

KEY POINTS

- Around half of the population of Asia and the Pacific live in remote and rural areas. Health systems serving these communities face an acute challenge in providing adequate access to hospital care for time-sensitive and specialist treatments.
- Once underserved areas are identified, the barriers causing these gaps need to be properly understood. These are typically a complex, mutually reinforcing set of cost, workforce, and quality issues: cost because rural hospitals are generally more expensive to run on a per-patient basis, workforce because recruitment and retention are more difficult, and quality because of fewer resources and specialist staff.
- This brief suggests ways of improving access to hospital services in rural and remote areas. Long-term solutions should be guided by a multidecade vision for hospital provision that considers trends in demographics, disease patterns, technology, connectivity, climate risk, and clinical advances.

Expanding Hospital Access in Rural and Remote Areas

INTRODUCTION

Countries in Asia and the Pacific have made rapid progress toward universal health coverage, with hundreds of millions of people brought into new health-care coverage and financial protection mechanisms over the past 2 decades (WHO and IBRD 2021; Cotlear et al. 2015). However, there have been particular challenges creating “effective coverage” of secondary and tertiary care for rural and remote communities, whose inhabitants make up around half the population of Asia and the Pacific. For these and other underserved areas, significant barriers to accessing hospital care remain even when financial hurdles are removed (ILO 2021; Campbell et al. 2013). Problems include

- Hospitals being several hours’ or days’ journey away because they are uneconomical to run outside of urban centers;
- Rural hospitals being poorly staffed because of challenges in recruitment and retention, hence offering lower-quality care, leading to patients bypassing them and self-referring to urban centers; and
- Lengthy or repeated hospital visits to facilities far away, making it unfeasible or unaffordable for rural patients to balance with work and caring responsibilities back home.

These gaps are compounded by the fact that, in many countries, people living in rural and remote areas suffer from poorer overall health to begin with; thus, those with the greatest need get the worst access. Rural patients are also more likely to delay seeking care or treatment, further resulting in higher morbidity, mortality, and per-patient costs of care (Syed, Gerber, and Sharp 2013). Impacts of climate change, such as floods and storms destroying critical transport links, further complicate access to health services.

Acknowledgments: This brief is a partnership between the Asian Development Bank (ADB), the Bill and Melinda Gates Foundation (BMGF), and Aceso Global. It was financially supported by the ADB Regional Malaria Trust Fund and the BMGF as part of the series, “Papers on Universal Health Coverage in Asia and the Pacific.” Aceso Global (Jonty Roland, Jerry La Forgia, Maureen Lewis, Marianne Enciso, Anne Coyne, and Esteban Bermudez) prepared the brief, with substantial inputs from the BMGF (Hong Wang) and under the overall supervision of ADB (Patrick Osewe, Arin Dutta, Vasoontara Sbirakos Yiengprugsawan, Hidido Huitzing, Pranav Mohan, Michelle Apostol, Sheela Rances, William Parr).

A strong primary care system is the foundation of health-care provision in rural and remote areas, as with urban areas. However, for a variety of health needs that are beyond the reasonable capabilities of primary care providers (e.g., acute time-sensitive or highly specialized health needs), communities need to have access to hospital care. Yet, achieving equal—or even acceptable—hospital care for rural and remote communities becomes increasingly difficult, with the development of more complex, specialized, and expensive secondary and tertiary care.

High-, middle-, and low-income countries struggle with balancing access and sustainability in hospital infrastructure for underserved areas. As countries in Asia and the Pacific strive to fill in gaps in their hospital infrastructure, many western countries have been closing down rural hospitals at a rapid pace (Vaughan and Edwards 2020). Fortunately, there is a great deal of innovation and experience globally with which to inform future policy and political responses to this problem, as illustrated in the case studies from the People’s Republic of China (PRC) (Box 1), Pakistan (Box 2), and Australia (Box 3).

This policy paper summarizes the common issues and solutions to improving access to hospital services in rural and remote areas.

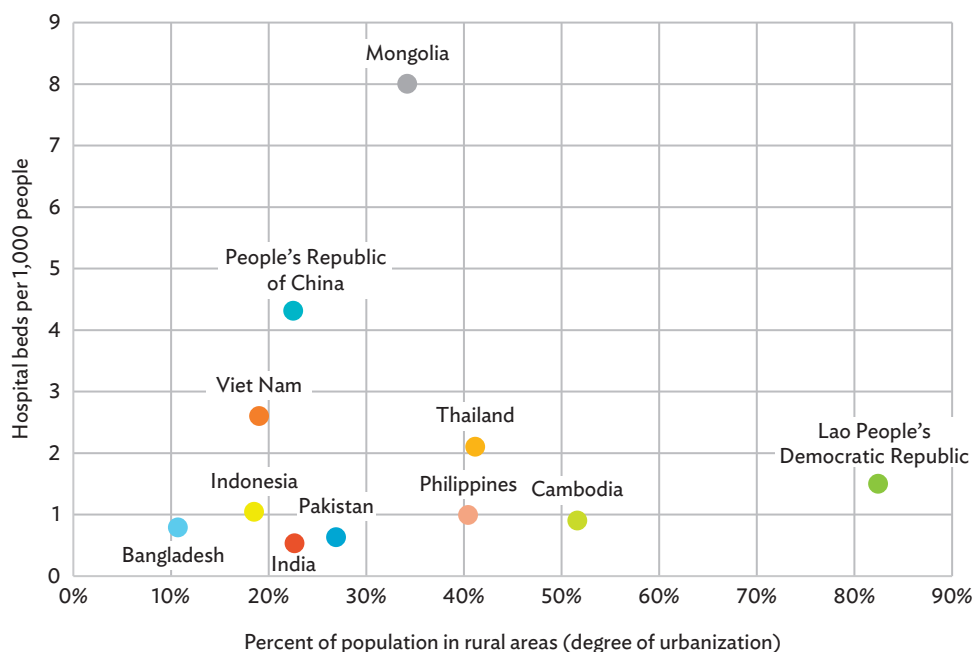
It does not cover all possible issues and options in Asia and the Pacific, but is intended to clarify and steer conversations between health system actors at a strategic level.

HOW DO YOU KNOW IF AN AREA IS “UNDERSERVED” OR NOT?

The first and most critical stage in hospital system planning for underserved areas is understanding in greater detail which areas are in fact underserved and in what ways. The concepts of “urban,” “rural,” and “remote” lie on a continuum, and countries differ in the definitions they use (Dijkstra et al. 2020; OECD 2012)—such as (i) minimum population size for an urban area (e.g., 5,000 in India; 50,000 in Japan; and 100,000 in the PRC); (ii) population density thresholds (e.g., contiguous areas with more than 1,000 residents per square kilometer); or (iii) features of the area itself (e.g., proportion of agricultural workers).

Even using standardized definitions, countries in Asia and the Pacific greatly differ in the extent of their populations’ rurality and remoteness (Figure 1). Yet, even the region’s highly urbanized countries face a similar challenge of matching

Figure 1: Proportion of Population in Rural Areas and Hospital Bed Ratios in a Sample of Asian Countries



Note: Degree of urbanization is a statistical measure that uses satellite images and GIS data to classify large areas according to their population density. A “rural” area is broadly defined as having fewer than 300 inhabitants per square kilometer and not part of a settlement of at least 5,000 people.

