; chronic respiratory disease; early cancer diagnosis; hypertension case-finding. The program was introduced in December 2021 as part of the NHS's broader strategy to tackle health inequities that were exacerbated by the COVID-19 pandemic and long-standing systemic issues. Since its launch, the program has been adopted in nearly all 42 ICSs' strategies as a key component to tackle healthcare access inequality.

Singapore – NCIS Home: Launched in 2017, NCIS-On-the-Go is an initiative by the National University Cancer Institute, Singapore (NCIS) to provide cancer treatment and care in community settings, allowing patients to receive chemotherapy and other oncology services closer to home. Initially only offered at Jurong Clinic, the service was expanded in mid-2023 to other two locations. NCIS-On-the-Go allows cancer patients to receive selected cancer services and treatments in the community, such as blood taking, caring for long-term intravenous lines, anti-cancer or supportive treatments that can be administered under the skin, and the removal of chemotherapy infusion pumps.

Netherlands – Better@Home: The Better@Home program is an initiative aimed at providing hospital-level care to patients in their own homes, delivering various treatments that traditionally require hospitalization, such as intravenous antibiotics, wound care, and physiotherapy. The goal is to enhance patient comfort, improve recovery times, and reduce the strain on hospital resources. The program is primarily funded by a combination of public health insurance funds and government grants. Health insurers in the Netherlands, under the framework of the Health Insurance Act, play a significant role in funding these initiatives to encourage the shift from hospital-based to home-based care.

Belgium – Walloon Network for Cardiology (Réseau wallon de cardiologie – RWC): Launched in 2016, RWC operates primarily as an organizational and collaborative framework that connects various healthcare institutions, cardiologists, and researchers across Wallonia. Its primary aim is to enhance the quality and efficiency of cardiology care in the region through shared resources, knowledge, and expertise. Similar collaborative networks have been established in Belgium's other regions, for example, the Flemish Oncology Network (Vlaams Oncologisch Netwerk (VON)), launched 2010, and the Brussels Mental Health Network (Réseau Bruxellois de la Santé Mentale (RBSM)), started in 2012.

Pillar 2: Data and technology

What is the pillar?

Digital health infrastructure in decentralized care refers to the development and maintenance of essential technologies that enable efficient and coordinated healthcare delivery across different settings. This includes systems like Electronic Health Records (EHRs), telemedicine platforms, home-care technologies, and ensuring interoperability between various healthcare providers.

Key aspects of decentralized health infrastructure include:

- **Electronic Patient Records (EPRs):** National platforms integrating EPRs allow healthcare providers to access patient data across different care settings, ensuring continuous and coordinated care. For example, Singapore's National Electronic Health Record (NEHR) facilitates seamless data sharing, while the UK uses digital patient records to support Primary Care Networks (PCNs) and other decentralized models.
- **Data sharing and interoperability:** Ensuring interoperability between different healthcare systems is crucial for preventing fragmented care. Countries like the UK and the Netherlands have implemented standards to support the secure and efficient exchange of patient data, with initiatives like the National IT Institute for Healthcare (NICTIZ) playing a key role in the Netherlands.
- **Telehealth and remote monitoring:** Technologies like telemedicine platforms and wearable biosensors reduce the need for in-person visits, enabling virtual consultations and continuous patient monitoring. For instance, the Luscii Remote Monitoring Platform in the Netherlands allows patients to send real-time health data using wearables, improving chronic condition management.
- **Advanced technologies:** Artificial intelligence (AI) and smart hospital systems further enhance decentralized care. AI tools, such as Healthplus.ai in the Netherlands, improve diagnostics and enable proactive monitoring, reducing complications and healthcare costs.

A robust digital health infrastructure is essential for the success of decentralized care, improving patient outcomes, resource efficiency, and the overall capacity of healthcare systems.

Why is it important for decentralized care?

Data and technology enable the distribution of healthcare services beyond traditional hospital settings. Healthcare providers can access and share patient information across various care settings, reducing the need for in-person visits, and making healthcare more accessible and convenient, especially for patients in remote or underserved areas. Additionally, they empower patients to take an active role in managing their health, leading to better health outcomes and a more personalized care experience.

