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Romania Regional Hospital Analysis Study

Regional Referral Networks in Romania

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Abbreviations

ANMCS	National Authority for Quality Management in Health Care *(Autoritatea Naţională de Management al Calităţii în Sănătate)*
CABG	Coronary Artery Bypass Graft
COPD	Chronic Obstructive Pulmonary Disease
CT	Computed Tomography
CVA	Cerebrovascular Accident
DRG	Diagnosis-related Group
EIB	European Investment Bank
EU	European Union
GDP	Gross Domestic Product
GP	General Practitioner
ICD	International Classification of Diseases
JASPERS	Joint Assistance to Support Projects in EU Regions
MOH	Ministry of Health
MOI	Ministry of Internal Affairs
NE	North-East (*Nord-East*)
NHIH	National Health Insurance House
NSPHMPDB	National School of Public Health, Management and Professional Development
NW	North-West (*Nord-Vest*)
OECD	Organisation for Economic Co-operation and Development
OOP	Out-of-pocket
PACS	Picture Archiving and Communication System
PCI	Percutaneous Coronary Intervention
PPP	Purchasing Power Parity
SMURD	Mobile Emergency Service for Resuscitation (*Serviciul Mobil de Urgenţă, Reanimare și Descarcerare*)
SRSS	Structural Reform Support Service
SW	South-West (*Sud-Vest*)

Executive summary

The government of Romania plans to build three new regional hospitals in the North-West (NW), North-East (NE), and South-West (SW) regions. These are envisaged to be tertiary referral hospitals providing highly complex care to their region. Five or six further regional hospitals may follow this first batch.

Regional hospitals offer many potential benefits to the citizens of their regions. Further investment in acute care is difficult to justify in Romania's hospital-dominated health sector. However, with very different configurations to the county emergency hospitals they will replace, regional hospitals offer an opportunity to disrupt entrenched service delivery models. Greater access to complex specialist care outside Bucharest may also improve equity for residents in these regions. Moreover, there are potential benefits beyond health in these lagging regions, where place-based investments and better public services can attract human capital and support growth.

These benefits will not be realized, however, with 'business as usual'. Weak stewardship often means there is little consideration of the integration and added value of new health facilities in Romania. Yet no hospital exists in isolation. Additional hospitals, however sophisticated, will not improve the outcomes for patients without consideration of their function in the surrounding health system. Indeed, given current conditions, regional hospitals will quickly become congested with patients bypassing primary care, receiving treatment for low-complexity conditions, or unable to be discharged to lower-level facilities. Ultimately, this will diminish the resources available for patients who do require complex care: the raison d'être of the new hospitals.

Regional hospitals are not just bricks and mortar, but the apex of a complex regional health system. As flagship public hospitals, regional hospitals are planned to be the hub of each regional health system. Work to date, however, has focused on design and construction rather than how regional hospitals will interact and coordinate with other facilities. This is a missed opportunity, as many countries have utilized the opportunity of large infrastructure investments in health to engineer system change. Regional hospitals offer the potential to not only disrupt service delivery within their walls, but also across their region. To perform this role, they will need to provide coordinated care: the deliberate organization of patient care activities between providers to facilitate the appropriate delivery of health care services.

The likely integration of regional hospitals into this system can be evaluated through the prism of regional referral networks. A regional referral network is the organized system through which patients are transferred between providers in a region. Such networks are essential to the proposed function of regional hospitals by ensuring risk-appropriate care is delivered across the health system, strengthening quality and efficiency. Referral criteria for patients are usually constructed from evidence demonstrating better outcomes in facilities with the appropriate resources, which could be specialist expertise, diagnostic and treatment facilities, and/or number of patients, and summarized in regional clinical pathways. These pathways support clinicians in lower-level hospitals to refer patients to regional hospitals when it is agreed that more complex care is necessary. Regional hospitals also need to be able to refer patients back to lower-level facilities for rehabilitation so that capacity is freed up to accept new complex cases (counter referral). To conserve the limited resources at regional hospitals to treat highly complex cases from across the region, tools are also needed to minimize admissions of conditions that can be managed at lower-level hospitals or in primary care.

To highlight factors in the wider health system that are crucial to the role of regional hospitals, the World Bank undertook a comprehensive assessment of regional referral networks in Romania. Both factors in individual facilities and between facilities support referral networks and thus the role of regional hospitals (set out in Table 3). This report drew on available hospital activity data, stakeholder interviews, and literature review to assess the extent to which these factors are in place using tracer conditions, such as total knee replacements and stroke. Tracer conditions are common health problems aligned to the country context, for which optimal management involves multiple providers and levels of care. This way, tracer conditions can highlight strengths and weaknesses in referral networks.

