

Hospitals in Health Systems: Opportunities for Efficient, High-quality, and Integrated Care

Editors

Mickey Chopra

Xiaohui Hou

Kojo Twum Nimako

Sanam Roder-DeWan



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1818 H Street NW
Washington DC 20433
Telephone: 202-473-1000
Internet: www.worldbank.org

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ABOUT THE AUTHORS

Mickey Chopra is currently the Lead Health Specialist for Service Delivery in the Health, Nutrition, and Population Global Practice of the World Bank, with a specific focus on the organization, management, and quality of health services. Prior to this he was the Chief of Health and Associate Director of Programs at UNICEF's New York Headquarters, leading the agency's work on maternal, newborn, and child health; immunization; pediatric HIV/AIDS; and health system strengthening, policy, and research. For seven years he worked in a rural hospital in South Africa.

Xiaohui Hou is a Senior Economist in the Health, Nutrition, and Population Global Practice at the World Bank. She has more than 15 years of experience in global health, including leading policy dialogues, lending operations, flagship analytical projects, and program development in countries across various regions. Recently, she undertook an external services opportunity as the Deputy Head of the Subregional Office for East and North-East Asia in the United Nations Economic and Social Commission (UNESCO) for Asia and the Pacific. She has served as a visiting scholar at several universities, and her work has been published in books and peer-reviewed journals. She holds a PhD in health services and policy analysis, and a master's degree in economics from the University of California, Berkeley.

Kojo Nimako, MD, DrPH, MPH, is a Senior Health Specialist in the World Bank's Health, Nutrition, and Population Global Practice (HNP GP). He leads the quality-of-care portfolio of HNP GP's Service Delivery Team, providing program implementation and research technical assistance to World Bank task teams and client countries in the Africa and Asia regions. He also leads the Service Delivery Redesign Community of Practice hosted by the World Bank and the Global Financing Facility for Women, Children and Adolescents (GFF). He previously worked as a maternal and newborn health specialist with the Bill & Melinda Gates Foundation, and prior to that worked as a physician in Ghana.

Sanam Roder-DeWan, MD, DrPH is the technical lead for Service Delivery Redesign at the World Bank; an Associate Professor of Community and Family Medicine at Dartmouth School of Medicine; and a Health Equity Faculty Fellow at The Dartmouth Institute. Her research and implementation work focuses on health system quality improvement to equitably improve maternal and newborn mortality outcomes in resource-constrained settings globally, including in the US. She led the quality improvement section of the Lancet Global Health Commission on High Quality Health Systems (2018) and the World Bank-WHO joint collection on Quality of Care in the *BMJ* (2023).

Authors

Abdulai Tinorgah is a Senior Public Health Physician interested in primary health care system development. He is currently a Consultant with the World Bank. He was the Design Consultant for the pilot Preferred Primary Care Provider Networks in Ghana, and is continuing to support Ghana's ongoing national Networks of Practice program in the post-pilot period.

Anna Koziel is a Senior Health Specialist in the Health, Nutrition, and Population Global Practice of the World Bank. She has over twenty-five years of experience working with country governments in Europe and Asia, providing innovative solutions to challenges in the health sector. Her areas of expertise include primary health care strengthening and care coordination; service delivery strengthening; hospital reform; health system resilience; human capital development; long-term care; and tobacco control. She has worked extensively with senior policy makers, providing technical assistance in the design and implementation of key reforms at the intersections of patient's needs, modern technologies, and data management systems. She has worked with the World Health Organization, the private sector, NGOs, and governments.

Carl Otto Schell is a Researcher at Global Public Health at Karolinska Institute and the Centre for Clinical Research Sörmland, Uppsala University in Sweden. His research in Malawi, Sweden, Sri Lanka, Tanzania, and Kenya includes the epidemiology of critical illness and the potential for feasible resilient health system strengthening to improve the outcomes of acute care, and the implementation of such care in health facilities. His work involves collaborations with universities around the world and with UNICEF, WHO, and the World Bank. He is a practicing Senior Consultant Physician in Internal Medicine and Cardiology at Nyköping Hospital in Sweden.

Dorothy Oluoch, PhD, is a Health System Researcher based at the KEMRI-Wellcome Trust Programme in Kenya. Her research interests include reproductive health among adolescents and other vulnerable groups, and maternal, newborn, and child health. She currently coleads studies on families' experiences with preterm births, neonatal care in hospitals, and is developing work focused on post-discharge care for vulnerable babies. She has a keen interest in incorporating families' and caregivers' voices into quality improvement strategies, and contributing to the agenda of strengthening people-centered care in low and middle-income countries.

Edit Velenyi, a Senior Economist with the World Bank, supports countries in designing and implementing reforms to expand universal health care, including primary care reform, hospital sector modernization, and sustainable health care financing. During her 22 years with the World Bank, she has worked with the Health, Nutrition, and Population Global Practice and the Development Economics Research Group, spanning Africa, Asia, and Latin America and the Caribbean, combining development economics and policy research with operational work. She has published on health policy evaluation, economic shocks and health financing, and systems resilience. Edit holds a PhD in Economics from the University of York; an MA from the Johns Hopkins University; and an MA from the Budapest Business School.

Ermo Cheng is a PhD candidate at the Peking University School of Mathematical Sciences; and a Research Fellow at PKU China Center for Health Economic Research. He has served as actuary at the China Reinsurance Group Corporation and Chief Data Scientist at Aden Tech. Currently, he is a key figure leading the project of Planetary Health Axis (PHA) of PKU Institute for Global Health and Development. His research areas are in financial statistics, capital management, risk management, health economics, and disease burden statistics.

Gordon G. Liu has a PhD from Peking University. He is BOYA Distinguished Professor of Economics at the PKU National School of Development, Dean of the PKU Institute for Global Health and Development, and a fellow of the Chinese Academy of Medicine, and is the co-organizer for the "US-China Track II Dialogue on Health." He serves as associate editor for Health Economics, and the Editor-in-Chief for the *China Journal of Pharmaceutical Economics*. Prior to joining Peking University, he was on the faculties at the University of Southern California, and the University of North Carolina at Chapel Hill. In 2004-2005 he was president of the Chinese Economists Society (CES).

Jeremy Veillard is the Lead Health Specialist in the Latin America and Caribbean Region of the Health, Nutrition, and Population Global Practice at the World Bank. He is a former health care executive in Canada and France, with deep expertise in quality of care, service delivery performance, and health systems research and analytics. He has a PhD in public health with a focus on health systems research from the University of Amsterdam, and a masters' degree in hospital administration from the Ecole des Hautes Etudes en Santé Publique, France.

Juan Pablo Toro is a business administrator from the Universidad de los Andes in Colombia. He is a specialist in regional development planning, and holds an MS in population and development from the London School of Economics. He has held various positions in the public sector at the territorial and national levels in Colombia; for example, the department of Casanare; the Colombian Agency for International Cooperation; the National Planning Department; and the Ministry of Health and Protection. He has also worked as coordinator of the Millennium/Sustainable Development Goals Program at UNDP-Colombia, and has been a health consultant for the World Bank since 2016.

Karima Khalid is a Lecturer and Senior Consultant at MUHAS with over 15 years of experience in critical care, anesthesia, health systems research, and policy engagement. She is a leading critical care expert in Tanzania, and has extensive experience in capacity building and educational projects such as NSOAP, SURG-Africa, and SAFE and VAST courses. She is engaged in various global critical care initiatives and has numerous publications on essential emergency and critical care (EECC). She serves on WFSA's Critical Care Committee, CANECSA's Education and Scientific Committee, and is one of the regional directors of VAST. She is currently leading the UNICEF-supported implementation of EECC in Tanzania.

Katarzyna Dubas-Jakóbczyk, MPh, PhD, is an Associate Professor at the Health Economics and Social Security Department, Institute of Public Health, Jagiellonian University in Krakow, Poland. She is a health policy and health economics researcher working in the field of organizational and financial reforms within the health care sector, including on issues related to hospital governance, provider payment reforms, and capacity planning at both the health system and the provider levels.

Lisa Hinton is a senior social scientist in the Medical Sociology & Health Experiences Research Group, Nuffield Department of Primary Care Health Sciences, University of Oxford. Her applied research uses patient experiences for health care improvement in primary and secondary care settings in high and low income settings, including in the UK and Kenya. She focuses on women's and maternal health, primary care, and health care improvement, and she regularly collaborates with DIPEX International, a unique global collaboration of scholars, clinicians, and patients committed to research on people's experiences of health, health care, and illness; and on bringing that new knowledge into the world.

Marwa Ramadan is an Extended-Term Consultant with the Global Financing Facility for Women, Children and Adolescents (GFF) at the World Bank. Currently, she manages the GFF data portal, and serves as a results specialist for Afghanistan, Haiti, and the Democratic Republic of Congo. Since joining the World Bank in 2019, Marwa has contributed to analytics for the Primary Health Care Performance Initiative (PHCPI), and led the development of the Primary Health Care data repository. Her previous roles include serving as an analyst at Johns Hopkins University's Centre for Humanitarian Health, and working as an epidemiologist with Doctors Without Borders. Marwa holds a PhD in International Health Systems from Johns Hopkins University, specializing in health system measurement in challenging environments.

Mike English is a UK-trained pediatrician who worked in Kenya for 25 years as part of the KEMRI-Wellcome Nairobi Programme. He now co-leads the Health Systems Collaborative in Oxford. His work in developing and implementing national, evidence-based clinical guidelines helped provide a foundation for the Clinical Information Network (CIN) that is enabling large clinical trials and some of the largest hospital-based observational studies in Africa. He partners with Kenyan colleagues to conduct mixed-methods implementation research on technologies, families' experiences of care, and how they are influenced by health workforce factors (the HIGH-Q project). He is leading a new long-term project on the future of the African First Referral Hospital (the AFRHiCARE Partnership).

Mikhael Iglesias is a climate and health specialist consultant with the World Bank's Health Climate, Environment and Disaster Program (HCED) in the HNP Global Engagement Unit; he is also a Climate and Health Focal Point for the Latin America and the Caribbean Region. His work advances climate change adaptation and mitigation measures in the health sector, incorporating research analyses into World Bank programs. He previously worked as a Program Manager at the Venezuela National Liver Transplantation Program, and as a professor and researcher developing projects on food insecurity and mental health in the context of complex humanitarian emergencies. He has a degree in psychology from Universidad Católica Andrés Bello, and a master's in international development (Latin American Studies) from New York University.

Mukesh Chawla, PhD (Economics) has worked for over thirty years with governments and international development partners in Europe, Asia, and Africa on a variety of health sector issues. Prior to his retirement from the World Bank, he was an Adviser in the Bank's Health, Nutrition, and Population Unit, and Founder-Coordinator for the Pandemic Emergency Financing Facility. He has written extensively on the role of markets and market-like institutions in the creation of incentives that strengthen health systems; fiscal space for health; innovations in health financing; the design of health sector reforms; and the economics of aging populations. Prior to joining the World Bank, he held a research faculty position at Harvard University.

Nan Peng is a PhD candidate at the China Pharmaceutical University for School of International Pharmaceutical Business, and a research fellow at the PKU China Center for Health Economics Research. She was a visiting fellow at the International Center for Pharmaceutical Affairs Regulatory Science at the University of Southern California. Her research areas are pharmaco-economics and drug policy evaluation. She has published articles in Chinese and English-language journals, and was awarded "Excellent Oral Presentation" in the 5th China Pharmaco-economics Young Scholars Forum in 2021; "Outstanding Paper Award" in the 5th China Hospital Pharmaco-economics Forum in 2021; and "Oral Presentation" in the 16th China Health Technology Assessment Forum in 2023.

Nancy Kagwanja is a health policy and systems researcher in the Health Systems Research and Ethics Department at KEMRI-Wellcome Trust. She has experience researching health policy implementation, resilience, and governance. She has worked with midlevel health managers in Kenya examining coping mechanisms to deal with stressors on human resources for health, governance, budgeting, and priority setting, and their impact on the wider health system. Her research interests include understanding how feedback mechanisms function within health systems to incorporate public views into health system decision-making, and exploring strategies for strengthening health system responsiveness to public feedback.

Nigel Edwards is an independent health policy expert working as an advisor with WHO Europe. He was Chief Executive at the Nuffield Trust from 2012 to 2023. He has a long career in health policy working on innovation and change in health care delivery, and in providing challenging analysis on health policy. He is Honorary Visiting Professor at the London School of Hygiene and Tropical Medicine, and the University of Birmingham in the UK.

Pablo Andres Villalobos Dintrans is an economist, public policy, and public health researcher and practitioner. He works as a consultant for local and international organizations in health policy, health financing, health systems, population aging, and long-term care. He is an associated researcher at the Millennium Institute for Caregiving Research (MICARE) and the Global Network of Long-Term Care (GNLTC) of the World Health Organization, and is on the editorial board of the *Health Systems and Reform Journal* and the *Journal of Long-Term Care*. He received his DrPH from the Harvard T.H. Chan School of Public Health.

Qinghong He, PhD, Research Fellow, Institute of Economics, Chinese Academy of Social Sciences; Peking University China Center for Health Economic Research. From 2020 to 2023, she was a postdoctoral fellow at the Peking University National School of Development. She received a PhD in economics from Southwestern University of Finance and Economics. Her research interests include health economics, hospital management, and health policy evaluation. She has published numerous papers on health policy and health economics in both Chinese and international journals.

Ravi Oodit, a general surgeon with over 30 years of clinical experience, leads the Quality and Safety Perioperative Care Group in the Division of Global Surgery at the University of Cape Town in South Africa. He has worked extensively with the Enhanced Recovery After Surgery (ERAS) Society, playing a pivotal role in adapting its principles to developing and implementing perioperative care guidelines for low and middle-income countries. Ravi pioneered the implementation of the first ERAS program in South Africa. He is committed to bridging the “know-do” gap to improve patient care.

Ronald Mutasa is the Practice Manager for the East Asia and Pacific region of the Health, Nutrition, and Population Unit of the World Bank. He has more than two decades of global health experience, including several years leading flagship World Bank lending programs in health systems strengthening and reform across Asia and Africa. He has led World Bank research initiatives on infectious disease prevention and control, vaccine security, primary health care reform, nutrition, and human capital development. He has published in peer-reviewed journals on quality of care, and demand and supply-side incentives for health. A public health physician, he holds a PhD in Public Health from George Washington University, as well as advanced degrees in development economics and health policy.

Rosanna Mazhar works in global health research and program implementation, and is currently a consultant with the World Health Organization’s Health Emergencies Programme. She previously provided research support to the Health Systems Collaborative unit at the Nuffield Department of Medicine, University of Oxford, where she was involved in a project related to the provision of essential treatment in critical illness during the COVID-19 pandemic in Kenya and Tanzania; and in another project on the role of first-referral hospitals in low and middle income countries. Prior to this, she supported the coordination of health sector humanitarian response operations in Bangladesh; implemented projects in Tanzania to optimize health information utilization; and managed TB/HIV research projects in eSwatini.

Sassy Molyneux is a Professor of Global Health based in the Nuffield Department of Medicine at the University of Oxford. She is an interdisciplinary researcher with a background in human geography, behavioral research, and organizational studies. She moved back to the UK from Kenya in 2020 after 27 years of working at the KEMRI-Wellcome Trust Programme. Her main research interests span health policy and systems research (governance, finance, responsiveness to patient and public priorities and needs, and treatment seeking); implementation research; and empirical ethics.

Stélio Tembe is currently a doctoral candidate at the University of Washington, pursuing a doctorate in Global Health Leadership and Practice (DrGH). He has a background as a physician and extensive experience in public health program implementation and primary health care. He also holds a master’s degree in public health from the University of Washington. His primary interests are in health system strengthening, implementation science, and the application of implementation strategies to improve maternal, newborn, and child quality of care.

Tamara Mulenga Willows is a medical doctor, an academic GP Fellow with Queen Mary's University in London, and a global health researcher working in the Tower Hamlets borough of London. She previously provided research support to the Health Systems Collaborative unit at the Nuffield Department of Medicine, University of Oxford. In her current role she works with teams in Kenya and Tanzania, and she has participated in developing other work focused on types of hospitals in low- and middle-income countries. Before working on the Health Systems Collaborative Unit, she worked as a junior doctor in the National Health Service, as well as a Health Behavior Change Fellow at the Centre for Infectious Disease Research in Zambia, as part of the Global Health Corps Fellowship.

Tim Baker is an associate professor, critical care physician, and anesthesiologist with positions at Muhimbili University of Health and Allied Sciences in Dar es Salaam, Tanzania; the Karolinska Institutet in Sweden; and LSHTM and QMUL in the UK. He has 20 years of experience in global critical care research, programmatic and clinical work, and has worked with WHO, the World Bank, UNICEF, USAID, PATH, WFSA, and the Centre for Global Development. He conducts consultancies and leads global collaborative research and capacity-building programs, focusing on health system innovations, and strategies for ensuring the provision of foundational, cost-effective care to critically ill patients.

Yaxuan Liu has an MS from the London School of Economics & Political Science, and is a research fellow at the PKU China Center for Health Economic Research. She is currently a research fellow at the University of Chicago Booth School of Business. Her academic work has been published in economics journals both domestically and internationally. Her research interest lies in the intersection of economics and finance.

ABBREVIATIONS AND ACRONYMS

AGU	Acute Geriatric Unit
ALOS	Average Length of Stay
ASC	Ambulatory Surgical Center
ASOS	African Surgical Outcomes Study
BOR	Bed Occupancy Rate
Cat-DDO	Catastrophe Deferred Drawdown Option
CCA	Climate Change Adaptation
CCB	Climate Co-Benefits
CDSS	Clinical Decision Support System
CEmONC	Comprehensive Emergency Obstetric and Newborn Care
CEE	Central and Eastern Europe
CHE	Current Health Expenditure
CHIP	Children's Health Insurance Program (US)
CHPS	Community-based Health Planning and Services (Ghana)
CIN	Clinical Information Network (Kenya)
COPD	Chronic Obstructive Pulmonary Disease
CPOE	Computerized Physician Order Entry
CPR	cardiopulmonary resuscitation
CRM	crew resource management
DALY	Disability-adjusted life years
DCP	Disease Center Priorities
DGHS	Director General of Health Services (Sri Lanka)
DLI	Disbursement-Linked Indicators
DNP	National Planning Department (Colombia)
DP	Development Partner
DRG	Diagnosis-Related Groups
DRM	Disaster Risk Management
DRGs-PPS	Diagnosis Related Groups Prospective Payment System
DSC	Day Surgery Center
EBCD	Experience-based codesign
ED	Emergency Department
EDGE	Excellence in Design for Greater Efficiencies
EECC	essential emergency and critical care
EHR	Electronic Health Records
EIAS	ERAS Monitoring and Evaluation System
EMR	Electronic Medical Records
EMT	Emergency Medical Team
ePRO	Electronic Patient Reported Outcome
ERAS	Enhanced Recovery After Surgery
EU	European Union
EWS	Early Warning System

FASTR Frequent Assessments and System Tools for Resilience
FMEA Failure Modes and Effects Analysis
FLH First Level Hospital
FRH First Referral Hospital
GFDRR Global Facility for Disaster Reduction and Recovery
GHS Ghana Health Service
GHG Green House Gas Emission
GNI Gross National Income
HBC Hospital-Based Care
HIC High-Income Country
HQSS High-Quality Health Systems
HRH Human resources for health
IBRD International Bank for Reconstruction and Development
ICU Intensive Care Unit
IFC International Finance Corporation
IMMS Indoor Morbidity and Mortality Schedule (Sri Lanka)
ISOS International Surgical Outcomes Study
JGP Jednorodne Grupy Pacjentów (Diagnostic Related Groups) (Poland)
JLN Joint Learning Network
KWPF Korea World Bank Partnership Facility
LDHF low dose, high frequency
LMIC Low- and Middle-Income Country
LSS Lean Six Sigma
MA Medical Alliances
MeSH Medical Subject Headings
MNH Maternal and Newborn Health
MOH Ministry of Health
MOF Ministry of Finance
MPDSR Maternal and Perinatal Death Surveillance and Response
MSF Medecins San Frontiers
NCD Non-Communicable Disease
NFZ National Centralized Health Fund (*Narodowy Fundusz Zdrowia*) (Poland)
NHWA National Health Workforce Accounts (WHO)
NRCMS New Rural Cooperative Medical Scheme (China)
NHIS National Health Insurance Scheme (Ghana)
NGO Nongovernmental Organization
NICU Neonatal Intensive Care Unit
NIHR National Institute for Health and Care Research
NoP Networks of Practice
OECD Organisation for Economic Co-operation and Development
OSIRIS Optimising Shared Decision-Making for High-Risk Major Surgery (UK)
PAHO Pan American Health Organization
PCC Patient-Centered Care

PCORI Patient Centered Outcomes Research Institute
PDHS Provincial Directors of Health Services (PDHS) (Sri Lanka)
PDSA Plan Do Study Act
PforR Program for Results financing
PHC Primary Health Care
PIGCCS Comprehensive Climate Change Management Plan (Colombia)
PLN Polish (currency)
POE Post-Occupancy Evaluation
PPP Public-Private Partnerships
PPP Preferred Primary Care Provider (Ghana)
PPS Prospective Payment System
PREMS patient-reported experience measures
PROMS patient-reported outcome measures
PSSP Primary Health Care Strengthening Project (Sri Lanka)
QALY Quality Adjusted Life Years
QI Quality Improvement
RCT Randomized Controlled Trial
RRT Rapid Response Team
RTLS Real Time Location Systems
SDG Sustainable Development Goals (UN)
SDI Service Delivery Indicators
SDM Shared Decision-Making
SDR Service Delivery Redesign
SHI Social Health Insurance
SIDS Small Island Developing States
LSS Lean Six Sigma
SiSCLIMA National Climate Change System (Colombia)
SMM Severe Maternal Morbidity
SPZOZ Independent Health Care Units (*Samodzielny Publiczny Zakład Opieki Zdrowotnej*) (Poland)
SVG St. Vincent and the Grenadines
TeamSTEPPS Team Strategies and Tools to Enhance Performance and Patient Safety
TRS Technical Report Series
UHC Universal Health Coverage
UMIC Upper Middle-Income Country
WCH West China Hospital
WHO World Health Organization

EXECUTIVE SUMMARY

Improving global health outcomes amid fiscal constraints, climate risks, pandemics, and other crises is a formidable challenge for governments worldwide. The recently published WHO/World Bank Universal Health Coverage (UHC) progress report (2023) underscores a concerning reality: despite the goal of UHC, over half of the global population lacks full access to quality health care, and progress on UHC has stalled. This pervasive lack of access is coupled with significant financial hardship, with over 1 billion people facing catastrophic out-of-pocket health spending, and nearly 17 percent of the global population pushed into poverty due to health care costs.

Policy makers face an array of challenges in addressing the needs generated by this plethora of shocks and crises. Government spending is projected to contract or remain stagnant relative to 2019 through 2028 in nearly two-thirds of all LMICs. At the same time, the priority of health in government spending has dropped close to or even below pre-COVID levels in most low-income and lower middle-income countries (Kurowski et al. 2022). Moreover, policy attention is increasingly and understandably turning to climate change and other priorities at both the national and global levels.

As the world strives for a more equitable and sustainable future, directing resources toward strengthening health care in low and middle-income countries (LMICs)—including better integration and leveraging of hospitals as an integral part of a system approach—is a pivotal step toward unlocking human potential and fostering a healthier, more prosperous world. The benefits extend far beyond the confines of health care: they also influence economic growth, societal development, and global health resilience.

Building on the seminal work of Preker and Harding (2003) regarding the importance of hospital governance, and LaForgia and Couttolenc (2008) on hospital leadership and management capacity, this publication focuses on situating hospitals as part of a holistic integrated care system.

Hospitals and Health Care

Hospitals are a critical part of health systems and the quest for better health for all. They are relied upon for many key services and often consume a large percentage of the resources and personnel in a country's health ecosystem. Yet they are often a side note in broader health discussions, or they are considered in isolation.

While primary care serves as the bedrock of a robust health care system by supporting prevention, early diagnosis, and ongoing management of common and chronic conditions, hospital-based care plays a pivotal role in ensuring access to acute and operative care, specialized interventions, advanced treatment modalities, and in preparing for and responding to emergencies.

But from a patient's perspective these distinctions are not what matters. **What matters is whether they can get the care they need when and where they need it**, at a price they can afford—and that the pieces of the system work together seamlessly to produce the best possible outcomes. Competition between hospitals and primary health care, whether perceived or real, hinders the holistic approach that is needed to plan national investment in health care. It also undermines workforce optimization, and ultimately compromises the quality of patient experience in the quest for seamless care.

In this context, the current focus on primary health care and frontline clinics is welcome, but it is not enough. Hospitals—the services they provide, their infrastructure, expertise, and workforce—must also be an integral part of the solution. This requires a systems-based approach, and a paradigm shift in the relationship between primary health care and hospitals. It requires placing them together within a broader health system framework.

This publication reflects the initiation of a global endeavor; it is an initial attempt to tackle this challenge. It does not claim to provide a unified, authoritative blueprint that will work for all situations. Instead, based on existing knowledge and lessons from the frontlines around the world, it is designed to form the basis for country-level dialogues by highlighting three key principles, and four key action areas for building better systems. It is primarily intended to serve as a resource for World Bank task teams as they explore the intricacies of and opportunities for hospital reform while interacting with governments to design and implement health sector investments. It will also be useful outside of the World Bank as reference material for policy makers, health care practitioners, and researchers.

Three Key Operating Principles

The systems approach espoused in this publication is based on three operating principles:

- (i) Systems must have an unrelenting focus on seamlessly providing patients with care when and where they need it;
- (ii) Systems must be agile enough to be able to mitigate the impacts of system shocks and prevailing risks like climate change, pandemics, and conflict.
- (iii) Systems should foster approaches that build on proven interventions, but adapt them to this changing environment, and leverage emerging tools and methods for better outcomes.

Patient-centered continuity of care. What matters most to people is whether the health system works for them. A patient's paramount concern is being able to access quality health care services when they need them. Reforms and investments must be underpinned by a nuanced understanding of hospitals within the continuum of care, and they must be synergized with primary health care. This underscores the utility of models of care in advancing an integrated hospital agenda. These models, which range from decentralizing care through remote monitoring and telemedicine to fostering networks and specialization and redesigning the relationship between hospitals and primary care, offer promising avenues for transformative change. Similarly, forming networks and fostering specialization can enhance efficiency and effectiveness within a system of health care delivery.

Adaptability to climate and other system shocks. Health systems, including hospitals, can be slow to adapt, particularly given the imperative to “do no harm,” and the high cost of making mistakes. Yet the consequences of climate emergencies, pandemics, and other health system shocks pose multifaceted challenges for hospital planning that necessitate a comprehensive reevaluation of infrastructure and operational strategies. Climate preparedness is of particular urgency as the frequency and intensity of extreme weather events increase. Shifting disease patterns, many driven by climate change, demand adaptable health care facilities; and the spread of vector-borne diseases to new regions requires enhanced surveillance systems and infectious disease management protocols. Developing sustainable practices, from energy-efficient buildings to resilient supply chains, is also imperative in order to mitigate the health care sector's contribution to climate change, and to ensure that hospitals remain operational in the face of evolving environmental challenges.

Leveraging proven strategies, and innovating for the future. Hospital reform is not a new venture. There are proven reform interventions across the dimensions of efficiency, quality, and integration that can be leveraged to address deficits in health systems. However, the persistence of legacy challenges in areas like governance, financing, and human resource management, and the emergence of new areas of focus such as digital integration, and crisis readiness and response highlight the need for innovative approaches to operationalizing these proven standards. As detailed in this publication, this entails work across numerous components in ways that balance “staying the course” with affirmative steps to transform movement along that course in light of changing needs and opportunities.

Areas of Action

With its focus on supporting country-based teams, the bulk of this publication focuses on key action areas for reform efforts that employ approaches driven by the three operating principles discussed above. The content is grouped into four major sections: there are individual sections on efficiency, quality, and integration as the three entry points for hospital reform; and a final section that discusses cross-cutting topics in hospital reform (Figure 1).

The three sections on the entry points for reform—efficiency, quality, and integration—each include a series of chapters with a mix of case studies and reviews of relevant elements of reform. The reviews are objective analyses of key reform concerns, or examples of relevance to LMICs. The case studies present narratives on specific hospital reforms across a variety of settings, highlighting the implementation process and how various elements of the implementation model impact the reform.

The cross-cutting section addresses some key considerations for hospital reform in the areas of governance, health care innovations, and system resilience. These include chapters on the relevance of first referral hospitals, important questions to ask when establishing a hospital, minimum requirements for emergency and critical care, and climate resilience.

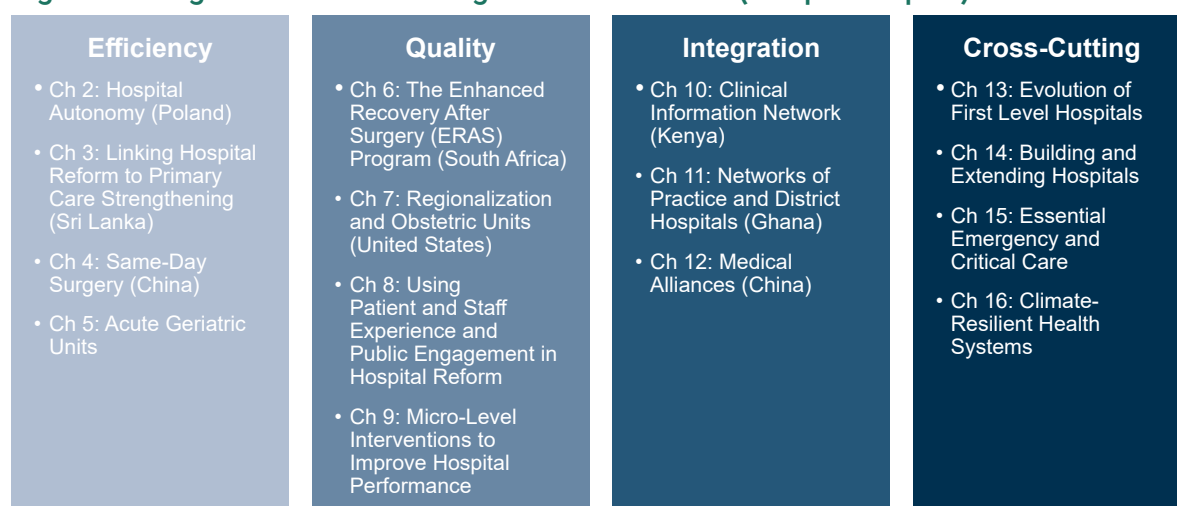
Each chapter is written in a format tailored to the topic and the content. Some chapters are case studies that present key country experiences (for example, the chapters on autonomization of hospitals in Poland, and on networks of practice in Ghana). Others review seminal topics related to hospital reform (for example the chapters on acute geriatric care, and the scoping review of micro-level hospital improvement strategies); still others combine reviews and case studies to discuss key issues (such as the chapters on regionalization of care in HICs).

Future Opportunities

This publication is offered as a springboard to encourage greater focus on a continuum of essential services for patients across all levels and all aspects of health care, as part of a holistic systems agenda to produce better and more equitable outcomes for all.

The world of hospitals, their roles, challenges, and reform is vast in scope—far too expansive to be covered fully in a single volume. This publication makes no claim to cover everything. Instead, as noted above, it purposefully focuses on an intentionally limited set of issues and key entry points that can serve as starting points for reform. Key areas that should be considered in follow-on work include digital health and hospitals, human resources and hospitals, and hospital payment strategies in LMICs.

Figure 1: Insights Across Four Key Areas of Reform (Chapter Topics)



References

- Kurowski, C., D. B. Evans, A. Tandon, P. H-V. Eozenou, M. Schmidt, A. Irwin, J. S. Cain, E. S. Pambudi, and I. Postolovska. 2022. "From Double Shock to Double Recovery: Implications and Options for Health Financing in the Time of COVID-19: Technical Update 2 - Old Scars, New Wounds." Washington, DC: World Bank Group.
- LaForgia, G. M., and B. F. Couttolenc. 2008. *Hospital Performance in Brazil*. Washington, DC: World Bank. <https://doi.org/10.1596/978-0-8213-7358-3>
- Preker, A.S. and A.L. Harding. 2003. *Innovations in Health Service Delivery: The Corporatization of Public Hospitals*. Washington DC.; World Bank
- WHO and International Bank for Reconstruction and Development / The World Bank. 2023. *Tracking Universal Health Coverage: 2023 Global Monitoring Report*. License: CC BY-NC-SA 3.0 IGO.

SECTION 1

OVERVIEW

CHAPTER 1:

OVERVIEW: WHY HOSPITALS, AND WHY THIS PUBLICATION

Mickey Chopra, Xiaohui Hou, Kojo Nimako, Sanam Roder-DeWan

Improving global health outcomes amidst fiscal constraints, climate crises, and pandemics is a formidable challenge for governments worldwide. The recently published WHO/World Bank 2023 UHC Global Monitoring Report underscores a concerning reality: despite the goal of universal health coverage (UHC), over half of the global population, over 4.5 billion people, lacks full access to quality health care. This pervasive lack of access is coupled with significant financial hardship, with over 1 billion people facing catastrophic out-of-pocket health spending, and nearly 17 percent of the global population pushed into poverty due to health care costs (WHO and The World Bank 2023).

Hospitals and Health Care

Hospitals and Primary Care: Complementary Components for Health

A patient's paramount concern is being able to access quality health care services seamlessly. Competition between hospitals and primary health care, whether perceived or real, hinders the holistic approach needed for national investment in health care; undermines workforce optimization; and ultimately compromises the quality of patient experience in the quest for seamless care.

Primary care—which includes preventive measures, early diagnosis, and the ongoing management of common and chronic conditions—serves as the bedrock of a robust health care system. It fosters continuity of care, and empowers communities through building strong patient-provider relationships. Hospital-based care plays a pivotal role in ensuring access to acute and operative care, specialized interventions, and advanced treatment modalities. Emergencies, surgeries, and critical care all require the expertise and facilities offered by hospitals.

Optimal patient outcomes are achieved through an integrated system in which primary health care and hospital-based care collaborate, and cohesively address diverse needs across the continuum of care. Given the widespread constraints in fiscal space, it is important to offer a package of essential services to meet patients' needs, which includes both primary care and hospital services.

Moving beyond the outdated notion of competition, and embracing a user-centric approach is paramount. We must envision and actively work toward a seamlessly integrated health care system, one that is capable of navigating the complex challenges of our time and delivering equitable health outcomes for all. The simple reality is that there is no “silver bullet”—no single action or health subsector that can be targeted to achieve these larger goals, which are urgently needed and increasingly expected by people and communities around the world. Investment in and coordination of services are required across the continuum.

In this context, the current global focus on primary health care and frontline clinics is welcome, but it is not enough. Hospitals—the services they provide, their infrastructure, expertise, and workforce—must also be an integral part of the solution. This requires a paradigm shift in the relationship between primary health care and hospitals, placing them together within a broader health system framework.

Multiple Challenges for Hospital Sector: Key Thematic Areas

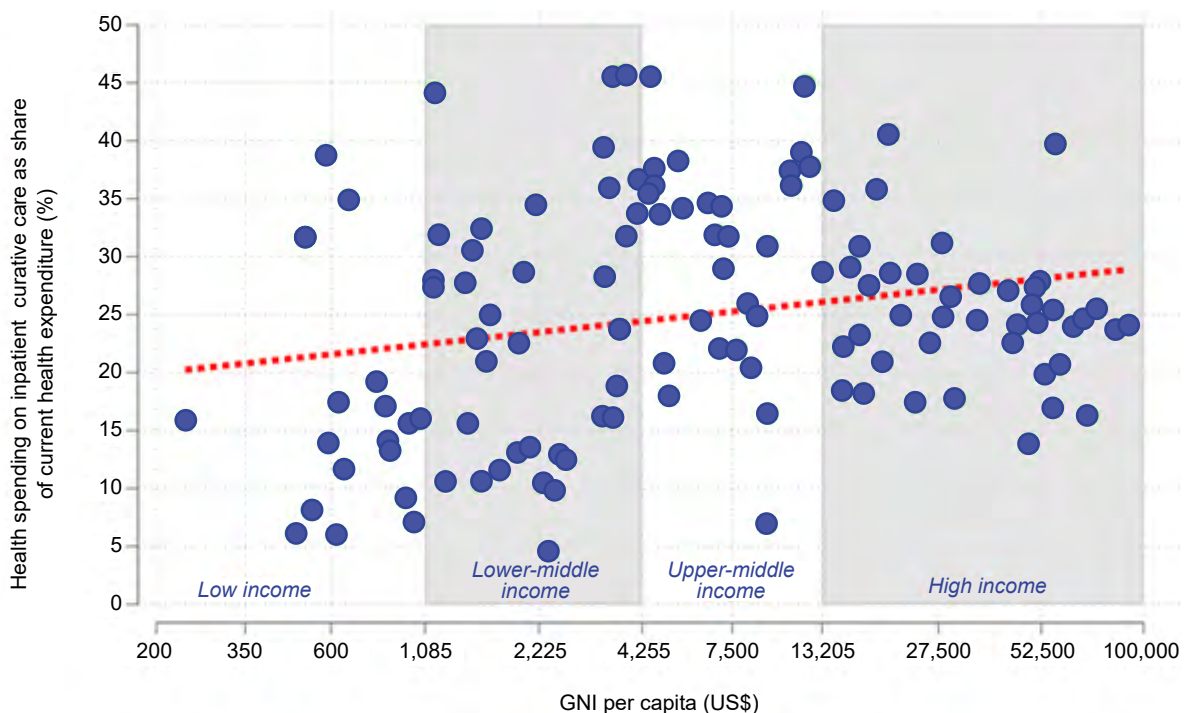
Hospitals face a myriad of challenges within a dynamic and rapidly evolving landscape. The priority issues can be grouped into five categories: i) resources, costs, and efficiency; ii) quality of care; iii) fragmentation across the different levels of care; iv) climate impacts; and v) governance and financing reforms.

Resources, costs, and efficiency. Hospitals are pivotal health care institutions in all countries, independent of the country's income level. However, their role in achieving optimal health outcomes raises critical questions about efficiency, quality, and integration—particularly in view of escalating health care expenditure, potential threats to the quality of care, and emerging challenges such as climate change.

Hospitals consume a large share of health care expenditures; in many countries, this share is increasing. For example, 2020 data from 33 countries in the Organisation for Economic Co-operation and Development (OECD) show that an average of approximately 37.5 percent of health care expenditures went to hospitals, ranging from 28.8 percent in Germany to 52.9 percent in Turkey. In the United Kingdom, an analysis of nine years of routine data from the National Health Service (NHS) found that spending for hospital-based care (HBC) is the largest category, accounting for over 50 percent of the total NHS budget (Rodriguez et al. 2020).

There are similar and longstanding concerns that hospitals in developing countries absorb more resources than any other kind of recurrent government spending on health. It is not uncommon for hospital services to consume a sizeable percentage of health budgets in these countries. When analyzing health spending on inpatient curative care as a share of current health expenditures, there is a general trend toward increasing expenditure in inpatient care at higher income levels (Figure 1.1). However, the linear fitting depicted in Figure 1.1 obscures one of the most important observations: many middle-income countries are spending more on hospitals relative to their total expenditure on health than high-income countries (HICs).

Figure 1.1: Health Spending on Inpatient Curative Care, Across Countries, by Income Groups



Source: World Health Organization (WHO) Global Health Expenditure Database 2023.

Note: GNI = gross national income.

This high level of inpatient spending is partly driven by demand for quality care, but it also results from inefficiencies in the health care system overall. For example, studies from several LMICs show that for many maternal and newborn care services, including routine birth care, about 30 to 60 percent of users bypass primary care facilities to seek higher-quality care in hospitals (Amoro et al. 2021; Kruk et al. 2009; Shah 2016).

Hospitals also consume a large share of the health workforce. Although there is a lack of precise data on the percentage of the health care workforce directly employed in hospitals, by all indications the percentage is high. For example, according to the WHO National Health Workforce Accounts (NHWA), between 2016 and 2021 data from 74 countries showed that a median of 78 percent of nurses worked in hospitals.

Quality of care. The growing emphasis on expanding access to health care services requires a concurrent focus on quality. Studies highlight the potential disconnect between these areas, and raise concerns regarding the overall effectiveness of health care interventions. A recent global analysis shows that in LMICS, nearly 60 percent of mortality that is amenable to health care action is attributable to poor quality care rather than a lack of access to care. This quality deficit is nearly universal across LMICs and for most conditions (Kruk et al. 2018a). Numerous reports, such as the Institute of Medicine's *To Err Is Human* (2000); the WHO, OECD, and World Bank's *Delivering Quality Health Services: A Global Imperative for Universal Health Coverage* (2018); and the report of *The Lancet Global Health Commission on High Quality Health Systems* (Kruk et al. 2018b) emphasize the criticality of addressing patient safety concerns such as medical errors, hospital-acquired infections, and adverse events, as well as implementing investments that address systemic challenges related to quality, including strengthening health workforce training for improved competence, and reorganizing the platforms for the provision of care to ensure improved outcomes.

The patient's experience of care, an often neglected area of the quality agenda, also requires attention. Issues such as inadequate or excessive treatment, overcrowding, and poor patient-provider interactions raise significant concerns about quality of care, and could diminish the desire of people to use or reuse the health system, as well as their trust in the system. A recent study done across 12 LMICs reported that only 32 percent of health care users were very confident that they would receive effective care if they were to fall ill (Roder-Dewan et al. 2020).

These challenges concerning technical and interpersonal quality of care necessitate robust safety measures, improved communication, and a patient-centric approach to ensure positive health outcomes along with increased access to care. This approach must consider the preferences of users, and engender an environment in which patients have high expectations for quality care when they use the health system.

Fragmentation. Fragmentation in health care delivery—that is, the systemic misalignment of incentives, or lack of coordination that leads to inefficient allocation of resources, or harm to patients—has been identified as one of the main problems in the provision of health care around the world (Enthoven 2009; Shih et al. 2008; WHO 2008; Vargas et al. 2016). Along with inefficient allocation of resources, the fragmentation of services generates ineffectiveness and inequality, as well as problems with the quality of services (Stange 2009; Vargas et al. 2016; Burstin et al. 2016). All of these issues highlight the need for integration, and a more holistic approach to health care that ensures coordination between providers or across the transitions across multiple levels of care (Shih et al. 2008).

Integration is a cross-cutting theme that requires particular attention due to pervasive fragmentation across health systems. This press for integration is made more urgent by the increasing need for population-oriented management of health and health care services as countries seek to achieve improvements at scale within the prevailing fiscal constraints. In addition, there is burgeoning interest in many LMICs to explore the “networking” of health facilities and services as a tool for advancing the health system goals of quality, equity, and efficiency. This calls for an investigation of available country experiences, and identification of potential strategies that could guide future work in this area of intervention.

Climate change. The consequences of climate change also pose multifaceted challenges for hospital planning, and call for a comprehensive reevaluation of infrastructure and operational strategies. Rising global temperatures are contributing to an increase in the frequency and intensity of extreme weather events such as hurricanes, floods, and heat waves. Health systems must anticipate these events to ensure that hospitals are resilient structures capable of withstanding environmental hazards.

Additionally, shifting disease patterns driven by climate change demand adaptable health care facilities. The spread of vector-borne diseases to new regions requires hospitals to enhance their surveillance systems and infectious disease management protocols. Respiratory conditions may also surge due to worsened air quality, necessitating advanced ventilation systems and adequate medical resources.

Furthermore, climate-induced population displacement may strain the health care infrastructure, particularly in regions prone to environmental hazards. Hospitals must prepare for potential surges in the number of patients and the associated strain on resources. Developing sustainable practices, from energy-efficient buildings to resilient supply chains, is imperative in order to mitigate the health care sector's contribution to climate change and ensure that hospitals will remain operational in the face of evolving environmental challenges.

Governance and financing reforms. Public hospitals in LMICs occupy a precarious position. They serve as vital state-managed institutions, and wield significant political and social capital, yet they struggle to keep pace with rising public expectations, escalating costs, and the need for increased effectiveness. Policy makers have responded to these challenges by undertaking substantial reforms related to governance, regulation, financing, and the involvement of the private sector in public hospitals.

Preker and Harding's seminal 2003 publication outlined a framework for transitioning from state-dominated models to a range of hospital autonomy models. This includes the state assuming a supervisory and regulatory role, and introducing market-based incentives and management structures applicable to both public and private providers. This approach, while diverse in its implementation, seeks to address the governance-hospital power balance and market influence within each country. Effective governance transformation necessitates robust regulatory capacity. In 2003, Preker and Harding emphasized two key lessons: maintaining input-based oversight until new accountability mechanisms are established; and ensuring that clear regulations safeguard social functions.

Reforms in governance and regulation have often been accompanied by financing reforms. Payment methods to hospitals can also enhance efficiency and quality across facilities by promoting a more output-oriented payment system. This includes diagnostic-related group (DRG)-based provider payments, pay-for-performance, and other schemes. Design features aimed at reducing health care spending include rewards for activities that lower the use of expensive services (such as minimizing hospital readmissions, and the use of certain diagnostic and therapeutic technologies), as well as reducing the length of hospital stays. Incentives for system investments, process redesign, and improved coordination of care delivery have also been highlighted as key to achieving efficiency gains or enhancements in patient safety. However, the actual design and implementation of provider payment reforms can have unintended consequences, making close monitoring and evaluation absolutely essential in order to continuously refine both the design and the implementation of these payment strategies. LMICs have attempted various approaches, including transitioning from input-based financing to strategic purchasing, or from global budgets to payments for specific activities (for example, DRGs).

The private sector plays an increasingly prominent role in LMICs due to fiscal constraints. Contracting and public-private partnerships (PPPs) offer potential advantages, including mobilizing finance, expanding access, enhancing efficiency and quality, and improving health outcomes. While initially PPPs focused on infrastructure, integrated models have emerged, incorporating clinical service delivery and private sector management practices to improve quality and access to specialized care.

Operationalizing Reform: Practical—and Mixed—Lessons from the Field

While the opening chapters of this publication address the thematic areas outlined above, as practitioners know too well, the devil is often in the details—in the challenges of converting policy directives into actual programs that realize those goals while providing quality care in the midst of operational realities and resource constraints.

With that in mind, much of this publication is devoted to chapters that delve deeper into the challenges of operationalization, and that share insights gained from practical and specific reform efforts in a range of countries.

Reconsidering Care Models, and Scaling Reform

New impetus for large-scale investment and reform of the hospital sector was provided by the COVID-19 pandemic, which exposed widespread inadequacies in hospital infrastructure, such as shortages of intensive care units and oxygen delivery systems. A similar impetus is provided by the prevailing risks that climate change poses for health. Four chapters in this publication present options for policy makers to consider as they undertake such reviews:

- **Willows, Mazhar, and English present the case for more clearly defining the role of what they have named “frontline” hospitals.** Through case studies they show how explicit attention to the role and function of frontline hospitals can overcome the false dichotomy between hospitals and primary health care.
- Building upon their experience responding to COVID-19, **Baker, Schell, and Khalid highlight the opportunity to reconceptualize critical care of patients in hospitals.** Essential Emergency and Critical Care (EECC) is a health system innovation with a horizontal approach that focuses on illness severity rather than specialty and diagnosis. It unites a focus on the severity of the illness with the concept of essentialness—providing the fundamental, most cost-effective, first tier of care. Adopting EECC can lead to far more cost-effective investments for building sufficient capacity to prevent the millions of deaths caused by insufficient access to critical care.
- **Edwards and Koziel** bring many of these issues together to present a series of critical questions, data needs, and processes required to make **more rational decisions regarding new infrastructure investment decisions** in hospitals.
- **Luzardo, Toro, and Veillard** use experiences from the Latin America and Caribbean region to present options for adaptation and mitigation against **climate-related risks** to infrastructure and health care provision.

Shifting Focus: Targeting Technical Interventions in Efficiency, Quality, and Integration

Considering the mixed experiences with macrolevel governance and financing reforms, greater attention is being paid to more specific technical interventions and innovations that hold promise for achieving progress as they attempt to navigate, rather than substantially change, macrolevel constraints in governance, regulation, payment, and management systems. These innovations can be broadly categorized into three themes: i) improving efficiency; ii) enhancing the quality of care; and iii) fostering smarter integration within the broader health care system.

Improving efficiency. Hospital autonomy has been considered a promising mechanism to improve efficiency. In Chapter 2, Dubas-Jakóbczyk, Koziel, and Chawla describe the hospital reform experience in Poland. Driven largely by consistent and increasing costs, along with perceptions of poor quality of care, Poland undertook a major shift in a significant component of its hospital sector, away from state-controlled centralized models toward increasing hospital autonomy. Initially they granted the autonomy to bid for state contracts and manage their own finances and human resources, before shifting toward full hospital corporatization. Independent evaluation of these efforts found no significant impact on the revenue structure or profitability of the reformed hospitals, which led to the government reversing the reforms. Reasons for the failure of the reforms included lack of public support, reluctance of staff to shift to new contractual arrangements, and lack of the comprehensive reform of the whole system that would enable the full advantages of hospital autonomy to pay dividends.

The Polish experience is not atypical. A recent systematic review of hospital autonomy in LMICs found no significant improvement in quality, efficiency, or management indicators, while costs and out-of-pocket payments increased (Ravaghi et al. 2018). These findings support Harding and Preker's predictions, attributing the shortcomings to weaknesses in regulatory and management capacity, leading to incomplete reform implementation, poor program control, limited decision autonomy, and inadequate accountability systems. Resistance from public sector unions, combined with the entrenched interests of politicians and bureaucrats have further impeded progress with reform, given the role of hospitals as significant sources of expenditure and political capital.

The experience with payment reforms is more promising. A recent review by Ghazaryan et al. (2021) suggests that transitioning to active payment methods in LMICs is associated with lower costs, increased efficiency, and maintained quality. However, the limitations include poor study quality and limited geographic scope. (Primarily Asian countries were studied).

The heterogeneity in reform outcomes is undeniable, influenced by national capacity, political context, and cultural characteristics. As La Forgia and Couttelenc (2008) succinctly noted:

Although autonomy is a necessary ingredient in reform, it alone cannot drive performance in public hospitals. Also needed are service contracts, contract enforcement, performance-based financing, flexible human resource management, and a robust information environment. (p. ix)

Within a constrained fiscal environment, the pressures are mounting on hospitals to improve their efficiency, as they account for the lion's share of health sector expenditures, and the entire health sector competes with other sectors for limited public resource allocations.

At the systems level, *The Lancet Global Health* Commission on High-Quality Health Systems emphasizes the importance of aligning medical complexity with appropriate levels of care. This necessitates coordination among health care facilities and across different care settings. Service delivery redesign (SDR), particularly in LMICs, offers a promising approach, emphasizing the reshaping of care locations (Roder-DeWan et al. 2020). In Chapter 3, a case study from Sri Lanka by Mutasa and Chopra highlights the risks of neglecting the systems-level balance between different levels of care in the context of open access to hospital-level care and a rapid demographic and epidemiological transition. On the other hand, in Chapter 7, Roder-DeWan presents regionalization of childbirth services driven by financial challenges, hence largely unplanned. The results do suggest some improvements in efficiency and quality of care, but perhaps at the expense of equity.

Setting performance targets across the hospital sector, including the use of peer performance benchmarking, helps to identify and share efficiency best practices. Essential steps include i) establishing system-wide policy guidance for performance monitoring; ii) creating best practice guidance for resource allocation (Walters et al. 2022); iii) establishing a centralized efficiency improvement unit; and iv) ensuring timely, transparent reporting. From Mutasa and Chopra's case study, we see that enhancing the Sri Lanka Ministry of Health's stewardship of hospitals through standardized performance indicators has the potential to allow the government, through key ministries, to systematically monitor hospital performance across the domains that are crucial for informed management. At the same time, establishing hospital performance indicators would enable the Ministry of Health to benchmark hospitals and introduce targeted interventions to strengthen low-performing facilities.

At the hospital level, some models of care warrant piloting and possible scaling up. Shifting to day-surgery models is not new in many advanced economies, but it is still relatively novel in LMICs. The increasing prevalence of day surgery exemplifies another avenue for efficiency gains. Improved anesthetics, laparoscopic procedures, minimally invasive techniques, and efficient organizational schemes have facilitated this shift. This strategy optimizes outcomes and reduces costs for high-frequency, low-cost, and low-variation procedures like arthroscopies and cholecystectomies (Lafortune et al. 2012).

The case study on the Day Surgery Center (DSC) at West China Hospital (WCH) presented by Dintrans in Chapter 4 demonstrates the effectiveness of the day-surgery model for managing a significant volume of surgeries, contributing to shorter hospital stays and greater cost savings. The keys for success have included: i) well-defined protocols and criteria for patient and operation selection; ii) a robust patient service system for pre-operative assessments and health care education; and iii) a skilled team of health care professionals.

Caring for older adults can be resource-intensive. Cost saving is critical to ensure continued care and seamless transitions for patients moving to their next phase of care. With rapidly aging populations in many countries (Hou et al. 2023), acute geriatric units (AGUs) are an increasingly critical strategy in reducing hospital-acquired functional decline for older patients. Such holistic care models—addressing not just the medical, but also the functional, mental, and social aspects of patient care—are key for improved outcomes and cost savings, as the review by Dintrans in Chapter 5 reveals. Clear guidelines and protocols are also essential for defining the operational aspects of AGUs, such as admission and discharge criteria, care management plans, and the roles of the team members, to make them successful.

Finally, technological advances such as remote monitoring and telemedicine are decentralizing health care functions, extending care beyond traditional facilities, and offering the potential to increase the efficiency of the whole system. Examples include select surgeries and dialysis in Europe, and innovative pharmaceutical applications for chronic conditions such as diabetes and mental health. The "Hospital at Home" model exemplifies acute care provision in a patient's residence, demonstrating potential cost-effectiveness and improved clinical outcomes (Kanagala et al. 2023).

Enhancing Quality: Opportunities from the Macro to the Micro Levels of Action

Designing effective hospital reform programs in LMICs often means grappling with an astonishingly poor baseline quality. When assessments of hospital quality are available, they may largely reflect hospital readiness and inputs, and may overestimate the quality experienced by patients. The COVID-19 pandemic revealed large gaps in the ability of hospitals to deliver standard lifesaving services such as appropriate oxygen supplementation for hypoxic patients. Looking at measurement more broadly, the lack of coordination is starkly evident in the high number of inpatient admissions for ambulatory-sensitive conditions such as diabetes, congestive heart failure, and asthma.

In Chapter 9, Ramadan, Tembe, and Nimako present a comprehensive review of microlevel hospital quality improvement strategies, and highlight the nuanced efficacy of various interventions. Despite the prevalence of standard in-service training programs, their ubiquity is not matched by robust evidence of impact, with an average performance improvement of only 10 percentage points. Meticulously designed programs that focus on specific clinical aspects such as teamwork and communication exhibit more substantial effects on patient outcomes. However, the decay in knowledge retention and use over time that is seen with training programs underscores the need for innovative approaches.

A judicious combination of monetary and nonmonetary incentives has proven effective in elevating hospital quality; but careful consideration is required regarding intrinsic motivation when implementing financial incentives. Decision tools, particularly when integrated with digital platforms, emerge as valuable assets for enhancing both clinical and management decisions. Electronic medical records, crucial for reducing medical errors, and improving patient experience also play a pivotal role in hospital settings.

Initiatives targeting provider-patient relationships demonstrate promising outcomes, as do shared decision-making models and personalized patient education approaches. Nevertheless, whether these findings can be generalized to LMIC settings necessitates cautious interpretation.

In Chapter 6, Oodit and Chopra delve into a paradigmatic microlevel quality improvement solution: the Enhanced Recovery After Surgery (ERAS) program. Given the alarmingly high post-operative mortality rates in LMICs, ERAS amalgamates best practices into a focused implementation package. High-fidelity ERAS implementation has shown up to a 50 percent reduction in postoperative complications across varied income settings. While entry costs and basic health system functionality are prerequisites for ERAS implementation, targeted efforts in higher-functioning hospital facilities in low-resource settings can yield positive results.

In Chapter 7 the exploration by Roder-DeWan of regionalization in maternal and newborn health services reveals a compelling but underused macrolevel quality improvement strategy, targeting the organizational dynamics of hospital systems. Regionalization initiatives concentrate high-complexity, high-cost services in centralized hospitals, and can foster connectivity among facilities to ensure optimal care levels. The de facto regionalization of maternity services in the US, exemplified through the closure of critical-access obstetric units, serves as a poignant case study, offering valuable lessons for LMICs that are contemplating this approach. This chapter underscores the potential pitfalls of regionalization that is driven by cost considerations, and warns against inadvertently widening disparities among vulnerable and remote populations.

Macrolevel approaches encompassing health system organization, provider education, governance, and demand-driving mechanisms must be integrated into the hospital quality improvement toolkit.

In Chapter 8 Oluoch, Molyneux, Kagwanja, and Hinton delve into the transformative use of patient voice as a crucial improvement strategy spanning health system levels. Novel assessment approaches rooted in the lived experiences of patients and staff, including patient experience surveys, patient-reported outcome measures, and qualitative methods offer rich insights. These results, harnessed through multistakeholder engagement, mobilize action around hospital improvement. Integrating patient voice measurement with evidence- and consensus-based standards, such as the Essential Emergency and Critical Care (EECC) framework for LMIC settings (Chapter 15), allows for comprehensive monitoring and gap analysis. This synergistic approach ensures that hospitals deliver services that translate into improved outcomes for diverse populations.

Fostering Smarter Integration

Returning to the Polish case study, the inability of hospital autonomy to achieve significant financial savings or performance improvements was compounded by the perception that it further fragmented service provision. The reversal of hospital autonomy led to a hospital network model. These models involve merging, integrating, or functionally converging hospitals into multihospital groups or chains, or integrating services across different system levels, including primary care. This approach allows for sharing resources, minimizing duplication, and streamlining service provision. Countries such as France, Germany, the United Kingdom, and the United States have witnessed significant adoption of these models (Angeli and Maarse 2012).

Integration aligns with modern patient expectations as they seek personalized, convenient, and coordinated care. A seamless flow of information between primary care providers, specialists, and hospitals facilitates this, leading to more effective, patient-centered care. Additionally, during public health crises like pandemics, integrated health care is crucial for rapid information sharing, coordinated responses, and effective mitigation strategies.

Integration can be broadly classified as vertical or horizontal. Vertical integration involves the integration of services across different levels of the health system, or different levels of care complexity—for example, integrating primary and secondary care facilities. Horizontal integration, on the other hand, involves links between facilities at the same level of the health system or in one specialty area—for example, cardiology and cardiothoracic surgical hospitals that are integrated to provide care to their patient population. Integration has also been referred to as “networking”—a reference to the links that must be present in a nonfragmented system. There is increasing interest in networking in LMICs, and lessons learned from the three cases of networking presented in this publication— from Kenya in Chapter 10 (English); Ghana in Chapter 11 (Tinorgah, Nimako, and Roder-DeWan); and China in Chapter 12 (Lui and colleagues)— reveal some key opportunities and relevant considerations for countries that are planning, or are in the midst of implementing, networking interventions in LMICs:

- While geographic proximity may form the foundation for defining the various nodes in a network, a further articulation of the purpose of the network is necessary in order to guide their functioning. Networks can be condition/disease-focused; for example, the Clinical Information Network (CIN) in Kenya is focused on maternal and newborn health. They can also be disease/condition-agnostic (like the Medical Alliances of China). The goals of networks can also vary widely, with examples such as sharing or maximizing resources as in the case of Ghana’s Networks of Practice (NoP) program; or they may collaborate on learning and knowledge production, as in the case of Kenya’s CIN. They may provide clinical support from higher-level facilities to lower-level ones (for example, the Medical Alliances in China and the NoPs in Ghana); they may enhance communication and referrals; and/or enhance community engagement and population health, among other goals. Because there can be multiple configurations and types of networks, the objective(s) for forming them must be unambiguous and stated clearly at the start of the program in order to guide implementation.
- Networking requires physical inputs, including well-equipped facilities and service protocols, but the relational components may be a more significant determinant of success. A culture of collaboration needs to be established if it is not already present, and this may not be a straightforward process, as in the case of Kenya’s CIN. Significant attention must be devoted to how providers across different facilities will work together to pursue the goals for networking. An overall strategy that details the functions of the various nodes of the network, mechanisms for collaboration, and a training program for health care workers is needed in order to guide implementation.
- The financing structures used for networking initiatives must aim to incentivize networking, and avoid polarizing the component units in a network. The Medical Alliance case from China discussed in Chapter 12 reveals that a misalignment between the financing structures and the care protocols in some settings resulted in some facilities avoiding managing complex cases in order to conserve their capitated allocations. But reimbursing services for the whole group rather than individually, as a mechanism to prevent this perverse incentive, is also complex. For example, in Ghana, attempts at group financing at the primary care level was unsuccessful in the early days of their networking program. In the “Close” Medical Alliance models in China, apex facilities are responsible for managing the functioning of the alliance, including distributing financial resources, and ensuring that patients receive care at the right level of the health system. This strategy, which links financing with population needs and outcomes, holds promise for more effective use of financing resources. But clearly there is a great need for more research on financing options for networks in LMICs.

How This Report is Organized: Target Audience and Objectives, Structure, and Future Opportunities

Target audience and objectives. This publication is primarily intended to serve as a resource for World Bank task teams to explore the intricacies of and opportunities for hospital reform as they interact with governments to design and implement health sector investments. It will also be useful outside of the World Bank as reference material for policy makers, health care practitioners, and researchers in this field.

Structure. The publication is grouped into four main sections: the first three present cases and reviews centered on efficiency, quality and integration as entry points for hospital reforms. These three sections each include a series of chapters with a mix of case studies and reviews of relevant hospital models or reforms. The last section is a cross-cutting section that addresses some key considerations for hospital reform, including the relevance of first-referral hospitals, important questions to ask when establishing a hospital, minimums for emergency and critical care, and climate resilience.

Each chapter is written in a format tailored to the topic and the content. Some of chapters are case studies presenting key country experiences (for example, the chapters on autonomization of hospitals in Poland and on networks of practice in Ghana). Others focus on reviewing seminal topics related to hospital reform (like the chapters on acute geriatric care and the scoping review of microlevel hospital improvement strategies); yet others combine reviews and case studies to discuss key issues (for example, the chapter on regionalization of care).

Future opportunities. The world of hospitals, their roles, challenges, and reform is vast in scope—and far too expansive to be covered fully in a single volume. This publication makes no claim to cover everything. Instead, as noted above, it purposefully focuses on an intentionally limited set of issues and key entry points that can serve as starting points for reform. Some of the key areas that should be considered in follow-on work include digital health and hospitals, human resources and hospitals, and hospital payment strategies in LMICs.

This publication is offered as a springboard to encourage greater focus on a continuum of essential services for patients across all levels and all aspects of health care, as part of a holistic systems agenda to produce better and more equitable outcomes for all.

References

- Amoro, V. A., G. A. Abihiro, and K. A. Alatinga. 2021. "Bypassing Primary Healthcare Facilities for Maternal Healthcare in North West Ghana: Socio-economic Correlates and Financial Implications." *BMC Health Services Research* 21(1): 545.
- Burstin, H., S. Leatherman, and D. Goldmann. 2016. "The Evolution of Healthcare Quality Measurement in the United States." *Journal of Internal Medicine* 279 (2): 154–59. <https://doi.org/10.1111/joim.12471>
- Ghazaryan, E., B. A. Delarmente, K. Garber, M. Gross, S. Sriudomporn, and K. D. Rao. 2021. "Effectiveness of Hospital Payment Reforms in Low- and Middle-Income Countries: A Systematic Review." *Health Policy and Planning*, 36 (8)L 1344–56. <https://doi.org/10.1093/heapol/czab050>
- Hou, Xiaohui, J. Sharma, and F. Zhao. "Silver Opportunity: Building Integrated Services for Older Adults Around Primary Health Care." Washington, DC: World Bank Group. <http://documents.worldbank.org/curated/en/099025503072337503/P17583208782960a40bf6804d1758e50f1e>
- Institute of Medicine (US) Committee on Quality of Health Care in America. 2000. *To Err Is Human: Building a Safer Health System*. L. T. Kohn, J. M. Corrigan, and M. S. Donaldson (Eds.). Washington, DC: National Academies Press (US).
- Kanagala, S. G., V. Gupta, S. Kumawat, F. Anamika, B. McGillen, and R. Jain. 2023. "Hospital at Home: Emergence of a High-Value Model of Care Delivery." *The Egyptian Journal of Internal Medicine* 35 (1): 21. <https://doi.org/10.1186/s43162-023-00206-3>
- Kruk, M., G. Mbaruku, C. W. McCord, M. Moran, P.C. Rockers and S. Galea. 2009. "Bypassing Primary Care Facilities for Childbirth: A Population-Based Study in Rural Tanzania." *Health Policy and Planning* 24 (4): 279–88. <https://doi.org/10.1093/heapol/czp011>
- Kruk, M. E., A. D. Gage, N. T. Joseph, G. Danaei, S. García-Saisó, and J. A. Salomon. 2018a. "Mortality Due to Low-Quality Health Systems in the Universal Health Coverage Era: A Systematic Analysis of Amenable Deaths in 137 Countries." *The Lancet* 392 (10160): 2203-12.
- Kruk, M. E., A. D. Gage, C. Arsenault, K. Jordan, H. H. Leslie, S. Roder-DeWan, O. Adeyi et al. 2018b. "High-Quality Health Systems in the Sustainable Development Goals Era: Time for a Revolution." *The Lancet Global Health* 6 (11): e1196–e1252. [https://doi.org/10.1016/S2214-109X\(18\)30386-3](https://doi.org/10.1016/S2214-109X(18)30386-3)
- La Forgia, G. M., and B. F. Couttolenc. 2008. *Hospital Performance in Brazil*. Washington, DC: World Bank. <https://doi.org/10.1596/978-0-8213-7358-3>
- Lafortune, G., G. Balestat, and A. Durand. 2012. *Comparing Activities and Performance of the Hospital Sector in Europe: How Many Surgical Procedures Performed as Inpatient and Day Cases?* Paris: OECD Health Division. https://www.oecd.org/health/Comparing-activities-and-performance-of-the-hospital-sector-in-Europe_inpatient-and-day-cases-surgical-procedures.pdf
- Preker, A.S. and A.L. Harding. 2003. *Innovations in Health Service Delivery: The Corporatization of Public Hospitals*. Washington DC.; World Bank.
- Ravaghi, H., Z. Foroughi, A. Nemati, and V. D. Bélorgeot. 2018. "A Holistic View on Implementing Hospital Autonomy Reforms in Developing Countries: A Systematic Review." *Health Policy and Planning* 33 (10): 1118–27. <https://doi.org/10.1093/heapol/czy095>
- Roder-DeWan, S., A. Gage, L. R. Hirschhorn, N. A. Twum-Danso, J. Liljestrand, K. Asante-Shongwe, M. Kruk et al. 2020. "Level of Confidence In and Endorsement of the Health System Among Internet Users in 12 Low-Income and Middle-Income Countries." *BMJ Global Health* 5 (8): e002205.
- Rodriguez Santana, I., M. J. Aragón, N. Rice, and A. R. Mason. 2020. "Trends In and Drivers of Health Care Expenditure in the English NHS: A Retrospective Analysis." *Health Economics Review* 10 (1): 20. <https://doi.org/10.1186/s13561-020-00278-9>
- Shah, R. 2016. "Bypassing Birthing Centres for Childbirth: A Community-Based Study in Rural Chitwan Nepal." *BMC Health Services Research* 16: 597. <https://doi.org/10.1186/s12913-016-1848-x>
- Shih, A. K. Davis S. Schoenbaum, A. Gauthier et al. 2008. *Organizing the U.S. Health Care Delivery System for High Performance*. New York: The Commonwealth Fund.
-

Stange, K. C. 2009. "The Problem of Fragmentation and the Need for Integrative Solutions." *The Annals of Family Medicine* 7 (2): 100-03. <https://doi.org/10.1370/afm.971>

Vargas, I., A. S. Mogollón-Pérez, P. De Paepe, M. R. Ferreira da Silva, J.-P. Unger, and M.-L. Vázquez. 2016. "Barriers to Healthcare Coordination in Market-Based and Decentralized Public Health Systems: A Qualitative Study in Healthcare Networks of Colombia and Brazil." *Health Policy and Planning* 31 (6): 736-48.

Walters, J. K., A. Sharma, E. Malica, and R. Harrison. 2022. "Supporting Efficiency Improvement in Public Health Systems: A Rapid Evidence Synthesis." *BMC Health Services Research* 22 (1): 293. <https://doi.org/10.1186/s12913-022-07694-z>

World Health Organization (WHO). 2008. *Integrated Health Services – What and Why?* Geneva: WHO.

WHO and International Bank for Reconstruction and Development / The World Bank. 2023. *Tracking Universal Health Coverage: 2023 Global Monitoring Report*. License: CC BY-NC-SA 3.0 IGO.

World Health Organization, OECD, and the World Bank. 2018. *Delivering Quality Health Services: A Global Imperative for Universal Health Coverage*. License: CC BY-NC-SA 3.0 IGO.

SECTION 2

EFFICIENCY AS AN ENTRY POINT FOR HOSPITAL REFORM

CHAPTER 2:

HOSPITAL AUTONOMY IN POLAND

Katarzyna Dubas-Jakóbczyk, Anna Koziel, Mukesh Chawla

Key Messages

- **Context:** Poland's health system relies heavily on hospitals, with a large number of beds (compared to EU averages), predominantly funded and owned by the public sector.
- **Challenges:** Fragmentation across health care sectors and high rates of avoidable hospitalizations for chronic conditions highlight inefficiencies in the coordination of care, contributing to significant health care challenges.
- **Single Public Purchaser:** The National Health Fund, as the primary health care funder in Poland, significantly impacts hospital procurement practices and financial stability.
- **Reforms:** Several hospital reforms have been initiated that incorporate elements designed to enhance hospital autonomy by altering provider organizational forms and financing principles.
- **Impact:** Available data suggests that neither hospital corporatization nor the changes in financial rules under hospital network reform have significantly improved hospital management or the financial stability of providers.

Introduction

The health system in Poland is heavily hospital-centered (Dubas-Jakóbczyk and Koziel 2020). As in many other Central and Eastern European (CEE) countries, the hospital sector in Poland is characterized by an oversized infrastructure, public ownership, and public financing. In 2019 there were over 250,000 hospital beds spread across 1,086 hospitals in Poland, averaging about 627 beds per 100,000 people compared to the European Union average of 523 (Sowada, Sagan, Kowalska-Bobko et al. 2019; Dubas-Jakóbczyk and Koziel 2020; Dubas-Jakóbczyk, Domagała, Zabdyr-Jamróż et al. 2023; Eurostat database 2023). Public hospitals account for almost 90 percent of the total number of hospital beds, and almost 55 percent of public financing of health in Poland. In comparison, among the 31 OECD countries for which data are available, the share of hospitals in total current health expenditures ranged from 28.3 percent in Germany to 53.2 percent in Turkey; and was above 35 percent in 21 countries (OECD Health Statistics, 2020).

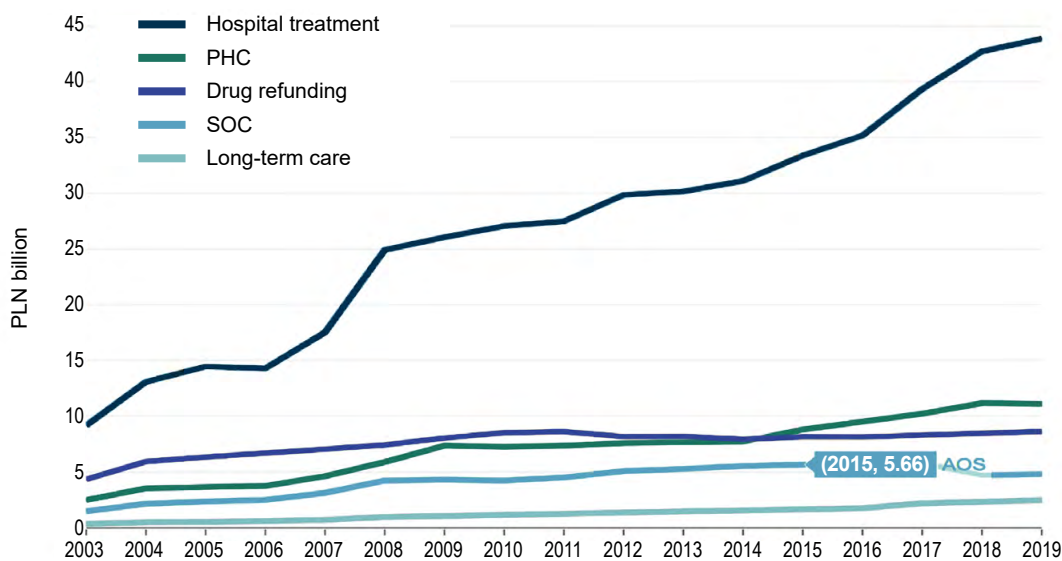
Public hospitals are owned by three levels of local government, ministries, and medical universities, and are spread across counties (or *powiats*), districts (or *voivods*), and regions (or *marshal*) levels. The roughly 12 million hospitalizations in 2019 were almost equally divided across hospitals in *powiats* (24.5 percent of all hospitalizations), *voivods* (24.2 percent), *marshals* (25 percent) and university hospitals (20.6 percent). The remaining few hospitalizations took place outside of the hospital network.

Reducing the number of curative care beds, and implementing cost-containment measures for hospitals have been common trends in European health systems over the past three decades (Dubas-Jakóbczyk et al. 2020). CEE countries inherited large hospital sectors from the Soviet period, and in many countries the organizational structure of hospitals had not been systematically redesigned to ensure synergies with external incentives. As a result, most countries have focused on reducing the number of hospital beds, but in some, such as Poland, Bulgaria, and Romania, the bed-population ratio actually increased, largely because the fragmented governance structure in these countries has not encouraged initiatives to reduce the number of beds (Kurpas 2020).

The fragmentation of care across the primary, outpatient, and inpatient sectors represents a huge challenge, contributing to inefficiency and ineffectiveness in Poland's health care system (Chawla, Koziel, and Siegrist 2021). These three sectors often operate independently from each other, with limited information sharing, minimal care coordination, and consequently, wasteful allocation of resources. This lack of coordination is starkly evident in the high number of inpatient admissions for ambulatory-sensitive conditions like diabetes, congestive heart failure, and asthma. Poland reports rates of avoidable hospital admissions for chronic conditions such as asthma, chronic obstructive pulmonary disease (COPD), congestive heart failure, and diabetes that exceed the European Union (EU) average (OECD 2020). Notably, Poland records the highest number of hospital admissions for congestive heart failure in adults, with 511 admissions per 100,000 population, almost twice the EU average of 276. Likewise, the figures for hospital admissions due to diabetes in Poland are 210 per 100,000, compared to the EU average of 131. For asthma and COPD, Poland reports 236 hospital admissions per 100,000, which is higher than the EU average of 209 (OECD Health Statistics 2020).

Another area of inefficiency lies in the underutilization of day surgery for procedures like cataract removal, inguinal hernia repair, and tonsillectomy. The utilization rates for these procedures have remained largely unchanged since 2000 and, except for cataract removal, continue to lag significantly behind EU averages (Kurpas 2020). Furthermore, hospitalization rates for chronic conditions such as asthma and COPD remain high, contributing to one of the highest rates of avoidable hospitalizations in the EU: the overall hospitalization rate increased from 0.26 hospitalizations per insured person in 2009 to 0.29 in 2017. Consequently, expenditures for hospital services have grown significantly, rising from PLN 9 billion in 2009 to PLN 55 billion in 2020 (Figure 2.1). These increases have outpaced the growth in expenditures for primary care and insurance reimbursement for drugs.