Source: European Commission. Global Human Settlement Layer (accessed 28 April 2023); and World Bank. Hospital beds (per 1,000 people) (accessed 28 April 2023).

hospital services to population needs in a way that minimizes the extent of underserved areas without creating unnecessary oversupply. Hence, thinking of hospital access in terms of areas or communities that are “underserved,” rather than “rurality” specifically, is more helpful.

A. Is the Problem Lack of Facilities, Lack of Services, or Lack of Quality?

There are several ways in which an area might be “underserved” in terms of health-care access: there may be no hospital available within a reasonable distance (geographic gaps), there may be hospital but with inadequate service mix (clinical service gaps), or there may be hospital that patients bypass due to concern about the quality and affordability of treatment they will receive (demand gaps). Different analytic approaches should be used to analyze each of these problems, as it is likely that different barriers (and hence solutions) will apply (Figure 2).

B. Understanding Geographic Gaps in Access

The crudest approach to understanding geographic coverage of hospitals is to simply use a rule of thumb—e.g., having one hospital of a certain size for each administrative unit, or having a certain number of hospital beds per capita for each region or locality, regardless of need, demand, or real-world connectivity between communities. Historically, the rule of thumb is the most widespread approach to capital planning decisions in health systems globally.

A more refined method—and probably the most common for hospital planners in emerging markets today—is geospatial mapping of connectivity to hospital facilities to identify areas of under- or over-supply. Mapping approaches, such as the two-step floating catchment area (2SFCA), can be used to analyze travel times of residents to their most easily accessible hospital via the most efficient route (Nagy 2022). The method, which depends on available data mapping systems, initially breaks a region or country into a grid of square kilometers with population estimates for each cell, then builds a map of average travel times to existing hospitals using the most efficient form of transport (Carrasco-Escobar

et al. 2020). Figure 3 shows the percentage population in selected Asian countries unable to reach any health-care facility (not just hospitals) within an hour by motorized transport, calculated using the 2SFCA method.

More detailed analyses might consider travel costs as potential barrier to patients’ health-care access (Cheng et al. 2016). Some systems might also disaggregate hospitals that are public, donor-funded, or empaneled in the network of universal coverage scheme versus those that operate predominantly through out-of-pocket revenues.

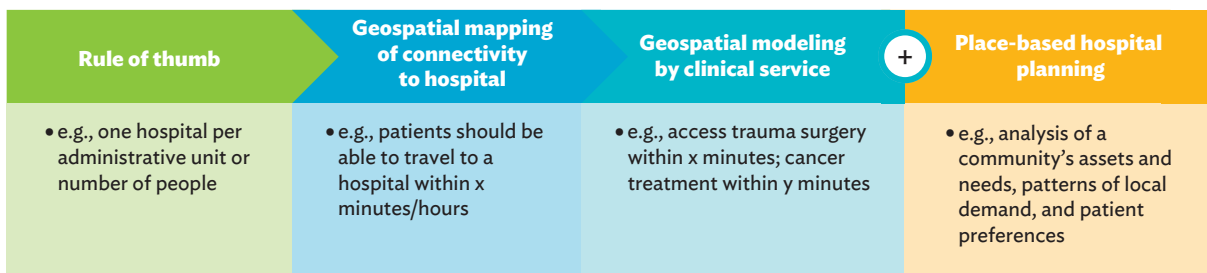
Geospatial analysis of travel times to hospitals will reveal geographic gaps faced by different populations but will not say what the “right” level of access and provision should be. To solve this, some countries apply a slightly more informed threshold—e.g., all communities above a certain size or population density should have access to a hospital within 1 hour by vehicle or boat.

C. Understanding Clinical Service Gaps

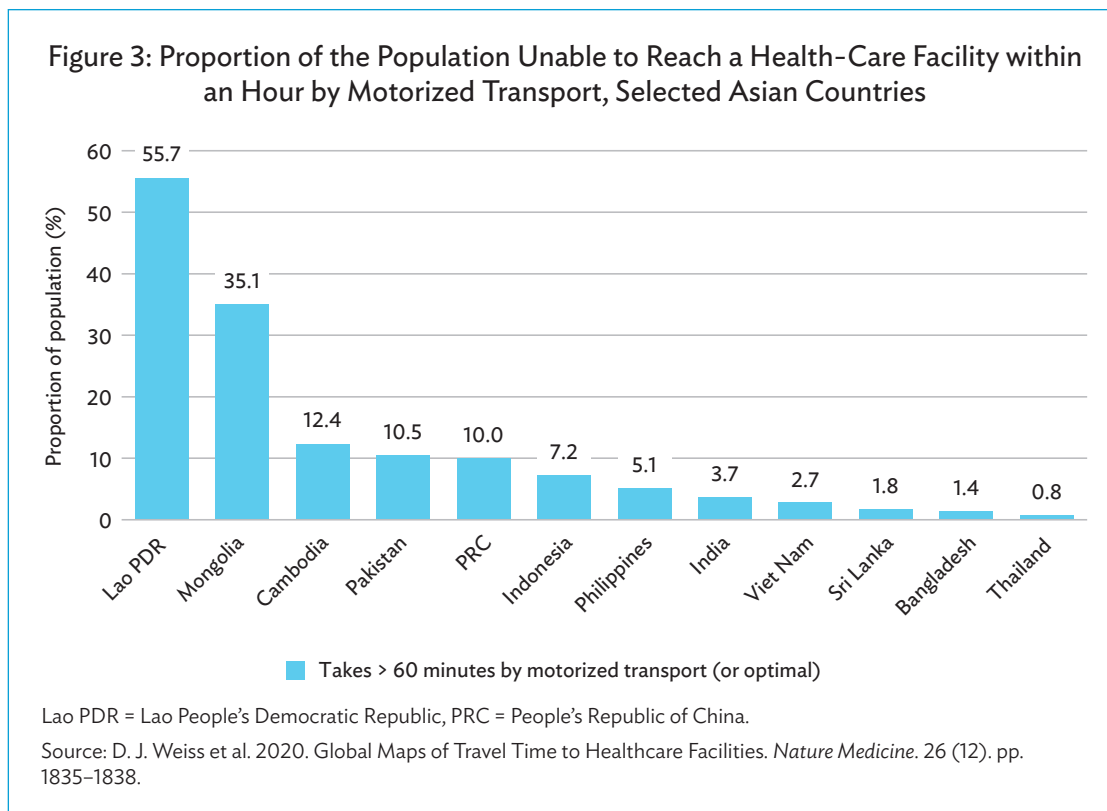
Analyzing geographic gaps alone is not sufficient in understanding how different communities may be underserved. Hospitals are not homogenous—some services (e.g., obstetrics) are far more time-sensitive than others, and therefore need faster access. The most complex interventions might require a minimum volume of patients; hence, rural areas will never be able to provide that service at an adequate level of quality. Furthermore, the requirements for hospital care will also depend on the capabilities available within the primary care system, as the boundary between the two is different across different health systems.