Benchmarking Examples

United Kingdom

The UK gives a high priority to technology to improve access to care, reduce the burden on hospitals, and provide services closer to home. Telehealth services, online consultations, and digital health platforms are widely used. The NHS's early adoption of EHRs and extensive use of telehealth services highlight a strong commitment to digital health.

While all four countries prioritize EHRs, the UK has a national policy mandating their use across the NHS, resulting in a widespread level of adoption among most providers within the NHS, and increasing steps towards developing levels of integration and accessibility across different healthcare settings. The implementation of the National Program for IT in the early 2000s aimed to ensure that all NHS providers adopted EHR systems, while the current NHS Long Term Plan continues to prioritize widespread EHR usage.

Key technology policies: Historic Approach

- NHS Digital (2016), formerly the Health and Social Care Information Centre (HSCIC), was formed to collect, store and analyze healthcare social-care data in England.
- NHS Virtual (2017-2019) began as early pilot programs launched in various NHS trusts to test the feasibility of providing hospital-level care at home. Pilots focused on patients with chronic conditions and those requiring post-operative care.
- COVID-19 accelerated the adoption of telehealth, remote monitoring, and digital patient records, showcasing the critical role of technology in healthcare. Also accelerated the development of virtual wards as healthcare systems sought to reduce hospital admissions.
- The Health and Care Act (2022) consolidated NHS Digital onto NHS England, also forming Integrated Care Systems (ICSs), and further cementing the role of digital technologies in creating a more connected and efficient healthcare system.

Singapore

Of the four benchmark countries, Singapore gives the highest importance to technology, leveraging advanced digital health solutions, telemedicine and integrated care platforms to support decentralized care. These research findings show comprehensive adoption of digital patient records in Singapore compared to the other countries assessed.

Key technology policies: Historic Approach

- National Electronic Health Record (NEHR) 2011: Launched by the MOH in collaboration with Accenture, the NEHR was designed to provide a single, unified health record for each patient, accessible across all healthcare providers in Singapore. It aims to facilitate seamless data sharing and enhance the quality of care by ensuring that healthcare professionals have access to comprehensive and up-to-date patient information. As of December 2022, all public healthcare institutions in Singapore, including restructured hospitals, polyclinics, and specialty centers, are connected to and contribute data to the NEHR, while efforts are ongoing to include private healthcare providers.
- Industry Transformation Map (ITM) – launched in 2017 and refreshed 2023: The ITM aims to transform the healthcare sector by adopting innovative and sustainable strategies. This includes digitization efforts, strengthening IT and digital system enablers, and addressing new regulatory issues through the Healthcare Services Act and the Health Information Bill.
- The MOH's Office for Healthcare Transformation (MOHT) launched pilot programs in 2017 focusing on home-based care, using remote monitoring devices to manage patients at home and reduce hospitalizations.
- In 2018, LEAP enabled controlled experimentation with telemedicine and mobile medical technologies. Five years later, the pilot program was analyzed, leading to the launch of the official MIC@Home project, which continues to expand.
- Telehealth and remote monitoring expanded significantly in 2020 due to the COVID-19 pandemic.

Netherlands

The Netherlands prioritizes technology to improve healthcare accessibility, efficiency, and coordination. Telemedicine and home-care devices are integral to the Dutch healthcare system.

Key technology policies: Historic Approach

- Electronic Patient Records (EPR) – early 2000s: EPRs digitize patient information, making it accessible to healthcare providers across the country, which improves coordination, reduces errors, and enhances the efficiency of care delivery.

During the mid to late 2000s, the adoption of EPRs was expanded significantly. The Dutch government, in collaboration with healthcare providers and technology companies, worked on standardizing EPR systems to ensure interoperability.

- Telehealth services – expanded significantly during the COVID-19 pandemic (2020 onwards): allows patients to consult with healthcare providers remotely, enabling continuous care management, especially for chronic diseases.
- Digital Health Initiatives (eHealth) – 2020: eHealth initiatives have focused on integrating digital tools like remote monitoring and health apps to enhance patient engagement and facilitate preventive care.
- National Prevention Agreement 2023 – promoted preventive healthcare by engaging municipalities and local organizations in community-based programs aimed at reducing the prevalence of lifestyle-related diseases through digital interventions and health monitoring.