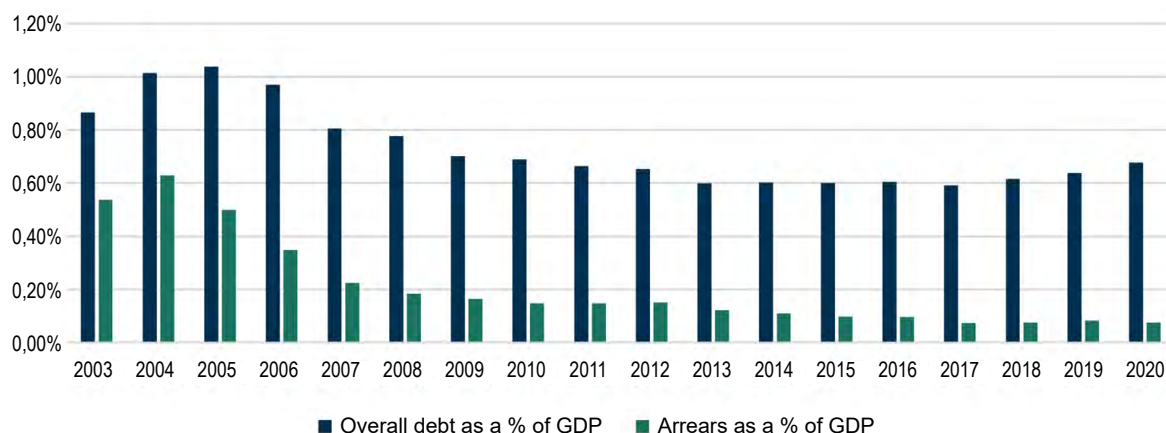
Figure 2.1: National Health Fund Expenditures by Types of Services, 2003-2019 (PLN billion)



Source: World Bank calculations (Outpatient care provided within the hospital network is extracted from hospital spending.) National Health Fund (in Polish: Narodowy Fundusz Zdrowia, or NFZ)

Debt is a persistent and pervasive issue in public hospitals in Poland, to the extent that it has become increasingly challenging to categorize it as an isolated problem or a consequence of structural inefficiencies – or a blend of both (OECD/European Observatory on Health Systems and Policies 2019). In 2020, the total liabilities of public hospitals amounted to 15.7 billion PLN, equivalent to 0.7 percent of GDP. Within this total, 1.7 billion PLN (11 percent) constituted arrears, or overdue liabilities (Figure 2.2). Hospitals owned by local government units carried the largest share of debt and arrears (Dubas-Jakóbczyk et al. 2020).

Figure 2.2: Hospital Debts as a Percentage of GDP, 2003-2020



Source: World Bank analyses, based on Ministry of Health data 2021

The growing debt of public hospitals in Poland has been a source of concern for more than two decades now, and has been attributed to a mix of macro- and micro-level factors, including weak stewardship, oversized infrastructure, fragmentation of the ownership structure, underfunding, and inadequate financial mechanisms. At the level of specific hospitals, additional micro-level features such as poor management, weak ownership control, and the general state of the hospital infrastructure may be leading factors. Within the last two decades the central government has initiated and supported numerous efforts aimed at addressing these problems. One set of these reforms focused on granting greater independence and autonomy to hospitals in making decisions related to management, operations, and financial matters, and included corporatization of public hospitals and changes in the public payer payment schemes that allowed for greater flexibility in service delivery. This paper examines these governance reforms.

Overview of Hospital Reforms in Poland

The general framework of Poland's current health care system took shape during the post-Soviet transition period of the 1990s. Following the dissolution of communism, Poland embarked on a large-scale transformation of its political, economic, and social systems. With respect to health care financing, major changes included the establishment of a social health insurance system and the creation of dedicated, independent public payer institutions known as *Kasy Chorych*, or Sickness Funds, in 1999. Simultaneously, hospitals transitioned from being budgetary units to independent not-for-profit health care entities under the designation *Samodzielny Publiczny Zakład Opieki Zdrowotnej*, (SPZOZ), and a general principle of free competition in securing contracts with the public payer was introduced. These reforms were accompanied by a decentralization of civil administration, following which the newly established territorial self-governments (counties, districts, regions) assumed ownership of public hospitals. Numerous other initiatives and changes were introduced within the health care system in the following two decades, but the overall structure remained largely unchanged. Table 2.1 presents an overview of the timeline of the principal reforms in Poland's hospital sector over the past three decades.

Table 2.1: Overview of Hospital Sector Reforms in Poland

Year/s	Reform Content
1991	<p>Legal form of hospitals transformed from budgetary units to independent health care providers.</p> <ul style="list-style-type: none"> The legal form of independent health care units (<i>samodzielny publiczny zakład opieki zdrowotnej</i>--SPZOZ) for hospital providers was introduced, based on the dedicated Law on Health Care Units.¹ This allowed hospital providers to be transformed from budgetary units into SPZOZs.
1999	<p>Public health insurance introduced; hospital ownership transferred to territorial self-governments.</p> <ul style="list-style-type: none"> The public health insurance system was introduced², including dedicated payer institutions--regional Sickness Funds (<i>Kasy Chorych</i>). The country administration decentralization reform was implemented, and ownership of the majority of SPZOZs was transferred from the central government to the independent territorial self-governments: municipalities, counties, and <i>voivodeship</i>.
2000 - 2010	<p>Hospitals corporatized by self-governments, based on individual, bottom-up initiatives.</p> <ul style="list-style-type: none"> Based on existing regulations, many territorial self-governments (mostly counties) transformed their SPZOZ into commercial code companies, usually keeping the ownership of all, or a majority of, shares. Between 2000 and 2010 a total of 114 hospitals owned by territorial self-government was transformed into companies (mostly limited liability companies).
2003	<p>Centralized National Health Fund (main payer within the health insurance system) established.</p> <ul style="list-style-type: none"> A Centralized National Health Fund (<i>Narodowy Fundusz Zdrowia</i> -- NFZ) took the place of the regional Sickness Funds as the main payer within the public health insurance system. Dedicated regulation from 2003 was replaced the following year by the Act on Health Services financed by public sources, which is still in force.³ Since its founding in 2003, NFZ is the main source of funding for all hospital inpatient care providers regardless of their ownership structure. In 2008, NFZ introduced the Polish version of diagnostic related groups (DRGs) as the main payment method for inpatient care. It was followed by ongoing adjustments in payment mechanisms, including both tariff valuation processes and volume limit principles.
2005 - 2009	<p>Hospital restructuring and a debt-relief program is launched by the central government to improve hospital management and financial standing.</p> <ul style="list-style-type: none"> Based on a dedicated regulation,⁴ public hospitals could receive loans from the central budget and/or their debts could be relieved on the condition of conducting a restructuring process. A total number of 561 SPZOZs applied for a loan, while 532 completed the restructuring process. The overall value of loans given by the government-owned bank was 2.2 billion PLN, 59 percent of which was subsequently written off. In addition, some of the tax (and other public) liabilities were written off (approximately 750 million PLN);
2009 - 2011	<p>Hospital corporatization and debt-relief program launched by the central government for territorial self-governments.</p> <ul style="list-style-type: none"> A dedicated program for territorial self-governments was established.⁵ Local governments could receive loans from the central budget and debt-relief programs on the condition of conducting corporatization, transforming their SPZOZs into companies. A total number of 62 local government units participated: 54 SPZOZs were transformed into commercial companies, and an additional 26 were liquidated.

1 Ustawa z dnia 30 sierpnia 1991 r. o zakładach opieki zdrowotnej, Dz. U. 1991 nr 91 poz. 408.

2 Ustawa z dnia 6 lutego 1997 r. o powszechnym ubezpieczeniu zdrowotnym. Dz.U. 1997 nr 28 poz. 153.

3 Ustawa z dnia 27 sierpnia 2004 r. o świadczeniach opieki zdrowotnej finansowanych ze środków publicznych. Dz.U. z 2022 r. poz. 2561.

4 Ustawa z Dnia 15 Kwietnia 2005 r. o Pomocy Publicznej i Restrukturyzacji Publicznych Zakładów Opieki Zdrowotnej. Dz.U. 2005 nr 78 poz. 684.

5 Uchwała Nr 58 /2009 Rady Ministrów z dnia 27 kwietnia 2009 r. w sprawie ustanowienia programu wieloletniego pod nazwą "Wsparcie jednostek samorządu terytorialnego w działaniach stabilizujących system ochrony zdrowia". Rada Ministrów: Warszawa, Poland, 2009.

Year/s	Reform Content
2011 - 2013	<p>Financial incentives offered to public hospital owners to expedite the corporatization process.</p> <ul style="list-style-type: none"> • In 2011 a new Act on Therapeutic Activities, defining the principles of health care provider functioning, was implemented.⁶ • During the first years after its implementation, the regulation provided similar incentives toward the corporatization launched in the 2009 program for territorial self-governments. (That is, debt-relief elements based on conducting hospital corporatization.) • In 2011–2013, 34 local government units corporatized a total number of 45 SPZOZs. Most owners of hospitals with a financial deficit decided to cover the deficit instead of conducting corporatization.
2015	<p>Financial incentives for hospital corporatization withdrawn.</p> <ul style="list-style-type: none"> • After the parliamentary election in 2015, the new government removed the incentives for corporatization (the debt-relief elements). The process itself is not forbidden, yet there are no additional financial incentives from the central government. • Instead, a stronger emphasis was put on the owner's accountability. Beginning in 2017 SPZOZ directors are obliged to prepare an assessment and prognosis of the hospital's financial situation, based on a dedicated financial indicator matrix. The report must be formally approved by the owner.
2017	<p>Hospital network reform (including a change in the payment scheme) launched.</p> <ul style="list-style-type: none"> • In 2017 a system of basic hospital service provision (a hospital network) was implemented. A total number of 592 hospitals were included in the network, the vast majority of which were public. The included hospitals were divided into seven reference levels (three basic and four specialist). • The included hospitals received guaranteed access to public financing (for four years) and are financed based on a global budget principle for the complex care provided (inpatient as well as ambulatory specialty visits and rehabilitation). • The budget calculation formula included financial incentives to acquire an accreditation certificate, and shift toward the provision of ambulatory care.
2021-2022	<p>Proposal to centralize public hospital management mooted – but withdrawn.</p> <ul style="list-style-type: none"> • In 2021 the government presented a reform project aimed at improving hospital service coordination by implementing a centralized system for hospital sector supervision and restructuring processes. • One of the elements focused on launching an independent central agency responsible for monitoring public hospital financial standing, and initiating and/or managing hospital restructuring processes (on the predefined condition that the agency could even replace the hospital management).
2023	<p>Law on quality in health care and patient safety introduced.</p> <ul style="list-style-type: none"> • A dedicated regulation on the quality of health care was adopted,⁷ with implementation starting in 2024. • The law introduced numerous new obligations for hospitals in terms of acquiring new quality authorization and certification standards, as well as monitoring and reporting adverse events.

Source: Authors' compilation

The transition of hospitals from state-owned budgetary units to SPZOZs marked a pivotal component of structural changes within the health care system during the post-Soviet era. The fundamental premise was to create a framework in which hospitals would compete for contracts and have the autonomy to manage their finances independently. Key features of the SPZOZ legal form are as follows:

- (i) The appointment of the SPZOZ director is made by the owner through an open tender process. Candidates must meet predefined criteria, which include having at least five years of experience in a directorial role, or three years of experience along with a post-graduate diploma in management.
- (ii) An obligatory Social Council, primarily consisting of owner representatives (up to 15 members), serves in an advisory capacity. There are no formal requirements regarding the education or experience of the Council members, although they do submit proposals and provide opinions on matters such as fixed asset management, financial decisions, and restructuring plans.
- (iii) Decisions related to the sale, lease, or rental of any components of the hospital's fixed assets, as well as any restructuring plans, require formal consent from the owner.

⁶ Ustawa z Dnia 15 Kwietnia 2011 r. o Działalności Leczniczej. Dz.U. 2011 nr 112 poz. 654.

⁷ Ustawa z dnia 16 czerwca 2023 r. o jakości w opiece zdrowotnej i bezpieczeństwie pacjenta. Dz.U. 2023 poz. 1692.

The financial sustainability of the hospital is based on a plan developed by the director. The SPZOZ is expected to cover its total costs through its own revenues. However, in practice, it lacks the capacity to declare bankruptcy, and the director's responsibility for financial losses is limited. The specifics of the regulations related to situations in which the SPZOZ incurs financial losses have evolved over time. Nevertheless, the general rule is that the obligation to cover the hospital's losses falls on the owner.⁸

The reforms listed in Table 2.1 encompass both structural changes in the health care system that have significantly impacted the hospital sector, and specific hospital-focused reforms and initiatives. During this period, public hospitals shifted from being budgetary units to SPZOZs, and in some cases from SPZOZs to corporatized public companies. Additionally, the role of private hospitals expanded. These transformations were concurrent with other pertinent health care system reforms, including the introduction of a centralized, single-payer institution known as the *Narodowy Fundusz Zdrowia*, or NFZ, which has replaced the previously decentralized Sickness Funds. Since its establishment in 2003, NFZ has remained the primary source of funding for all hospital inpatient care providers, regardless of their ownership structure.

It's worth noting that in the last two decades, significant changes that took place outside the health care system have impacted the functioning of hospitals. The most significant changes were access to European Union (EU) structural funds from 2004 onward, and the enactment of the law on public-private partnerships (PPP) in 2008. EU funds have emerged as a crucial source of financing for investment projects in hospitals, contributing 12 billion PLN between 2007 and 2020 in support of nearly 3,000 infrastructure projects (Dubas-Jakóbczyk and Kozieł 2022). Likewise, a few PPP hospital projects were realized, including one involving the design, construction, and management of a county hospital by an external private investor.⁹

Corporatization of Public Hospitals

The SPZOZ legal framework encountered substantial criticism almost from its inception, with experts voicing concerns about its stringent and bureaucratic governance model, which constrains both the autonomy and the accountability of hospital management. This criticism was closely intertwined with the issue of SPZOZs persistently accumulating debts and incurring arrears (Dubas-Jakóbczyk and Kozieł A. 2020). Effective management of SPZOZs has faced substantial challenges, including the limited decision-making authority of the hospital director, which necessitates the owner's consent for many decisions; legal obstacles to diversifying sources of revenue, including restrictions on serving commercial patients; heavy reliance on the public payer as the primary revenue source; and the absence of the option of bankruptcy (Golinowska, Sowada, and Tambor et al. 2012; Najwyższa Izba Kontroli (NIK) 2016).

In general, the exact regulations related to the SPZOZs' possibilities of providing commercial services were ambiguous, and have met with various interpretations through the years, ranging from i) a complete ban on any type of commercial services with respect to the benefit package; to ii) the possibility of providing commercial services with respect to those services that were not covered in the contract with the public payer; to iii) the possibility of providing commercial services within the same scope as those contracted with public payer, but with arrangements for care that guarantee that public patients are not discriminated against, and that public resources are not used for generating private revenue (Leśniewski 2017). For many years, the Ministry of Health promoted the first, most restrictive interpretation.

Corporatization has emerged as a potential solution to enable hospitals to generate additional revenue from commercial services, and to enhance the financial management of public hospitals. A corporatized hospital is subject to regulations that apply to commercial code companies. The Chief Executive Officer (CEO) holds significant decision-making authority, and may also be personally liable for the company's financial outcomes. Failure by a CEO to fulfill their obligations can result in personal liability for the company's debts, and legal actions from the owners. Consequently, the incentives for effective financial management are notably more robust compared to the SPZOZ model. Additionally, the mandatory Supervisory Board holds a stronger position in corporatized hospitals than the Social Council in SPZOZs.

The fundamental premise behind corporatization was to create strong incentives for managers and owners of hospital companies in order to enhance the implementation of restructuring programs, and to ensure financial stability. Additionally, it was expected that corporatized hospitals would be able to expand the scope of services outside contact with public payer, for example for "private" patients. Additional arguments in favor of corporatization were linked to hospitals' enhanced capacity to diversify their sources of revenue.

8 The exact regulation (Paragraph no 59, of the Act on Therapeutic Activities, - *Ustawa z Dnia 15 Kwietnia 2011 r. o Działalności Leczniczej. Dz.U. 2023 nr 991, 1675, 1972*) states that if the hospital cannot cover the financial loss, the owner has to cover it. In previous years, the regulation stated that the owner had a choice to cover the financial loss, or corporatize the SPZOZ, or liquidate it. In practice, however, owners almost often covered the hospital losses.

9 Reasons for the limited application of PPP in the Polish health care system are complex. On the one hand, public partners sought to limit the financial risks on their side; on the other hand, private investors needed guarantee of funding for health care provision. The absence of long-term security of funding from NFZ proved to deter of private investment. <https://www.ppp.gov.pl/baza-zawartych-umow-ppp/>

The initial processes of corporatization for SPZOZs commenced as early as 2000, driven by local government initiatives on an individual basis. Between 2009 and 2013, several central government programs and regulations provided support for these efforts, and as an incentive to pursue corporatization, hospital owners were often offered partial debt forgiveness as an incentive to pursue corporatization. In total, 174 SPZOZs were corporatized between 2000 and 2013. However, following the 2015 parliamentary elections, all incentives for corporatization were withdrawn, and SPZOZs came to represent the predominant organizational form of public hospitals (Table 2.2). In 2020, out of a total of 575 SPZOZs, local governments at three different administrative levels (municipalities, counties/cities, and *voivodeships*) owned 489 units; medical universities owned 38 units; and three different ministries owned the remaining 48 SPZOZs (Figure 2.3).

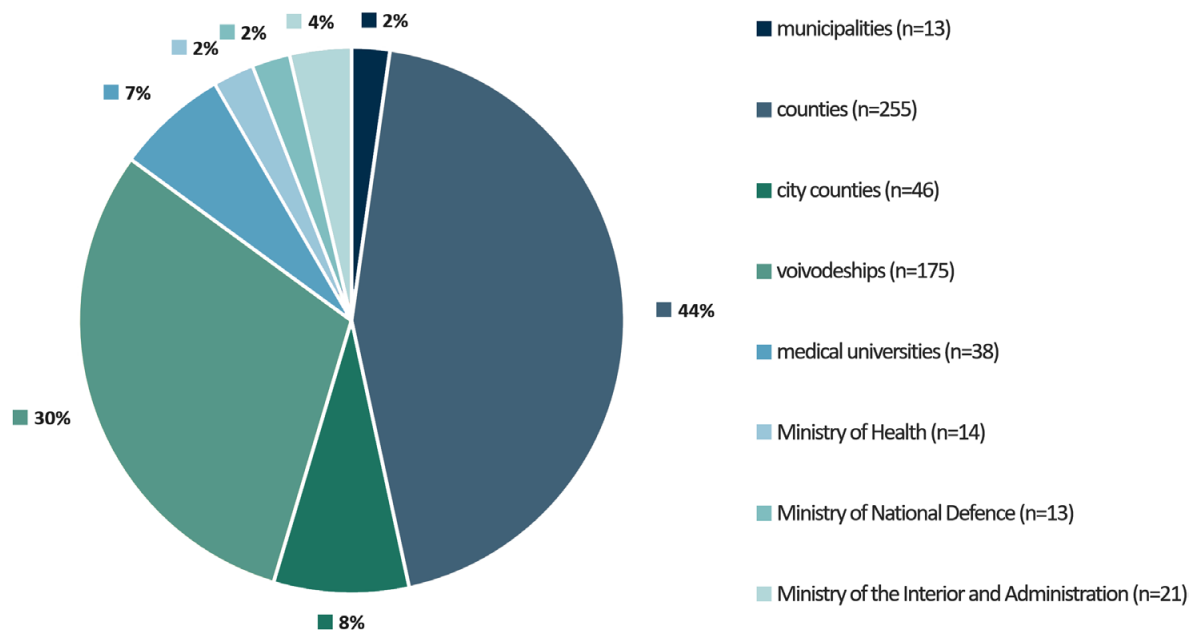
Table 2.2: General Structure of Hospital Provider Organizational Forms in Poland

Organizational form	Ownership	Legal foundations	Role in the system
Independent health care units (SPZOZ)	PUBLIC: local governments, medical universities, ministries	The 2011 Act on Therapeutic Activities (<i>Ustawa z dnia 15 kwietnia 2011 r. o działalności leczniczej. Dz.U. 2011 nr 112 poz. 654 z późn. zm.</i>)	Approximately 570 hospitals, including both smaller local general hospitals, regional multidisciplinary units, university hospitals, and different types of hospitals owned by ministries
Research institutes	PUBLIC: Ministry of Health (supervisory body)	The 2010 Act on Research Institutes (<i>Ustawa z dnia 30 kwietnia 2010 r. o instytutach badawczych. Dz. U. 2010 Nr 96 poz. 618 z późn. zm.</i>)	Approximately 15 hospitals (highly specialized clinical units)
Commercial companies (mostly limited liability or join-stock company)	PUBLIC: local governments or PRIVATE: private investors	The 2000 Commercial Companies Code (<i>Ustawa z dnia 15 września 2000 r. Kodeks spółek handlowych. Dz. U. 2000 Nr 94 poz. 1037</i>)	Approximately 120 corporatized public hospitals (mostly owned by counties – local general hospitals); approximately 300 private hospitals (usually smaller, often single-specialty units)

Source: Authors' compilation

Corporatization did not have a significant impact on the revenue structure or profitability of hospitals. An analysis of 20 corporatized hospitals conducted by the Supreme Audit Office found no significant changes in the management processes of these entities. The corporatized hospitals did not implement effective cost-containment measures. Only one corporatized hospital had introduced a cost-reporting system that enabled valuation and profitability assessment, and only six corporatized hospitals had introduced internal audit mechanisms. The revenue structure of corporatized hospitals also remained largely unchanged, with over 90 percent of total revenues continuing to be derived from contracts with the NFZ. In the subgroup of corporatized hospitals whose debts were assumed by local governments during transition from the SPZOZs, financial improvements were short-lived in 50 percent of cases in which deficits started increasing in subsequent years (NIK 2015).

Figure 2.3: Ownership Structure of SPZOs in 2020 (n=575)



Source: Ministry of Health (2021) <https://www.gov.pl/web/zdrowie/raport-w-sprawie-zalozen-reformy-szpitalnictwa>

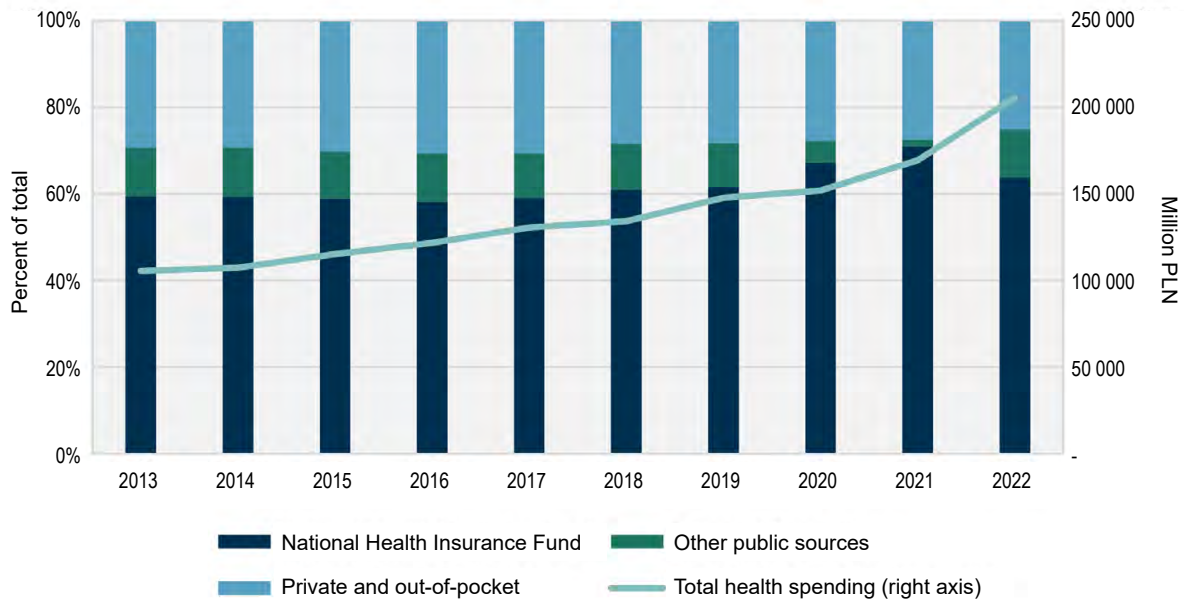
Dubas-Jakóbczyk et al. (2020) show that in 2018, among a total of 129 corporatized public hospitals, 84 (65 percent) incurred financial losses, and 53 (41 percent) had overdue liabilities. By way of comparison, during the same year, among 659 SPZOs, 316 (48 percent) experienced financial losses, and 257 (39 percent) had overdue liabilities (Dubas-Jakóbczyk, Kocot, and Kozieł 2020).

The Role of the Single Public Purchaser of Hospital Services

A major reason for the limited success of corporatization of public hospitals in Poland is the dominance of the National Health Fund, which is the major source of funding for health care providers in Poland irrespective of their ownership status or organizational structure.¹⁰ Of the total health spending of 206 billion PLN in 2022, the share of public spending on health was 75 percent. Except for the COVID-19 years (2020 and 2021), the annual share of NFZ spending in total public spending has been around 85 percent (Figure 2.4).

10 Even though the market of privately-owned hospitals has grown in Poland, their dominant source of revenue is the contract with the public payer. Data gathered from 150 private hospitals by the National Association of Private Hospitals in Poland shows that between 2015 and 2021, the share of NFZ in the total revenue of private hospitals was between 55 and 65 percent. In 2021, the revenue structure of private hospitals was as follows: 56 percent contract with the public payer; 39 percent direct patient payments; 5 percent private insurance packages. Source: Ogólnopolskie Stowarzyszenie Szpitali Prywatnych (OSSP) (2023). Stan sektora szpitali prywatnych w Polsce. <https://ossop.pl/wp-content/uploads/2023/08/Stan-sektora-szpitali-prywatnych-w-Polsce-2023.pdf>

Figure 2.4: Annual Spending on Health, All Sources



Source: NFZ financial plans <https://www.nfz.gov.pl/bip/finanse-nfz/>; <https://www.statista.com/statistics/1112897/poland-public-and-private-health-care-expenditures/#:~:text=In%20Poland%2C%20the%20total%20current,36.9%20billion%20zloty%20on%20health>

Since its establishment in 2003, NFZ has procured hospital services through an annual contracting procedure typically conducted in the form of competitive tenders, with negotiations being a rare exception. The primary payment method has been the known as *Jednorodne Grupy Pacjentów*, or JGP, which was introduced in 2008 as the Polish version of diagnostic-related groups. Although there were some adjustments to the contracting rules, such as modifications in the assessment criteria for providers' offers, and the introduction of maps showing health needs, in practice hospital services were predominantly procured based on historical factors that were often tied to the existing infrastructure of providers. For hospitals, the primary concern revolved around the final value of the contract, and payment for services delivered beyond the contractual limits. The practice of providing services beyond the contract limits and subsequently seeking payment from NFZ was a common feature of the Polish hospital sector. Typically, depending on the availability of financial reserves, NFZ attempted to settle these outstanding liabilities, at least partially. Nonetheless, in many cases the issue was ultimately resolved through legal proceedings and court judgments.

A major alteration to the procurement rules was introduced as part of hospital network reform in 2017. The overarching objectives of this reform were to enhance the organization of health care services provided by hospitals, which included the coordination of both inpatient and outpatient care, as well as to improve continuity and stability in the financing of hospital providers (Dubas-Jakóbczyk, Kowalska-Bobko, and Sowada 2019). The reform introduced a system of basic hospital service provision, categorizing hospitals into seven groups, or levels, based on the scope of services they offer. These levels consisted of three basic and four specialist categories. Beyond inpatient care, the services provided within the network encompassed ambulatory specialist care in hospital outpatient units, rehabilitation services, and services available during nighttime and holidays. The initial version of the network, implemented in 2017, included a total of 592 hospitals, the majority of which were publicly owned (encompassing SPZOZs, institutes, and corporatized public hospitals). The second version of the network was implemented in 2023, with no major changes in its composition or structure.

Hospitals that are part of the network are guaranteed access to public financing for a four-year period. They receive funding based on a global budget principle for the overall care provided within this defined time frame, as opposed to the previous method of financing per case. The global budget is calculated for each hospital and encompasses all types of care, with JGPs being the fundamental unit for budget calculation. A contracting procedure was retained as an alternative method for non-network services and hospitals. During the initial four years of the network's operation, the formula for the global budget calculation included incentives to encourage a shift toward providing outpatient care. This was achieved by offering a budget increase percentage in response to a corresponding percentage increase in the provision of outpatient services. In 2021, the volume limits for all outpatient services were removed by payers to reduce waiting times, resulting in the exclusion of these services from global budget financing.

Evidence related to the impact of the hospital network reform on autonomy and coordination of services is limited. The global budget formula, by its nature, offers more flexibility in terms of managing the structure of service provision. Prior to its implementation, hospitals could only shift services between contracted scopes of services within predefined limits (for example, up to 20 percent) and after obtaining formal consent from the payer. Additionally, the four-year guarantee of public financing provided a more stable foundation for strategic planning. However, the specific circumstances of individual hospitals may significantly influence their ability to adapt to changing conditions. Furthermore, since the network inclusion criteria covered only predefined types of services, some hospitals may have had only a few of their existing wards and outpatient clinics included in the global budget financing. Consequently, their share in the total revenue from public payers may not be dominant.

In 2019, the Supreme Audit Office conducted an assessment of 29 hospitals incorporated into the network, of which 22 were SPZOZs, and 7 were corporatized public hospitals. This evaluation encompassed the period before and after the network's implementation, revealing that hospitals seldom made organizational changes to meet the network's inclusion criteria. In cases where certain types of services were discontinued, it was often due to a shortage of physicians (that is, hospitals were unable to hire doctors with the required specialization) rather than a deliberate management decision. Additionally, for hospital wards that were part of the network, the average bed occupancy ratio remained relatively low (60 percent). The auditors pointed out that the inclusion criteria for a network did not correlate with the actual utilization rates. Consequently, it also encompassed hospitals/wards whose operation may not be a priority in addressing the health care needs of the population (NIK 2019).

It's important to note that the period of hospital network implementation was marked by significant challenges at the health care system level. These challenges encompassed a worsening shortage of medical professionals, and increased competition in recruiting specialist physicians. Additionally, the implementation of regulations requiring annual wage increases for medical staff, which were adopted in 2017, led to a rise in hospital staff costs. Furthermore, the subsequent onset of the COVID-19 pandemic added substantial pressure to hospital management. In 2022, many hospital representatives reported their inability to meet the regulatory wage increases for medical staff due to escalating financial deficits.¹¹

The most pivotal recent reform that has substantially influenced the governance system of hospitals is the 2017 hospital network and its accompanying payment scheme modification. However, it is worth noting that there have been some minor changes to the payment scheme introduced by the payer over the past few years. These changes have been aimed at steering hospital behaviors, such as encouraging the centralization of highly specialized procedures and promoting outpatient and day-care provision. These adjustments have primarily involved the introduction of additional financial incentives and the elimination of volume limits for specific sets of services. For instance, starting in 2018, "correction factors" were implemented to enhance the payment value for hospitals that meet predefined criteria related to the number of surgical operations performed, specifically for certain types of cancer, each year. Volume limits for outpatient and day-patient care services were progressively removed, while tariff values for specific services were significantly raised, including those for some day surgeries and outpatient pediatric consultations.

11 The wage increase was to be financed via increased tariffs/prices proposed by the dedicated Tariffication Agency, supervised by the Ministry of Health.

Conclusion

Public hospitals in Poland operate within a multifaceted governance structure in which ownership is distributed among three tiers of local government, ministries, and medical universities. The Ministry of Health establishes the regulatory framework, encompassing professional and technical standards, while the National Health Fund serves as the primary funding source. There is no centralized entity with steering functions at the regional or national level, and the entire system is heavily influenced by the prevailing political landscape.¹² Over the past two decades, several hospital reforms have been initiated that incorporate elements designed to enhance hospital autonomy by altering provider organizational forms and financing principles. However, available data on performance and outcomes is limited and fragmented, with indications suggesting that neither hospital corporatization nor the changes in financial rules under the hospital network reform have significantly improved hospital management or the financial stability of providers.

12 Dubas-Jakóbczyk K, Domagała A, Zabdyr-Jamróz M, et al. (2023). Op Cit.

References

- Chawla, M., A. Koziel and R. Siegrist. 2021. "Build-Back Better and Faster: An Actionable Roadmap for Hospital Reforms in Poland after COVID-19." Washington, DC: World Bank.
- Dubas-Jakóbczyk et al., 2020. "Hospital Reforms in 11 Central and Eastern European Countries Between 2008 and 2019: A Comparative Analysis." *Health Policy*. 2020 Apr;124(4):368-379.
- Dubas-Jakóbczyk, K., A. Domagała, M. Zabdyr-Jamróż M, et al. 2023. "The 2021 Plan for Hospital Care Centralization in Poland: When Politics Overwhelms the Policy Process." *Health Policy* 129: 104707. <https://doi.org/10.1016/j.healthpol.2023.104707>
- Dubas-Jakóbczyk, K., I. Kowalska-Bobko, C. Sowada. 2019. "The 2017 Reform of the Hospital Sector in Poland: The Challenge of Consistent Design." *Health Policy* 123 (6): 538-43. <https://doi.org/10.1016/j.healthpol.2019.03.013>
- Dubas-Jakóbczyk, K., E. Kocot, A. Koziel A. 2020. "Financial Performance of Public Hospitals: A Cross-Sectional Study among Polish Providers." *International Journal of Environmental Research and Public Health* 17 (7): 2188. <https://doi.org/10.3390/ijerph17072188>
- Dubas-Jakóbczyk, K. and A. Koziel. 2020. "Towards Financial Sustainability of the Hospital Sector in Poland: A Post Hoc Evaluation of Policy Approaches." *Sustainability* 12 (12): 4801. <https://doi.org/10.3390/su12124801>
- Dubas-Jakóbczyk, K. and A. Koziel. 2022. "European Union Structural Funds as the Source of Financing Health Care Infrastructure Investments in Poland: A Longitudinal Analysis." *Frontiers in Public Health* 10: 873433 <https://doi.org/10.3389/fpubh.2022.873433>
- Eurostat database (2023). <https://ec.europa.eu/eurostat/web/main/data/database>
- Golinowska, S., C. Sowada, M. Tambor et al. 2012. "Równowaga finansowa oraz efektywność w polskim systemie ochrony zdrowia." *Wydawnictwo Vesalius* Kraków.
- Kurpas (2020): Challenges in Implementing Integrated Care in Central and Eastern Europe – Experience of Poland.
- Leśniewski B. 2017. "Działalność komercyjna szpitali: światło zielone czy żółte migające? Menedżer Zdrowia <https://www.termedia.pl/mz/Dzialalnosc-komercyjna-szpitali-swiatlo-zielone-czy-zolte-migajace-26047.html>
- Najwyższa Izba Kontroli (NIK) 2015. "Działalność szpitali samorządowych przekształconych w spółki kapitałowe, Kwiecień 2015. <https://www.nik.gov.pl/plik/id.8411.vp.10488.pdf>
- _____. 2016. "Restrukturyzacja wybranych SPZOZ korzystających ze środków publicznych." *Wrzesień* <https://www.nik.gov.pl/plik/id.11697.vp.14057.pdf>
- _____. 2019. Funkcjonowanie systemu podstawowego szpitalnego zabezpieczenia świadczeń opieki zdrowotnej. Warszawa 2029. <https://www.nik.gov.pl/plik/id.21081.vp.23713.pdf>
- Organisation for Economic Co-operation and Development (OECD). 2020. "Health at a Glance: Europe 2020." https://www.oecd-ilibrary.org/social-issues-migration-health/health-at-a-glance-europe-2020_82129230-e
- OECD Health Statistics. 2020. <https://www.oecd-ilibrary.org/sites/58a359ac-en/index.html?itemId=/content/component/58a359ac-en>
- OECD/European Observatory on Health Systems and Policies. Poland: Country Health Profile 2019, State of Health in the EU; http://www.euro.who.int/_data/assets/pdf_file/0007/419470/Country-Health-Profile-2019-Poland.pdf?ua=1 (accessed on 1 May 2020).
- Sowada, C., A. Sagan, I. Kowalska-Bobko et al. 2019. "Poland: Health System Review." *Health Systems in Transition* 21 (1): 1–235.
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CHAPTER 3:

SRI LANKA'S ROAD TO A MORE EFFICIENT HEALTH SYSTEM: LINKING HOSPITAL REFORM AND PRIMARY HEALTH CARE STRENGTHENING

Ronald Mutasa, Mickey Chopra

Key Messages

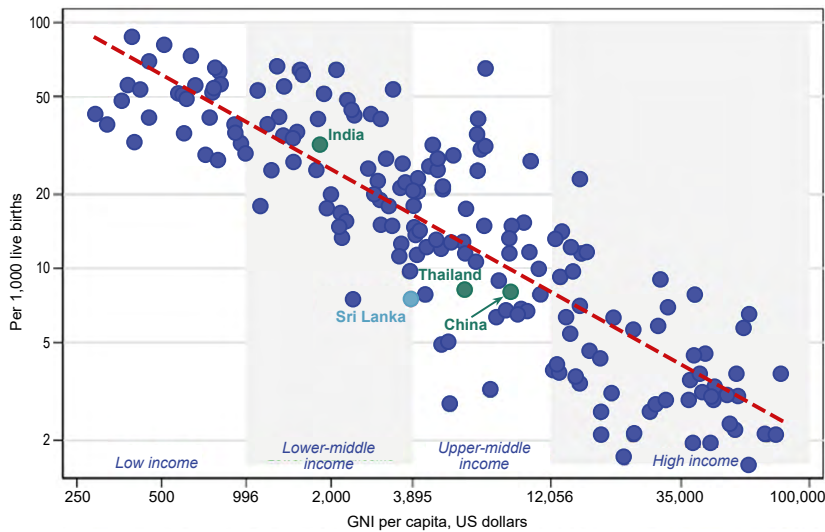
- Sri Lanka has made significant strides in providing free and accessible basic health services; however, challenges persist in achieving financial sustainability, and meeting the demand for health care.
- The hospital financing system in Sri Lanka relies on general tax revenue, with resources allocated primarily based on historical patterns; this leads to a disproportionate allocation of expenditure across different levels of care.
- Health care seeking behavior in Sri Lanka tends to favor higher-level care institutions, resulting in overcrowding in tertiary hospitals and underutilization of primary care facilities. This imbalance challenges the efficiency and effectiveness of the health care system.
- To improve efficiency, Sri Lanka needs to strengthen its hospital sector while simultaneously revitalizing primary health care.
- Policy options include enhancing secondary hospitals through integration of services, bolstering Ministry of Health (MOH) stewardship, exploring results-focused provider payment mechanisms, and engaging more with the private sector.

Introduction

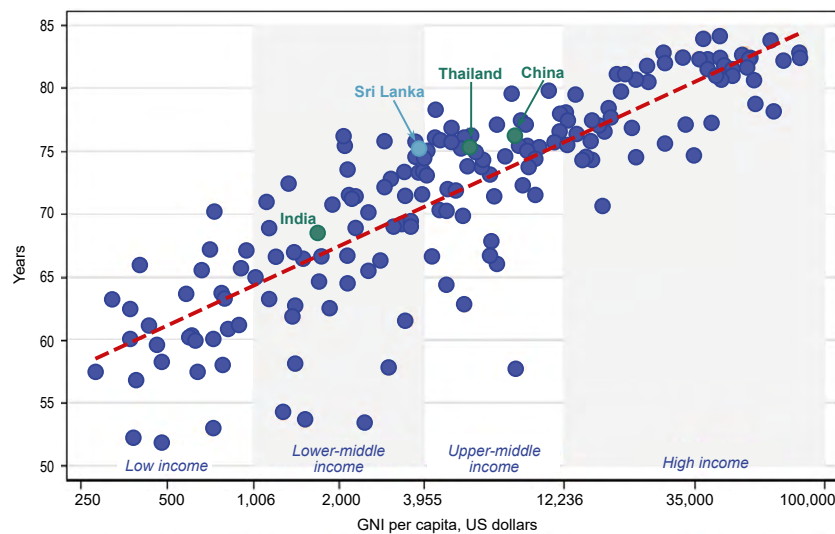
Sri Lanka has achieved free and widely accessible basic health service coverage, thanks to the government's long-standing commitment to ensuring access to primary health care (PHC) for the majority of the population (Figure 3.1). Sri Lanka's achievements in universal health care access, maternal and child health outcomes, and controlling communicable diseases over the past 30 years have been commendable, despite the country's allocating a lower share of its gross domestic product to spending on public health than countries at similar income levels.

However, as in some other middle-income countries, Sri Lanka's health care system has neither achieved financial sustainability nor met the health care system demands needed to match its upper-middle-income status. Health outcomes for noncommunicable diseases (NCDs), including cardiovascular diseases and cancer, are raising increasing concern given Sri Lanka's epidemiological and demographic transition, and rising middle-class expectations for better-quality services. In addition, with one of the fastest growing older-adult populations among its regional and global peers, Sri Lanka's health care system requires a substantial shift in the structure, services, and systems needed to address geriatric conditions. Despite an increasingly sturdy public health system, Sri Lanka is also vulnerable to pandemics and other health shocks, as the COVID-19 pandemic demonstrated.

Figure 3.1: Sri Lanka: A Top Performer for Many Health Indicators
(World Development Indicators, n.d.)



Source: World Development Indicators
Note: Both X- and Y-axes are expressed in logarithmic scale.



Source: World Development Indicators
Note: Both X-axis is expressed in logarithmic scale.

This chapter summarizes the performance and contributions of Sri Lanka’s hospitals in its progress toward universal health care (UHC). It considers these issues within the Sri Lankan context of shifting disease burdens, demographic change, a growing middle class, and both current and anticipated pandemic outbreaks.

The chapter opens with an analysis of hospital financing in Sri Lanka. It then discusses patterns of health care-seeking behavior in the country, and highlights an imbalance across levels of care that is weakening the efficiency of the system. The chapter’s later sections highlight policy options for integrating the hospital system into a revitalized primary care level to better respond to the population’s needs—while promoting financial sustainability.

Hospital Financing in Sri Lanka

Box 3.1 provides a broad overview of Sri Lanka’s hospital system: our discussion here hones in on the core issue of hospital financing.

Health care services in Sri Lanka, including hospital care, are provided free of charge at public facilities. The system is funded by general tax revenue, with resources allocated by line-item budgets and wages (input-based financing), largely guided by historical patterns. The current financing mechanism for health service providers helps control costs regardless of output levels, but is less responsive to actual needs.

Over the last three years, the per capita public hospital expenditure in real terms at each level has slightly increased (Figure 3.2). On the other hand, the hospital expenditure share of each level has remained static; half the total is spent by tertiary hospitals, 43 percent by secondary hospitals, and less than 10 percent at the primary level (divisional hospitals) (Figure 3.3). This short-term stability in the share of expenditure by levels of care likely reflects the historical, input-based allocation of resources.

Figure 3.2: Per Capita Hospital Expenditure

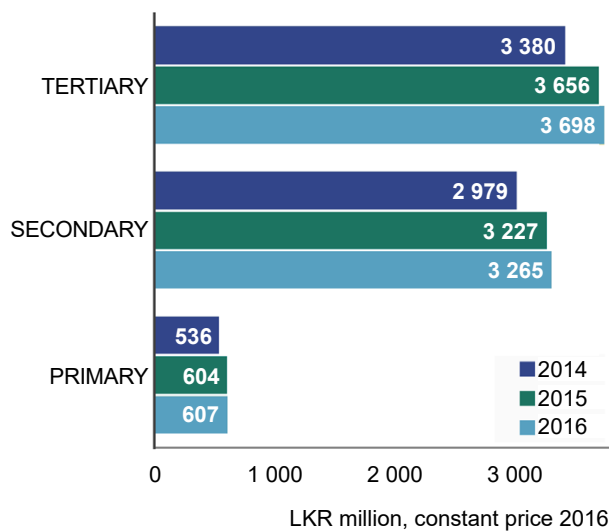


Figure 3.2: Per Capita Government Hospital Expenditure by Level of Care, 2014–2016
Source: (Ministry of Health, Nutrition & Indigenous Medicine Sri Lanka, 2018).

Figure 3.3: Proportion of Expenditure by Level

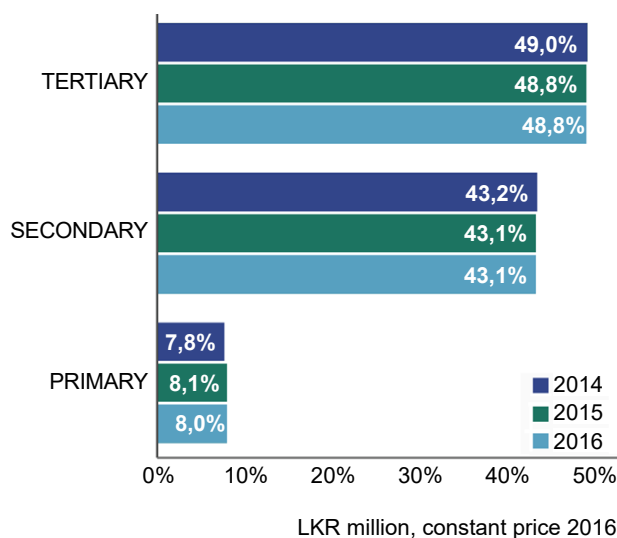


Figure 3.3: Share of Government Hospital Expenditure by Level of Care, 2014–2016
Source: Source: (Ministry of Health, Nutrition & Indigenous Medicine Sri Lanka, 2018).

Box 3.1: An Overview of Hospitals in Sri Lanka

Hospital management and administrative structure: In Sri Lanka, certain categories of hospitals are managed by the Ministry of Health (MOH), while the majority are managed by provincial health ministries. MOH hospitals report to the Department of Health Services (DOHS), which is led by the Director General of Health Services (DGHS). A parallel administrative structure exists for provincial hospitals, with provincial hospital directors reporting to Provincial Directors of Health Services (PDHS).

Financing: All public hospitals in Sri Lanka are essentially financed by the central government. Though provinces are responsible for financing provincial hospitals, in reality the revenue generation from provincial council taxation is limited, and provinces struggle to meet expectations regarding service quality. Many factors have contributed to the central government's financial control over provincial hospitals: i) salary structures and job descriptions for hospital staff are set by MOH; ii) the appointment of doctors to provincial hospitals remains a function of the central government, though wages are borne by provincial budgets; iii) block grants from the center are computed based on the number and salary grades of workers, severely limiting the provincial authorities' ability to change staffing structures in provincial hospitals; and iv) the purchase and distribution of medicines and supplies remains a function of the center; only the secondary and tertiary hospitals have limited autonomy for self-purchasing.

Accountability and supervision: Several practices and supervisory mechanisms, including routine reporting and periodic review of hospital performance, have been established to maintain accountability. The MOH has released a manual that sets out the expectations, roles, and responsibilities of hospital managers. Hospital directors must submit monthly expenditure reports. A quarterly Indoor Morbidity and Mortality Schedule (IMMS) provides information on patient turnover, morbidity, mortality, and operations. The MOH has also recently mandated the establishment of Quality and Safety units at all hospitals, and performance reviews are conducted quarterly.

Despite the centralized system, hospital directors have considerable autonomy to manage their hospitals. No financial incentives are used to motivate them. The success of the system relies heavily on the public-mission ethos that is deeply rooted in MOH. A drawback of the current system is that there is little or no scrutiny of day-to-day operations, and limited accountability to patients at the hospital level. For example, there are no formal complaint procedures to assess patient satisfaction, or measures for clinical governance.

Management of clinical services: Though hospital directors have the authority to develop new clinical services and interventions, their role is limited by the fact that they can only work within the limits of existing resources, including the medical staff. Constraints in acquiring specialist expertise are a major limiting factor in introducing new clinical services. The expansion and development of clinical services is also limited because hospitals are required to use their limited resources to provide the minimum service package defined for their institution.

Despite these constraints, many hospitals have been successful in developing new approaches to enhance clinical quality. Successful interventions have been replicated in other provinces, and some have been promoted by MOH for nationwide adoption. Several initiatives—including the introduction of General Outpatient Departments (GOPDs) and the establishment of NCD clinics and Emergency Triage Units—originated in this way.

Long-Range Trends in Hospital Spending

When examining longer-term trends, the share of Sri Lanka's health spending that is flowing to higher-level hospital care has risen over time. Figure 3.4 shows the share of expenditure on secondary and tertiary hospitals relative to total health expenditure over a period of 25 years. There has been a shift toward allocating more resources to the higher-level hospitals. The shift potentially implies that an increasing volume of health services is provided at costly higher-level hospitals that could have been managed by less costly, lower levels of care. Dalpatadu et al. (2016) have attributed this shift to the open-access principle, whereby Sri Lankan patients have the freedom to seek care from any health institution they choose, regardless of its level. In response to this demand-side pressure, and with increasing patient preference for higher-level facilities, the government has continuously shifted its resources to higher-level hospitals, particularly to the tertiary level. The following section further analyzes these patterns and their implications.

Figure 3.4: Pattern of Public Hospital Expenditure

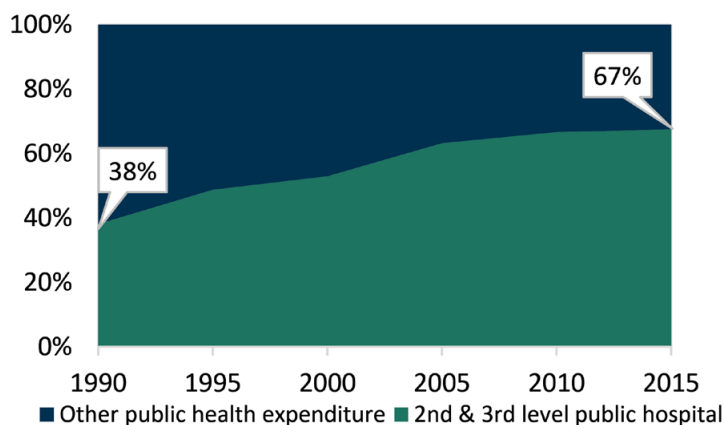


Figure 3.4: Share of Expenditure at Higher-Level Public Hospitals, 1990–2015
Source: (Amarasinghe et al. 2018).

Health Care Seeking Behavior in Sri Lanka: Tilted Toward Higher Levels of Care

The use of health care services is generally high in Sri Lanka, for both outpatient and inpatient services. The average number of annual outpatient visits per capita is above five (including private health care), which is close to the average for countries in the Organisation for Economic Co-operation and Development (OECD), and far higher than that in other middle-income countries (Figure 3.5). Inpatient services, measured as hospital discharges per 1,000 population, are far higher than any comparator among either middle-income countries, or advanced health systems (Figure 3.6). However, this may in part reflect differences in definitions. In Sri Lanka, an individual is considered “admitted” even if he/she spends only a few daytime hours at the hospital, whereas many health systems classify a hospital admission as 24 hours or more (or overnight). Anecdotal evidence from one hospital in Sri Lanka’s Western Province suggested that about 30 percent of hospital admissions are discharged on the same day, with their length of stay recorded as one day.

Figure 3.5: Outpatient Visits Per Capita Per Annum

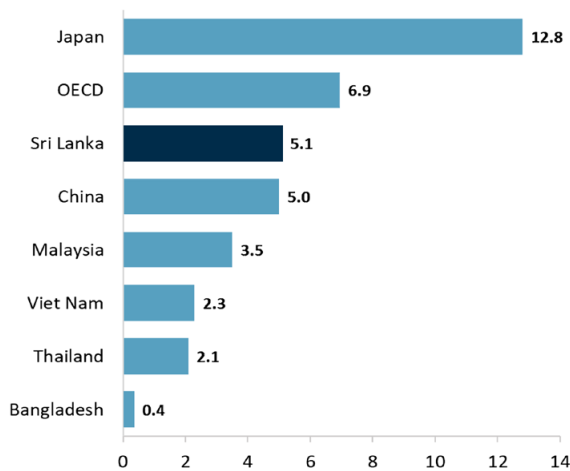


Figure 3.5: Consultations Per Capita Per Annum
Source: (OECD/WHO, 2018)

Figure 3.6: Inpatient services*

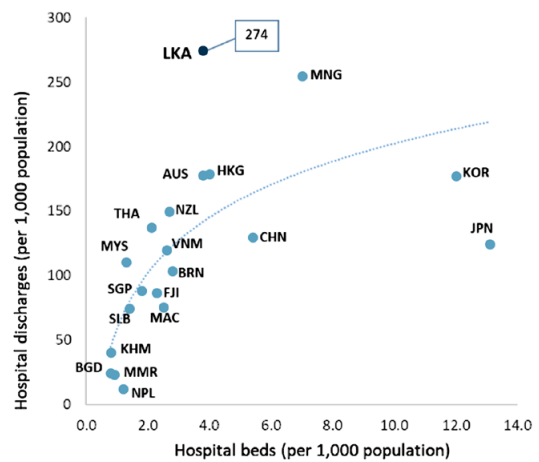


Figure 3.6: Hospital Beds vs. Discharges per 1,000 People
Source: (OECD/WHO, 2018)

Notes: * — As measured as hospital beds vs. discharges per 1,000 people; AUS = Australia; BGD = Bangladesh; BRN = Brunei Darussalam; CHN = China; FJI = Fiji; HKG = Hong Kong; KHM = Cambodia; KOR = South Korea; JPN = Japan; LKA = Sri Lanka; MAC = Macau; MMR = Myanmar; MNG = Mongolia; MYS = Malaysia; NPL = Nepal; NZL = New Zealand; SGP = Singapore; SLB = Solomon Islands; THA = Thailand; VNM = Vietnam.
Source: OECD and WHO 2018.

As mentioned above, under the open-access principle, patients in Sri Lanka can opt to seek medical care directly from higher-level institutions; and given the absence of a solid referral mechanism, patients tend to bypass smaller institutions and seek care from secondary or tertiary hospitals. This leads to underutilization of smaller institutions, and overcrowding in the higher-level institutions. Figures 3.7 and 3.8 show the patterns of health care utilization for each level of institution.

Figure 3.7: Outpatient Use by Level of Care

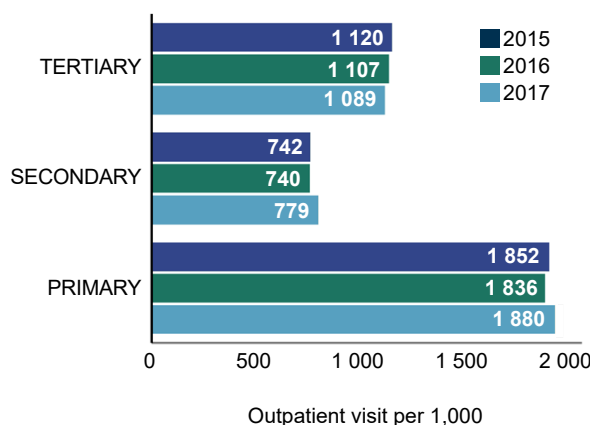


Figure 3.7: Outpatient Utilization by Level of Care 2015–2017
Source: (Annual Health Bulletin 2015; Annual Health Bulletin 2016; Annual Health Bulletin 2017)

Figure 3.8: Inpatient Use by Level of Care

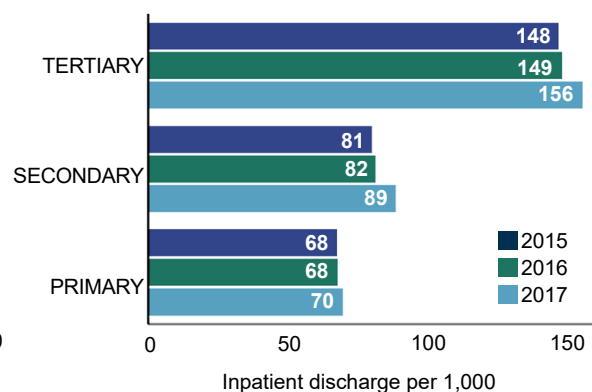


Figure 3.8: Inpatient Utilization by Level of Care 2015–2017
Source: (Annual Health Bulletin 2015; Annual Health Bulletin 2016; Annual Health Bulletin 2017).

The utilization pattern shows that tertiary care is overused for both inpatient and outpatient care. For inpatient care, the relative volume of service provision at each level corresponds to the relative number of beds. Table 3.1 shows the distribution of hospital beds in Sri Lanka's public sector: tertiary hospitals dominate, accounting for 45 percent of all beds in the public sector, and tertiary bed numbers are increasing over time. Primary hospitals offer roughly 30 percent of beds, and secondary hospitals about 20 percent. The dominance of beds at the tertiary level indicates the size of the investments that have been concentrated at this level.

Table 3.1: Hospital Beds at Each Level as Share of Total Number of Beds in the Public Sector

Year	Tertiary Care	Secondary Care	Primary Care	2nd+3rd	Others
2017	45%	21%	27%	66%	7%
2016	45%	20%	28%	65%	7%
2015	45%	20%	28%	65%	7%
2014	45%	19%	29%	64%	7%
2013	43%	20%	29%	63%	8%
2012	43%	22%	29%	65%	6%
2011	42%	19%	30%	62%	8%

Source: (Annual Health Bulletin 2012; Annual Health Bulletin 2013; Annual Health Bulletin 2014; Annual Health Bulletin 2015; Annual Health Bulletin 2016; Annual Health Bulletin 2017; Annual Health Bulletin 2018).

The number of beds is not the only issue; bed occupancy rates are highest in tertiary hospitals and below 50 percent at the primary level (Figure 3.9). These figures again suggest a systematic overuse of higher-level institutions, and underuse of the lower levels.

Figure 3.9: Bed Occupancy Rate in 2017

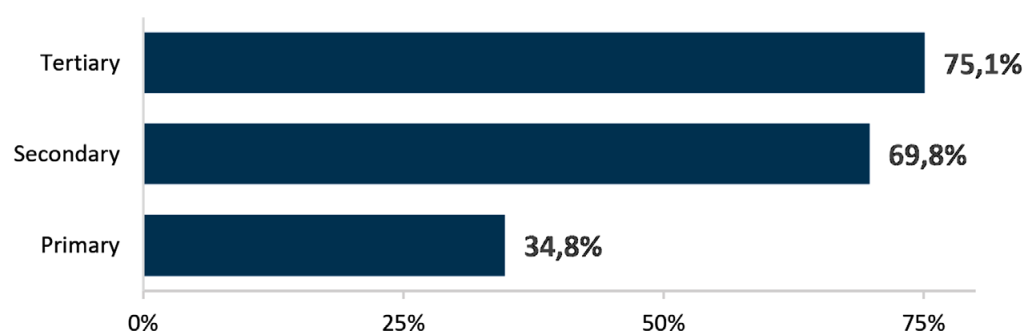


Figure 3.9: Bed Occupancy Rate 2017
Source: (Sri Lanka Annual Health Statistics 2017).

Improving the Efficiency of Sri Lanka's Hospital Sector

The current architecture of Sri Lanka's hospital sector reflects policy makers' efforts to manage dual demands: i) open access to health care services for the population; and ii) financial risk protection (Dalpatadu et al. 2016). The historical results have been impressive. Today, however, rising fiscal pressures, shifting demographics, a rapidly-changing disease burden, and a growing, quality-conscious middle-class make it imperative for Sri Lankan policy makers to modernize the country's hospital sector.

Strengthening Hospitals and Primary Care Simultaneously

A fundamental factor constraining hospital-sector efficiency in Sri Lanka is the imbalance in use between different levels of care, as discussed in the previous sections of this chapter. In principle, lower-level health institutions could serve the majority of patient needs, while the higher levels could be reserved for complicated cases only. Underuse of the primary level is broadly attributable to patients bypassing these facilities. This pattern in turn reflects patient perception that lower-level health facilities lack adequate staffing, equipment, medications, and other supplies, along with perceived shortfalls in the quality of primary care.

Sri Lanka's health leaders have launched fresh efforts to reinforce the country's primary health care (PHC) capacities and build patient confidence in this level of care. Currently, the Ministry of Health (MOH) is implementing the Primary Health Care Strengthening Project (PSSP), with support from the World Bank. The PSSP aims to build the capacity of first-level hospitals *and* primary medical care units, and increase use at the primary level of the system. This is expected to bring a significant number of patients to the lower level to seek care for uncomplicated cases.

Simultaneously, the country needs to bolster its secondary-level hospital capacity for accommodating referral cases. The government of Sri Lanka's 2019 policy vision for hospitals was an important step in this process. Below, we propose options to deliver and reinforce that vision. Consistent with global evidence and best practices in hospital reform, the options presented here combine changes to macro-incentives for strengthening management and team performance; investment in infrastructure; and systems interventions.

Priorities and Policy Options

Several lines of action offer opportunities for Sri Lanka's health sector to advance this agenda, boosting hospital efficiency in step with PHC gains. These include strengthening secondary hospitals through horizontal and vertical integration; bolstering MOH stewardship of secondary hospitals (for example by adopting standardized hospital performance indicators); considering a shift to results-focused provider payment models; and deepening engagement with private sector hospitals.

1. Strengthen Secondary Hospitals Through Integration

The rapid shift in Sri Lanka's disease profile, and the high rates of self-referral and use of secondary and tertiary care demand policy action. Under PSSP, MOH is working to empanel populations to access NCD services and other essential care at the primary level. This is a commendable step. Along with this, health leaders may consider the following approaches to fully leverage the country's secondary hospitals, in line with practices and experiences in other middle- and high-income countries:

- **Horizontal integration** of services can better enable secondary hospitals to offer a package of high-quality integrated care aligned with epidemiological priorities and citizen expectations. This entails investment to strengthen staffing, equipment, and infrastructure in secondary hospitals. Such reforms can enable these institutions to expand their offerings in geriatric and NCD care, for example, thus complementing primary care services and helping to meet rising demand in these crucial areas.
- **Vertical integration** can strengthen the links between the primary, secondary, and tertiary levels of care to improve patient access to a well-coordinated continuum of care. Sri Lanka's ongoing efforts to strengthen the primary care system through the PSSP are crucial. However, this will not result in reduction of the current overuse of tertiary care unless secondary hospitals are further strengthened so that they can manage a proportion of the cases that are currently being treated in tertiary facilities.

2. Strengthen MOH Stewardship of Secondary Hospitals

MOH could realize substantial gains by strengthening its stewardship of secondary and tertiary care hospitals. The key would be to revisit centralized management practices and systems that are no longer fit for purpose, and do not align with global best practices. Evidence from other middle- and high-income countries that have recently undertaken hospital reforms suggests that benefits can be obtained by reinforcing hospital autonomy; providing more room for local-level planning, implementing context-matched innovations; and introducing transparent accountability practices between MOH and hospital administrators.

In Sri Lanka, the following measures may improve MOH stewardship of hospitals:

- **Apply standardized hospital performance indicators.** Experiences in Vietnam suggest that developing a hospital performance-monitoring system based on standardized indicators can deliver important benefits. Such indicators enable a uniform approach to measuring hospital performance across the country.¹ This would allow the government, through key ministries (Health, Finance, and Provincial Affairs), to monitor hospital performance systematically across the domains that are crucial for informed management. Vietnam's hospital performance indicators, for example, enable the government to track: i) **outcomes**, through a set of effectiveness indicators; ii) **efficiency**, through a set of input and output measurements; iii) output **quality** through patient satisfaction; technical quality via supervisor assessments; and rates of unplanned readmission; iv) **financial management**; and v) human resource **staffing and performance**. A standardized hospital performance-monitoring system gives hospital teams the opportunity to organize themselves and develop innovative local approaches to achieve the indicators. At the same time, the indicators allow the MOH to benchmark hospitals and introduce targeted interventions to strengthen low-performing facilities.
- **Bolster information systems.** Globally, leveraging Electronic Health Records (EHR) to digitize hospital processes often yields significant improvements in the management of patients and hospitals. When properly implemented, EHR systems can improve the quality of care, increase time efficiency and adherence to guidelines, and reduce medication errors. However, EHR systems are resource-intensive; they require customization at every hospital in which they are implemented; and they increase the amount of time that clinicians must spend on documentation.
- **Recognize and reward performance.** While the current system of hospital management in Sri Lanka relies on self-motivation and a public-service ethos, global evidence points to the effectiveness of introducing performance management systems that recognize and reward outstanding effort through nonmonetary and/or monetary mechanisms. MOH can introduce rewards and recognition based on hospital performance determined by the hospital performance indicators. In many studies, frontline health workers have noted that team incentives can potentially play a role in further motivating staff and improving the services that hospitals deliver to the population. This report does not advocate for a specific type of incentive; MOH is best suited to design reward systems for the Sri Lankan context.

3. Consider Results-Focused Provider Payment Mechanisms

Although the government's input-based financing approach to its health care system has delivered outcomes, Sri Lanka's changing burden of disease, and growing financial pressures in the hospital sector may motivate the Ministry of Finance and MOH to explore the feasibility of output-based approaches to financing hospitals. Such approaches have been implemented with success in other upper-middle-income countries.

One option is to explore capitation approaches, whereby financing for hospitals is linked to the patients and caseload served by the hospital. Another option is to explore case-based approaches, such as the diagnosis-related group (DRG) approach that was successfully introduced in Thailand in the early 2000s with the dual goal of cost containment and financial protection. Vietnam is currently in the early stages of implementing DRGs as one facet of its health sector reform. Output-based mechanisms require careful feasibility studies, and learning from pilots before going to scale. However, as lessons learned in Thailand indicate, health systems can achieve substantial gains if output-based approaches are introduced carefully. The introduction and rollout of these models must include locally driven reviews and adjustments. The Thai Casemix Center for Health Systems Research Institute provided such analysis during the Thai government's rollout of its DRG approach.

1 The government of Vietnam has developed and monitored 23 key hospital performance indicators across six domains. The country's Ministry of Health and Ministry of Finance have been using these indicators since 2014 to monitor the performance of 73 hospitals nationwide.

4. Strengthen Engagement with the Private Sector

The private sector in Sri Lanka offers some additional capacity to support hospital reforms aimed at improving outcomes and efficiency. Of the 800 hospitals in the country, 200 are in the private sector. The private sector operates predominantly in populous districts, where there are relatively better operating margins, higher patient volumes, and a sizeable proportion of outpatient services. To date, the government has pursued only limited engagement with private-sector actors in the provision of clinical and nonclinical services. Given current demographic and epidemiological trends, and rising demands on the health sector overall, expanding this engagement provides an important opportunity for the future.

Conclusion

Historically, Sri Lanka has achieved remarkable health results for its income level. Today the country, and in particular its hospital system, face fresh challenges linked to an aging population, shifts in the burden of disease, rising inpatient care costs, and the threat of pandemics, among other factors. Boosting the efficiency of the country's hospitals is vital as Sri Lanka navigates this new health landscape.

Our analysis has shown substantial imbalance in care provision across the primary, secondary, and tertiary levels of care in Sri Lanka. It has also identified measures that can enable the country to address this imbalance, bolster health system efficiency, and deliver improved health outcomes for the Sri Lankan people. The key to success will be linking hospital reform with accelerated strengthening of the country's primary health care system. Concrete policy options that hold promise in this respect include securing greater horizontal and vertical service integration for the country's secondary hospitals; bolstering MOH stewardship of the secondary hospital tier; exploring the introduction of results-oriented provider payment models; and more deliberately leveraging the capacities of Sri Lanka's private sector. As it advances these agendas, Sri Lanka will prepare its hospital system to respond flexibly to emerging challenges, and deliver the results its citizens want, while better controlling costs.

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Hideki Higashi, Deepika Eranjanie Attygalle, and Yi Zhang

References

- Amarasinghe, S.N., K.C.S. Dalpatadu, and R.P. Rannan-Eliya, R. P. (2018). Sri Lanka health accounts: National health expenditure 1990-2016 (Health Expenditure Series No. 5). Colombo: Institute for Health Policy.
- Dalpatadu, S., P. Perera, R. Wickramasinghe, and R.P. Rannan-Eliya. 2016. *The Sri Lankan model of public hospital governance*. Asia Pacific Network in Health Systems Strengthening (ANHSS), Institute for Health Policy.
- Ministry of Health, Nutrition and Indigenous Medicine (Sri Lanka). (n.d.). *Annual Health Bulletin 2011*. Ministry of Health, Nutrition and Indigenous Medicine.
- Ministry of Health, Nutrition and Indigenous Medicine (Sri Lanka). (n.d.). *Annual Health Bulletin 2012*. Ministry of Health, Nutrition and Indigenous Medicine.
- Ministry of Health, Nutrition and Indigenous Medicine (Sri Lanka). (n.d.). *Annual Health Bulletin 2013*. Ministry of Health, Nutrition and Indigenous Medicine.
- Ministry of Health, Nutrition and Indigenous Medicine (Sri Lanka). (n.d.). *Annual Health Bulletin 2018* (ISBN 978-955-702-204-8). Ministry of Health, Nutrition and Indigenous Medicine.
- Ministry of Health, Nutrition and Indigenous Medicine (Sri Lanka). (2016). *Annual Health Bulletin 2014* (ISBN 978-955-577-998-2). Ministry of Health, Nutrition and Indigenous Medicine.
- Ministry of Health, Nutrition and Indigenous Medicine (Sri Lanka). (2017). *Annual Health Bulletin 2015* (ISBN 978-955-702-045-7). Ministry of Health, Nutrition and Indigenous Medicine.
- Ministry of Health, Nutrition and Indigenous Medicine (Sri Lanka). (2017). *Annual Health Bulletin 2016* (ISBN 978-955-702-109-6). Ministry of Health, Nutrition and Indigenous Medicine.
- Ministry of Health, Nutrition and Indigenous Medicine (Sri Lanka). (2018). *Annual Health Bulletin 2017* (ISBN 978-955-702-193-5). Ministry of Health, Nutrition and Indigenous Medicine.
- Ministry of Health, Nutrition & Indigenous Medicine Sri Lanka. (2018). *Sri Lanka National Health Accounts 2014, 2015, 2016*. The Ministry of Health, Sri Lanka.
- Ministry of Health, Nutrition and Indigenous Medicine (Sri Lanka). (2019). *Sri Lanka Annual Health Statistics 2017*. Ministry of Health, Nutrition and Indigenous Medicine.
- OECD/WHO. (2018). *Health at a glance: Asia/Pacific 2018: Measuring progress towards universal health coverage*. OECD Publishing. https://doi.org/10.1787/health_glance_ap-2018-en
- The World Bank. (n.d.). World Development Indicators. Retrieved from <https://databank.worldbank.org/source/world-development-indicators>
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CHAPTER 4:

DAY SURGERY CENTER IN THE WEST CHINA HOSPITAL

Pablo Andrés Villalobos Dintrans

Key Messages

- Cost containment is a relevant topic for health systems around the world.
- Innovations in hospitals have increased the number of ambulatory (same-day) procedures in many countries.
- The case of the West China Hospital shows that implementing same-day wards in hospitals requires establishing protocols and guidelines for the hospital staff, as well as criteria for patient and intervention selection.
- The experience of same-day surgery, in this case from China, shows that this strategy can help improve outcomes, including length and cost of stay, and patient satisfaction.

Introduction

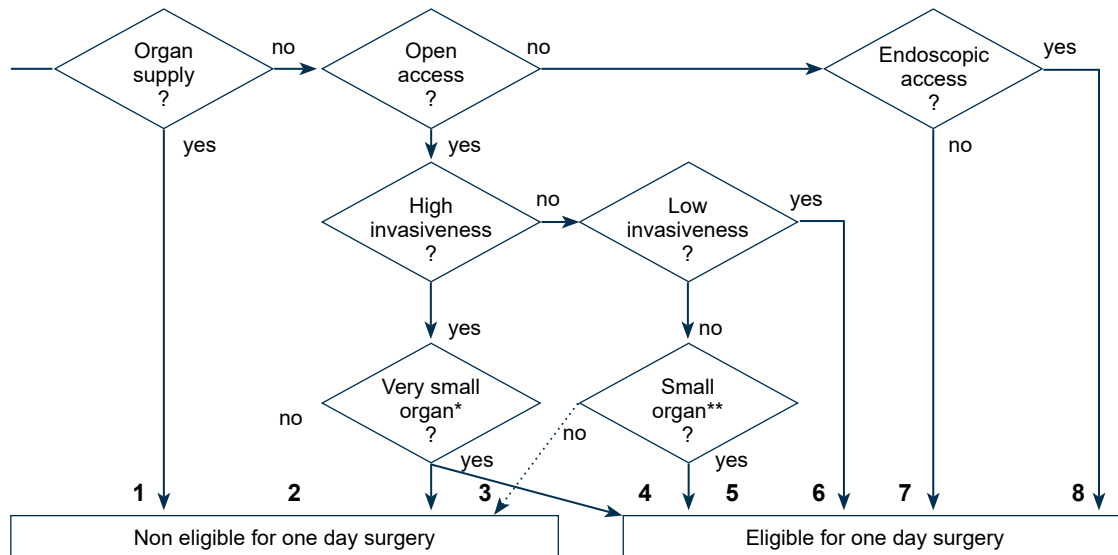
Day surgery, or same-day surgery, is generally defined as a nonemergency procedure—excluding minor surgeries under local anesthesia—undertaken during the period of a normal working day (not exceeding 12 hours) in a hospital or other facility set up for this purpose. The increase in day surgery has been driven by innovations in surgical and anesthetic techniques, together with financial incentives and patient expectations (Gilliard et al., 2006; Hoffmann et al., 2018). Although there are differences in the procedures involved, and the proportion of use between countries, data shows that overall, same-day and outpatient procedures have been increasing (Jenkins et al. 2001; Gilliard et al. 2006; Definitive Healthcare 2023).

Several studies report increased patient satisfaction with day surgery, but also highlight the need to closely monitor potential negative effects such as readmissions and negative health outcomes—particularly pain—directly associated with the rapid discharge of patients (Hoffmann et al. 2018; Coley et al. 2002; Lemos et al. 2009; Watt-Watson et al. 2004; Shnaider and Chung 2006; Siddique et al. 2021). The literature highlights that, although some procedures can be shifted to one-day surgery, there are limitations to using this initiative; the extent to which it can be implemented is limited by the patients' need (constrained to certain conditions), the specific features of the clinical procedure, and the conditions of each health center. There are at least two ways to identify eligible procedures: i) a comprehensive list of ambulatory clinical procedures (mainly for reimbursement purposes); and ii) general criteria for including/ excluding certain procedures and conditions. In the United States, Medicare updates and publishes a list of eligible procedures included in the Ambulatory Surgical Center (ASC) payment system (CMS 2013); the 2023 version includes 3,716 surgical procedures considered as eligible for ambulatory surgery. On the other hand, when establishing the criteria to identify procedures to be shifted to one-day surgery, Gilliard et al (2006) propose an algorithm to identify one-day procedures based on:

- Identification of a surgical procedure (versus a nonsurgical one) as one that requires incision through the skin or mucous membrane.
- Classification of surgical procedures based on their access routes: i) open access that requires an organ supply (support of circulatory function, for instance); ii) other kinds of open access (including approach through a small incision of the abdominal or thoracic wall if using an optic device); iii) another approach through integument small incision (without optic device), percutaneous endoluminal access, endoscopic access through a hollow body structure, and closed reduction of fracture with a fixation device; iv) direct access to a surface region (skin or body cavity through a speculum).

The list, in this case, is based on the surgical route, the complexity of the surgical deed, and the mass of injured tissue, as represented in Figure 4.1.

Figure 4.1: Algorithmic Identification of Procedures Eligible for One-Day Surgery Proposed by Gilliard et al. (2006).



Notes: *Very small organs: fingers and eye structures **Small organs: idem + hand, foot, salivary glands and teeth, nerves, lymph nodes.

This chapter explores the barriers, enablers, and results of same-day processes in China. China is an interesting case because most of the information on day surgery comes from developed countries, in which day surgery represents a large fraction of elective surgeries; in China, day surgery is considered to be still in its infancy (Deng et al. 2019).

Implementing a Same-Day Facility in China

The West China Hospital (WCH) (also known as Huaxi Hospital, or The International Hospital of Sichuan Province) is situated in the Sichuan Province in southwest China. The hospital was founded in 1892 and is one of the country's leading general hospitals (West China School of Medicine 2023a; 2023b).