Using geospatial modeling of access times to specific groupings of clinical services may address this problem—this means, mapping travel times of patients to particular types of hospital services depending on the scale they need and the importance of providing them locally. This requires more detailed data on the individual clinical capabilities of each hospital but has the considerable advantage of showing specific clinical services gaps. This modeling

Figure 2: Levels of Sophistication in Hospital Capacity Planning in Rural and Remote Areas



Source: Prepared by Aceso Global 2023.



might reveal, as was the case in the PRC (Box 1), that particular access gaps could be more successfully addressed by enhancing the service package of lower-tiered facilities rather than building new full-service hospitals. It also allows for more specific minimum access time targets depending on real-world clinical evidence rather than rules of thumb—e.g., different travel time targets for access to emergency versus other types of secondary care.

D. Understanding Demand Gaps

Geospatial mapping of hospital access is useful at identifying underserved areas—both geographical and clinical—at a high level and helping with prioritization decisions about *where* greater investment is needed. However, when making decisions *in what specific ways* to increase secondary and tertiary capacity in a particular area, a more granular, place-based approach to hospital service planning is needed. This complements, rather than replaces, geospatial analysis and helps to answer more detailed questions of service design, quality, performance, and affordability. Place-based planning recognizes that all underserved areas are not identical—e.g., the needs of an isolated mining town differ considerably from that of a remote agricultural or indigenous community. Place-based planning approaches involve detailed qualitative work to understand a range of important local factors, including

- Listening to the **views of local community** members, leaders, and caregivers about their perceived barriers and gaps in hospital-care access;

- Analyzing existing **patterns of demand** to see why and where patients currently go for hospital care, how this is funded, and the extent to which they report distance as a reason for foregoing health care, including their tolerance for different travel times;
- Examining the **assets and strengths** of a particular community and their potential to create innovative solutions, as opposed to only looking at what they lack; and
- Assessing the **performance of existing hospitals** and nearby health-care providers, e.g., their waiting times, lengths of stay, and occupancy rates.

The findings of such place-based analyses are often that distance is relative (Buzza et al. 2011). In other words, the picture shown on a geospatial map of travel times may concretely reveal large “medical deserts” for particular hospital services, but these data may be perceived differently in the lived experience of patients, and do not show much of the key information necessary to design an appropriate solution. Prioritization and a broad, health systems perspective are needed, as it will not be feasible to deliver all the requests of every community. By using place-based planning, this prioritization can draw on a more informed cost-benefit analysis that takes into account the full range of benefits and potential synergies of different options, rather than simply filling in gaps in a map.

Box 1: The People’s Republic of China’s Evolving Response to Rural Hospital Systems

The People’s Republic of China (PRC) has followed a phased approach to bridging the vast gaps in hospital-care access faced by its rural citizens over the past 2 decades. The creation of the New Cooperative Medical Scheme in 2003 was a milestone in the country’s journey to universal health coverage, which by 2008 had covered more than 90% of the PRC’s rural residents.^a Today, the benefit package and financial protection given to rural Chinese citizens are almost equivalent to that of their urban counterparts, but still there is highly unequal geographic access—especially to hospital care. There are currently less than half as many hospital beds per 1,000 people in rural areas compared to urban areas.^b Rural citizens with chronic conditions are 1.5 times more likely to experience catastrophic health expenditures, in part due to the costs of travel into cities to receive care.^c

Among the key reasons for this disparity is an approach to health-care planning in which multiple levels of government all develop their own capital investment strategies, often with little coordination, and generally using input-based methodologies. This results in the disproportionate expansion of large, well-endowed urban hospitals at the expense of poorly resourced rural and lower-tier facilities, partly because the urban hospitals have a more powerful voice across the fragmented planning processes.^d Guidance that recommended capital planning approaches be driven by population health needs was issued as far back as 1997, but a recent analysis of planning approaches in three provinces showed that in reality, beds-per-population was the only documented factor considered in capital investments.

In a bid to move toward a less urban- and hospital-centric health-care system, new policy guidelines were issued in 2015 to rationalize health-care facility planning. These specified detailed

functions and roles for different tiers of health-care facility, requiring these to be planned according to changing population needs and, crucially, to be integrated so that each facility’s service scope should be coordinated and evolved in relation to other providers. Still, this does not fully account for the growing role of private hospitals in the PRC, nor the underlying payment system, which rewards high-tech and specialized care to an extent that encourages further hospital- and urban-centric investment.

In more recent years, Chinese health-care planners have made extensive use of different geospatial mapping techniques to understand gaps in access, comparing travel times to the various tiers of hospital to try and create a more equal system of provision.^e In doing this, the focus is increasingly not on location but on quality and capability of lower-tier or rural hospitals, as rural patients very often choose to bypass their most accessible hospital and still travel long distances to seek care in a top-tier urban hospital.^f

Efforts to combat this challenge include piloting “medical consortiums”—vertically integrated provider groups that encourage urban centers of excellence to collaborate with lower-tier and rural facilities. Direct public investments have also been put into rural hospital infrastructure, especially their on-site diagnostic capabilities, and encouraging rotation of staff between urban and rural facilities. Bonded scholarships of free medical education in exchange for 6 years of rural service after graduation have also been introduced.^g There has also been increasing support for telemedicine solutions, through the concept of “internet hospitals,” which includes telemedicine connectivity and interoperability between urban and rural hospitals.^h

^a Y. Zhang et al. 2021. Ten-Year Impacts of China’s Rural Health Scheme: Lessons for Universal Health Coverage. *BMJ Global Health*. 6 (4).

^b Y. Liu et al. 2018. Factors Influencing Choice of Health System Access Level in China: A Systematic Review. *PLoS ONE*. 13 (8).

^c Y. Si et al. 2017. Catastrophic Healthcare Expenditure and Its Inequality for Households with Hypertension: Evidence from the Rural Areas of Shaanxi Province in China. *International Journal for Equity in Health*. 16 (1). 27.

^d World Bank and World Health Organization. 2019. Lever 8: Modernizing Health Service Planning to Guide Investment. In *Healthy China: Deepening Health Reform in China*. Washington, DC: World Bank.

^e G. Cheng et al. 2016. Spatial Difference Analysis for Accessibility to High Level Hospitals Based on Travel Time in Shenzhen, China. *Habitat International*. 53 (5). pp. 485–494; and J. Pan and D. Shallcross. 2016. Geographic Distribution of Hospital Beds throughout China: A County-Level Econometric Analysis. *International Journal for Equity in Health*. 15 (1). 179.

^f Y. Liu, Q. Kong, and E. Bekker-Grob. 2019. Public Preferences for Health Care Facilities in Rural China: A Discrete Choice Experiment. *Social Science & Medicine*. 237. 112396.

^g A. Zhu et al. 2019. Analysis of Strategies to Attract and Retain Rural Health Workers in Cambodia, China, and Vietnam and Context Influencing Their Outcomes. *Human Resources for Health*. 17. 2.

^h Deloitte. 2021. Internet Hospitals in China: The New Step into Digital Healthcare.

WHAT ARE THE BARRIERS TO IMPROVING ACCESS TO HOSPITALS IN UNDERSERVED AREAS?