Belgium

Technology is prioritized to reduce hospital burden, improve care coordination, and enhance patient access to services. The eHealth platform and telemedicine initiatives are key components of Belgium's healthcare strategy, with a focus on regional adaptation. Belgium continues to refine and develop its digital healthcare policies and frameworks, aiming to achieve a more integrated, patient-centered system that leverages data for better outcomes and more efficient care delivery.

Key technology policies Historic Approach

- eHealth Platform (2008) – created to improve the quality and continuity of care by enabling secure electronic sharing of health information among healthcare providers and patients.
- EHRs (initiated in 2008, ongoing development) – laid the foundation for coordinated care across Belgium's healthcare system.
- Reimbursement Policy for Telemedicine (2020) – allowed for broader use of remote consultations and digital health services.

Types of technology used in decentralized care.

- Telehealth technology and remote monitoring devices significantly reduce the need for in-person visits and enable virtual consultations and continuous patient monitoring. Portable devices such as portable infusion pumps and home dialysis machines are also key to delivering safe and effective treatment outside of hospitals.
- Wearable biosensors and mobile health apps enhance real-time health tracking and patient engagement, allowing for timely interventions and better management of chronic conditions. In the Netherlands, the Luscii Remote Monitoring Platform enables patients to use wearables to send health data, which is analyzed in real time to alert healthcare professionals to potential issues. These technological advancements collectively optimize resource allocation, improve patient outcomes, and increase the overall capacity of healthcare systems.
- Artificial intelligence (AI), used for predictive analytics, identifies complex patterns in medical data and improves diagnostic accuracy. Tools such as Healthplus.ai, based in the Netherlands, predict surgical site infections, enabling proactive patient monitoring. AI-driven diagnostics lead to early interventions, reducing healthcare costs and improving patient outcomes by preventing complications before they become severe.
- Smart hospitals integrate advanced IT systems, automation, and data analytics to optimize operations and connect hospitals with other care settings.
- Electronic prescribing systems enhance the accuracy and efficiency of the prescribing process, reducing medication errors and improving patient safety.

Pillar 3: Infrastructure and framework

What is the pillar?

Infrastructure in the context of decentralized healthcare refers to the physical, digital, and organizational assets required to deliver healthcare services outside traditional hospital settings. This includes the development and optimization of regional healthcare hubs, the establishment of home-based and community care facilities, and the integration of digital health technologies. Additionally, robust infrastructure must be supported by sustainable funding models and reimbursement mechanisms to ensure the long-term viability of decentralized care. Infrastructure is the backbone that supports the delivery of decentralized care, ensuring that healthcare services are accessible, efficient, and capable of meeting the diverse needs of the population. By combining investment in infrastructure with appropriate funding and reimbursement, countries can reduce health inequalities and improve access to care across different demographics and regions.

Key aspects of digital health infrastructure and framework include:

- Establish regional health systems to coordinate care within regions.
- Invest in technology and infrastructure to develop and maintain digital health infrastructure.
- Ensure interoperability and data sharing to ensure seamless and secure data exchange between different healthcare providers and systems.
- Implement patient-centered care models that are convenient, accessible, and tailored to individual preferences.
- Promote home-based and community care, with programs that shift care from hospitals to home and community settings.
- Foster public engagement and build trust through education and transparent communication to build trust and acceptance of new care models.
- Address regulatory and financial barriers to streamline regulations and provide financial incentives to support decentralized care initiatives.
- Ensure sustainable funding models, with stable and flexible funding mechanisms to support decentralized healthcare initiatives in the long-term.

Why is it important for decentralized care?

The right infrastructure reduces health inequalities and improves access to care across different demographics. Some regions may face more infrastructure limitations than others – additional funding and resources may be required to improve physical and/or digital infrastructure to improve equity of healthcare access and services in these areas.