Due to the increase in demand for surgeries, the hospital created a Day Surgery Center (DSC) in October 2009, the first of its kind in the country; currently, the center has several wards (Outpatient Operating Room, Wound Treatment Center, and Puncture Diagnosis and Treatment Center), with 52 beds in total (West China School of Medicine 2023b). At WCH, day surgery is defined as a planned surgery with a patient discharge that occurs within 24 hours in which patients can stay overnight, aiming to reduce the length of stay and costs without compromising the quality of care and patient satisfaction (Jiang et al. 2020).¹

The modality of day surgery has been implemented in over 20 major surgical specialties with more than 200 surgical types—excluding neurosurgery and cardiac surgery—and including nonsurgical departments such as cardiology, gastroenterology, and respiratory medicine.

¹ As stated by Jiang et al. (2020), there are several terms used to define “day surgery”, including same-day surgery, ambulatory surgery, and outpatient surgery. These terms vary from country to country.

Implementation of the Day Surgery Center

Protocols and Baseline Requirements

The experience of WHC in implementing its Day Surgery Center (DSC) shows first of all the need for trained human resources and coordination between clinical, administrative, and medical quality control staff and systems in order for the process to work. To facilitate coordination among personnel, WHC established protocols regarding the responsibilities of various roles (for example, administrative supervisor and department director), and a process for selecting medical staff based on specialty and experience, as well as enthusiasm and passion (Jiang et al. 2020). Additionally, the hospital established a patient service system for preoperative assessment, surgery scheduling, healthcare education, coordination with preoperative visits, assessment, and surgery scheduling (Jiang et al. 2020).

The COVID-19 pandemic has imposed challenges to the provision of health care services around the world. Considering its high patient mobility, the COVID-19 related risks were even higher in a health facility like the DSC. This situation triggered the implementation of new protocols to manage risk of infection while continuing to provide services (Jiang and Ma 2021). The DSC introduced several changes to address this challenge, including medical staff and potential patient education; ward disinfection and maintenance; additional inspection stations for patients; companion management; changes in the admission process; medical staff management (routine temperature monitoring and the use of face masks), and perioperative management (Jiang and Ma 2021).

The operation of the DSC requires human resources as well as a dedicated infrastructure within the hospital. For its launch, DSC recruited 5 physicians and 26 nurses (Jiang et al. 2020); today it has 47 health care professionals, including 7 physicians (the director of the center, 3 attending physicians, and 3 doctors), and 40 nurses. It includes several wards with a total of 52 beds (West China School of Medicine 2023b).

Criteria and Procedures

A key decision in the implementation of the one-day surgery strategy is the establishment of flows; that is, the movement of patients, the sharing of information or equipment between departments; and making staff groups or organizations part of the care pathway (NHS 2017). WHC also established a quality assurance system, which has been identified as a key element in the implementation of this type of strategy (Hoffmann et al. 2018; Coley et al. 2002; Watt-Watson et al. 2004). The hospital's quality assurance system comprised several areas, as follows (Jiang et al. 2020).

- **Patient selection:** Adequate family and social support; access to transportation for 24 hours postoperatively; residence less than two hours' driving distance from the hospital; and additional individual features related to age and health condition.
- **Operation selection:** The list of eligible procedures was developed by the Day Surgery Management Committee of WCH, based on the following criteria: estimated operation time of less than two hours; management of postoperative pain by prescription of oral analgesics only; and no special postoperative care required back home.
- **Surgeon qualification:** At least 10 years of experience operating independently; a minimum number of cases (depending on the procedure); enthusiasm for, and commitment to the promotion and development of day surgery.
- **Nurse qualification:** At least 10 years of pre- and postsurgical care experience; strong communication skills; comprehensive knowledge of various specialties; knowledge of hospital regulations, national policies, and medical insurance reimbursement procedures.

Results

Number of Surgeries

Between January 1, 2010 and December 31, 2018, 48,854 surgeries were performed in the DSC, representing 34.71 percent of total surgeries at WCH during that period. Since its establishment, the ratio of surgeries at the DSC versus those performed at the inpatient department has increased from 6.16 percent in 2010 to 25.11 percent in 2018 (Jiang et al. 2020).

The main types of surgeries performed at the DSC are: laparoscopic cholecystectomy, inguinal hernia repair, excision of colonic polyps, excision of gastric polyps, vein stripping and ligation, excision of breast masses, adenoidectomy, pediatric laparoscopic hernia repair, pediatric resection of hydroceles, pediatric phalloplasty, pediatric orchidopexy, and pediatric hypospadias repair (Jiang et al. 2020).

Length of Stay and Cost

The average length of stay for the most common procedures (laparoscopic cholecystectomy, hernia repair, varicose vein, endoscopic polypectomy) is around five days when performed at the inpatient department, versus 24 hours (1 day) at the DSC. For example, the average cost for the most common surgeries (laparoscopic cholecystectomy, hernia repair, and endoscopic polypectomy) is between 3,000 and 6,000 RMB (roughly between 450 and 900 US dollars) in the DSC; the same procedure costs between 3,500 and 8,000 RMB (roughly between 530 and 1200 US dollars) otherwise, implying roughly 15 percent in savings (Jiang et al. 2020).

Patient Perceptions

A study carried out in 2011, reviewed the in-person and telephone surveys of 225 patients admitted to the Center in December 2011 (Yu et al. 2014). The results from 153 valid questionnaires show that the item most valued by the patients (87 percent) was the shorter length of stay and the treatment duration (convenience value), followed by the lesser influence of surgery on the lives of the patients and their family (social value) (60 percent), the safer and more effective treatment (59 percent), and the greater economic value (reduced expenditure of surgery) (43 percent). In terms of risk perception, the larger risk identified by patients (75 percent) was the risk of postoperative complications and adverse events, followed by the lack of rehabilitation knowledge (53 percent), and psychological risks associated with the surgery (27 percent). Finally, the satisfaction expressed with day surgery was linked to service attitude (99 percent), environment on the wards (99 percent), operating skills (99 percent), clinical service process (98 percent), operation result (95 percent), and the communication process (84 percent) (Yu et al. 2014).

It is important to highlight the role of adequate information in shaping patients' expectations and perceptions. A recent study performed at the DSC shows that for patients, the most important information given was the details concerning anesthesia (82.6 percent); and that the relevance given to various pieces of information can differ between patients and medical staff; for example, the survey results show that patients place more importance on the effect of the surgery and pain management than medical staff do (Deng et al. 2019).

Conclusions

The experience of the DSC at WCH shows that a good design (protocols, infrastructure, criteria for patients, procedures, and staff) can lead to improvement in health outcomes, including in patient satisfaction, length of stay, and costs.

The first lesson is that the extent to which procedures can be shifted from traditional surgeries to one-day surgery depends on each health facility's particular features, and the ability to perform the change. The increase in one-day surgeries around the world can be explained by significant advances in surgical procedures, including innovations in surgical and anesthetic techniques (Gilliard et al. 2006; Hoffmann et al. 2018). As with many other innovations, in the end, the potential to improve performance is based on strengthening the health system, including investments in infrastructure, equipment, health products, human resources (to perform the surgery), information systems (for example, improved referral systems between care levels, and shared information between providers), financing (to align incentives for patients and providers), and leadership (to scale up initiatives and monitor their implementation) (World Health Organization 2010).

Second, the increase of same-day and outpatient procedures in several countries, and the interest in expanding the strategy within countries is driven by its several benefits (Jenkins et al. 2001; Gilliard et al. 2006; Definitive Healthcare 2023). The strategy combines financial and positive health outcomes, including a decrease in hospital and health system costs, and an increase in patient satisfaction. This explains its use as a cornerstone for implementing value-based health care delivery models (US Department of Health and Human Services 2011; NEJM Catalyst 2017). However, it is necessary to emphasize the existence of potential costs associated with the strategy as well.

First, despite its good results, negative outcomes such as pain, major complications, the need for reoperation, and readmissions (Hoffmann et al. 2018; Coley et al. 2002; Watt-Watson et al. 2004) need to be considered and managed, as well as the existence of dissimilar effects on different populations, particularly on high-risk and vulnerable populations (Siddique et al. 2021). For example, data on readmissions due to same-day surgery shows that these are relatively scarce: a study performed in a hospital in Pittsburgh, USA showed that the 30-day readmission rate reached 5.7 percent, but only 1.5 percent of unanticipated admissions and readmissions in a year were attributable to the same-day procedure, most of them occurring due to pain (38 percent) (Coley et al. 2002). Similar results were found in Scotland, where a study on outcomes of same-day surgeries showed that 7.8 percent of the patients were readmitted to hospital after discharge, with pain being the main cause of readmission (26 percent) (Bain et al. 1999). Data for US hospitals on a specific procedure (appendectomy in pediatric patients) showed no differences in readmissions (using a threshold of 30 days after surgery) between same-day surgery and those discharged 1-2 days after surgery (Cairo et al. 2017). The figures exhibited by the DSC at WCH are lower than those reported in other countries, with an unplanned readmission rate and return to hospital rate relatively stable for the period 2010-2018, around 0.40 percent and 0.25 percent, respectively (Jiang et al. 2020). As shown in the case of the DSC, limiting the risks and managing patient expectations (including the role of information) are relevant to taking advantage of the strategy, and minimizing its unintended consequences.

Second, from an operational perspective, when implementing same-day surgery, hospitals should opt for committing to a preestablished process and standards that involve not only health results but also time. This is at the heart of the improvement in efficiency (better results, smaller times and costs) but it implies that hospitals are not able to delay any part of the process: the “inpatient buffer” disappears. Although this is good news for patients, the commitment requires dedicated teams and wards to be fulfilled. These dedicated resources in turn imply extra costs that could offset some of the gains from rapid discharge (Quemby and Stocker 2014). Studies find that cost savings from implementing the strategy can be explained, for example, by lower surgical and anesthesia-related times (Fabricant et al. 2016), laboratory tests, and medical consultations (Fisher 1996); however, the final result will crucially depend on the particular intervention analyzed (Seale and Ledet 1999; Pineault et al. 1985; Marla and Stallard 2009).

In summary, the case of the DSC at WCH helps to illustrate the outcomes of implementing a potentially beneficial strategy at the hospital level. On the one hand, the main incentive for embarking on this challenge is related to improvement in hospital outcomes, including length of stay and readmission, which impacts both the costs of health care and patient satisfaction. On the other hand, moving away from a traditional inpatient surgery model to a one-day scheme requires some investment in designing the strategy (criteria, protocols, information systems, physical and human capital resources) and in resources for its implementation, including the availability of staff and medical personnel, training, and a cultural change. These elements constitute the enablers and barriers to continuing to expand these strategies in other contexts: unfortunately, costs play a crucial role in making this cost-benefit decision. Although there is no information on the total cost of implementing this change in the case of the WCH, the fact that the DSC has continued to grow over time, and the increase in same-day surgeries around the world allows us to assume that the benefits of savings and improvement for hospitals and patients outweigh the implementation costs of the strategy.

References

- CMS. 2013. CMS-1589-FC. Ambulatory Surgical Center Payment- Final Rule with Comment Period. 2013. Accessed Nov 15, 2023. <https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/ASCPayment/ASC-Regulations-and-Notices-Items/CMS-1589-FC>
- Coley, K. C., B. A. Williams, S.V. DaPos, C. Chen, and R. B. Smith. 2002. "Retrospective Evaluation of Unanticipated Admissions and Readmissions After Same Day Surgery and Associated Costs." *Journal of Clinical Anesthesia* 14 (5): 349-53.
- Definitive Healthcare. 2023. "Shifting Care from Hospitals to ASCs." Accessed Nov. 10, 2023. <https://www.definitivehc.com/blog/shifting-care-hospitals-asc>
- Deng, X., S. Liang, H. Li, D. Gouda, T. Zhu, and K. Xiao. 2019. "A Cross-Sectional Study to Assess the Difference in Perception of Day Surgery Information Between Patients and Medical Staff in China." *Patient Preference and Adherence* 5(13): 381-387.
- Fabricant, P. D., M. A. Seeley, J. Rozell, E. Fieldston, J. M. Flynn, L. M. Wells, and T. J. Ganley. 2016. "Cost Savings from Utilization of an Ambulatory Surgery Center for Orthopaedic Day Surgery." *Journal of the American Academy of Orthopaedic Surgeons* 24 (12): 865-71.
- Fischer, S. P. 1996. "Development and Effectiveness of an Anesthesia Preoperative Evaluation Clinic in a Teaching Hospital." *Anesthesiology* 85 (1): 196-206.
- Gilliard, N., Y. Eggli, and P. Halfon. 2006. "A Methodology to Estimate the Potential to Move Inpatient to One Day Surgery." *BMC Health Services Research* 6 (78): 1-12.
- Hoffmann, J. D., N. A. Kusnezov, J. C. Dunn, N. J. Zarkadis, G. P. Goodman, R. A. Berger. 2018. "The Shift to Same-Day Outpatient Joint Arthroplasty: A Systematic Review." *The Journal of Arthroplasty* 33 (4): 1265-74.
- Jenkins, K., D. Grady, J. Wong, R. Correa, A. Armanious, and F. Chung. 2001. "Post-Operative Recovery: Day Surgery Patients' Preferences." *British Journal of Anaesthesia* 86 (2): 272-74.
- Jiang, L., and H. Ma. 2021. "Surgical Protocol in a West China Day Surgery Center During the COVID-19 Pandemic: Practice and Experience." *Surgical Innovation* 28 (1): 53-57.
- Jiang, L., R. Houston, C. Li, J. Siddiqi, Q. Ma, S. Wei, and H. Ma. 2020. "Day Surgery Program at West China Hospital: Exploring the Initial Experience." *Cureus* 12 (7) : e8961.
- Lemos, P., A. Pinto, G. Morais, J. Pereira, R. Loureiro, S. Teixeira, and C.S. Nunes. 2009. "Patient Satisfaction Following Day Surgery." *Journal of Clinical Anesthesia* 21 (3): 200-205.
- Marla, S., and S. Stallard. 2009. "Systematic Review of Day Surgery for Breast Cancer." *International Journal of Surgery* 7 (4): 318-23.
- NEMJ Catalyst*. 2017. "What is Value-Based Healthcare?". 2017. Accessed Nov 5, 2023. <https://catalyst.nejm.org/doi/full/10.1056/CAT.17.0558>
- NHS. 2017. Institute for Innovation and Improvement. Improvement Leaders' Guide Improving Flow Process and Systems Thinking. Accessed Nov 5, 2023. <https://www.england.nhs.uk/improvement-hub/wp-content/uploads/sites/44/2017/11/ILG-2.3-Improving-Flow.pdf>
- Pineault, R., A. P. Contandriopoulos, M. Valois, M. L. Bastian, and J. M. Lance. 1985. "Randomized Clinical Trial of One-Day Surgery: Patient Satisfaction, Clinical Outcomes, and Costs." *Medical Care* 23 (2): 171-82.
- Quemby, D. J., and M. E. Stocker. 2014. "Day Surgery Development and Practice: Key Factors for a Successful Pathway." *Continuing Education in Anaesthesia, Critical Care & Pain* 14 (6): 256-61.
- Seale, A. K., and W. P. Ledet. 1999. "Minicholecystectomy: A Safe, Cost-Effective Day Surgery Procedure." *Archives of Surgery* 134 (3): 308-10.
- Shnaider, I., and F. Chung. 2006. "Outcomes in Day Surgery." *Current Opinion in Anesthesiology* 19 (6): 622-29.
- Siddique, S. M., K. Tipton, B. Leas, S. R. Greysen, N. K. Mull, M. Lane-Fall, and A. Y. Tsou. 2021. "Interventions to Reduce Hospital Length of Stay in High-Risk Populations: A Systematic Review." *JAMA Network Open* 4 (9): e2125846-e2125846.
-

U.S. Department of Health and Human Services. 2011. "Report to Congress: Medicare Ambulatory Surgical Center Value-Based Purchasing Implementation Plan." Accessed Nov 10, 2023. https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/ASCPayment/Downloads/C_ASC_RTC-2011.pdf

Watt-Watson, J., F. Chung, V. W. Chan, and M. McGillion. 2004. "Pain Management Following Discharge After Ambulatory Same-Day Surgery." *Journal of Nursing Management* 12 (3): 153-61.

West China School of Medicine. 2023a. *Home*. Accessed Nov 2, 2023. <https://www.wchscu.cn/Home.html>

West China School of Medicine. 2023b. *Day Surgery Center*. Accessed Nov 2, 2023. <https://www.wchscu.cn/details/51602.html>

World Health Organization (WHO). 2010. "Monitoring the Building Blocks of Health Systems." Geneva: WHO Document Production Services.

Yu, W. P., Y. Chen, G. M. Duan, H. Hu, H. S. Ma and Y. Dai. 2014. "Patients' Perceptions of Day Surgery: A Survey Study in China Surgery." *Hong Kong Medical Journal* 20 (2): 134.

CHAPTER 5:

ACUTE GERIATRIC UNITS: A CARE STRATEGY FOR AGING POPULATIONS

Pablo Andrés Villalobos Dintrans

Key Messages

- Older people are increasing around the world, with a commensurate increase in need for hospital services.
- The functional ability of older people may be compromised by long hospital stays.
- The implementation of acute geriatric units (AGUs) can integrate the management of functional ability into hospital settings.
- A well-trained multidisciplinary team is key to the successful implementation of such a strategy.
- AGUs can help improve patients' functional status after discharge and also reduce hospital stays and costs.

Introduction

What are acute geriatric units?

The implementation of acute geriatric units (AGUs)¹ is a strategy used to reduce hospital-acquired decline in functional ability,² particularly for older people in the tertiary level of care; and to improve other relevant patient outcomes in this population (World Health Organization 2015; NSW Government 2024).

AGUs have dedicated physical locations and structures within the health facility, and are staffed by multidisciplinary teams (NSW Government 2024; Palmer 2018). These units provide care to older adults during hospital admissions for acute medical illness, including acute exacerbations of chronic diseases (Baztán et al. 2009; O'Shaughnessy et al. 2022). Patients are transferred to the AGU from another unit within the hospital (usually an emergency department). In the AGU, they are assessed by an older-adult care specialist (for example, a geriatrician) who, working with the rest of the multidisciplinary team, designs a personalized care plan (NSW Government 2024).

The main goal of these units is to provide services that can prevent the loss of older adults' functional ability once they are discharged from the hospital, while stabilizing an acute condition. This reduces complications when older patients return home. When successful, the approach also diminishes the risk of rehospitalization, which is associated with greater hospital expenditure, institutionalization, and mortality. Thus, AGUs can reduce the cost of hospital care while improving key patient outcomes (Baztán et al. 2009; 2011; Fox et al. 2013; O'Shaughnessy et al. 2022).

1 Also referred to as acute care for elders units (ACE).

2 The World Health Organization defines "functional ability" as the health-related attributes that enable people to be and to do what they have reason to value. Functional ability includes the intrinsic capacity of the individual; relevant environmental characteristics; and the interactions between the individual and these characteristics (World Health Organization 2015).

What does it take to create an AGU?

An AGU is a hospital unit, but it is also a broad care strategy. Experiences from various countries show that AGU implementation requires, at a minimum, the following:

Skilled Human Resources: Since AGUs propose a multidimensional therapeutic approach, they rely on a multidisciplinary team, including personnel who are able to provide functional, mental, biomedical, and social assessments for older patients (Palmer 2018; Ministerio de Salud de Chile 2018). The AGU team is usually composed of a physician/ geriatrician, nurses, and allied health staff (social workers, physiotherapists, occupational therapists, speech pathologists, dietitians, and pharmacists) (NSW Government 2024; Palmer 2018; Ministerio de Salud de Chile 2018; Baztán et al. 2011; Vallecillo et al. 2021). This is arguably the most important element in AGU implementation, since the presence of trained multidisciplinary teams is highly efficient in preventing functional decline in older people, which is precisely the goal of AGUs (Baztán et al. 2011). The human resources component also implies the training and education of the team (Palmer 2018; Ministerio de Salud de Chile 2018; Essomba et al. 2021).

Infrastructure and Equipment: AGUs also require a physical space, since the unit is usually understood to have “its own physical location and structure” within the hospital (O’Shaughnessy et al. 2022). This implies architectural and design adaptations appropriate for the patients concerned, as well as infrastructure that enables the work of the multidisciplinary team. This includes facilities similar to or shared with other units at the hospital, such as waiting rooms, bathrooms, beds, and bathrooms, but also AGU-specific infrastructure, such as an early stimulation room and the equipment to provide adequate care and perform the activities planned by the multidisciplinary team (Palmer 2018; Ministerio de Salud de Chile 2018; Essomba et al. 2021).

Guidelines and Protocols: In order to successfully implement an AGU strategy, practitioners need clear indications of what to do and how to do it. This includes entry and discharge criteria, the steps and procedures to be applied (functional assessment, care management plan), length of stay, as well as roles and responsibilities within the team (Palmer 2018; Ministerio de Salud de Chile 2018; Essomba et al. 2021).

Intersectoral Policies: Coordination with other institutions and people outside the hospital is also fundamental. For example, establishing discharge destinations may require collaboration with the community, local authorities, and/or other actors if the person leaving the AGU needs to be admitted to a particular public health or social program; if he/she is going back home; or if the patient needs admission to a long-term care facility. This implies setting up a multisectoral committee for coordinating such arrangements (Ministerio de Salud de Chile 2018).

Implementation Facilitators and Barriers

In general, enablers and barriers to implementation can be grouped into at least four categories (Villalobos Dintrans and Bossert 2017): i) costs; ii) technical requirements; iii) goals; and iv) implementation requirements.

First, **financial factors** can be crucial for implementing the strategy, since the project’s cost must be aligned with the institution’s budget (Essomba et al. 2021). Second, the **technical requirements** include trained human resources, infrastructure and equipment, and guidelines and protocols. These must match the technical needs of the project and the technical capacities (institutional strengths) of the organization (Wiltsey Stirman et al. 2021; Schell et al. 2013; Winterton and Hulme Chambers 2017). In particular, medical review, early rehabilitation, patient-centered care, and clear protocols have been identified as success factors (NSW Government 2024; Palmer 2018; Fox et al. 2013; Ministerio de Salud de Chile 2018; Vallecillo et al. 2021).

Third, the **institution and the team need to be committed to the AGU’s goals**, and the AGU model needs to be perceived as effective (Palmer 2018; Fox et al. 2013; Vallecillo et al. 2021). Finally, **motivation and cultural change**—including overcoming resistance to change and internal conflicts arising with the project—have also been reported as key success factors (NSW Government 2024; Palmer 2018; Fox et al. 2013; Ministerio de Salud de Chile 2018; Vallecillo et al. 2021). Cultural acceptance is crucial for promoting the strategy and implementing the required changes within the hospital (Palmer 2018; Villalobos Dintrans and Bossert 2017; Grealish et al. 2023). The multidisciplinary team and the rest of the institution need to be aligned with the AGU’s principles (NSW Government 2024; Ministerio de Salud de Chile 2018).

Evidence of AGU Impacts

Several studies, including systematic reviews, have found **positive effects of AGUs** in relation to several outcomes. The main goal of AGUs is **preventing functional loss among older people** who require hospitalization after an acute health event. In general, studies report that AGU care helps reduce functional decline, including cognitive decline, and is favorably compared to the results seen among patients cared for in conventional units at the hospital (O'Shaughnessy et al. 2022; Baztán et al. 2009; Fox et al. 2012). Another outcome relates to **iatrogenic complications**, including falls, pressure ulcers, and delirium. Several studies have measured positive AGU impacts on these indicators (Fox et al. 2012; 2013; Abdalla et al. 2018). In contrast, regarding mortality, the results show little or no difference between AGUs and conventional care units (O'Shaughnessy et al. 2022; Baztán et al. 2009; Fox et al. 2012).

One of the variables on which **AGUs show consistently positive results is the length of the hospital stay**. Patients cared for in AGUs usually have a length of stay shorter than 12 days (Jayadevappa et al. 2006; Baztán et al. 2009; 2011; Ministerio de Salud de Chile 2018), and a shorter stay than people receiving traditional care (Baztán et al. 2009; 2011; Fox et al. 2012; 2013; Sinha et al. 2018). Discharge destination is another outcome that has been studied; the results show that after discharge from an AGU, patients are more likely to be living at home and less likely to be discharged to a nursing home, an effect that prevails over time (Baztán et al. 2009; Fox et al. 2012).

This reduction in length of stay translates into a reduction in costs. **Studies also report a lower cost of stay in AGUs versus traditional care units** (Jayadevappa et al. 2006; Baztán et al. 2009; 2011; Fox et al. 2012; 2013; Sinha et al. 2018; Flood et al. 2013) and emergency units (Naouri et al. 2023).³ **Hospital readmissions also show positive effects of the AGU, with lower readmission rates**, which also imply lower costs for the health system. Although the results on this indicator are mixed, studies report either no effect (O'Shaughnessy et al. 2022; Fox et al. 2012), or a lower readmission rate for patients treated in AGUs (Jayadevappa et al. 2006; Baztán et al. 2009; 2011; Fox et al. 2012; Flood et al. 2013). **Studies also show a positive effect for AGUs in terms of patient satisfaction** (Counsell et al. 2000; Ekerstad et al. 2018; Gregersen et al. 2016).

Factors that Influence AGU Effectiveness

Unlike many other strategies for implementing changes at the hospital level, AGUs do not entail evident risks for the patients. However, studies have identified several factors that impact AGU effectiveness. A salient example is the **functioning of the multidisciplinary team**—including clear clinical leadership, usually by a geriatrician (O'Shaughnessy et al. 2022; Fox et al. 2012). Studies show that in general, AGUs do not have more staff than conventional units, so the differences between them seem due to specialization and the organization of work (Baztán et al. 2009). This also requires, for example, setting up periodic multidisciplinary meetings and a dedicated ward environment (O'Shaughnessy et al. 2022; Baztán et al. 2011). Reviews conclude that some interventions, such as physical exercise, are more effective when implemented by a specialized multidisciplinary team than when implemented in an isolated manner by different health professionals (O'Shaughnessy et al. 2022; Baztán et al. 2011).

Besides the multidisciplinary team, other factors such as **patient-centered care, frequent medical review, early rehabilitation, and early discharge planning are identified as relevant AGU components for achieving positive outcomes** (O'Shaughnessy et al., 2022; Baztán et al. 2011; Fox et al. 2012). In this regard, the implementation of a patient-centered approach, including direct responsibility for the patient, has also been identified as a positive factor, since it ensures compliance with diagnostic and therapeutic recommendations and the implementation of the care plan, which contributes to the AGU's effectiveness (Baztán et al. 2009).

3 It is worth noting that the meta-analysis from O'Shaughnessy et al. (2022) reported no cost savings associated with the implementation of AGU using six studies (four from the US and two from Sweden). This is similar to the results reported by the meta-analysis carried out by Ijadi Maghsoodi et al. (2022) using nine studies. The authors find that the costs of geriatric-specific models were non-significantly less than the costs of conventional care; however, this result is reverted when removing an outlier (due to significant statistical heterogeneity). After this correction, the analysis confirmed that the costs of geriatric-specific interventions were significantly less than the costs of conventional care.

Conclusions

AGUs can be implemented in diverse ways within a hospital environment to improve care for older adults—a population that demands intensive hospital services and faces potential risks in the traditional health system. **AGUs serve several purposes. They can help improve the health status and functioning of older people who enter a hospital for acute care. In addition, they can be seen as a strategy to achieve other purposes, such as improving patient satisfaction and reducing costs.** These features make AGUs particularly attractive for countries seeking cost-containment strategies, especially at a time of worldwide population aging (United Nations 2022). This is especially important considering that older adults typically account for a large share of hospital days and, consequently, health system costs (Sanderson and Scherbov 2010; Hartholt et al. 2011; Harper 2014; Fox et al. 2012).

This poses a challenge but it also offers opportunities, particularly for low- and middle-income countries, since they will experience faster population aging processes and devote fewer resources to their health systems (United Nations 2022; World Health Organization 2024). Although most experiences with AGUs come from high-income countries such as the United States, Spain, Sweden, and Australia, countries like Chile (Ministerio de Salud de Chile 2018), Nigeria (Akoria 2016) and Cameroon (Essomba et al. 2021) are starting similar initiatives, showing the feasibility of implementing AGUs in such settings. Incorporating a geriatric perspective in hospitals—for example, a geriatric assessment for older patients (Villada-Gómez et al. 2023)—as well as in the training of health professionals (Bhattacharyya et al. 2022; Karikari et al. 2020)—can facilitate the successful implementation of this strategy.

References

- Abdalla, A., M. Adhaduk, R. A. Haddad, Y. Alnimer, C. F. Ríos-Bedoya, and G. Bachuwa. 2018. "Does Acute Care for the Elderly (ACE) Unit Decrease the Incidence of Falls?" *Geriatric Nursing* 39 (3): 292-95.
- Akoria, O. A. 2016. "Establishing In-Hospital Geriatrics Services in Africa: Insights from the University of Benin Teaching Hospital Geriatrics Project." *Annals of African Medicine* 15 (3): 145-53.
- Baztán, J. J., F. M. Suárez-García, J. López-Arrieta, and L. Rodríguez-Mañas. 2011. "Eficiencia de las Unidades Geriátricas de Agudos: Metaanálisis de Estudios Controlados." *Revista Española de Geriatria y Gerontología* 46 (4) : 186-92.
- Baztán, J. J., F. M. Suárez-García, J. López-Arrieta, L. Rodríguez-Mañas, and F. Rodríguez-Artalejo 2009. "Effectiveness of Acute Geriatric Units on Functional Decline, Living at Home, and Case Fatality Among Older Patients Admitted to Hospital for Acute Medical Disorders: Meta-Analysis." *BMJ* 338(7690): 334-336
- Bhattacharyya, D. S., M. H. Hossain, G. K. Dutta, I. Nowrin and K. M. Saif-Ur-Rahman. 2022. "Service Coverage and Health Workforce Allocation Strategies for Geriatric and Palliative Care in Low-and Middle-Income Countries: A Protocol for a Systematic Review and Meta-Analysis. *Medicine* 101 (10): e29030.
- Counsell, S. R., C. M. Holder, L. L. Liebenauer, R. M. Palmer, R. H. Fortinsky, D. M. Kresevic, D. M., L. M. Quinn, et al. 2000. "Effects of a Multicomponent Intervention on Functional Outcomes and Process of Care in Hospitalized Older Patients: A Randomized Controlled Trial of Acute Care for Elders (ACE) in a Community Hospital." *Journal of the American Geriatrics Society* 48 (12): 1572-81.
- Ekerstad, N., G. Östberg, M. Johansson, and B. W. Karlson. 2018. "Are Frail Elderly Patients Treated in a CGA Unit More Satisfied with Their Hospital Care Than Those Treated in Conventional Acute Medical Care?" *Patient Preference and Adherence* 7(12): 233-40.
- Essomba, M. J. N., V. B. Nzana, R. S. S. Njonou, S. P. Choukem, L. Ciaffi, G. Paula, M. Zingui-Ottou, et al. 2021. "Setting Up Geriatric Care in Sub-Saharan Africa: A 1-Year Experience in the Yaounde Central Hospital of Cameroon." <https://assets.researchsquare.com/files/rs-777213/v1/a0600259-2fdd-4e98-816c-001930d7360a.pdf?c=1631888945>
- Flood, K. L., P. A. MacLennan, D. McGrew, D. Green, C. Dodd, and C. J. Brown, C. J. 2013. "Effects of an Acute Care for Elders Unit on Costs and 30-day Readmissions." *JAMA Internal Medicine* 173 (11): 981-87.
- Fox, M. T., M. Persaud, I. Maimets, K. O'Brien, D. Brooks, D. , Tregunno, and E. Schraa. 2012. "Effectiveness of Acute Geriatric Unit Care Using Acute Care for Elders Components: A Systematic Review and Meta-Analysis. *Journal of the American Geriatrics Society* 60 (12): 2237-45.
- Fox, M. T., S. Sidani, M. Persaud, D. Tregunno, I. Maimets, D. Brooks, and K. O'Brien. 2013. "Acute Care for Elders Components of Acute Geriatric Unit Care: Systematic Descriptive Review." *Journal of the American Geriatrics Society* 61 (6): 939-46.
- Grealish, L., K. Ranse, J. A. Todd, L. Armit, S. Billett, L. Collier, K. Bail, et al. 2023. "Barriers and Enablers to Embedding Fundamental Nursing Care for Older Patients—Implications of a Mixed Methods Study for Nursing Leadership." *Journal of Advanced Nursing* 79 (3): 1162-73.
- Gregersen, M., A. Haahr, L. P. Pedersen, and E.M. Damsgaard. 2016. "Patient Satisfaction and Early Geriatric Follow-Up After Discharge in Older Acute Medical Patients." *Clinical Nursing Studies* 4 (3): 78-85.
- Harper, S. 2014. "Economic and Social Implications of Aging Societies." *Science* 346 (6209): 587-91.
- Hartholt, K. A., E. F. van Beeck, S. Polinder, N. van der Velde, E. M. van Lieshout, M. J. Panneman, T. J. M. van der Cammen, et al. 2011. "Societal Consequences of Falls in the Older Population: Injuries, Healthcare Costs, and Long-Term Reduced Quality of Life." *Journal of Trauma and Acute Care Surgery* 71 (3): 748-53.
- Ijadi Maghsoodi, A., V. Pavlov, P. Rouse, C. G. Walker, and M. Parsons. 2022. "Efficacy of Acute Care Pathways for Older Patients: A Systematic Review and Meta-Analysis." *European Journal of Ageing* 19 (4): 1571-85.
- Jayadevappa, R., S. Chhatre, M. Weiner, and D. B. Raziano. 2006. "Health Resource Utilization and Medical Care Cost of Acute Care Elderly Unit Patients." *Value in Health* 9 (3): 186-92.
- Karikari, G., D. K. Lohrmann, and L. Huber. 2020. "Stimulators of Medical Students' Interest in Geriatric Medicine—A Systematic Review." *Australasian Journal on Ageing* 39 (3) : e226-e238.
-

Ministerio de Salud de Chile. 2018. « Orientación Técnica de Atención Integral para Personas Mayores Frágiles en Unidades Geriátricas de Agudos (UGA) ». Ministerio de Salud. <https://www.minsal.cl/wp-content/uploads/2019/01/Orientaci%C3%B3n-T%C3%A9cnica-de-Atenci%C3%B3n-Integral-para-Personas-Mayores-Fr%C3%A1giles-en-Unidades-Geri%C3%A1tricas-de-AgudosUGA.pdf>

Naouri, D., Y. Jordanov, N. Lapidus, and N. Pelletier-Fleury. 2023. "Cost-Effectiveness Analysis of Direct Admission to Acute Geriatric Unit Versus Admission After an Emergency Department Visit for Elderly Patients." *BMC Geriatrics* 23 (1): 283.

NSW Government. 2024. "Geriatric Acute Wards." <https://aci.health.nsw.gov.au/networks/aged-health/about/building-partnerships/geriatric-acute-wards>

O'Shaughnessy, Í., K. Robinson, M. O'Connor, M. Conneely, D. Ryan, F. Steed, L. Carey, et al. 2022. "Effectiveness of Acute Geriatric Unit Care on Functional Decline, Clinical and Process Outcomes Among Hospitalised Older Adults with Acute Medical Complaints: A Systematic Review and Meta-Analysis." *Age and Ageing* 51 (4): afac081.

Palmer, R. M. 2018. "The Acute Care for Elders Unit Model of Care." *Geriatrics* 3 (3): 59.

Sanderson, W. C., and S. Scherbov. 2010. "Remeasuring Aging." *Science* 329 (5997): 1287-88.

Schell, S. F., D. A. Luke, M. W. Schooley, M. B. Elliott, S.H. Herbers, N. B. Mueller, and A. C. Bunger. 2013. "Public Health Program Capacity for Sustainability: A New Framework." *Implementation Science* 8 (15): 1-9.

Sinha, S. K., J. Bennett, R. Ramsden, J. Bon, and T. Chalk. 2018. "Delivering Improved Patient and System Outcomes for Hospitalized Older Adults Through an Acute Care for Elders Strategy." *Healthcare Management Forum* 31 (4): 126-32. Sage CA: Los Angeles, CA: SAGE Publications.

United Nations. 2022. *World Population Prospects 2022*. <https://population.un.org/wpp/>

Vallecillo, G., M. Anguera, N. Martin, and M. J. Robles. 2021. "Effectiveness of an Acute Care for Elders Unit at a Long-Term Care Facility for Frail Older Patients with COVID-19." *Geriatric Nursing* 42 (2): 544-47.

Villada-Gómez, J. S., M. C. Florian-Perez, T. Murillo-Molina, J. Erazo-Cordoba, S. Rios-Trujillo, D. Betancur-Zuluaga, J. A. Naranjo-Gómez, et al. 2023. "Critical Care in Older People in Low and Middle-Countries (LMICs): Comprehensive Geriatric Assessment (CGA) Protocol in Andes Mountains." *European Journal of Medical and Health Sciences* 5 (6): 85-89.

Villalobos Dintrans, P., & T. J. Bossert. 2017. "Institutionalization and Sustainability of Donor-Funded Quality Assurance Initiatives: The Case of Honduras." *Research and Evaluation Report*. USAID ASSIST Project. Chevy Chase, MD: University Research Co., LLC (URC).

Wiltsey Stirman, S., J. Kimberly, N. Cook, A. Calloway, F. Castro, M. Charns. 2012. "The Sustainability of New Programs and Innovations: A Review of the Empirical Literature and Recommendations for Future Research." *Implementation Science* 7 (17): 1-19.

Winterton, R., and A. Hulme Chambers. 2017. "Developing Sustainable Social Programmes for Rural Ethnic Seniors: Perspectives of Community Stakeholders." *Health & Social Care in the Community* 25 (3): 868-77.

World Health Organization. 2015. *World Report on Ageing and Health*. Geneva: World Health Organization.

World Health Organization 2024. Global Health Expenditure Database. <https://apps.who.int/nha/database>

SECTION 3

QUALITY AS AN ENTRY POINT FOR HOSPITAL REFORM

CHAPTER 6:

IMPROVING QUALITY AND SAFETY IN PERIOPERATIVE CARE: THE ENHANCED RECOVERY AFTER SURGERY (ERAS) PROGRAM

Ravi Oodit and Mickey Chopra

Key Messages

- There is a significant gap between best practices and current care in perioperative surgery globally. This leads to poorer patient outcomes, wasted resources, and higher costs.
- Implementing the Enhanced Recovery After Surgery (ERAS) program can improve patient outcomes, reduce complications, and shorten hospital stays. ERAS is a multidisciplinary approach with evidence-based guidelines for pre-, intra-, and post-operative care.
- Low- and Middle-Income Countries (LMICs) often lack the infrastructure, resources, and trained personnel to implement ERAS effectively. There is also a need for guidelines adapted for resource-limited settings.
- Recommendations:
 - Develop a global platform to share knowledge, address challenges, and support research on ERAS in LMICs.
 - Establish ERAS hubs at well-equipped hospitals to serve as centers of excellence and training.
 - Adapt ERAS guidelines and training programs for LMICs.
 - A multistakeholder global effort is needed to improve perioperative care. This includes surgeons, anesthesiologists, nurses, policymakers, and international organizations.

Introduction

Surgery is an essential component of public health, and a key to achieving Universal Health Coverage (UHC). It is estimated that more than 300 million surgical procedures are performed annually worldwide, with appreciable implications for global health (Rose et al. 2015). As populations age and the incidence of injuries, cancer, and cardiovascular disease continues to rise, the impact of surgical intervention on health care systems will continue to increase.

The risk of complications is inherent in surgical procedures and can lead to delayed recovery, prolonged hospital stays, and increased health care costs (Anderson et al. 2013). Finding ways to actively reduce complications can have significant and far-reaching benefits. By prioritizing and embedding efforts to minimize complications in the system, health care providers not only mitigate the physical and emotional burden on patients but also contribute to enhanced patient safety and reduced length of stay in hospital, promoting a more streamlined and efficient health care system (ISO Study Group 2016). Investing in strategies to improve perioperative care is thus crucial.

Complications, including mortality and length of stay in hospital are surrogate markers of quality and safety in perioperative care. Postoperative complications are estimated to affect up to 20 percent of all hospitalized patients globally, and more than half of such events are known to be preventable (Rose et al. 2015). Complications place a significant burden on the health and well-being of patients, their families, and health care systems. In an era of increasing demand for access to surgical care, but also significant financial constraints, the delivery of value-based perioperative care needs to be prioritized. This chapter discusses the Enhanced Recovery After Surgery (ERAS) program, a proven approach to strengthening quality in perioperative care. It describes in particular the barriers and facilitators to ERAS implementation in resource-limited settings.

Perioperative Care in Global Perspective

Globally, data on perioperative complications, cost effectiveness, and care processes are limited and often of poor quality. Relevant trials often have variable endpoints. National perioperative registries are absent in many countries, and it is often difficult to compare data across countries and institutions. Key data on quality and safety that use measures such as quality adjusted life years (QALY) are scant; this complicates efforts to compare interventions and improve policy.

Three large recent studies have found that surgical patients in low- and middle-income countries (LMICs) tend to have poorer perioperative outcomes than those in high-income countries (HICs). The International Surgical Outcomes Study (ISOS), African Surgical Outcomes Study (ASOS), and Global Surgery Collaborative studies all point to substantial global disparities. ASOS, for example, found that the post-surgery mortality rate among African patients was twice the global average, despite African patients' being at lower initial risk when compared to international cohorts. The majority of the deaths analyzed in ASOS (94 percent) occurred within the first 24 hours after surgery. Most of these likely resulted from a failure to recognize and rescue the deteriorating patient due to inadequate postoperative care facilities and resources. The Global Surgery Collaborative concluded in their 2021 publication that in LMICs, the absence of consistently available postoperative care facilities was associated with 7 to 10 more deaths per 100 major complications than expected (ISO Study Group 2016; Biccard et al. 2018; Knight et al. 2021).

The overall global cost burden of postoperative complications is uncertain, but is projected to increase by 10 percent annually based on age projections alone (Ludbrook 2022). Surgical site infection, the third leading cause of hospital-associated infections globally, is estimated to cost up to \$30,000 per patient in LMICs and up to \$34,000 per patient in HICs (Monahan et al. 2020). Most available cost data are intra-institutional and reflect in-hospital costs. There is little data on the cost of out-of-hospital complications, including the financial impact on patients and their families, and the costs to the broader health care system.

Strategies to Improve Perioperative Care

Raising the quality and safety of perioperative care is complex. Every surgical procedure requires careful planning and multidisciplinary teamwork (including the patient, nurses, anesthetists, surgeons, and pharmacists, but also hospital managers and policy makers). Key macro and micro resources need to be available (essential drugs, oxygen, sterilized equipment, reliable water, electricity). Progress also requires ongoing quality assurance, training, change management, and continuous monitoring and evaluation programs both within individual institutions and at the country level.

A recent joint publication from the World Health Organization (WHO), the Organisation for Economic Co-Operation and Development (OECD), and the World Bank outlined a 7-step framework to accelerate the delivery of high-quality perioperative care (WHO 2018):

- Changing clinical practice on the front line;
- Setting standards;
- Engaging and empowering patients, families, and communities;
- Providing information and education for health care workers, managers, and policy makers;
- Using continuous quality improvement programs and methods;
- Establishing performance-based incentives (financial and nonfinancial);
- Developing legislation and regulation.

A recent scoping review aimed to identify all of the perioperative quality improvement (QI) interventions that have been implemented at scale in LMICs over a 60-year period (from 1960 to 2020) (White, Ahuja, and Peven 2022). Thirty-one efforts that meet the inclusion criteria were identified. The interventions include the Surgical Safety Checklist, the Antibiotic Stewardship program, and the ERAS program. Of these, the ERAS program is the only one that has incorporated the WHO, OECD, and World Bank framework for QI and safety.

The ERAS Model

The ERAS Program¹ is an innovative integrated service delivery platform in perioperative care through which institutions can be held accountable for outcomes (Ljungqvist, Scott, and Fearon 2017). ERAS features a patient-centered, multidisciplinary team approach to perioperative care. In countries where ERAS has been implemented for patients undergoing elective surgery, postoperative complications and hospital stay have typically been reduced by 20-50 percent and costs by 10-20 percent; and reductions in nursing workload have also been achieved (Greco et al. 2014; Nguyen et al. 2016; Hübner et al. 2015). A study from Sweden reported that the risk of five-year cancer-specific mortality decreased by 42 percent when compliance with ERAS guidelines was above 70 percent (Gustafsson et al. 2016). Most ERAS studies have been conducted in HICs. However, units in LMICs that have implemented the program have achieved comparable results (Oodit et al. 2021; Slim et al. 2023).

The ERAS Care Program includes three main components:

- a) Evidence-based management guidelines;
- b) An implementation program;
- c) A monitoring and evaluation system

Components of the ERAS Care Program

The ERAS management guidelines address 22 elements of care in the pre-, intra-, and postoperative periods. The guidelines focus on reducing the perioperative pathophysiological catabolic stress response and immunosuppression. A meta-analysis of single and multicenter studies has shown that as compliance with the ERAS guidelines improves, complications are reduced. Centers with a 90 percent compliance rate had complication rates of less than 20 percent. Those with a compliance rate of 50 percent or less had a complication rate of about 50 percent (ERAS Compliance Group 2015).

The ERAS implementation program focuses on building a well-functioning integrated multidisciplinary team that can implement the evidence-based guidelines, reaching and maintaining a high level of adherence. The program adopts change-management principles and includes a series of seminars and action periods. It runs over a span of 10 to 12 months. The team is centered around the patient and family. Team members include the surgeon, anesthetist, ERAS nurse coordinator, nursing and operating room teams, physiotherapist, dietician, physician, data-capturer, and hospital managers and administrators. All stakeholders have a defined, unique, and critical role in implementing and sustaining quality improvement. A key member of the team is the ERAS nurse coordinator, who accompanies the patient from the time of diagnosis to their 30-day follow-up and discharge. The nurse coordinator is responsible for preoperative counseling, discharge planning, and postoperative care, and plays a crucial role in teaching and training.

The ERAS Interactive Audit System (EIAS), a monitoring and evaluation system, is an integral part of the implementation program that allows the teams to continuously monitor compliance with the guidelines, measure outcomes, and effect change. The approach is based on the Deming Plan-Do-Study-Act (PDSA) cycle. The system is a web-based, real-time database that is designed to allow centers to conduct locally and internationally relevant research, and to benchmark their outcomes and compliance against other ERAS centers.

The ERAS program has been piloted in South Africa across six hospitals, in both the public and private sector, with over 1,000 patients participating in the pilot to date. The experience and learnings from this pilot are reflected in the remaining sections of this chapter.

Barriers and Facilitators to ERAS Scaling Up

Implementation of the ERAS program requires a well-functioning health care system and the financial resources to invest in the program. HICs, where QI and safety are seen as necessities, are strongly positioned to implement ERAS. In LMICs, the lack of essential infrastructure, chronic resource shortfalls, and competing health priorities tend to make improving perioperative care appear less urgent. Within many LMICs, however, there are well-resourced and functioning public and private hospitals that could take leadership in the scaling up of ERAS.

1 Professors Olle Ljungqvists (Orebro University, Sweden) and Ken Fearon (Edinburgh University, Scotland) initiated the ERAS Study Group in 2001. This body became the ERAS Society, which established the ERAS care program.

HICs have developed strong, profession-driven leadership in QI and safety in perioperative care. This is key to ensuring acceptance and sustainability. Such professional leadership has emerged more slowly in LMICs. The barriers include the demands of providing even basic clinical services in resource-constrained, high-patient-volume environments; the staff shortages that affect many LMIC health systems; and difficulties in identifying, upskilling, and supporting local champions of QI and safety.

The ERAS guidelines are primarily geared toward specialists and subspecialists working in tertiary hospitals. In LMICs, however, the greatest need for surgical and anesthetic care concerns generalists operating within primary and secondary hospitals. In response, the ERAS Society, with support from the World Bank, has published guidelines for elective abdominal and pelvic surgery in LMICs (Oodit et al. 2021). However, these guidelines need to be implemented, and their scale-up needs to be planned and tested. Profession-driven guidelines for the other surgical procedures that could rapidly make an impact at scale (for example, caesarean section, emergency laparotomy, trauma) have not been established to date.

Although the ERAS guidelines are evidence-based and peer-reviewed, awareness of their value remains limited in many settings. The key reason is a lack of dedicated teaching on perioperative care at the undergraduate and postgraduate levels across all perioperative health care professions. Given the generalizability of the guidelines across specialties and between HICs and LMICs, there is an opportunity to share resources and establish an internationally accredited virtual teaching program to address this urgent need.

The EIAS database is widely recognized as the “gold standard” for improving quality and safety in perioperative care. It has successfully addressed various limitations associated with big data on an international scale, including concerns related to data security, reliability, sharing, underreporting, result heterogeneity, and the transition from paper to electronic patient records. The database captures an extensive range of 220 to 280 data fields per patient, a substantial undertaking that is feasible in well-resourced health care systems but challenging in LMICs. To establish relevant outcome measures at the patient, clinical, policy, and governance levels, multistakeholder engagement is crucial.

Challenges in Frontline Implementation

Teams in LMICs who already wish to implement the guidelines and effect change often find difficulty in implementation. Key obstacles from the experience in South Africa include:

- **Number and complexity of interventions.** ERAS encompasses 22 interventions which, when implemented as a multidisciplinary “bundle,” result in improved patient experience and outcomes. Most of the 22 interventions challenge long-held, deeply rooted surgical care practices. Implementing sustainable change across 22 interventions in resource-constrained environments is difficult. The ideal would be to identify a smaller set of key interventions that will yield the greatest benefit. To date, attempts to define such a short set of priority measures have been unsuccessful, and further research is required.
- **New and challenging staff roles and responsibilities.** The perioperative nurse care coordinator is a key member of the ERAS team. The care coordinator facilitates the patient’s care from the time the surgery is planned to a 30-day postoperative follow-up. This is a new role in the perioperative field, and globally only a handful of nursing colleges offer dedicated training at the under- or postgraduate levels. Posts, salaries, and defined roles and career paths need to be established.
- **Need for greater clarity on essential equipment and drugs.** An essential equipment and drug list needs to be established for LMICs (analgesic drugs, warm blankets, intravenous fluids, thermometers, and other priority tools and technologies). Consensus-developed care guidelines can inform this process. The list could facilitate purchasing within individual institutions and could achieve significant efficiencies and cost savings on a national level.
- **Cost is an entry barrier.** High entry costs for implementation programs, database licenses, care coordinator salaries, team support, technology, office space, and internet access, create a financial barrier. However, despite substantial initial expenses, self-funding becomes viable due to significant savings seen within the first year, a model that has been successfully implemented at scale in HICs. On the other hand, LMICs face challenges in securing seed funding to initiate programs. To address this challenge, exploring novel funding solutions is crucial. One potential avenue involves raising donor funding for a proof of concept, anticipating that subsequent cost savings will facilitate program expansion in LMICs.

Toward the Future: A Growing Global Network to Strengthen Perioperative Care

In perioperative care, as in other fields, the hub-and-spokes organizational design model can drive change at scale. Perioperative care “hubs” can be established through collaboration with established entities such as professional societies, nongovernmental organizations (NGOs), and alliances such as the Surgical Safety Checklist, Antibiotic Stewardship, and Surgical Site Infection initiatives.

To operationalize this model, partners can establish a dynamic international platform for perioperative care to facilitate knowledge transfer, engage in collaborative problem-solving, and address contextual challenges. The global platform can also support locally relevant research, pilots, and implementation plans; and it can accelerate advocacy and mobilize funding to improve perioperative care, particularly in LMICs.

Tertiary and quaternary academic units in established perioperative hubs can implement the ERAS program or similar QI models, and establish centers of excellence in perioperative care. Together, partners can develop models for teaching across disciplines relevant to perioperative care at the undergraduate and postgraduate levels. The hubs can collaborate with policy makers, primary and secondary hospital clinical leads, and hospital managers (the “spokes”) to develop tailored quality-improvement solutions, including through intersectoral collaboration.

Developing an overarching national governance and policy framework in the perioperative space is difficult, given the complexity of service provision and the variability of care across disciplines. National governance and policy can best be formulated once the standard of care is formalized, critical resources are secured, and reliable tools are in place to monitor outcomes in perioperative quality and safety, enabling continuous quality improvement. As partners work to create these conditions in their local institutions and at the country level, the hub-and-spokes model can support national policy and guidelines on perioperative best practice.

Conclusions

There is an urgent need to improve the quality and safety of perioperative care globally. Doing so will yield both immediate and downstream benefits: improved patient and provider experience; enhanced patient outcomes; more effective use of resources; and greater cost efficiency.

A significant gap exists between current evidence and best practice in perioperative care. However, powerful QI tools, including the ERAS model, already exist, and there is evidence supporting their effectiveness. To improve perioperative outcomes, the barriers to acceptance, adoption, knowledge translation, and implementation of these tools must be overcome. Implementation research in perioperative care remains undervalued and underfunded.

Overcoming institutional challenges in implementing QI interventions requires a multifaceted and collaborative approach. Hospitals can successfully deploy complex interventions by cultivating a safety culture; engaging key stakeholders; providing comprehensive training; integrating workflows; implementing continuous monitoring; addressing documentation challenges; and demonstrating strong institutional leadership. The result will be an environment where patient safety is prioritized.

Building a multistakeholder global perioperative coalition to share skills, resources, and learning may prove a valuable starting point. It will require visionary leadership to reimagine and re-engineer long-familiar service delivery platforms. A systems approach to change is needed, with a scale-up plan; and with all stakeholders willing to be held accountable for the care and outcomes they deliver.

References

- Anderson, O., R. Davis, G. B. Hanna, and C. A. Vincent. 2013. "Surgical Adverse Events: A Systematic Review." *The American Journal of Surgery*. 206 (2): 253–62.
- Biccard B., T. E. Madiba, H. L. Kluyts et al. 2018. "Perioperative Outcomes in the African Surgical Outcomes Study: A 7-day Prospective Observational Cohort Study." *The Lancet* 391 (10130): 1589–98.
- ERAS Compliance Group. 2015. "The Impact of Enhanced Recovery Protocol Compliance on Elective Colorectal Cancer Resection: Results from an International Registry." *Annals of Surgery*. 261 (6): 1153-59.
- Greco M., G. Capretti, L. Beretta, M. Gemma, N. Pecorelli, M. Braga. 2014. "Enhanced Recovery Program in Colorectal Surgery: A Meta-Analysis of Randomised Controlled Trials." *World Journal of Surgery*. 38 (6): 1531-41.
- Gustafsson, U.O., H. Opielstrup, A. Thorell, J. Nygren, O. Ljungqvist. 2016. "Adherence to the ERAS Protocol Is Associated with 5-Year Survival After Colorectal Cancer Surgery: A Retrospective Cohort Study." *World Journal of Surgery*. 40 (7): 1741-47.
- Hübner M., V. Addor, J. Sliker, A. C. Griesser, E. Lécureux, C. Blanc, et al. 2015. "The Impact of an Enhanced Recovery Pathway on Nursing Workload: A Retrospective Cohort Study." *International Journal of Surgery*. 24 (Pt A): 45-50.
- International Surgical Outcomes Study Group. 2016. "Global Patient Outcomes After Elective Surgery: Prospective Cohort Study in 27 Low-, Middle- and High-Income Countries." *British Journal of Anaesthesia* 117 (5): 601–09
- Knight, S. R., Shaw, C. A., Pius, R., Drake, T. M., Norman, L., Ademuyiwa, A. O., et al. 2021. "Global Variation in Postoperative Mortality and Complications after Cancer Surgery: A Multicentre, Prospective Cohort Study in 82 Countries." *The Lancet*, 397 (10272), 387-397.
- Ljungqvist, O., M. Scott, K. Fearon. 2017. "Enhanced Recovery After Surgery." *JAMA Surgery* 152 (3): 292.
- Ludbrook, G.L. 2022. "The Hidden Pandemic: The Cost of Postoperative Complications." *Current Anesthesiology Reports* 12 (No?): 1–9. <https://doi.org/10.1007/s40140-021-00493-y>
- Monahan, M., S. Jowett, T. Pinkney, P. Brocklehurst, D. G. Morton, Z. Abdali, T. E. Roberts. 2020. "Surgical Site Infection and Costs in Low- and Middle-Income Countries: A Systematic Review of the Economic Burden." *PLoS One* 15(6):e0232960. doi: 10.1371/journal.pone.0232960. PMID: 32497086; PMCID: PMC7272045.
- Nguyen, X., W. Anderson, W. Tracy, J. Lawrence, P. Faris, O. Ljungqvist et al. 2016. "An Economic Evaluation of the Enhanced Recovery After Surgery (ERAS) Multisite Implementation Programme for Colorectal Surgery in Alberta." *Canadian Journal of Surgery*. 59 (6): 6716.
- Oodit, R., B. Biccard, G. Nelson et al. 2021. "ERAS Society Recommendations for Improving Perioperative Care in Low- and Middle-Income Countries Through Implementation of Existing Tools and Programs: An Urgent Need for the Surgical Safety Checklist and Enhanced Recovery After Surgery." *World Journal of Surgery* 45 (11): 3246–48.
- Oodit, R., D. Constant, F. Maree, I. Lorrimer, E. Dalwai, J. Moodley. 2021. "Colorectal Surgical Outcomes Following Implementation of an Enhanced Recovery After Surgery Programme in Cape Town." *South African Journal of Surgery* 59 (4): 157–63.
- Rose J., T. G. Weiser, P. Hider, L. Wilson, R. L. Gruen, S. W. Bickler. 2015. "Estimated Need for Surgery Worldwide Based on Prevalence of Diseases: A Modelling Strategy for the WHO Global Health Estimate." *Lancet Global Health*. 3 (Suppl 2): S13-20
- Slim, N., W. Teng, E. Shakweh, H. Sylvester, M. Awad, R. Schembri, R. Oodit, et al. 2023. "Enhanced Recovery Programme After Colorectal Surgery in High-Income and Low-Middle Income Countries: A Systematic Review and Meta-Analysis." *International Journal of Surgery*. 109 (11): 3609–16.
- White, M.C., S. Ahuja, K. Peven. "Scaling Up of Safety and Quality Improvement Interventions in Perioperative Care: A Systematic Scoping Review of Implementation Strategies and Effectiveness." 2022. *BMJ Global Health* 7: e010649.
- World Health Organization (WHO). 2018. "Improving the Quality of Health Services: Tools and Resources. Turning Recommendation into Practice." Geneva: World Health Organization. Licence: CC BY-NC-SA 3.0 IGO.
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CHAPTER 7:

REGIONALIZATION AS A LEVER OF HOSPITAL REFORM: THE CASE OF RURAL OBSTETRIC UNIT CLOSINGS IN THE UNITED STATES, AND IMPLICATIONS FOR LOW- AND MIDDLE-INCOME COUNTRIES

Sanam Roder-DeWan

Key Messages

- Regionalization (or centralization) programs direct patients to risk-appropriate levels of care and link facilities together.
- Most high-income countries have adopted regionalized approaches to perinatal care based on evidence that regionalized systems can reduce morbidity and mortality; regionalization is underutilized in LMICs.
- The health impacts of rural obstetric unit closings in the United States appear to be positive at the population level because pregnant people “trade up” to more distant, but higher-quality facilities.
- If perinatal regionalization is driven by financial pressures, the most vulnerable and remote families are left behind.
- Perinatal regionalization programs in LMIC settings should be carefully planned; they should include revised clinical guidance, robust access programs to address equity risks, and the optimization of key health worker cadres, especially midwives.

Introduction

Regionalization of service delivery that is intended “to improve patient outcomes by directing patients to facilities with optimal capabilities for a given type of illness or injury” (Committee on the Future of Emergency Care in the United States Health System 2007) is one of several hospital reform processes that target the organization of health systems. Regionalization directs patients to a risk-appropriate level of care and links facilities together. It is believed to improve health outcomes through two pathways: i) increasing service utilization at high-quality, high-volume facilities, and ii) improving coordination of care between facilities (Lorch, Myers, and Carr 2010). Regionalization is also implemented to improve cost efficiency and is often the result of economic challenges rather than aspirations for quality improvement of the system.

Though health system organization is identified as a core element of health systems in most frameworks (Roberts et al. 2008; Kruk et al. 2018), it is often overlooked as an explicit target for improvement, perhaps because of the complexity of addressing such an upstream driver of outcomes. Most literature on the regionalization (or centralization) of health services comes from high-income settings and focuses on expensive and complex services such as cancer care and surgery. The organizational reform processes described in the literature from low-and middle-income countries (LMICs) tend to focus on decentralization of services, and is often linked with the pursuit of Universal Health Coverage, and task shifting (Iverson et al. 2019).

Regionalization of childbirth services specifically is of growing interest in LMICs as a core element of Service Delivery Redesign (SDR) for maternal and newborn health (MNH), a health system quality improvement strategy recommended by the Lancet Global Health Commission on High Quality Health Systems (Kruk et al. 2018). The core hypothesis of SDR for MNH is that because childbirth complications are unpredictable and require rapid expert care, equitably increasing access to high-quality comprehensive emergency obstetric and newborn care (CEmONC) (usually delivered in hospitals), regardless of prenatal risk, will improve population birth outcomes (Roder-DeWan et al. 2020). SDR goes on to match centralization processes with access interventions for marginalized communities, community engagement to raise demand for right-based care, policy changes, and microlevel quality improvement at all levels of care.

Given the conceptual overlap between these reform processes, what lessons can be drawn from the experience of higher-income countries that have used regionalization of service delivery to apply to LMIC settings that are planning SDR reforms? This analysis will draw primarily from experience in the United States, where regionalized perinatal care has a long history of policy support, implementation, and evaluation.

Does regionalization of service delivery improve health outcomes?

The health impact of regionalization has been measured at the population level as well as at the facility level. Regionalized trauma systems, especially, have a mature evidence base that has led to widespread adoption and implementation of such systems in most high-income countries. For patients with severe trauma, regionalized systems have been associated with improved survival rates in adults by 15-20 percent, and improvements in intermediate outcomes such as reduced delays in receiving inpatient treatment (Mullins and Mann 1999; Shackford, Hollingworth-Fridlund, and Eastman 1986). In a classic nationwide study in the United States tracking outcomes among motor vehicle accident patients, regionalized care alone reduced death by 8 percent (Nathens et al. 2000). The evidence for regionalized trauma systems for injured pediatric patients is similarly robust, showing significant declines in mortality (Hulka et al. 1997; Lorch, Myers, and Carr 2010). In their review of emergency care in the US health system, the National Academies of Sciences, Engineering, and Medicine say that “Because not all hospitals within a community have the personnel and resources to support the delivery of high-level emergency care, critically ill and injured patients should be directed specifically to facilities that have such capabilities” (Committee on the Future of Emergency Care in the United States Health System 2007).

The evidence for regionalization of perinatal care is also positive, though more limited, due to methodological challenges. Canada began regionalizing perinatal care in the 1960s, with other high-income countries not far behind (Yu and Dunn 2004). Early studies from California showed that premature babies born in higher-volume specialty hospitals were more likely to survive than peers born in facilities with lower-level neonatal intensive care units (NICU) (Phibbs et al. 1996). Similar results have been replicated across high-income settings, but the study of regionalization as a reform process intended to improve perinatal outcomes at the population level is more challenging. A systematic review of perinatal regionalization included only eight studies from the US, Canada, and France, all demonstrating, to varying degrees and with varying levels of risk-of-bias, improvements in outcomes for neonates; correlation, but not causality, could be established through the review (Rashidian et al. 2014).

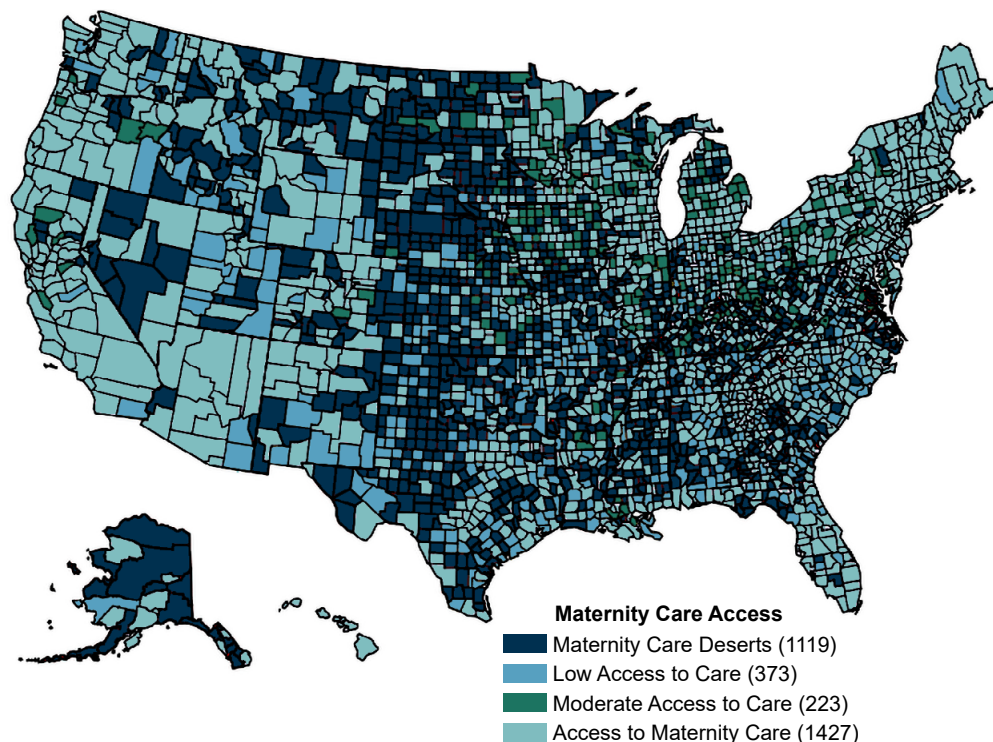
Despite the challenges of studying perinatal regionalization, most high-income countries have adopted a regionalized approach to providing perinatal services. In the US, the American Academy of Pediatrics describes levels of neonatal care with standards for service delivery by level and by illness type (Fetus and Newborn 2004; FETUS et al. 2012). Their policy statement on levels of neonatal care concludes that “facilities that provide hospital care for newborn infants should be classified on the basis of functional capabilities, and these facilities should be organized within a regionalized system of perinatal care” (Fetus and Newborn 2004). The American College of Obstetricians and Gynecologists, and the Society for Maternal Fetal Medicine have published a similar consensus statement: “To standardize a complete and integrated regionalized system of perinatal care and risk-appropriate maternal care, the American College of Obstetricians and Gynecologists and the Society for Maternal-Fetal Medicine recommend a classification system for levels of maternal care as defined in the appendix. Each higher level of care includes and builds on the capabilities of the lower levels.” Their table outlines four levels of care, starting with accredited birth centers. The next three levels of care are hospital-based services with increasing surgical and specialty capabilities” (‘Levels of Maternal Care: Obstetric Care Consensus No. 9 Summary’ 2019).

Regionalization of care through obstetric unit closings in the United States

Over the last three decades, the US has experienced the gradual but persistent closing of birthing units in rural areas and critical access hospitals.¹ This is occurring against the backdrop of worsening maternal health outcomes and substantial racial disparities. The maternal mortality rate in the US was 33/100,000 live births in 2021, which is 16 points higher than it was in 2018; the rate for Black women in the US is 2.6 times higher than for non-Hispanic white women, at 70/100,000. Nearly half of these deaths occur within one week of birth; over half occur between one week and one year after birth. The US now has the highest maternal mortality rate among high-income peers (Hoyert 2023.).

The trend in obstetric unit closings amounts to a nationwide perinatal regionalization process that some have likened to a natural experiment in SDR for MNH. Over 400 counties in the United States have closed their hospital-based obstetric units in the past three decades, and more than half of counties, mostly rural, have no hospital obstetric services (Fischer, Royer, and White June 2022; Hung et al. 2017). Obstetric unit closings in the United States have led to a documented increase in **maternity care deserts**, defined as areas without maternity care resources, birth centers offering obstetric care, or obstetric providers (Brigance et al. 2022). Women in maternity care deserts are at increased geographic risk of having a poor birth outcome. Rural populations in the US have a 9 percent increased chance of maternal and newborn morbidity or mortality compared to those living in urban areas (Kozhimannil et al. 2019). More than 18 million women of reproductive age live in rural America; nearly six million rural women in the US now live in maternity care deserts (see Figure 7.1) (Hung et al. 2017). Though the US is not alone as a high-income country that is selectively reducing hospital services for birthing people in poor rural areas - the UK, Canada, France, and several Scandinavian countries have also closed obstetric units in small rural hospitals - the increasing maternal mortality rate in the US begs a closer look at this hospital reform process.

Figure 7.1: Maternity Care Deserts, 2020



Source: U.S. Health Resources and Services Administration (HRSA), Area Health Resources Files, 2021. Reproduced from: Nowhere to Go: Maternity Care Deserts Across the US (Report No. 3). (Brigance, et al. (2022). March of Dimes. <https://www.marchofdimes.org/research/maternity-care-deserts-report.aspx>

1 Critical Access Hospital is a US designation for facilities that meet the following criteria: 25 or fewer acute care inpatient beds; located more than 35 miles from another hospital; maintain an annual average length of stay of 96 hours or less for acute care patients; 24/7 emergency care services (<https://www.ruralhealthinfo.org/topics/critical-access-hospitals>)

Unlike SDR reforms, the gradual regionalization of birth services in rural America is largely driven by financial challenges. These challenges are caused by low birth volumes, as well as an unfavorable payer mix in rural areas. In a comparison of rural hospitals that were able to maintain their birthing units and those that were not, the former had nearly four times the number of births as the latter (Hung et al. 2016). In this same study, maintaining volumes over 100 births each year was associated with 90 percent lower odds of a unit closure (AORs = 0.10, 95 percent CI = [0.02, 0.43]; $p < .001$). Low birth volumes make it difficult to adequately equip, staff, or maintain childbirth units.

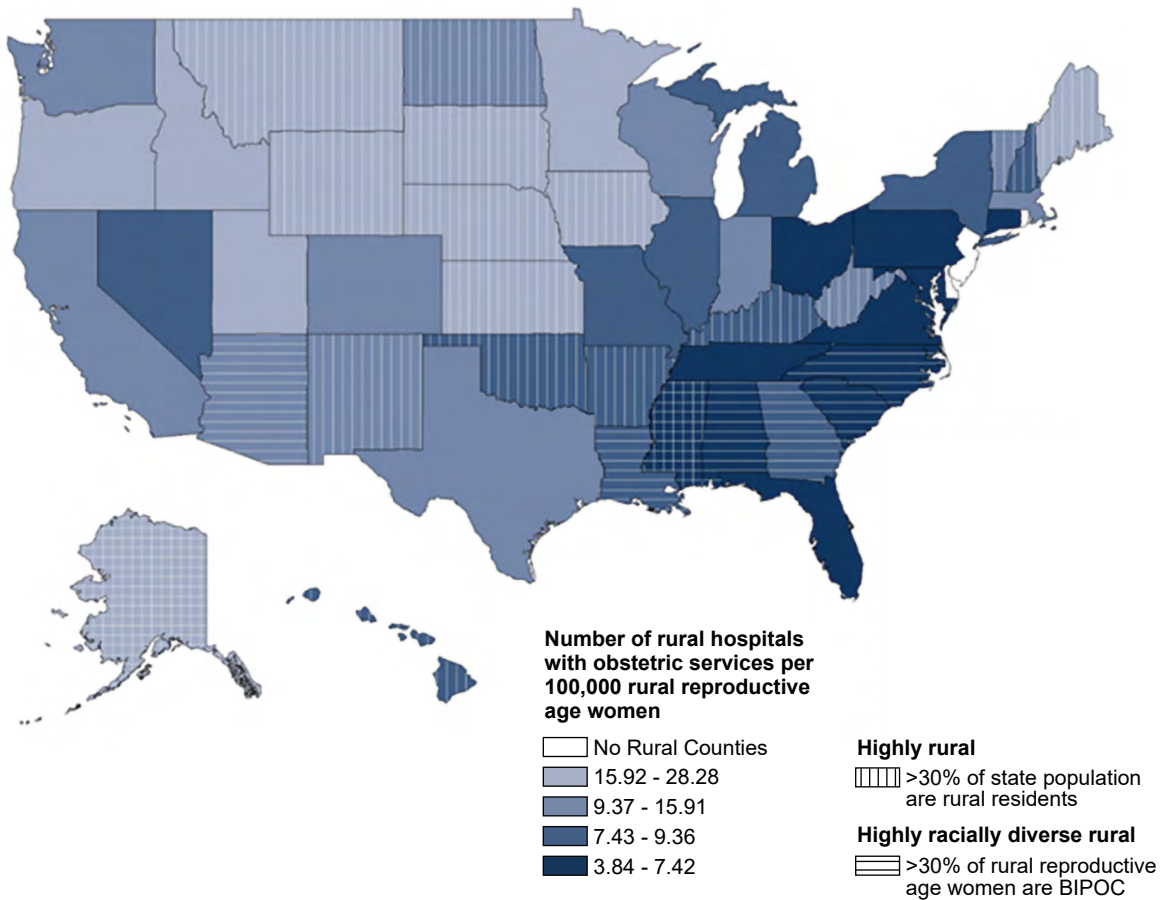
Though the US does not have universal health coverage, it does consider maternal and newborn health care an essential health benefit, and requires all insurance plans to cover these services. Medicaid and the Children's Health Insurance Program (CHIP) are federal government insurance programs for low-income pregnant/postpartum women, and children. However, the states have significant control over their implementation. For example, income eligibility criteria vary widely from state to state, with some states offering coverage up to 380 percent of the national poverty line, and others limiting access to those below 138 percent of the line (Foundation" 2023). In many states, Medicaid also only provides coverage for 60 days post-partum, despite the increasing proportion of deaths occurring in the late post-partum period. Reimbursement rates for Medicaid beneficiaries are significantly lower than for privately insured patients, and Medicaid reimbursement rates are also less likely to increase with the rising cost of health care than private insurer rates. This combination makes financial sustainability more challenging for hospitals that serve a high proportion of patients with Medicaid insurance, or those who are self-pay. Not surprisingly, states with more restrictive Medicaid income eligibility are significantly more likely to close their obstetric units (Hung et al. 2017). Rural births are more likely to be covered by Medicaid than US births overall (50 vs. 43 percent) ("Availability of Hospital-Based Obstetric Care in Rural Areas" 2022).

In addition to financial constraints, rural obstetric units experience the brunt of national workforce shortages. The US had a shortage of almost 9,000 obstetric providers in 2020; this number is expected to rise to 22,000 by 2050. At the county level, 50 percent do not have an obstetric provider, and 56 percent do not have access to a nurse/midwife. Counties without family physicians, who often provide obstetric and newborn services to the most rural and vulnerable populations, were more likely to lack hospitals with obstetric services (Hung et al. 2017).

Low volumes also challenge the ability of obstetric and newborn providers to maintain their skills and deliver quality care. In a retrospective study of vital statistics records in the US, severe maternal morbidity (SMM) was more than double for low-risk people giving birth in low-volume rural facilities than low-risk people giving birth in high-volume rural facilities (Kozhimannil et al. 2023). Similarly, across five LMICs, low-volume, nonhospital facilities with fewer than 500 births per year consistently scored worse on measures of quality obstetric care (Kruk et al. 2016). A vicious cycle ensues: low volumes make the delivery of quality services challenging, which then leads those families who can do so to seek care at larger, more reputable facilities, which further decreases volumes.

Given these supply-side drivers, obstetric unit closings disproportionately impact vulnerable communities, with a high share of low-income families and Medicaid/CHIP recipients (Hung et al. 2017). The lower the median family income, and the more rural the community, the more likely it is to lack hospital obstetric services. US racial history complicates matters further; in an adjusted analysis, counties with a higher proportion of non-Hispanic Black residents had higher odds of lacking obstetric services (Hung et al. 2017). The American South, which has the highest maternal and newborn mortality rates in the country and the longest and most brutal history of structural and interpersonal racism, also has the lowest density of hospital obstetric services (see Figure 7.2) (Interrante JD 2021).