Before designing appropriate solutions, it is likewise important to understand *why* these gaps in hospital-care access exist—*what* are the underlying barriers. Geographic gaps in access are most likely the result of a lack of investment in new facilities. For private hospital operators, this could either be because of opportunity cost—the

commercial returns of a hospital serving rural areas being lower than urban ones—or because the market conditions are such that a hospital in a particular area would be financially unsustainable. For the public sector, lack of investment can similarly be driven by opportunity cost—the returns (whether in health, political capital, or some other priority) of an urban center are perceived as greater than a new rural facility. Governments can also get caught in an upward spiral of investment in urban hospitals that reduces the budget allocation for new facilities elsewhere: urban facilities are overwhelmed by demand from outlying, underserved areas, leading

to a need to expand, which takes up available capital spending, leading to further inequalities in public funding between urban and rural hospitals.

Clinical service gaps can also be the result of underinvestment in existing facilities—e.g., more specialist technologies and services are financially unviable in a particular setting. Equally, there may be operational hurdles to sustaining a full suite of secondary and tertiary services, such as recruiting and retaining sufficiently skilled professionals and maintaining essential supplies. Demand gaps can have a variety of immediate causes—from mistrust in the quality of care offered by rural facilities, to affordability of those facilities, to concerns that the higher performance, specialization, and scope of urban hospitals are worth the additional travel time.

In practice, the ultimate root causes of gaps in hospital-care access are a spiral of three underlying barriers that interact, exacerbate, and compound each other in a negative cycle of financial unsustainability, reduced quality, and more thinly stretched human resources (Figure 4):

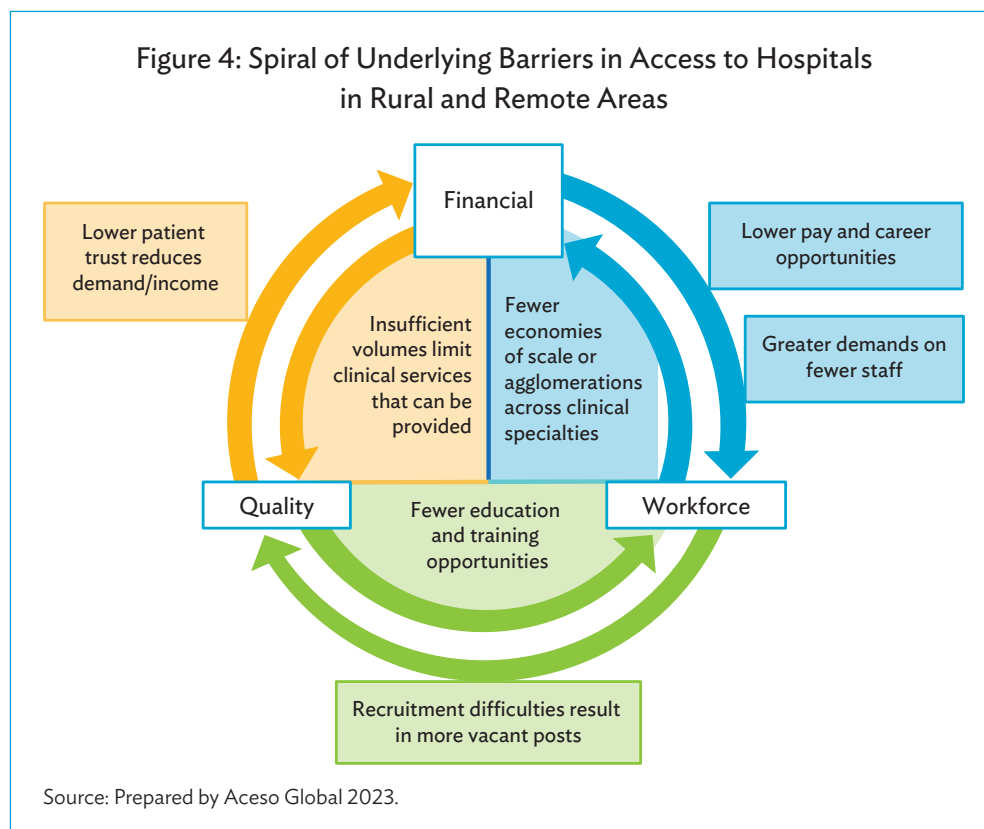
- **Financial barriers** include having lower patient volumes (therefore revenue), more limited range of departments across which to spread costs, and higher overall costs in some areas, such as supply chain;
- **Workforce barriers** include difficulties in recruiting and retaining staff, and providing adequate educational opportunities; and

- **Quality barriers** include more limited clinical capabilities, lower levels of specialized technology and skills, inefficiencies in operational performance, and difficulty of maintaining essential supplies.

Understanding how this spiral operates in a specific geography is vital before considering which solutions to deploy. In many cases, all three barriers will need to be addressed for access to meaningfully improve, whether the key gaps are geographic, clinical, or quality-related. For instance, incentives for private investment will not work if private operators see that the resulting hospital will not be financially viable nor attract adequate demand. Likewise, public investment without necessary staffing or patient trust will produce “white elephants.”

A. Underlying Financial Barriers

Issues with the underlying finances of rural and remote hospitals fall into two main categories. First are economies of scale: rural hospitals will have less ability to create efficiencies if they are smaller and/or serving a reduced or more sparsely populated catchment. International literature suggests that below 200 beds, hospitals begin to have higher costs per patient, as the fixed minimum requirements for a hospital (equipment, required staffing levels, etc.) have to be spread across a smaller volume of patients and more variable occupancy rates (Vaughan and Edwards 2020). Second, rural and remote hospitals may face higher overall running costs than their urban



equivalents (Palmer, Appleby, and Spencer 2019), resulting from factors such as

- Increased supply chain costs for having medical goods shipped and maintained;
- Inability to benefit from agglomerations, whereby urban hospitals may be able to share costs such as lab capacity with neighboring providers;
- Having an older patient population, with more complex health needs or who delays seeking care until a health issue becomes more acute; and
- Greater distances to travel for rural staff providing outreach services from the hospital, during which time they are not productive.

How these factors play out depends upon the provider mix that a health system uses for hospital services. In a country where most hospitals are private, firms will face a less compelling business case to build or sustain a rural or remote hospital—profitability may be lower and risk higher, resulting in an increased cost of capital. If the region is depopulating, then this will further weaken the financial case for private operators to invest. The same market failures may not exist for public hospitals, but the pressure to demonstrate value for money in the provision of publicly funded health services may be just as strong. Conversely, where elected officials have a more direct say in hospital planning, there may be political pressure to build or maintain poor value hospitals that do not have the required volume and specialization to provide quality of care.

A key solution to these issues of rural and remote hospital costs is to ensure that the payment model for hospital services adequately reflects the value that they produce and accounts for unavoidable additional costs they face.

B. Underlying Workforce Barriers

For many countries, staffing rural and remote hospitals is the number one challenge—not building or sustaining the actual facility (Campbell et al. 2013). Many countries have the experience of constructing hospitals in underserved areas, only to find that there are insufficient health workers to run them. This results in hospitals that are unable to provide the services they were built for or have long waits or suboptimal quality.