Benchmarking examples

United Kingdom

The UK focuses on empowering local organizations and fostering partnerships among hospitals, primary care, and community services. Key structural strategies include:

- Development of Integrated Care Systems (ICSs): ICSs have evolved to include integrated care boards (ICBs) and integrated care partnerships (ICPs) who oversee the planning, funding allocation, and delivery of services at a regional level, integrating NHS trusts, local authorities, and voluntary organizations to deliver more responsive care.
- Transformation of Primary Care Networks (PCNs): PCNs have been developed to deliver care more collaboratively, including extended hours and shared services across practices.
- Community-based care models: Have shifted services traditionally provided in hospitals to community settings, including enhanced GP services, community pharmacies, and social care.

- Restructured funding mechanisms: These have moved from activity-based funding to outcome-based approaches, which encourages more efficient and effective care delivery, ensuring resources are used where they are needed most.

Funding, reimbursement, and payment in the UK

Within the UK health system, funding, reimbursement and payment for drugs and medical devices involve a complex interplay between NHS funding, NICE guidance, local commissioning decisions, and negotiations with pharmaceutical companies. The NHS overall is funded through general taxation and managed centrally.

Focus on productivity and value for money

A key strategy of the NHS as part of their 2024/2025 priorities and operational planning guidance includes efficient use of resources, referencing meeting efficiency targets, raising productivity, and resource management across Integrated Care Boards (ICBs) and healthcare providers. Key points include:

- Efficiency and Productivity: ICBs and providers are expected to meet a 2.2% efficiency target and raise productivity by aligning plans across activity, workforce, and finance.
- Workforce Productivity: Plans should focus on increasing workforce efficiency, reducing agency spend (with a target of 3.2% of the total pay bill), and using tools like e-rostering and e-job planning to optimize workforce deployment. Trusts must also eliminate off-framework agency use by July 2024.
- Operational Productivity: Acute trusts should restore productivity to pre-pandemic levels, using best practices and national toolkits to benchmark and improve. This includes improving diagnostic, clinical, and operational productivity.
- Efficiency Savings: Trusts must reduce variation, optimize medicines value, and ensure compliance with best-value frameworks. Efforts include improving the pricing of continuing care placements, adopting new generics and biosimilars, and utilizing national contracts for energy and procurement.
- Collaboration and Benchmarking: NHS England will provide core productivity and efficiency metrics to help providers and systems compare performance, with a focus on transparency and identifying areas for improvement.

Singapore

Singapore's healthcare system is organized into three major geographical regions (see section 4.1). Primary Care Networks (PCNs) and Regional Health Systems (RHSs) then integrate primary and community care to ensure coordinated and accessible services. Hospitals, polyclinics, and community care are aligned under RHSs, giving them control over regional healthcare management. Other structural changes include:

- Primary care: Strengthened by the MOH, with more resources and support directed to polyclinics and GP clinics, increasing their ability to manage chronic diseases.
- Community-based care: More care has been shifted from hospitals to community settings, leveraging hospital-based doctors, community nurses, and digital tools such as remote monitoring devices.

Healthcare providers

Singapore's three major healthcare clusters – Singhealth, National Healthcare Group, and National University Health System – form the Regional Health Systems (RHSs). They bridge the gap between hospitals and decentralized care providers, fostering collaboration and coordinating services delivery.

Private Care Physicians (PCPs), and private clinics, form the backbone to the system and are often members of PCNs, while private healthcare providers complement public services by providing additional capacity and specialized care, often in partnership with the public sector.

Homecare services are provided by the hospitals' own teams. Programs like MIC@Home and others involve hospital medical

teams, including doctors, nurses, and other healthcare professionals, who conduct home visits and use telehealth technologies to monitor and treat patients. Providing home-care services through their own teams, supported by government policies and reimbursements, provides hospitals with a balanced approach to maintaining profitability.

Reimbursement and costs

Hospitals receive reimbursement for home-care services through various means, including government subsidies, insurance payments, and sometimes out-of-pocket payments from patients. These subsidies are similar to those for inpatient care and are means-tested to ensure adequate support for patients.

Programs like PCNs and community health initiatives are primarily funded through government budgets and specific grants. Some insurance reimbursement and out-of-pocket payments from patients may also supplement primary government funding. Homecare programs like MIC@Home are supported by government subsidies and are means tested to ensure they are affordable and accessible.