Figure 7.2: Access to Hospital-Based Obstetric Services for Rural Residents, Focusing on Highly Rural and Racially Diverse States, 2018



Reproduced from: State and Regional Differences in Access to Hospital-Based Obstetric Services for Rural Residents, 2018. Interrante et al. UMN Rural Health Research Center Policy Brief. August 2021

The literature on the impact of this gradual centralization of childbirth services through the selective closing of rural obstetric units is mixed. A systematic review of obstetric unit closings in high-income settings identified a possible increase in babies born before arriving in facilities but was unable to show that these closings were associated with worse outcomes for mothers or babies. (No US studies were included in this review) (Malouf et al. 2020). A difference-in-difference analysis of rural obstetric unit closings in the US found an increase in scheduled inductions (1.7 percentage-point increase) and a decreased risk of cesarean section (1.1 percentage points), but no worsening of maternal and newborn outcomes (Fischer, Royer, and White 2022). Several indicators of maternal morbidity (including transfusion and perineal lacerations) improved slightly. The study concludes that closings may improve birth outcomes because births shift from lower-quality rural facilities to higher-quality centralized facilities. Similar results were published concurrently in another working paper from the economics literature, showing a decrease in cesarean sections among low-risk women. The author suggests that the decrease is driven by differences in provider practice; specifically, a shift to higher-quality facilities with evidence-based restrictions on indication-for-cesarean. No other negative impacts on maternal or neonatal health were detected (Battaglia 2023).

Studies that disaggregate by degree of rurality do find some impact on birth outcomes. A 2018 study of rural births in the US between 2004 and 2014 (n= 4,941,387) showed that rural counties not adjacent to an urban area that lost hospital obstetric services experienced a statistically significant increase in out-of-hospital birth (0.70 percentage points [95% CI, 0.30 to 1.10]) and preterm birth ((0.67 percentage points [95% CI, 0.02 to 1.33]) (Kozhimannil et al. 2018). A 2023 study, in contrast, found that outcomes improved for the most rural populations, but worsened in “moderately” rural communities². The most rural families appear to be seeking care outside of their counties, while those in between may be shifting to alternative rural facilities within their county of residence (Durrance, Guldi, and Schulkind).

Research to date does not fully address the differential impact that these closings might have on vulnerable or disenfranchised populations, or the indirect costs (and subsequent compromises) that families make when a local hospital closes its obstetric unit. The public narrative, in contrast, clearly captures the impact that these closings, which often happen with very short notice, have on communities. The New York Times, for example, has covered the issue multiple times in articles such as, “It’s 4 A.M. The Baby’s Coming. But the Hospital is 100 Miles Away” (2018) which describes the stress of needing to travel during labor, or “Rural Hospitals are Shuttering Their Maternity Units” (2023), which highlights the strength of small local facilities in providing culturally appropriate care.

Conclusions

Intentional regionalization programs designed to improve quality and outcomes have a strong evidence-base, and decades of implementation experience in high-income settings. The health impact of regionalization driven by financial pressures, as in the case of rural obstetric unit closings in the US, is less clear. Though the media coverage of the gradual regionalization of perinatal services through the closing of rural obstetric units has been uniformly negative, the causal evidence to show that closings lead to worse birth outcomes is lacking. In fact, it appears that obstetric unit closings may lead to “trading up,” where births occur in higher-quality, higher-volume facilities in more centralized locations. **There are, however, serious equity risks with the latter as the burden of closings falls on the most rural and most impoverished communities.**

The literature on regionalization shows that facilities that are part of a regionalized system should have the capacity to communicate and should share protocols for risk-appropriate care so that both underlying regionalization mechanisms (that is, increased use of higher-quality facilities and coordination of care) remain at play. This lesson is consistent with a growing body of evidence on the importance of networks of care in LMICs (Kalaris et al. 2022; Agyekum et al. 2023). The impact of regionalization programs on health outcomes may take decades to realize, making the measurement of interim milestones critical for course-correction, and to maintain momentum. These interim measures may include the use of risk-appropriate facilities, measures of human resource efficiency, unplanned home births, births en route, and patient-reported quality. Given the risks of regionalization for marginalized populations, programs should center the needs and challenges of the most vulnerable populations, and monitor balancing indicators of equity throughout program implementation.

These findings should be interpreted with caution, especially if applied to low-income settings; no studies were identified that described the opportunity cost, indirect cost, or socioemotional stress of needing to travel farther for childbirth services. In low-income settings the marginal costs of traveling farther may be impoverishing, or even insurmountable for families; they should be carefully measured, monitored, and managed. Programs that seek to regionalize perinatal care in such settings will need to incorporate access programs such as travel vouchers or maternity waiting homes, and should avoid payment structures that differentially reimburse facilities caring for the poor. **An intentional regionalization program, in contrast to the less intentional experience of the US vis-à-vis obstetric unit closings, can build equity considerations into the planning process and reduce the risk of disproportionately burdening society’s most vulnerable subgroups.**

Prospective planning of regionalized perinatal systems will also allow systems to prepare clinical recommendations with access and geography in mind. For example, guidance on when pregnant women should travel in relation to the signs and symptoms of labor can vary based on their proximity to childbirth facilities, and thus prevent unintentional out-of-facility births or births in poorly prepared facilities. Or, in a planned system, critical access facilities designed primarily for emergent childbirth cases can receive appropriate skills-maintenance training and referral pathways.

2 Low birthweight increased by 10.4 percent (p<0.01) in these moderately rural counties.

Finally, regionalized perinatal systems will need to maximize the appropriate scope of all obstetric and newborn care providers. Midwives need to function independently when caring for low-risk mother/baby pairs, with appropriate and timely back-up in case of complications. Likewise, family physicians with obstetric training can manage the vast majority of childbirth complications and can be mobilized to care for most cases at the secondary hospital level. Perinatal regionalization that depends on obstetricians and pediatricians alone are likely to face shortages, leaving more remote facilities understaffed.

Regionalization is a macrolevel hospital reform lever that should not be overlooked in national efforts to improve the quality and efficiency of maternal and newborn health care. Intentionally building regionalization into reform programs will allow planners to mitigate potential risks, especially risks to vulnerable populations, and plan for geographically sensitive interventions. Experience in high-income settings such as the US, can be cautiously applied to low- and middle-income settings, especially if programs are well monitored and able to adapt as they are implemented.

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References

- Agyekum, E. O., K. Kalaris, B. Maliqi, A. C. Moran, A. Ayim, and S. Roder-DeWan. 2023. 'Networks of care to strengthen primary healthcare in resource constrained settings', *BMJ*, 380: e071833.
- "Availability of Hospital-Based Obstetric Care in Rural Areas." In. 2022. *Report to Congressional Committees*. United States Government Accountability Office.
- Battaglia, Emily. 2023. 'The Effect of Hospital Maternity Ward Closures on Maternal and Infant Health', *Working paper*.
- Brigance, C., Lucas R., E. Jones, A. Davis, M. Oinuma, K. Mishkin, and Z. Henderson. 2022. "Nowhere to Go: Maternity Care Deserts Across the U.S. (Report No. 3)." In, edited by March of Dimes.
- Committee on the Future of Emergency Care in the United States Health System, Board on Health Care Services. 2007. "Emergency Medical Services at the Crossroads." In, edited by National Academies Press. Washington, DC: Institute of Medicine.
- Durrance, Christine, Melanie Guldi, and Lisa Schulkind. 'The effect of rural hospital closures on maternal and infant health', *Health services research*, n/a.
- Fetus, Committee on, and Newborn. 2004. 'Levels of Neonatal Care', *Pediatrics*, 114: 1341-47.
- FETUS, COMMITTEE ON, NEWBORN, Wanda Denise Barfield, Lu-Ann Papile, Jill E. Baley, William Benitz, James Cummings, Waldemar A. Carlo, Praveen Kumar, Richard A. Polin, Rosemarie C. Tan, Kasper S. Wang, and Kristi L. Watterberg. 2012. 'Levels of Neonatal Care', *Pediatrics*, 130: 587-97.
- Fischer, SJ, H Royer, and CD White. June 2022. 'Health Care Centralization: The Health Impacts of Obstetric Unit Closures in the US.', *National Bureau of Economic Research (NBER) Working paper Series*.
- Fischer, Stefanie J., Heather Royer, and Corey D. White. 2022. "Health Care Centralization: The Health Impacts of Obstetric Unit Closures in the US." In *NBER Working Paper No. 30141*.
- Foundation", "Kaiser Family. 2023. 'Medicaid and CHIP Income Eligibility Limits for Pregnant Women as a Percent of the Federal Poverty Level'. <https://www.kff.org/health-reform/state-indicator/medicaid-and-chip-income-eligibility-limits-for-pregnant-women-as-a-percent-of-the-federal-poverty-level/?currentTimeframe=0&sortModel=%7B%22colId%22:%22Location%22,%22sort%22:%22asc%22%7D>.
- Hoyert, DL. 2023. 'Maternal mortality rates in the United States, 2021', *CHS Health E-Stats*.
- Hulka, F., R. J. Mullins, N. C. Mann, J. R. Hedges, D. Rowland, W. H. Worrall, R. D. Sandoval, A. Zechnich, and D. D. Trunkey. 1997. 'Influence of a statewide trauma system on pediatric hospitalization and outcome', *J Trauma*, 42: 514-9.
- Hung, Peiyin, Carrie E. Henning-Smith, Michelle M. Casey, and Katy B. Kozhimannil. 2017. 'Access to obstetric services in rural counties still declining, with 9 percent losing services, 2004-14', *Health Affairs*, 36: 1663-71.
- Hung, Peiyin, Katy B. Kozhimannil, Michelle M. Casey, and Ira S. Moscovice. 2016. 'Why Are Obstetric Units in Rural Hospitals Closing Their Doors?', *Health services research*, 51: 1546-60.
- Interrante JD, Tuttle MS, Basile Ibrahim B, Admon LK, and Kozhimannil KB. 2021. "State and Regional Differences in Access to Hospital-Based Obstetric Services for Rural Residents, 2018." In *UMN Rural Health Research Center Policy Brief*.
- Iverson, K. R., E. Svensson, K. Sonderman, E. J. Barthélemy, I. Citron, K. A. Vaughan, B. L. Powell, J. G. Meara, and M. G. Shrimme. 2019. 'Decentralization and Regionalization of Surgical Care: A Review of Evidence for the Optimal Distribution of Surgical Services in Low- and Middle-Income Countries', *Int J Health Policy Manag*, 8: 521-37.
- Kalaris, K., E. Radovich, A. E. Carmone, J. M. Smith, A. Hyre, M. L. Baye, C. Vougmo, A. Banerjee, J. Liljestrand, and A. C. Moran. 2022. 'Networks of Care: An Approach to Improving Maternal and Newborn Health', *Glob Health Sci Pract*, 10.
- Kozhimannil, Katy B., Peiyin Hung, Carrie Henning-Smith, Michelle M. Casey, and Shailendra Prasad. 2018. 'Association Between Loss of Hospital-Based Obstetric Services and Birth Outcomes in Rural Counties in the United States', *Jama*, 319: 1239-47.
- Kozhimannil, Katy Backes, Julia D. Interrante, Carrie Henning-Smith, and Lindsay K. Admon. 2019. 'Rural-Urban Differences In Severe Maternal Morbidity And Mortality In The US, 2007-15', *Health Affairs*, 38: 2077-85.
-

- Kozhimannil, Katy Backes, Stephanie A. Leonard, Sara C. Handley, Molly Passarella, Elliott K. Main, Scott A. Lorch, and Ciaran S. Phipps. 2023. 'Obstetric Volume and Severe Maternal Morbidity Among Low-Risk and Higher-Risk Patients Giving Birth at Rural and Urban US Hospitals', *JAMA Health Forum*, 4: e232110-e10.
- Kruk, M. E., H. H. Leslie, S. Verguet, G. M. Mbaruku, R. M. K. Adanu, and A. Langer. 2016. 'Quality of basic maternal care functions in health facilities of five African countries: an analysis of national health system surveys', *Lancet Glob Health*, 4: e845-e55.
- Kruk, Margaret E., Anna D. Gage, Catherine Arsenault, Keely Jordan, Hannah H. Leslie, Sanam Roder-DeWan, Olusoji Adeyi, Pierre Barker, Bernadette Daelmans, Svetlana V. Doubova, Mike English, Ezequiel García-Elorrio, Frederico Guanais, Oye Gureje, Lisa R. Hirschhorn, Lixin Jiang, Edward Kelley, Ephrem Tekle Lemango, Jerker Liljestrand, Address Malata, Tanya Marchant, Malebona Precious Matsoso, John G. Meara, Manoj Mohanan, Youssoupha Ndiaye, Ole F. Norheim, K. Srinath Reddy, Alexander K. Rowe, Joshua A. Salomon, Gagan Thapa, Nana A. Y. Twum-Danso, and Muhammad Pate. 2018. 'High-quality health systems in the Sustainable Development Goals era: time for a revolution', *The Lancet Global Health*, 6: e1196-e252.
- 'Levels of Maternal Care: Obstetric Care Consensus No. 9 Summary'. 2019. *Obstetrics and gynecology*, 134: 428-34.
- Lorch, S. A., S. Myers, and B. Carr. 2010. 'The regionalization of pediatric health care', *Pediatrics*, 126: 1182-90.
- Malouf, R. S., C. Tomlinson, J. Henderson, C. Opondo, P. Brocklehurst, F. Alderdice, A. Phalguni, and J. Dretzke. 2020. 'Impact of obstetric unit closures, travel time and distance to obstetric services on maternal and neonatal outcomes in high-income countries: a systematic review', *BMJ Open*, 10: e036852.
- Mullins, Richard J., and N. Clay Mann. 1999. 'Population-Based Research Assessing the Effectiveness of Trauma Systems', *Journal of Trauma and Acute Care Surgery*, 47.
- Nathens, Avery B., Gregory J. Jurkovich, Peter Cummings, Frederick P. Rivara, and Ronald V. Maier. 2000. 'The Effect of Organized Systems of Trauma Care on Motor Vehicle Crash Mortality', *Jama*, 283: 1990-94.
- Phibbs, C. S., J. M. Bronstein, E. Buxton, and R. H. Phibbs. 1996. 'The effects of patient volume and level of care at the hospital of birth on neonatal mortality', *Jama*, 276: 1054-9.
- Rashidian, A., A. H. Omidvari, Y. Vali, S. Mortaz, R. Yousefi-Nooraie, M. Jafari, and Z. A. Bhutta. 2014. 'The effectiveness of regionalization of perinatal care services - a systematic review', *Public health (London)*, 128: 872-85.
- Roberts, M, W Hsiao, P Berman, and M Reich. 2008. *Getting Health Reform Right: A Guide to Improving Performanc and Equity* (Oxford University Press).
- Roder-DeWan, Sanam, Kojo Nimako, Nana A. Y. Twum-Danso, Archana Amatya, Ana Langer, and Margaret Kruk. 2020. 'Health system redesign for maternal and newborn survival: rethinking care models to close the global equity gap', *BMJ Global Health*, 5: e002539.
- Shackford, S. R., P. Hollingworth-Fridlund, and A. B. Eastman. 1986. 'The Effect of Regionalization upon the Quality of Trauma Care as Assessed by Concurrent Audit before and after Institution of a Trauma System: A Preliminary Report', *Journal of Trauma and Acute Care Surgery*, 26.
- Yu, Victor Y. H., and Peter M. Dunn. 2004. 'Development of regionalized perinatal care', *Seminars in Neonatology*, 9: 89-97.
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Appendix: Levels of Maternal and Neonatal Care: Definitions, Capabilities, and Health Care Providers

Level		Definition	Capabilities	Health Care Provider
	Accredited Birth Center	Care for low-risk women with uncomplicated singleton term vertex pregnancies who are expected to have an uncomplicated birth.	Refer to birthcenters.org for American Association of Birth Centers' Standards for Birth Centers.	
I	Basic Obstetric	Care of low- to moderate-risk pregnancies with ability to detect, stabilize, and initiate management of unanticipated maternal–fetal or neonatal problems that occur during the antepartum, intrapartum, or postpartum period until the patient can be transferred to a facility at which specialty maternal care is available.	<ul style="list-style-type: none"> • Ability to begin emergency cesarean delivery within an appropriate time interval, having limited obstetric ultrasonography with interpretation and support services such as lab testing and blood bank readily available at all times. • Stabilization and the ability to facilitate transport to a higher-level hospital when necessary. • Ability, in collaboration to initiate and sustain education and quality improvement programs to maximize patient safety. 	Every birth attended by: At least one qualified birthing professional (midwife, family physician, or ob- gyn) and an appropriately trained and qualified RN; physician with privileges to perform emergency cesarean delivery; primary maternal care providers, including midwives, family physicians, or ob-gyns and anesthesia providers readily available at all times.
	Well newborn nursery	Provide a basic level of care to neonates who are at low risk	<ul style="list-style-type: none"> • Ability to provide neonatal resuscitation at every delivery. • Evaluate, stabilize and provide care for infants born 35–37 wk gestation who remain physiologically stable. • Stabilize newborn infants who are ill and those born at <35 wk gestation until transfer to a higher level of care. 	Pediatricians, family physicians, nurse practitioners, and other advanced practice registered nurses.

Level		Definition	Capabilities	Health Care Provider
II	Specialty Obstetric	Level I facility plus care of appropriate moderate- to high-risk antepartum, intrapartum, or postpartum conditions.	<ul style="list-style-type: none"> Standard obstetric ultrasound imaging, computed tomography scan, magnetic resonance imaging, non-obstetric ultrasound imaging, and maternal echocardiography with interpretation readily available. 	<p>Level I facility health care providers plus:</p> <p>Ob-gyn; physician obstetric leadership; an MFM; anesthesiologist; internal or family medicine physicians and general surgeons readily available at all times for obstetric patients.</p>
	Special care nursery	Care in a specialty-level facility should be reserved for stable or moderately ill newborn infants who are born at ≥ 32 weeks' gestation or who weigh ≥ 1500 at birth with problems that are expected to resolve rapidly and who would not be anticipated to need subspecialty-level services on an urgent basis.	<p>Level I capabilities plus:</p> <ul style="list-style-type: none"> Provide care for infants convalescing after intensive care. Provide mechanical ventilation for brief duration (< 24 h) or continuous positive airway pressure or both. Stabilize infants born before 32 wk gestation and weighing less than 1500 g until transfer to a neonatal intensive care facility. 	<p>Level I health care providers plus: Pediatric hospitalists, neonatologist, and neonatal nurse practitioners.</p>
III	Subspecialty	Level II facility plus care of more complex maternal medical conditions, obstetric complications, and fetal conditions.	<p>Level II capabilities plus:</p> <ul style="list-style-type: none"> Specialized obstetric ultrasound and fetal assessment, basic interventional radiology available at all times. On-site medical and surgical ICUs with adult critical care providers and an MFM present at all times. 	<p>Level II health care providers plus:</p> <p>Nursing leaders and adequate number of appropriately trained and experienced RNs; board-certified ob-gyn and anesthesiologist physically present at all times; an MFM and full complement of subspecialists for inpatient consultation at all times.</p>
	Neonatal intensive care (NICU)	Infants who are born at < 32 weeks' gestation, weigh < 1500 g at birth, or have medical or surgical conditions, regardless of gestational age, should be cared for at a level III facility.	<p>Level II capabilities plus:</p> <ul style="list-style-type: none"> Provide sustained life support. Provide prompt access to a full range of pediatric medical subspecialists. Provide full range of respiratory support. Perform advanced imaging. 	<p>Level II health care providers plus:</p> <p>Pediatric medical subspecialists; pediatric anesthesiologists; pediatric surgeons and pediatric ophthalmologists.</p>

Level		Definition	Capabilities	Health Care Provider
IV	Regional Perinatal	Level III facility plus on-site medical and surgical care of the most complex maternal conditions and critically ill pregnant women and fetuses throughout antepartum, intrapartum, and postpartum care	Level III capabilities plus: <ul style="list-style-type: none"> On-site ICU care for obstetric patients with primary or co-management by maternal-fetal medicine team. Perinatal system leadership. 	Level III health care providers plus: <p>Medical-fetal medicine team; Nursing Service Line leadership; board-certified anesthesiologist with obstetric anesthesia fellowship training/ experience physically present at all times; at least of the subspecialties: neurosurgery, cardiac surgery, or transplant readily available at all times for consultation.</p>
	Regional NICU	Care of the most complex and critically ill newborn infants and should have pediatric medical and pediatric surgical specialty consultants continuously available 24 hours a day.	Level III capabilities plus: <ul style="list-style-type: none"> Located within an institution with the capability to provide surgical repair of complex congenital or acquired conditions. Maintain a full range of pediatric medical and surgical subspecialists, and pediatric anesthesiologists. 	Level III health care providers plus: <p>Pediatric surgical subspecialists.</p>

Based on AAP 2012 and ACOG 2019. Levels of obstetric and newborn care do not always align in the same facility.

CHAPTER 8:

HOSPITAL REFORM: LISTENING TO PATIENT AND STAFF EXPERIENCE, AND ENGAGING THE BROADER PUBLIC

Dorothy Oluoch, Sassy Molyneux, Nancy Kagwanja, Lisa Hinton

Key Messages

- Patient experience and broader public engagement are crucial components of quality health care, and vital to understanding and improving health systems.
- Understanding what it is really like for patients to experience ill health, and the quality of their encounters with health care services, can help identify what is working well, inform the design or modification of services, and inspire improvements along the care pathway to achieving high-quality care.
- There is a broad range of approaches to collecting patient and staff experiences, ranging from surveys to in-depth interviews and observational studies. Each should be rigorously collected and analyzed, and they all offer both strengths and weaknesses.
- Patient experiences can, and do, provide opportunities for generating powerful and actionable insights to inform hospital reform and improvement.

Introduction

Hospitals are crucial components of the health service delivery system, providing specialist and, in many settings, primary-level care. They account for a substantial proportion of a country's health care expenditure and skilled medical workforce; yet they are facing tremendous challenges in a rapidly changing environment.

The World Bank's involvement in hospital reform often targets improving hospital performance and efficiency, focusing on areas such as governance, financing, and relationships with other providers, and igniting demand or system developments such as telemedicine (Nimako et al. 2021; English et al. 2023). However, recent analyses of the components of high-quality care encourage a broader conceptualization. In 2018, the Lancet Global Health Commission on High Quality Health Systems argued that the foundations of high-quality health systems should include the "population and their health needs and expectations, governance of the health sector and partnerships across sectors, platforms for care delivery, workforce numbers and skills, and tools and resources, from medicines to data" (Kruk et al. 2017). The commission called for new research to tackle what it described as "vast blind spots" in areas that include user experience, but did not offer guidance in how to achieve this goal.

Reviews suggest that, along with safety and clinical effectiveness, patient experience and broader public engagement are crucial components of quality care, and are vital to understanding and improving health systems. In this chapter we will outline:

- An introduction to the zeitgeist for patient experiences and how they might be used;
 - Current evidence for the impact of patient experience-based improvements on key hospital outcomes (for example, clinical safety, medication errors, adverse events, and staff retention);
 - The different ways they can be collected, and the strengths and weaknesses of various approaches;
 - Some examples of how insights into patient and staff experiences can be used to improve care;
 - The potential to complement patient experience inputs with broader public/community engagement efforts.
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How can patient experience be used to improve health services?

A focus on the patient's experience is now recognized as integral to high-quality care (Doyle, Lennox, and Bell 2013). In 2001 the Institute of Medicine reported the work of the Committee on the Quality of Health Care in the United States (US), and described a set of core components of high-quality care that still resonate across the world today (Institute of Medicine (US) Committee on Quality of Health Care in America 2001; Hinton et al. 2024). These included, along with safety, efficiency, and effectiveness, a focus on patient-centered care - care that is respectful of and responsive to individual patient preferences, needs, and values, and that ensures that patient values guide all clinical decisions. In 2018, independent reports from the US, the World Bank, and the Lancet Global Health Commission again linked quality of care to patient-centeredness (Kruk et al. 2017; National Academies of Sciences 2018; World Health Organization 2018). But as Larsson et al. have argued, how this is measured and evaluated is challenged by a lack of clarity and precision about the terms used, and the frequent blurring of two broad approaches; patient satisfaction and patient experience.

Collecting and analyzing patient experiences allows access to the perspectives of the human actors within health systems – both those who are using the system, and those who are providing care. By understanding what it is really like for patients to experience ill health, and the nature of their encounters with health care services, health systems can identify what is working well; design or modify services to meet patient needs and preferences; and create improvements along the care pathway to achieve high-quality care (Oluoch et al. 2023; Ziebland et al. 2013). **Patient satisfaction** is a measure of patients' experiences of care, health outcomes, and/or confidence in health services (Larson et al. 2019; Dunsch et al. 2018). High-income countries (HICs) and lower and middle-income countries (LMICs) such as Kenya and South Africa routinely use national surveys to capture feedback about patients' experiences of care. The Kenya Health Service Delivery Indicator survey includes reports of patient satisfaction (IBRD and Government of Kenya 2019), and in South Africa patient satisfaction surveys are conducted annually across the county's health facilities (Gatti et al. 2021; Sutherns and Olivier 2022). In this chapter, we explore the broad range of approaches to both capturing and understanding patient experience, and using the insights gained to improve care in hospitals.

Collecting patient experiences has become a significant concept in contemporary health care policy and administration, and it is now evoked in a wide range of settings. Duschinsky and Paddison provide the genealogy of a concept now significant in high-income health systems, such as in the United Kingdom (UK) and the US, where patient experiences can encompass patient voice; patient choice; patient expertise; patient perspectives; patient authority, and finally, patients as auditors (Duschinsky and Paddison 2018). They describe a trend of assessing patient experience, often through surveys, as a means of feedback, quality assurance, and tracking improvement (Locock, Graham et al. 2020; Locock, Montgomery et al. 2020). In the US, the UK, and Europe over the past twenty years patients have been able to report on aspects of their care experiences using standardized surveys (Schlesinger, Grob, and Shaller 2015), for example the national GP Patient Survey Programme in the UK (Campbell et al. 2009) and the European Quality of Life Survey (Fujisawa and Klazinga 2017). And in South Africa, guidelines for conducting patient experience surveys were published in 2017 (National Department of Health 2017).

Along with the proliferation of patient experience surveys, two other significant trends have emerged, accelerated by the development of the Internet and policy initiatives. First, users of health services, both patients and caregivers, are increasingly giving voice to their own experiences in narrative form across various platforms such as patient feedback sites (for example, Care Opinion) and social media (Grob et al. 2019; Mazanderani et al. 2021). Second, patients are now routinely included in research (PCORI in the US, NIHR in the UK) and codesign efforts designed to enhance the relevance and equity of health service design and delivery (Robert et al. 2022; Palmer et al. 2019).

Two decades after the Institute of Medicine vision, the 2018 Lancet Commission on High Quality Health Systems in the Sustainable Development Goals (SDG) era positioned positive user experiences as essential components of high-quality health systems, and called for more research on patient experiences to inform and drive quality improvement (Kruk et al. 2017; Institute of Medicine (US) Committee on Quality of Health Care in America 2001). In the UK, the landmark *Women's Health Strategy* for England, published in 2022, called for women's voices and priorities to be placed at the heart of research and health service delivery (Department of Health and Social Care 2022). And WHO, OECD, and the World Bank, in setting out a vision for quality in health systems to deliver universal health coverage, included a clear focus on people-centered care, and on engaging and empowering patients and families (World Health Organization 2018). Why this is so important, and how it might be achieved is discussed below.

Current evidence for the impact of patient experience-based improvements on key outcomes

Growing evidence suggests that patient-led organizations have better clinical safety (fewer medication errors, adverse events, and hospital-acquired infections); decreased mortality; improved staff experience, morale, and retention; lower operating costs; shorter lengths of stay; and fewer malpractice claims.

There is a significant shift in focus from “clinical” health-related outcomes only, to patients’ overall well-being (McMillan et al. 2013). As a result, many institutions across the world are working toward patient-centered care (PCC), as a core component of integrated care. The Institute of Medicine has defined PCC as “health care that establishes a partnership among practitioners, patients and their families (when appropriate) to ensure that decisions respect patients’ wants, needs and preferences and that patients have the education and support they need to make decisions and participate in their own care” (IOM 2001). Working toward patient-centeredness necessarily challenges traditional health system thinking and health care practice by placing the needs and perspective of the patient at the core of the innovation/service design process, and creating space for patient perspectives (McNichol 2012; Robert, Donetto, and Williams 2020; Bate and Robert 2008). A PCC model encourages active collaboration and shared decision-making between patients, families, caregivers, and providers. For the attainment of positive patient experiences, institutions need to adopt certain practices that align with the principles of PCC as outlined by the Picker Institute: respect for patients’ preferences; coordination and integration of care; information and education; physical comfort; emotional support; involvement of family and friends; continuity and transition; and access to care (Shaller 2007; Garrubba et al. 2015). To improve and strengthen health care systems, an understanding of patients’ perspectives is an essential element (Batalden 2018).

A systematic review by Doyle et al. explored evidence on the links between patient experience and clinical safety and effectiveness outcomes. They included 40 individual studies, and a negative association was reported in only one. The vast majority reported consistent positive associations between patient experience, patient safety, and clinical effectiveness for a wide range of disease areas, settings, outcome measures, and study designs. Their findings also demonstrated positive associations between patient experience, and self-rated and objectively measured health outcomes; adherence to recommended clinical practice and medication; preventive care (such as health-promoting behavior, the use of screening services, and immunization); and use of resources (such as hospitalization, length of stay, and primary-care visits). The review also noted positive associations between patient experience and measures of the technical quality of care and adverse events, as well as positive associations between patient experience and patient safety, and clinical effectiveness (Doyle, Lennox, and Bell 2013).

Positive associations were identified between the quality of patient-clinician communication and adherence to medication in 125 out of 127 studies analyzed in Zolnieriek et al.’s meta-analysis (Haskard Zolnieriek and Dimatteo 2009). Rathert and Boren’s review of outcomes and PCC reported that organizations that are more patient-centered have more positive outcomes, such as greater satisfaction with care, greater job satisfaction among health care professionals, increased quality and safety of care, and greater quality of life and well-being of patients (Rathert, Wyrwich, and Boren 2012). Included in their review was a study of discharged acute myocardial infarction patients that reported poorer long-term outcomes if the levels of PCC were low (Fremont et al. 2000). More recently, Kuipers, Cramm and Nieboer have found that patient-centered care and co-creation of care were associated positively with patient satisfaction, physical and social well-being, and could contribute to better outcomes (Kuipers, Cramm, and Nieboer 2019). For health care professionals, delivering PCC is also beneficial to their satisfaction with work and well-being (Kuipers, Nieboer, and Cramm 2021). In terms of measuring patient experience at scale to stimulate improvements, Jamieson Gilmore and colleagues conducted a narrative review of Patient Reported Experiences Measures (PREMS), large quantitative datasets derived from standardized surveys (discussed below), to understand the ways in which these are used in health system strategies (Jamieson Gilmore et al. 2023). They report that while PREMS data are used widely as performance information at all system levels (macro, meso and micro), there is as yet no substantive evidence of the impact of the actions they stimulate on patient experience or other system outcomes such as clinical safety or readmissions costs.

Strengths and weaknesses of various approaches to the collection of patient and staff experiences

Collecting, understanding, and—crucially—**mobilizing** patient experiences can be achieved through multiple routes (Coulter et al. 2014). There are a broad range of approaches to collecting patient and staff experiences, ranging from the satisfaction surveys discussed above, to in-depth interview or observation studies. Each of these offer some strengths and some weaknesses. While quantitative methods are more commonly used, qualitative methods can generate rich data to help us assess *what* a patient’s experience is currently like, design survey questions to measure *if* improvement activities make a difference; and understand *why* patient experience is poor, generating ideas for change. In other words, they can tell us not just what is wrong, but what “good” looks like, and what could be better (Liberati et al. 2019); they can challenge assumptions (some things matter less to patients than we think); and they can act as a powerful motivator for action and remind us of what we are trying to achieve (Ziebland et al. 2013, 2021). This section briefly outlines the major quantitative and qualitative approaches used, and offers some examples of when and how they have been used.

Patient Experience Surveys and Measures

Patient experience surveys are often confused with patient satisfaction surveys, but these two types of surveys are distinct from each other. Patient experience surveys provide information about more than just patient contentment (Ziebland et al. 2013a). They are highly structured and they are scalable, designed to support collecting large volumes of comparable quantitative data. They have become a central plank of health system management and improvement efforts, and are, in many settings, linked to hospital payments and clinician revalidation (Locock, Montgomery, et al. 2020; Schlesinger, Grob, and Shaller 2015; Powell et al. 2019; Figueroa et al. 2018). New and novel approaches seek to use these types of surveys to capture user perspectives on quality. For example the recently developed People’s Voice Survey measures health system quality in regard to health status, health system utilization patterns, ratings of care quality, and confidence and trust in the health system (Lewis et al. 2023). The key limitation with these surveys is that although they make assumptions about which characteristics of care are most important to patients in order to allow for objective evaluation, in so doing they leave little scope for unanticipated aspects or domains of experience to emerge.

Patient-reported outcome measures (PROMS) and patient-reported experience measures (PREMS) are patients’ self-reports of their health status, experience, and quality of life, and are now central to evaluating the provision of care. Patient-reported outcome measures (PROMS) are questionnaires that seek to measure patients’ views of their health status. Crucially, they are used both before and after an intervention, for example a surgical procedure, to assess outcomes related to that intervention (Ziebland et al. 2013b). Patient-reported experience measures (PREMS) are questionnaires that ask patients about their experiences while receiving care (Kingsley and Patel 2017). They are different from patient satisfaction surveys in that they allow patients to report subjectively on their experiences, capturing insights such as whether they felt listened to. These approaches are increasingly used to compare health providers, although this is not without its problems (Browne, Cano, and Smith 2017).

Ethnographic approaches to health experiences research

Ethnographic studies will typically deploy researchers in a health care setting (for example, a primary care facility or emergency department) for an extended period to immerse themselves in the field. Ethnographers watch what people do and collect observations that generate descriptive data on local culture, lived experience, and how health care work is enacted (Calabrese 2013). Participant observations are used to understand social interactions and community life from the inside. While these approaches are used to generate rich insights, they are time-intensive and tend to focus on a small sample of study sites; the observations can take hundreds of hours and analysis is lengthy. However, ethnographic approaches are well suited to studying hospitals, and have been deployed extensively in studies ranging from surgery and anaesthesia to maternity and neonatal units (Grove et al. 2022; A. Smith et al. 2003; Armstrong, Cupit, and Mackintosh 2018; D. Oluoch et al. 2023). More recently, rapid ethnographic approaches in health care research have been developed (Vindrola-Padros and Vindrola-Padros 2018).

Focus Groups

Focus groups, where small groups of participants are brought together to discuss a specific set of topics, are widely used in health services research in HIC and LMIC settings (Kitzinger 2007) . They are a collective activity, their main purpose being to explore an issue within a group discussion and bring together multiple perspectives. Typically focus groups have about 5-8 participants; they are used to gain understanding and knowledge of the key issues around a topic, based on participants' reported experiences, beliefs, and attitudes. They can often be used as a basis for questionnaire development, or evaluating research findings. They can be conducted face to face or online, as stand-alone studies or in combination with other qualitative methods. Examples of focus groups being used in hospital settings include understanding birthplace choices in the UK, remote assessments for Covid-19, and chronic illness management in Kenya (Lisa Hinton et al. 2018; Wieringa et al. 2023; Porter et al. 2009).

Interviews

Qualitative interviews are widely used in health service research. As with focus groups, they are based on talking to people, asking participants (patients, health care professionals, caregivers) a series of questions; interviewees are guided by the researcher to tell their stories or share their experience of health care (Lisa Hinton and Ryan 2019). Interview questions can range from highly structured to more open unstructured approaches, and can be conducted face to face, or via telephone or online (Davies et al. 2020). Interview studies can generate rich insights into patient experience and have been widely deployed in both high-income and low-income settings. The sample size for interview studies is generally small (ranging from 20-40 interviews). Interviews can be time-consuming, and they generate large quantities of data for analysis, but they can provide in-depth evidence to describe experiences of health care and generate ideas for improvement and implementation (Entwistle et al. 2011; L. Hinton, Locock, and Knight 2014; Marsh, Kamuya, and Molyneux 2011). Patient narratives collected through in-depth interviews are a method of collecting unstructured accounts of their health and illness. They are powerful for revealing what is important to patients and for addressing “how” and “why” questions.

Box 8.1: Resources for Patient Experience Research¹

Patient Experience Surveys and Measures

People's Voice Survey

"Measuring People's Views on Health System Performance: Design and Development of the People's Voice Survey." 2023. *Plos Medicine*. 20 (10): e1004294.

Service Delivery Indicators (SDI) Health Surveys.

<https://www.worldbank.org/en/programs/service-delivery-indicators/health/methodology>

PROMS and PREMS

"Patient Reported Outcomes." In *Understanding and Using Health Experiences*. Oxford: Oxford University Press.

"Patient-Reported Outcome Measures and Patient-Reported Experience Measures." *Bja Education*. 17 (4):137-44.

Ethnographic Approaches to Health Experiences Research

"How Do Frontline Staff Use Patient Experience Data for Service Improvement? Findings from an Ethnographic Case Study Evaluation." *Journal of Health Services Research & Policy*. 25 (3):151-61.

"The Contribution of Ethnography to the Evaluation of Quality Improvement in Hospital Settings: Reflections on Observing Co-Design in Intensive Care Units and Lung Cancer Pathways in the UK." *Anthropology & Medicine* 2: 26 (1):18-32.

"Using Computer Decision Support Systems in NHS Emergency and Urgent Care: Ethnographic Study Using Normalisation Process Theory." *BMC Health Services Research*. 13 (1):1-3.

Focus Groups

"Safety Implications of Remote Assessments for Suspected COVID-19: Qualitative Study in UK Primary Care." *BMJ Quality & Safety*.

"Successfully Implementing and Embedding Guidelines to Improve the Nutrition and Growth of Preterm Infants in Neonatal Intensive Care: A Prospective Interventional Study." *BMJ open*. 1;7 (12): e017727.

"Examining the Implementation of the Free Maternity Services Policy in Kenya: A Mixed Methods Process Evaluation." *International Journal of Health Policy and Management*. 7 (7): 603.

Interviews

"Quality Framework for Remote Antenatal Care: Qualitative Study with Women, Healthcare Professionals and System-Level Stakeholders." *BMJ Quality & Safety*.

"Using Secondary Analysis of Qualitative Data of Patient Experiences of Health Care to Inform Health Services Research and Policy." *Journal of Health Services Research & Policy*. 19 (3):177-82.

"Understanding and Using Health Experiences: Improving Patient Care." OUP Oxford Apr 4.

"Not Just Surveys and Indicators: Narratives Capture What Really Matters for Health System Strengthening." *Lancet Global Health*. 1:11 (9): e1459-63.

1 Find full bibliography of resources in the appendix

How Insights into Patient Experiences Can Be Used to Improve Care

In this section we provide a brief overview of sample projects that have used in-depth qualitative research on patient experiences to generate improvements in hospitals. This approach to in-depth qualitative research can be used in isolation, or in co-designed activities, for example the experience-based co-design approach described below.

Patient narratives to improve care. Recent examples of using patient experiences to improve care include studies of experiences of late miscarriage and maternal morbidity.

- In the UK researchers interviewed 38 parents whose baby had died before, during, or shortly after birth (that is, between 20+0 and 23+6 weeks of gestation) in order to identify practical ways to improve health care provision in such circumstances (L. K. Smith et al. 2020). This research highlighted the importance of terminology and diagnosis, and concluded that for parents experiencing the death of a baby at the margins between miscarriage, stillbirth, and neonatal death, using appropriate terminology is vital, as it validates their loss and prepares them for the experiences of labor and birth. These findings were reported in an obstetric journal (Smith et al. 2020) and contributed to the Pregnancy Loss Review commissioned by the Department of Health and Social Care (Clark-Coates et al. 2023).
- Recognizing that patient experiences are important drivers for improving the quality of health care, a 2014 study sought to investigate the experiences of women and their birth partners concerning severe complications in pregnancy. Interviews were undertaken with 35 women who had experienced maternal morbidity in the UK. Thematic analysis generated actionable improvements, were published in a clinical journal, and contributed to new guidelines for care of the critically ill mother (L. Hinton, Locock, and Knight 2014; Royal College of Anaesthetists 2018).

Using observations and patient perspectives to understand shared decision-making. Shared decision-making (SDM) is a collaborative model of care in which patients and clinicians work together to discuss treatment or management options; consider outcome preferences; and agree on a care plan. While this appears to be beneficial in surgery and other areas of health care, it is not always clearly defined or described (Niburski et al. 2020; Shaw et al. 2023). As part of the OSIRIS research program,² a recent study in five UK National Health Service hospitals used multiple qualitative methods (including video recordings of consultations, interviews, and focus groups with patients, caregivers, and surgeons) to characterize shared decision-making consultations. Three types of consultation were identified – resolution-focused, evaluative, and deliberative – with each providing different opportunities for shared decision-making. The study team, which included surgeons and social scientists, concluded that decisions about major surgery for patients at high risk of poor outcomes are not necessarily shared decisions, and provided a schema to guide shared decision-making consultations based on the clinical context, the focus of the consultation, and the type of decision to be taken (Fig. 2, p. 61 in Shaw et al. 2023).

Experience-based codesign (EBCD). EBCD is a collaborative approach that draws on qualitative research methods to generate insights into health service experiences, and uses these to co-design service improvements. It is an approach that has been used widely in high-income settings, and is also being adopted for use in low-income settings. Examples include using EBCD in an emergency department (ED) to identify service improvements for palliative care processes in the UK (Blackwell et al. 2017), and in South Africa to design practical improvements in paediatric services for malnourished children with HIV (Van Deventer, Robert, and Wright 2016). In the UK this participatory action research approach was used to enable collaboration between older patients with palliative needs, and staff in an ED (Blackwell et al. 2017). Using ethnographic observations, interviews, and focus groups with patients, family members, and staff, this study identified quality improvement (QI) priorities, which led to changes in the ED's palliative care processes; for example, redesigning triage processes and routine palliative care training for ED staff. In South Africa, EBCD was used to address low levels of mother, caregiver, and staff engagement with malnourishment in HIV-positive children. The EBCD approach, with involvement from staff and mothers or caregivers generated 25 QI initiatives that had been initiated or planned by the end of the study, including a play area for children attending the HIV clinic, and the development of new standard operating procedures to improve clinical handover and waiting times (Van Deventer, Robert, and Wright 2016).

2 Optimising Shared Decision-Making for High-Risk Major Surgery <https://osiris-programme.org/>

Community/Public Engagement

Patient experiences can be seen as one approach to engaging with the public in order to transform hospitals, as part of a broader effort to strengthen health system accountability and governance. Along with these approaches, a range of mechanisms, with varying depth of interaction, have been introduced in many countries to gather input and ideas from local communities (Vinodkumar Rao et al. 2022). Common formal initiatives involving direct interaction between community members and hospital staff or managers include hospital boards with community representatives, hospital outreach activities in surrounding communities, and awareness-raising sessions in hospitals. These interactive initiatives are often part of a wider set of initiatives in a given geographical location, as illustrated in Box 8.2.

Box 8.2: Feedback Mechanisms Available in One Coastal County in Kenya

Interactive Mechanisms Involving Community Members

Hospital Level

- Hospital board awareness-raising sessions
- Outreach activities

Other Health Facilities and Broader Health System

- Health facility committees in PHC facilities
- Public participation meetings held at county level
- Community Health Committees at community level
- County Health Board at county level
- Civil Society Organizations working within subcounties
- Community Health volunteers and assistants across communities and PHC facilities

Primarily Unidirectional Mechanisms

Hospital Level (and other health facilities)

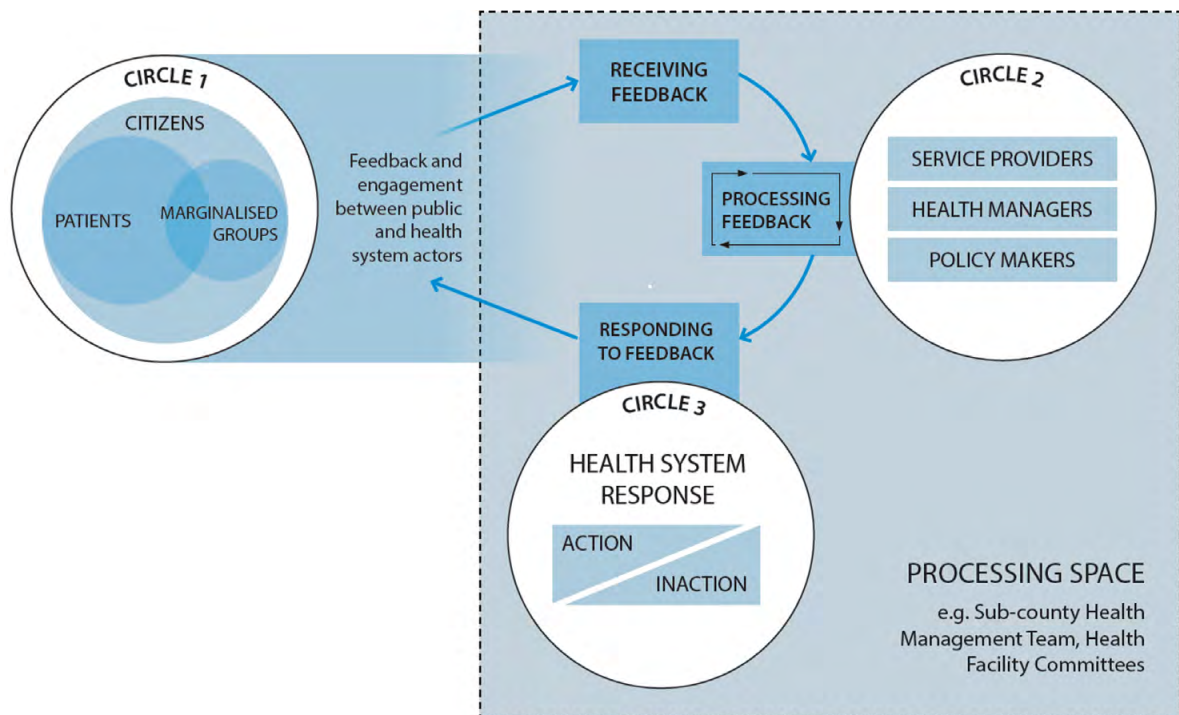
- Annual client satisfaction surveys
- Suggestion boxes/complaint boxes
- Hotlines
- Service charters
- Customer care desks

Broader Health System

- Subcounty complaints committee

The literature suggests that several mechanisms or initiatives need to be brought together and acted upon in order to impact health facility quality of care. In India, for example, a combination of awareness raising and toll-free hotlines improved women's input into maternal child health services (Dasgupta et al. 2015). In the US, a combination of engagement with leadership, centralized reporting, and improving response times was necessary to improve hospital complaint systems (Levin and Hopkins 2014). A framework developed by Kagwanja and colleagues (Figure 8.1) based on the literature illustrates how responses to community inputs should ideally happen: community members provide feedback into the facility/wider system through varied mechanisms (formal and informal, more and less interactive) (Circle 1). This feedback is processed by policy makers, system managers, and/or service providers (Circle 2) and by "processing spaces" such as facility or subnational management committee teams), who respond when appropriate (Circle 3) (Kagwanja et al. 2023). Such processes work best if integrated into other health system change processes such as quality improvement and human resource management systems. Integrating the perspectives of patients, the public, providers, and their managers into change processes can support the uptake of public input and provide a way for the public to "see" action being taken on their input, which is important for system learning, and can ensure accountability (Hulton, Matthews, and Stones 2007; Mirzoev and Kane 2017; Khan et al. 2021).

Figure 8.1: Conceptual Framework Describing Processes of Receiving and Responding to Public Feedback (Kagwanja et al. 2023)



A challenge with many current initiatives is that the input from patients and the public gathered through feedback initiatives are rarely brought together, discussed within the health system, and acted upon. This not only wastes resources but also potentially undermines the goals of community engagement. One promising approach incorporated into community engagement initiatives at various health system levels are **community scorecards**. In Ghana, community members were supported by Community Health Management Committee members to score facility performance as part of a national strategy to enhance community participation in the local health system (Gilmore et al. 2023; ALMA 2020). Introduction of the scorecard contributed to greater awareness of the channels for voicing feedback, and actions taken to improve quality of services. At the same time, facility-level quality improvement teams worked more closely with facility managers to respond to health center committee requests and action plans; and at the district and municipal levels, community card scores were discussed at routine quarterly performance review meetings. The initiative was reported to strengthen accountability among health care providers by positively impacting health workers' attitudes and professionalism (ALMA 2020).

Sustained public engagement requires adequate resource allocation and building the capacity of the public and staff involved. In South Africa, the removal of funding and the lack of budget for community participation contributed to inactive health facility committees and the closure of previously vibrant Local Action Groups (Cleary et al. 2014). In Niger, lack of incentives for health facility committee members contributed to their failure to conduct their oversight roles (Meuwissen 2002). Public engagement initiatives can contribute to positive transformation in hospitals, and to broader efforts to strengthen health system accountability and governance. However, sustained impact requires commitment, time, capacity, and resources.

Conclusions

It is now recognized that patient experiences are important drivers for improving the quality of health care, and have much to offer those engaged in health system strengthening, hospital reform, and the improvement of health care. This chapter has outlined current evidence for the impact of patient-experienced based improvements on key hospital outcomes; provided a guide to various methodological approaches for collecting patient experiences; and given examples of how patient experience interventions can be used to improve care.

The potential to complement patient experience data with broader public/community engagement efforts has also been discussed. While acknowledging the potential for patient experience data, it is important to recognize that there are barriers, risks, and potential harms that should be considered ethically and responsibly, and challenges in translating patient experience data into improvements (Gann 2013). Ethical challenges include ensuring that people feel comfortable and empowered to speak about or share their experiences without feeling victimized or putting themselves at risk of poor care. There are significant methodological issues to consider to ensure that sampling is robust and patient experience data is collected and analyzed rigorously (Ziebland, Grob, and Schlesinger 2021).

We also need to recognize that health system improvement and hospital reform will be shaped and constrained by both internal and external contextual factors—regulatory, financial, legal, technological, and/or sociopolitical – as well as by different expectations of care from various system actors. However, understanding patients' experiences can, and does, provide opportunities for generating powerful and actionable insights for hospital reform and improvement (K. D. Oluoch et al. 2023).

References

- ALMA. 2020. "Ghana Community Scorecard Case Study 3: Achievements WHAT IS COMMUNITY SCORECARD?"
- Armstrong, Natalie, Caroline Cupit, and Nicola Mackintosh. 2018. "Using Ethnography to Study Improving Health Care: Reflections on the 'Ethnographic' Label." *BMJ Quality & Safety* 27: 258–60. <https://doi.org/10.1136/bmjqs-2017-007599>.
- Batalden, Paul. 2018. "Getting More Health from Health Care: Quality Improvement Must Acknowledge Patient Coproduction." *BMJ* 2018;362:k3617 <https://doi.org/10.1136/bmj.k3617>.
- Bate, Paul, and Glenn Robert. 2008. "Book Review: Bringing User Experience to Healthcare Improvement: The Concepts, Methods and Practices of Experience-Based Design." *International Journal of Integrated Care* 8: 207. <https://doi.org/10.1136/ijic-2008-000207>.
- Blackwell, Rebecca Wright, K. Lowton, G. Robert, C. Grudzen, and P. Grocott. 2017. "Using Experience-Based Co-Design with Older Patients, Their Families and Staff to Improve Palliative Care Experiences in the Emergency Department: A Reflective Critique on the Process and Outcomes." *International Journal of Nursing Studies* 68: 83–94. <https://doi.org/10.1016/j.ijnurstu.2017.01.002>.
- Browne, John P., Stefan J. Cano, and Sarah Smith. 2017. "Using Patient-Reported Outcome Measures to Improve Health Care: Time for a New Approach." *Medical Care* 55 (10): 901–04. <https://doi.org/10.1097/MLR.0000000000000792>.
- Calabrese, Joseph D. 2013. "Ethnographic Approaches to Health Experiences Research." *Understanding and Using Health Experiences*. 16–26. <https://doi.org/10.1093/ACPROF/OSO/9780199665372.003.0003>.
- Campbell, John, P. Smith, S. Nissen, P. Bower, M. Elliott, and M. Roland. 2009. "The GP Patient Survey for Use in Primary Care in the National Health Service in the UK- Development and Psychometric Characteristics." *BMC Family Practice* 10 (1): 1–8. <https://doi.org/10.1186/1471-2296-10-57/TABLES/2>.
- Clark-Coates, Zoe, Mbe Bcah, Samantha Collinge, and R. M. Cp. 2023. "The Independent Pregnancy Loss Review-Care and Support When Baby Loss Occurs before 24 Weeks Gestation." Pregnancy Loss Review: independent report. Department of Health and Social Care. CP805
- Cleary, Susan, N. Schaayi, E. Botes, N. Figlan, U. Lehmann, and L. Gilson. 2014. "Re-Imagining Community Participation at the District Level: Lessons from the DIALHS Collaboration." *South African Health Review*, 2014(1), 151-161.
- Coulter, Angela, Louise Locock, Sue Ziebland, and Joe Calabrese. 2014. "Collecting Data on Patient Experience Is Not Enough: They Must Be Used to Improve Care." *BMJ* 348. <https://doi.org/10.1136/BMJ.G2225>.
- Dale Shaller. 2007. "Patient-Centered Care: What Does It Take? | Commonwealth Fund." <https://www.commonwealthfund.org/publications/fund-reports/2007/oct/patient-centered-care-what-does-it-take>.
- Dasgupta, Jashodhara, Y.K. Sandhya, S. Lobis, P. Verma, and M. Schaaf. 2015. "Using Technology to Claim Rights to Free Maternal Health Care: Lessons About Impact from the *My Health, My Voice* Pilot Project in India." *Health and Human Rights Journal*, 17, 135.
- Davies, Louise, K. L. LeClair, P. Bagley, H. Blunt, L. Hinton, S. Ryan, and S. Ziebland. 2020. "Face-to-Face Compared With Online Collected Accounts of Health and Illness Experiences: A Scoping Review." <https://doi.org/10.1177/1049732320935835> 30 (13): 2092–2102. <https://doi.org/10.1177/1049732320935835>.
- Department of Health and Social Care. 2022. "Women's Health Strategy for England." <https://www.gov.uk/government/publications/womens-health-strategy-for-england/womens-health-strategy-for-england#priority-areas>.
- Deventer, Claire Van, Glenn Robert, and Anne Wright. 2016. "Improving Childhood Nutrition and Wellness in South Africa: Involving Mothers/Caregivers of Malnourished or HIV Positive Children and Health Care Workers as Co-Designers to Enhance a Local Quality Improvement Intervention." *BMC Health Services Research* 16 (1). <https://doi.org/10.1186/s12913-016-1574-4>.
- Doyle, Cathal, Laura Lennox, and Derek Bell. 2013. "A Systematic Review of Evidence on the Links Between Patient Experience and Clinical Safety and Effectiveness" 3: 1570. <https://doi.org/10.1136/bmjopen-2012>.
-

- Dunsch, Felipe, David K. Evans, Mario Macis, Qiao Wang, and the World Bank. 2018. "Bias in Patient Satisfaction Surveys: A Threat to Measuring Healthcare Quality." *BMJ Global Health* 3: 694. <https://doi.org/10.1136/bmjgh-2017-000694>.
- Duschinsky, Robbie, and Charlotte Paddison. 2018. "The Final Arbiter of Everything: A Genealogy of Concern with Patient Experience in Britain." *Social Theory and Health* 16 (1): 94–110. <https://doi.org/10.1057/S41285-017-0045-2>.
- English, Mike, Jalemba Aluvaala, Michuki Maina, Trevor Duke, and Grace Irimu. 2023. "Quality of Inpatient Paediatric and Newborn Care in District Hospitals: WHO Indicators, Measurement, and Improvement." [https://doi.org/10.1016/S2214-109X\(23\)00190-0](https://doi.org/10.1016/S2214-109X(23)00190-0).
- Entwistle, Vikki Ann, E. F. France, S. Wyke, R. Jepson, K. Hunt, S. Ziebland, and A. Thompson. 2011. "How Information About Other People's Personal Experiences Can Help with Healthcare Decision-Making: A Qualitative Study." *Patient Education and Counseling* 85 (3): e291–98. <https://doi.org/10.1016/J.PEC.2011.05.014>.
- Figuerola, Jose F., Yevgeniy Feyman, Xiner Zhou, and Karen Joynt Maddox. 2018. "Hospital-Level Care Coordination Strategies Associated with Better Patient Experience." *BMJ Quality & Safety* 27 (10): 844–51. <https://doi.org/10.1136/BMJQS-2017-007597>.
- Fremont, Allen M., Paul D. Cleary, J. Lee Hargraves, Rachel M. Rowe, Nancy B. Jacobson, and John Z. Ayanian. 2000. "Patient-Centered Processes of Care and Long-Term Outcomes of Myocardial Infarction." *Journal of General Internal Medicine*, 2001 December;16:800-8
- Fujisawa, Rie, and Nicolaas S. Klazinga. 2017. "Measuring Patient Experiences (PREMS): Progress Made by the OECD and Its Member Countries between 2006 and 2016." *OECD Health Working Papers*. <https://doi.org/10.1787/893A07D2-EN>.
- Gann, Bob. 2013. "Understanding and Using Health Experiences: The Policy Landscape." *Understanding and Using Health Experiences* 150–62. <https://doi.org/10.1093/ACPROF:OSO/9780199665372.003.0015>.
- Garrubba M., A. Melder, and Joseph C. 2015. "Patient Experience Feedback Driving Quality Improvement Citation The Use of Patient Experience Feedback in Quality Improvement Initiatives: A Literature Review. Centre for Clinical Effectiveness." Monash Innovation and Quality; Monash Health, Melbourne, Australia
- Gatti, Roberta, K. Andrews, C. Avitabile, R. Conner, J. Sharma, and A. Y. Chang. 2021. "The Quality of Health and Education Systems Across Africa: Evidence from a Decade of Service Delivery Indicators Surveys." World Bank Publications. <https://doi.org/10.1596/978-1-4648-1675-8>
- Gilmore, B., P. H. Dsane-Aidoo, M. Rosato, N. O. Yaqub, R. Doe, and S. Baral. 2023. "Institutionalising Community Engagement for Quality of Care: Moving beyond the Rhetoric." <https://doi.org/10.1136/bmj-2022-072638>.
- Glenn, Robert, L. Locock, O. Williams, J. Cornwell, S. Donetto, and J. Goodrich. 2022. "Improving Quality and Safety in Healthcare Co-Producing and Co-Designing." 2022. <https://www.cambridge.org/core/services/aop-cambridge-core/content/view/157832BBAE1448211365D396CD110900/9781009237031AR.pdf/co-producing-and-co-designing.pdf>.
- Grob, Rachel, M. Schlesinger, L. R. Barre, N. Bardach, T. Lagu, D. Shaller, A.M. M. Parker, et al. 2019. "What Words Convey: The Potential for Patient Narratives to Inform Quality Improvement." *The Milbank Quarterly* 97 (1): 176. <https://doi.org/10.1111/1468-0009.12374>.
- Grove, Amy, C. Pope, G. Currie, and A. Clarke. 2022. "Paragons, Mavericks and Innovators—A Typology of Orthopaedic Surgeons' Professional Identities. A Comparative Case Study of Evidence-Based Practice." *Sociology of Health and Illness* 44 (1): 59–80. <https://doi.org/10.1111/1467-9566.13392>.
- Haskard Zolnierok, Kelly B., and M. Robin Dimatteo. 2009. "Physician Communication and Patient Adherence to Treatment: A Meta-Analysis." *Medical Care* 47 (8): 826. <https://doi.org/10.1097/MLR.0B013E31819A5ACC>.
- Hinton, L., L. Locock, and M. Knight. 2014. "Experiences of the Quality of Care of Women with Near-Miss Maternal Morbidities in the UK." *BJOG : An International Journal of Obstetrics and Gynaecology* 121: 20–23. <https://doi.org/10.1111/1471-0528.12800>.
- Hinton, Lisa, F. H. Dakin, K. Kuberska, N. Boydell, J. Willars, T. Draycott, C. Winter, et al. 2024. "Quality Framework for Remote Antenatal Care: Qualitative Study with Women, Healthcare Professionals and System-Level Stakeholders." *BMJ Quality & Safety* 33 (5): bmjqs-2021-014329. <https://doi.org/10.1136/BMJQS-2021-014329>.
-

- Hinton, Lisa, C. Dumelow, R. Rowe, and J. Hollowell. 2018. "Birthplace Choices: What Are the Information Needs of Women When Choosing Where to Give Birth in England? A Qualitative Study Using Online and Face to Face Focus Groups." *BMC Pregnancy and Childbirth* 18 (1): 1–15. <https://doi.org/10.1186/S12884-017-1601-4/TABLES/2>.
- Hinton, Lisa, and Sara Ryan. 2019. "Interviews." *Qualitative Research in Health Care* 43–55. <https://doi.org/10.1002/9781119410867.CH4>.
- Hulton, Louise Anne, Zoë Matthews, and Robert William Stones. 2007. "Applying a Framework for Assessing the Quality of Maternal Health Services in Urban India." *Social Science & Medicine* 64 (10): 2083–95. <https://doi.org/10.1016/J.SOCSCIMED.2007.01.019>.
- Institute of Medicine (US) Committee on Quality of Health Care in America. 2001. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, DC: National Academies Press. <https://doi.org/10.17226/10027>.
- International Bank for Reconstruction and Development, World Bank, and Government of Kenya. 2019. "Kenya Health Service Delivery Indicator Survey 2018 Report." <http://www.copyright.com/>.
- Jamieson Gilmore, Kendall, I. Corazza, L. Coletta, and S. Allin. 2023. "The Uses of Patient Reported Experience Measures in Health Systems: A Systematic Narrative Review." *Health Policy* 128: 1–10. <https://doi.org/10.1016/J.HEALTHPOL.2022.07.008>.
- Jashodhara Dasgupta, Y. K. Sandhya, S. Lobis, P. Verma, M. Schaaf. 2015. "Using Technology to Claim Rights to Free Maternal Health Care: Lessons about Impact from the My Health, My Voice Pilot Project in India." *Health Human Rights*. 17 (2): 135-147
- Kagwanja, Nancy, L Gilson , B. Tsofa, J. Olivier, H. Leli, and S. Molyneux. 2023. "Understanding health system responsiveness to public feedback at the sub-national level in Kenya." In: KEMRI-Wellcome Trust Research Programme.
- Khan, Gadija, N. Kagwanja, E. Whyte, L. Gilson, S. Molyneux, N. Schaay, B. Tsofa, E. Barasa, and J. Olivier. 2021. "Health System Responsiveness: A Systematic Evidence Mapping Review of the Global Literature." *International Journal for Equity in Health*. BioMed Central Ltd. <https://doi.org/10.1186/s12939-021-01447-w>.
- Kingsley, Charlotte, and Sanjiv Patel. 2017. "Patient-Reported Outcome Measures and Patient-Reported Experience Measures." *BJA Education* 17 (4): 137–44. <https://doi.org/10.1093/BJAED/MKW060>.
- Kitzinger, Jenny. 2007. "Focus Groups." *Qualitative Research in Health Care: Third Edition* 21–31. <https://doi.org/10.1002/9780470750841.CH3>.
- Kruk, Margaret E., Pate Muhammad, and Mullan Zoë. 2017. "Introducing the Lancet Global Health Commission on High-Quality Health Systems in the SDG Era." [https://doi.org/10.1016/S2214-109X\(17\)30101-8](https://doi.org/10.1016/S2214-109X(17)30101-8).
- Kuipers, Sanne Jannick, Jane Murray Cramm, and Anna Petra Nieboer. 2019. "The Importance of Patient-Centered Care and Co-Creation of Care for Satisfaction with Care and Physical and Social Well-Being of Patients with Multi-Morbidity in the Primary Care Setting." <https://doi.org/10.1186/s12913-018-3818-y>.
- Kuipers, Sanne Jannick, Anna Petra Nieboer, and Jane Murray Cramm. 2021. "Making Care More Patient Centered; Experiences of Healthcare Professionals and Patients with Multimorbidity in the Primary Care Setting." *BMC Family Practice* 22 (1). <https://doi.org/10.1186/s12875-021-01420-0>.
- Larson, Elysia, Jigyasa Sharma, Meghan A. Bohren, and Özge Tunçalp. 2019. "When the Patient Is the Expert: Measuring Patient Experience and Satisfaction with Care." *Bulletin of the World Health Organization* 97 (8): 563–69. <https://doi.org/10.2471/BLT.18.225201>.
- Levin, Cynthia Mahood, and Joseph Hopkins. 2014. "Creating a Patient Complaint Capture and Resolution Process to Incorporate Best Practices for Patient-Centered Representation." *The Joint Commission Journal on Quality and Patient Safety* 40 (11): 484-AP12. [https://doi.org/10.1016/S1553-7250\(14\)40063-1](https://doi.org/10.1016/S1553-7250(14)40063-1).
- Lewis, Todd P., Neena R. Kapoor, Amit Aryal, Rodrigo Bazua-Lobato, Susanne Carai, Emma Clarke-Deelder, Kevin Croke, et al. 2023. "Measuring People's Views on Health System Performance: Design and Development of the People's Voice Survey." *PLoS Medicine* 20 <https://doi.org/10.1371/journal.pmed.1004294>.
- Liberati, Elisa G., C. Tarrant, J. Willars, T. Draycott, C. Winter, S. Chew, and M. Dixon-Woods. 2019. "How to Be a Very Safe Maternity Unit: An Ethnographic Study." *Social Science & Medicine* 223: 64-72. <https://doi.org/10.1016/j.socscimed.2019.01.035>.
-

- Locock, Louise, C. Graham, J. King, S. Parkin, A. Chisholm, C. Montgomery, E. Gibbons, et al. 2020. "Understanding How Front-Line Staff Use Patient Experience Data for Service Improvement: An Exploratory Case Study Evaluation." *Health Services and Delivery Research* 8 (13): 1–170. <https://doi.org/10.3310/HSDR08130>.
- Locock, Louise, C. Montgomery, S. Parkin, A. Chisholm, J. Bostock, S. Dopson, M. Gager, et al. 2020. "How Do Frontline Staff Use Patient Experience Data for Service Improvement? Findings from an Ethnographic Case Study Evaluation." *Journal of Health Services Research and Policy* 25 (3): 151–61. <https://doi.org/10.1177/1355819619888675>.
- Marsh, Vicki M., Dorcas M. Kamuya, and Sassy S. Molyneux. 2011. "'All Her Children Are Born That Way': Gendered Experiences of Stigma in Families Affected by Sickle Cell Disorder in Rural Kenya." *Ethnicity and Health* 16 (4–5): 343–59. <https://doi.org/10.1080/13557858.2010.541903>.
- Mazanderani, Fadhila, Susan F. Kirkpatrick, Sue Ziebland, Louise Locock, and John Powell. 2021. "Caring for Care: Online Feedback in the Context of Public Healthcare Services." *Social Science and Medicine* 285. <https://doi.org/10.1016/j.socscimed.2021.114280>.
- McMillan, Sara S., E. Kendall, A. Sav, M. A. King, J. A. Whitty, F. Kelly, and A. J. Wheeler. 2013. "Patient-Centered Approaches to Health Care." *Http://Dx.Doi.Org/10.1177/1077558713496318* 70 (6): 567–96. <https://doi.org/10.1177/1077558713496318>.
- McNichol, Elaine. 2012. "Patient-Led Innovation in Healthcare: The Value of the 'User' Perspective." *International Journal of Healthcare Management* 5 (4): 216–22. <https://doi.org/10.1179/2047971912Y.0000000020>.
- Meuwissen, Liesbeth Emm. 2002. "Problems of Cost Recovery Implementation in District Health Care: A Case Study from Niger." *Health Policy and Planning* 17 (3): 304–13. <https://doi.org/10.1093/HEAPOL/17.3.304>.
- Mirzoev, Tolib, and Sumit Kane. 2017. "What Is Health Systems Responsiveness? Review of Existing Knowledge and Proposed Conceptual Framework." *BMJ Global Health*. 2 (4): e000486. <https://doi.org/10.1136/bmjgh-2017-000486>.
- National Academies of Sciences, Engineering, and Medicine. 2018. "Crossing the Global Quality Chasm: Improving Health Care Worldwide." Washington, DC: The National Academies Press. <https://doi.org/10.17226/25152>.
- National Department of Health. 2017. "National Guideline on Conducting Patient Experience of Care Surveys in Public Health Establishments." Pretoria, Republic of South Africa: Department of Health.
- Niburski, Kacper, Elena Guadagno, Sadaf Mohtashami, and Dan Poenaru. 2020. "Shared Decision Making in Surgery: A Scoping Review of the Literature." *Health Expectations: An International Journal of Public Participation in Health Care and Health Policy* 23 (5): 1241. <https://doi.org/10.1111/HEX.13105>.
- Nimako, Kojo, A. Gage, C. Benski, S. Roder-Dewan, K. Ali, C. Kandie, A. Mohamed, et al. 2021. "Health System Redesign to Shift to Hospital Delivery for Maternal and Newborn Survival: Feasibility Assessment in Kakamega County, Kenya." *Global Health: Science & Practice*, 9(4), 1000-1010. <https://doi.org/10.9745/GHSP-D-20-00684>
- Oluoch, Dorothy, L. Hinton, M. English, G. Irimu, T. Onyango, and C. O. H. Jones. 2023. "Mothers' Involvement in Providing Care for Their Hospitalised Sick Newborns in Kenya: A Focused Ethnographic Account." *BMC Pregnancy and Childbirth* 23: 389. <https://doi.org/10.1186/s12884-023-05686-3>.
- Oluoch, Dorothy, S. Molyneux, M. Boga, J. Maluni, F. Murila, C. Jones, S. Ziebland, M. English, L. Hinton. 2023 Not just surveys and indicators: narratives capture what really matters for health system strengthening. *The Lancet Global Health*, 11(9):e1459-63.
- Palmer, Victoria, W. Weavell, R. Callander, D. Piper, L. Richard, L. Maher, H. Boyd, et al. 2019. "The Participatory Zeitgeist: An Explanatory Theoretical Model of Change in an Era of Coproduction and Codesign in Healthcare Improvement." *Medical Humanities* 45 (3): 247–57.
- Porter, Thomas, J. Chuma, and C. Molyneux. 2009. "Barriers to Managing Chronic Illness Among Urban Households in Coastal Kenya." *Journal of International Development* 21 (2): 271–90. <https://doi.org/10.1002/JID.1552>.
- Powell, John, H. Atherton, V. Williams, F. Mazanderani, F. Dudhwala, S. Woolgar, A-M Boylan et al. 2019. "Using Online Patient Feedback to Improve NHS Services: The INQUIRE Multimethod Study." *Health Services and Delivery Research* 7 (38): 1–150. <https://doi.org/10.3310/HSDR07380>.
-

- Rathert, Cheryl, Mary D. Wyrwich, and Suzanne Austin Boren. 2012. "Patient-Centered Care and Outcomes." *Http://Dx.Doi.Org/10.1177/1077558712465774* 70 (4): 351–79. <https://doi.org/10.1177/1077558712465774>.
- Robert, Glenn, Sara Donetto, and Oli Williams. 2020. "Co-Designing Healthcare Services with Patients." *The Palgrave Handbook of Co-Production of Public Services and Outcomes* 313–33. https://doi.org/10.1007/978-3-030-53705-0_16.
- Royal College of Anaesthetists. 2018. "Care of the Critically Ill Woman in Childbirth; Enhanced Maternal Care." <https://www.rcoa.ac.uk/sites/default/files/documents/2019-09/EMC-Guidelines2018.pdf>
- Schlesinger, Mark, Rachel Grob, and Dale Shaller. 2015. "Using Patient-Reported Information to Improve Clinical Practice." *Health Services Research* 50: 2116–54. <https://doi.org/10.1111/1475-6773.12420>.
- Shaw, Sara E., G. Hughes, R. Pearse, E. Avagliano, J. R. Day, M. E. Edsell, J. A. Edwards, L. Everest, and T. J. Stephens. 2023. "Opportunities for Shared Decision-Making about Major Surgery with High-Risk Patients: A Multi-Method Qualitative Study." *British Journal of Anaesthesia* 131 (1): 56–66. <https://doi.org/10.1016/J.BJA.2023.03.022>.
- Smith, A., D. Goodwin, M. Mort, and C. Pope. 2003. "Expertise in Practice: An Ethnographic Study Exploring Acquisition and Use of Knowledge in Anaesthesia." <https://doi.org/10.1093/bja/aeg180>.
- Smith, L. K., J. Dickens, R. Bender Atik, C. Bevan, J. Fisher, and L. Hinton. 2020. "Parents' Experiences of Care Following the Loss of a Baby at the Margins between Miscarriage, Stillbirth and Neonatal Death: A UK Qualitative Study." *BJOG, An International Journal of Obstetrics & Gynaecology* 127 (7): 868. <https://doi.org/10.1111/1471-0528.16113>.
- Sutherns, Tammy, and Jill Olivier. 2022. "Mapping the Multiple Health System Responsiveness Mechanisms in One Local Health System: A Scoping Review of the Western Cape Provincial Health System of South Africa." *International Journal of Health Policy and Management* 11 (1): 67. <https://doi.org/10.34172/IJHPM.2021.85>.
- Vindrola-Padros, Cecilia, and Bruno Vindrola-Padros. 2018. "Quick and Dirty? A Systematic Review of the Use of Rapid Ethnographies in Healthcare Organisation and Delivery." *BMJ Quality & Safety* 27 (4): 321–30. <https://doi.org/10.1136/BMJQS-2017-007226>.
- Vinodkumar Rao, P. Saligram, S. Faiz Rashid, R. Tolhurst, R. Steege, S. Murthy, B. Nakkeeran, et al. 2022. "Community Engagement, Co-Production or Citizen Action? Lessons from COVID-19 Responses in India and Bangladesh's Informal Urban Settlements" *Columbia Journal of International Affairs*. <https://jia.sipa.columbia.edu/news/community-engagement-co-production-or-citizen-action-lessons-covid-19-responses-india-and>.
- Wieringa, Sietse, A. L. Neves, A. Rushforth, E. Ladds, L. Husain, T. Finlay, C. Pope, and T. Greenhalgh. 2023. "Safety Implications of Remote Assessments for Suspected COVID-19: Qualitative Study in UK Primary Care." *BMJ Quality and Safety* 32 (12): 732–41. <https://doi.org/10.1136/BMJQS-2021-013305>.
- World Health Organization. 2018. "Delivering Quality Health Services: A Global Imperative for Universal Health Coverage." <http://apps.who.int/bookorders>.
- Ziebland, Sue, A. Coulter, J. D. Calabrese, L. Locock, F. Mazanderani, and J. Powell. 2013a. "Graham C, Woods P. Patient Experience Surveys. In: *Understanding and Using Health Experiences* Oxford University Press. <https://global.oup.com/academic/product/understanding-and-using-health-experiences-9780199665372?cc=us&lang=en&>.
- _____. 2013b. "Jenkinson C., Fitzpatrick R. "Patient Reported Outcomes." In: *Understanding and Using Health Experiences* - Sue Ziebland; Angela Coulter; Joseph D. Calabrese; Louise Locock - Oxford University Press." 2013. <https://global.oup.com/academic/product/understanding-and-using-health-experiences-9780199665372?cc=us&lang=en&>.
- _____. 2013c. "Understanding and Using Health Experiences: Improving Patient Care." www.oxfordscholarship.com.
- Ziebland, Sue, Rachel Grob, and Mark Schlesinger. 2021. "Polyphonic Perspectives on Health and Care: Reflections from Two Decades of the DIPEX Project." *Https://Doi.Org/10.1177/1355819620948909* 26 (2): 133–40. <https://doi.org/10.1177/1355819620948909>.
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Appendix: Resources for Patient Experience Research (with full bibliography)

Patient experience surveys and measures

People's Voice Survey Lewis TP, Kapoor NR, Aryal A, Bazua-Lobato R, Carai S, Clarke-Deelder E, et al. Measuring people's views on health system performance: Design and development of the People's Voice Survey. *Plos Medicine*. 2023;20(10):e1004294.

Service Delivery Indicators (SDI) Health Surveys. <https://www.worldbank.org/en/programs/service-delivery-indicators/health/methodology>

PROMS and PREMS

Jenkinson C, Fitzpatrick R. Patient reported outcomes. In: Ziebland S, Coulter A, Calabrese J, Locock L, editors. *Understanding and using health experiences*. Oxford: Oxford University Press; 2013.