The barriers to attracting and retaining sufficient health workers in rural and remote hospitals are fairly consistent across countries. As with other regions, clinicians in Asia and the Pacific tend to cite fewer (if not inferior) educational opportunities in rural posts, as well as fewer opportunities for professional advancement, lower pay, poorer housing, and personal preferences against rural living that may be influenced by poor Internet coverage, lower quality schooling for children, and other amenities such as entertainment, retail, and banking (Putri et al. 2020).

While the primary focus of most countries is on recruitment and retention of doctors and nurses in rural and remote

hospitals, skilled and sufficient administrators for these hospitals are also important. Hospitals are complex environments requiring experienced and appropriately trained management. Poorly run hospitals will be less attractive to clinicians and patients. Furthermore, in the absence of good managers, senior doctors and nurses are required to do the bulk of administrative work, further widening the gap in available time and expertise to care.

C. Underlying Quality Barriers

Barriers to quality of care in rural and remote hospitals often compound financial sustainability and workforce issues. If patients do not trust the safety and expertise of their local rural hospital, they may choose to travel further to visit an urban center of excellence—resulting in underutilization of rural facilities (in turn resulting in lower revenue, then lower staffing, etc.).

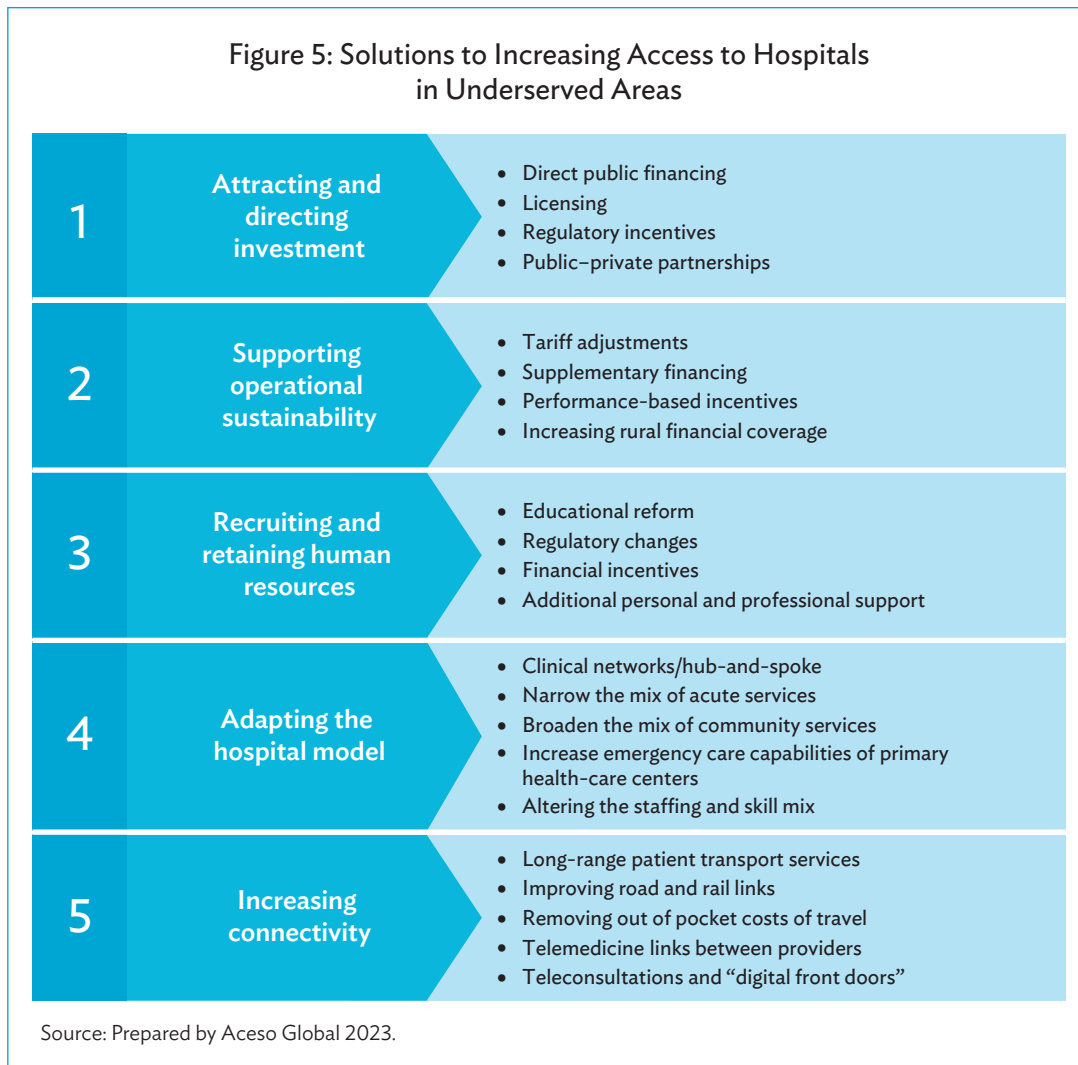
The most common concerns around quality of care in rural and remote hospitals include the skills and experience of the staff working there, the availability of modern medical technology, and perceptions of the hospital building itself. Rural hospitals may also face greater challenges of keeping equipment maintained and experience longer outages when technology breaks down while they wait for technical support.

Finally, it is important to recognize that, in some cases, barriers to reforming hospital care lie with vested interests in the status quo, however suboptimal that may be for rural and remote communities. Despite significant gaps in access in some countries, a hospital system that skews toward cities may benefit some powerful actors in the system. Since 1997, the Asian Development Bank (ADB) has been supporting Mongolia's health-care system reform, which was characterized by an excessive number of acute hospital beds concentrated in the capital, Ulaanbaatar, and a large number of unjustified admissions and long lengths of stay (Jigjidsuren, Oyun, and Habib 2021). Significant results in rationalizing this picture have now been made, but this took five attempts at major reforms over 20 years to achieve. Key factors behind this slow progress were the opposition from urban hospitals, who did not wish to see a dilution of their resources; the clinicians, who did not wish to be redeployed; and the resistance from the Ministry of Finance.

WHAT SOLUTIONS EXIST?

Having analyzed the gaps and underlying barriers to hospital access facing underserved areas, solutions can be designed to effectively address them. Typically, these will be needed in combination depending on which gaps (geographic, clinical service, and/or demand) are identified and which root causes (finance, workforce, and/or quality) have produced them. While by no means comprehensive, some of the most common and effective solutions are described in Figure 5, grouped into five main categories:

1. **Attracting and directing investment** involve interventions that will improve the attractiveness of the initial business case for public and/or private investment in new facilities, or substantial upgrading of existing facilities. These include