Netherlands

More responsibility for healthcare delivery and financing has been transferred from national and regional authorities to local municipalities. This empowers local communities to tailor care solutions to their specific needs. Key structural changes include:

- Regional Collaborative Networks (RCNs): Regionally focused, broad collaborative networks that address diverse healthcare needs within specific areas, emphasizing community involvement and resource sharing. They emphasize regional partnerships and collaboration among local healthcare providers and may include both public and private entities. Funded and regulated by both national and regional authorities, with a strong emphasis on regional cooperation and locally tailored solutions.
- Integrated Care Organizations (ICOs): Specialized care networks that provide coordinated and continuous care for specific patient populations, particularly those with chronic conditions, through multidisciplinary teams and integrated care plans. They are typically hospital-led with specialized centers for specific conditions, and rely heavily on technological integration. ICOs are funded through a mix of public insurance, municipal budgets, and national programs, regulated by national health authorities.

Reimbursement and costs

Hospitals providing home-care services under programs like Better@Home are reimbursed through health insurers and government funding. The Health Insurance Act (ZVW) allows hospitals to negotiate better contracts and reimbursement rates with insurers, provided they demonstrate effective use of homecare to reduce admissions and improve outcomes.

Belgium

Belgium's healthcare system is divided into three regions: Flanders, Wallonia, and Brussels. Each region has its own health agency responsible for organizing and delivering healthcare services tailored to the specific needs of its local population.

Belgium's decentralized care strategy is enabled through significant structural changes, deployment of new technologies, workforce training, and supportive policies and partnerships. These elements work together to create a responsive, efficient, and high-quality healthcare system tailored to the diverse needs of the population. Key strategies include:

- Federalization of Healthcare: Belgium's healthcare system is divided into federal and regional competencies. The federal government oversees general health policy, health insurance, and hospital regulation. In contrast, the regions (Flanders, Wallonia, and Brussels-Capital) are responsible for health promotion, preventive care, elderly care, and mental health services. This structural change allows regions to tailor healthcare services to their specific demographic and health needs, improving responsiveness and efficiency.
- Establishment of Regional Health Agencies: Agencies such as the Flemish Health Institute (VIZ), Wallonian Agency for Healthcare, Social Promotion, and Sport (AviQ), and Brussels Health Inspection and Control Agency (HAC) ensure that healthcare policies are locally relevant and effectively implemented, fostering a decentralized approach to healthcare management.

Homecare team management

Homecare programs are typically managed by the hospital's dedicated homecare department or a specialized team within the hospital. This team often includes nurses, GPs, and sometimes specialists, who coordinate care delivery directly to patients' homes. Hospitals may also collaborate with community-based healthcare organizations to ensure comprehensive care.

Reimbursement and costs

Reimbursement for homecare services is typically provided by federal and regional health insurance schemes. Policies like the reimbursement for telemedicine services have made homecare financially viable for hospitals, ensuring that they receive adequate compensation for services rendered outside of the hospital setting.

Pillar 4: Training

What is the pillar?

Training in the context of decentralized healthcare refers to the comprehensive education and continuous development of healthcare professionals to equip them with the necessary skills and knowledge to effectively deliver decentralized care. This pillar encompasses training on the use of digital health technologies, adapting to new organizational structures, and the implementation of community and home-based care programs. The training pillar is essential for ensuring that the workforce is not only competent in traditional healthcare delivery but also adept at utilizing innovative tools and approaches required for decentralized care.

Key aspects of decentralized training include:

- Conduct comprehensive needs assessment to understand how professionals currently work and what would need to change in a decentralized system.
- Establish regional health systems including support for professionals to coordinate care within areas.
- Invest in technology and infrastructure ensuring healthcare teams can use new systems effectively.
- Ensure interoperability and data sharing with training for users to understand how to interact with the data.
- Empower and train healthcare professionals to adapt to new care models and technologies.
- Implement patient-centered care models and support healthcare professionals in the new models that deliver better outcomes for individuals.
- Promote home-based and community care, with training programs that help professionals to deliver care in home and community settings.
- Monitor and evaluate performance to ascertain if further training and development programs are needed for healthcare professionals to meet decentralized-care objectives.