Kingsley C, Patel S. Patient-reported outcome measures and patient-reported experience measures. *Bja Education*. 2017;17(4):137-44

Ethnographic approaches to health experiences research

Locock L, Montgomery C, Parkin S, Chisholm A, Bostock J, Dopson S, Gager M, Gibbons E, Graham C, King J, Martin A. How do frontline staff use patient experience data for service improvement? Findings from an ethnographic case study evaluation. *Journal of health services research & policy*. 2020 Jul;25(3):151-61.

Vougioukalou S, Boaz A, Gager M, Locock L. The contribution of ethnography to the evaluation of quality improvement in hospital settings: reflections on observing co-design in intensive care units and lung cancer pathways in the UK. *Anthropology & medicine*. 2019 Jan 2;26(1):18-32.

Pope C, Halford S, Turnbull J, Prichard J, Calestani M, May C. Using computer decision support systems in NHS emergency and urgent care: ethnographic study using normalisation process theory. *BMC health services research*. 2013 Dec;13(1):1-3.

Focus groups

Wieringa S, Neves AL, Rushforth A, Ladds E, Husain L, Finlay T, Pope C, Greenhalgh T. Safety implications of remote assessments for suspected COVID-19: qualitative study in UK primary care. *BMJ Quality & Safety*. 2022 Mar 8.

Johnson MJ, Leaf AA, Pearson F, Clark HW, Dimitrov BD, Pope C, May CR. Successfully implementing and embedding guidelines to improve the nutrition and growth of preterm infants in neonatal intensive care: a prospective interventional study. *BMJ open*. 2017 Dec 1;7(12):e017727.

Tama E, Molyneux S, Waweru E, Tsofa B, Chuma J, Barasa E. Examining the implementation of the free maternity services policy in Kenya: a mixed methods process evaluation. *International journal of health policy and management*. 2018 Jul;7(7):603.

Interviews

Hinton L, Dakin FH, Kuberska K, Boydell N, Willars J, Draycott T, Winter C, McManus RJ, Chappell LC, Chakrabarti S, Howland E. Quality framework for remote antenatal care: qualitative study with women, healthcare professionals and system-level stakeholders. *BMJ quality & safety*. 2022 May 11.

Ziebland S, Hunt K. Using secondary analysis of qualitative data of patient experiences of health care to inform health services research and policy. *Journal of Health Services Research & Policy*. 2014 Jul;19(3):177-82.

Ziebland S, Coulter A, Calabrese JD, Locock L, editors. *Understanding and using health experiences: improving patient care*. OUP Oxford; 2013 Apr 4.

Oluoch D, Molyneux S, Boga M, Maluni J, Murila F, Jones C, Ziebland S, English M, Hinton L. Not just surveys and indicators: narratives capture what really matters for health system strengthening. *The Lancet Global Health*. 2023 Sep 1;11(9):e1459-63.

CHAPTER 9:

MICROLEVEL INTERVENTIONS FOR IMPROVING HOSPITAL PERFORMANCE

Marwa Ramadan, Stélio Tembe, Kojo Nimako

Key Messages

- This chapter presents the results of a scoping review on microlevel hospital quality improvement strategies, highlighting those in which effectiveness is supported by the evidence.
- The literature on improving quality shows that microlevel quality improvement strategies should be complemented by meso- and/or macrolevel interventions.
- In this chapter, microlevel solutions are divided into workforce strategies (training, supervision, communication, and motivation); tools (decision support systems, eHealth technologies, and quality improvement tools); and patient engagement and patient-centered care (educational initiatives and personalized approaches).
- The effectiveness of these strategies varies widely, and in many cases the intervention has not been widely and rigorously tested.
- A significant proportion of the strategies identified have been primarily implemented or tested in high-income settings; thus, in translating these findings to low and middle-income (LMIC) settings, implementers must consider the capacity of the prevailing system to absorb these interventions and the needed adaptations to make them contextually fit-for-purpose.

Introduction

In this chapter, we draw on published literature to describe a variety of strategies for improvement of hospital performance that have demonstrated their effectiveness in various settings. We focus on microlevel interventions—that is, interventions at the point of care or facility level—that play a role in improving the quality of service delivery and hospital performance. As has been shown in the extant literature, on their own these microlevel interventions cannot guarantee quality at scale (Kruk et al. 2018). The interventions described here should therefore be considered complements to a health system where the macro, or systems-level requirements for quality have been or are being addressed.

We conducted an umbrella review to compile a broad range of interventions that have demonstrated some success in various settings. We give special emphasis to strategies that are both realistic and effective, and may have reasonable applicability in low-resource settings. Through this scoping approach our goal is to create, at a high level, a compendium of hospital improvement strategies that could benefit stakeholders in various health care environments, especially in low- and middle-income countries (LMICs).

Methodology

We aimed to answer the question “What are the microlevel strategies linked with improved hospital performance?”

Hospital performance was defined as the processes of care that, according to the High Quality Health Systems Framework (Kruk et al 2018), include **competent care and systems** (interventions that promote correct diagnosis, appropriate treatment, safety, continuity, and timely management); and **positive user experience** (interventions that promote respect, privacy, confidentiality, and patient preference).

We conducted a systematic search in two databases, PubMed and Embase, using a combination of medical subject headings (MeSH) and keywords tailored to the themes of quality improvement, process improvement, and health care delivery in hospital settings. To expand our search beyond traditional methods, we also employed an Artificial Intelligence (AI)-based snowball sampling technique, which helped to uncover a wider spectrum of relevant literature that specifically addressed our search concepts. Given the large number of studies initially obtained (n=1215), we limited our search to systematic reviews, scoping reviews, and meta-analyses published between 2003 and 2023 that included microlevel interventions and strategies for improving hospital performance (n=202).

The search was agnostic of any specific health condition, disease area, or geography. We excluded reviews not published in English, and publications not related to hospital improvement strategies at the microlevel, including studies focused only on the primary care level. Out of the 202 reviews screened, 73 met our inclusion criteria and were included for final review and extraction. The data extraction process was designed to systematically collect key information from each study, including the aim and context of the interventions, the main outcome(s), and the overall success of extracted interventions. In addition, whenever data was available, we extracted information on the effectiveness of interventions in LMICs. We also did additional freehand searches of the bibliographies of the reviewed papers for any citations that would provide additional data to strengthen the discussion.

Initially using a deductive approach, we drew on the High-Quality Health Systems (HQSS) Framework (Kruk et al. 2018) as a coding approach to map the extracted interventions to the **five health system foundations**: i) **Population**: interventions that addressed the health needs, knowledge, and expectations of different groups, focusing on their impact on individuals, families, and communities; ii) **Governance**: interventions in the context of leadership, policies, financing, and management; iii) **Platforms**: interventions related to the impact of health care facilities' organization of care; iv) **Workforce**: interventions relating to health workers and managers, focusing on their skills, education, training, and work environment; and v) **Tools**: interventions involving physical resources like equipment, information systems, and data.

After extracting the first set of articles, we realized that governance and platform interventions were mostly higher-level (above the micro level), or that they overlapped with another thematic area. We therefore adapted our coding framework and organized our final results into the following three themes:

1. **Workforce Strategies**: Interventions focused on the human element in service delivery within hospitals. This theme underscores the significance of continuous training and professional development for health care workers, and the importance of supervision and feedback. It highlights the necessity of interventions focused on collaborative teamwork, effective communication skills, a supportive work environment, and workforce satisfaction, which are all crucial for efficient hospital operations and for delivering high-quality patient care.
2. **Tools**: This theme summarized interventions mapped to tools as a foundation of care, and examined how decision support systems, eHealth technologies, and quality improvement tools can streamline care processes, improve patient safety, and enhance the quality of care.
3. **Patient engagement and patient-centered care**: This theme summarized interventions related to patient engagement. It emphasized the patient-centered model of care, the need for educational initiatives for patients, the use of technology to facilitate patient-provider interactions, and the adoption of personalized care approaches.

Results

Workforce Strategies

Training

The proficiency and continuous development of the health workforce has been fundamental to the provision of quality care in hospital settings. Staff training has been the most frequently used approach for improving quality at the microlevel. The literature shows that staff training alone has, on average, only moderate effects on performance (about 10 percentage-point improvement in measured outcomes), and is somewhat improved when combined with supervision (an up to 18 percentage-point increase), highlighting the importance of a multifaceted approach to professional development (Rowe et al. 2005, 2018).

The literature suggests some key areas where training is of particular importance: in specialized areas, such as modern technologies like health information systems, training plays a crucial role in operational efficiency and the quality of patient care, as more of these technologies have become a part of the standard of care (Abraham et al. 2020; Cortoos et al. 2007; Overmann et al. 2021) such as bedrails and belts in beds and chairs, are commonly used in general hospital settings. However, there is no clear evidence on their effectiveness but some evidence on potential risks for harm. DESIGN: Scoping review. METHODS: We conducted a systematic database search (MEDLINE via PubMed, CINAHL, Cochrane Library; March 2020). Another important area of training focuses on communication among health workers. For example, training in cultural competency has been essential for effective communication with diverse patient groups (Taira et al. 2019). Training programs like Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS), and Crew Resource Management (CRM) have been mentioned as good examples of such communication and teamwork skills programs (Husebø and Akerjordet 2016). Clinician-targeted training aimed at optimizing clinical outcomes, and the emphasis on two-way communication training as part of a family-centered approach have also been recognized as important strategies for improving work performance and quality of care, particularly in high-pressure areas like the operating room (Provencher et al. 2021; Vamos et al. 2023).

While in-service training is important for performance, knowledge decay over the long term has been a concern (Arsenault et al. 2022). This emphasizes the need for improved pre-service training, intermittent retraining, and greater use of practical rather than traditional didactic training methods. Simulation-based training is one such practical approach, and it has been shown to be feasible for implementation, and effective in improving outcomes in LMICs. (Puri et al. 2017; Bulamba et al. 2019; Martinerie et al. 2018). The use of low-dose, high-frequency (LDHF) training strategies have also been proposed to have superior effects on knowledge retention and use, and have demonstrated applicability in LMICs, albeit sometimes at a high cost (Cavichiollo et al. 2018; Willcox et al. 2017).

Mentorship, another strategy related to training, is a flexible teaching and learning process based on mutual trust and respect that seeks to build confidence and competence among health care workers. Mentorship has been found to help improve both health worker satisfaction, and patient quality and safety outcomes (Schwerdtle et al. 2017).

Supervision and Feedback

The implementation of well-structured supervision systems, especially in combination with training, has been shown to have positive impacts on health worker performance, with some studies showing improvement of up to 19 percentage points (Rowe et al. 2005, 2018). This strategy ensures that health care professionals adhere to best practices and protocols, thereby improving the quality of patient care. To be impactful, the focus of supervision must shift from mere monitoring to providing ongoing guidance, which is essential for maintaining high standards of care and operational efficiency.

Closely related to supervision, and sometimes considered a type of supervision, are audits with feedback (Rowe et al. 2018). These have been effective in identifying errors in clinical care and improving outcomes at the facility level. Maternal and perinatal death surveillance and response (MPDSR) is a specific example of audits that have been shown to produce improved performance if done in a blame-free learning environment, and if there is follow-through on recommended actions (Willcox et al. 2023).

Also related to supervision, hospital boards and leadership play a role in setting priorities, defining targets, and monitoring workforce performance. The governance structures used by boards to oversee improvement and engage with clinical leaders and frontline staff, including meetings, committees, and reporting systems, has been identified as helpful for successful management of hospitals (Millar et al. 2013). Leadership walkthroughs, for instance, by facilitating direct engagement between leadership and health care providers, have the potential to improve patient safety. In one multicenter study, Safety Climate Scores improved by 10-15 percentage points with the introduction of leadership walkthroughs (Frankel et al. 2008). The rigorous organizational management skills required to implement and sustain this intervention should, however, be borne in mind, especially because only modest, and sometimes no effects have been reported in some settings where leadership walkthroughs have been implemented (Morello et al. 2013).

Workforce Communication Interventions

The enhancement of hospital performance is significantly influenced by communication and collaboration within the health workforce. Teamwork is a primary mechanism proposed to achieve this. In one systematic review, it was found that there is generally a nonnegative effect of teamwork on processes and outcomes of care, with one of the studies showing that patients had nearly five times increased odds of experiencing death or severe complications in the postoperative period if clinical staff demonstrated poor teamwork behaviors (Schmutz and Manser 2013).

The use of multidisciplinary teams, specifically developed and trained to work cohesively, is an important variation on clinical teamwork. The successful integration of diverse health care professionals into such teams leads to more effective interdepartmental collaboration (Manning and Islam 2023; O'Leary et al. 2012; Walker et al. 2016). For example, in Manning and Islam's 2023 systematic review it was found that across many studies multidisciplinary collaboration, including interdisciplinary rounds and huddles, improves patient flow and discharge rates. The individual contribution of multidisciplinary teams to these outcomes is, however, difficult to isolate since it is usually part of a complex of interventions. Team-based training is also known to enhance communication and team effectiveness. In one study, multidisciplinary efficiency awareness training for 1,787 nurses, surgeons, and anesthesiologists working in operating rooms resulted in significantly improving the start time of operations by an average of 22 minutes, and decreasing the turnover times by an average of 16 minutes (Epstein 2014; Gualandi et al. 2019; Overdyk et al. 1998).

The literature also shows that well-coordinated communication and planning platforms, including electronic medical records, detailed discharge summaries, and structured communication templates can improve communication between hospitalists and primary care physicians, which is essential for ensuring continuity of care and seamless care coordination between these two levels of the health system (Kripalani et al. 2007). A comprehensive team approach in quality improvement initiatives, and paralleling workforce engagement with effective communication strategies, is vital for enhancing the overall quality and performance of health care services (Honda et al. 2018).

Workforce Compensation, Incentives, and Motivation Strategies

Past reviews and models for high-performing health systems have highlighted the importance of incentives and motivation for enhancing work performance (Petros Gile et al. 2015); in some settings financial incentives, including monetary rewards and recognition, have been successfully used to actively engage health care professionals in quality improvement initiatives. For example, in several case studies from the United States, residents and fellows who were offered financial incentives ranging from \$400 to \$1200 were more likely to achieve better quality outcomes (Suelflow 2016).

Nonmonetary incentives are, however, somewhat more effective than bonuses (Mathes et al. 2019). The role of intrinsic motivation must therefore not be discounted in achieving better performance.

Employee empowerment is one mechanism that can be used to achieve intrinsic motivation. A culture of empowerment can be created by providing more autonomy for decision-making, acknowledging health workers' contributions and achievements, and providing opportunities for shared leadership, for example their participation in audits. This has been found to boost job satisfaction, which leads to a more engaged and efficient workforce, and contributes to improved hospital performance (Hut-Mossel et al. 2021; Petros Gile et al. 2015; Veenstra et al. 2022). Some studies draw a direct correlation between autonomy and a positive work environment, and improved patient safety (Yuk and Yu 2023). Others further suggest that such a work environment could enhance the recruitment and retention of a skilled workforce (Pursio et al. 2021)

Creating an environment of mutual respect among and between clinical and nonclinical staff, and encouraging open communication in a psychologically safe atmosphere are additional management functions identified in the literature as engendering a positive work environment and enhancing care quality and safety (Taylor et al. 2015).

Tools

Decision Support and Management Tools

The strategic use of decision support and management tools in health care has been linked to improved care and hospital performance. Clinical decision support tools seamlessly integrated into the workflow of health workers have demonstrated positive impacts on care quality. In a multicenter study from Kenya with over 41,000 participants, it was found that the inclusion of a decision support prompt into electronic records to signal immunologic treatment failure for patients with HIV triples the odds of a patient receiving appropriate remedial treatment when treatment fails (Oluoch et al. 2016).

Management decision-making is also enhanced with appropriate management tools. Resource tracking tools like the Real-Time Location Systems (RTLS) technology, which tracks the location of equipment and personnel, have helped in managing health care workflow, reducing wait times, and optimizing operational efficiency (Overmann et al. 2021). In one study, the implementation of an RTLS system within the hospital information system resulted in the reduction of patient waiting times and improved efficiency¹. Similarly, Simulation Predictive Models assist in forecasting patient flow and resource needs, thus helping with effective patient scheduling, which enhances the patient experience and reduces wait times (Maninchedda et al. 2023). Lean Management tools and principles have helped streamline patient flow and reduce crowding, demonstrating their effectiveness in optimizing hospital operations (Abdallah and Alkhalidi 2019). Bed management software and data tracking tools have also been used for efficient patient flow management, bed availability, and improving the patient admissions process. For example, in one of the studies reviewed by Walker et al, the implementation of a bed management system over a period of three years resulted in the improvement of bed turnover time from 111 to 49 minutes, and the reduction of patient transportation time (interval from when a patient is discharged to when patient transport arrives to escort patient from a room) from 45 to 26 minutes (Tortorella et al. 2013; Walker et al. 2016). The use of clinical practice guidelines as a tool has standardized care procedures, ensuring adherence to best practices and enhancing care quality (Vlassov et al. 2020). Strategic design elements, such as visual cues, have also been effectively used to promote practices like hand hygiene, suggesting that thoughtful environmental adjustments can lead to improved adherence to health care standards, especially when combined with optimized workload management (Akpaka 2014).

Robust risk management tools such as Failure Modes and Effects Analysis (FMEA) have been highlighted in the literature for their role in enhancing the safety and reliability of hospitals (Liu et al. 2020)AIMS, AND OBJECTIVES: Failure mode and effects analysis (FMEA. As a prospective risk analysis technique, FMEA plays a significant role in identifying and analyzing potential failures in health care processes based on factors like occurrence, severity, and detection. FMEA applications have spanned diverse areas in hospital settings such as radiation therapy, ICU care processes, medication administration, clinical laboratory testing, and blood transfusion processes. For example, the application of FMEA to improve medication safety at a teaching hospital in Sri Lanka helped in discovering that overcrowded dispensing counters were the cause of 57 failure modes, which in turn helped to prioritize correction efforts and the active involvement of pharmacists in the process (Anjalee et al. 2021).

E-health Technologies

The integration of eHealth technologies plays a significant role in enhancing hospital performance, as indicated by several studies. The improvement in clinical data management and decision-making is notably achieved through the use of Electronic Medical Records (EMRs), Computerized Physician Order Entry (CPOE), e-Prescribing, and Clinical Decision Support Systems (CDSS). These tools streamline processes and aid in bringing about more informed clinical decisions, contributing to the efficiency and effectiveness of health care delivery (Keasberry et al. 2017).

¹ Specifically, the mean waiting time of patients in the intervention group decreased significantly (from 5.4 to 4.3 min, 20% decrease) compared with the control group (from 3.8 to 3.5 min, 8% decrease)(Kim et al., 2010).

The role of Electronic Medical Records (EMRs) in decision support has been extensively recognized in the literature. EMRs offer functionalities such as the copy-paste feature, which significantly enhances efficiency in data management, with attendant benefits for reducing errors (Al Bahrani and Medhi 2023). They also incorporate databases and registries for benchmarking practices, the use of which have been proven to improve therapy rates and reduce in-hospital mortality (de By et al. 2020). Software tools within EMRs for ensuring data accuracy are also helpful in maintaining the integrity and reliability of patient data, which underpins effective health care delivery (Al Bahrani and Medhi 2023). Furthermore, EMR platforms that include audit and feedback systems, educational interventions, and electronic reminders are identified as effective for continuous quality improvement (Jalbert et al. 2019).

Communication technologies, like dual-handset phones and remote interpretation systems, have been introduced in some settings to enhance patient-provider communication for patients with limited language proficiency. For example, the literature has shown that the introduction of dual-handset phones for surgical patients with limited language proficiency significantly improved the rates of adequate informed consent (54 vs. 29 percent, $p = 0.001$); however, these patients still had lower odds of informed consent compared to English-speakers, suggesting a need for multiple interventions. In a related study, the implementation of a phone-based remote interpretation system in some settings was found to result in an increase in satisfaction rates of both patients and staff (Lee et al. 2017; Taira et al. 2019).

The literature also highlighted digital electronic Patient-Reported Outcomes (ePRO) systems for their effectiveness in capturing patient-reported outcomes. This data can provide health care providers with direct insights into patients' perspectives and experiences, enabling more personalized and effective care (Aiyegbusi et al. 2023).

Quality Improvement Tools

Performance metrics, quality dashboards, and safety benchmarks are identified in the literature as tools that are helpful for tracking progress and informing hospital policies (Millar et al. 2013). These tools provide critical insights into organizational performance, allowing for data-driven decision-making and policy development in health care settings. They have mostly been implemented and studied in high-income country (HIC) settings. In the context of process improvement, key tools used in Six Sigma and Lean Six Sigma (LSS) projects, such as process mapping and statistical analysis tools, have been effective in identifying and rectifying inefficiencies in health care processes (Honda et al. 2018). Plan-Do-Study-Act (PDSA) cycles have similarly been used in facility-level quality improvement initiatives to successfully plan, implement, and improve quality interventions (Taylor et al. 2014). The utility of checklists in supporting teamwork, and the use of bed management software for efficient patient flow management have also contributed to enhancing hospital performance (Costar and Hall 2020; Walker et al. 2016). Furthermore, the implementation of error management systems have been vital in identifying, analyzing, and mitigating risks in the delivery of clinical care, thereby enhancing patient safety and outcomes (Francis et al. 2008; Husebø and Akerjordet 2016).

Patient Engagement and Patient-Centered Care

Patient-Provider Communication Interventions

Enhancing the quality of communication between health care providers and patients is crucial for effective patient engagement. One documented strategy for enhancing communication has been educating patients and their families on their condition and care process. For example, in a review of communication strategies between health care providers and patients on hemodialysis, it was found that educating patients and their families about the disease, the various treatment options available, and their potential consequences empowered these patients to actively participate in their care. Additionally, active engagement of patients in the decision-making process, and ensuring that they were involved in discussions about their treatment options positively influenced their attitudes toward their dialysis treatment (Al Nuairi et al. 2022). A broader systematic review of studies on shared decision-making from the United States also found significant positive effects on patient feelings of satisfaction (Shay et al 2015).

Interpersonal communication skills are also vital for enhanced provider-patient interaction. Enabling patient voice through self-efficacy is one strategy for achieving this; for example, encouraging parental self-efficacy in postnatal care by providing daily one-to-one time between new mothers and midwives. In one study, it was shown that this strategy allowed mothers to discuss their concerns and gain knowledge, enhancing their confidence in the care of their babies, and in interacting with health care providers (Conry et al. 2012).

Adapting patient care strategies during unprecedented situations, as was the case during the COVID-19 pandemic, is also essential to ensure effective communication in such challenging circumstances. Key adaptation strategies identified in the literature from the period of the pandemic include the use of virtual platforms for consultations and counseling, which enables continued patient engagement, and telephone-based screenings and education on health risks and precautions. For maternal care specifically, modified antenatal care strategies, including adapted visit schedules, education on self-monitoring practices, and telephonic follow-up for ultrasound findings ensured timely and clear communication of important health information, maintaining patient awareness and continuing care while reducing the risks from face-to-face interactions (Gold et al. 2022).

Among the population of patients with limited language proficiency, additional strategies are required. Interventions identified in the literature include both technological and interpersonal communication strategies. For instance, as previously noted the use of dual-handset phones have been shown to significantly increase the rates of adequate informed consent among this population. In addition to such technological solutions, policy initiatives such as restructuring services to ensure the availability of interpreters, and targeted educational programs, have helped improve staff proficiency in interacting with patients who have limited language skills. Furthermore, access to a broad spectrum of linguistic services, including 24-hour toll-free phone lines with linguistic support, and providing bilingual clinicians, have also been used to cater to diverse language needs with positive results (Taira et al. 2019).

Personalized Patient Treatment Strategies

Personalized patient care ensures that treatment and care processes are tailored to the individual needs and preferences of patients. This approach may involve integrating educational programs and support services that empower patients with knowledge about their health conditions and treatment options so they can take a more active role, and be more confident in their health care decisions and care pathways. This link has been documented in a realist review by Provencher and colleagues (Provencher et al. 2021) to identify interventions that mitigate the risk of falling among elderly patients; in one Randomized Controlled Trial (RCT) from this review, tailored patient education was associated with a reduction in the risk of falls among elderly patients². Another patient-centered strategy recommended by the review involved designating a patient coordinator for integrated personalized care for each patient, from admission to discharge, as a strategy to improve continuity of care and ensure smooth transitions across the continuum of care (Provencher et al. 2021).

Personalized care also considers the personal and socioeconomic attributes and desires of the patient. In a review of patient satisfaction determinants among hemodialysis patients, strategies used to personalize care included tailored nutrition and childcare services, easy access to hemodialysis facilities with reliable transportation, accommodation of individual patient needs for various treatment times and locations, and considering patient preferences for treatment frequency and duration (Al Nuairi et al. 2022). In one of the studies, providing reliable transportation and flexible scheduling was one of the commonest themes that emerged for improving adherence among interviewed dialysis patients; in another study, patients expressed higher satisfaction with care when they were able to select their dialysis modality (Chenitz et al. 2014; Ladin et al. 2017).

Providing patients with nontraditional options for nonpharmacological care within acceptable safety limits also contributes to the personalization of their care. For example, among patients in isolation due to infectious diseases, music therapy and art therapy have been used to try to mitigate the adverse mental health outcomes associated with isolation (Kramer et al. 2001; Saw et al. 2018). Beyond any potential clinical impacts, giving patients the option to include nontraditional strategies of their choosing could help them to engage more in the treatment process and improve their satisfaction with care.

In all cases of personalized care, the physical environment of the facility, including maintaining cleanliness, hygiene, and a calm ambiance, is a basic minimum for creating a comforting atmosphere for patients. The emphasis on safety, and the availability of suitable resources such as comfortable furniture and up-to-date equipment have also been key in enhancing physical comfort during treatment (Barlas et al. 2001; Mahmood and Tayib 2020; Nielsen and Overgaard 2020).

Patient Flow Strategies and Care Transition Models

Effective care organization necessitates a focus on policies that are both practical and centered around patient well-being (Pichardo-Lowden et al. 2017). Emphasizing the importance of a holistic approach in management, Manning and Islam highlight the importance of developing patient flow strategies that take the entire hospital system into account, including crucial areas like emergency units, to optimize patient throughput. As previously noted, multidisciplinary collaboration, including interdisciplinary rounds and huddles, improves patient flow and discharge rates (Manning and Islam 2023).

2 5.4 falls /1000 patient days in the intervention group, compared to 18.7 falls/1000 patient days in the control group) (Hill et al., 2013).

Many care transition models have also shown evidence of reducing readmission of patients with chronic diseases. Among these models, the Coleman Care transition model was highlighted as an evidence-based, low-cost, and low-intensity intervention that has been effectively implemented in many hospitals and community-based agencies to reduce hospital readmissions (Kelly 2011). Through this model, patients and their families receive four weeks of in-hospital and home visits from a transition coach, a specially trained nurse who assists patients in learning how to manage multiple prescriptions, adhere to discharge recommendations, and give their other health care providers the information they require for effective management. In a randomized controlled trial evaluating it in the United States, the Coleman model resulted in the reduction of readmission rates by 35 percent in urban areas and 12 percent in rural areas (Coleman et al. 2006; Manning and Islam 2023; O’Leary et al. 2012; Walker et al. 2016).

Another strategy that has been employed in improving patient flow is the creation of roles specifically dedicated to enhancing patient intake and throughput. One documented example is the creation of the clinical assistant role in some Emergency Departments (EDs), to reduce overcrowding by managing the flow of incoming patients, assigning them efficiently to doctors, providing waiting time estimates, and addressing the anxiety of patients and their families. The clinical assistant also handles administrative tasks, and assists patients with paperwork and nonmedical inquiries. Evidence from one of the studies reviewed by Maninchedda et al. shows that in busy EDs, the addition of clinical assistants significantly lowers waiting time; the median waiting time in this study was 16 minutes in the group with clinical assistants (n= 12257) versus 19 minutes in the control group (n=12985 ,p <0.0001); the number of patients who leave without receiving care was 242 in the group with clinical assistants, versus 329 in the control group (p= 0.004) (Huang et al. 2013; Maninchedda et al. 2023).

Strengths and Limitations

This review offers a catalog of hospital improvement interventions, focusing on microlevel action. This compendium is designed to be a versatile resource, allowing quick and easy identification of strategies that could be beneficial to address specific improvement objectives.

However, our methodology does present some limitations that should be considered when using the collated strategies. First, it is important to highlight that many of the reviews included in our scoping review predominantly featured studies from high-income settings, with limited evaluation of the role of context in feasibility; the reviews that did examine context often concluded that there was substantial variation in the success of suggested interventions when implemented in different contexts. These observations underscore the need for customization of the strategies to account for context-specific factors when assessing the feasibility and effectiveness of hospital improvement strategies in LMICs.

Second, our review was limited to only published systematic reviews, scoping reviews, and meta-analyses, which means we may have missed interventions that are only documented in the gray literature, and some burgeoning interventions that are not yet mainstream.

Conclusion

From this review, we show that there are multiple touchpoints in the care delivery process where interventions can be instituted to improve the competency of the care delivered, and enhance people’s experience of care, and that many strategies exist to address these needs. While this review provides a breadth of potential interventions that can be used to improve the processes of care, in many cases the intervention has not been widely and rigorously tested. This indicates the need for users of this compendium to consider the list of interventions provided as only a first step in identifying solutions. Any intervention of interest would need to be considered in the light of the evidence available to support it, noting that this review is a high-level appraisal of multiple intervention areas.

The assessment of the evidence from some of the reviews was also sometimes complicated by interventions being instituted as part of a set. While this presents a challenge for isolating individual effects of the component parts, it also signals the potential for multifaceted interventions to provide greater benefits. A prime example is the demonstrated greater gains from combined supervision and training compared to either one alone (Rowe et al. 2018).

The role of context also needs to be highlighted in the conversation about what works. Where available, we presented the evidence from LMICs. But the majority of these interventions have been implemented or tested primarily in HICs. Even where evidence from LMICs exist, there are many contextual variations inherent in health care systems across LMICs, and a one-size-fits-all approach cannot be adopted. Thus, in translating these findings to specific settings, implementers must consider the prevailing system's capacity to absorb these interventions, and the sociocultural determinants of success; and accordingly, adapt the interventions to fit the setting. More implementation research on interventions in LMICs would be helpful in expanding our understanding of what works in LMICs, and how they work.

Following from the point on system capacity, we would like to reiterate the point that **microlevel interventions will struggle to produce their intended outcomes in a dysfunctional macro system**. For example, successfully implementing a decision-support system to identify drug failure among HIV patients may be a pyrrhic victory if the supply chain for HIV medication cannot assure the availability of medicines. **System managers therefore need to take a holistic view of improvement, and not only concentrate on point-of-care interventions that are generally easier to implement.**

We encourage future work to expand on the subthemes developed in this review, and to provide more detailed assessments to help guide future hospital improvement efforts in LMICs.

References

- Abdallah, A.B. and R.Z. Alkhaldi. 2019. "Lean Bundles in Health Care: A Scoping Review." *Journal of Health Organization Management*, 33 (4): Article 4. <https://doi.org/10.1108/JHOM-09-2018-0263>
- Abraham, J., J. Hirt, F. Kamm, and R. Möhler. 2020. "Interventions to Reduce Physical Restraints in General Hospital Settings: A Scoping Review of Components and Characteristics." *Journal of Clinical Nursing* 29: Article 17–18. <https://doi.org/10.1111/jocn.15381>
- Aiyegbusi, O. L., S. E. Hughes, J. D. Peipert, L. M. V. Schougaard, R. Wilson, and M. J. Calvert. 2023. "Reducing the Pressures of Outpatient Care: The Potential Role of Patient-Reported Outcomes." *Journal of the Royal Society of Medicine* 116 (2): Article 2. <https://doi.org/10.1177/01410768231152222>
- Akpaka, C. 2014. "Best Practices for Hand Hygiene Compliance by Health Care Providers in the Inpatient Setting." *American Journal of Infectious Diseases* 10 (2): 84-87. <https://doi.org/10.3844/ajidsp.2014.84.87>
- Al Bahrani, B., and I. Medhi. 2023. "Copy-Pasting in Patients' Electronic Medical Records (EMRs): Use Judiciously and With Caution." *Cureus* 15 (6): Article 6. <https://doi.org/10.7759/cureus.40486>
- Al Nuairi, A., H. Bermamet, H. Abdulla, M.C. E. Simsekler, S. Anwar, and K. L. Lentine. 2022. "Identifying Patient Satisfaction Determinants in Hemodialysis Settings: A Systematic Review." *Risk Management Healthcare Policy* 15: 1843–57. <https://doi.org/10.2147/RMHP.S372094>
- Anjalee, J. A. L., V. Rutter, and N. R. Samaranyake. 2021. "Application of Failure Mode and Effects Analysis (FMEA) to Improve Medication Safety in the Dispensing Process – A Study at a Teaching Hospital, Sri Lanka." *BMC Public Health* 21 (1): 1430. <https://doi.org/10.1186/s12889-021-11369-5>
- Arsenault, C., S. Y. Rowe, D. Ross-Degnan, D. H. Peters, S. Roder-DeWan, M. E. Kruk, and A. K. Rowe. 2022. "How Does the Effectiveness of Strategies to Improve Healthcare Provider Practices in Low-Income and Middle-Income Countries Change After Implementation? Secondary Analysis of a Systematic Review." *BMJ Quality & Safety* 31 (2): Article 2.
- Barlas, D., A. E. Sama, M. F. Ward, and M. L. Lesser. 2001. "Comparison of the Auditory and Visual Privacy of Emergency Department Treatment Areas with Curtains Versus Those with Solid Walls." *Annals of Emergency Medicine* 38 (2): 135–39. <https://doi.org/10.1067/mem.2001.115441>
- Bulamba, F., C. Sendagire, A. Kintu, A. Hewitt-Smith, F. Musana, M. Lilaonitkul, and M. S. Lipnick et al. 2019. "Feasibility of Simulation-Based Medical Education in a Low-Income Country: Challenges and Solutions from a 3-year Pilot Program in Uganda." *Simulation in Healthcare* 14 (2): 113-20.
- Cavicchiolo, M. E., F. Cavallin, F. Bertuola, D. Pizzol, G. Segafredo, O.M. Wingi, L. Da Dalt, G. Putoto, and D. Trevisanuto. 2018. "Effect of a Low-Dose/High-Frequency Training on Real-Life Neonatal Resuscitation in a Low-Resource Setting." *Neonatology* 114 (4): 294–302. <https://doi.org/10.1159/000490370>
- Chenitz, K. B., M. Fernando, and J. A. Shea. 2014. "In-Center Hemodialysis Attendance: Patient Perceptions of Risks, Barriers, and Recommendations." *Hemodialysis International* 18 (2): 364–73. <https://doi.org/10.1111/hdi.12139>
- Coleman, E. A., C. Parry, S. Chalmers, and S.-J. Min. 2006. "The Care Transitions Intervention: Results of a Randomized Controlled Trial." *Archives of Internal Medicine* 166 (17): 1822–28. <https://doi.org/10.1001/archinte.166.17.1822>
- Conry, M. C., N. Humphries, K. Morgan, Y. McGowan, A. Montgomery, K. Vedhara, E. Panagopoulou, and H. McGee. 2012. "A 10 Year (2000-2010) Systematic Review of Interventions to Improve Quality of Care in Hospitals." *BMC Health Services Research* 12 (1): Article 1. <https://doi.org/10.1186/1472-6963-12-275>
- Cortoo, P.-J., S. Simoons, W. Peetermans, L. Willems, and G. Laekeman. 2007. "Implementing a Hospital Guideline on Pneumonia: A Semi-Quantitative Review." *International Journal of Quality Health Care* 19 (6): Article 6. <https://doi.org/10.1093/intqhc/mzm045>
- Costar, D. M., and K. K. Hall. 2020. "Improving Team Performance and Patient Safety on the Job Through Teamtraining and Performance Support Tools: A Systematic Review." *Journal of Patient Safety* 16 (3S Suppl 1): Article 3S Suppl 1. <https://doi.org/10.1097/PTS.0000000000000746>
- de By, T. M. M. H., R. Muslem, K. Caliskan, G. Bortolussi, T. Philipsen, Ö Friberg, A. J. J. C. Bogers, and D. Pagano. 2020. "Consolidated Quality Improvements Following Benchmarking with Cardiothoracic Surgery Registries: A Systematic Review." *European Journal of Cardio-Thoracic Surgery: Official Journal of the*
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- European Association for Cardio-Thoracic Surgery* 57 (5): Article 5. <https://doi.org/10.1093/ejcts/ezz330>
- Epstein, N. E. 2014. "Multidisciplinary In-Hospital Teams Improve Patient Outcomes: A Review." *Surgical Neurology International* 5 (Suppl 7): Article Suppl 7. <https://doi.org/10.4103/2152-7806.139612>
- Francis, R. C. E., C. D. Spies, and T. Kerner. 2008. "Quality Management and Benchmarking in Emergency Medicine." *Current Opinion in Anaesthesiology* 21 (2): Article 2. <https://doi.org/10.1097/ACO.0b013e3282f5d8eb>
- Frankel, A., S. P. Grillo, M. Pittman, E. J. Thomas, L. Horowitz, M. Page, and B. Sexton. 2008. "Revealing and Resolving Patient Safety Defects: The Impact of Leadership WalkRounds on Frontline Caregiver Assessments of Patient Safety." *Health Services Research* 43 (6): 2050–66. <https://doi.org/10.1111/j.1475-6773.2008.00878.x>
- Gold S., L. Clarfield J. Johnstone, Y. Diambomba, P.S. Shah, W. Whittle, N. Abbasi et al. 2022. "Adapting Obstetric and Neonatal Services During the COVID-19 Pandemic: A Scoping Review." *BMC Pregnancy and Childbirth* 22 (1): Article 1. <https://doi.org/10.1186/s12884-022-04409-4>
- Gualandi, R., C. Masella, and D. Tartaglini. 2019. "Improving Hospital Patient Flow: A Systematic Review." *Business Process Management Journal* 26 (6): Article 6. <https://doi.org/10.1108/bpmj-10-2017-0265>
- Hill, A.-M., C. Etherton-Bear, and T. P. Haines. 2013. "Tailored Education for Older Patients to Facilitate Engagement in Falls Prevention Strategies After Hospital Discharge: A Pilot Randomized Controlled Trial." *PloS One* 8 (5): e63450.
- Honda, A. C., V. Z. Bernardo, M. C. Gerolamo, and M. M. Davis. 2018. "How Lean Six Sigma Principles Improve Hospital Performance." *Quality Management Journal* 25 (2): Article 2. <https://doi.org/10.1080/10686967.2018.1436349>
- Huang, E. P.-C., S. S.-H.Liu, C.-C. Fang, H.-C. Chou, C.-H. Wang, Z.-S. Yen, and S.-C. Chen. 2013. "The Impact of Adding Clinical Assistants on Patient Waiting Time in a Crowded Emergency Department." *Emergency Medicine Journal* 30 (12): 1017–19. <https://doi.org/10.1136/emered-2012-201611>
- Husebø, S. E., and K. Akerjordet. 2016. "Quantitative Systematic Review of Multi-Professional Teamwork and Leadership Training to Optimize Patient Outcomes in Acute Hospital Settings." *Journal of Advanced Nursing* 72 (12): 2980-3000. <https://doi.org/10.1111/jan.13035>
- Hut-Mossel, L., K. Ahaus, G. Welker, and R. Gans. 2021. "Understanding How and Why Audits Work in Improving the Quality of Hospital Care: A Systematic Realist Review." *PloS One* 16(3): e0248677. <https://doi.org/10.1371/journal.pone.0248677>
- Jalbert R., A. Gob, and I. Chin-Yee. 2019. "Decreasing Daily Blood Work in Hospitals: What Works and What Doesn't." *International Journal of Lab Hematology* 41 Suppl 1: 151–61. <https://doi.org/10.1111/ijlh.13015>
- Keasberry, J., I. Scott, C. Sullivan, A. Staib, and R. Ashby. 2017. "Going Digital: A Narrative Overview of the Clinical and Organizational Impacts of eHealth Technologies in Hospital Practice." *Australian Health Review* 41 (6): 646-64. <https://doi.org/10.1071/ah16233>
- Kelly, M. D. 2011. "Self-Management of Chronic Disease and Hospital Readmission: A Care Transition Strategy." *Journal of Nursing and Healthcare of Chronic Illness* 3 (1): 4-11. <https://doi.org/10.1111/j.1752-9824.2010.01075.x>
- Kim, J.-Y., H.-J.Lee, N.-S. Byeon, H.-C. Kim, K.-S. Ha, and C.-Y. Chung. 2010. "Development and Impact of Radio-Frequency Identification-Based Workflow Management in Health Promotion Center: Using Interrupted Time-Series Analysis." *IEEE Transactions on Information Technology in Biomedicine: A Publication of the IEEE Engineering in Medicine and Biology Society* 14 (4): 935–40. <https://doi.org/10.1109/TITB.2009.2026167>
- Kramer, M. S., R. W. Platt, S. W. Wen, K. S. Joseph, A. Allen, M. Abrahamowicz, B. Blondel, G. Bréart, and System, F. H. S. G. of the C. P. S. 2001. "A New and Improved Population-Based Canadian Reference for Birth Weight for Gestational Age." *Pediatrics* 108 (2):
- Kripalani, S., A. T. Jackson, J. L. Schnipper, and E. A. Coleman. 2007. "Promoting Effective Transitions of Care at Hospital Discharge: A Review of Key Issues for Hospitalists." *Journal of Hospital Medicine* 2 (5): 314-23. <https://doi.org/10.1002/jhm.228>
- Kruk, M. E., A. D. Gage, C. Arsenault, K. Jordan, H. H. Leslie, S. Roder-DeWan, O. Adeyi et al. 2018. "High-Quality Health Systems in the Sustainable Development Goals Era: Time for a Revolution." *The Lancet. Global Health* 6 (11): e1196–e1252. [https://doi.org/10.1016/S2214-109X\(18\)30386-3](https://doi.org/10.1016/S2214-109X(18)30386-3)
- Ladin, K., N. Lin, E. Hahn, G. Zhang, S. Koch-Weser, and D. E. Weiner. 2017. "Engagement in Decision-Making and Patient Satisfaction: A Qualitative Study of Older Patients' Perceptions of Dialysis Initiation and Modality Decisions." *Nephrology Dialysis Transplantation* 32 (8): 1394–1401. <https://doi.org/10.1093/ndt/gfw307>
-

- Lee, J. S., E. J. Pérez-Stable, S. E. Gregorich, M. H. Crawford, A. Green, J. Livaudais-Toman, and L.S. Karliner. 2017. "Increased Access to Professional Interpreters in the Hospital Improves Informed Consent for Patients with Limited English Proficiency." *Journal of General Internal Medicine* 32 (8): 863–70. <https://doi.org/10.1007/s11606-017-3983-4>
- Liu H.C., L. J. Zhang Y. J. Ping, and L. Wang. 2020. "Failure Mode and Effects Analysis for Proactive Healthcare Risk Evaluation: A Systematic Literature Review." *Journal of Evaluation in Clinical Practice* 26 (4): 1320-37. <https://doi.org/10.1111/jep.13317>
- Mahmood, F. J., and A. Y. Tayib. 2020. "The Role of Patients' Psychological Comfort in Optimizing Indoor Healing Environments: A Case Study of the Indoor Environments of Recently Built Hospitals in Sulaimani City, Kurdistan, Iraq." *HERD: Health Environments Research & Design Journal* 13 (2): 68–82. <https://doi.org/10.1177/1937586719894549>
- Main, E. K., and D. Bingham. 2008. "Quality Improvement in Maternity Care: Promising Approaches from the Medical and Public Health Perspectives." *Current Opinion in Obstetrics and Gynecology* 20 (6): 574-80. <https://doi.org/10.1097/GCO.0b013e3283184040>
- Maninchedda, M., A. S. Proia, L. Bianco, M. Aromatario, G. B. Orsi, and C. Napoli. 2023. "Main Features and Control Strategies to Reduce Overcrowding in Emergency Departments: A Systematic Review of the Literature." *Risk Management Healthcare Policy* 16: 255–66. <https://doi.org/10.2147/RMHP.S399045>
- Manning, L., and M. S. Islam. 2023. "A Systematic Review to Identify the Challenges to Achieving Effective Patient Flow in Public Hospitals." *International Journal of Health Planning and Management* 38 (3): 805-28. <https://doi.org/10.1002/hpm.3626>
- Martinerie, L., F. Rasoaherinomenjanahary, M. Ronot, P. Fournier, B. Dousset, A. Tesniere, C. Gronnier, et al. 2018. "Health Care Simulation in Developing Countries and Low-Resource Situations." *Journal of Continuing Education in the Health Professions* 38 (3): 205-12.
- Mathes, T., D. Pieper, J. Morche, S. Polus, T. Jaschinski, and M. Eikermann. 2019. "Pay for Performance for Hospitals." *Cochrane Database of Systematic Reviews* 2019, Issue 7. Art. No.: CD011156. DOI: 10.1002/14651858.CD011156.pub2. Accessed 03 May 2024
- Millar, R., R. Mannion, T. Freeman, and H. T. O. Davies. 2013. "Hospital Board Oversight of Quality and Patient Safety: A Narrative Review and Synthesis of Recent Empirical Research." *Milbank Quarterly* 91 (4): 738-70. <https://doi.org/10.1111/1468-0009.12032>
- Morello, R. T., J. A. Lowthian, A. L. Barker, R. McGinnes, D. Dunt, and C. Brand. 2013. "Strategies for Improving Patient Safety Culture in Hospitals: A Systematic Review." *BMJ Quality and Safety* 22 (1) <https://doi.org/10.1136/bmjqs-2011-000582>
- Nielsen, J. H., and C. Overgaard. 2020. "Healing Architecture and Snoezelen in Delivery Room Design: A Qualitative Study of Women's Birth Experiences and Patient-Centeredness of Care." *BMC Pregnancy and Childbirth* 20 (1): 283. <https://doi.org/10.1186/s12884-020-02983-z>
- O'Leary, K. J., N. L. Sehgal, G. Terrell, M. V. Williams, and High Performance Teams and the Hospital of the Future Project Team. 2012. "Interdisciplinary Teamwork in Hospitals: A Review and Practical Recommendations for Improvement." *Journal of Hospital Medicine* 7 (1): 48-54. <https://doi.org/10.1002/jhm.970>
- Oluoch, T., A. Katana, D. Kwaro, X. Santas, P. Langat, S. Mwalili, K. Muthusi et al. 2016. "Effect of a Clinical Decision Support System on Early Action on Immunological Treatment Failure in Patients with HIV in Kenya: A Cluster Randomised Controlled Trial." *The Lancet HIV* 3(2): e76–e84. [https://doi.org/10.1016/S2352-3018\(15\)00242-8](https://doi.org/10.1016/S2352-3018(15)00242-8)
- Overdyk, F. J., S. C. Harvey, R. L. Fishman, and F. Shippey. 1998. "Successful Strategies for Improving Operating Room Efficiency at Academic Institutions." *Anesthesia and Analgesia* 86 (4): 896–906. <https://doi.org/10.1097/00000539-199804000-00039>
- Overmann, K.M., D.T.Y. Wu, C. T. Xu, S. S. Bindhu and L. Barrick. 2021. "Real-Time Locating Systems to Improve Healthcare Delivery: A Systematic Review." *Journal of American Medical Informatics Association* 28 (6): 1308-17. <https://doi.org/10.1093/jamia/ocab026>
- Petros Gile, P., J. Van De Klundert, and J. Van De Broek. 2015. "The Link Between Management Practices, Health Professional Performance and Patient Outcomes." *Working Paper of Public Health* 4 (1) <https://doi.org/10.4081/wpph.2015.6719>
-

- Pichardo-Lowden, A., P. Haidet, and G. E. Umpierrez. 2017. "Perspectives on Learning and Clinical Practice Improvement for Diabetes in the Hospital: A Review of Educational Interventions for Providers." *Endocrine Practice* 23 (5). <https://doi.org/10.4158/ep161634.ra>
- Provencher, V., M. D'Amours, M. Menear, N. Obradovic, N. Veillette, M.-J. Sirois, and M.-J. Kergoat. .2021. "Understanding the Positive Outcomes of Discharge Planning Interventions for Older Adults Hospitalized Following a Fall: A Realist Synthesis." *BMC Geriatrics* 21 (1), Article 84. <https://doi.org/10.1186/s12877-020-01980>.
- Puri, L., J. Das, M. Pai, M. Agrawal, J. E. Fitzgerald, E. Kelley, R. Aggarwal et al. 2017. "Enhancing Quality of Medical Care in Low Income and Middle Income Countries Through Simulation-Based Initiatives: Recommendations of the Simnovate Global Health Domain Group." *BMJ Simulation & Technology Enhanced Learning* 3: S15.
- Pursio, K., P. Kankkunen, E. Sanner-Stiehr, and T. Kvist. 2021. "Professional Autonomy in Nursing: An Integrative Review." *Journal of Nursing Management* 29 (6) 1565–77. <https://doi.org/10.1111/jonm.13282>
- Rowe, A. K., D. de Savigny, C. F. Lanata, and C. G. Victora. 2005. "How Can We Achieve and Maintain High-Quality Performance of Health Workers in Low-Resource Settings?" *Lancet* 366 (9490);. [https://doi.org/10.1016/S0140-6736\(05\)67028-6](https://doi.org/10.1016/S0140-6736(05)67028-6)
- Rowe, A. K., G. Labadie, D. Jackson, C. Vivas-Torrealba, and J. Simon. 2018. "Improving Health Worker Performance: An Ongoing Challenge for Meeting the Sustainable Development Goals." *BMJ* 362: k2813. <https://doi.org/10.1136/bmj.k2813>
- Saw, J. J., E. A. Curry, S. L. Ehlers, P. D., Scanlon, B. A. Bauer, J. Rian, D.R. Larson, and A.P. Wolanskyj. 2018. "A Brief Bedside Visual Art Intervention Decreases Anxiety and Improves Pain and Mood in Patients with Haematologic Malignancies." *European Journal of Cancer Care* 27 (4): e12852. <https://doi.org/10.1111/ecc.12852>
- Schmutz, J., and T. Manser. 2013. "Do Team Processes Really Have an Effect on Clinical Performance? A Systematic Literature Review." *BJA: British Journal of Anaesthesia* 110 (4): 529–44. <https://doi.org/10.1093/bja/aes513>
- Schwerdtle, P., J. Morphet, and H. Hall. 2017. "A Scoping Review of Mentorship of Health Personnel to Improve the Quality of Health Care in Low and Middle-Income Countries." *Globalization and Health* 13: 1-8.
- Shay, L.A. and J.E. Lafata. 2015. "Where is the Evidence? A Systematic Review of Shared Decision Making and Patient Outcomes." *Medical Decision Making* 35 (1): 114-31. doi: 10.1177/0272989X14551638.
- Suelflow, E. 2016. "Systematic Literature Review: An Analysis of Administrative Strategies to Engage Providers in Hospital Quality Initiatives." *Health Policy Technology* 5 (1): 2-17. <https://doi.org/10.1016/j.hlpt.2015.10.001>
- Taira, B. R., K. Kim, and N. Mody. 2019. "Hospital and Health System-Level Interventions to Improve Care for Limited English Proficiency Patients: A Systematic Review." *Joint Commission Journal on Quality and Patient Safety* 45 (6): 446-58. <https://doi.org/10.1016/j.jcjq.2019.02.005>
- Taylor, M. J., C. McNicholas, C. Nicolay, A. Darzi, D. Bell, and J. E. Reed. 2014. "Systematic Review of the Application of the Plan–Do–Study–Act Method to Improve Quality in Healthcare." *BMJ Quality & Safety* 23 (4): 290-98.
- Taylor, N., R. Clay-Williams, E. Hogden, J. Braithwaite, and O. Groene. 2015. "High Performing Hospitals: A Qualitative Systematic Review of Associated Factors and Practical Strategies for Improvement." *BMC Health Services Research* 15(1): Article 244. <https://doi.org/10.1186/s12913-015-0879-z>
- Tortorella, F., D. Ukanowicz, P. Douglas-Ntagha, R. Ray, and M. Triller. 2013. "Improving Bed Turnover Time With a Bed Management System." *JONA: The Journal of Nursing Administration* 43 (1): 37. <https://doi.org/10.1097/NNA.0b013e3182785fe7>
- Vamos, C.A., T. R. Foti, E. Reyes Martinez, Z. Pointer, L. A. Detman, and W. M. Sappenfield. 2023. "Identification of Clinician Training Techniques as an Implementation Strategy to Improve Maternal Health: A Scoping Review." *International Journal of Environmental Research and Public Health* 20 (11): Article 11. <https://doi.org/10.3390/ijerph20116003>
- Veenstra, G. L., K.F. A. A. Dabekaussen, E. Molleman, E. Heineman, and G. A. Welker. 2022. "Health Care Professionals' Motivation, Their Behaviors, and the Quality of Hospital Care: A Mixed-Methods Systematic Review." *Health Care Management Review* 47(2): 155. <https://doi.org/10.1097/HMR.0000000000000284>
-

Vlassov, V.V., K. Bates and M. McKee. 2020. "Quality Improvement in Hospitals in the Russian Federation, 2000-2016: A Systematic Review." *Health Econ Policy Law* 15 (3): 403-13. <https://doi.org/10.1017/S1744133119000252>

Walker, C., K. Kappus, and N. Hall. 2016. "Strategies for Improving Patient Throughput in an Acute Care Setting Resulting in Improved Outcomes: A Systematic Review." *Nursing Economics* 34 (6): Article 6.

Willcox, M. L., I. A. Okello, A. Maidwell-Smith, A. K. Tura, T. van den Akker, and M. Knight. 2023. "Maternal and Perinatal Death Surveillance and Response: A Systematic Review of Qualitative Studies." *Bulletin of the World Health Organization* 101 (1): 62.

Willcox, M., H. Harrison, A. Asiedu, A. Nelson, P. Gomez, and A. LeFevre. 2017. "Incremental Cost and Cost-Effectiveness of Low-Dose, High-Frequency Training in Basic Emergency Obstetric and Newborn Care as Compared to Status Quo: Part of a Cluster-Randomized Training Intervention Evaluation in Ghana." *Globalization and Health* 13 (1): 88. <https://doi.org/10.1186/s12992-017-0313-x>

Yuk, S., and S. Yu. 2023. "The Effect of Professional Autonomy and Nursing Work Environment on Nurses' Patient Safety Activities: A Perspective on Magnet Hospitals." *Journal of Nursing Management* 2023: e5587501. <https://doi.org/10.1155/2023/5587501>

SECTION 4

INTEGRATION AS AN ENTRY POINT FOR HOSPITAL REFORM

CHAPTER 10:

LEVERAGING THE PRINCIPLES OF NETWORKS AND LEARNING SYSTEMS TO IMPROVE THE QUALITY OF HOSPITAL CARE: THE CLINICAL INFORMATION NETWORK IN KENYA

Mike English

Key Messages

- Improving clinical practices in hospitals at large scale, including the adoption of and adherence to the use of checklists, evidence-based guidelines, and other aspects of high-quality care has proven challenging in all settings; many intervention strategies aimed at improving quality in this regard have delivered disappointing results.
- Many have argued that such interventions fail because they do not acknowledge the complexity of health systems and the multiple interacting factors that prevent health workers and the teams and facilities they work in to change their behavior; in order to achieve the desired effects it is further argued that interventions should be informed by careful thinking about the mechanisms needed to produce change in the target context.
- Networks are seen as one potential intervention strategy to influence and align all those involved in providing care, from senior managers to frontline workers; and therefore promote the desired improvements in care across potentially large parts of the health system.
- In this chapter we will articulate, as an example, how one type of cross-hospital network in Kenya was designed, and successfully employed to improve multiple clinical practices (assessed as quality indicators) in the inpatient pediatric wards of 24 hospitals that formed an emerging network over a period of 10 years.

Quality and Safety of Care in Hospitals

High-quality hospital care is effective, safe, timely, and people-centered. From a system perspective it should also be equitable, integrated, and efficient (Kruk et al., 2018). To deliver valued health outcomes many countries need to improve in all of these areas, including achieving the UN's Sustainable Development Goals (SDGs), through universal health coverage (UHC). Any hospital providing quality care requires that system inputs such as infrastructure and material resources are adequate; that personnel are sufficient in number and skills; and that managers, teams, and individuals are able to organize effectively to identify and respond to patient needs and preferences.

Unfortunately, well into the 21st century, inputs as basic as water, sanitation, and power are often inadequate in many LMICs; this compounds the major and persistent challenges of insufficient human and material resources available (World Health Organisation, 2016; World Health Organization & United Nations Children's Fund, 2021). This has predictable consequences. The quality of care is often poor, and organizational processes such as improvement activities, team relationships, staff morale, and patient experiences are all adversely impacted. Weaknesses in broader health system functions such as information systems, leadership, and governance often further conspire to reduce the quality of hospital care.

Improving Quality of Care

Can quality of hospital care in LMICs be improved, at least to some degree, in the face of such foundational issues—without huge investment?

A wide array of tools and improvement strategies derived from high-income country practices are now well established (Foundation, 2021; Institute of Healthcare Improvement, 2003, 2023). These have informed many improvement efforts in LMICs, and some have reported success at quite large scale (Group, 2008; Linnander et al., 2016; Quality Assurance Project, 2009; Singh et al., 2016). Some have also foundered, or proved unsustainable once external expert technical support, enhanced supervision, and sometimes specific financing are no longer available (Kacholi & Mahomed, 2020; Project, 2019).

One central and recurring question, in the context of severe resource challenges, is how can a culture of quality care in a hospital be developed to sustain the incremental changes over time that are the hallmark of continuous quality improvement efforts? In such settings local improvement actions may need to incur minimal or no local financial costs, and be achieved within the envelope of existing budgets. Improvements, then, rely greatly on the motivation and persistence of facility and team leaders and their frontline staff. Yet despite this reliance on leader and team behaviors, quality improvement is often seen as a largely technical exercise comprised of tools, training, data, and planning. These aspects are of course important, but they are synergistic with, not a substitute for, motivated personnel.

In this report I articulate, in brief, how an improvement intervention was specifically designed to change cultures and motivate facility teams over sustained periods of time in a resource-constrained setting. Before describing our specific example, I outline broader principles derived from emerging debates on networks and learning systems that we drew on as we developed our change strategy.

Networks and Learning Systems

Networks in health systems take many forms but they also “have similar characteristics, such as having a shared communal goal or vision, strong visionary leadership, robust communication, and trust,” features that overlap with those of quality improvement collaboratives. (Kalaris et al., 2023; Zamboni et al., 2020). They can be one means to influence cultures and “improve processes and quality of care, increase evidence-based practice, facilitate change, share knowledge and innovation, and achieve joint goals” (Kalaris et al., 2023)

Learning health care systems were discussed in a 2007 report from The Institute of Medicine (IOM, later renamed the National Academy of Medicine). They defined the core elements of a learning health care system (Olsen L et al., 2007). These include specific efforts to: (i) create a network of engaged and highly motivated stakeholders; (ii) enable clinical staff to use information tools (such as electronic health records) integrated into their routine work so that clinical data are entered only once and repurposed many times for the purposes of research, quality improvement, and health system performance monitoring (the data-in-one principle); (iii) foster implementation of evidence into routine clinical care to improve quality; and (iv) promote shared, continuous learning. More recently, the Alliance for Health Policy and Systems Research has articulated a wider definition of learning system principles (Sheikh & Abimbola, 2022). These recognize that learning at the micro, meso, and macro levels is interconnected – across individuals, groups, and teams, and at organizational and cross-organizational levels. This learning takes many forms, such as problem-oriented learning, system-oriented learning (for example, learning to inform policy or strategy); and how to advance learning itself, for example through knowledge exchange processes (Sheikh & Abimbola, 2022).

I now discuss an example of a network developed in an LMIC, incorporating learning health system principles. I focus particularly on how such an approach might foster a culture of improvement and motivate facility teams over sustained periods of time in a resource-constrained system. I assume the reader is already familiar with the principles of and common technical approaches to quality improvement that are discussed in many other reports (Foundation, 2021; Institute of Healthcare Improvement, 2023).

The Kenyan Clinical Information Network

The Kenyan Clinical Information Network (CIN) aimed to improve public-sector, inpatient hospital care for children and newborns. The activities it engaged in were informed by bodies of theory and careful consideration of how a team embedded in but not part of the formal health system might influence hospital practices at scale. This network had a special focus on changing the behaviors of key actors in hospitals, such as departmental leaders and teams of frontline workers.¹ At the same time CIN had a mandate to foster research on improvement, implementation, and intervention effectiveness (English et al., 2021). The principal practical aims of the CIN and how these were operationalized over a period of more than five years, are summarized in Table 10.1.

Table 10.1: Operationalization of the Principles of the Kenyan Clinical Information Network (CIN).

Principles	How operationalized
Professional and wider stakeholder engagement, consensus development, vision and goal setting	CIN was initiated as a partnership between one center within the Kenya Medical Research Institute, the National Ministry of Health's Neonatal and Child Health Unit; the University of Nairobi Department of Pediatrics and Child Health; and the Kenya Pediatric Association, and senior hospital doctors and nurses responsible for pediatric and neonatal wards. The hospitals involved typically had between 1 and 2 qualified pediatricians who were key focal points, but sometimes there were none. Specialist pediatric and neonatal nurses are extremely few; nurse leaders were typically generally trained but in charge of the wards' nursing teams (Irimu et al., 2018) These stakeholders were involved in foundational meetings, including establishing the vision and goals, in 6-12 monthly network meetings from 2014 (except for 2020 and 2021, during the COVID pandemic), and a variety of additional meetings to decide on practice guidelines or standards (English, Irimu, et al., 2017; Irimu et al., 2018; Keene et al., 2019; Murphy et al., 2018)
Improved structured medical and nursing records; formal co-design	In even the large busy general (non-tertiary) hospitals comprising the CIN, most acute and day-to-day clinical management is initiated and delivered by very junior medical personnel, typically prelicensure interns. (Ogero et al., 2020) Structured medical records served as important job aids, and training and interprofessional communication tools; they also enabled better data collection. These spanned medical and nursing tools that were codesigned with staff, hospitals, and authorities to facilitate their use and long-term adoption (Muinga et al., 2021; Mwakyusa S et al., 2006; Tuti et al., 2016)
Improving information systems; timely data capture and quality assurance	Kenya's health management information system focuses on the collation of aggregate inpatient data, whereas individual patient level data is needed to assess many quality of care indicators. The CIN, drawing on the adoption of structured medical records, deployed a low-cost, retrospective data collection strategy that provided a "common routine data platform" to support learning health system activities, including regular audit and feedback for hospitals and other stakeholders (Gachau et al., 2017; Irimu et al., 2018; Maina et al., 2018; Tuti T et al., 2015).
Defined evidence-based practices, clinical skills sharing, and feasible goals	CIN leveraged earlier work to agree on, through professional consensus, clear clinical practice guidelines for the most common causes of hospital admission for children and newborns (English, Irimu, et al., 2017; English et al., 2011). These have become the foundation for a widely accepted clinical skills training approach (English et al., 2011; Irimu G et al., 2008). The guidelines and training target the Kenyan context of resources and provide a platform for establishing realistic improvement goals with hospital teams (Irimu et al., 2018).
Regular audit and feedback of quality indicators	With a robust information pipeline and agreed-upon improvement goals it became possible (using standardized computer programming) to provide feedback reports on quality indicators at least every 3 months, and for some indicators even more frequently (Gachau et al., 2017; Tuti et al., 2016). As indicated above, this feedback was discussed and reinforced at network meetings (Irimu et al., 2018).
Mentorship, peer-to-peer learning, benchmarking, and team leader skills building	At the inception of CIN, respected senior pediatricians provided specific but quite simple skills sessions on the practical aspects of managing a team. These sessions were repeated, or new short skills sessions were provided on occasion, from 2014 to 2022, in part to account for hospital personnel changes. Training was typically part of the 6-12 monthly network meetings, which often lasted two full days and provided opportunities to discuss quality performance, exchange ideas for improvement, and give senior pediatricians the chance to offer ideas and advice (Irimu et al., 2018)

¹ These theoretical perspectives are described in detail elsewhere (English, 2013; English, Ayieko, et al., 2017; English et al., 2020).

Developing the Intangible “Software” of CIN

Many quality improvement interventions focus on tangible health system components. These include system hardware, people, organizational structures, technologies, tools, and information systems. They also include tangible software: training, guidelines, and quality improvement groups and procedures.

The intangible aspects of health systems are, however, just as critical. These include peoples’ interests, relationships, values, and norms (Blaauw D et al., 2003; Sheikh et al., 2011). Hardware and tangible software are often the focus of operational activities (see Table 10.1). But the CIN was also explicitly developed to build or strengthen intangible software. This included working with multiple stakeholders, including authoritative governmental and professional institutions, but especially with hospital departmental leaders, to articulate and reinforce new norms aligned to a new shared vision and goals (Irimu et al., 2018). This built on prior work to create local ownership of and expectations for evidence-based clinical practice and quality standards through consensus-based processes. In so doing CIN aimed to put evidence-based practice and high-quality care at the heart of professional and institutional values and norms (English, Irimu, et al., 2017; English et al., 2020; Murphy et al., 2018).

These efforts to change things at the macro or institutional level were reinforced at the meso level by enabling hospital teams to share information about their performance on quality of care with the government in meetings that provided a “safe space” (Irimu et al., 2018). These meetings enabled all participants to understand one another’s limitations, but also provided opportunities for benchmarking and learning. Importantly, they also recognized success and reaffirmed commitment to quality. By specifically strengthening relationships between professionals within and between hospitals, the network promoted internalization of changing norms and practices at the meso and micro levels, creating forms of shared or distributed leadership and governance to support quality of care (McGivern et al., 2017; Nzinga et al., 2018)

Within facilities, at the micro level the regular provision of quality-of-care indicator reports to clinical team leaders, often accompanied by personalized emails or telephone calls from a network coordinator, also served multiple purposes. Improvements in the information system (hardware) enabled hospital-specific quality of care reports to be distributed (tangible software). These helped direct attention and effort (intangible software) to key improvement needs in line with classical feedback theory (Hysong et al., 2006; Kluger A & A., 1996).

However, within the context of a network of peers these reports take on a wider professional, normative role, a shared expectation of quality improvement (McGivern et al., 2017). Indeed, creating a peer group of practice leaders can provide a critical mass of professionals who can prompt a re-evaluation of professional roles, and acceptance of previously unacknowledged managerial responsibilities for improving services (Nzinga et al., 2019). Thus there is evidence that senior clinicians become more engaged in management and leadership to promote quality, and that professionals and their institutions are willing to set and embrace quality standards (Keene et al., 2019; McGivern et al., 2017; Murphy et al., 2018; Nzinga et al., 2018, 2019). Enactment of these leadership roles is associated with the adoption of new practices and technologies over time (Enoch et al., 2020; Irimu et al., 2018; Tuti et al., 2021).

Over time these professional leaders also help to change the thinking of much wider professional groups, which in turn helps foster adoption of new or improved practices (Nzinga et al., 2018, 2019). Also important are the new relationships between the important national stakeholders and hospital teams that have been established through network processes. This is valuable, since clinical governance of quality care in practice **must** be a shared and widely distributed process (Braithwaite, 2006; English et al., 2020; Martin et al., 2013; Martin et al., 2015; Suddaby & Viale, 2011; Tangcharoensathien et al., 2021). Networks such as the Kenyan CIN can help achieve this form of distributed, locally championed, and harmonized quality improvement.

Impacts of CIN

CIN did not have the financial resources to address any of the hospitals' often quite limited infrastructure, or its human or material resource deficits (Ayieko et al., 2016; Gathara et al., 2019; Maina et al., 2019). As a result, mortality in CIN hospitals still has much room for improvement (Ayieko et al., 2016; Irimu et al., 2021). There is, however, evidence that CIN has resulted in many improved care processes; many recommended clinical practices defined as indicators of high-quality care in global and national clinical recommendations were adopted. These successes, measured across multiple process-of-care quality indicators, reflect better technical content of clinical care by the junior clinicians who provide frontline services. Examples of these better practices include high levels of the use and completion of admission “checklists,” which require more careful patient assessment and diagnosis. Improvement from baselines of typically less than 20 percent to over 80 percent ratings of “good performance” were achieved for the assessment of children’s nutritional and HIV status, and the use of pulse oximetry. Other improvements included more rational and accurate prescribing of drugs, including antibiotics, and a 30 percent reduction in the odds of inpatient death from diarrhea and dehydration (Akech et al., 2019; Gachau et al., 2017; Gachau et al., 2018; Maina et al., 2017; Maina et al., 2018; Opondo et al., 2018). These improvements in multiple clinical practices often took 6-18 months to be realized, during which time there was progressive improvement; they were typically then sustained over long periods of time—many years in some cases. Such progressive and sustained improvement was achieved despite the fact that the junior medical staff providing almost all of the frontline care changed in most hospitals every 3-4 months, every year, over periods of up to 10 years. These results therefore represent long-term effects of CIN (Enoch et al., 2020; Gachau et al., 2017; Irimu et al., 2018; May & Finch, 2009).

What is CIN an example of?

As stated above, CIN was a specific intervention that used the principles of networks and learning health systems to promote collaborative improvement in a resource-constrained setting. Its design reflects its origins within a nationally embedded research group without formal authority. CIN provided “external” support. This did not extend to providing finance or health care materials to hospitals, but it did include support for the information system, and for the personnel who undertake data collection, management, and analysis. It also supported expert mentorship, and network meetings. The CIN is therefore a strengthening strategy for a health system with a particular focus on implementing a locally agreed-upon and contextually feasible quality improvement agenda.

From the outset, however, CIN was designed to achieve its aims while operating within a complex health system (Plsek P E & Greenhalgh T, 2001). Its interrelated intervention principles, and the way these were operationalized, were theorized to be synergistic. We therefore suggest that ***it is the principles and processes of CIN that can be replicated, rather than a set of specific and prespecified rules that are exactly replicated***(Cathain et al., 2019; Hawe et al., 2009). We propose that strategies like the Kenyan CIN that can deal with the reality of complex systems are needed to achieve improved quality, as opposed to trying to replicate models of managing health care systems as though they are bottling factories (Long et al., 2018; Mannion & Braithwaite, 2012; Morton A & Cornwell J, 2009). Importantly, we must continuously learn, and examine whether or not the overall approach or its components are successful, or if they need to be adapted. ***Ultimately, it is valued health outcomes, not the impossible goal of an exact recipe for achieving them, that are the goal.***

Conclusions

All interventions and change strategies require resources. To improve care, we have to change the status quo, and we have to overcome system inertia. The energy to do this, most often in the form of human resource time, represents a new system input whether it also involves direct financial or material transactions or not. Sometimes the initial efforts mean that quality in some aspect is improved, reaching a new and acceptable “set-point” of performance, so that the required quality standard simply becomes the new norm (Hysong et al., 2011). We observed examples of this, for example in the achieving of very high levels of compliance with the use of admissions checklists, and adherence to first-line medical treatments (Gachau et al., 2017; Maina et al., 2018). However, often our aim is continuous quality improvement; consequently the supply of effort, and thus resources must be continuously sustained. The strategy for long-term support needs careful thought, however. There is a risk, especially in LMICs, where technical partners come and go, and are linked to fixed project life-cycles, that this takes the form of a continuous stream of discrete and diverse quality improvement projects that do not create long-lasting change (Project, 2019).

I argue therefore that **delivering long-lasting change will likely require that long-term attention is paid to building or strengthening the institutions, values, and norms needed to support people centered, high-quality hospital care.** These developments in health systems go beyond the policy documents, performance indicators, new tools, and quality improvement training that are the hallmark of many programs. Unfortunately, longer-term support for the hard work of realigning the institutions, professions, educational systems, and people who make up complex health systems around a shared vision and goals for quality care is rare. In systems still dominated by the idea that “if it can’t be measured it can’t be managed,” the importance of the system’s intangible software and the cultural work that needs to be done to improve quality is often ignored. We suggest that **networks and linked learning systems provide a promising entry point for achieving better health care.** To do this they too must have at least a medium-term vision, and be embedded in health systems with strong links to important institutional actors. A careful appraisal of the existing health system, insights gained from theory and prior improvement efforts, and realistic goals are all also important as part of a principle-based strategy suited to intervention in complex systems.