- (i) Providing a program of **direct public investment** in expanding or constructing new hospital facilities. For example, in the 1980s, the central government of Thailand decided to redirect money earmarked for urban hospitals toward rural district hospitals (Wibulpolprasert and Fleck 2014). To sustain these providers, an ongoing additional grant or flat-rate payment may be needed to support particular clinical services that are unlikely to be financially viable given levels of demand or need in an area.
 - (ii) Offering **public-private partnerships (PPPs)** between governments and for-profit or faith-based organizations to share the initial construction costs of new hospitals in underserved areas and guarantee their long-term viability. Full-scale hospital PPPs can take a wide variety of forms—from models in which a private sector partner builds and maintains the facility (potentially taking responsibility for clinical services too) for a period of time before transferring ownership to the public sector, to models in which the private partner has full ownership but with a commitment of ongoing revenue from government in the form of an availability payment, or guaranteed volume of patient demand. PPPs can also be targeted at specific services that the public sector finds challenging to perform in remote settings—e.g., a private company takes responsibility for the purchase, maintenance, and replacement of equipment within public hospitals and is paid on the basis of performance.
 - (iii) Offering **nonfinancial incentives** to private operators to build new hospitals in underserved areas. Examples are free or discounted land for development, an easier licensing process, and government support in connecting new hospital with utilities and road infrastructure. Governments may also choose to influence future investment by more strictly limiting or regulating licenses for new hospitals proposed in urban areas with adequate coverage.
2. **Supporting operational sustainability** involves improving the ongoing financial viability of hospitals located in remote and rural areas. This is necessary for attracting investment into

new facilities and for supporting existing facilities to expand and improve. Common levers used by different health systems globally include

- (i) Proposing a **bonus rate above the standard tariff** paid to hospitals in remote and rural areas. One example is offering an uplift on all diagnosis-related groups deemed to be essential to provide in that area, or likely to suffer from diseconomies of scale due to a hospital being unavoidably small or remote.
- (ii) Ensuring **comprehensive financial coverage for health care** of rural populations to spur adequate local demand for services of rural hospitals. This might be through expanding enrollment to national health insurance or enhancing existing coverage to include a greater range of secondary and tertiary care services.
- (iii) Using **pay-for-performance mechanisms** to reward improvements in the operating effectiveness and efficiency of existing rural and remote hospitals. Box 2 provides an example of performance-related financial incentives on the basis of real-time service levels, reduced absenteeism, lengths of stay, or user satisfaction.

Box 2: Performance-Related Financial Incentives for Rural Hospitals in Khyber Pakhtunkhwa, Pakistan

The Khyber Pakhtunkhwa province of Pakistan is home to around 38.5 million people (2021 estimate), over 80% of whom live in rural areas. A 2019 health system review commissioned by the Asian Development Bank (ADB) identified a particular need for improvements to secondary care in the province—largely the result of government focusing on tertiary hospitals and international donors supporting primary care services, leading to secondary care receiving less attention.

Physical access to secondary care hospitals was adequate, with 32 inpatient facilities spread across the 35 districts. However, in practice, these were underutilized as patients opted instead to travel to tertiary hospitals in the main city of Peshawar over concerns of poor quality of care in their local facilities.

In 2021, a new results-based loan was signed between ADB and the government of Khyber Pakhtunkhwa, as part of a \$417 million health system strengthening program. Under the terms of this agreement, ADB will disburse \$100 million in financing as the province's 32 nonteaching hospitals achieve a broad range of performance milestones designed to improve clinical quality and public confidence. These key performance indicators range from basic metrics such as functioning toilets, to meeting more technical standards of safe care in operating theaters, to demonstrating reduced levels of vacant posts and absenteeism.

The program is planned to conclude in 2026, by which time it is hoped that there will be a substantial shift in utilization of these hospitals and resulting improvement in effective access.

Source: Asian Development Bank.

3. **Recruiting and retaining human resources** involve strategies to secure a sufficiently staffed and skilled workforce for rural hospitals. There is extensive evidence of effective interventions to achieve this, with the most successful examples including “bundles” of coordinated interventions blended together (WHO 2010; Liu, Zhu, and Tang 2018), such as
 - (i) **Educational interventions**—e.g., selecting medical students from a rural background, creating special educational tracks for rural students, adapting curricula with specific rural health content, and situating medical schools in rural areas;
 - (ii) **Regulatory changes**—e.g., return service agreements that carry a compulsory period of service in rural areas after graduation in exchange for free or discounted medical education (varying from 2 years in Nepal to 9 years in Japan); and creating new cadres of specialist rural doctors to recognize their unique skills, like the Rural Generalist in Australia (Box 3);
 - (iii) **Financial incentives**—e.g., ensuring parity of pay between urban and rural health workers and, if necessary, giving higher pay to health workers in understaffed areas; and allowing opportunities to supplement public clinicians’ pay through private work (dual practice); and
 - (iv) **Additional personal and professional support**—e.g., better housing, better working conditions in the hospitals (including adequate drugs and equipment), employment opportunities for spouses, and guarantees of permanent employment.
4. **Adapting the hospital model** involves changing the scope of service that hospitals in underserved areas provide, whether by taking out some functions that a full-service hospital might usually provide, adding additional capabilities, or sharing functions with other providers so as to improve quality and/or reduce overall costs. These solutions can help maintain the financial viability of rural hospitals, improve their quality, and mitigate workforce gaps. Countries have arrived at different solutions for configuring hospitals in rural and remote areas to optimize the trade-offs between access, quality, and cost:
 - (i) Creating **clinical networks between rural and remote hospitals** so that through collaboration they can recreate the scale that they lack individually. This could mean that aspects of one or more clinical service might be shared—either physically or virtually—between different rural and remote hospitals. For example, several rural hospitals might jointly procure medical equipment, jointly employ some staff, or jointly deliver a particular clinical service.
 - (ii) Implementing **hub-and-spoke models**, whereby a central (typically urban) “hub” hospital with a wide range of services and specialties partners with a number of smaller “spoke” hospitals, often in more rural and remote areas. The spokes have more limited capabilities but are still able to benefit from centralization and scale, e.g., through shared staffing and supervision, clinical protocols, telemedicine links, and referral agreements that allow patients to be rapidly moved between sites as needed. Specialists might rotate between facilities

Box 3: Multifaceted Solutions to Australia’s Extreme Rurality Challenges

Few health-care systems globally face access challenges as extreme as Australia, a country that—despite being one of the most urbanized in the world—also has one of the lowest population densities: 3 people per square kilometer, second only to Mongolia in Asia.^a For the 500,000 people living in remote or very remote communities, travel times to hospital can be long—with average drive times of up to 11 hours to the nearest hospital for some regions.^b

Over many years, Australia’s state and federal governments have developed a comprehensive range of solutions to these challenges. Five key components of this multifaceted strategy are (i) adaptive hospital models, (ii) a specialist rural health workforce, (iii) flexible health financing, (iv) patient transport, and (v) local autonomy in service design.