Why is it important for decentralized care?

As healthcare delivery shifts from centralized hospital-based systems to more localized, community-based settings, healthcare workers need to be proficient in new technologies and care protocols that are fundamental to decentralized care.

Benchmarking examples

United Kingdom

The NHS's national objectives for 2024/25 include a dedicated section for workforce development. Within that overarching plan, specific and ongoing workforce training programs include:

- Interdisciplinary training: Training programs emphasize interdisciplinary care, fostering collaboration among healthcare professionals from different backgrounds to deliver comprehensive care.
- Digital literacy: As technology adoption increases, healthcare workers receive training to utilize digital tools effectively, ensuring seamless integration into daily workflows.
- Leadership and change management: Training equips healthcare leaders with skills to manage the transition to decentralized models effectively.

Singapore

The LEAP initiative, described earlier in this paper, included offering training, resources, and support to GPs and primary care teams, focused on improving chronic disease management, fostering better patient engagement, and promoting preventative care within the community.

Although the LEAP sandbox concluded in February 2021, it remains a foundational element of decentralized care and provided the springboard that helped launch MIC@Home in 2022, which in turn has an objective to train and expand the healthcare workforce to support its aims. Providing specialized training for healthcare professionals in remote patient management and home-care delivery is an important element of MIC@Home – as is recruiting additional nurses, allied health professionals and doctors to meet the increased demand for home-based care.

Ongoing workforce training programs include:

- Primary care training: Programs were developed to train GPs to manage chronic diseases and provide holistic care, equipping GPs with the skills needed to manage a broad spectrum of health conditions and coordinate care.
- Care integration training: Training programs for healthcare workers to improve collaboration across different care levels. The training encourages multidisciplinary teamwork and effective communication to enhance patient outcomes.

Netherlands

Through collaborative efforts and strategic investments in technology, training and integrated care models, the Netherlands has successfully implemented decentralized care initiatives. Workforce training programs include:

- Upskilling healthcare professionals: Including training in telemedicine, remote patient monitoring, and collaborative care approaches.
- Training for social care workers: Focusing on empowering social care workers to support patients with chronic conditions and managing complex care needs effectively.
- Patient empowerment initiatives: Educating and training patients on self-management skills for chronic conditions, allowing them to participate more actively in managing their own health.

Enhanced training and support go into programs such as Better@Home, providing additional training for healthcare professionals on delivering home-based care. The initiative also identified gaps in caregiver support that could be addressed through training while providing important lessons for future success.

Belgium

Specialized decentralized care programs, including regional networks, provide training programs as part of their successful

development. The Walloon Network for Cardiology, for instance, provides training programs for cardiology fellows and other healthcare professionals, focusing on both practical skills and theoretical knowledge, essential for high-quality cardiac care across the region.

Other workforce training programs include:

- Continuous professional development: Regional health agencies offer continuous training programs for healthcare professionals to keep them updated with the latest medical practices and technologies.
- Training in digital competencies: Specific training programs focus on equipping healthcare professionals with the skills needed to use digital health tools effectively, including EHRs, telemedicine platforms, and digital diagnostic tools.

Decentralized care: Outcomes, KPIs, and lessons learned

All four benchmarking countries measure patient satisfaction and health outcomes to gauge the success of decentralized care. Key performance indicators (KPIs) typically include metrics on hospital admissions, readmissions, and emergency department visits to assess the impact of decentralized care on reducing the burden on hospitals.

- The UK emphasizes hospital admission rates, wait times, and coordination of care as primary KPIs.
- Singapore focuses on primary care utilization, patient engagement, and chronic disease management.
- The Netherlands prioritizes patient and staff satisfaction, healthcare costs, and preventative care metrics.
- Belgium measures access to care, telemedicine utilization, and the effectiveness of integrated care programs.

Outcomes and lessons

United Kingdom

Decentralized care has brought significant overall improvements to patients in the UK.