References

- Akech, S., Ayieko, P., Irimu, G., Stepniwska, K., English, M., & authors, C. I. N. (2019). Magnitude and pattern of improvement in processes of care for hospitalised children with diarrhoea and dehydration in Kenyan hospitals participating in a clinical network. *Tropical Medicine & International Health*, 24(1), 73-80. <https://doi.org/doi:10.1111/tmi.13176>
- Ayieko, P., Ogero, M., Makone, B., Julius, T., Mbevi, G., Nyachiro, W., Nyamai, R., Were, F., Githanga, D., Irimu, G., & English, M. (2016). Characteristics of admissions and variations in the use of basic investigations, treatments and outcomes in Kenyan hospitals within a new Clinical Information Network. *Arch Dis Child*, 101, 223-229. <https://doi.org/10.1136/archdischild-2015-309269>
- Blaauw D, Gilson L, Penn-Kekana L, & H., S. (2003). Organisational relationships and the 'software' of health sector reform. In *Disease Control Priorities Project Background Paper*. Washington, DC.
- Braithwaite, J. (2006). Responsive regulation and developing economies. *World Development*, 34(5), 884-898.
- Cathain, A., Croot, L., Duncan, E., Rousseau, N., Sworn, K., Turner, K. M., Yardley, L., & Hoddinott, P. (2019). Guidance on how to develop complex interventions to improve health and healthcare. *BMJ Open*, 9(8), e029954. <https://doi.org/10.1136/bmjopen-2019-029954>
- English, M. (2013). Designing a theory-informed, contextually appropriate intervention strategy to improve delivery of paediatric services in Kenyan hospitals. *Implementation Science*, 8(1), 39. <http://www.implementationscience.com/content/8/1/39>
- English, M., Ayieko, P., Nyamai, R., Were, F., Githanga, D., & Irimu, G. (2017). What do we think we are doing? How might a clinical information network be promoting implementation of recommended paediatric care practices in Kenyan hospitals? *Health Research Policy and Systems*, 15, 4. <https://doi.org/10.1186/s12961-017-0172-1>
- English, M., Irimu, G., Akech, S., Aluvaala, J., Ogero, M., Isaaka, L., Malla, L., Tuti, T., Gathara, D., Oliwa, J., & Agweyu, A. (2021). Employing learning health system principles to advance research on severe neonatal and paediatric illness in Kenya. *BMJ Global Health*, 6(3), e005300. <https://doi.org/10.1136/bmjgh-2021-005300>
- English, M., Irimu, G., Nyamai, R., Were, F., Garner, P., & Opiyo, N. (2017). Developing guidelines in low-income and middle-income countries: lessons from Kenya. *Arch Dis Child*, 102(9), 846. <https://doi.org/10.1136/archdischild-2017-312629>
- English, M., Nzinga, J., Irimu, G., Gathara, D., Aluvaala, J., McKnight, J., Wong, G., & Molyneux, S. (2020). Programme theory and linked intervention strategy for large-scale change to improve hospital care in a low and middle-income country - A Study Pre-Protocol [version 2; peer review: 4 approved]. *Wellcome Open Research*, 5(265). <https://doi.org/10.12688/wellcomeopenres.16379.2>
- English, M., Wamae, A., Nyamai, R., Bevins, B., & Irimu, G. (2011). Implementing locally appropriate guidelines and training to improve care of serious illness in Kenyan hospitals: a story of scaling-up (and down and left and right). *Arch Dis Child*, 96(3), 285-290. <https://doi.org/10.1136/adc.2010.189126>
- Enoch, A. J., English, M., the Clinical Information, N., McGivern, G., & Shepperd, S. (2020). Variability in the use of pulse oximeters with children in Kenyan hospitals: A mixed-methods analysis. *PLoS Medicine*, 16(12), e1002987. <https://doi.org/10.1371/journal.pmed.1002987>
- Foundation, H. (2021). *Quality improvement made simple - What everyone should know about health care quality improvement*. <https://doi.org/10.37829/HF-2021-I05>
- Gachau, S., Ayieko, P., Gathara, D., Mwaniki, P., Ogero, M., Akech, S., Maina, M., Agweyu, A., Oliwa, J., Julius, T., Malla, L., Wafula, J., Mbevi, G., Irimu, G., & English, M. (2017). Does audit and feedback improve the adoption of recommended practices? Evidence from a longitudinal observational study of an emerging clinical network in Kenya [10.1136/bmjgh-2017-000468]. *BMJ Global Health*, 2(4). <http://gh.bmj.com/content/2/4/e000468.abstract>
- Gachau, S., Irimu, G., Ayieko, P., Akech, S., Agweyu, A., & English, M. (2018). Prevalence, outcome and quality of care among children hospitalized with severe acute malnutrition in Kenyan hospitals: A multi-site observational study. *PLoS One*, 13(5), e0197607. <https://doi.org/10.1371/journal.pone.0197607>
- Gathara, D., Serem, G., Murphy, G. A. V., Obengo, A., Tallam, E., Jackson, D., Brownie, S., & English, M. (2019). Missed nursing care in newborn units: a cross-sectional direct observational study. *BMJ Quality & Safety*, bmjqs-2019-009363. <https://doi.org/10.1136/bmjqs-2019-009363>
-

- Group, S. A. E. D. C. W. (2008). Every death counts: use of mortality audit data for decision making to save the lives of mothers, babies, and children in South Africa. *The Lancet*, 371(9620), 1294-1304.
- Hawe, P., Shiell, A., & Riley, T. (2009). Theorising interventions as events in systems. *Am J Community Psychol*, 43. <https://doi.org/10.1007/s10464-009-9229-9>
- Hysong, S., Best, R., & Pugh, J. (2006). Audit and feedback and clinical practice guideline adherence: Making feedback actionable. *Implementation Science*, 1(1), 9. <http://www.implementationscience.com/content/1/1/9>
- Hysong, S. J., Khan, M. M., & Petersen, L. A. (2011). Passive Monitoring Versus Active Assessment of Clinical Performance: Impact on Measured Quality of Care. *Medical care*, 49(10), 883-890 810.1097/MLR.1090b1013e318222a318236c. http://journals.lww.com/lww-medicalcare/Fulltext/2011/10000/Passive_Monitoring_Versus_Active_Assessment_of.2.aspx
- Institute of Healthcare Improvement. (2003). The Breakthrough Series. IHI's Collaborative Model for Achieving Breakthrough Improvement. <http://www.ihl.org/>
- Institute of Healthcare Improvement. (2023). *How to Improve*. Institute of Healthcare Improvement,. Retrieved 15th March from <https://www.ihl.org/resources/Pages/HowtoImprove/default.aspx>
- Irimu G, Wamae A, Wasunna A, Were F, Ntoburi S, Opiyo N, Ayieko P, Peshu N, & English M. (2008). Developing and introducing evidence based clinical practice guidelines for serious illness in Kenya. *Archives of Diseases in Childhood*, 93, 799-804.
- Irimu, G., Aluvaala, J., Malla, L., Omoke, S., Ogero, M., Mbevi, G., Waiyego, M., Mwangi, C., Were, F., Gathara, D., Agweyu, A., Akech, S., & English, M. (2021). Neonatal mortality in Kenyan hospitals: a multisite, retrospective, cohort study. *BMJ Global Health*, 6(5), e004475. <https://doi.org/10.1136/bmjgh-2020-004475>
- Irimu, G., Ogero, M., Mbevi, G., Agweyu, A., Akech, S., Julius, T., Nyamai, R., Githang'a, D., Ayieko, P., & English, M. (2018). Approaching quality improvement at scale: a learning health system approach in Kenya [10.1136/archdischild-2017-314348]. *Arch Dis Child*, 103(11), 1013-1019. <https://doi.org/10.1136/archdischild-2017-314348>
- Kacholi, G., & Mahomed, O. H. (2020). Sustainability of quality improvement teams in selected regional referral hospitals in Tanzania. *International Journal for Quality in Health Care*, 32(4), 259-265. <https://doi.org/10.1093/intqhc/mzaa032>
- Kalaris, K., Wong, G., & English, M. (2023). Understanding networks in low-and middle-income countries' health systems: A scoping review. *PLOS Global Public Health*, 3(1), e0001387. <https://doi.org/10.1371/journal.pgph.0001387>
- Keene, C. M., Aluvaala, J., Murphy, G. A. V., Abuya, N., Gathara, D., & English, M. (2019). Developing recommendations for neonatal inpatient care service categories: reflections from the research, policy and practice interface in Kenya. *BMJ Global Health*, 4(2), e001195. <https://doi.org/10.1136/bmjgh-2018-001195>
- Kluger A, & A., D. (1996). The Effects of Feedback Interventions on Performance: A Historical Review, a Meta-Analysis, and a Preliminary Feedback Intervention Theory. *Psychological Bulletin*, 119, 254-284.
- Kruk, M. E., Gage, A. D., Arsenault, C., Jordan, K., Leslie, H. H., Roder-DeWan, S., Adeyi, O., Barker, P., Daelmans, B., Doubova, S. V., English, M., Elorrio, E. G., Guanais, F., Gureje, O., Hirschhorn, L. R., Jiang, L., Kelley, E., Lemango, E. T., Liljestrang, J., . . . Pate, M. (2018). High-quality health systems in the Sustainable Development Goals era: time for a revolution. *The Lancet Global Health*, 6(11), e1196-e1252. [https://doi.org/10.1016/S2214-109X\(18\)30386-3](https://doi.org/10.1016/S2214-109X(18)30386-3)
- Linnander, E., McNatt, Z., Sipsma, H., Tatek, D., Abebe, Y., Endeshaw, A., & Bradley, E. H. (2016). Use of a national collaborative to improve hospital quality in a low-income setting. *Int Health*, 8(2), 148-153. <https://doi.org/10.1093/inthealth/ihv074>
- Long, K. M., McDermott, F., & Meadows, G. N. (2018). Being pragmatic about healthcare complexity: our experiences applying complexity theory and pragmatism to health services research [journal article]. *BMC Medicine*, 16(1), 94. <https://doi.org/10.1186/s12916-018-1087-6>
- Maina, M., Akech, S., Mwaniki, P., Gachau, S., Ogero, M., Julius, T., Ayieko, P., Irimu, G., & English, M. (2017). Inappropriate prescription of cough remedies among children hospitalised with respiratory illness over the period 2002-2015 in Kenya. *Trop Med Int Health*, 22(3), 363-369. <https://doi.org/10.1111/tmi.12831>
- Maina, M., Aluvaala, J., Mwaniki, P., Tosas-Auguet, O., Mutinda, C., Maina, B., Schultz, C., & English, M. (2018). Using a common data platform to facilitate audit and feedback on the quality of hospital care provided to sick newborns in Kenya. *BMJ Global Health*, 3(5), e001027. <https://doi.org/10.1136/bmjgh-2018-001027>
-

- Maina, M., Tosas-Auguet, O., McKnight, J., Zosi, M., Kimemia, G., Mwaniki, P., Schultsz, C., & English, M. (2019). Evaluating the foundations that help avert antimicrobial resistance: Performance of essential water sanitation and hygiene functions in hospitals and requirements for action in Kenya. *PLoS One*, 14(10), e0222922. <https://doi.org/10.1371/journal.pone.0222922>
- Mannion, R., & Braithwaite, J. (2012). Unintended consequences of performance measurement in healthcare: 20 salutary lessons from the English National Health Service. *Internal medicine journal*, 42(5), 569-574.
- Martin, G. P., Leslie, M., Minion, J., Willars, J., & Dixon-Woods, M. (2013). Between surveillance and subjectification: Professionals and the governance of quality and patient safety in English hospitals. *Social Science & Medicine*, 99, 80-88.
- Martin, G. P., McKee, L., & Dixon-Woods, M. (2015). Beyond metrics? Utilizing 'soft intelligence' for healthcare quality and safety. *Social Science & Medicine*, 142, 19-26.
- May, C., & Finch, T. (2009). Implementation, embedding, and integration: an outline of normalization process theory. *Sociology*, 43. <https://doi.org/10.1177/0038038509103208>
- McGivern, G., Nzinga, J., & English, M. (2017). 'Pastoral practices' for quality improvement in a Kenyan clinical network. *Social science & medicine (1982)*, 195, 115-122. <https://doi.org/10.1016/j.socscimed.2017.11.031>
- Morton A., & Cornwell J. (2009). What's the difference between a hospital and a bottling factory? *BMJ*, 339, b2727.
- Muinga, N., Paton, C., Gicheha, E., Omoke, S., Abejirinde, I.-O. O., Benova, L., English, M., & Zweekhorst, M. (2021). Using a human-centred design approach to develop a comprehensive newborn monitoring chart for inpatient care in Kenya. *BMC Health Services Research*, 21(1), 1010. <https://doi.org/10.1186/s12913-021-07030-x>
- Murphy, G. A. V., Omondi, G. B., Gathara, D., Abuya, N., Mwachiro, J., Kuria, R., Tallam-Kimaiyo, E., & English, M. (2018). Expectations for nursing care in newborn units in Kenya: moving from implicit to explicit standards [10.1136/bmjgh-2017-000645]. *BMJ Global Health*, 3(2). <http://gh.bmj.com/content/3/2/e000645.abstract>
- Mwakyusa S, Wamae A, Wasunna A, Were F, Esamai F, Ogutu B, Muriithi A, Peshu N, & English M. (2006). Implementation of a structured paediatric admission record for district hospitals in Kenya - results of a pilot study. *BMC Int Health Hum Rights*, 6, 9. http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=16857044
- Nzinga, J., McGivern, G., & English, M. (2018). Examining clinical leadership in Kenyan public hospitals through the distributed leadership lens. *Health Policy and Planning*, 33(suppl_2), ii27-ii34. <https://doi.org/10.1093/heapol/czx167>
- Nzinga, J., McGivern, G., & English, M. (2019). Hybrid clinical-managers in Kenyan hospitals: Navigating between professional, official and practical norms. *Journal of health organization and management*, 0(0), null. <https://doi.org/doi:10.1108/JHOM-08-2017-0203>
- Ogero, M., Akech, S., Malla, L., Agweyu, A., Irimu, G., & English, M. (2020). Examining which clinicians provide admission hospital care in a high mortality setting and their adherence to guidelines: an observational study in 13 hospitals. *Arch Dis Child*, 105(7), 648-654. <https://doi.org/10.1136/archdischild-2019-317256>
- Olsen L, Aisner D, & McGinnis JM. (2007). *The Learning Healthcare System: Workshop Summary (IOM Roundtable on Evidence-Based Medicine)*. N. A. Press.
- Opondo, C., Allen, E., Todd, J., & English, M. (2018). Association of the Paediatric Admission Quality of Care score with mortality in Kenyan hospitals: a validation study. *The Lancet Global Health*, 6(2), e203-e210. [https://doi.org/10.1016/S2214-109X\(17\)30484-9](https://doi.org/10.1016/S2214-109X(17)30484-9)
- Plsek PE, & Greenhalgh T. (2001). Complexity science: The challenge of complexity in health care. *BMJ*, 323(7313), 625-628. http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?cmd=Retrieve&db=PubMed&dopt=Citation&list_uids=11557716
- Project, U. A. (2019). *Institutionalizing Quality Improvement in Uganda: A review and a look forward*. L. University Research Co. https://pdf.usaid.gov/pdf_docs/PA00WGCR.pdf
- Quality Assurance Project. (2009). *Collaboratives, A Feasible Improvement Strategy for Less Developed Countries*. Retrieved June 10th 2016 from <http://www.urc-chs.com/resources/collaboratives-feasible-improvement-strategy-less-developed-countries>
-

- Sheikh, K., & Abimbola, S. (2022). Strong health systems are learning health systems. *PLOS Global Public Health*, 2(3), e0000229. <https://doi.org/10.1371/journal.pgph.0000229>
- Sheikh, K., Gilson, L., Agyepong, I. A., Hanson, K., Ssengooba, F., & Bennett, S. (2011). Building the Field of Health Policy and Systems Research: Framing the Questions. *PLoS Medicine*, 8(8), e1001073. <https://doi.org/10.1371/journal.pmed.1001073>
- Singh, K., Brodish, P., Speizer, I., Barker, P., Amenga-Etego, I., Dasoberi, I., Kanyoke, E., Boadu, E. A., Yabang, E., & Sodji-Tettey, S. (2016). Can a quality improvement project impact maternal and child health outcomes at scale in northern Ghana? *Health Research Policy and Systems*, 14, 45. <https://doi.org/10.1186/s12961-016-0115-2>
- Suddaby, R., & Viale, T. (2011). Professionals and field-level change: Institutional work and the professional project. *Current Sociology*, 59(4), 423-442. <https://doi.org/10.1177/0011392111402586>
- Tangcharoensathien, V., Sirilak, S., Sritara, P., Patcharanarumol, W., Lekagul, A., Isaranuwachai, W., Wittayapopasakul, W., & Chandrasiri, O. (2021). Co-production of evidence for policies in Thailand: from concept to action. *BMJ*, 372, m4669. <https://doi.org/10.1136/bmj.m4669>
- Tuti T, Michael Bitok, Chris Paton, Boniface Makone, Lucas Malla, Naomi Muinga, David Gathara, & English, M. (2015). Innovating to enhance clinical data management using non-commercial and open source solutions across a multi - centre network supporting inpatient paediatric care and research in Kenya. *Journal of the American Medical Informatics Association*, 0:1–11. doi:10.1093/jamia/ocv028.
- Tuti, T., Aluvaala, J., Akech, S., Agweyu, A., Irimu, G., & English, M. (2021). Pulse oximetry adoption and oxygen orders at paediatric admission over 7 years in Kenya: a multihospital retrospective cohort study. *BMJ Open*, 11(9), e050995. <https://doi.org/10.1136/bmjopen-2021-050995>
- Tuti, T., Bitok, M., Malla, L., Paton, C., Muinga, N., Gathara, D., Gachau, S., Mbevi, G., Nyachiro, W., Ogero, M., Julius, T., Irimu, G., English, M., Nyamai, R., Were, F., Ayieko, P., Chengondu, J., Namayi, E., Shikokoti, J., Mokuu, J. (2016). Improving documentation of clinical care within a clinical information network: an essential initial step in efforts to understand and improve care in Kenyan hospitals. *BMJ Global Health*, 1(1). <https://doi.org/10.1136/bmjgh-2016-000028>
- World Health Organisation. (2016). *Global strategy on human resources for health: workforce 2030*. WHO. http://www.who.int/reproductivehealth/publications/maternal_perinatal_health/improving-mnh-health-facilities/en/
- World Health Organization & United Nations Children's Fund. (2021). *Global progress report on WASH in health care facilities: Fundamentals first*. <https://www.who.int/publications/i/item/9789240017542>
- Zamboni, K., Baker, U., Tyagi, M., Schellenberg, J., Hill, Z., & Hanson, C. (2020). How and under what circumstances do quality improvement collaboratives lead to better outcomes? A systematic review. *Implementation Science*, 15(1), 27. <https://doi.org/10.1186/s13012-020-0978-z>
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CHAPTER 11:

NETWORKS OF PRACTICE IN GHANA, AND THE ROLE OF THE DISTRICT HOSPITAL

Abdulai Tinorgah, Kojo Nimako, Sanam Roder-DeWan

Key Messages

- Ghana implemented a pilot of a “networks of care” program which provided the basis for the current Networks of Practice (NoPs) Primary Health Care reform.
- NoPs are configured to have health centers as hubs and lower facilities as spokes.
- The Ghana experience highlights the inevitable role of district hospitals in health care networks. Although they were not initially specifically included in the pilot, during implementation their role evolved as a necessary anchor for all networks in a district.
- PHC financing is recognized as a key bottleneck to successful implementation of the NoP program. There are ongoing conversations about how the National Health Insurance Scheme (NHIS) can reimburse networks in a timely way, especially for preventive and promotive services rendered to communities. Plans to pilot payment methods hold promise for developing a sustainable financing strategy for the NoPs.

Introduction

In Ghana, the concept of networking has been adopted as one of the key mechanisms for achieving health system efficiency, quality, and improved outcomes in primary care. It is also a response to widespread bypassing of health centers for direct access to hospitals. This case study describes the evolution of the concept, and discusses the inclusion and contribution of hospitals in this network model of service delivery in the country.

A “Network of Care” is a model of health service delivery where formal and informal relational and technical links are created between various health facilities and service points. Carmone and colleagues describe a network of care as “a group of public and/or private health service delivery sites deliberately interconnected through an administrative and clinical management model which promotes a structure and culture that prioritizes client-centered, effective, efficient operation and collaborative learning, enabling providers across all levels of care, not excluding the community, to work in teams and share responsibility for health outcomes” (Carmone et al. 2020). In Ghana, these networks are referred to as Networks of Practice.

Country Profile

Ghana, a middle-income country in West Africa with a population of 31 million, has a vibrant health sector, generally considered one of the best-performing and most innovative in Sub-Saharan Africa. The country has a three-tier health service delivery structure: the primary level of care consists of community-based Health Planning and Services (CHPS) compounds and zones, health centers, and district hospitals. The secondary level consists of regional hospitals; and the tertiary level of care includes teaching hospitals and other highly specialized facilities. While Ghana is experiencing an epidemiologic transition toward more chronic and complex illnesses, episodic infectious diseases, maternal and neonatal disorders, and other primary-care-amenable conditions still account for most of the disability-adjusted life years in the country (IHME 2020). Primary care is therefore a key focus of many national strategies.

The History of Facility Networks in Ghana

In Ghana, the idea for networking facilities arose during the pilot implementation of capitation as a payment mechanism by NHIS, the country's public insurance system. The capitation system was piloted from 2012 to 2017 in the Ashanti region. It focused on the primary level of care, and was designed to pay a fixed amount per person covered for a specified package of services for a given period. It was expected that through capitation, cost containment would be achieved and health outcomes improved, since facilities would want their capitated population to be healthier so that the facilities would retain more of the capitated amount. From the outset, the Capitation Steering Committee proposed the idea of networking to allow facilities to leverage resources to meet accreditation requirements. This was designated as a Group Practice. Members of a Group Practice were to be able, together, to provide all components of the per capita package, and were to be geographically close enough to each other so as not to unduly inconvenience clients in terms of travel costs (both time and financial). During implementation of the capitation pilot, it was observed that in some districts, several informal network arrangements were formed to expand the number of CHPS compounds or zones benefitting from capitation; these included twinning of credentialed and non-credentialed CHPS compounds, and organizing regular outreaches by higher level cadres, like physician assistants or midwives, to CHPS compounds, since CHPS compounds typically lack these cadres.

The synthesized conclusions of three independent evaluations of the Ashanti pilot showed that it faced challenges in implementation, but the choice of capitation as a payment method remained relevant, given the challenges and objectives of NHIS to expand enrollment while ensuring sustainability. Many of the issues with the Ashanti pilot were found to be related to technical compromises in program design and inadequate supporting systems, stakeholder communication, and monitoring. There were also political sensitivities in the choice of the Ashanti region for the pilot, since this region was a stronghold of the main opposition party of the time.

In January 2014, based on lessons learned from the pilot, the Ministry of Health (MoH) directed that capitation as a payment method in the NHIS be scaled nationwide on an incremental basis. This plan remained on the drawing board for three years, and was entirely aborted in late 2017. But before it was totally aborted, the Ministry of Health, with support from the USAID-funded Systems for Health program, agreed to implement a pilot of a Preferred Primary Care Provider (PPP) network to further explore the network model as a supporting intervention for strengthening PHC.

The pilots were allowed to run even after the scaling-up of capitation was aborted; they ran from 2017 to 2019 in two districts in the Volta Region, across 42 facilities. The formation of each network was preceded by a training program on networking and the principles of quality improvement and community mobilization, as well as the upgrading of facilities with basic equipment and supplies. In the initial design of the pilot, the focus was on the hub and spokes at the subdistrict level (that is, health centers and CHPS). The district hospital was not initially considered an integral part of the networks. The pilot networks were operational for about 18 months, and while early positive trends were observed, no conclusions could be drawn concerning the impact of the networks on patient outcomes like morbidity and mortality.

There was no formal evaluation of these pilot networks, but anecdotal evidence and administrative data from supervisory visits suggest that there was enhanced communication between network members, streamlined referral practices, and a general improvement in facility and provider collaboration across various levels of the health system that improved service delivery and the experience of care. Some of the key challenges identified included lack of resources to facilitate meetings and collaboration (mobile phone credit, vehicles, equipment, funds), and lack of strong network links to the district level, including the district hospital.

Policy Dialogue and National Adoption of a Networks of Practice Strategy

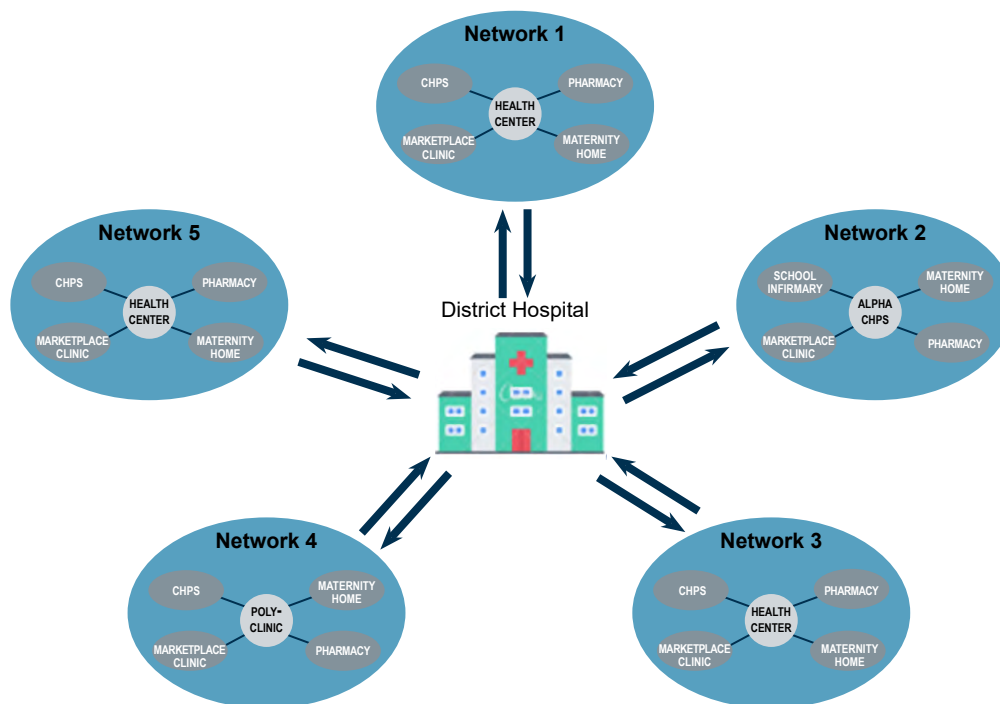
The MoH held a series of stakeholder consultations and consensus-building engagements in mid-2019, at the end of implementation of the Preferred Primary Care Provider (PPP) networks pilot, and agreed that the network model should be scaled nationwide as a stand-alone intervention (separate from a financing intervention), led by the Ghana Health Service (GHS). The strategy was at this point renamed the Networks of Practice program.

While the PPP network pilots were being concluded, Ghana was also developing a new national health policy emphasizing Universal Health Coverage (UHC). This process identified Networks of Practice as the main PHC reform to achieve UHC, which was then written into the accompanying UHC Roadmap document.

Two parallel processes ensued in expanding the networks. On one track was the scaling-up of the PPP pilot model in additional districts in the Volta and Bono regions, led by the regional GHS administrations and supported by donors. These focused on the networking of CHPS compounds and existing health centers. On the other track was the renewed focus by GHS headquarters on strengthening and upgrading existing health centers to Model Health Center status, which meant that these upgraded health centers would serve as the hub for the Networks of Practice as described in the UHC Roadmap. This second process was based on the GHS analysis that the over-focus on CHPS in national and donor strategies neglected health centers to the extent that most could not perform their required functions. This has contributed to a phenomenon in which there is significant bypassing of health centers and CHPS compounds to district hospitals and other higher-level centers for certain kinds of care—for example, antenatal care and childhood diarrhea—that could be well-managed in lower-level primary care facilities (Amoro et al 2021).

These two processes have now been reconciled, with one overarching strategy: networks will be mainly composed of a Model Health Center as the hub, and other primary care facilities (CHPS compounds, maternity homes, pharmacies, and school infirmaries, including private establishments) will be linked to the hub. A Model Health Center is a health center upgraded to a defined standard, and staffed by physician assistants and midwives; the district hospital is staffed by doctors and is able to perform surgeries. All of these levels of care are managed by the Ghana Health Service, which facilitates the collaboration. Each network will be linked to the district hospital, which will serve as a hub in a wider network. The strategy also acknowledges the possibility of having some networks where a facility other than a health center is the hub (Figure 11.1).

Figure 11.1: Configuration of Networks of Practice in a District (illustrative)



The GHS has developed a Concept Note for NoPs, and is in the process of finalizing Implementation Guidelines to guide simultaneous scaling-up in the regions (“Ghana Health Service Implementation Guidelines for Networks of Practice” 2024)

Evolution of the Role of the District Hospital in Ghana

The district hospital is the apex facility for referral at the district level, and is often the only health facility in the district with a medical doctor. The district hospital is expected to provide technical support and coaching to subdistrict providers, mostly focusing on health centers, for quality clinical services, as well as prompt response to referrals, with feedback to the referring network. District hospitals could either enhance or undermine confidence in the networks, depending on the way they operate and relate to the lower levels.

A major reason why district hospitals were excluded in the pilot design that defined the networks was that the pilot was designed in anticipation of the national rollout of capitation as a payment mechanism. The unit for capitation payment was the network at the subdistrict level; this did not include the district hospital. However, in the design of the pilot, financial and other incentives to get district hospitals to be supportive were to be modelled and tested. One option was to build the cost of quality assurance, supervision, and referral into capitation, so that capitation payments would include incentives for the district hospital to play that role. Another option was to arrange to pay for these support services using other payment mechanisms, so that district hospitals could make claims based on agreed-upon performance criteria. A third option was that a specific budget allocation could be made to district hospitals by the MoH or NHIS for outreach, quality monitoring, and referrals. However, none of these were implemented, and district hospitals remained on the periphery in the design of the PPP pilot.

Therefore, the role of the district hospitals evolved through implementation rather than by design. Referral was one of the early systems that was strengthened as a result of network formation, by bringing together the networks within a district and the district hospital. WhatsApp platforms linked spokes to hubs on the one hand, and networks to the district hospital on the other. The district hospital, which was not explicitly written into the initial design, became an important plank holding all the networks in a district together. Eventually, it became evident that the district hospital must be an integral part of the design of provider networks within the district. The pilot adjusted to this during implementation, and the current national program, the Networks of Practice program, reflects the prominence of the district hospital.

In the current Concept Note and the Implementation Guidelines for the Networks of Practice program (Ghana Health Service 2024), district hospitals serve as a hub to all networks within the district (see Figure 11.1, above). It is their responsibility to:

- Provide clinical and technical support to the health centers and other facilities in the network.
- Collaborate closely with district health directorate and the National Ambulance Service (and other hospitals in the district, if any) to strengthen the referral system and feedback mechanisms through dedicated communication platforms.
- As part of the district health directorate, to undertake supportive supervision to NoPs, especially mentoring doctors, physician assistants, midwives, and other clinical staff, to ensure high-quality service delivery.

As a demonstration of the seminal role of district hospitals, a telemedicine component has been added to the network structure in one of the districts in the Volta region. In this district, telemedicine intervention resides in the district hospital, and remote support is provided to the various hubs and networks by health care providers from the district hospital.

Conclusions

Moving from the pilot PPP networks to the national scale reform of Network of Practice depended on several factors that have influenced the government's policy decisions. Key among these was the leadership role played by the Ministry of Health, which hosted the pilot steering committee. This meant that there was already significant political buy-in for any output that would come out of the pilot; it was therefore not surprising that MoH decided to scale up the program nationally following the recommendations of the steering committee.

While the decision to scale up the NoP program had political buy-in, it was not immediately supported by a clear strategy on how the scale-up would be carried out, and therefore risked being forgotten by policy makers. However, the vision was kept alive through a confluence of activities that kept the conversation on the political agenda; this included the concurrent development of the UHC Roadmap, which needed to identify major reforms which would help to achieve the 2030 UHC target, and ongoing efforts by the leadership of the Ghana Health Service to expand attention to health centers, which had suffered neglect due to the focus on CHPS over the preceding two decades. The result was a Networks of Practice program that had a Model Health Center as the centerpiece, backed by a medium-term national health policy, and became the flagship program around which other interventions are being built.

In developing the strategy for implementing the national NoP program, the lessons from the PPP pilot have become the foundation on which guidelines are being developed. This experience from the pilots has been instrumental in developing NoP governance structures, and has provided the evidence base on which district hospitals have become integrated into the NoP architecture.

One of the key bottlenecks to a successful network is funding, as demonstrated in the capitation and PPP pilots. Direct donor funding of networks has been the primary means for supporting network formation during the pilot. The national scale-up of the Networks of Practice will, however, be led by the government through GHS, and will be an inflection point in network formation, management, supervision, and, importantly, financing. Though NoP financing is still a gray area in the implementation strategy, ongoing conversations on how NHIS can reimburse networks, especially for preventive and promotive services rendered to communities, and plans to test various global payment strategies, hold promise for developing a sustainable financing strategy for the NoPs.

The transition from intensive development partner (DP) support in the pilot to a government-owned scaling-up process has provided lessons on effective collaboration between DPs and government. We now have an assertive and technically engaged government, and responsive and flexible DPs helping both financially and with technical prompts. With GHS taking full ownership of funding and management of the NoPs, institutional alignment and sustainability is more likely.

Looking ahead, the Ghana Health Service is adopting an analytical approach to the national scaling-up of the NoP program. Among other analytics, there will be an implementation research program that will accompany the implementation. The intention is to use the lessons learned from early implementation to guide the adaptation of the networks during the scaling-up process. The implementation research program will investigate all of the different NoP models to elucidate the success factors and challenges of the various nodes in a network, including those of the district hospital.

The location of services in a network is one technical function that could impact its overall performance. The Networks of Practice program has hypertension, and maternal and newborn health as its tracer conditions; however, the program does not seek to revise the current organization of care for these two conditions. Testing alternate models of care delivery—for example, making all routine visits for hypertension and diabetes occur at the health center and CHPS levels, or providing all birth care within a district in or close to hospitals—could be built into the NoP program and implementation research process. The jury is still out on how such reorganization will impact outcomes in LMICs, and the NoP program could be a source of data to help answer this question.

Previous primary health care projects, like the CHPS strategy, have been most successful in rural areas where options are limited, but have shown little headway in urban areas where other facilities, including private ones, are more closely clustered and available. So far, the NoP program has been implemented in rural or semirural areas, leaving a gap in understanding the most appropriate configuration for urban areas. GHS is remaining flexible in defining the network configuration in urban areas, and is looking to learn from formative work that is to be done on patient pathways and network analyses, as well as the implementation research program, to inform scaling up into the urban centers. It is envisaged that private providers and hospitals, which are predominant in urban centers, would have significant influence on the structure of these urban networks.

Ghana has a primary health care system that has the district hospital at its apex. This creates an opportunity for better rebalancing of care at the primary care level, ensuring that the full suite of services needed at that level can be received by the population, at the right place, and at the right time. In creating a network for health service delivery, the district hospital occupies a place of relevance for supervision, mentorship, and clinical service quality. A good integration of the district hospital into the Networks of Practice model holds promise for the improvements in quality, equity, and outcomes that this intervention seeks to produce.

References

Amoro, V. A., G.A. Abihiro and K.A. Alatinga 2021. "Bypassing Primary Healthcare Facilities for Maternal Healthcare in North West Ghana: Socio-Economic Correlates and Financial Implications." *BMC Health Services Research*, 21(1), 545.

Carmone A.E, K. Kalaris, N. Leydon et al. 2021. "Developing a Common Understanding of Networks of Care Through a Scoping Study." *Health Systems & Reform* 2020 6 (2): e1810921

Ghana Health Service Implementation Guidelines for Networks of Practice. 2024. Accra, Ghana: Government of Ghana.

Institute for Health Metrics and Evaluation (IHME). 2020. GBD Compare. October 15, 2020 ed. Seattle, WA: IHME, University of Washington

CHAPTER 12:

THE DEVELOPMENT OF MEDICAL ALLIANCES IN CHINA

Gordon G. Liu, Qinghong He, Xiaohui Hou, Ermo Cheng, Yaxuan Liu, Nan Peng

Key Messages

- The distribution of medical resources in China has been skewed towards tertiary hospitals, leaving lower-tier and primary care institutions with insufficient resources.
- The Medical Alliances (MA) initiatives aimed to promote better resource allocation across different tiers of health care facilities.
- Medical Alliances vary in structure and intensity of integration intensity. Urban MAs, led by tertiary hospitals, focus on resource sharing across various medical institutions, whereas county MAs concentrate on integrating rural health care management.
- Studies indicate that MAs have improved the referral systems and the distribution of patients across health care tiers, enhancing service levels and reducing costs at secondary hospitals.
- However, MAs face significant challenges, including uneven referrals, insufficient incentives for primary care institutions, and gaps in management and integration.
- Proposals for future improvements include refining insurance policies, enhancing information systems, and providing better support for primary care through technology and training.

Introduction

For many years, the distribution of high-quality medical resources in China has been unbalanced. Considerable resources are concentrated in tertiary hospitals, while lower-tier hospitals and primary care institutions have insufficient capacity (Feng et al. 2022; Ying et al. 2018). In 2009, the Chinese government launched a new round of national health care reform, which proposed to strengthen the role of primary care institutions and improve the health care system so as to solve the problem of “*Kan Bing Nan, Kan Bing Gu*” (“Getting medical care is difficult and expensive”) (Lu and Pan 2019; Wang et al. 2011). However, many problems still inhibit the development of primary care institutions, including inadequate human resources, and suboptimal general practitioner (GP) practice (Wang et al. 2011).

In response, in December 2016 the State Council of the People’s Republic of China launched a policy reform initiative to promote vertical integration of various tiered hospitals through Medical Alliances (MAs), the aim of which is to better allocate hospital resources across tiers. An MA refers to the formulation of a collaborative alliance or medical group across different tiers of medical institutions (Ying et al. 2018). In other words, in order to better serve outpatients and inpatients in community settings, the primary goal of this reform is to help coordinate a downward shift of medical resources to primary care, while improving the efficiency of referral upward to secondary care (Feng et al. 2022).

MA Models by Organizational Governance

There are four popular models of MAs: i) urban medical alliances; ii) county medical alliances; iii) specialty alliances; and iv) telemedicine collaboration networks (General Office of the State Council 2017). The **urban MAs** are led by a tertiary hospital and cooperate with several secondary hospitals, community health care service centers, and rehabilitation hospitals. Compared with other models, the urban MAs focus on vertical integration of medical institutions to promote the sharing of resources among institutions at different tiers; the other three modes focus more on the allocation of resources in different regions (Feng et al. 2022).

The **county MAs** mainly focus on exploring the integration of rural county management with county hospitals as leaders, township health centers as hubs, and village health centers as the basis (Ran et al. 2020). As the leaders of urban/rural linkages, county hospitals play an important role in ensuring the formation of a mechanism to regulate the division of labor and collaboration within county, township, and village health centers.

The **specialty alliances** bring together the specialist resources of various regional medical institutions, as appropriate, to form a series of specialized centers across the regions.

The **telemedicine collaboration networks** encourage the public hospitals to provide telemedicine, teleteaching and teletraining services to primary care institutions, by using information technology to promote the vertical flow of resources, and improve the access of high-quality medical resources and the overall efficiency of medical services.

MA Models by Intensity of Integration

The MAs can also be classified into three types according to intensity of service integration within an MA system: i) loose MAs (for example, technical assistance); ii) semi-close MAs (hosting operations); and iii) close MAs (Tang et al. 2021; Zhang 2022).

In **loose MAs** the core hospitals share resources with other medical institutions through medical collaboration in terms of technology, expertise, and equipment. The financial governance, personnel, and management of its participating hospitals remain unchanged. The study revealed that the loose MAs achieved a 42 percent year-on-year increase in the number of patients referred downstream, and a significant increase in the number of chronic disease outpatient consultations at the primary care level (Cao et al. 2020). However, each medical institution is individually responsible for any overspending of its medical insurance reimbursement, and member hospitals still maintain a competitive relationship driven by the financial incentive to “pass the buck” to each other for seriously ill patients (Wu and Xu 2020).

Semi-close MAs refer to a core hospital signing contracts with other hospitals to establish a relationship of asset-free cooperation; the core hospital is responsible for the overall operation and management of the MAs. For example, the semi-close MAs in Wuxi, established in 2014, have built a joint treatment platform to improve the technical capability of community health centers, increasing the volume of outpatients and inpatients and the number of two-way referrals in community health centers (He and Yi 2018). However, it is difficult to become a community of interest due to the fragmented distribution of administration, personnel, and property that is involved in semi-close medical associations.

Close MAs are linked by property rights and the unified management of people, property, and materials within the MAs, as for example, Tianchang in Anhui or Luohu in Shenzhen. Close MAs implement a group-based medical insurance payment system that places the medical insurance budget. The payment of close MAs seems effective in controlling costs and guiding the flow of patients and referral choices (Gong et al. 2020; Yu et al. 2020; Zhao et al. 2019). However, problems remain in some areas, for example imperfect supporting measures and insufficient support for information technology construction (Liu et al. 2018; Liu and Tang 2020; Yu et al. 2018).

Provider Payment

Health insurance payment reform can be the institutional engine for the formation of long-term endogenous dynamics in regional MAs (Yang et al. 2018), and has a significant impact on the stakeholders of the MAs (government departments, medical institutions, medical staff, and patients) (Li et al. 2020). Table 12.1 shows the payment practices of four typical regional MAs in Jingkou (Zhenjiang), Huangpi (Wuhan), Tianchang (Anhui), and Luohu (Shenzhen).

Table 12.1: The Provider Payment in Four Typical MAs

	Jingkou, Zhenjiang	Huangpi, Wuhan	Tianchang, Anhui	Luohu, Shenzhen
Starting Time	2009	2013	2015	2015
Type/pattern	Loose urban	Close county	Loose county	Close urban
Connecting means	Contracts	Properties	Contracts	Properties
Payment method	Global budget by capitation + payment by service unit + disease-based payment on clinical pathway	Global budget + single disease payment + per-diem payment	Global budget by capitation + disease-based payment on clinical pathway	Global budget by capitation
Mechanism of approval for global capitation	Based on the number of capitation visits in the previous year and the annual medical cost per capitation	Based on the number of beneficiaries, workload, and average medical costs within the medical alliance	Based on the number of enrolled residents in the district	Based on the number of participants contracted by the medical alliance this year
Time of payment	Monthly prepayments and year-end settlements	At the beginning of each quarter, 80 percent of the payment amount is pre-allocated to the medical alliance, and the remaining 20 percent is paid according to the quarterly assessment results and settled at the end of the year	In the first month of each quarter, the advance fund will be allocated to each medical institution in the medical association, and 1/4 of the annual plan will be allocated on a quarterly basis. The final account will be settled at the end of the year.	One-time package prepayment at the beginning of the year
Payment methods with medical institutions outside the medical alliance	Purchase of service	Purchase of service	Purchase of service	-
Flexible Payment Mechanism	40 percent of the annual balance will be allocated to the medical alliance such that the latter fully covers unreasonable overspending, while reasonable overspending will be subsidized on a case-by-case basis	15 percent will be used as a cut-off line for the annual balance incentive: if the annual balance ratio is within 15 percent, the entire amount will be allocated to the medical alliance; if the balance ratio is above 15 percent, 60 percent of the balance will be allocated to the medical alliance; 80 percent of overspending will be borne by the alliance	The part of the annual balance will be allocated to the medical alliance, which will be distributed among county hospitals, township health centers, and village health centers in the ratio of 6:3:1	The entire portion of the annual balance is allocated to the medical alliance, which can be used for operational expenses, personnel training expenses, and performance-based salary. The overspend portion is fully borne by the medical alliance
Choice of medical institutions	Free choice of medical institutions	Mandatory primary care at the primary institutions and free access to care among MAs	Free choice of medical institutions	Mandatory primary care + optional family doctor contracting
Adjustment of medical insurance reimbursement policy	«One free and three priority» services for patients referred to the hospital	The adjustment of deductible + copayment ratio		Abolish the residents' individual medical insurance accounts

Creating an enabling business environment through provider payment reform is critical. Several main features of payment reform have enabled the formation and implementation of MAs. The first was to change from a single medical institution as the recipient of payment to a medical alliance, and to transition from retrospective payments to mixed prospective payments by capitation aggregation.

The second is to use a variety of ways to approve the total capitation fee. For example, in Huangpi the number of beneficiaries, the total number of visits per year, and the average health spending per visit in the areas covered by the MAs are approved based on the total amount of the New Rural Cooperative Medical Scheme (NRCMS) for the year, after pre-withholding 10 percent as a reserve.

The third is to establish a multistage payment mechanism. In Huangpi, 80 percent of the payment is pre-allocated to the medical alliance at the beginning of each quarter, and the remaining 20 percent is paid according to quarterly assessment results.

Fourth, for patients admitted to other designated medical institutions in the county, members of the medical consortium pay each other in the form of services purchased. For patients receiving medical treatment outside of the area, if the relevant institution has an account in the medical insurance fund, it can participate in the year-end settlement and redistribution of the affiliated MAs.

The fifth is adjustment on the demand-side medical insurance payment policy. For example, Huangpi requires that inpatients enrolled in NRCMS must first receive a consultation at the primary medical institutions and then be referred to higher-tier hospitals if necessary. If they go to higher-tier medical institutions without approval, nothing will be reimbursed by the NRCMS Fund. In Jingkou, the higher-tier hospital provides “one free and three priority” services for patients referred to the hospital; that is, there is no registration fee, there is appointment priority for specialist outpatient care, arrangement priority for auxiliary examination, and arrangement priority for hospitalization. Luohu MAs intend to abolish the residents’ individual medical insurance accounts and incorporate the full amount of medical insurance funds into the common fund, so that residents will pay the appropriate consultation fees instead of out-of-pocket medical expenses.

The sixth is the freedom of patients to seek medical treatment within and outside of the medical alliance. Jingkou, Tianchang and Luohu MAs do not keep insured residents from seeking medical treatment within and outside the regions. Patients can freely decide to stay or to leave based on their satisfaction with the services provided by the MAs. In this respect, the quality of care can be improved by encouraging reasonable competition and innovation. Although Huangpi mandates primary care and cascade referrals for NRCMS-insured inpatients, they are free to choose different MAs for their primary care.

The last feature of the reforms is the implementation of flexible settlement within the MAs, and the integration of incentive and restraint mechanisms. Jingkou allocates 40 percent of the annual balance to the alliance, with unreasonable overspending being fully covered by the alliance itself, and reasonable overspending being subsidized, depending on the circumstances. Tianchang allocates part of the annual balance to the MAs, which was distributed among the county hospital, the township health center, and the village health center in the ratio of 6:3:1. Luohu allocates the entire portion of the annual balance to the medical alliance, which can be used for operational expenses, personnel training expenses, and performance-based salary. The overspending portion is fully borne by the MAs.

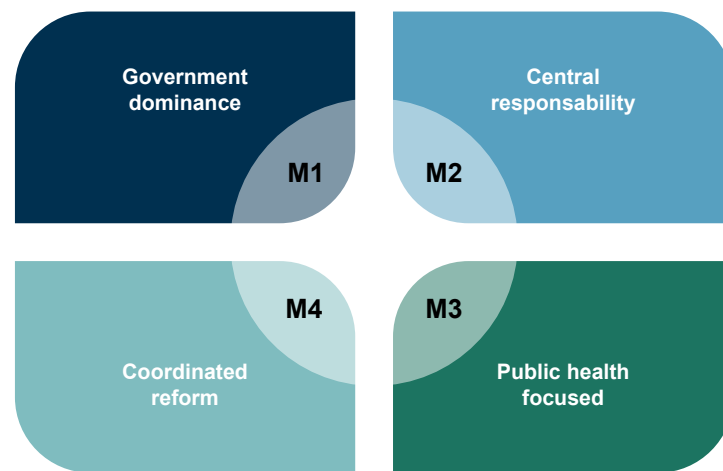
Provider payment methods were also adjusted to tailor the payment to specialty MAs and telemedicine MAs. The specialty alliances are linked by disease categories—which are difficult to constrain and measure in conformity with uniform payment standards—hence they should implement disease-based payment under the global budget and capitation (Ying 2022). A few provinces have also introduced payment of telemedicine MAs. For example, Guangxi province has introduced four medical service items that are delivered remotely (outpatient clinic; electrocardiogram diagnosis; pathology diagnosis; and imaging diagnosis) into the scope of payment of basic medical insurance in the region (Guangxi Medical Insurance Bureau 2019). Payment is made in conformity with current reimbursement categories and the current pricing of medical services in Guangxi. Shaanxi Province and Hubei Province have also included similar telemedicine programs in their basic medical insurance reimbursement (Ankang Medical Insurance Bureau 2021; Hubei Health Planning Commission 2017).

Regulation

Principles and Performance Assessment

The National Health Commission guided four fundamental principles in the construction of MAs (National Health Commission 2020). First, urban and county MAs should adhere to the government dominance principle, based on the distribution of regional medical resources and the implementation of grid-based public health management. Second, the government should play a leading role in protecting the public welfare of fundamental health care. Third, different parties should implement coordinated reform to appropriately guide the division of labor and benefit-sharing mechanism within the MAs. Fourth, public health is a priority: this requires high-quality resources within the wider health care ecosystem.

Figure 12.1: The Four Fundamental Principles of Constructing MAs



Even though MAs bring many positive effects, problems can arise from the failure to reconcile the conflicting interests of stakeholders. Several policies have been implemented to solve these problems, as shown in Figure 12.2.

Figure 12.2: Comprehensive Performance Assessment Program for MAs



The National Health Commission has issued a comprehensive performance assessment program for MAs (National Health Commission 2018). MAs would be evaluated on various metrics using both quantitative and qualitative measures, such as the allocation of medical resources to tertiary hospitals; grassroots services to improve the health of the residents; and the satisfaction of service recipients. The assessment and evaluation results would serve as the basis of personnel appointments and dismissals to build an effective incentive mechanism. The leading hospitals should proactively collaborate with primary health institutions, by establishing a staggered development model and a two-way referral mechanism for the medical consortium and providing life-cycle health management services for patients. At the same time, an effective resource-sharing mechanism should be built to provide one-stop service. Supporting policies (medical insurance payment, financial subsidy, telemedicine charging, and reimbursement policies) should be progressively proposed and implemented. Finally, a digitized information system could greatly improve the efficiency of performance measurement.

Further improvements are expected to take place in MA systems, including: i) strengthening the guiding role of the performance appraisal of MAs; ii) strengthening the horizontal comparability of indicators; and iii) including the indicators of the cultural integration of MAs into the four measures of the performance appraisal of the medical consortium (Du et al. 2022).

Measurement and Evaluation

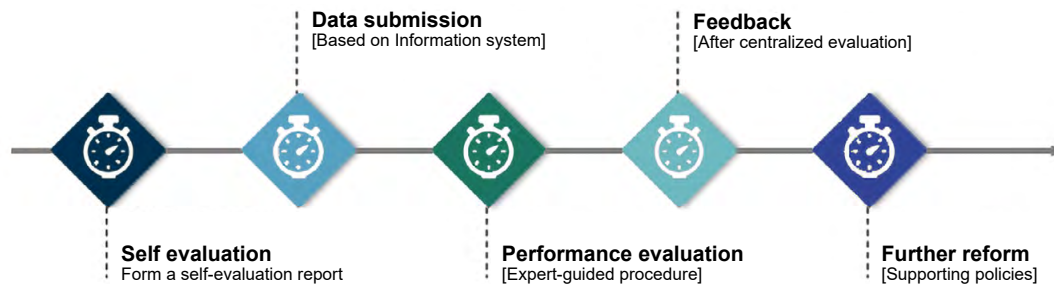
Currently, the performance of MAs is monitored and measured in four main dimensions: responsibility; management; service; and interest, as presented in Table 12.2. In general, there are three levels in the performance measurement for each criterion: i) clear institutional arrangements and implementation; ii) clear arrangement without implementation so far; and iii) no institutional arrangement.

Table 12.2: Measuring Criteria and Description for MAs in Different Dimensions

Dimension	Measuring criteria	Description
Responsibility alliance	Party committees and government dominance	The administrative committee regularly evaluates the work of the MA, exerting collaborative efforts to promote county-level medical and public health services
	Decision power of MA	The lead agency of the MA can sign agreements with the Medicare agency on behalf of all its members
	Effective evaluation of MA	Link the appointment and salary of the head of the MA to performance
Management alliance	Personnel	Ensure the autonomy of the county medical community in post setting, performance assessment, income distribution, and professional title appointment
	Financing	Conduct unified financial management, separate accounting, improve budget management
	Medicine	Unify management of drug supplies, procurement and distribution, payment for goods, and a standardized drug list
Service alliance	Orderly referral of patients	Establish the scope and process of hierarchical diagnosis and treatment with primary care, two-way referral, treatment of acute and chronic conditions, and upward and downward linkage of patients
	Information sharing	Establish a health information sharing platform
	Integration of treatment and prevention	Provide a full range of health services during the whole life cycle
Interest alliance	Unified revenue management	Medical income shall be subject to unified management and independent accounting
	Medical insurance reform	Formulate payment policies suitable for the characteristics of medical services in the county MA

Provincial and prefectural-level health administrative departments should carry out comprehensive performance assessments on the MAs in conjunction with relevant departments, taking into account local conditions. The comprehensive assessment needs to be carried out semiannually or annually. The five steps of the evaluation procedure are presented in Figure 12.3.

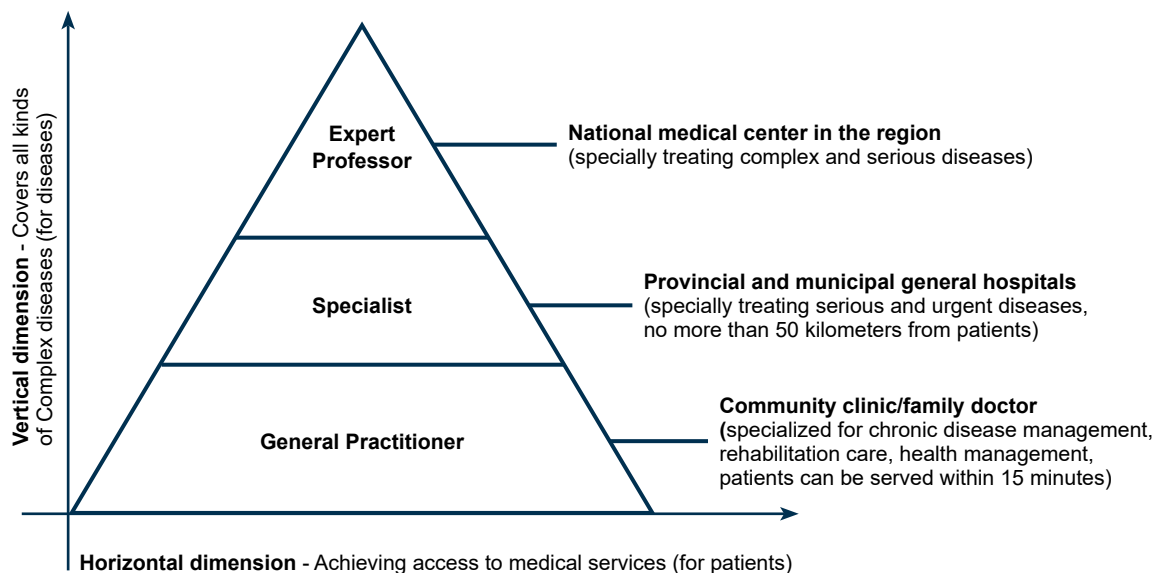
Figure 12.3: The Evaluation Procedure: Five Steps



Ongoing Reform

The current medical service governance system is still far from perfect. Many scholars have drawn the blueprint of an upgraded system. A “positive triangle” medical service governance model could be constructed based on insurance payment techniques like DRGs-PPS (Diagnosis Related Groups Prospective Payment System), as shown in Figure 12.4 (Yang et al. 2020). Both the accessibility of medical resources for patients and the coverage of disease types would be subject to structured regulation at tiered hospitals.

Figure 12.4: An Improved Medical Service Governance Model



Private Sector Involvement

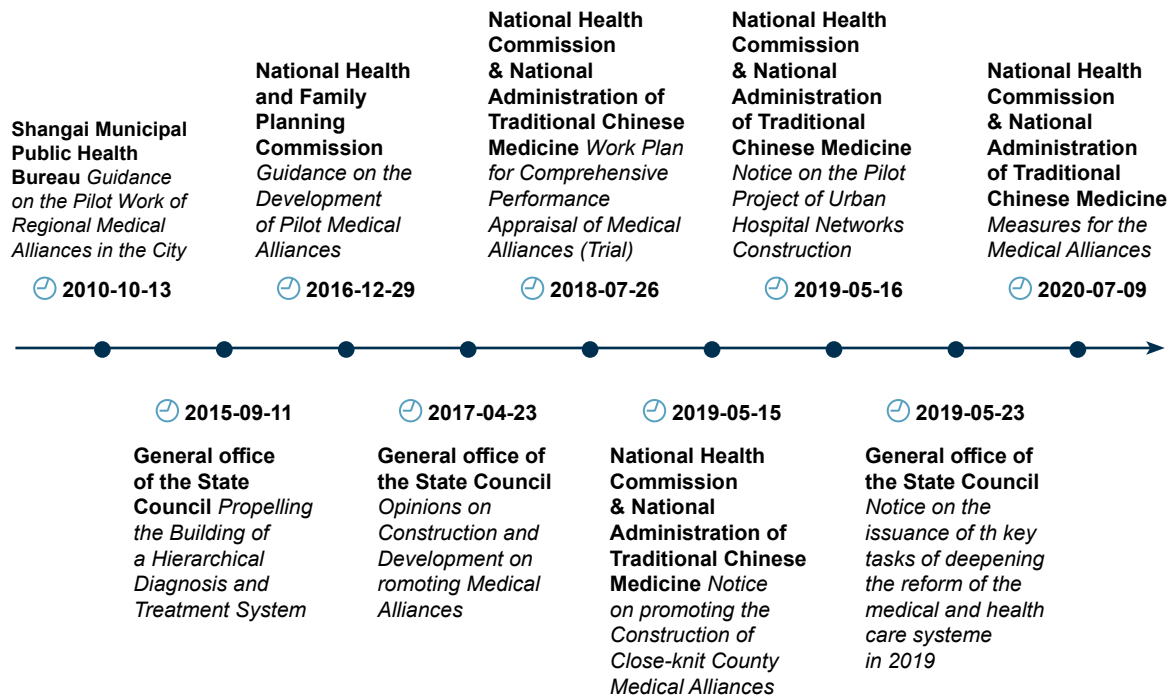
The National Health Commission's guidelines on the construction of MAs point out that the lead hospitals should take the initiative to attract private medical institutions to participation in MAs, and encourage them to follow the voluntary principle of participation (National Health Commission 2019). To date, the construction of private hospital MAs has at last been rapidly developed. However, for some private medical institutions that have excellent activity and strong influence in the local area, the question of whether to join the MAs is not such a pressing one on the grounds of inclusion of health insurance, and the integration of urban and rural services. However, for small and medium-sized private medical institutions that lack high-quality medical resources, see few outpatients, and are in urgent need of external support if they are to lose their image as "small and scattered" – being integrated into a medical alliance is undoubtedly a decisive step forward.

For example, in June 2019, the Health Commission of Zhejiang Province released "Opinions on Supporting Private Medical Institutions to Participate in the Construction of County Medical Alliances" (Health Commission of Zhejiang Province 2019). On the one hand, Zhejiang Province will support private medical institutions that join the construction of MAs; will allow private medical institutions to take the lead in forming MAs; and will encourage MAs or public hospitals to share through contracting their medical equipment and other resources to private medical institutions. On the other hand, in the "medical insurance payment" model, private medical institutions may enjoy the same terms as public hospitals.

The Rollout of Medical Alliances

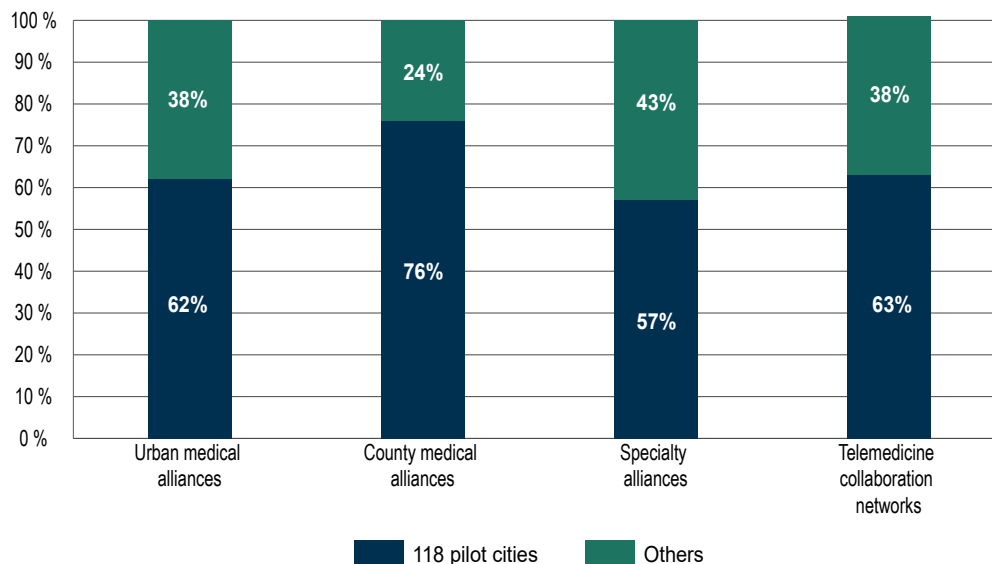
Since the turn of the 21st century, the construction of MAs in China has been the focus of health care reform. In October 2010, Shanghai was the first city to issue the pilot document on the MAs, but it was not until 2013 that the National Health and Family Planning Commission explicitly encouraged states to explore the construction of MAs; this marked the official launch of the construction of MAs in China. In December 2016, the National Health and Family Planning Commission put forward guidance on carrying out pilot MAs, and clearly stated that the construction of MAs was an important initiative to integrate medical resources in the region; promote the allocation of quality medical resources; enhance the capacity of primary medical services; and improve the medical service system. On May 23, 2019, the General Office of the State Council issued a Notice on the issuance of the key tasks of deepening health care reform, focusing on the construction of urban MAs in 100 cities and county MAs in 500 counties. Subsequently, in July of the same year, a list of 118 pilot cities for the construction of urban MAs was issued. Since then, China has comprehensively promoted the construction of MAs, and has formed a more comprehensive system for them, as shown in Figure 12.5.

Figure 12.5: Key Policy Documents for MAs



In 2018, the Chinese government decided to construct urban MAs in 118 pilot cities. As shown in Figure 12.6, as of 2021, some models of MAs were developing more rapidly than those in the 118 pilot cities, with the most obvious development being that of county MAs.

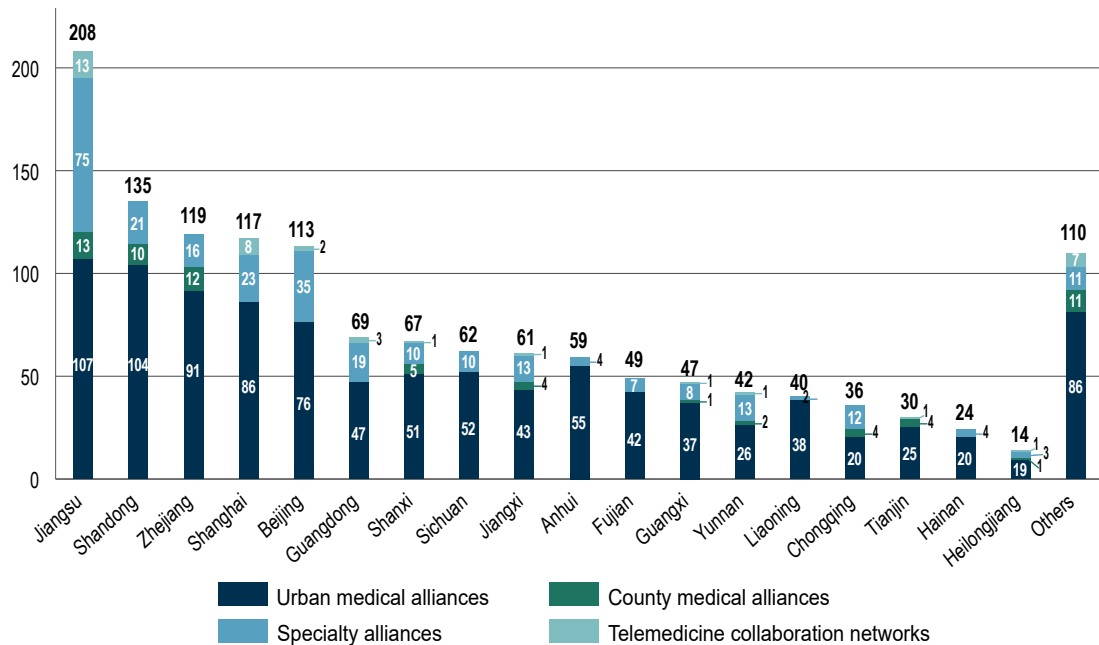
Figure 12.6: Distribution of MAs in the 118 Pilot Cities and Other Cities



Data source: IQVIA, <https://www.iqvia.com/zh-cn/locations/china>

As shown in Figure 12.7, by 2021 about 80 percent of the MAs came from the top 12 provinces and cities when grouped at the provincial level (1106/1402), with the coastal and eastern regions developing more rapidly. Of these four main models, the urban MAs had a clear numerical advantage over the other three.

Figure 12.7: National Distribution of MAs by Provinces and Cities



Data source: IQVIA, <https://www.iqvia.com/zh-cn/locations/china>

Note: Other provinces include Gansu, Guizhou, Hebei, Henan, Hubei, Hunan, Inner Mongolia, Jilin, Ningxia, Shanxi, Qinghai, Tibet, and Xinjiang.

The Impact of Medical Alliances

There has been some literature evaluating the effects of MAs in China. Some of the literature has found that MAs contribute to hierarchical diagnosis and treatment. For example, using health insurance claims data and hospital-level data from a typical city in China, Feng et al. (2022) found that the construction of MAs improved the referral system by providing more efficient services of diagnosis, treatment, nursing, and rehabilitation. After the MAs were set up, the number of visits to secondary and lower-tier hospitals increased significantly, while the average length of stay decreased significantly. They also found that the improvement of quality, reputation, and choices for patients with mild diseases were the main reasons for the reallocation of patients.

Based on claims data from the New Rural Cooperative Medical Scheme (NRCMS) in Y County from 2008 to 2015, Ran et al. (2020) found that MA reform increased the number of inpatients in county hospitals and township health centers within MAs. Moreover, township health centers within MAs had a substantial increase in the number of inpatients (an average of 10.45 new inpatients monthly) compared with those outside MAs. Furthermore, the MA reform in Y County significantly improved the capability of township health centers within MAs. Drawing on the inpatient discharge data from 2011 to 2013, Wu and Jian (2015) found that after MAs were set up, the cost efficiency index in the tertiary general hospitals had increased, while in secondary general hospitals the case mix index had declined, and the cost efficiency index had increased. Results showed that the MAs played a role in the triage of patients, and improved the service levels and management efficiency of the secondary general hospitals. Some studies have also found that MAs increased the volume of two-way referral services; improved the capacity of hospital medical services; reduced hospital operating costs; enhanced overall competitiveness; and improved the quality of care (Luo et al. 2020; Wang et al. 2020).

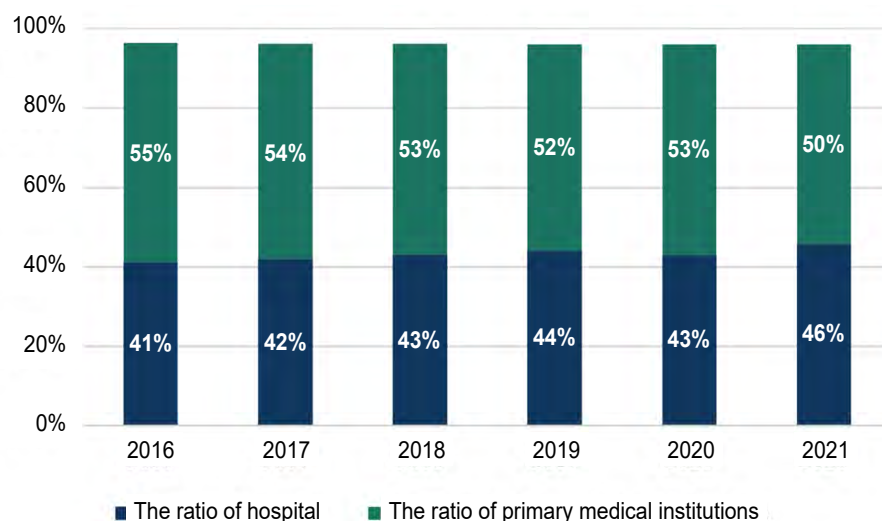
By contrast, some literature has found that MAs allow tertiary hospitals to use their monopoly power in medical resources to attract more patients, creating the so-called “siphon effect,” which is not conducive to hierarchical diagnosis and treatment (Gao 2017). Some studies have also found that the distribution of benefits among medical institutions within MAs remains unchanged, that a community of authority and responsibility has not been formed, and that the lack of incentives for tertiary hospitals makes the operation less efficient (Xiong et al. 2018). Using data from China Health Statistics Bulletin and the China Health Statistical Yearbook from 2009 to 2018, Feng et al. (2022) found that there was no longer a close two-way relationship between either tertiary hospitals and township health centers or tertiary hospitals and secondary hospitals. And Xiao et al. (2021) found that the construction of urban MAs was effective from 2018 to 2019, but there were shortcomings in policy implementation and operational management, and wide regional differences in efficiency and effectiveness were noted, with northern regions generally lagging behind their southern counterparts.

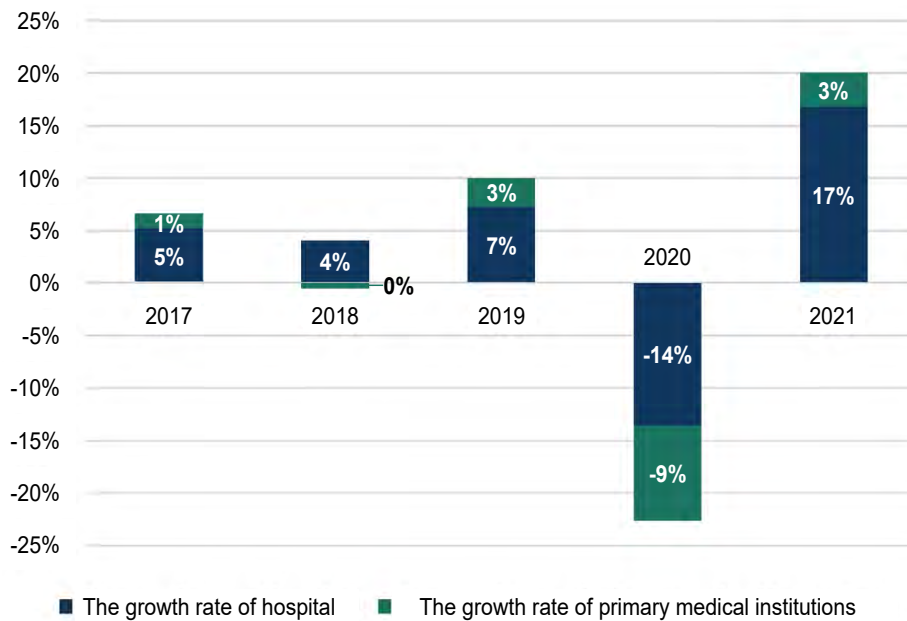
From the physician’s perspective, the impact of the MAs is also twofold. A self-reported survey by 1,032 physicians in districts D and F of Beijing found that most physicians expressed dissatisfaction with MAs, because they undertake more unpaid tasks in MAs. However, the physicians in small hospitals submit more favorable evaluations, because their medical competence was raised with the help of physicians from large hospitals in the region (Zuo et al. 2021). Xu et al. (2020) found the doctors made trade-offs between income, working time, and working location with respect to providing extra medical services for patients within the context of MAs.

The goal of the MAs is to promote the sharing of medical resources, upward and downward mobility of physicians, two-way referral of patients, and improvement of the level of medical services in primary institutions. However, the medical level of grassroots institutions has not been consistently solidified, and there is still a big difference between them and the leading hospitals; therefore patients still choose the leading hospitals for their first consultation. An academic survey of an MA in Beijing found that 26.2 percent of patients were willing to turn to tertiary hospitals, while only 2.8 percent were willing to turn to primary care institutions. Cai et al. (2018) conducted 1,000 electronic questionnaires about the patients’ preferred medical institution after illness, in 50 community health service centers in 10 cities. Results indicated that 93.5 percent of respondents preferred a tertiary general hospital or a specialist hospital, while 62.58 percent believed that the MAs has not yet played a role. In addition, 5.46 percent of respondents thought that there was no advantage in MAs.

Throughout the national data, the siphoning phenomenon of large hospitals still exists, as shown in Figures 12.8 and 9. More specifically, data from the National Health Commission shows that from January to September 2018, the total number of visits to health care institutions nationwide reached 6.14 billion. Of these, hospitals accounted for 2.63 billion visits, an increase of 5.1 percent, while primary care institutions hosted 3.28 billion visits, an increase of 1.5 percent. Clearly, primary care institutions saw a much more marginal increase.

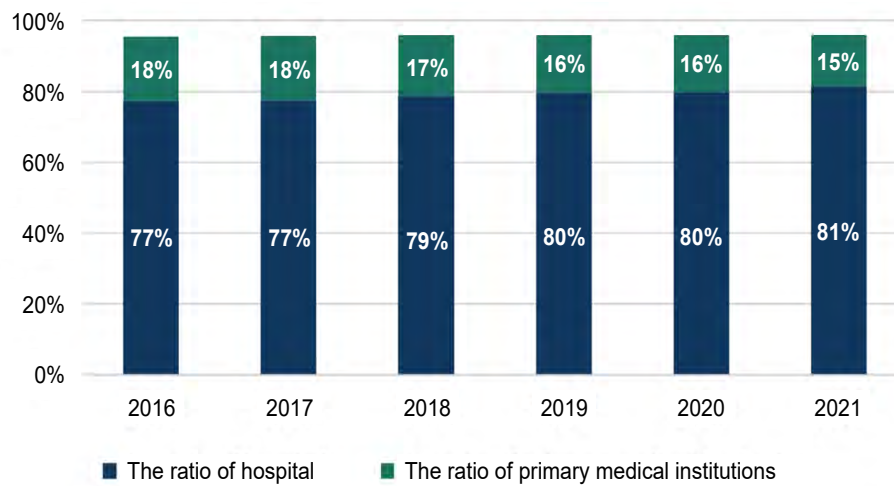
Figure 12.8: The Ratio and Growth Rate of Outpatient Visits Between Hospitals and Primary Medical Institutions

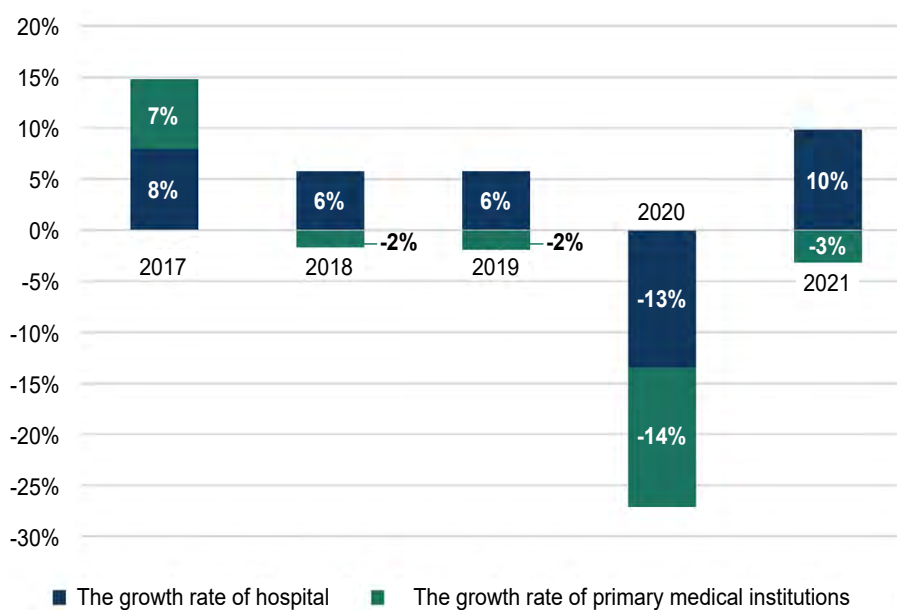




Source: Statistical bulletin on the development of health care in China.

Figure 12.9: The Ratio and Growth Rate of Hospital Admissions Between Hospitals and Primary Medical Institutions





Source: Statistical bulletin on the development of health care in China.

Conclusions

The biggest challenge of the MAs is that the two-way referral is not smooth; there are more referrals from the bottom to the top, and fewer from the top to the bottom. Ye et al. (2016) pointed out that the implementation problems of MAs mainly lay in the inadequate capacity of two-way referral arrangements between medical institutions, the lack of a unified information system, and the limitations of medical insurance reimbursement policy, including the lack of an internal benefit distribution balance coordination mechanism, and the conflict between the medical insurance free access mechanism and the capitation payment under prospective global budget incentive mechanism (Yang et al., 2018). According to a survey conducted by scholars on MAs in Luoyang city, 69.4 percent of referrals from the grassroots to higher-tier hospitals were made, while only 17.2 percent of referrals from higher-tier hospitals were made to primary care institutions. A similar situation was found in the MAs in Beijing, where only 1.1 percent of residents have experienced referrals to a community health care center.

Another obstacle faced by MAs is that primary care physicians have a lower level of medical skills, and their medical equipment is still outdated. The 2017 White Paper on China's Primary Care Innovation Industry points out that the majority of community care physicians have only a secondary vocational school education, or a three-year college education; only 1.6 percent have postgraduate degrees.¹ According to Zhu (2017), the collaborative relationship established by the MAs does to a certain extent provide information channels for tertiary hospitals, which makes it easier for them to find excellent doctors and "poach" them.

The third obstacle facing the MAs is the unclear management mechanism, which makes it difficult to form close MAs; loose MAs are more common in practice. The fiscal system in China entails "hierarchical management," which means that tertiary hospitals are managed by provinces and prefectures, while secondary hospitals and primary care institutions are managed by districts and counties, and fiscal subsidies are also provided by the respective governments (Zhu 2017). However, the close MAs are managed by the tertiary hospitals, meaning that the management authority of the district and county governments is hollowed out, but the fiscal subsidies for secondary and primary care institutions are still provided by the district and county governments. Thus, the entanglement of interests between these departments has led to unruly patterns of management of the MAs.

1 <https://www.vbdata.cn/36338>.

The fourth obstacle facing the MAs is the lack of a reasonable incentive system. First of all, after patients with common diseases are first seen by primary care doctors and the transfer of patients in recovery, the global budget of medical insurance for primary care institutions is likely to be overspent, which will discourage the acceptance of transferred patients at the primary care institutions. Second, the leading hospital lacks any incentive to help the departments in primary care institutions. Specifically, it is difficult to assess and calculate the workload of the leading hospital staff assigned to treat patients at the primary care institutions. Therefore, rationalizing the performance assessment is crucial to the operation of the MAs.

Chen et al. (2022) have argued that the government should refine health insurance reimbursement policies and strengthen the guiding role of health insurance; build a public health information platform to enhance information interoperability; and increase public health investment. In addition, large public hospitals should adopt multiple measures.

- First they should improve the level of information technology, and make up for staff shortages through telemedicine;
- Second, they should actively seek government support to guarantee the welfare of specialists from higher-tier hospitals and health personnel in primary care institutions.
- They should also strengthen training and learning (Ding et al. 2019).