Different states have developed a variety of adaptive hospital models for remote areas, which preserve the most essential time-critical acute services while keeping scale and cost at a much lower level. Small remote hospitals and emergency care facilities can be staffed by specially trained general practitioners on a part-time or on-call basis, with support from advanced nurse practitioners, while some standalone acute services might be entirely nurse practitioner-led. Clinical departments might have lower numbers of specialists than would be the minimum in urban centers, and there will be greater use of point-of-care testing. Most also have agreements with local ambulance services for paramedics to provide care in hospital when required. Because transferring patients from the most rural facilities are greatly challenging, they are more likely to have on-site radiology and lab departments. Even the smallest facilities manage to treat 90% of patients without transferring them.^c

These adaptive staffing models require a highly trained, specialist rural health workforce to maintain quality and patient trust. Australia has implemented a host of strategies to address this challenge, including raising the profile and prestige of rural and remote medicine through the creation of a dedicated College and Medical School for Rural and Remote Medicine. Certain states recognize and offer greater financial reward (on par with urban hospital specialists) to rural generalists, as well as creating specific professional pathways for them to advance through.^d There is also an expectation of junior doctors working in rural and remote areas as part of their training, as well as bonded scholarships, but these are supported by training curricula that emphasize the specific skills required for remote medicine.^e

Flexible health financing also takes into account the needs of rural and remote services, including a specific funding innovation known as “Multi-Purpose Services,”^f which allows the pooling of national and state funds for health and long-term care to create more flexible, multifunctional services—e.g., combining the services of a hospital and aged care facility into one. Adjustments to the payment model of Australia’s largest insurance scheme, Medicare, also promote telehealth support between hospital specialists and rural residents by paying a higher rate for these services than the same service delivered face-to-face.

Rapid movement of patients and doctors through dedicated long-range transport services also form a key part of Australia’s strategy. Private air ambulance services, long-range road transport, and the Royal Flying Doctor Service collectively offer good nationwide coverage.

^a World Bank. Population Density (people per sq. km of land area)—Australia (accessed 26 April 2023).

^b Barbieri, S. and L. Jorm. 2019. Travel Times to Hospitals in Australia. *Scientific Data*. 6 (1). 248.

^c Baker, T. et al. 2022. Rural Emergency Care Facilities May Be Adapting to Their Context: A Population-Level Study of Resources and Workforce. *The Australian Journal of Rural Health*. 30 (3). pp. 393–401.

^d Australian Government, Department of Health and Aged Care. 2016. *National Strategic Framework for Rural and Remote Health*. Canberra.

^e Rechel, B. et al. 2016. Hospitals in Rural or Remote Areas: An Explanatory Review of Policies In 8 High-Income Countries. *Health Policy*. 120 (7). pp. 758–769.

^f AgedCare101. What is the definition of a Multi-Purpose Services?

- (iii) Designating or designing a **different service mix** for rural and remote hospitals than would be viable or permissible in other areas. This involves paring down the facility to only offer the most essential services needed locally, which may require special financial support to make them viable. In the United States, for example, rural hospitals are most likely to provide obstetrics, emergency trauma, psychiatric, and basic interventional radiology services among their scope (Croll and Gale 2022). Some countries drop the “hospital” label altogether, instead preferring to equip rural primary health-care providers with acute care skills.
- (iv) Providing **additional capabilities** not available in their urban counterparts, in line with changing the service mix. In Canada, there are more than 330 hospitals in rural and remote regions, averaging around 18 beds each and serving 20% of the population who live in these communities. “Rural health hubs” have been created to address the specific health needs that exist in these communities. Alongside minimum critical services such as an emergency department and, in some cases, surgical facilities, the hubs may also have addiction services, mental health, long-term community and home care, rehabilitation, palliative, and complex continuing care (Rechel et al. 2016).
- (v) Simultaneously adapting the **staffing models** and the hospital model. In Australia (Box 3), for example, many remote emergency and acute hospital departments

are staffed on a part-time basis, or by family medicine physicians or nurses with enhanced training, skills, and licenses (i.e., nurse practitioners). Medium-sized hospitals may have fewer consultants per department, and there is greater use of trainees and international medical graduates.

specialists in urban centers). New tools for telemedicine to transform rural health care are emerging all the time but, in areas with poor Internet or phone coverage, more basic technologies may be equally effective, e.g., using two-way radios.

5. **Increasing connectivity** focuses on how to get rural and remote patients the care they need more efficiently without significantly changing the supply or distribution of hospital facilities. This can be done by

- (i) Providing dedicated **long-range patient transport services** to underserved communities. These include air ambulances and vehicles equipped to provide rapid patient transport over long distances. Networks of medical and nominated nonmedical vehicles, boats, and aircraft for emergency patient transport are common in many large countries and island communities. A more recent development is the increasing use of technology to begin treatment by the receiving hospital while the patient is en route. Smart ambulances, for example, are now being deployed in Malaysia, equipped with high resolution cameras and microphones, medical devices such as electrocardiogram, and satellite communication systems (Dyangku 2022).
- (ii) Improving **civil transportation infrastructure** between cities and rural and remote areas. Better road, rail, air, and sea links have the added advantage of creating many nonhealth spillover benefits, such as economic growth and opportunities for rural and remote communities. This may also be the best value-for-money solution even on purely health grounds, as concluded in one Chinese region where improving transport links was found to be more economical than adding extra hospital capacity to outlying areas (Tao and Wang 2022).
- (iii) Removing **out-of-pocket costs of patient travel**, especially if the distances are long or repeated appointments are needed. The mobile money service M-Pesa is used in several African countries to directly transfer money to patients who need to use nonmedical means of transport. One example is the Ambulance Taxi service operating in several remote districts of Tanzania to transport mothers in labor on the roughly 3-hour drive to the nearest hospital. The full price of the journey is paid directly to the taxi driver using M-Pesa, with no cost to the mother. An evaluation of the programs first year found that it had reduced maternal mortality by 27% (Bryan et al. 2017).
- (iv) Using **telemedicine solutions** to replace some care that would previously have required face-to-face interactions in a hospital. While not obviating the need for surgical theaters, intensive care units, and other core hospital capabilities, telemedicine can enable the outsourcing of certain functions (e.g., interpretation and diagnosis of digital diagnostics) or mitigation of physician shortages (e.g., telemedicine tools that enable rural hospital generalists to communicate with

WHAT ARE THE KEY LESSONS AND ENABLERS OF SUCCESS?

Reflecting on the experience of health systems that have attempted to expand access to hospitals in rural and remote areas, a number of key lessons emerge that decision-makers should pay attention to.

The foremost lesson is to carefully analyze the problem before jumping to solutions. Health-care decision-makers need to understand the extent of geographic, clinical, and demand gaps, and to **use as sophisticated an approach to capacity planning as possible**. Crude rules of thumb to guide hospital capacity planning should be avoided, in favor of broader cost-benefit approaches that take into account travel times, potential to improve health outcomes, and the perspectives of local communities.

Second, in areas emerging as underserved through this analysis, it is important to **properly consider the underlying barriers that have resulted in these gaps**. While it may not be possible to resolve all cost, workforce, and quality issues through a single project or reform, understanding which can and cannot be overcome will help determine which types of hospital model can be viable. For mixed health systems, this will also help to decide where attracting private investment is a viable option and where market failures are such that a more public-sector financed or delivered solution is needed. Typically, a complex interplay of barriers exists in underserved areas, requiring a blend of solutions to be deployed at once.