- In 2022, there were 800,000 (12%) fewer hospital admissions than in 2019, elective admissions were down by 279,000 (21%) and emergency admissions by 521,000 (9%).
- General practice is now delivering record numbers of appointments, despite a smaller number of GPs in England compared to 2015.
- Between 2022/2023 and 2024/2025, when adjusted for population size and aging, the planned NHS England budget will have decreased by an average of 1.6% per year in real terms. This indicates a better allocation of money.
- Surveys indicate varying levels of patient satisfaction, with positive feedback on digital and community services, but concerns about access to face-to-face consultations.

Obstacles to implementation have included resistance from healthcare professionals and the public; challenges in simultaneously investing in training, infrastructure, and campaigns; infrastructure limitations in many regions; gaps in digital training; and inconsistencies in local implementation.

Singapore

Singapore's decentralized care pilots have proven to be successful, leading to the implementation of MIC@Home, and plans for its further expansion.

- A 2022 MOH survey showed a 40% rise in teleconsultations, indicating greater convenience for patients.
- The MIC@Home program has reduced wait times in emergency departments, for primary care appointments, and for hospital

beds. The initiative saved around 5,000 bed days between September and December 2021 during the COVID-19 pandemic by managing patients in virtual wards at home.

- By June 2023, the MIC@Home program had saved approximately 7,000 bed days, translating into reduced overhead costs and better resource allocation.
- A 2021 study by the National University of Singapore found that patients using telemedicine reported high satisfaction for convenience and time saved.
- Other programs, such as NCIS-On-The-Go for cancer patients, have shown both cost savings and high patient satisfaction.

Challenges have included overcoming regulatory hurdles, ensuring seamless integration of existing care models with digital infrastructure, shifting resources without compromising quality of care, ensuring adequate staffing and training, and managing costs and reimbursement.

Netherlands

Decentralized care in the Netherlands has significantly improved healthcare delivery, demonstrating cost savings and increased access to care in remote areas.

- Programs like Better@Home have demonstrated cost savings of €2 million annually by reducing hospital stays from 2018 to 2023.
- Between 2018 to 2023, telemedicine increased access to care by 20% in remote areas.
- Programs like Buurtzorg Nederland have reported high patient satisfaction due to personalized home care and continuity of care.
- Integrated care networks, such as ParkinsonNet and DementiaNet, enhanced continuity of care by 25% and reduced fragmentation by 18% from 2018 to 2023.
- Digital health tools and telemedicine enhanced overall care delivery efficiency by 15% between 2018 and 2023.

Challenges include a lack of coordination among various healthcare providers, financial and budgetary constraints, hurdles for technology integration and privacy standards, and facilitating adoption and training.

Belgium

Decentralized care has brought some significant improvements to patients; however, challenges in measuring overall data limit the availability of results.

- Hospital readmission rates show some promise; a pilot program for heart failure patients in Flanders using home care and remote monitoring achieved a 15% reduction in readmission rates compared to traditional care.
- Travel times are shorter, with residents in rural areas of Belgium now traveling 10–15 minutes to access primary healthcare in rural areas, compared to 30–45 minutes in the early 2010s.
- Implementing an e-health platform in Brussels resulted in a 7% increase in patient satisfaction around appointment scheduling and communication.

Belgium has encountered several challenges in implementing decentralized care, including regulatory complexity and the need for standardized practices, as well as difficulties with coordination and leadership. Financial barriers and the need for significant investment have compounded these issues, alongside the complex, resource-intensive demands of integrating and adopting new technologies. Additionally, patient engagement has been low, with a lack of trust in home and community care settings, necessitating clear communication strategies and ongoing support to build confidence in these services.

How a country implementing decentralized care measure success

For a new country implementing decentralized care, measuring success should involve a comprehensive set of KPIs that align with the strategic objectives of decentralized healthcare. These KPIs should be designed to capture both the immediate impacts of decentralized care and its long-term sustainability.