Wang and Guan (2021) have proposed measures to strengthen government incentives and penalties; build a win-win cooperation mechanism; establish close MAs in urban areas; and improve the technical capacity of member hospitals to improve joint strategic planning,

References

- Ankang Medical Insurance Bureau. 2021. Ankang City: Proposal to Include Telemedicine Service Items in Medical Insurance Reimbursement. <https://ybj.ankang.gov.cn/Content-2344128.html>.
- Cao, B., C. Gao, L. Qiu, Z. Chen. 2020. "Exploration of the Operation of the Regional-Flexible Medical Alliance." *Chinese Hospital Management* 40: 98–99.
- Ding, N., Y. Chen, Y. Hu, Y. Su, Y. Peng, D. Xu. 2019. "Practice and Thinking of the Construction of Cross-Regional Medical Alliance of Specialists." *Chinese Hospital Management* 39: 68–69.
- Du, Y., B. Song, Y. Shen, D. Zhou, L. Yang. 2022. "Analysis and Optimization of Performance Evaluation Index of National Medical Consortium from the Perspective of Symbiosis Theory." *Chinese Hospital Management* 42: 44–46.
- Feng, C., J. Zhu, Y. Chen. 2022. "The Evolution and Inter-Sectoral Interaction Mechanism of China's National Medical Alliance: An Analysis Based on Complex Systems Theory." *International Journal of Health Planning and Management* 37: 1454–76.
- Feng, J., S. Lyu, Z. Wang. 2022. "Medical Resource Sharing and Patients' Choice: Evaluation of the Medical Consortium Construction Policy in China." *J. Manag. World* 38: 144-157 + 173 +158.
- Gao, H., 2017. "Health Management and Graded Treatment System in China." *Journal of Public Management* 14: 139-144 +159.
- General Office of the State Council. 2017. "Guidance from the General Office of the State Council on Promoting the Construction and Development of Medical Alliance. http://www.gov.cn/zhengce/content/2017-04/26/content_5189071.htm.
- Gong, F., X. Sun, Y. Li, W. Li. 2020. "Practice Research on Health-Oriented Medical Insurance Payment Mode Reform." *Chinese Hospital Management* 40: 86–88.
- Guangxi Medical Insurance Bureau. 2019. "Notice of Guangxi Province on the Inclusion of Some Telemedicine Service Items into the Scope of Payment of Basic Medical Insurance Fund." <http://ybj.gxzf.gov.cn/xxgk/zcfg/zcjd/t662105.shtml>.
- He, J., L. Yi. 2018. "Practice and Reflection of Exploring the Construction of Medical Alliance in Wuxi." *Chinese Journal of Hospital Administration* 34: 189–91.
- Health Commission of Zhejiang Province. 2019. "Several Opinions on Supporting Private Medical Institutions to Participate in the Construction of County Medical Alliance." https://wsjkw.zj.gov.cn/art/2019/8/9/art_1229123408_857099.html.
- Hubei Health Planning Commission 2017. "Hubei Province: Notice on the Reform of Payment Methods and Other Related Work of Medical Reform." http://www.hubei.gov.cn/hbfb/bmdt/201710/t20171027_1513834.shtml.
- Li, F., S. Lu, S. Gu, C. Jin, Y. Ning. 2020. "Analysis on the Progress and Influence of the Medical Insurance System Reform of Medical Alliance in China." *Health Economics Research*. 37: 30–33.
- Liu, S., F. Wang, M. Tian, M. Jia, K. Chen, Y. Zhao, X. Jiang, W. Tan. 2018. "Analysis of the Impact of County Medical Alliance on Patient Flows under the NRCMS: A Case study of Dingyuan County of Anhui Province." *Chinese Journal of Health Policy* 11: 45–49.
- Liu, Z. and W. Tang. 2020. "Review on Payment Models and Effects of Closely Partnered Medical Unions." *China Health Insurance* 14–19.
- Lu, L. and J. Pan. 2019. "The Association of Hospital Competition with Inpatient Costs of Stroke: Evidence from China." *Soc. Sci. Med.* 230: 234–45.[Fullname of j j journal]]
- Luo, X., M. Liu, and Y. Tang. 2020. "Practice and Reflection on the Construction of Regional Hospital Consortium Under the Background of Graded Diagnosis and Treatment." *Modern Hospital* 20: 175–78.
- National Health Commission. 2018. "Notice on the Issuance of the Medical Alliance Comprehensive Performance Assessment Work Plan." <http://www.nhc.gov.cn/yzyqj/s3594q/201808/570358dbf0af41238f46bb89e4af538b.shtml>.
- National Health Commission. 2019. "Notice on the Issuance of the Promotion of Sustained, Healthy and Standardized Development of Private Medical Institutions." http://www.gov.cn/xinwen/2019-06/12/content_5399740.htm.
-

- National Health Commission. 2020. "Interpretation of the Medical Alliance Management Measures." http://www.gov.cn/zhengce/2020-07/31/content_5531670.htm.
- Ran, Y., H. Gao, D. Han, G. Hou, Y. Chen, and Y. Zhang. 2020. "Comparison of Inpatient Distribution Amongst Different Medical Alliances in a County: A Longitudinal Study on a Healthcare Reform in Rural China." *International Journal of Equity in Health* 19: 1–9.
- Tang, J., C. Hu, Z. Gao, L. Chen, and Z. Qin. 2021. "Study on Medical Insurance Payment of Medical Alliance." *Journal of Community Medicine* 19: 826–30.
- Wang, H., M. K. Gusmano, and Q. Cao. 2011. "An Evaluation of the Policy on Community Health Organizations in China: Will the Priority of New Healthcare Reform in China Be a Success?" *Health Policy* 99: 37–43.
- Wang, X., W. Liu, C. Niu, L. Xue. 2020. "Evaluation and Analysis of the Operational Effect of Medical Cooperation: Analysis of an Area in Beijing." *China Med. Pharm.* 10: 225–229.
- Wang, Y. and Z. Guan. 2021. "Research on the Cooperation Strategy of Medical Institutions in Medical Association in the Context of High-Quality Development of Public Hospitals." *China Health Economics*. 40: 15–17.
- Wu, B. and L. Xu. 2020. "Challenges and Countermeasures for Medical Alliance Leaders in the Context of Overall Health Insurance Payment." *Chinese Journal of Hospital Administration* 36: 720–25.
- Wu, Z. and W. Jian. 2015. "Influence of Contractual Medical Association on Inpatient Service Performance." *J. Peking Univ. Sci.* 47: 469–73.
- Xiao, J., J. Gao, R. Zhao, C. Liu, Y. Yang, H. Guo, X. Zhong, Y. Rao, and K. Zhao. 2021. "Implementation Status and Comprehensive Evaluation of Chinese Urban Medical Alliance in China." *Chinese Hospital Management* 41: 9–13.
- Xiong, W., C. Gao, Y. Zhang, and K. Xin. 2018. "Thinking on Large Public Hospitals Development Strategy Under the Background of Hierarchical diagnosis and Treatment." *Soft Sci. Health* 32: 37–39.
- Xu, R.H., L. Zhou, Y. Li, and D. Wang. 2020. "Doctor's Preference in Providing Medical Service for Patients in the Medical Alliance: A Pilot Discrete Choice Experiment." *International Journal of Environmental Research and Public Health* 17: 2215.
- Yang, F., Y. Yang, and Z. Liao. 2020. "Evaluation and Analysis for Chinese Medical Alliance's Governance Structure Modes Based on Preker-Harding Model." *International Journal of Integrated Care* 20.
- Yang, Z., H. Tan, P. Zhang, W. Yan, X. Liu, W. Zheng, Y. Zhang, and B. Wu. 2018. "Reform of Medical Insurance Payment of the Regional Longitudinal Health Consortium in China: Practice Mode and Policy Route." *Chinese Health Resources* 21: 127–32.
- Ye, X., Z. Guan, K. Meng, and Z. Chen Z. 2016. "Analysis of the Research Status of Regional Medical Association Analysis in China Based on Bibliometric Method." *Chinese Primary Health Care* 30: 4–6.
- Ying, C., W. Cheng, T. Long, P. Liu, X. Yan, S. Hu, W. Miao, and J. Gao. 2018. "Exploration and Consideration of the Medical Alliance Modes." *Iranian Journal of Public Health* 47: 1160.
- Ying, Y., 2022. "How Medical Insurance Payment Reform and Medical Alliances Fit Together." <https://m.yunnan.cn/system/2022/05/16/032084246.shtml>.
- Yu, J., Y. Tu, and C. Wu. 2020. "Exploring Chinese Solutions for an Integrated Health Service System: A Survey of County Medical Alliances in Anhui, Shanxi and Zhejiang." *Government Studies* 36: 5-15 (in Chinese).
- Yu, Y., T. Dai, Y. Yang, Y. Zheng, and Y. Xie. 2018. "Analysis of Prepaid Method of Medical Insurance in Controlling Medical Expenses in Medical Alliance in County Regions in Tianchang City." *Chinese Hospital Management* 38: 55–57.
- Zhang, J., 2022. "Research on the Construction of Performance Evaluation Index System for the Reform of Medical Insurance Payment Mode in Closely Partnered Medical Unions." Jiangxi University of Chinese Medicine.
- Zhao, M., M. Jia, F. Wang, M. Tian, and R. Liu. 2019. "Measures and Effects of the Pilot of County-Based Healthcare Network in Deqing County of Zhejiang Province." *Chinese Journal of Health Policy* 12 53–58.
- Zhu, H., 2017. "Why Has China Not Set Up Hierarchical Care?" <https://www.zgyjbx.com/index.php?m=content&c=index&a=show&catid=16&id=32374>.
- Zuo, X., Y. Wang, J. Shi, X. Feng, K/ Meng. 2021. "What Truly Matters for the Implementation of Medical Alliances? A Cross-Sectional Study in China from The Perspective of Physicians." Research Square; 2021. DOI: 10.21203/rs.3.rs-723663/v1.
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SECTION 5

CROSS-CUTTING CONSIDERATIONS FOR HOSPITAL REFORM

CHAPTER 13:

THE EVOLUTION OF FIRST REFERRAL HOSPITALS

Tamara Willows, Rosanna Mazhar, Mike English

Key Messages

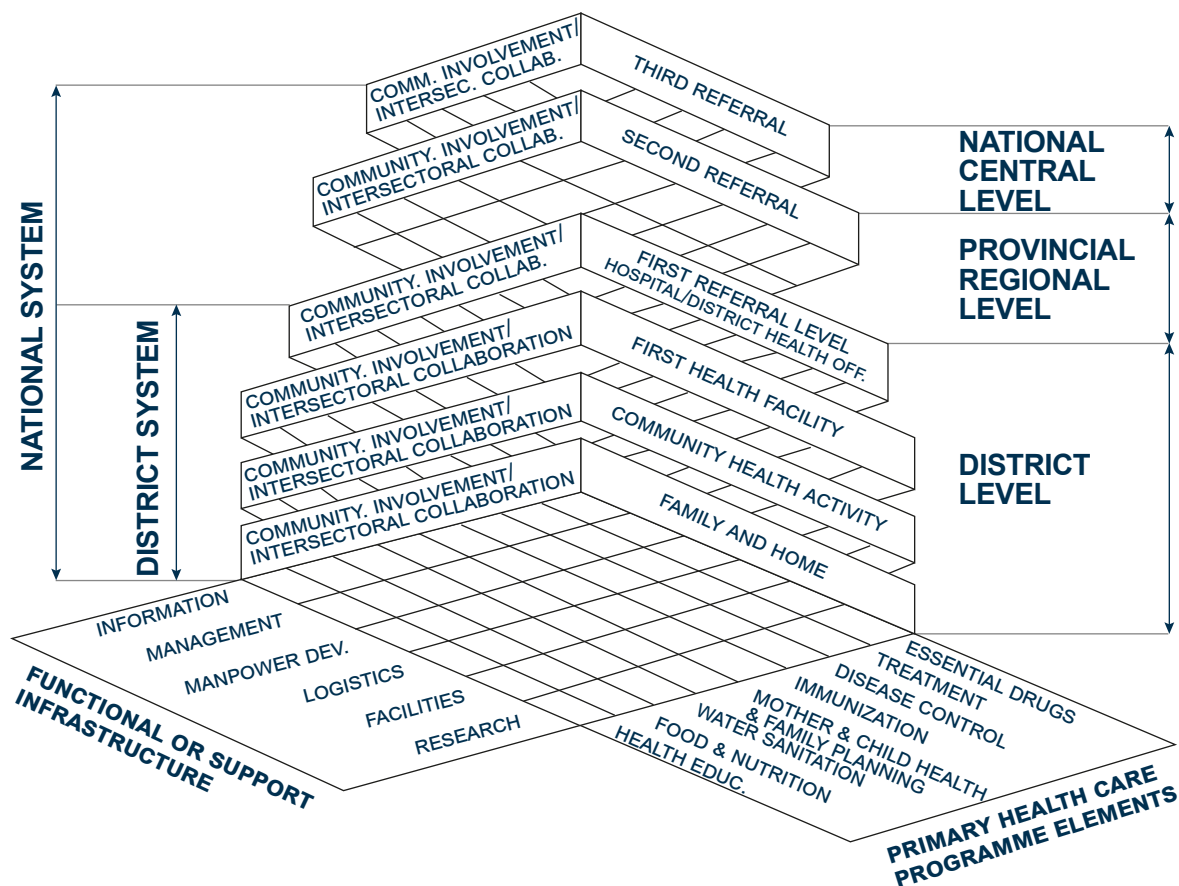
- First referral hospitals (FRH, often called district hospitals) are the hospitals closest to the community that offer expertise (for example, surgery) or technologies to complement more widely available “basic” ambulatory, maternity or inpatient care.
- Despite having been a subject of interest in global health policy in the latter half of the 20th century, in more recent decades they appear to have been overshadowed in low-income settings.
- At the global level, there is confusion regarding the definitions and roles of FRH. They have fallen off the policy agenda globally, and they suffer from lack of advocates in part related to the absence of cohesive definition. Yet the expectations for service delivery from them remains high.
- At the level of individual countries, the precise roles of FRH may be poorly defined, while they seem to have disappeared altogether in some countries.
- This chapter provides an opportunity for global and national policy makers to reflect on the role of FRH in relation to the wider health system, and how they could be optimized or redesigned as a clinical service platform to support the delivery of universal health coverage (UHC).

Introduction

The concept of first level hospitals (FLH), introduced in the 1980s, has undergone notable change over the decades, resulting in inconsistent understanding of their purpose and function across regions, organizations, and individual countries. When nations converged at Alma Ata in 1978 to discuss achieving primary health care (PHC) for all, it set a precedent for the first of many meetings outlining what a health system capable of delivering primary health care (PHC) should consist of (WHO 1978). At the first meeting on the Role of Hospitals in Primary Health Care organized by WHO in 1981, technocrats used the term “hospitals at the first referral level”, characterising these as the first hospitals to receive referrals from community health centers within the district health system (WHO 1992). While introducing receipt of referrals to the role of FLH, they introduced the term district hospital as a synonym for these hospitals, alluding to the administrative district’s role in managing hospitals within their region (WHO 1987). We will use the term First Referral Hospital (FRH) to encompass this broader idea of a facility providing the first level of referral services for a defined population such as a district.

The district health system was designed to manage the health of a defined population group in a specific geographic area through health institutions and any other sector that influences the health of people (WHO 1987). The proposed design of the health system, illustrated in Figure 13.1, was based on the principles of primary health care, with FRH envisioned to address 85-95 percent of the estimated burden of illness (WHO 1996). On the other hand, the complexity and variation in a smaller proportion of diseases would require highly specialized services at larger advanced hospitals. The term district hospitals became a more commonly used synonym for FRH from the 1980s (after Alma Ata), but as countries gained political independence and developed in a variety of ways, the almost universal presence of administrative districts diminished, and associated district hospitals were phased out in some countries (WHO 1996).

Figure 13.1: Model of health system based on primary health care taken from the WHO Western Pacific Series No.4 District Hospitals: Guidelines For Development.



In 1993, the Disease Control Priorities Project Volume 1 referred to the district hospital and alluded to it being a part of primary health care infrastructure, although it stopped short of providing a definition (Jamison et al. 1993). At its inception, the purpose of DCP was to address major sources of the burden of disease in low middle-income countries in a manner that maximized access to specific services. On the other hand, the subsequent volumes, DCP 2 and 3, published in 2006 and 2015, made a case for district hospitals as the FRH, and attempted to bring “First Level Hospital and First Referral Level Hospital” into common parlance. Both DCP2 and DCP3 defined FRH using the following key characteristics:

1. The first referral level within a health system that provides inpatient and outpatient services (English, Ngugi, and Smith 2015).
2. They could also, if required, act as a gatekeeper for uncommon conditions that are more easily managed at higher levels of the health system (English, Ngugi, and Smith 2015).
3. They provide the technical expertise and professional authority necessary for implementing national policy at a local level in the district health system (English, Ngugi, and Smith 2015).

The most appropriate and easily understood term for FRH remains unclear.

Clinical Services at First Referral Hospitals

When suggestions for the role FRH would play were examined in 1981, 2006, and 2015 by technocrats, they proposed dividing clinical service work into the following categories at the FRH:

Table 13.1: Clinical Service Categories as Proposed by WHO, DCP2, and DCP3 (English, Ngugi, and Smith 201; WHO 1992a).

WHO (1981)	DCP2 (2006)	DCP3 (2015)
Emergency room	Family medicine and primary Health care	Maternal and newborn care
Medical ward	Medicine	Child Health
Surgery and operating suite	Obstetrics	Surgery
Obstetric care	Mental health	Reproductive health
Pediatric care	Eye care	HIV
Psychiatric care	Rehabilitation	Cancer
Rehabilitation	Surgery	Adult Febrile Illness
Outpatient care	Pediatrics	TB
Day care in hospital	Geriatrics	Cardiovascular disease
Laboratory	District laboratory services	Musculoskeletal
Diagnostic imaging		Congenital disorders
Pharmacy		Injury
Blood Bank		Rehabilitation
Sterilization		Palliative care
Dietary services		Pathology
Mortuary		

Table 13.1 shows that while there is much similarity between the services recommended across the three documents, DCP3 recommendations represent the growing ambition for FRH, and their expected capacity to deliver a wider range of services than was originally envisioned in 1981.

WHO outlined the rationale for their suggested clinical service areas as ones that would support the provision of health care at the community level within a district health system, and promote a decentralized approach to health care (WHO 1992). WHO envisioned the FRH as a place with services that should only be accessed when community health centers lacked the capacity to manage a condition (WHO 1992). They would also have the ability to refer more complex cases higher up in the health system, as illustrated in Figure 13.1 (WHO 1992). The tiered health system illustrated in Figure 13.1 was designed to provide services that promote health to the majority of the population at the district level of the health system, close to where they live, with a selection of specialist services in a small number of areas in a country that would be reserved for rarer, more complex cases. Emergency cases were deemed the only circumstance when people could access FRH directly, without a community health center referral (WHO 1992). However, WHO proposed their list of clinical services with the caveat that implementing these recommendations would be predicated on multiple context-dependent factors such as local epidemiology, and staff availability (WHO 1992).

On the other hand, the DCP project was developed to address the continued loss of life and suffering faced by many people in low middle-income countries post Alma Ata, in a manner that focused on tasks and services required rather than individual specialities (Jamison et al. 2018; Jamison et al. 1993). An accelerated demographic transition brought about an epidemiological transition, necessitating increased focus on a wider scope of conditions than had been funded until then, and prompting a cost-effectiveness review by the World Bank and its partners for selected clinical services. The clinical service areas outlined in DCP2 were suggested by technocrats based on a hub-and-spoke model approach for the health system that would, in theory, maximize efficiency for the FRH in low-resource countries by concentrating on interventions that could be done frequently at that level. The interventions proposed for FRH were based on principles of equity, and modified from the experience of more industrialized countries to address the most important causes of morbidity and mortality in low and low-middle income countries.

Although further suggestions about clinical services at the FRH have been made in academic literature since the publication of DCP3, it remains the most recent document published that proposes a global consensus on suggested FRH services. While WHO's universal health coverage packages and service compendium encourage countries to think about which level of the health system would be the most appropriate platform to deliver recommended services, it does not prescribe these service delivery levels (WHO n.d.).

Declining emphasis in policy

The post WWII era saw a shift in thinking and policy on first referral hospitals (FRH). Starting in 1956 with a WHO review of the organization of medical care, the functions and roles of FRH were increasingly seen to extend beyond curative services, to include preventive activities in support of broader public health goals. This gained traction with the Alma Ata declaration in 1978, which saw these facilities as playing a role in supporting the attainment of health for all through links between primary health activities. This notion was solidified in the 1980s with the introduction of the district health system model and the term "district hospital," which was synonymous with FRH. In 1985, WHO attempted to address this ambiguity, stating that hospitals at the first referral level should provide "a fully comprehensive range of promotive, preventive, curative, and rehabilitative health activities."

Over time, however, the interest in FRH appears to have waned, while the ambiguity has persisted. With the obvious exception of DCP3, which considers FRH as distinct entities in its essential service package, they have largely disappeared from policy discussions, alongside the concept of district health systems (English et al. 2024). Indeed, WHO's World Health Assembly resolutions over the past 15 years have made scant reference to FRH. Moreover, recent global and regional normative guidance or policy documents tend to discuss hospitals in an undifferentiated manner, presenting them as a unified entity without distinguishing hospital levels. In the absence of coherent policy on the roles and functions of FRH, the almost adversarial characterization of the relationship between the "hospital sector" and "primary health care," which in part encouraged the paradigm shift of the late 20th century, seems to have either remained or resurfaced in the 21st century.

The conflation of FRH with the undifferentiated "hospital sector," combined with the lack of consensus around hospitals' roles in primary health care, contributes to this confusion. As a result, contrary to their envisioned supportive roles toward PHC, hospitals (including FRH) are often presented as benefiting from skewed resource allocation compared with primary health care, in part due to the high costs associated with delivering hospital services. Notionally excluding hospitals from primary health care may also result in their exclusion from national universal health coverage efforts.

Further, the observed FRH policy vacuum has implications for the selection of services to be offered by these facilities (Mazhar et al. 2024). While the design of minimum service packages will always depend on context-specific needs and resource availability, decisions regarding whether and how a given service can be delivered at the level of FRH, or cannot reliably be provided at the primary health facility level, should be as evidence-based as possible. Yet with the exception of research on delivering surgical services at FRH, these facilities, which play such a critical role in health systems appear to be neglected in the academic arena too. Thus, while individual countries have defined health system level hierarchies, and in some cases FRH services packages, they have done so with little evidence of best practices, or guidance from international normative agencies, with potential implications for resource optimization (Mazhar et al. 2024).

Trajectory in Low-Resource Countries: Country Case Studies

Unsurprisingly, given contextual differences, the implementation of FRH varies greatly by country. Case studies from eight countries (Myanmar, Vietnam, South Africa, Sri Lanka, Rwanda, Burundi, Papua New Guinea, and Nepal) revealed heterogeneity in every aspect of FRH, from their names to their size, their positioning in the health system, and the services they offer. Remarkably, the observed differences do not appear to be across regional or economic lines; rather, each country appears to have charted its own path.

Some countries situate FRH conceptually within secondary care, others within primary care, and some within both, depending on their size and location. Bed capacities also vary considerably across the eight country case studies, from a range of 5-15 in Nepal to 50-600 in South Africa. The case studies also highlight differences in health care hierarchies. While hospitals that fulfill the role of FRH are usually those closest to the population that they serve, in some countries (such as Myanmar, Sri Lanka, and Burundi) an “intermediate” hospital at a lower level of sophistication exists to help address access issues in more remote areas. Such facilities are not equipped to function at the level of an FRH; instead they offer a limited scope of selected perceived priority services at a higher level of care than can be offered by a primary health unit.

The classification and content of FRH-defined service packages also differ by country. Sri Lanka, for example, adopts a life course approach to classification, while others categorize either according to standard programmatic areas or to medical disciplines. Interestingly, none of these eight countries appear to have followed the classification approach taken in the third edition of the Disease Control Priorities, or the WHO Technical Report Series 819 (TRS) district hospital guidance document (WHO 1992). While emergency, surgical, obstetric, and pediatric services were commonly listed across all countries, some services are much less covered. These include nutrition (in only 1 of 8 countries); gender-based violence (1 of 8 countries); palliative care (2 of 8 countries); mental health or psychiatric care (4 of 8 countries); elderly care or geriatrics (4 of 8 countries); rehabilitation (4 of 8 countries); dental care (5 of 8 countries); and eye care or ophthalmology (5 of 8 countries).

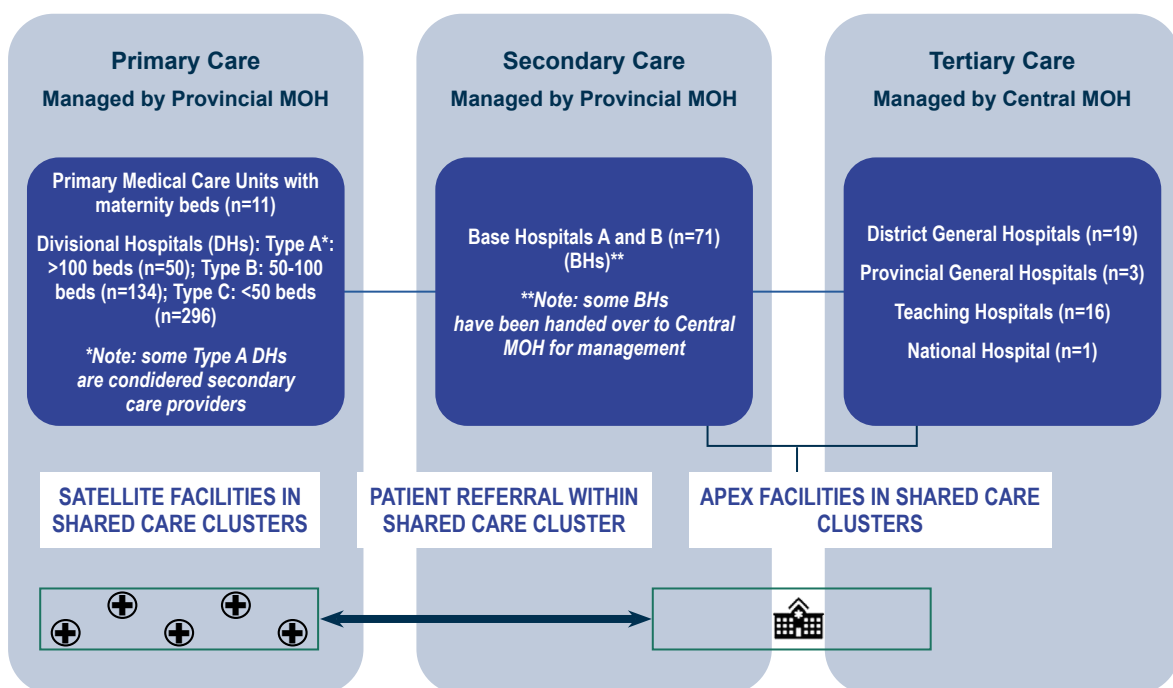
The examples of Sri Lanka, Nepal, and South Africa, discussed below, help to exemplify the different health system trajectories, including how FRHs are situated within the respective contexts and broader health systems of these countries. It should be noted, however, that despite these observed differences, FRHs (in their various forms) do continue to exist, and fulfil important functions in all three countries, in contrast to high-income countries (HIC).

Sri Lanka

Sri Lanka's health system embraced the concept of health as a fundamental right from as early as the 1920s, initially through primary health strengthening, and then in the 1930s through strengthening hospitals. Hospitals in the public sector include divisional hospitals under primary care, with bed capacities ranging from less than 50 to more than 100 beds, manned by non-specialist doctors. Although divisional hospitals are the lowest-level facilities in Sri Lanka's hospital care pyramid, the expected services at these facilities are in keeping with them being primary care facilities, with limited inpatient capacity. The contextual FRHs are therefore, base hospitals which, although they are not the first hospitals in the health system hierarchy, are categorized as secondary care. They average 158-307 beds (depending on the locality), and provide specialized services in general surgery, general medicine, obstetrics and gynecology, and pediatrics. The next tertiary care level includes hospitals that provide super-specialized services (Rajapaksa et al. 2021). Health care, including hospital care, has been free at the point of service since 1951 (Rannan-Eliya and Sikurajapathy 2008). Sri Lanka's health system was restructured in 1994 with an aim to attain “Health for All by the Year 2000” through primary health care (Ministry of Health 1994), and a strategy was launched in 2000 to ensure one district hospital per district (Rajapaksa et al. 2021). As a result, hospital bed capacities increased considerably, by 19 percent between 2007–2016 (WHO South-East Asia Region 2020). However, Sri Lanka's domestic financing for health care has been critiqued for being disproportionately directed at hospitals and curative functions. While this is credited with helping to reduce maternal and child mortality, the absence of a clear set of guidelines for rational development may have resulted in a disproportionate expansion of specialized services, with major capital spending on larger hospitals in the last decade.

Meanwhile, challenges related to the underutilization of lower-level health facilities and overcrowding at higher-level facilities exist. A “shared care cluster” concept was introduced in 2018 to help address this “bypassing” phenomenon (Rajapaksa et al. 2021), whereby primary care facilities are linked with their closest apex hospital (which includes base hospitals and all tertiary hospitals), and patients enter the system through designated primary-care centers based on demarcated catchment areas (Kumar 2019). Sri Lanka’s Essential Services Package, which defines minimum service standards for health facilities including the base hospitals, was launched in 2019 as an important complementary tool. Despite this progress, implementation of the policy and service package has reportedly faced challenges, including overcoming the strong interest and demand by policy makers to build larger specialized care hospitals, which is inconsistent with the reform objectives (Rajapaksa et al. 2021); and the human resource requirements for the service package are yet to be defined and published.

Figure 13.2: Diagram Illustrating the Health Care Structure and Shared Care Cluster Approach in Sri Lanka



South Africa

The South African health system has undergone considerable change since the end of apartheid in 1994, and is working towards unifying its previous 14 health departments to allow a more even distribution of resources and access to services without the burden of out-of-pocket payments. Measures put in place toward this goal include free health care for all children under six years old, and breastfeeding and pregnant women at both health centers and hospitals. In 2003, The National Health Act 61 inscribed into law a unified framework for the health system that outlines which type of services should occur at each level of the health system, and formalizes the country's district health system. The health system consists of four tiers: the primary, secondary, tertiary, and quaternary levels. The primary health level does not include any hospitals; district hospitals are the contextual FRH, and the first level of hospital care within the health system. These are subdivided by size (small, 50-150 beds; medium, 150-300; and large, 300-600 beds), with services provided by generalist doctors, nurses, and allied health professionals, with ad hoc support provided by visiting specialist doctors. A Service Package, published in 2002, defines both the staffing and service norms, and the standards for district hospitals. The secondary level, which consists of some district hospitals and some regional hospitals, delivers diagnostic and screening services along with curative services. The tertiary and quaternary levels provide curative and more specialist diagnostic services. Although the government spends over 80 percent of its national budget for health on hospital care, inequities in the distribution of services persist, as well as hospital overcrowding, which suggests that despite their acknowledged importance in the health system, district hospitals require continued support for improvement.

Nepal

Nepal's health sector planning began in 1975, and its first National Health Policy was introduced in 1991. In 2007, the right to free basic health services was enshrined into law through ratification of its constitution. Nepal's public-sector hospital categories were revised following the 2015 federalization policy, and are currently divided into four tiers. The contextual FRH, basic or primary hospitals, are at the bottom of the hospital hierarchy, and are classified under primary health. These are typically 5-15 bed facilities with a target for at least one 15-bed hospital per municipality. The next levels include secondary A hospitals (25-50 beds, with a target of at least one 50-bed hospital per district), followed by secondary B hospitals (100-300 beds, with a target of at least one per province). The highest tier includes all tertiary-level specialized and teaching hospitals at the central level. Hospitals in the public sector are supported heavily by private sector hospitals, and are concentrated in Nepal's urban areas. These have increased drastically in recent years, from 16 in 1990 to 301 in 2014, with data from 2012 indicating that there were nearly four times as many private-sector hospital beds as public sector ones (Government of Nepal 2015). This reliance on private hospitals suggests inadequacies in the public sector, including in basic hospitals; this is supported by the relatively low scores, with provincial variation, from the hospital-strengthening program joint assessment (Minimum Service Standards tool).

Trajectory in High-Income Countries

Although high-income nations had notionally accepted the district health system and its associated health system structure as the most appropriate vehicle for delivering universal healthcare, the application of this thinking differs from country to country. Germany, the United Kingdom, and South Korea each finance universal health coverage differently: in Germany through social health insurance coverage; in the UK, through single-payer national insurance coverage; and in South Korea through government financing scheme. These provide useful illustrative examples of various FRH trajectories used in high-income countries (OECD 2011).

Germany

The foundations of the German health system were laid in 1883 with the introduction of Social Health Insurance (SHI) to finance the provision of health care to people without the burden of exploitative costs (Light 1985). Before World War Two (WW2), office-based clinical services operated in isolation from inpatient hospital care, which at the time was not differentiated into hierarchical levels. Following the partition of Germany, West Germany maintained a fragmented, undifferentiated non-hierarchical hospital system based on autonomy and individual choice. By contrast, East Germany, under the rule of the Soviet Union, developed a centralized, integrated health system because public health and preventative medicine aligned with their ideological philosophy. Within this system they created ambulatory polyclinics with affiliated district hospitals that provided generalist and some specialist care, mirroring the WHO district health system. County (district)-level governments managed primary care including the FRH, while state-level hospitals addressed complex care. The district hospitals, East Germany's FRH, were designed to serve 70-150,000 people within a specific administrative area. After German reunification in 1991, the German government decided to realign the health system in East Germany with that of West Germany, thus abolishing the district hospital model. Currently, the concept of the FRH in Germany has ceased to exist, and hospital care is accessed either through referral from specialists and general practitioners, or self-referral to emergency services.

United Kingdom

The health system in the United Kingdom and the role of hospitals has also undergone considerable change, from independent, undifferentiated charitable hospitals in the 19th century to tiered hospitals with links to general practice-led primary care after World War 2 (Cylus et al. n.d.). In 1920, a proposal was made for a hierarchical health system in which primary care centers would be linked to district hospitals, then regional hospitals, and finally university teaching hospitals, which would manage rarer and more complex health problems across large geographic areas (Cylus et al. n.d.). Although district hospitals were proposed in 1920, implementing this concept only began after World War 2, in 1962, following a hospital plan white paper (Reconstruction of Hospital Service 1962; Ministry of Health 1962). This document further elaborated the concept of district hospitals to include hospitals of 100-800 beds serving a catchment population of 100-150,000 (Ministry of Health 1962). However, the district hospital concept proved difficult to implement due to the economic situation in the 1960s and 70s, coupled with the growth of medical and surgical specialities, and the health care workers required to provide clinical services (Cylus et al. n.d.). Instead, smaller hospitals were built to deliver some of these services in addition to community hospitals, which were designed to provide care locally. Although community hospitals were proposed as a cost-effective alternative to the wider district hospital plan, they have been steadily closed over the last few decades for financial reasons. Currently, district general hospitals, the UK's iteration of an FRH, serve much larger catchments of 290,000 people; services are spread across more than one hospital and housed under the concept of "acute trusts" (Cylus et al. n.d.).

South Korea

After gaining independence, several private health insurance schemes were created in South Korea to serve a growing industrialized labor market, along with private and public undifferentiated hospitals. In 1999 all of the private health insurers were consolidated into one universal health insurance scheme, along with the division of the health system into clinic-level medical institutions, general hospital level, and tertiary level (The Law Reviews n.d.). Before then, in 1994 hospitals were divided into acute care and long-term hospitals, with the latter focusing on chronic illness and patients who were recently in an acute care hospital but who required ongoing care (Chun et al. n.d.). Although each level provides more advanced services than the one below, clinic services have limited power in gatekeeping hospital services, with the exception of specialized hospitals, which require a referral. This has contributed to general practitioners and hospitals competing to provide ambulatory care, and clinical-based specialists providing advance services independent of hospitals, to compete with hospitals (Chun et al. n.d.). Although regional governments have power over some hospitals, they do not control clinic-based medical institutions, which come under the purview of municipal bodies. General hospitals might in theory represent the closest equivalent to FRHs, but it is difficult to ascertain some of the similarities between them, and FRH as envisioned by WHO and DCP.

These three examples illustrate that while FRHs do exist in some high-income countries, the implementation of these ideas has varied significantly. Although these countries appear to have recognized the value to the health system of FRHs, they have now either been removed from the system (as in Germany), or faded and overlapped with other tiers of hospitals for purposes of cost-effectiveness (as in the UK).

Conclusions

First Referral Hospitals (FRHs) exist in some form across many health systems, especially in low and middle-income countries. In higher-income settings, health services have become increasingly specialized, resulting in further concentration of services in some countries, such that it is hard to recognize an FRH or district hospital in the format envisioned in policy discussions on primary care systems. It is also clear from our case studies that hospitals around the world have evolved in forms that reflect and align with the history and politics of each country. As primary health care systems were being developed in the post-WW2 era, and the period over which many LMICs gained independence, there was an initial vision for FRHs that would serve the most common population needs with clear links to primary care facilities. Even at this time it was acknowledged that there would be a need for local contextualization of policies on FRH that reflected disease epidemiology, and each country's capacity.

However, the absence of ongoing guidance over the last three decades may have resulted in the current apparent confusion over what FRHs should be called, and what role they should play in a health system. The examples in this chapter demonstrate that even within countries that recognize the importance of FRHs in policy, their precise roles may be poorly defined, and may differ from country to country. While the hospital sector has often expanded, much of this expansion is accounted for by larger facilities offering higher levels of specialist care, typically in larger urban areas. To address this imbalance, there is a need for a reinvigorated debate around FRH that examines the roles of these hospitals in achieving UHC and supporting PHC. A renewed focus on FRHs would help to address the current confusion over their role in health systems, particularly in LICs, and could possibly strengthen primary health care systems as a counterpoint to the poorly balanced growth in the hospital sector.

References

- Chun, C. B., S. Y. Kim, J. Y. Lee, S. Y. Lee, and World Health Organization. (n.d.). Republic of Korea: Health System Review (p. 66).
- Cylus, J., E. L. Richardson, M. Findley, C. Longley, D. O'Neill, and World Health Organization." (n.d.). United Kingdom: Health System Review.
- English, E. L., C. F. Ngugi, and I. P. Smith. 2015. "The District Hospital." In *Disease Control Priorities in Developing Countries*. Chapter 65: (p. 1211 - 1228).
- English, M., L. Rispel, F. Ssengooba, and N. Edwards. 2024. "Breaking the Silence on First Referral Hospitals and Universal Health Coverage." *The Lancet Global Health* 12 (3): e366-e367.
- Government of Nepal. 2015. Nepal Health Sector Strategy 2015-2020. In: *Ministry of Health and Population* (Ed.). Retrieved from: https://climate.mohp.gov.np/downloads/Nepal_Health_Sector_Strategy_%202015-2020.pdf
- Jamison, D. T., A. Alwan, C. N. Mock, R. Nugent, D. Watkins, O. Adeyi, A. Binagwaho et al. 2018. "Universal Health Coverage and Intersectoral Action for Health: Key Messages from Disease Control Priorities." *The Lancet* 391 (10125): 1108-20.
- Jamison, D. T., W. H. Mosley, A. R. Measham, and J. L. Bobadilla. 1993. "Disease Control Priorities in Developing Countries: A Summary." Washington, DC. World Bank Document (dcp-3.org).
- Jamison, D. T., W. H. Mosley, A. R. Measham, and J. L. Bobadilla, J. L. 1993. "Disease Control Priorities in Developing Countries: A World Bank Book." Oxford, UK: Oxford University Press.
- Jeffries Mazhar, R., T. M. Willows, S. Bhattarai, C. S. Tinn, N. Misago, and M. English. 2024. "First Referral Hospitals in Low-and Middle-Income Countries: The Need for a Renewed Focus." *Health Policy and Planning* 39 (2): 224-32.
- Kumar, R. 2019. "Public-Private Partnerships for Universal Health Coverage? The Future of 'Free Health' in Sri Lanka." *Globalization and Health* 15 (1): 1-10. DOI: 10.1186/s12992-019-0522-6.
- The Law Reviews. (2021). *Health Care Law: Chapter 9 South Korea*. London. *The Law Business Research Ltd*. Fifth Edition. p 99-109.
- Light, D. W. 1985. "Values and Structure in the German Health Care Systems." *The Milbank Memorial Fund Quarterly. Health and Society*. New York. Wiley. Vol 63. No. 4615-647. <https://doi.org/10.2307/3349852>
- Ministry of Health. 1962. *Hospital Plan for England and Wales*. London, Her Majesty's Stationery Office (Cmnd 1604).
- Ministry of Health. 1994. *Manual of Management of Divisional Hospitals*. Sri Lanka: Ministry of Health and Women's Affairs.
- OECD. 2011. "Classification of Health Care Financing Schemes (ICHA-HF)." In *A System of Health Accounts*. Paris: OECD Publishing. DOI: 10.1787/9789264116016-9-en.
- Rajapaksa, L., P. De Silva, P. Abeykoon, L. Somatunga, S. Sathasivam, S. Perera et al. 2021. *Sri Lanka Health System Review*. New Delhi: World Health Organization Regional Office for South-East Asia.
- Rannan-Eliya, R., and L. Sikurajapathy. 2008. *Sri Lanka: "Good Practice" in Expanding Health Care Coverage*. Colombo, Sri Lanka: Institute for Health Policy.
- Reconstruction of Hospital Service. 1962. *British Medical Journal* 1 (5273): 244-51. PMID: PMC1957280.
- World Health Organization (WHO). 1978. Declaration of Alma-Ata. International Conference on Primary Health Care, Alma-Ata, USSR, 6-12 September 1978. Retrieved from: https://cdn.who.int/media/docs/default-source/documents/almaata-declaration-en.pdf?sfvrsn=7b3c2167_2.
- _____. 1987. Declaration on Strengthening District Health Systems Based on Primary Health Care. https://iris.who.int/bitstream/handle/10665/61958/WHO_SHS_DHS.pdf?sequence=1.
- _____. 1992. *The Hospital in Rural and Urban Districts*. Geneva: World Health Organization (WHO). Contract No.: 819.
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_____ 1992a. The Hospital in Rural and Urban Districts: Report of a WHO Study Group on the Functions of Hospitals at the First Referral Level. <https://apps.who.int/iris/handle/10665/37704>.

_____ 1996. District Hospitals: Guideline for Development. WHO Western Pacific.

WHO South-East Asia Region. 2020. "Improving Retention of Health Workers in Rural and Remote Areas: Case Studies from WHO South-East Asia Region." Delhi, India: WHO.

CHAPTER 14:

BUILDING A NEW HOSPITAL: KEY QUESTIONS AND CONSIDERATIONS

Nigel Edwards, Anna Koziel

Key Messages

- Major investments in hospitals need to be considered in the context of the wider health and care system.
- Rigorous testing of the assumptions being made, the use of benchmarks, referencing experience from elsewhere, and other techniques for avoiding “group think” are important.
- Overall capacity to treat patients rather than number of beds should be the focus.
- While good forecasting is important, a high level of flexibility is incorporated into plans due to the speed of medical advances and the need to adapt to changing patterns of disease, pandemics, and other external factors.
- Hospitals have a large environmental footprint, and plans need to consider the impact of the building and the services to be delivered.
- There are a number of well-known pitfalls in planning hospitals; care is needed to avoid them.

Introduction

Building or extending hospitals represents a substantial investment, but it is also a long-term commitment to funding a set of activities with a total value of many times the initial sum spent on the building.

Making the right decision about what to build, where it should be located, and its size and content is important, but it is also very difficult for several reasons; and unfortunately, the rigor and quality of planning has not always been very high. This may be because of the complexity of hospitals in terms of both the number of activities they carry out and the extent to which these are often dependent on each other. Furthermore, hospitals have traditionally often been planned as though they were stand-alone organizations rather than parts of a wider system. It is not possible to create a high-quality, long-term plan for a hospital without an understanding of the wider system in which it operates. This includes local services such as primary care, home nursing, social care, other hospitals, and the wider referral network for more specialized care. Understanding this is particularly important since high levels of investment in hospitals can stifle the capacity for change in the wider health care system by monopolizing the resources available for investment.

Some of the risks associated with poor decision-making can be managed by the careful interrogation of building plans to ensure that they are rigorous, that they take into account local health systems, and that they consider appropriate measures to create sufficient flexibility in the face of unexpected change.

Markets in hospital care do not work very well to ensure an optimal distribution of services across a region or country (Trinh, 2020). There are a number of reasons for this, including the relatively passive approach of many payers; the inflexible nature of the assets; and the opportunities for cross-subsidization between various activities. This means that some form of strategic decision-making is required to determine the shape of the hospital network and the location of some of the key strategic services (trauma, emergency cardiology interventions, stroke, etc.).

The often political nature of the process, the importance of hospitals to the local economy and its sense of community, the complex trade-offs, and the involvement of many stakeholders means that even when the solutions proposed are evidence-based and robust, public and political opposition can cause proposals to fail. Therefore, the way stakeholders are involved, and how their support is gained, along with the local political and media response may be just as important, or even more important, than the technical quality of the plans for ensuring their success.

This chapter proposes some lines of inquiry that can be used to help hospital planners be more effective and use evidence-based approaches to improve the probability that the investment will deliver a high-value outcome.

Main Investment Considerations

There are five main domains where it can be particularly useful to pose questions about proposals for investment:

1. The overall strategy and the case for investment, based on population need and changes in health care, including the assumptions made about the future performance of the hospital and the local health system;
2. Environmental sustainability and resilience in the face of future changes;
3. Measures to ensure the flexibility of the proposed building;
4. The business case for the investment value for money, and the financial sustainability of the services; and
5. The quality and inclusiveness of the planning process.

Needs Analysis and Service Strategy

A key question for any proposed investment is the extent to which the proposed changes will meet the needs of the population that the hospital serves in terms of volume, access, and quality. It is also vital to understand how the hospital will fit into the wider pattern of provision of care across the system. Where this has been done well it includes:

- Policy makers setting expected standards for i) **Access** (maximum travel times for critical conditions); ii) **Minimum population size** required to sustain specialized services; iii) Principles about **equity of distribution**; and iv) The **capital budget envelope**.
- Specifying how hospitals will work together, and the arrangements for escalation of complex patients, or collaborative working in specialized areas such as cancer.
- An understanding of the capability and capacity of other parts of the health system, and how this may evolve over time.
- A view of the overall network of hospital and primary care provision in terms of the functions being delivered and broad estimates of the scale of the services. (Very detailed plans for individual facilities or services are not required at this stage of the process.)

For the individual hospital there are a set of similar questions. There should be evidence that there is a need for the proposed scope of services and the level of capacity in the area served by the hospital. It is important to ensure that any unmet need is identified and considered. This may include elements of the population that currently have low levels of access.

The projected level of demand and activity, the expected performance in terms of length of stay, day treatment and occupancy, and other metrics are key determinants of the physical capacity and the workforce that will be required. These are a key part of the strategy for clinical services that should underpin any proposed investment.

The high-level questions that need to be considered include:

- Are the proposals consistent with the overall strategy for health care delivery in terms of priorities such as geographical access, waiting times, outcomes, efficiency, etc.?
 - Are the assumptions within the strategy about key parameters of demand and performance plausible, and based on appropriate modelling and benchmarks? (Length of stay, rates of day treatment, and assumptions about occupancy rates are of particular significance.)
 - Have rational choices been made about the location of services?
 - Is there a clear vision for the future pattern of services that is supported by clinicians, payers, and other stakeholders? Is this evidence-based, and clinically and economically sustainable?
 - Have any proposed changes or opportunities for change in the provision of primary care and other services that can impact the demand for hospital capacity been fully considered? For example, is expanding home care an alternative to increasing the number of inpatient beds?
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- Have the workforce implications of the investment been considered, and is there a strategy to deal with these?
- Do proposals consider how the adoption of appropriate health information technology will impact the way services will operate?
- Have the implications of the presence and strategies of other providers been fully considered?

Modelling Needs and Capacity

The catchment area of the hospital needs to be properly defined, and potential changes in population and demography should be fully understood in order to identify the population to be used as a basis for demand forecasting. Hospitals tend to overclaim the population they serve; therefore, care is needed in the calculation process; there are several methods for doing this (Brown et al. 2006; Gilmour 2010; Senn and Samson 1982).

There is no standard formula for converting a given level of population need into hospital activity, beds, other capacity or workforce requirements. Using historical data risks replicating out-of-date practices and assumes (almost certainly incorrectly) that the characteristics of current age cohorts will remain unchanged over time. For example, it is probable that 75-year-olds in 20 years' time will not have the same morbidity profile as the current 75-year-olds.

There is a long-term trend for hospital activity to increase, independent of population size and structure. This reflects the availability of new treatments, an increased ability to offer these to a wider group of patients, and other exogenous factors—for example, a policy change to increase screening for colon cancer. The same factors apply to treatments and lengths of stay in hospital. Assumptions in these areas all need to be rigorously tested.

Reductions in length of stay, realistic bed occupancy assumptions, the development of ambulatory care, day treatment, and investigation and the growth of out-of-hospital care need to be factored into forecasts. However, these changes also mean that inpatient care and number of beds are becoming less significant as a currency for planning. Other activities and facilities in the hospital are increasingly important determinants of cost and capacity (for example, operating theatres, endoscopy, cardiac and respiratory labs, imaging, etc). Overall workload and capacity across a range of treatment resources need to be considered – not just beds. There are no norms that can be used to do this – not least because the requirement for beds and some other capacities are the product of other aspects of the system, such as the availability of home care, nursing homes, and high-quality rehabilitation, the capability of primary care, the quality of ambulance services, etc.

In many countries it may be necessary to consider the future demand for planned procedures (such as hip replacement, where intervention rates are often low). The use of international or other good practice benchmarks and epidemiological data can be helpful here.

Viable and Evidence-Based Models

Internationally, there are differences in the population sizes or activity levels considered necessary to create the critical mass needed to support different types of services. There is evidence to support the development of large and centralized services for highly specialized care such as transplant surgery, acute stroke, ST elevated myocardial infarct, neonatal intensive care, major vascular surgery, trauma care various types of cancer treatment, neurosurgery, plastic surgery, and other services with a need for scarce expertise and equipment. These services ideally require large teams; they need to serve sizeable populations to be economically viable, and to provide sufficient work for professional skills to be maintained.

Even for highly specialized care the evidence to support these decisions is not always clear, and it is largely absent for many services such as internal general medicine, and a number of other areas of high-volume care (Vaughan and Browne 2023). In these areas, choices about size and scope require local decision-making based on the availability of resources, staff, minimum viable staffing, and equipment levels, and an assessment of the economic viability of the service delivery model. These will need to be traded off against considerations of access for patients and staff, particularly for those services where time is crucial.

Decisions to develop new, highly specialized services should be closely scrutinized to ensure that they are consistent with the evidence where this exists; that there is payer support; and that the provider will have sufficient size, adequate numbers of well-trained staff, and other supporting infrastructure to sustain them and provide high-quality care.

Location Decisions, and Understanding the Wider Impact of Change

The location of the hospital needs to be consistent with the usual patterns of travel of the population and, as much as possible, should be positioned to minimize patient and staff travel. Hospitals in out-of-town locations may take advantage of cheap land and better parking facilities, but they impose a cost on staff and patients of additional travel, which has implications for sustainability.

The decision on location and the level of service will have an impact on existing providers and payers. Owners need to consider this, as well as the interaction of the investment with the wider health care delivery system more generally. Some duplication of services, or overlap between providers in some types of services--such as planned care or diagnostics--may be considered appropriate in systems where choice and market mechanisms are an important feature. But if providers make overly optimistic estimates of how much demand they can capture from others, overcapacity may result. This may create risks of supply-induced demand, causing volume risks for payers as providers seek to fill the capacity to cover the costs of their additional capacity.

Payers and local governments may also want to ensure that the proposed changes will not have adverse impacts on access.

Environmental Sustainability and Resilience

The World Health Organization (WHO) has called for more “green hospitals” and “zero-waste hospitals” and has provided guidance (WHO 2020). Worldwide, buildings generate 48 percent of CO₂ emissions, and many hospitals are among the most unsustainable buildings (Karliner et al. 2019).

Investors in health care facilities need to be able to demonstrate that they have fully considered issues of sustainability across the whole life cycle of the building, from the construction of the buildings to ensuring that the design supports sustainable operation, and taking into consideration demolition, waste, disposal, and material reuse at the end of life.

Resilience in the face of natural disasters, climate change, and major outbreaks of infectious disease also need to be tested. The COVID-19 pandemic revealed that many hospitals have been designed in ways that were not well-suited to the situations of high demand from patients with a highly transmissible respiratory infection (lack of single rooms, inflexible spaces and engineering, lack of capacity in oxygen supply, inability to create separate flows for different types of patients, diagnostic areas and theatres that could not segregate their work, etc.). The provision of single rooms with ensuite facilities, and the ability to create isolation space with negative pressure proved important.

Flexibility and Resilience

Given the rapid change in health care technology and some of the difficulties in forecasting the shape of future activity, it will be important that buildings have the flexibility to change.

Flexibility does come at a cost, and there is a practical question about the benefits of future flexibility compared with the upfront costs of building it in that will need to be considered. There is a balance to be struck in the appropriate level of redundancy and scope for easy retrofitting, and the cost–benefit equation involved. However, experience has shown that the lifetime costs of not being flexible can be much greater than the initial investment of building in flexibility.

Financial and Business Case Questions

Payers, funders, and financiers of major capital investments generally require the development of a business case to support the decision-making around any major capital investment. Payers will want to understand the projected impact of the proposed project on existing providers, and the health care delivery system as a whole. They will need to consider the potential for adverse consequences, including duplication of services, fragmentation of the delivery system, and the financial viability of other health care providers.

The critical success factors that surround any major capital investment involve having a clear need, offering value for money, having capacity in the marketplace, being affordable, and being deliverable. (See Box 14.1.)

Box 14.1: Critical Success Factors for Major Public Sector Investments

Good strategic fit and ability to meet business needs. Does it meet the agreed-upon spending objectives, related business needs, and service requirements? Does it have good holistic fit, and synergy with other strategies, programs, and projects?

Value for money. How far does the option chosen optimize social value (social, economic and environmental), and balance the potential costs, benefits, and risks?

Supplier capacity and capability. Do potential suppliers have the ability to deliver the required services?

Affordability. Can it be well-financed from available funds? Is it well-aligned with resourcing constraints?

Achievability. How likely is the option to be delivered given an organization's ability to respond to the changes required? Does the organization have the level of available skills required for successful delivery?

The Planning Process

Stakeholder Involvement

Public and political opposition to proposals to rationalize hospitals can create significant obstacles to change – especially where those opposing change can mobilize the support of local or national politicians. Early involvement of stakeholders with a high level of transparency, and sufficient time for proposals to be considered can help reduce the risk of proposals being delayed due to political opposition. Involving patients, the public, and other stakeholders will increase the probability that the new development fits the needs of users, and that it will add value to the local community.

Potential Pitfalls

People involved in developing proposed investments can fall victim to a number of biases, or pressure from stakeholders that can distort decisions in ways that can be unhelpful. There are also a number of risks; the risks commonly experienced in many projects include:

- *Optimism Bias.* The tendency to overestimate positive events or trends, whether this is the impact of policy measures to reduce hospital demand, the length of the planned construction project, or the savings available from operating a new hospital.
- *Value Engineering.* The process of reducing costs through changing specifications. This can remove important features which, while potentially saving construction costs, add significantly to the costs of operating the building or require modifications in future that may outweigh the initial savings.
- *System Myopia.* Failure to understand the system in which the hospital will operate may lead to misspecification in terms of both size and content. This can also mean that opportunities to link hospital development to wider investment and economic development in an area are lost.
- *Rigid and Inflexible Design.* Errors in forecasting, and the emergence of new technology or demands are inevitable. The problem is less a matter of failing to forecast these than planning in ways that does not allow for cost-effective adaptation.
- *Risks Related to Incentives in the System.* Where capital has no direct cost to the investing organization, or where it is rationed so that organizations have infrequent opportunities to access it, there is a risk of incentives that maximize the size of the proposed development.
- *Goals of the Project.* There is a danger of the goal becoming the delivery of the project, rather than the longer-term benefits it is supposed to produce.
- *Stakeholder Management* – Many proposals fail due to the opposition of stakeholders, particularly where they have involved the closure, centralization, or redesignation of facilities as part of the development. A process for appropriate engagement with politicians, the public, and other important stakeholders is a key element in mitigating this risk.

External scrutiny and testing of these developments can help to identify and mitigate these risks. However, care should also be taken not to introduce the risk of creating an expensive, long-winded, and risk-averse process that reduces innovation and increases costs.

Evaluation

One regrettable aspect of major hospital investment in the past has been a lack of rigorous post-occupancy evaluation (POE). There has often been little reflection or learning from the process of planning and procurement, analysis of the finished building, and/or the extent to which the investment met its original goals. This is a lost opportunity. We would recommend that policy makers and investors in major capital projects insist on a structured, rigorous, and well-resourced evaluation program, delivered with appropriate independence.

Conclusions

Given both the scale of the initial capital outlay and the long-term commitment to spending that the decision also implies, proposals to invest in hospitals need proper scrutiny.

It is very important that decisions are looked at in the context of the whole health system and not simply the perspective of the individual hospital. This means using modelling techniques and intelligence from local stakeholders to test:

- How changes in the capacity and capability of primary care will impact referrals, and admissions for conditions where primary care management reduces hospital use;
- The impact of the activities of other providers on the demand for care;
- The potential for duplication of services, or an adverse impact on the financial or service stability of other providers;
- How changes in long-term and home care provision could impact length of hospital stay; and
- The overall impact of the hospital on the resources available for all health services in the area.

Benchmarking and forecasting to test assumptions about demand, key parameters such as length of stay, changes in care models and pathways, and other key variables are important. These require rigorous testing and sensitivity analysis. It is also important to have a clear plan for what will happen if the assumptions are wrong, which is highly likely. Flexible plans are required for the internal design of the buildings, the use of home care and other services, the ability to otherwise expand capacity in the case of underestimation of demand, and repurposing and alternative use if there is overestimation.

Testing proposals against criteria related to the sustainability of the investment; the commercial, economic and financial case; and the capability to deliver the project effectively is also important.

It can be seen that in many areas decisions are about trade-offs between different objectives, for example economies of scale vs. access, flexibility vs. construction costs, and so on. This means that it will be important for the decision-making process to identify where these exist, clearly state them, and have a transparent way of deciding on the solution that is adopted.

In using the questions and ideas set out here it will be important to balance the need for agility to promote innovation and to avoid bureaucratic obstacles, against the equally important need to avoid the pitfalls, biases, and other problems that can arise from an inflexible application of approval processes.

References

- Karliner J., S. Slotterback, R. Boyd, B. Ashby, and K. Steele. 2019. *Healthcare's Climate Footprint*. Health Care Without Harm, Climate-smart health care series, Green Paper Number One, Produced in collaboration with Arup <https://www.arup.com/perspectives/publications/research/section/healthcares-climate-footprint>
- Brown, P., D. Ho, M. Shaw, J. Verne, and C. Trotter. 2006. "Estimating Catchment Populations in the South West: Why and How." *UK Public Health Association Annual Conference, Telford*.
- Gilmour, S. J. 2010. "Identification of Hospital Catchment Areas Using Clustering: An Example from the NHS." *Health Services Research* 45 (2): 497–513. <https://doi.org/10.1111/j.1475-6773.2009.01069.x>
- Senn, S. J., and W. B. Samson. 1982. "Estimating Hospital Catchment Populations." *Journal of the Royal Statistical Society Series D (The Statistician)* 31 (1): 81–96. <https://doi.org/10.2307/2988103>
- Trinh, H. Q. 2020. "Strategic Management in Local Hospital Markets: Service Duplication or Service Differentiation." *BMC Health Services Research* 20 (1): 880. <https://doi.org/10.1186/s12913-020-05728-y>
- Vaughan, L., and J. Browne. 2023. "Reconfiguring Emergency and Acute Services: Time to Pause and Reflect." *BMJ Quality and Safety* 32 (4):185–88. <https://doi.org/10.1136/bmjqs-2022-015141>
- World Health Organization (WHO). 2020. *WHO Guidance for Climate Resilient and Environmentally Sustainable Health Care Facilities*. <https://www.who.int/publications-detail-redirect/9789240012226>

CHAPTER 15:

ESSENTIAL EMERGENCY AND CRITICAL CARE

Carl Otto Schell, Karima Khalid, Tim Baker

Key Messages

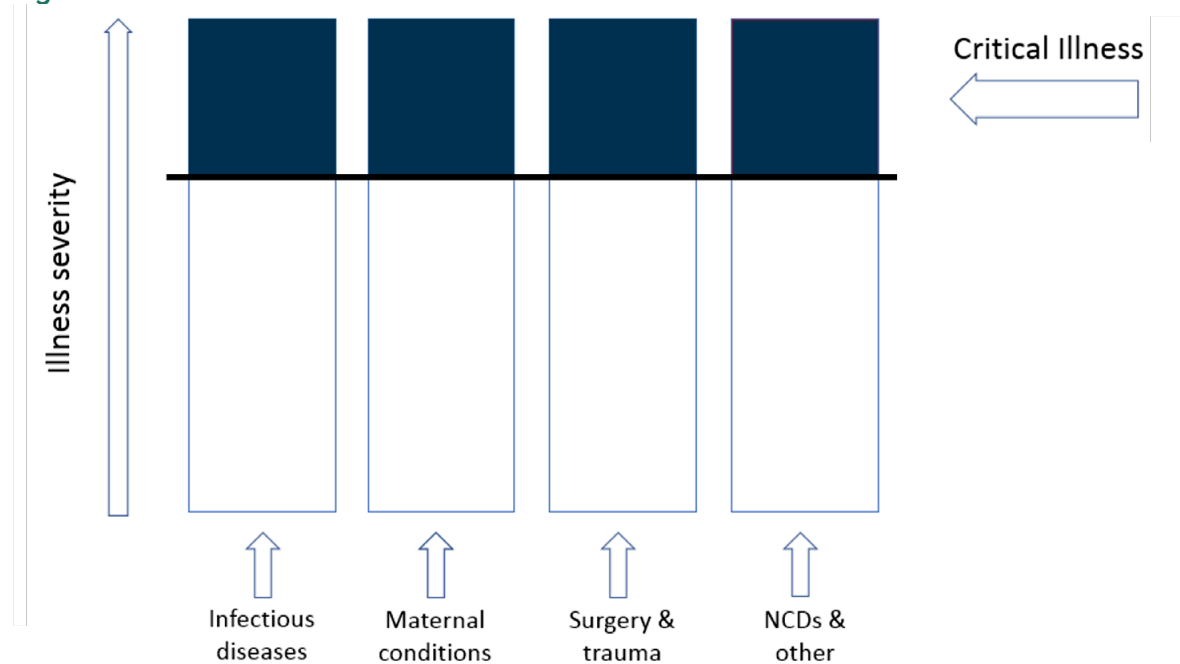
- Critical illness is the most severe form of acute illness; it is illness with a high risk of imminent death if care is not provided.
- Critical illness occurs at all ages, in all specialties, and can be due to any underlying disease. It is very common; one in ten patients in hospitals are critically ill, and estimates suggest a global burden of 45 million adults each year.
- The vast majority (more than 90 percent) of critically ill patients are cared for in health facilities and general hospital wards *outside* of intensive care units.
- Essential Emergency and Critical Care (EECC) is low-cost, cost-effective, lifesaving care that is feasible to provide across all wards and units in all hospitals in the world.
- There are large unmet needs of EECC in hospitals around the world, leading to a substantial amount of preventable deaths.
- Ensuring the provision of EECC when building capacity in health facilities as part of universal health coverage could increase equity, safety, and efficiency, and reduce mortality across all acute care specialties.

Critical Illness: An important Challenge for Hospitals

Critical illness is “a state of ill health with vital organ dysfunction, a high risk of imminent death if care is not provided and the potential for reversibility.” (Kayambankadzanja et al. 2022). With an estimated burden of 45 million adult cases annually, and limited access to care especially in low- and middle-income countries (LMICs) critical illness poses an important public health challenge (Adhikari et al. 2010; Adhikari & Rubenfeld 2011; Kifle et al. 2022; Murthy et al. 2015).

Critically ill patients are those with very severe illness who also need urgent care (figure 15.1). While critical illness can be due to any diagnosis and occur anywhere, critically ill patients are mostly cared for in hospitals (Bartlett et al. 2023). Within hospitals, critical illness is managed in emergency units, general wards, high-care units, and intensive care units (ICUs) – and contrary to common perception, the vast majority of critically ill patients (94 percent in a recent Swedish study), are cared for in general wards (Schell et al. 2023). In Tanzania, 10 percent of patients reporting to the emergency department are critically ill (Mboya et al. 2023). Among hospital inpatients, 11 percent in Sweden and 18 percent in Malawi are critically ill, with 30-day hospital mortalities of 18 and 19 percent respectively. Extremely poor outcomes, with hospital mortality between 15-82 percent have been shown in several studies (Amin et al. 2016; Amir et al. 2016; Hvarfner et al. 2022; Maluangnon, Kanogpotjanant, and Tongyoo 2023). Providing good-quality care to this large group of high-risk patients is a key function of hospitals, and one that requires new ways of thinking in order to increase efficiency and reduce the number of preventable deaths.

Figure 15.1: Critical illness is the most severe form of acute illness.



Severity is an aspect of illness relevant for all specialties and diagnoses. The critically ill have the highest severity, with vital organ failure and a high risk of imminent death if care is not provided (in red). For example, a patient with appendicitis may have low severity (stable vital organ function) or high severity (critically ill).

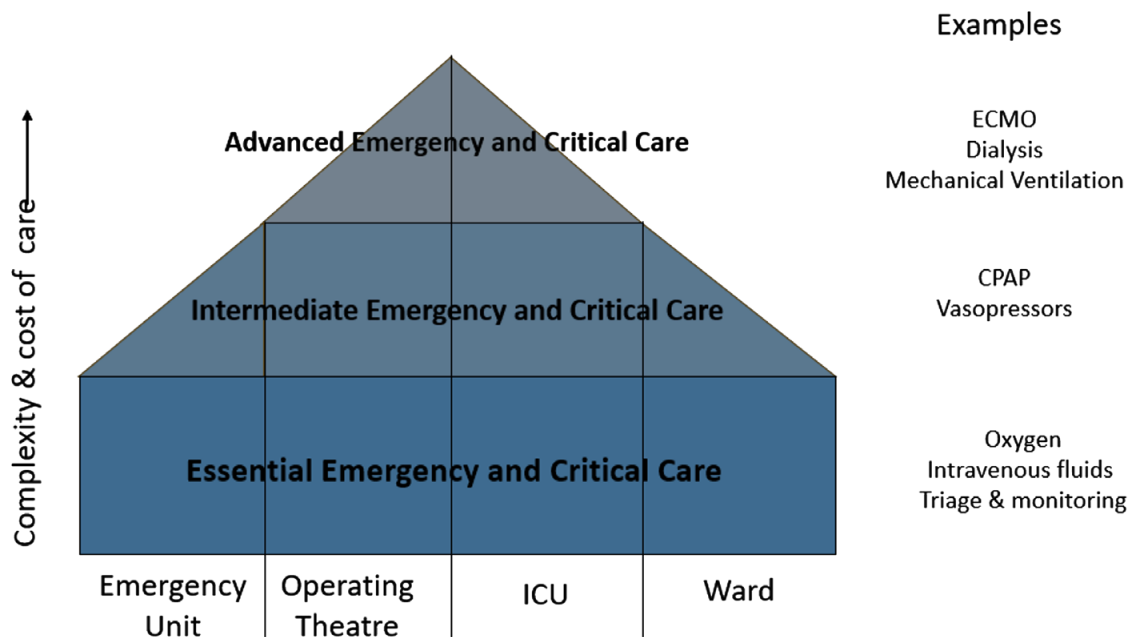
Source: Schell et al. 2018

NCDs: Non-Communicable Diseases

Although the number of critically ill patients is so high, there is a lack of knowledge about the hospital set-up required to provide them with quality care, especially in LMICs, possibly due to a wide variation in understanding of the terms “critical illness” and “critical care.” (Kayambankadzanja et al. 2022; Mkumbo et al. 2023) One recent definition is that critical care “is the identification, monitoring, and treatment of patients with critical illness through the initial and sustained support of vital organ functions.” (Kayambankadzanja et al. 2022) Some settings have a striking lack of capacity to care for critical illness – for example there is a large range of ICU beds per 100,000 population across the world, with more than 25 in some HICs to less than 0.1 in some countries in Africa (Ma and Vervoort 2020).

The World Bank’s Disease Control Priorities 3 (DCP3) highlighted the substantial deficiencies in the care of critically ill patients in emergency units in many parts of the world (Reynolds et al. 2017). However, critical care can be provided throughout hospitals, and at different levels of complexity and cost – from foundational, first-line care up to complex, resource-demanding care that is available only in ICUs (Figure 15.2). Providing critically ill patients with foundational care is essential for saving lives, and yet even this care is often missing in hospital settings across the world. For example in Tanzanian hospitals, 44 percent of the resources required for its provision are not ready in the wards (Khalid et al. 2024), and in Malawi, where 90 percent of hypoxic patients do not receive oxygen (Kayambankadzanja et al. 2021).

Figure 15.2: Three levels of critical care, graded by complexity and cost - and units where this care can be provided.



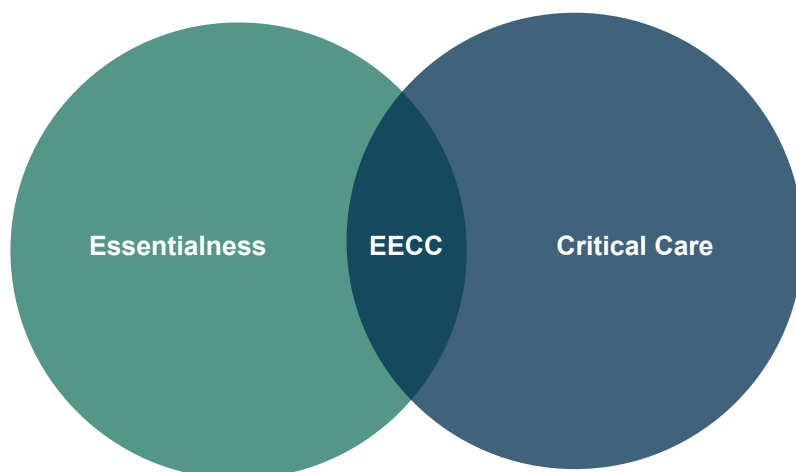
ICU: Intensive Care Unit ECMO: Extra Corporal Membrane Oxygenation CPAP: Continuous Positive Airway Pressure. Based on Buowari et al. 2022

One reason for the gap in the provision of critical care may be a specialty and diagnosis-based hospital structure. Such a structure may cause critical care to be a secondary consideration, after diagnostic and definitive care – which may risk delayed identification and care of critically ill patients, who become scattered throughout hospitals. For example, a man with a hip fracture may receive an x-ray and high-class surgery but die two days later in the ward due to an unrecognized or untreated critical illness. Critical care in hospitals can be unsystematic and non-uniform, and critically ill patients fall in the gaps between different diagnosis-based initiatives and specialties.

Essential Emergency and Critical Care: A Feasible Approach for Impact

Essential Emergency and Critical Care (EECC) is a health system innovation with a horizontal approach that focuses on *illness severity* rather than specialty and diagnosis (Schell et al. 2018). It unites the focus on severity of illness with the concept of *essentialness* – provision of the foundational, most cost-effective, first tier of care – with the aim of providing such care to *all critically ill patients in all hospitals in the world*, irrespective of their age, gender, diagnosis, or social status (Figure 15.3). Hospitals using EECC will be more likely to consider the severity of a patient's illness, quickly identify the critically ill (i.e., those with the greatest clinical need), and ensure that they are promptly provided with the essential treatment needed to stabilize vital organ functions. Providing all patients with this low-cost, lifesaving care could improve equity and efficiency in health care and reduce mortality within all acute care specialties.

Figure 15.3: EECC is the intersection of Essentialness and Critical Care



EECC: Essential Emergency and Critical Care

With the involvement of 269 clinical experts from various acute care disciplines and resource settings, in 2021 a Delphi consensus was reached, defining 40 clinical EECC processes—among them, triage, oxygen, intravenous fluids, and effective communication. In addition, 66 requirements for hospitals to be ready to provide EECC were specified, including requirements for infrastructure, equipment, consumables, human resources, drugs, training, routines, and guidelines (Schell et al. 2021). Ensuring effective coverage of EECC throughout the health system could lead to improved outcomes across medical disciplines both for those with infectious and noncommunicable diseases – in the general wards, in the emergency departments, in high-care units, and post-operatively. Early economic work has found EECC to be cheap and cost-effective. Providing EECC to critically ill patients in Tanzania has an estimated cost of \$17-21, compared to more than \$200 for ICU care (Guinness et al. 2023). An estimated EECC cost-effectiveness of \$14-37 per Disability-Adjusted Life-Year (DALY) averted is similar to core priorities in global health, such as malaria treatment or the provision of emergency obstetric care (Shah et al. 2023). Preliminary modelling estimates that scaling up EECC so that it is available to all critically ill patients in all parts of the world has the potential of saving a million lives annually.¹

Implementing Improved Critical Care

In recent years, critical care has jumped up on the global health agenda. Prior to the COVID-19 pandemic, the World Health Organization (WHO) developed the Basic Emergency Care training and is now developing critical care training and resources for countries to scale up critical care. COVID-19 has led to widespread scaling-up of oxygen, emergency care, and ICUs, and a critical care resolution was passed at the World Health Assembly in 2023 (Owoo et al. 2023). Since prioritization and cost-effectiveness are not addressed in many initiatives, health providers need assistance to introduce new services in the most impactful order, in line with WHO's Fair Choices Framework (Ottersen and Norheim 2014). Ensuring the scaling-up of EECC as a prerequisite to an expansion of ICUs would maximize impact, since EECC can stabilize patients in the wards; thus only the few who really need advanced care would need to be transferred to the ICU. This would facilitate the full potential of initiatives to improve effectiveness within ICUs through the use of telemedicine and other means (Ganapathy et al. 2022).

EECC should be seen as a fundamental part of pandemic and emergency preparedness; when emergencies lead to surges in critical illness, health systems that have EECC in place only need to scale up services, rather than introduce them from scratch (Buowari et al. 2022). The current global scale-up of oxygen provision, which is vital for critical illness, should not be a single-issue drive – instead patient-centeredness should guide the need to manage patients holistically, and provide them with all the essential care needed. EECC could be framed as “oxygen-plus,” with all other essential critical care needed by oxygen-dependent patients also being provided.

1 Uncertainty interval 0.5 – 2.1 million – unpublished.

In the nongovernmental (NGO) sector, Médecins Sans Frontières (MSF) has developed programs to provide quality critical care, based on an explicit focus on EECC. Countries are pushing to implement improved critical care systems; one notable example is Tanzania developing a National Strategic Plan for EECC, which demands that all stakeholders in the country use the plan to ensure that “all critically ill patients should receive high quality essential emergency and critical care services in all health facilities in Tanzania.”

Lessons to Guide Large-Scale Implementation of EECC

While it may seem puzzling that the most effective and feasible lifesaving actions for critically ill patients is not provided to all patients in all hospitals around the world, understanding why this is the case may provide important insights into how to change the status quo. It is a common psychological phenomenon that humans tend to be more attracted to new, advanced, or glamorous initiatives rather than to the less advanced or what is well-known. For example, it is often easier for politicians to promote the introduction of new medical technology to their target audiences rather than the improvement of foundational care. Learning from the implementation of similar initiatives can assist in designing successful implementation of EECC into health services.