Third, **actions should be prioritized in response to short-, medium-, and long-term needs**. For underserved areas with the most significant and urgent gaps, a rapid place-based study can be used to design a mix of solutions that will have an immediate impact locally; these solutions are typically on a project basis. Further responses should target barriers that can be addressed in the medium-term—in particular, the enabling environment that involves wider reforms to hospital licensing and regulation, health-care financing and payment models, and workforce training models. Finally, it is important that long-term decisions about future hospital capacity include a sufficiently long-term perspective on the wider environment in which hospitals will exist. New facilities will take many years to complete, during which time other planned physical and digital infrastructure projects may improve connectivity considerably. Population health needs may also change—e.g., if an area is rapidly ageing or depopulating or is acutely susceptible to the impacts of climate change, such as rising sea levels. Medical advances may also transform the nature of some clinical care, such as telemedicine, point-of-care tests, and artificial intelligence, enabling more specialist care to be provided in the home or local clinics. These impacts should be carefully considered in any long-term hospital masterplan.

Finally, **be innovative and resist the temptation to “copy and paste” urban hospital models into rural areas.** Planners should think in terms of individual clinical service group that fits the needs of the local population and be creative in the model they design to meet them. High-performing health systems globally have vastly different understandings of what “rural,” “small,” or “viable” means—not to mention what a “hospital” is. This suggests there is no optimum service design that should be copied. Rather, the wide range of solutions around the world should be seen as an invitation to innovate and pursue an end goal that fits each system’s unique history and preferences on the many cost–quality–access trade-offs. Demonstration projects can be an excellent starting point to examine new models of innovative acute care delivery in rural areas and see what works.

REFERENCES

- Bryan, L. et al. 2017. *Mobilizing Maternal Health: Saving Maternal Lives in Rural Tanzania through an Innovative Emergency Transportation System*. New York: Touch Foundation.
- Buzza, C. et al. 2011. Distance Is Relative: Unpacking a Principal Barrier in Rural Healthcare. *Journal of General Internal Medicine*. 26 Supplement 2 (S2). pp. 648–654.
- Campbell, J. et al. 2013. Human Resources for Health and Universal Health Coverage: Fostering Equity and Effective Coverage. *Bulletin of the World Health Organization*. 91 (11). pp. 853–863.
- Carrasco-Escobar, G. et al. 2020. Travel Time to Health Facilities as a Marker of Geographical Accessibility across Heterogeneous Land Coverage in Peru. *Frontiers in Public Health*. 8. 498.
- Cheng, G. et al. 2016. Spatial Difference Analysis for Accessibility to High Level Hospitals Based on Travel Time in Shenzhen, China. *Habitat International*. 53 (5). pp. 485–494.
- Cotlear, D. et al. 2015. *Going Universal: How 24 Developing Countries Are Implementing Universal Health Coverage Reforms from the Bottom Up*. Washington, DC: World Bank.
- Croll, Z., and J. Gale. 2022. *Community Impact and Benefits Activities of Critical Access, Other Rural, and Urban Hospitals, 2020*. Flex Monitoring Team.
- Dijkstra, L. et al. 2020. How Do We Define Cities, Towns, and Rural Areas? World Bank Blogs. *Sustainable Cities*.
- Dyangku, S. 2022. Here’s What the Smart Ambulances in Celcom & HeiTech’s Plans Will Be Capable of. *Vulcan Post*. 7 April.
- International Labour Organization (ILO). 2021. *Extending Social Health Protection: Accelerating Progress towards Universal Health Coverage in Asia and the Pacific*. Geneva.
- Jigjidsuren, A., B. Oyun, and N. Habib. 2021. Rationalizing Mongolia’s Hospital Services: Experiences, Lessons Learned, and Future Directions. *ADB East Asia Working Paper Series*. No. 37. Manila: Asian Development Bank.
- Liu, X., A. Zhu, and S. Tang. 2018. Attraction and Retention of Rural Primary Health-Care Workers in the Asia Pacific Region. *Asia Pacific Observatory on Health Systems and Policies. Policy Brief*. 5 (1). New Delhi: WHO Regional Office for South-East Asia.
- Nagy, D. 2022. Enhanced Two-Step Floating Catchment Area (E2SFCA). Tutorial. University of Pittsburgh School of Public Health.
- Organisation for Economic Co-operation and Development (OECD). 2012. *Redefining “Urban”—A New Way to Measure Metropolitan Areas*. Paris: OECD Publishing.
- Palmer, B., J. Appleby, and J. Spencer. 2019. *Rural Health Care: A Rapid Review of the Impact of Rurality on the Costs of Delivering Health Care*. Report prepared for the National Centre for Rural Health and Care.
- Putri, L. P. et al. 2020. Factors Associated with Increasing Rural Doctor Supply in Asia-Pacific LMICS: A Scoping Review. *Human Resources for Health*. 18 (1). 93.
- Rechel, B. et al. 2016. Hospitals in Rural or Remote Areas: An Explanatory Review of Policies In 8 High-Income Countries. *Health Policy*. 120 (7). pp. 758–769.
- Syed, S. T., B. S. Gerber, and L. K. Sharp. 2013. Traveling Towards Disease: Transportation Barriers to Health Care Access. *Journal of Community Health*. 38 (5). pp. 976–993.
- Tao, Z., and Q. Wang. 2022. Facility or Transport Inequality? Decomposing Healthcare Accessibility Inequality in Shenzhen, China. *International Journal of Environmental Research and Public Health*. 19 (11). 6897.
- Vaughan, L., and N. Edwards. 2020. The Problems of Smaller, Rural and Remote Hospitals: Separating Facts from Fiction. *Future Healthcare Journal*. 7 (1). pp. 38–45.
- Wibulpolprasert, S., and F. Fleck. 2014. Thailand’s Health Ambitions Pay Off. *Bulletin of the World Health Organization*. 92 (7). pp. 472–473.
- World Health Organization (WHO). 2010. *Increasing Access to Health Workers in Remote and Rural Areas through Improved Retention: Global Policy Recommendations*. Geneva.
- WHO and International Bank for Reconstruction and Development (IBRD). 2021. *Tracking Universal Health Coverage: 2021 Global Monitoring Report*. Geneva: WHO / Washington, DC: IBRD.

About the Asian Development Bank

ADB is committed to achieving a prosperous, inclusive, resilient, and sustainable Asia and the Pacific, while sustaining its efforts to eradicate extreme poverty. Established in 1966, it is owned by 68 members—49 from the region. Its main instruments for helping its developing member countries are policy dialogue, loans, equity investments, guarantees, grants, and technical assistance.

ADB Briefs are based on papers or notes prepared by ADB staff and their resource persons. The series is designed to provide concise, nontechnical accounts of policy issues of topical interest, with a view to facilitating informed debate. The Department of Communications administers the series.

ADB recognizes “China” as the People’s Republic of China.

The views expressed in this publication are those of the authors and do not necessarily reflect the views and policies of ADB or its Board of Governors or the governments they represent. ADB does not guarantee the accuracy of the data included here and accepts no responsibility for any consequence of their use.

Asian Development Bank
6 ADB Avenue, Mandaluyong City
1550 Metro Manila, Philippines
Tel +63 2 8632 4444
Fax +63 2 8636 2444

www.adb.org/publications/series/adb-briefs



Creative Commons Attribution 3.0 IGO license (CC BY 3.0 IGO)

© 2023 ADB. The CC license does not apply to non-ADB copyright materials in this publication.

<https://www.adb.org/terms-use#openaccess> <http://www.adb.org/publications/corrigenda> pubsmarketing@adb.org