KPI	Importance	Implementation
Hospital admission and readmission rates	Reducing hospital admissions is a key indicator of the effectiveness of decentralized care in managing health conditions outside of hospital settings. Lower readmission rates indicate better chronic disease management and effective follow-up care.	Track the number of hospital admissions and readmissions for conditions that could be managed through primary or community care. Monitor this metric on a regional basis to assess the effectiveness of decentralized care across different areas.
Patient satisfaction scores	Patient satisfaction is a crucial measure of the quality and acceptability of decentralized care services. High satisfaction scores reflect positive patient experiences and the success of patient-centered care models.	Regularly conduct patient satisfaction surveys to assess perceptions of care quality, accessibility, and communication. Use this feedback to identify areas for improvement and ensure that care delivery remains patient focused.
Healthcare costs and cost-effectiveness	One of the goals of decentralization is to optimize healthcare spending by reducing the reliance on expensive hospital-based treatments. Cost-effectiveness measures the financial efficiency of decentralized care models.	Compare the costs associated with decentralized care models to those of traditional hospital-based care. Monitor these costs over time to assess the sustainability of decentralized care.
Productivity	Productivity metrics are essential in decentralized care as they assess how efficiently healthcare resources (such as staff, facilities, and equipment) are used to achieve desired patient outcomes. Tracking productivity highlights the effectiveness of shifting services to less intensive settings (e.g., outpatient clinics), reducing the need for costly hospital-based care.	Implement productivity tracking by monitoring output-to-input ratios, particularly in areas with newly decentralized services, such as community care and outpatient procedures. Incorporate indicators like admission and readmission rates, length of stay, and emergency visits to capture efficiency gains.
Access to care	Ensuring equitable access to healthcare services is a fundamental goal of decentralization. Improved access, especially in rural and underserved areas, indicates the success of decentralized care in reaching wider populations.	Measure access by tracking utilization rates of local healthcare centers, telemedicine services, and home-based care programs. Monitor travel times and waiting periods for healthcare services to ensure reduced barriers to care.
Preventive care metrics	Preventive care is essential for reducing the long-term burden of chronic diseases. Successful decentralization should lead to increased preventive care activities such as screenings and vaccinations.	Track rates of preventive care activities such as vaccination coverage, cancer screenings, and health check-ups. These metrics provide insights into the effectiveness of decentralized care in promoting public health.

Health equity indicators	Decentralization aims to reduce disparities in healthcare access and outcomes. Health equity indicators help measure the success of these efforts.	Monitor health outcomes and access to care across different demographic groups, including socio-economic status, geographic location, and ethnicity. Indicators should show a narrowing of health disparities as decentralized care is implemented.
Integration and coordination of care	The effectiveness of decentralized care depends on the seamless integration and coordination of services across different levels of care. This ensures continuity of care and prevents gaps in service delivery.	Assess the level of integration by tracking coordination between primary, secondary, and tertiary care providers. Metrics could include the number of shared care plans, frequency of interdisciplinary team meetings, and patient feedback on care coordination.

Conclusion

Decentralized care shows potential in improving healthcare outcomes and system efficiency, while presenting challenges and complexity for countries starting out on theis journey. Success requires considerable attention to key fundamentals around policies and regulation, technology and data, infrastructure, and training mechanisms.

Robust regulatory frameworks that can adapt to regional needs while maintaining national standards are critical. There will be regions with fewer healthcare services and/or more need for services due to levels of deprivation and/or prevalence of disease, so it is important to implement regulations that are sufficiently flexible to allow for regional adaptations without compromising national healthcare standards.

Investment in physical and digital infrastructure is vital for facilitating decentralized care, establishing regional healthcare hubs, home-based and community-care facilities, and integrating a range of digital-health technologies such as EHRs and telemedicine. These come with high initial costs but will—in time—lead to cost savings on hospital admissions and care, as well as result in healthcare services that are more accessible, efficient, and tailored to regional needs.

Collaboration across sectors, as well as partnerships between a country's MoH, local governments, regulatory bodies and the private sector will help create the supportive framework and funding needed for decentralized care. Training across the system is also vital to ensure healthcare professionals can embrace new models and technology innovation, as well as work collaboratively across decentralized systems.

Decentralization doesn't mean rolling out everything simultaneously across all areas. The most effective systems strategically allocate a country's limited resources and funding through structured processes that enable testing, learning, and refinement. They maintain a constant focus on improving patient outcomes while ensuring a gradual and sustainable approach to scaling care.