Focus on Impact

The counterweight to the bias toward advanced care is a focus on impact. In the COVID-19 pandemic, initial efforts focused on advanced critical care. ICU capacity was massively scaled up in many high-income countries (HICs), and ventilators were donated to and bought for LMICs at scale, even though they had neither the human nor physical resources to use them safely and effectively (English et al. 2023). Oxygen shortages were common, and when this became apparent and reached public consciousness, notably in India, the argument for impact shifted attention toward more feasible lifesaving care. Critical care in general wards was improved in HICs, and the global community acted on the global deficiency of medical oxygen, a key EECC requirement (Kitutu et al. 2022). While pneumonia had caused more than 2 million deaths per year for long - much due to lack of oxygen - it was not until the pandemic that demand led to large-scale oxygen programs (Ferreira-Coimbra, Sarda, and Rello, 2020). Another example of impact-driven implementation is the WHO Surgical Safety Checklist, which was initially unpopular among clinicians--until the survival benefit was made clear (Bergs et al. 2014). Now this simple innovation to improve essential communication is an indisputably helpful practice to use before starting surgical procedures all over the world.

Learn from Other Cross-Cutting Initiatives

A particular challenge for cross-cutting initiatives like EECC is that the development of health care, from research to technology to practice, is largely driven within silos of medical specialties. At scientific conferences and medical colleges, the specifics of the specialty gain more attention than cross-cutting issues that may be more important for patient outcomes. Commercial actors have adapted to this structure in their stakeholder interactions, innovation, and marketing strategies. And while patients in HICs have benefitted from an explosion of medical advances during the last 30 years, very few of the advances have been of a cross-cutting or systemic nature.

However, a few cross-cutting initiatives have successfully been implemented at scale. For example, the creation of societies for cardiopulmonary resuscitation (CPR) were used to advocate for CPR with professional societies, the public, industry, and researchers, by creating job aides and licensing trainers. Repeated CPR trainings have become standard for the recertification of health workers in many hospitals. EECC is one step up from CPR, the intention being to prevent rather than treat cardiac arrests. This aim is shared with early warning systems (EWS) and rapid response teams (RRT), both of which can be understood as tools to implement EECC-related care in general wards. EWS are used to triage patients using simple – or sometimes more complex – algorithms (Friman, Bell, Djarv, Hvarfner, and Jaderling 2019). RRTs have been created to reduce delayed treatment of critical illness, with outreach teams from ICUs reviewing patients in general wards (Maharaj, Raffaele, and Wendon 2015). RRTs have been mostly initiated by ICUs, and supported by patient safety boards at the national and/or local level. Patient safety institutions have also sponsored EWS, and promoted improved communication, another EECC-process, by tools such as the SBAR-mnemonic: “Situation, Background, Assessment, Recommendation.” EECC is a key patient safety issue, and patient safety boards could provide the necessary “ownership” for the implementation of such cross-cutting health care processes. Unfortunately, such boards and cross-cutting initiatives are mostly found in high-income countries, and remain scarce in LMICs.

Increasing Awareness and Implementation in All Settings

Limited awareness of the large unmet need for critical care and its potential impact is likely the most important bottleneck to the provision of EECC. Implementing improved care for critical illness requires realizing that such care can be effective and cost-effective, and that novel approaches such as EECC may be needed. The current design of health facility assessments often reveal good resource availability at the hospital level, but also masks deficient readiness of the resources needed in the wards for the care of critically ill patients (Khalid et al. 2024). Implementation efforts often concentrate on training and the procurement of equipment, which may not be sufficient if the hospital system and processes of care are not conducive, and the equipment cannot be maintained (Dessap 2018) Accepting resource constraints and ensuring that the interventions that can have the greatest impact for the lowest cost are implemented first is likely to be the optimal approach; this is conceptualized as **progressive realization** (Ottersen and Norheim 2014.)

The Role of Business Models

Critically ill patients need EECC regardless of the prevailing health service business model. A pay-for-performance model may be able to increase incentives to provide effective and low-cost care if health outcomes are used as key metrics. However, an inherent risk with pay-for-performance is that health facilities may be reluctant to take care of critically ill patients who are likely to have poor outcomes, preferring to “cherry pick” stable patients. Such a risk may be mitigated by using population-based capitation finance models, as long as the patient’s and population’s underlying health status and socioeconomic environment are adequately accounted for. Effective regulation systems such as facility accreditations and patient safety boards are likely to be useful in achieving an effective coverage of EECC. Without these, the “ownership” and accountability for EECC quality will need to be clearly articulated to other actors. At the end, the most important drivers towards a high EECC coverage and quality of care may be institutions and individual health care leaders who focus on equity, feasibility, and *patient-centered impact*, resulting in well-informed and motivated health workers sharing these values.

Learning from Tanzania

Tanzania is at the forefront of EECC implementation. In Tanzania, a multifaceted approach involving researchers, policy makers, and other stakeholders has been used to raise awareness and implement EECC. Research, capacity building, and training of health workers; engagement with ministry of health officials, specialist societies, and clinicians; procurement of equipment and supplies; and mobilizing resources from international partners and donors have all moved EECC up on the health agenda.

Next Steps for Maximizing Impact

The vision of the EECC movement is that no one should die of a cause that EECC could prevent. This requires widespread implementation of EECC, and action on all levels – from research, global advocacy, and policy making to the individual clinical care of patients. The EECC Network (www.eeccnetwork.org) has been established to bring together these efforts, and provides a platform for interested clinicians, researchers, and policy makers throughout the world. There are currently over 700 members from over 50 countries, running programs on training, research, advocacy, and implementation. Continued expansion of the network requires funds and political engagement. EECC must align and collaborate with key stakeholders – UN agencies, governments, funders, professional organizations, and civil societies. Arguments need to be clearly articulated that EECC is cost-effective and feasible, that it has the potential to save many lives, and that it is currently not being widely provided, even though the techniques used are simple, and are known by many health workers. EECC is integral to Universal Health Coverage, Fair Choices, Patient Safety and Quality of Care; it is also needed to achieve the UN’s Sustainable Development Goals (SDGs) (Agency for Healthcare Research and Quality 2024; Kruk et al. 2024; Ottersen and Norheim 2014; WHO 2015). It should be central in all health systems.

The action plan for EECC needs to be multilevel, where all levels are necessary, and none are sufficient. Global actors need to prioritize EECC and include it in WHO and other agency programs. National and other decision-makers should devise policy plans, guidelines, and governance structures with the engagement of global and national specialist societies.

Training is important – both the inclusion of the principles of prioritizing the highest-impact care and the care of critical illness into pre-service curricula, and conducting in-service and refresher training for health workers. Implementation should be required in health care facilities, realized by health workers, and supported by effective governance and regulations. Primary Health Care facilities and hospitals require the resources for EECC, and these resources need to be ready at the bedside for use in identifying and treating patients with critical illness.

Finally, the existing research gaps in the field need to be filled, including acquiring better knowledge of the burden of critical illness, the unmet needs of EECC, and cost-effectiveness and modelling. As the processes in EECC are all standard of care, effectiveness studies can be challenging for ethical reasons, and EECC implementation should be scientifically studied for the effects on patient outcomes, care processes, and costs.

Conclusion

One of the most impactful changes possible for hospitals globally would be to refocus their efforts toward providing cost-effective, time-sensitive, feasible lifesaving care immediately and wherever it is needed. EECC is fundamental in this effort, and ensuring quality EECC delivery to all should be a key priority for health systems everywhere.

References

- Adhikari, N. K., R. A. Fowler, S. Bhagwanjee, and G. D. Rubenfeld. 2010. "Critical Care and the Global Burden of Critical Illness in Adults." *Lancet* 376 (9749): 1339-46. doi:10.1016/S0140-6736(10)60446-1
- Adhikari, N. K., and G. D. Rubenfeld. 2011. "Worldwide Demand for Critical Care." *Current Opinion in Critical Care* 17 (6): 620-25. doi:10.1097/MCC.0b013e32834cd39c
- Agency for Healthcare Research and Quality. 2024. "Six Domains of Healthcare Quality." Retrieved from <https://www.ahrq.gov/talkingquality/measures/six-domains.html>
- Amin, P., A. Fox-Robichaud, J. V. Divatia, P. Pelosi, D. Altintas, E. Eryuksel, Y. Mehta et al. 2016. "The Intensive Care Unit Specialist: Report from the Task Force of World Federation of Societies of Intensive and Critical Care Medicine." *Journal of Critical Care* 35: 223-28. doi:10.1016/j.jcrc.2016.06.001
- Amir, A., K. J. Saulsters, S. Olum, K. Pitts, A. Parsons, C. Churchill, K. Taseera, R. Muhindo, and C. Moore. 2016. "Outcomes of Patients with Severe Sepsis After the First 6 Hours of Resuscitation at a Regional Referral Hospital in Uganda." *Journal of Critical Care* 33: 78-83. doi:10.1016/j.jcrc.2016.01.023
- Bartlett, E. S., A. Lim, S. Kivlehan, L. I. Losonczy, S. Murthy, R. Lowsby, A. Papali et al. 2023. "Critical Care Delivery Across Health Care Systems in Low-Income and Low-Middle-Income Country Settings: A Systematic Review." *Journal of Global Health* 13: 04141. doi:10.7189/jogh.13.04141
- Bergs, J., J. Hellings, I. Cleemput, Ö. Zurel, V. De Troyer, M. Van Hiel, J-L Demeere, D. Claeys, and D. Vandijck. 2014. "Systematic Review and Meta-Analysis of the Effect of the World Health Organization Surgical Safety Checklist on Postoperative Complications." *British Journal of Surgery* 101 (3): 150-58. doi:10.1002/bjs.9381
- Buowari, D.Y., C. Owoo, L. Gupta, C.O. Schell, and T. Baker. 2022. "Essential Emergency and Critical Care: A Priority for Health Systems Globally." *Critical Care Clinics* 38 (4): 639-56. doi:10.1016/j.ccc.2022.06.008
- English, M., J. Oliwa, K. Khalid, O. Onyango, T. M. Willows, R. Mazhar, E. Mkumbo et al. 2023. "Hospital Care for Critical Illness in Low-Resource Settings: Lessons Learned During the COVID-19 Pandemic." *BMJ Global Health* 8 (11): e013407. doi:10.1136/bmjgh-2023-013407
- Ferreira-Coimbra, J., C. Sarda, and J. Rello. 2020. "Burden of Community-Acquired Pneumonia and Unmet Clinical Needs." *Advances in Therapy* 37 (4): 1302-18. doi:10.1007/s12325-020-01248-7
- Friman, O., M. Bell, T. Djarv, A. Hvarfner, and G. Jaderling. 2019. "National Early Warning Score vs Rapid Response Team Criteria: Prevalence, Misclassification, and Outcome." *Acta Anaesthesiologica Scandinavica*, 63 (2): 215-21. doi:10.1111/aas.13245
- Ganapathy, K., S.P. Haranath, A. A. Baez, and B. K. Scott. 2022. "Telemedicine to Expand Access to Critical Care Around the World." *Critical Care Clinics* 38 (4): 809-26. doi:10.1016/j.ccc.2022.06.007
- Guinness, L., A. Kairu, A. Kuwawenaruwa, K. Khalid, K. Awadh, V. Were, and E. Barasa et al. 2023. "Essential Emergency and Critical Care as a Health System Response to Critical Illness and the COVID 19 Pandemic: What Does It Cost?" *Cost Effectiveness and Resource Allocation* 21 (1): 15. doi:10.1186/s12962-023-00425-z
- Hvarfner, A., A. Al-Djaber, H. Ekström, M. Enarsson, M. Castegren, T. Baker, and C. O. Schell. 2022. "Oxygen Provision to Severely Ill COVID-19 Patients at the Peak of the 2020 Pandemic in a Swedish District Hospital." *PLoS One* 17 (1): e0249984. doi:10.1371/journal.pone.0249984
- Kayambankadzanja, R. K., C. O. Schell, M. Gerdin Wärnberg, T. Tamras, H. Mollazadegan, M. Holmberg, H. M. Alvesson, and T. Baker. 2022. "Towards Definitions of Critical Illness and Critical Care Using Concept Analysis." *BMJ Open* 12 (9): e060972. doi:10.1136/bmjopen-2022-060972
- Kayambankadzanja, R. K., C. O. Schell, I. Mbingwani, S. K. Mndolo, M. Castegren, and T. Baker. 2021. "Unmet Need of Essential Treatments for Critical Illness in Malawi." *PLoS One* 16 (9): e0256361. doi:10.1371/journal.pone.0256361
- Khalid, K., C. O. Schell, J. Oliwa, M. English, O. Onyango, J. McKnight, E. Mkumbo, K. Awadh, J. Maiba, and T. Baker. 2024. "Hospital Readiness for the Provision of Care to Critically Ill Patients in Tanzania: An In-Depth Cross-Sectional Study." *BMC Health Services Research* 24 (1): 182. doi:10.1186/s12913-024-10616-w
- Kifle, F., Y. Boru, H. D. Tamiru, M. Sultan, Y. Walelign, A. Demelash, A. Beane, R. Haniffa, A. Gebreyesus, and J. Moore. 2022. "Intensive Care in Sub-Saharan Africa: A National Review of the Service Status in Ethiopia." *Anesthesia & Analgesia* 134 (5): 930-37. doi:10.1213/ane.0000000000005799
-

- Kitutu, F. E., A. E. Rahman, H. Graham, C. King, S. El Arifeen, F. Ssengooba, L. Greenslade, and Z. Mullan. 2022. "Announcing the Lancet Global Health Commission on Medical Oxygen Security." *Lancet Global Health* 10 (11): e1551-e1552. doi:10.1016/s2214-109x(22)00407-7
- Kruk, M. E., N. R. Kapoor, T.P. Lewis, C. Arsenault, E. C. Boutsikari, J. Breda, and S. Carai. 2024. "Population Confidence in the Health System in 15 Countries: Results from the First Round of the People's Voice Survey." *Lancet Global Health* 12 (1): e100-e111. doi:10.1016/s2214-109x(23)00499-0
- Ma, X., and D. Vervoort. 2020. "Critical Care Capacity During the COVID-19 Pandemic: Global Availability of Intensive Care Beds." *Journal of Critical Care* 58: 96-97. doi:<https://doi.org/10.1016/j.jcrc.2020.04.012>
- Maharaj, R., I. Raffaele, and J. Wendon. 2015. "Rapid Response Systems: A Systematic Review and Meta-Analysis." *Critical Care (London, England)* 19: 254. doi:10.1186/s13054-015-0973-y
- Maluangnon, C., P. Kanogpotjanant, and S. Tongyoo. 2023. "Comparing Outcomes of Critically Ill Patients in Intensive Care Units and General Wards: A Comprehensive Analysis." *International Journal of General Medicine* 16: 3779-87. doi:<https://doi.org/10.2147/IJGM.S422791>
- Mboya, E., H. Ndumwa, D. Amani, P. Nkondora, V. Mlele, H. Biyengo, R. Mashoka et al. 2023. "Critical Illness at the Emergency Department of a Tanzanian National Hospital in a Three- Year Period 2019-2021." In: Research Square.
- Mekontso Dessap, A. 2018. "Frugal Innovation for Critical Care." *Intensive Care Medicine* 2: 252-54. doi:10.1007/s00134-018-5391-6
- Mkumbo, E., T. M. Willows, O. Onyango, K. Khalid, J. Maiba, C. O. Schell, J. Oliwa, J et al. 2023. "Same Label, Different Patients: Health-Workers' Understanding of the Label 'Critical Illness.'" *Frontiers in Health Services* 3. doi:10.3389/frhs.2023.1105078
- Murthy, S., A. Leligdowicz, and N. K. J. Adhikari. 2015. "Intensive Care Unit Capacity in Low-Income Countries: A Systematic Review." *PloS One* 10 (1): e0116949. doi:10.1371/journal.pone.0116949
- Ottersen, T., and O. F. Norheim. 2014. "Making Fair Choices on the Path to Universal Health Coverage." *Bulletin of the World Health Organization* 92 (6): 389. doi:10.2471/blt.14.139139
- Owoo, C., N.K. J. Adhikari, O. Akinola, D. Aryal, L.C. Azevedo, A. Bacha, J.I Baelani et al. "The World Health Assembly Resolution on Integrated Emergency, Critical, and Operative Care for Universal Health Coverage and Protection from Health Emergencies: A Golden Opportunity to Attenuate the Global Burden of Acute and Critical Illness." *Intensive Care Medicine* 49 (10): 1223-25. doi:10.1007/s00134-023-07176-8
- Reynolds, T. A., H. Sawe, A.M. Rubiano, S. D. Shin, L. Wallis, and C. N. Mock. 2017. "Strengthening Health Systems to Provide Emergency Care." In D. T. Jamison, H. Gelband, S. Horton, P. Jha, R. Laxminarayan, C. N. Mock, and R. Nugent (Eds.), *Disease Control Priorities: Improving Health and Reducing Poverty*. Washington DC: The International Bank for Reconstruction and Development / The World Bank.
- Schell C.O., A. Wellhagen, M. Lipcsey, L. Kurland, P. Bjurling-Sjöberg, C. Stålsby Lundborg, M. Castegren, and T. Baker. 2023. "The Burden of Critical Illness Among Adults in a Swedish Region-A Population-Based Point-Prevalence Study." *European Journal of Medical Research* 28 (1): 322. doi:10.1186/s40001-023-01279-0
- Schell, C. O., M. Gerdin Wärnberg, A. Hvarfner, A. Höög, U. Baker, M. Castegren, and T. Baker. 2018. "The Global Need for Essential Emergency and Critical Care." *Critical Care* 22 (1): 284. doi:10.1186/s13054-018-2219-2
- Schell, C. O., K. Khalid, A. Wharton-Smith, J. Oliwa, H. R Sawe, N. Roy, A. Sanga, et al. 2021. "Essential Emergency and Critical Care: A Consensus Among Global Clinical Experts." *BMJ Global Health*, 6 (9): e006585. doi:10.1136/bmjgh-2021-006585 %J BMJ Global Health
- Shah, H. A., T. Baker, C. O. Schell, A. Kuwawenaruwa, K. Awadh, K. Khalid, A. Kairu et al. 2023. "Cost Effectiveness of Strategies for Caring for Critically Ill Patients with COVID-19 in Tanzania." *PharmacoEconomics - Open*. doi:10.1007/s41669-023-00418-x
- World Health Organization (WHO). 2015. *Universal Health Coverage*. Retrieved from http://www.who.int/universal_health_coverage/en/
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CHAPTER 16:

CLIMATE-RESILIENT AND SUSTAINABLE HEALTH SYSTEMS: EXPERIENCES FROM THE LATIN AMERICA AND CARIBBEAN REGION

Mikhael Iglesias, Juan Pablo Toro, Jeremy Veillard

Key Messages

- Climate change poses the greatest threat to public health, necessitating climate-resilient and low-carbon health systems that can anticipate and ensure adequate preparedness; and can respond to, cope with, and recover from climate-related shocks and stress. Adopting resiliency and low-carbon measures has implications at the clinical, network, and system levels.
- In the past five years the World Bank's Health Nutrition and Population Global Practice in Latin America and the Caribbean, has prioritized investments in health infrastructure that incorporate resiliency and low-carbon features, as well as in disaster risk management (DRM) for health systems. Projects in Colombia and in the Caribbean have strengthened health systems by updating infrastructure codes for health facilities, developing comprehensive adaptation and mitigation strategies for the health sector, and building a climate-resilient health hospital.
- Having in-depth analytical products and technical assistance as well as client engagement and buy-in on the climate and health agenda have been the key system enablers for ensuring climate financing to health systems. The main challenges are linked to limited technical capacities in-country; complexity of project implementation at the subnational level; and/or fragmentation of health information systems.
- Moving forward, **health operations need to integrate climate change as a central piece in project design**. Climate-related risks, and ensuring sustainability, should be a cross-cutting edge as organizations plan and maintain health systems. Likewise, robust surveillance and monitoring of systems are critical for understanding shifts in the burden of disease due to climate change, and for identifying gaps and needs in the provision of health services. It is crucial to establish sustainable financial models that ensure resource allocation for furthering adaptation and mitigation measures at the clinical, network, and system levels.

Introduction

Human health and health systems are increasingly at risk due to changes in temperature, precipitation, and extreme weather events, making climate change the greatest threat to public health in the 21st century. It is estimated that diseases such as diarrhea, dengue, malaria, stunting, and heat-related illness will see at least 21 million additional deaths due to climate change; and the overall impacts of climate change on health will put an additional 44 million people into extreme poverty due to struggles with climate-related health risks. Changes in climate patterns will change the burden of disease profiles in countries, and will also cause direct damage to health systems via extreme weather events (World Bank 2024)

While health systems are at the forefront of ensuring healthy lives and livelihoods, the health care sector is also contributing to greenhouse gas (GHG) emissions. The health sector accounts for nearly 5 percent of total GHG emissions globally. Emissions come from three scopes: Scope 1 comes directly from health facilities, constituting 17 percent of the sector's footprint globally. Scope 2 (12 percent) comes from indirect emissions from electricity, steam, cooling, and heating. Scope 3 represents 71 percent of the sector's total GHG emissions, and comes primarily from the health care supply chain—that is, the production, transport, use, and disposal of essential medical products and equipment). (Healthcare Without Harm 2019).

Climate change is pressuring governments across the globe to build resiliency in their health systems to ensure the provision of health services before, during, and after climate-related shocks. At the same time, it is critical that the health systems of the 21st century are committed to reducing their GHG footprint, and ensuring a sustainable, low-carbon approach.

As climate change has become the most significant challenge for livelihoods and development, the World Bank has increased its commitment: the current goal is to reach 45 percent of total financing devoted to climate change-related investments by 2025 (World Bank 2023). The challenge is steep; as the World Bank and development partners step up their commitments, it is critical to identify the priorities and entry points for furthering the climate and health agenda needed to ensure sustainable and climate-resilient health systems.

This chapter starts by defining health systems in the face of climate change; then provides illustrative examples of resiliency and low-carbon health services at the clinical, network, and system levels; and finally describes three cases, from experiences with operations in the Latin America and the Caribbean region. The chapter concludes by stating gaps and opportunities, and suggesting a way forward.

Definition of Climate-Resilient Health Systems: Challenges, Commitments, and Agenda

Climate-resilient health systems can be defined as those that can anticipate and ensure adequate preparedness; and can respond to, cope with, and recover from climate-related shocks and stress, while continuing to improve livelihoods and population health (World Health Organization 2023), and approach universal health coverage (UHC) despite changes in climate patterns and climate-related hazards. The World Health Organization (WHO) has developed an operational framework for climate-resilient health systems with six health system building blocks: health service delivery; health workforce; health information; medical technologies; health financing; and leadership and governance. Each building block has distinct clinical, network, and system-level implications.

Clinical Level

At the clinical level, a climate-resilient and sustainable health system is characterized by adaptive health care facilities and services. This involves integrating climate considerations that will ensure uninterrupted service delivery by building energy-efficient and environmentally sustainable practices throughout clinical care pathways. Climate-resilient health care practices, including robust emergency response plans, training health care staff for climate-related health threats, and maintaining resilient and low-carbon supply chains for essential medical resources, are critical for ensuring sustainability and resilient service provision. Climate-resiliency and low-carbon health services highlight the importance of digital and technological tools (CASCADES-Canada, n.d.; University of Toronto, n.d.; World Health Organization, 2023).

Box 16.1: Low-Carbon Resilience, Clinical Level

Globally, cataract surgery is the highest-volume surgical procedure of all medical specialties; and an aging population will increase the demand. Carbon emissions for this procedure can range from 6 to 181.9 kg CO₂-eq (Mukamal 2023); ensuring a low-carbon, resilient approach to cataract surgery can include adopting a lighter post-surgery pathway. Some countries, for example the UK and India, have adopted a local and telemedicine approach to postoperative care to reduce travel and the related GHG emissions, while still ensuring a resilient provision of health services. At Aravind Eye Hospital in Pondicherry, India, they have reduced 270 tons of CO₂ emissions by reducing travel to and from the hospital for post-surgery clinical visits.

Network Level

At the network or organizational level, resiliency and sustainability involve the interconnectedness of health care facilities and services, as well as regulatory policies. A climate-resilient network is marked by efficient communication, and coordination mechanisms that can respond swiftly to climate-related health challenges. This can include the establishment of telemedicine and mobile health services to reach remote and vulnerable populations who are affected by climate change; and cross-sectoral, organizational, or political commitments, among other things. Additionally, a resilient network integrates a climate-resilient infrastructure that includes reliable transportation and communication systems, to ensure the seamless flow of essential medical products, pharmaceuticals, and equipment during emergencies (CASCADES-Canada n.d.; World Health Organization 2023).

Box 16.2: Low-Carbon Resilience, Network Level

Various networks or organizations, both public and private, play a critical role in strengthening the health care sector in the face of climate-related hazards, while cutting GHG emissions. Kaiser Permanente—a private-sector insurance and health provider in the United States—has become the first in the US to achieve carbon-neutral status, meaning that any CO₂ released into the atmosphere is balanced by removing an equivalent amount. In 2018 the organization started installing solar panel microgrids in hospitals to provide green energy at the facility level. By 2019, they had adopted a policy for the use of anesthetic gases that produced less pollution. They have also focused on better management of water use at the facility level. The organization plans to keep cutting emissions from the supply chain of medical products, and to achieve NetZero by 2050 (Kaiser Permanente 2020; Kaiser Permanente 2022).

System/National Level

At the system level, a climate-resilient and sustainable health system is embedded within national health policies and governance structures. This involves integrating climate considerations into health planning, financing, and regulation. Robust surveillance systems are in place to monitor and analyze climate-sensitive health indicators, allowing for evidence-based decision-making. Sustainable financing models ensure the continuous support of climate-resilient health care infrastructure and services. Policies also address social determinants of health that are impacted by climate change, with the aim of reducing health disparities and enhancing community resilience (CASCADES-Canada n.d.; World Health Organization 2023).

Box 16.3: Low-Carbon Resilience System, National Level

The main health service provider in the United Kingdom, the National Health Service (NHS), has taken a leading role in prioritizing climate crisis mitigation within the health sector. The NHS aims to achieve net-zero for its direct carbon footprint by 2040, and to extend this goal to key service providers by 2045, making the UK the first country to legislate a net-zero roadmap for the health sector through their Health and Care Act 2022. This legislative commitment underscores the urgency of addressing climate change in health care and is setting a precedent for environmental sustainability (National Health Service 2022).

From Operational Frameworks to Implementation: Cases from the Ground

From Fiscal Year 2020 to FY 2024 (YTD), the Health, Nutrition and Population Unit in the Latin America and the Caribbean (LAC) region has contributed a total of \$28.9B to climate finance through 42 operations, with 62 percent going to mitigation, and 28 percent to adaptation, and an average of 9 percent of climate co-benefits (CCBs) per operation (14.39 percent when COVID-19-related operations are removed). Notably, most projects with higher CCBs have prioritized investments in health facility infrastructure to strengthen them in the face of climate change while reducing the sector's carbon footprint by incorporating mitigation measures.

Furthering Hospital Infrastructure Standards

The resiliency of health facility infrastructure has been a key entry point in the face of climate change. Countries in Latin America and the Caribbean have been developing policies and regulations that oversee the construction and habilitation of buildings, ensuring that climate-resilient measures such as flood or hurricane-proof features are being integrated as mandatory components. In the last two years, three projects in the region (in Argentina, Chile, and Colombia)¹ have included indicators that focus on ensuring the integration of adaptation and mitigation features in health facility infrastructure codes. The two cases outlined below illustrate how climate-resilient and low-carbon infrastructure has been at the forefront of operations in the LAC region.

The Colombia Case

Extensive analytical and technical assistance conducted in Colombia has furthered the agenda for building climate-resilient, sustainable health systems, and provided the inputs for understanding the climate-related risks on human health and health sector infrastructure. The analytical report found that about 1 out of 5 health facilities in Colombia, including 4,416 primary care facilities and 143 hospitals, are directly exposed to floods. Moreover, around 549 primary care facilities and 20 hospitals are directly exposed to the risk of landslides, including the possibility of partial or complete collapse (World Bank 2023). Exposure to climate-related hazards increases the risk for the facilities, and the ability to provide services to vulnerable populations. This report opened the discussion with the National Planning Department (DNP) for assessing infrastructure needs based on vulnerability within the mix of public health and climate change challenges, feeding into ongoing efforts for developing a ten-year infrastructure investment plan.

Colombia has been updating regulatory policies for health infrastructure, and the habilitation of health facilities over the last five years. In 2019, the first Program for Results Financing (PforR) in Colombia financed the habilitation of the laws governing health facilities. In contrast, the 2024 PforR finances the updating of building and infrastructure codes, incorporating green hospital guidelines previously developed by the Ministry of Health. The lending operation has been acting as a catalyst for ongoing efforts by the Ministry of Health, and is taking the opportunity to advance the climate and health agenda in the country. In a nutshell, the PforR includes two Disbursement Linked Indicators (DLIs) that focus exclusively on climate-related indicators, comprising key mitigation activities such as developing a health care sector GHG baseline encompassed in a result area. One DLI aims to develop building codes for health facilities that integrate green hospital features and climate-resilient measures. The other DLI is aimed at the development of the Comprehensive Climate Change Management Plan for the Health Sector (PIGCCS is its Spanish acronym), which is the overarching policy that guides the development of strategies and programs to address the risks to human health and the health system in the face of climate change and the dangers related to it.

1 These three projects were Program for Results Financing (PforRs). These programs use the country's own institutions and processes, and link the disbursement of funds directly to the achievement of specific program results. For more information see: <https://www.worldbank.org/en/programs/program-for-results-financing>

Table 16.1: System Enablers and Present Challenges in the PforR financing in Colombia

System Enablers	<ul style="list-style-type: none"> • In-depth analytical support. A report on the impacts of climate change and health in Colombia have provided the necessary inputs to guide current and future operations. Notably, there was a component focusing on artificial intelligence-based models for prioritizing investments in health infrastructure that are highly exposed to climate-related hazards². • Colombia has developed key policy and strategic documents that position health as a priority in the climate change agenda³.
Present Challenges	<ul style="list-style-type: none"> • Subnational implementation. Monitoring and following up implementation at the subnational level can be challenging, especially in subnational units where technical capacities are limited. • Cross-sectoral engagement and collaborative mechanisms. Infrastructure and the adoption of climate and health strategies depend on multiple determinants that are not necessarily linked to the Ministry of Health. • Fragmentation of information systems. The Environmental Health Department depends on several information sources and systems that are being controlled by various departments and units within and outside the Ministry of Health, curtailing interoperability of the health system.

The Caribbean Case

The Caribbean countries are highly exposed and vulnerable to extreme weather events such as hurricanes, which puts pressure on the capacity and response of the health system in the face of climate-related hazards. In this context, the Ministry of Health at Saint Vincent and the Grenadines (SVG) engaged with the World Bank to design a project that would increase the health system’s capacity by building a new hospital. The vision encompassed constructing a hospital and establishing a climate-smart, green health care facility. Recognizing the integral link between infrastructure and operational resilience, the country team prioritized system-strengthening along with developing a new health facility. Understanding that a “smart” green hospital necessitates robust operations and services, efforts were directed toward elevating key areas for climate resilience within the hospital.

Prior analytical work by the Global Facility for Disaster Reduction and Recovery (GFDRR) provided technical assistance to the government of Saint Vincent and the Grenadines. This served as a tool for client engagement, and a baseline for understanding a climate-resilient hospital’s feasibility and structural needs. The analytics from this initiative identified strategic entry points for incorporating elements of resiliency into the health infrastructure to address the challenges of climate change as well as primary care and strengthened hospital management and governance. The technical assistance focused on understanding the institutional arrangements, capacity, and systems in place for disaster risk management (DRM), including preparedness efforts, and post-disaster mechanisms. Moreover, the technical assistance provided a strategic roadmap for investments that will strengthen the resiliency of the country in the face of climate-related and natural hazards (GFDRR 2019).

The project also leveraged technical capacities and collaboration from the International Finance Corporation (IFC) through their EDGE Green Building Certification project. The Ministry of Health expressed interest in pursuing certification for the new hospital and building technical capacities within the Ministry of Health and other government areas. Two training sessions further equipped the team with the necessary skills and knowledge to navigate the complexities of building a climate-resilient and low-carbon hospital in Saint Vincent and the Grenadines.

2 The study prioritized facilities based on i) exposure to climate risks; ii) the vulnerability of the population in its catchment area, as defined by the determinants; iii) the current state of the building infrastructure; and iv) health system reach in each department. Moreover, the Climate-Sensitive Risk Index was formulated for individual selected hazards (floods and landslides), as well as for a compound scenario encompassing the combined risk of multiple hazards. Departments are grouped together based on their overall risks. Over 20 determinants were selected for informing the risk directly, in addition to population health risks at the departmental level. This analysis used multiple models for clustering, a machine-learning algorithms type (a subcategory of Artificial Intelligence models), which combines determinants to render a single index for each department.

3 The National Climate Change Policy (2017), the Climate Action Law (Law 2169 of 2021), a National Climate Change Adaptation Plan (2012), the National Climate Change System (SISCLIMA), the Ten-Year Public Health Plan, and the Nationally Determined Contributions.

Table 16.2: System Enablers and Present Challenges in the Caribbean Project

System Enablers	<ul style="list-style-type: none"> • Previous engagement and analytical support by the DRM team outlined the feasibility of the project in terms of exposure and vulnerability to climate-related hazards. • The EDGE certification developed by IFC served as an engagement tool for client buy-in.
Present Challenges	<ul style="list-style-type: none"> • Inflation and price increases during Covid has yielded higher costs for the development of the new hospital. This has resulted in a financing gap, and the need to identify a partner to co-finance implementation of the project, delaying its effectiveness. • Limited technical capacities in-country. Adopting adaptation and mitigation measures for the hospital infrastructure has required the hiring of an international firm for the technical aspects.

Integrating Health Systems in Disaster Risk Management

With the occurrence of emergencies and sudden-onset disasters, reducing loss of life, restoring health conditions, and preventing long-term disabilities is critical. Health services provided under emergency response should be safe, people-centered, opportune, reasonable, interlaced, and competent (World Health Organization 2021). The Catastrophe Deferred Drawdown Option (CAT-DDO) credit instrument⁴ has been executed in Colombia for more than 20 years, supporting the design and implementation of DRM policies and programs, and, more recently with a climate change adaptation (CCA) approach at the national, subnational, and sectoral levels. The inclusion of the health sector in this instrument has been critical for strengthening its response capacity, including prehospital and hospital care, mental health, epidemiological surveillance, environmental health, and participation at the subnational level. CAT-DDO III was activated due to the impacts of the La Niña phenomenon in 2022. For the present iteration of CAT-DDO IV, two prior actions are being considered for a health system that can respond to shocks: Resilient Hospitals and Emergency Medical Teams (EMTs). This CAT-DDO has two main goals: i) that health care facilities that provide health services of low complexity adopt the EMT guidelines; and (2) that health care premises that provide medium and high-complexity health services adopt the resilient hospital program.

The proposed prior actions are aligned with many of the priorities for action stated in the *Sendai Framework for Disaster Risk Reduction 2015-2030 (UNDRR 2015)*, and with the *Ten-Year Public Health Plan (2022-2031) (Ministerio de Salud y Protección Social 2022)*. Among the priorities are strengthening disaster risk governance to manage disaster risk; investing in disaster risk reduction for resilience; and increasing disaster preparedness for effective response and “building back better” in the areas of recovery, rehabilitation, and reconstruction.⁵ On the other hand, the Ten-Year Public Health Plan (2022-2031) has included among its strategies the strengthening of i) public health care workers’ knowledge and skills for emergency and disaster risk management and ii) a resilient hospital program. According to the Pan American Health Organization (PAHO), the resilient hospitals program, within the adaptation of the Sendai Framework for the Americas, has developed four strategic pillars: i) promote safe hospitals both in their structure and in their nonstructural elements; ii) establish green hospitals to mitigate their impact on climate change; iii) ensure inclusive hospitals that leave no one behind; and iv) develop flexible and adaptable hospitals in their organization and functions, with a multihazard preparedness approach (Ministerio de Salud y Protección Social 2022)

4 The Development Policy Loan with a Catastrophe Deferred Drawdown Option (Cat DDO) is a “contingent financing line that provides immediate liquidity following a natural disaster, and/or health-related event, where funds become available for disbursement after the drawdown trigger—typically the member country’s declaration of a state of emergency—is met”. For more information see: <https://thedocs.worldbank.org/en/doc/1820b53ad5cba038ff885cc3758ba59f-0340012021/original/Cat-DDO-IBRD-Product-Note.pdf>

5 Some of the initiatives related to the health sector are implementing safe hospital programs; increasing the resilience of national health systems, including integrating DRM into primary health care, especially at the local level, by building the capacity of health workers and applying disaster risk reduction approaches in medical work; strengthening the capacity of countries to manage health-related disaster risk; implementing the International Health Regulations (2005) and building resilient health systems; and promoting the resilience of new and existing vital infrastructure, including hospitals and other health facilities, to ensure that they remain safe, effective, and operational during and after disasters, to provide essential and lifesaving services (UN 2015).

The implementation of the resilient hospital considers the functional integration of the hospital project with each of the structuring systems of the municipalities, ensuring its efficiency, consolidation, and preservation to plan interventions to be carried out in the territory. Therefore, contributing to the community's welfare and environmental sustainability, land use planning, and efficient land use (building permit approved for health use) according to norms. The normative will also consider i) conditions of public services, especially water resources and those that guarantee basic sanitation, including waste management; ii) air management conditions of natural and mechanical ventilation, as well as aspects of pollution control, prevention, and mitigation; iii) vector control conditions and integrated zoonosis management; iv) chemical safety control conditions; v) conditions of habitability, thermal comfort, and management of climatic conditions; and vi) food safety and food control conditions.

Table 16.3: System Enablers and Present Challenges in CAT-DDO Operations in Colombia

System Enablers	<ul style="list-style-type: none"> • Long-term engagement with the public health and planning authorities through World Bank financial tools and technical assistance have allowed building and consolidating partnerships and the confidence to implement new instruments for the health sector like the CAT-DDO. • Institutional leadership. The leading public entity in the health sector has dependencies with institutional strength in the areas of emergencies and disasters, public health, and the provision of health services, which support the design of public policies.
Present Challenges	<ul style="list-style-type: none"> • Despite having a robust legal framework, it is challenging to enforce the various policies and laws at the subnational level. • There are considerable differences across departments and municipalities in terms of financial resources, and institutional and technical capacities.

Lessons Learned and a Way Forward

Climate change is heavily impacting human health and health systems globally, and the increased commitment by the World Bank to ramp up financing highlights the need for reimagining how health systems should look like in a world of climate crisis. These efforts in the LAC region can provide valuable insights about how to further the climate and health agenda, and improve engagement with clients. Here are some key takeaways gained from our experience, and a path forward:

- Health operations need to integrate climate change as a central piece in project design. Climate-related risks and ensuring sustainability should be a cross-cutting edge as teams approach health systems. The Bank's operations can provide an opportunity for prioritizing and better understanding the risks posed by climate change, strengthening the health system, and getting closer to achieving universal health coverage.
- Analytics and technical assistance are critical tools for ensuring evidence-based interventions and operations. Furthering models of care for climate-sensitive diseases, or for understanding infrastructure vulnerability and exposure, are key for designing investment frameworks, and for underlining where resources are most needed.
- Firsthand knowledge-sharing programs like the Technical Deep Dives through financial and technical funds like the Global Facility for Disaster Reduction and Recovery (GFDRR) provide opportunities for governmental counterparts to acquire knowledge through workshops, site visits, peer-to-peer knowledge sharing, and action planning.
- Robust surveillance and monitoring systems are critical for understanding shifts in the burden of disease due to climate change, and for identifying gaps and needs in health service provision, the health workforce, and overall vulnerabilities of the health system in the face of climate change.
- Changes in medical products and equipment use aimed at reducing waste can contribute to reduction of the carbon footprint linked to the supply chain, by changing the demand side.

- Promoting resiliency and sustainability in the health system calls for sustainable financial models that ensure resource allocation to further adaptation and mitigation measures at the clinical, network, and system levels. Moving forward, governments can create a budget line for climate and health strategies and interventions.
- The World Bank is positioning itself as a leader in developing and promoting the climate change agenda. The organization's position can contribute to engaging with client countries, and furthering the agenda on the ground. To ensure learning across countries, regions, and Global Practices (GPs), and to build climate-resilient, sustainable health systems, it is critical for teams to adapt more quickly to changing climate pressures.

References

- CASCADES – CANADA. (n.d.) *Creating a Sustainable Canadian Health System in a Climate Crisis: Action Areas*. <https://cascadescanada.ca/action-areas/>
- GFDRR. 2019. *Saint Vincent and the Grenadines: Disaster Preparedness and Response Capacity Assessment and Technical Assistance*. <https://www.gfdr.org/en/saint-vincent-and-grenadines-disaster-preparedness-and-response-capacity-assessment-and-technical>
- Healthcare Without Harm. 2019. *Health Care's Climate Footprint: How The Health Sector Contributes to the Global Climate Crisis and Opportunities For Action*. [https://noharm-global.org/sites/default/files/documents-files/5961/Health caresClimateFootprint_092319.pdf](https://noharm-global.org/sites/default/files/documents-files/5961/Health%20caresClimateFootprint_092319.pdf)
- Kaiser Permanente. 2020. *The First Carbon Neutral Health System in the US*. <https://about.kaiserpermanente.org/commitments-and-impact/healthy-communities/news/first-carbon-neutral-health-system-in-us>
- Kaiser Permanente. 2022. *Tackling Climate Change to Drive Health and Health Equity*. <https://about.kaiserpermanente.org/commitments-and-impact/healthy-communities/news/tackling-climate-change-to-drive-health-and-health-equity>
- Ministerio de Salud y Protección Social. 2022. *Plan Decenal de Salud*. <https://www.minsalud.gov.co/plandecenal/Paginas/PDSP-2022-2031.aspx#:~:text=El%20Plan%20Decenal%20de%20Salud%20P%C3%ABlica%20es%20una%20pol%C3%ADtica%20p%C3%ABlica,fundamental%20a%20la%20salud%2C%20el>
- Mukamal, R. 2023. "Sustainability in Ophthalmology: Going Green for the Future of Eye Care." *EyeNet – American Academy of Ophthalmology*. <https://www.eyesustain.org/resource-library/going-green-for-the-future-of-eye-care>
- National Health Service (NHS). 2022. *Delivering a Net-Zero National Health Service*. <https://www.england.nhs.uk/greenernhs/a-net-zero-nhs/>
- UNDRR. 2015. *Sendai Framework for Disaster Risk Reduction 2015-2030*. <https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030>
- University of Toronto. "Sustainable Health Systems – Community of Practice." (n.d.) <https://www.sustainablehealthsystems.ca/about-community-of-practice>
- World Bank. 2023. *Impacts of Climate Change in Health in Colombia and Recommendations for Mitigation and Adaptation*. <https://openknowledge.worldbank.org/entities/publication/1bbf309c-5b31-4b3b-8ba3-a35f5d333579>
- World Bank. 2023. *World Bank Group Doubles Down on Financial Ambition to Drive Climate Action and Build Resilience*. <https://www.worldbank.org/en/news/press-release/2023/12/01/world-bank-group-doubles-down-on-financial-ambition-to-drive-climate-action-and-build-resilience>
- World Bank. 2024. "The Climate Crisis Is Driving a Global Public Health Emergency." <https://blogs.worldbank.org/investinpeople/climate-crisis-driving-global-public-health-emergency>
- World Health Organization. 2021. *Quality of Care*. https://www.who.int/health-topics/quality-of-care#tab=tab_1
- World Health Organization. 2023. *Operational Framework for Climate Resilient and Low Carbon Health Systems*. <https://www.who.int/publications/i/item/9789240081888>
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SECTION 6

MOVING FORWARD

CHAPTER 17:

MOVING FORWARD: URGENCY FOR CHANGE IN A RAPIDLY WARMING PLANET

Mickey Chopra, Xiaohui Hou, Kojo Nimako, Sanam Roder-DeWan

Taking a Systems Approach

Policy makers face an array of challenges in addressing the needs generated by a plethora of current shocks and crises. The persistent effects of the financial crisis, the COVID-19 pandemic, numerous conflicts, and climate change (to mention just a few) have slowed economic growth, increased debt levels, and reduced the fiscal space available for overall government expenditures, including spending on health. According to the World Bank, general government spending is projected to contract or remain stagnant relative to 2019 through 2028 in nearly two-thirds of all lower- and middle-income countries (LMICs). At the same time, after an initial spike in response to the pandemic, the priority of health in government spending has dropped close to or even below pre-COVID levels in most of these countries (Kurowski et al. 2022).

Other complexities add to the challenge. Progress on universal health coverage (UHC) has stalled, despite greater awareness of the need for health security and critical care services arising from the COVID-19 pandemic. At the same time, financial hardship caused by out-of-pocket health expenditures has been on the rise since 2015 (World Health Organization and World Bank 2023). Finally, policy attention is increasingly and understandably turning to climate change at both the national and global levels. This is translating into a reshuffling of development aid priorities, and further demands on domestic financing. There is a growing risk that health investments and expenditures will be further deprioritized unless the links between climate change and health, and especially the role of health systems in mitigation and adaptation to climate change, are well articulated, and investment cases are generated.

The brief review of World Bank hospital-focused projects in the last four years (in 16 projects across 5 regions), conducted as a prelude to this publication, provides an interesting snapshot of the importance and challenges of further investment in this sector.¹ For example, most of the activities reviewed addressed short-term urgent needs at selected facilities--adding ICU beds, recruiting rapid response teams, improving waste management, and implementing infection control measures at hospitals. The review identified only a few interventions that show long-term impacts on health system strengthening and resilience. Examples included efforts to maintain essential health services, implement better quality standards to improve services and patient experience, train personnel, and improve health information systems.

In addition to lending projects mentioned above, the World Bank also produced analytical work and technical assistance ranging from supporting governance to financing reforms; for example, hospital autonomization (or even corporatization), and the introduction of performance-based financing. Similarly, the Bank has often provided vital technical assistance to support the introduction of new costing and payment reforms such as Diagnostic Related Groups (DRGs). This, as well as the growth in more transparent reporting of important data, has led in many instances to improved performance and efficiency.

1 **Activities with short-term impact:** expanding critical care capacity at select facilities; establishing local isolation units (Cambodia, Maldives, Rwanda) and additional ICU beds; and recruiting rapid response teams (Cambodia, Togo, Zimbabwe) and additional health care personnel. Some countries developed waste management plans (Benin) and guidelines (Myanmar), provided biomedical infectious waste treatment equipment (Cambodia), and created medical waste management and disposal systems (Democratic Republic of the Congo, Zimbabwe). Some projects also implemented additional risk mitigation measures, such as hospital infection control guidelines (Uruguay) and standard operating procedures (Maldives).

Interventions with long-term impacts on health system strengthening and resilience: efforts to maintain essential health services (Maldives) and improve maternal and child health and noncommunicable disease (NCD) services in primary health care facilities (Armenia). Implementing better quality standards (Sint Maarten) and developing a hospital quality checklist (Zimbabwe) were used to improve structural quality, clinical processes, and patient experience. Building and launching new hospitals (Armenia, Sint Maarten) or configuring old ones (Zimbabwe, Kiribati) were partially justified in the context of rejuvenating primary care services and continuity of care. System strengthening measures included training health care personnel (Belarus, Tajikistan); strengthening health management information systems (Democratic Republic of the Congo); developing data standards for emergency and routine health care (Uruguay); and connecting health facilities to a centralized health information database and communication systems (Kiribati).

While hospitals have too often been viewed in isolation, with efforts centered around achieving individual institutional goals, this work takes a more holistic approach, viewing hospitals as integral parts of broader health care ecosystems, a view that is now gaining traction. This systems-based perspective acknowledges the interconnectedness of various factors influencing patient care and overall system performance.

Systems thinking recognizes that hospitals are influenced by factors such as patient perceptions, structural relationships, funding mechanisms, health care policies, and technological advancements. Adopting a systems approach makes it easier to understand how these interconnected elements impact patient care, allocation of resources, and overall system performance.

Urgency to Act

Such collaborative thinking is even more critical now, since hospitals will play a major role in the mitigation and adaptation to climate change while also meeting the rising expectations of populations for high-quality care. Nonetheless, the prevailing paradigm of viewing hospitals in isolation, fixated on achieving discrete institutional objectives, belies the intricate interconnectedness of hospitals within broader health care ecosystems.

Embracing a systems-based approach better reflects the multifaceted influences shaping patient care and system performance. In this milieu, urgent action is imperative, as hospitals assume a pivotal role in meeting both the challenges posed by climate change and also burgeoning health care demands. Reforms and investments must be underpinned by a nuanced understanding of hospitals within the continuum of care, and synergized with primary health care. This underscores the utility of models of care, as espoused by Durán and Wright (2020), in advancing an integrated hospital agenda. These models offer promising avenues for transformative change.

The models of care concept refers to the physical processes required to meet the demand for care in an efficient and high-quality manner. This report has highlighted several examples of models of care including:

1. **Shifting out of the hospital:** With recent advances in remote monitoring and telemedicine, many functions can now be conducted outside of formal health care institutions—in other centers, and even in the patient's home. In Europe, some elective surgeries and, most of all, dialysis are no longer inpatient hospital-based treatments requiring hyper-specialized professionals. Similarly, managing some cancers now entails less expensive hospital support services, for example, through the use of oral chemotherapy.
2. **Hospital – Primary Health Care redesign:** *The Lancet Global Health Commission* on High Quality Health Systems identified the misalignment between the complexity of medical conditions and levels of care as a major cause of poor outcomes (Kruk et al. 2018). For example, too many maternal deliveries are conducted in facilities with inadequate access to comprehensive emergency obstetric and newborn care (CEmONC) services. (See Chapter 7 on obstetric care regionalization). Redesign, often via clinical protocols, multidisciplinary care teams, cross-training, integrated registries, and grouping of homogeneous patients can also be used to address growing burdens of chronic diseases. (See, for example, van der Linden et al. 2001, on transmural care in the Netherlands).
3. **New forms of networks:** Reform efforts looking for economies of scale and scope, less duplication of resources, more effective training, greater market influence, and more efficient service provision have also emerged. The new models of care merge, integrate, or functionally converge several hospitals, creating multihospital groups or chains. In the United States and Europe (especially in France and Germany), more than 60 percent of hospitals are now part of some form of partnership, system, or network with back-office unification and normalization, especially in the private sector (Angeli and Maarse 2012). There is also a rising tide of interest in more formal networking among hospitals and primary care facilities in LMICs, as the cases described in this publication on the examples of Ghana (Chapter 11) and China (Chapter 12) demonstrate.
4. **Specialization and simplification:** Specific centers have become highly specialized in the management of some conditions—for example, prostate cancer treatment at the Martini Clinic in Hamburg (Porter and Guth 2012). Dutch “Independent Treatment Centers” have grown in numbers, from 31 in 2000 to 280 at the end of 2010, with prices 15–20 percent lower than in hospitals (Maarse et al. 2016). India offers a number of examples, including high-output cataract treatment centers and pediatric cardiac surgery.

Now more than ever, as hospitals assume a pivotal role in both combating climate change and meeting rising health care expectations, there is a pressing need for integrated reforms. Models of care that emphasize remote monitoring and telemedicine, or redesigning the relationship between hospitals and primary health care, offer promising avenues for progress. Similarly, forming networks and fostering specialization can enhance efficiency and effectiveness within health care delivery. Box 17.1 describes how a World Bank task team is supporting government partners to integrate these elements into comprehensive hospital reform in the Caribbean.

Box 17.1: The World Bank at Work: Strengthening the Hospital Sector in the Caribbean through Resilient Networks of Care

*Edit V. Velenyi*²

Despite strong commitment to Universal Health Coverage (UHC) in Caribbean Small Island Developing States (SIDS), limited resilience to climate and other shocks threatens health gains and the achievement of UHC. To prepare for future shocks, these countries aspire to upgrade their colonial-legacy hospital infrastructure and introduce climate-resilient, green, smart hospitals that leverage digital transformation to deliver patient-centered care. However, in the small-island context, it often is not feasible to provide full-spectrum services in any single location, or to justify investments in technology and advanced tertiary care. Given small population size, scarcity of specialist medical personnel, lack of economies of scale, production inefficiencies, and significant resources spent on overseas treatment, a network approach that concentrates advanced treatments in fewer locations and that links patients through a referral system is a rational alternative.

The World Bank has supported this ambition at country and regional levels, including through technical assistance (TA) and investments in medical technology, digital health, specialist training, and strategy development. For example, since 2020 the World Bank has been supporting the Government of Saint Vincent and the Grenadines (SVG) in developing a green, smart, and climate-resilient acute care hospital through TA financed by the Korea World Bank Partnership Facility (KWPF) and a \$101 million investment operation. The KWPF grant has supported the development of a hospital strategic plan and a blueprint for the new Arnos Vallé Acute Care Hospital to further feasible and sustainable digital transformation. The plans were inspired by knowledge exchanges with the Sint Maarten Medical Center and the Seoul National University Bundang Hospital (SNUBH). With construction of the hospital expected to start in late 2024, SVG can share its experience with other Caribbean countries on similar paths, including Barbados, Jamaica, and Grenada. The grant has also supported the signing of three memoranda of understanding between SNUBH and Caribbean hospitals following a study tour in South Korea in 2023.

The World Bank, along with catalytic know-how and technology transfer from South Korea, and through a regional knowledge exchange platform that connects islands in the Caribbean, is now supporting the conceptualization of a hospital network that harnesses digital health interventions to support equitable access to high-quality services across all of the Caribbean countries. To support replication and scaling, this technical assistance is designed to connect to ongoing and planned lending operations. While much work remains to be done, the progress that the Caribbean region has made to date in expanding access to UHC is laudable. The KWPF and the World Bank are committed to guiding these journeys and sharing lessons with SIDS in other regions.

2 I would like to acknowledge the contribution of the following colleagues to this work through the projects: Arsala Deane; Iván Dario Gonzalez Ortiz; Micaela Mussini, and Nejma Cheikh.

Implementing these models requires not only making operational adjustments but also addressing economic, institutional, and governance challenges. By operationalizing models of care within a broader framework of systems strengthening, policy makers can engage with the upstream interventions that are crucial for sustained impact. A few important points requiring further attention are summarized below:

Highlighting Essential Health Care to Foster Integration: This report highlights the need to take a patient-centered approach to the provision of care—in which seamlessness and effectiveness are paramount—rather than treating hospitals and primary health care as separate and opposing parts of the health system. ***This transformative shift in the health care dialogue—moving from primary health care and hospital care considered separately, to the integrated concept of essential health care—should help bridge the existing divide between health care tiers.*** Shifting the focus to a seamless continuum of care, from outpatient services to inpatient admissions and through post-discharge care will help improve people’s experience of care. With the new possibilities of telemedicine, home visits, and even intensive care provided at home, the key is to maximize the productivity and quality of the health work force. Focusing on a continuum of care for future health system investments offers room for more innovative thinking on how to strengthen the provision of health care than fragmentally investing, sometimes blindly, in different tiers of the health care system.

Leveraging “Digital” to Enhance Human Talent and Service Delivery: The digital revolution sweeping the health care space needs to be harnessed for improved care. While this report did not specifically discuss this issue, the use of digital innovations in health—including guideline-adherent electronic medical records systems, telemedicine, and automated data reporting—is an important agenda to take forward in future investments in hospitals. Technological innovation and digital tools can enhance efficiency and accessibility in health care delivery and can further optimize health care resources, particularly human resources. For example, employing information and communications technology (ICT) platforms for primary health care doctors, specialist services, nurses, and technicians can significantly improve health care delivery.

Navigating Political Landscapes for Effective Implementation: While this report touches on the interplay of hospital reform and local politics, more attention to this issue is needed going forward. Understanding this dynamic is essential for shaping interventions that are not only practical but also politically feasible, ensuring the successful implementation of proposed reforms.

Strengthening Financing and Provider Payments for Hospitals: Health financing and provider payment for hospitals will remain a challenging topic. As countries experiment with various provider payment methods to improve the efficiency and quality of hospital care, and to foster care integration, unintended consequences are almost inevitable. Hence, timely monitoring and evaluation to identify and mitigate possible negative consequences is essential. Public financial management is also important to ensure that hospitals, especially hospitals in low-income countries, have timely and sufficient operating funds to deliver care. A number of reports discuss the pros and cons of various hospital provider payment mechanisms, but more in-depth, country-specific analyses are needed on implementation and the interconnections between models of care and provider payment.

Boosting Resilience through System-Wide and Adaptive Strategies: This report presents the case for a strengthened focus on health system resilience—using adaptation and mitigation strategies for shocks such as climate-induced health risks, including risks of damage to health infrastructure and interruption in routine care emanating from climate emergencies (Chapter 16). This mindset of resiliency is necessary in order to implement comprehensive strategies to ensure that health systems can withstand and handle emerging challenges such as another pandemic, an aging population, and the epidemiologic transition toward noncommunicable diseases (NCDs). Adopting a more system-wide and adaptive strategy will encourage more innovative, efficient, and integrated health care systems that are better equipped to meet the needs of their populations.

Enhancing Measurement and Metrics: Beyond the content of care, the quality of health system metrics also needs to be addressed. Many indicators commonly used to assess hospital performance focus on inputs. However, processes of care and outcomes are stronger indicators of performance, and more energy should be devoted to strengthening the reporting of these indicators. A brief review of the strengths and weaknesses of commonly used and newer indicators for tracking hospital service delivery and performance is included in the Appendix. New strategies for collecting and using data more efficiently should also be explored in LMICs. Examples include rapid-cycle analytics for quick data collection and use (as the Global Financing Facility’s Frequent Assessments and System Tools for Resilience (FASTR) program seeks to do); leveraging health insurance claims data for assessing care quality and efficiency, as is being done by Ajay Tandon and colleagues in the South Asia Region (Tandon et al. 2023); and taking advantage of nontraditional sources of data, like social media, to monitor patient experience and trust in the health system.

Conclusion

Investing in hospitals in low- and middle-income countries is not merely a financial decision; it is an investment in the prosperity and well-being of nations. The benefits extend far beyond the confines of health care; they also influence economic growth, societal development, and global health resilience. As the world strives for a more equitable and sustainable future, directing resources toward strengthening health care in LMICs—including better integration and leveraging of hospitals as part of a systemic approach—emerges as a pivotal step toward unlocking human potential, and fostering a healthier, more prosperous world.

References

- Angeli, F., and H. Maarse. 2012. Mergers and Acquisitions in Western European Health Care: Exploring the Role of Financial Services Organizations. *Health Policy*, 105 (2– 3), 265– 272.
- Durán, A., and S. Wright. (eds.). 2020. *Understanding Hospitals in Changing Health Systems*. Pub City: Palgrave Macmillan.
- Kurowski, C., D. B. Evans, A. Tandon, P. H-V. Eozenou, M. Schmidt, A. Irwin, J. S. Cain, E. S. Pambudi, and I. Postolovska. 2022. “From Double Shock to Double Recovery: Implications and Options for Health Financing in the Time of COVID-19: Technical Update 2 - Old Scars, New Wounds .” Washington, DC: World Bank Group.
- Kruk, M. E., A. D. Gage, C. Arsenault, K. Jordan, H. H. Leslie, S. Roder-DeWan, O. Adeyi et al. 2018b. “High-Quality Health Systems in the Sustainable Development Goals Era: Time for a Revolution.” *The Lancet Global Health* 6 (11): e1196–e1252. [https://doi.org/10.1016/S2214-109X\(18\)30386-3](https://doi.org/10.1016/S2214-109X(18)30386-3)
- Maarse, H., P. Jeurissen, and D. Ruwaard. 2016. Results of the market-oriented reform in the Netherlands: a review. *Health Economics, Policy and Law*, 11(2), 161-178.
- Porter, M.E., and C. Guth. 2012. Creating a High-Value German Health Care System: Overall Assessment and Recommendations. In: *Redefining German Health Care*. Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-642-10826-6_10
- Tandon, A.; S. Chandrashekar, S. Chhabra, N. K. Manchanda. 2023. *From Scheme to System: Understanding the Concept and Measurement of Hospitalizations for Ambulatory-Care-Sensitive Conditions (English)*. Health, Nutrition, and Population (HNP) Discussion Paper Washington, DC: World Bank Group.
- World Health Organization and the World Bank. 2023. “Tracking Universal Health Coverage: 2023 Global Monitoring Report.” © Washington, DC: World Bank. <http://hdl.handle.net/10986/40348> License: [CC BY-NC-SA 3.0 IGO](https://creativecommons.org/licenses/by-nc-sa/3.0/).
- van der Linden, B. A., C. Spreeuwenberg, and A.J. Schrijvers. 2001. Integration of care in The Netherlands: the development of transmural care since 1994. *Health policy*, 55(2), 111-120.
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Appendix: Review of Indicators for Tracking Hospital Service Delivery and Performance

A core attribute of high-performing health systems is the capacity to measure and track progress. Measuring and reporting indicators for hospitals is therefore imperative in order to ensure that appropriate interventions and reforms are instituted to elevate the quality of hospital services in LMICs.

This Appendix presents the strengths and weaknesses of commonly reported hospital indicators, as well as others that are less frequently used but are potentially effective, and that should be considered for mainstreaming in order to advance quality hospital care.

For this review, common population and facility-level hospital indicators were identified by reviewing resources from the World Health Organization (WHO), the Pan American Health Organization (PAHO), the Organisation for Economic Cooperation and Development (OECD), Data for Impact by USAID, and the Joint Learning Network's (JLN) resource guide *Measuring Health System Efficiency In Low- And Middle-Income Countries*. The indicators included here were reported in at least two of these resources. A general literature search was also done to inform our description of the strengths and weaknesses of the indicators.

To generate the list of indicators that should be considered for mainstreaming, we also reviewed the abovementioned sources to identify key process and outcome measures that were less frequently reported, but which provide good insights into the technical and interpersonal quality of care in hospitals, or inferences on the functioning of hospitals within the larger health system.

The indicators are categorized as either facility-level (measured with respect to a hospital) or population-level (measured with respect to a population). They are further classified as structure, process, or outcome indicators.

Commonly Reported Hospital Indicators

Indicator	Definition	Strengths	Weaknesses
<p>Hospital/Bed Ratio</p> <ul style="list-style-type: none"> • Population-level • Structure indicator • Country-level targets • No global standard 	<p>Number of hospital beds per 1,000 or 10,000 population in the same geographical area that are immediately available for care, and staffed and maintained regularly.^{1,2}</p>	<p>Allows interpretation of available inpatient resources and supply-to-demand balance.^{2,3}</p> <p>Enables identification of investment gaps and underserved populations, and also assists in prioritization of resource allocation. Contributes to monitoring health system scale-up and strengthening.</p>	<p>Subpopulation demographics, geographical placement of facilities, and patient volumes make comparison challenging.^{2,3} Bed availability does not reflect accessibility to care from the perspective of affordability, quality, or travel logistics. Hospital/bed ratio trends may also be skewed by changing models of care, such as leveraging digital health technologies that enable at-home care.⁴</p>
<p>Average Length of Stay (ALOS)</p> <ul style="list-style-type: none"> • Facility-level • Process indicator • Historical performance or national average targets • No global standard 	<p>The number of all days inpatients spent admitted at a hospital, usually per year, compared to the number of admissions or discharges.⁵ Day cases are excluded.</p>	<p>Measures hospital efficiency, whereby shorter ALOS values equate to reduced cost per patient, and improved dispersion of care across the health system, such as shifting from inpatient to less expensive post-acute care.⁵</p>	<p>A shorter ALOS does not always indicate improved hospital efficiency. Shorter ALOS may be due to inappropriate admission of low-acuity cases or premature discharges, which may result in adverse post-discharge health consequences and high readmissions rates.⁶ Varied models of care create comparison difficulties for ALOS values, e.g., long-term care inclusion in hospital settings.</p>

Indicator	Definition	Strengths	Weaknesses
<p>Bed Occupancy Rate (BOR)</p> <ul style="list-style-type: none"> • Facility-level • Outcome indicator • No global standard: 85% BOR often cited as ideal maximum.⁵ 	<p>The percentage of bed-days that are occupied over a specified period of time. Occupied bed-days refers to the number of days the beds were occupied.⁷</p>	<p>Measures hospital capacity and efficiency. A high occupancy rate indicates that beds are being efficiently used, although too high of an occupancy rate (above 85%), may indicate that the hospital is under pressure, may not be able to deliver care safely, or is unprepared for unexpected cases.⁵</p>	<p>The optimal 85% maximum BOR frequently cited may oversimplify hospital performance and efficiency.⁸</p>
<p>Density of Hospitals per 100,000 Population</p> <ul style="list-style-type: none"> • Population-level • Structure indicator • No global standard 	<p>Number of hospitals per 100,000 population.⁹</p>	<p>Analyzes general service availability of hospitals to a population in terms of physical presence.¹ Also allows analysis of general service availability based on hospital distribution.</p>	<p>Does not account for the size of hospitals, which limits inferences about service availability.¹ Does not provide information on quality of care, only physical presence of the facility.</p>
<p>Hospital Readmission Rate</p> <ul style="list-style-type: none"> • Facility-level • Outcome indicator • Compare against historical trends or national averages • No global standard 	<p>Percentage of unplanned and unexpected hospital readmissions over a period of time.⁷</p>	<p>Measures effectiveness of health system care integration and health system performance.^{5,10} Reflects appropriateness of discharge protocols, patient length of stay, utilization, and cost. Pairs well with post-discharge mortality.</p>	<p>Relies on robust medical records, coding practices, and reporting compliance, which may not be available in some resource-constrained settings.⁷</p>
<p>Waiting Times for Elective Surgery</p> <ul style="list-style-type: none"> • Facility-level • Process indicator • No global standard; wait-times vary by surgical type. 	<p>Time between the date an operation was registered and the date of the procedure, for non-emergency surgeries.⁹ The start time and end time of waiting times may be variably defined.</p>	<p>Reflects availability and use of hospital services. Surgeon decision-making, equipment availability, scheduling efficiency, administrative organization, and the availability of surgeons, anesthesiologists, and other surgical team members are reflected in surgical wait-times.</p>	<p>Wait-time definitions vary across health care settings, relative to when the time commences and concludes, making comparisons difficult.¹¹ Elective surgeries do not all take place in hospitals, which must be specifically defined.</p>
<p>Current Health Expenditure (CHE) on Curative Care by Mode of Provision</p> <ul style="list-style-type: none"> • Population-level • Structure indicator • No global standard; comparison to similar contexts recommended 	<p>The amount of spending on curative care by mode of provision compared to the total CHE over a specific period of time.⁷</p>	<p>Monitoring—specifically with stratification to inpatient, outpatient, and day-patient care—may improve resource allocation and insight into overall health expenditure within hospital settings.</p>	<p>Curative care is not typically reported exclusively for hospital settings. Over 20% of CHE data is unclassified in some countries, presenting difficulties for data reliability.⁷ Curative care spending is affected by the entire health system model, such as care allocation models and government spending, challenging inference.⁷</p>

Indicator	Definition	Strengths	Weaknesses
<p>Annual Government Expenditure as a Function of Hospital Services</p> <ul style="list-style-type: none"> Population-level Structure indicator No global standard 	<p>The percentage of total government expenditure that is spent on hospital services.</p>	<p>Measures the financial resources allocated to hospital facilities, which typically represents a substantial proportion of total health expenditure.¹² Enables resource allocation prioritization and analysis of expenditure equity, and financial trends.</p>	<p>Data relating to hospital services are only available for 21 of 34 OECD European member countries,¹³ and are less available for LMICs. Expenditure will vary with health system models, making comparison difficult.</p>
<p>Hospital Employment per 1,000 Population</p> <ul style="list-style-type: none"> Population-level Structure indicator No global standard defined for hospital care (2.5 medical staff per 1,000 population defined for adequate primary care⁹). 	<p>Total hospital employment, or a stratified employment type, reported as a density per 1,000 population. May alternatively be reported as a specific employment type as a percentage of the total hospital head count.</p>	<p>Measures the availability of hospital human resources to the population, allowing identification of potential human resource strains within hospitals. Comparing stratified employment types of the hospital head count allows analysis of staff and skill mix, supporting hospital efficiency and performance.</p>	<p>No global standard is specified for hospitals. Benchmarks within countries are not available to effectively infer target staff mix and densities, for improved comparison. The head count for hospital employment for physicians may be underestimated due to dual practice (part-time employment is often not included in this measure).⁵</p>

Indicators Proposed for Mainstreaming

Indicator	Definition	Strengths	Weaknesses
<p>Adherence to Clinical Guidelines</p> <ul style="list-style-type: none"> Facility-level Process indicator Recommended to compare to similar facilities, providers, or historical performance No global standard 	<p>The number of relevant history and exam questions observed by the provider compared to the total number that should have been asked based on clinical guidelines, collected via clinical vignettes.¹⁴ Can also be defined for treatment and other aspects of care.</p>	<p>Provides inference of provider discrepancies in the care provided, patient and provider safety, and overall health care quality.¹⁵ Measures clinical guideline availability and provider education. Identifies management or educational gaps that may be impacting health care adherence and quality of care.</p>	<p>Requires accessible, documented guidelines and monitoring mechanisms.⁷ Clinical guidelines may also not be appropriate for a specific patient, or guidelines may not be well-designed.¹⁶</p>
<p>Diagnostic Accuracy for Tracer Conditions</p> <ul style="list-style-type: none"> Facility-level Process indicator No global standard; recommended to compare to historical performance or optimal provider 	<p>Percentage of cases correctly diagnosed, compared to the number of patients examined, typically based on vignette survey data.^{7,14}</p>	<p>Inference on the effectiveness and quality of hospital care. Provides insight into patient safety and appropriateness of care delivery.¹⁴ Diagnosis is affected by several hospital factors, such as availability of diagnostic equipment, patient-to-provider volumes, education of providers, and clinical guideline adherence.</p>	<p>Currently focused on primary care level, with common tracer conditions being malaria with anemia, diarrhea with dehydration, and diabetes.¹⁷ Focusing this indicator at hospital-sensitive conditions such as appendectomies or hysterectomies will be more beneficial to assessing quality of hospital care.¹⁸</p>

Indicator	Definition	Strengths	Weaknesses
Patient Reported Experiences Measures (PREMs) <ul style="list-style-type: none"> • Facility-level • Outcome indicator • No global standard 	The percentage of patients who meet key attributes of patient experience, such as accessibility, continuity, coordination, and people-centeredness. ¹⁴ Reported via patient exit surveys.	Measures quality of patient-oriented care, and what matters to patients. ¹⁹ Allows inference on effectiveness of hospital service delivery, cost allocation, and hospital management from the patient's perspective. ²⁰	Patient-reported experiences infrequently reported at a hospital level. Does not provide inference on the appropriateness of diagnosis or treatment delivered, and should be monitored along with other indicators such as adherence to clinical guidelines.
Patient Reported Outcome Measures (PROMs) <ul style="list-style-type: none"> • Facility-level • Outcome indicator • No global standard 	Measures a patient's interpretation of their health, quality of life, or functional status associated with care or treatment. ²¹	Measures care methodologies and equity of service delivery. Provides insight into cost-effectiveness of an intervention. ²¹ When paired with other indicators (to avoid tunnel vision of health system performance), generates a comprehensive picture of health system performance.	Currently used only infrequently. May be difficult to link patient-reported outcomes to particular treatments, since many factors—including patient compliance and social factors—influence outcomes. ²²

1. World Health Organization. 2010. *Monitoring the Building Blocks of Health Systems: A Handbook of Indicators and Their Measurement Strategies*. World Health Organization. Accessed March 27, 2024. <https://iris.who.int/handle/10665/258734>
2. Technical Specifications - Core Indicators. PLISA | Pan American Health Organization (PAHO). Published 2023. Accessed March 29, 2024. <https://opendata.paho.org/en/core-indicators/technical-specifications>
3. Number and distribution of inpatient beds per 10,000 population. Data for Impact. Accessed April 15, 2024. <https://www.data4impactproject.org/prh/health-systems/health-system-strengthening/number-and-distribution-of-inpatient-beds-per-10000-population/>
4. Denecke, K, R. May, E.M. Borycki, A. W. Kushniruk. 2023. "Digital Health as an Enabler for Hospital@Home: A Rising Trend or Just a Vision?" *Frontiers in Public Health* 11. doi:10.3389/fpubh.2023.1137798
5. OECD. *Health at a Glance 2023*.; 2023. doi:<https://doi.org/https://doi.org/10.1787/7a7afb35-en>
6. Han, T.S., P. Murray, J. Robin, P. Wilkinson, D. Fluck, and C.H. Fry. "Evaluation of the Association of Length of Stay in Hospital and Outcomes." *International Journal for Quality in Health Care*. 2022. 34 (2): mzab160. doi:10.1093/intqhc/mzab160
7. *Measuring Health System Efficiency in Low- And Middle-Income Countries: A Resource Guide*. Joint Learning Network for Universal Health Coverage. 2020. <https://www.jointlearningnetwork.org/wp-content/uploads/2020/02/Resource-Guide-Measuring-Health-System-Efficiency-200807.pdf>
8. Keegan, A.D. 2010. "Hospital Bed Occupancy: More Than Queuing for a Bed." *Medical Journal of Australia*. 193 (5): 291-93. doi:10.5694/j.1326-5377.2010.tb03910.x
9. Indicator Metadata Registry List. The Global Health Observatory. 2024. Accessed April 15, 2024. <https://www.who.int/data/gho/indicator-metadata-registry/imr-details/3361>
10. Benbassat, and J., M. Taragin. 2000. "Hospital Readmissions as a Measure of Quality of Health Care: Advantages and Limitations." *Archives of Internal Medicine* 160 (8): 1074-81. doi:10.1001/archinte.160.8.1074
11. OECD. *Waiting Times for Health Services*. 2020. doi:<https://doi.org/https://doi.org/10.1787/242e3c8c-en>
12. Mills, A. 1990. "The Economics of Hospitals in Developing Countries. Part I: Expenditure Patterns." *Health Policy Plan* 5 (2): 107-17. doi:10.1093/heapol/5.2.107
13. OECD. *Government at a Glance 2011*.; 2011. doi:https://doi.org/https://doi.org/10.1787/gov_glance-2011-en
14. *Primary Health Care Measurement Framework and Indicators: Monitoring Health Systems Through a Primary Health Care Lens*. 2022. World Health Organization. Accessed April 16, 2024. <https://www.who.int/publications-detail-redirect/9789240044210>
15. Panteli, D., H. Legido-Quigley, C. Reichebner, G. Ollenschläger, C. Schäfer, and R. Busse. 2019. "Clinical Practice Guidelines as a Quality Strategy." In: *Improving Healthcare Quality in Europe: Characteristics, Effectiveness and Implementation of Different Strategies [Internet]*. European Observatory on Health Systems and Policies. Accessed April 1, 2024. <https://www.ncbi.nlm.nih.gov/books/NBK549283/>

16. Woolf, S.H. R. Grol, A. Hutchinson, M. Eccles, and J. Grimshaw. 1999. "Potential Benefits, Limitations, and Harms of Clinical Guidelines." *BMJ*. 318 (7182): 527-30.
 17. MetaData Glossary | DataBank. The World Bank. 2018. Accessed April 9, 2024. <https://databank.worldbank.org/metadataglossary/service-delivery-indicators/series/SDI.H2.NRS.PCT>
 18. Tulchinsky, T.H., E. A. Varavikova. 2014. Chapter 15 - Health Technology, Quality, Law, and Ethics. In: *The New Public Health (Third Edition)*. Tulchinsky and Varavikova (eds). Academic Press 771-819. doi:10.1016/B978-0-12-415766-8.00015-X
 19. OECD. *Health at a Glance 2019*.; 2019. doi:<https://doi.org/https://doi.org/10.1787/4dd50c09-en>
 20. Manzoor, F., L. Wei, A. Hussain, M. Asif, S.I.A. Shah. 2019. "Patient Satisfaction with Health Care Services; An Application of Physician's Behavior as a Moderator." *International Journal of Environmental Research in Public Health*. 16 (18): 3318. doi:10.3390/ijerph16183318
 21. Weldring, T. and S.M.S. Smith. 2013. "Patient-Reported Outcomes (PROs) and Patient-Reported Outcome Measures (PROMs)." *Health Service Insights*. 6: 61-68. doi:10.4137/HSI.S11093
 22. Hostetter, M. and S. Klein. 2024. "Using Patient-Reported Outcomes to Improve Health Care Quality." *The Commonwealth Fund*. <https://www.commonwealthfund.org/publications/newsletter-article/using-patient-reported-outcomes-improve-health-care-quality>
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