Current and future referral networks as laid in the regional master plans were examined using tracer conditions. This analysis found that most admissions for the current county emergency hospitals are from their home county. This indicates that taking over the county emergency role may limit the capacity of regional hospitals to accept intercounty referrals. The distribution of total knee replacements indicates that referral networks for complex procedures not dependent on specialist equipment are weak. In all three regions, the procedure is being undertaken in local hospitals in small numbers, instead of referral to higher-level hospitals. Similarly, the distribution of stroke management indicates that stronger regional coordination is needed to improve outcomes for common conditions, particularly where early treatment and multidisciplinary care in dedicated units have been shown to improve outcomes. Out of 87 facilities treating stroke in the three regions, 14 treated more than 2,000 patients and 38 treated less than 100 patients on average.

While some conditions are in place to support regional referral networks, many of these require strengthening as part of the regional hospital work program. For example, regional clinical pathways for maternal and neonatal care offer a model for other clinical areas, with more regional clinical pathways needed to guide clinicians' decisions in the three regions. Existing collaboration agreements between county emergency hospitals and surrounding facilities provide a foundation for regional networks, but need to be expanded to support referrals and counter referrals. Strong communication channels are integral to well-functioning regional referral networks, with the emerging Romanian telemedicine system providing a strong foundation in this area. More hospitals in the three regions should be equipped with a picture archiving and communication system (PACS), however, to support quality of referrals. While planning documents for the new regional hospitals outline an innovative multidisciplinary model that supports the delivery of highly complex care, estimates for intensive care and allied health professionals do not factor in the intended increase in referrals of complex cases. Finally, strong community care and patient navigation can ameliorate overuse of emergency care and underuse of preventive and primary care. Community nurses and health mediator programs in all three regions should be expanded ahead of regional hospital construction.

Many factors essential to regional referral networks are weak or absent. Insufficient stewardship and poor-quality health data in Romania undermine the monitoring and performance management of referral networks. Quality standards aligned with regional clinical pathways need to be developed, with implementation of these standards supported through selective purchasing, pay-for-performance and incorporation into accreditation. Mechanisms will also be required to encourage adherence to regional referral networks. For example, prescriptions issued in hospital emergency or outpatient care could be subject to higher co-payments than those issued by family doctors to discourage bypassing of primary care. A bolder intervention would be to restrict prescriptions in the benefits package to family doctors. Without sufficient beds in each region to which regional hospitals can discharge patients for rehabilitation or long-term care, the regional hospitals will quickly be unable to accept new referrals for complex care.

Yet, when chronic care beds are mapped across the three regions, capacity is concentrated in regional centers. A comprehensive strategy to reduce admissions for conditions that can be better managed outside hospital is also needed, with a focus on primary care reform.

Any drive to regionalize complex care must be balanced against maintaining equitable access for all residents in a region. For example, means-tested reimbursement of travel costs and time for patients and carers referred to regional hospitals could be considered, along with hub-and-spoke models of service delivery. Here, patients requiring elective care are initially assessed in a peripheral 'spoke' hospital. Those requiring complex treatment are then referred to a central 'hub' facility, which concentrates a high volume of patients. After treatment, patients are transferred back to the referring facility or an appropriate alternative for rehabilitation, ensuring patients have access to their personal support networks. For some services, satellite units and visiting specialists (specialist outreach) may need to be implemented to ensure equitable access in rural/remote areas of the region.

Some aspects of this assessment were limited by data availability, and follow-up analysis would be useful. Data on referrals at the level of providers were not available, as well as reliable data on some tracer conditions. Given this, follow-up analysis would be beneficial to make informed policy decisions. For example, analysis of the provision of cancer and trauma care in the three regions. These are commonly regionalized in many countries to improve outcomes for patients. Regionalization of complex care will create greater demand for patient transfers, both emergency and nonemergency. An assessment of transfer capacity and root causes for nonurgent use is needed to prevent transfer capacity becoming a bottleneck to regionalized complex care.

Regional master plans need to elaborate the vision of regional referral networks, which could also be achieved through thematic master plans. While regional master plans map current and future service provision in each region by level of care, there are no details on these measures or how providers will interact with each other. In particular, expansion of chronic care capacity and counter-referral pathways requires greater detail in the regional master plans, along with catchment areas of lower-level hospitals. Greater elaboration of the vision and functioning of regional referral networks would support the ultimate functioning of regional hospitals. This could be achieved through thematic master plans, for example in cardiology or emergency care, that lay out the provider and referral networks for important clinical areas.

Regional coordination and management capacity will be needed to operationalize this vision. While technical working groups have been set up at a central level for regional hospitals, performance management of the regional health network will be required on an ongoing basis. As described earlier, an initial step is a regional coordination forum to bring together stakeholders and build consensus on health needs and clinical pathways. However, the MOH oversight and stewardship at a regional level will be needed to implement and manage these networks in the long-term. a forum in which stakeholders—including local authorities—can come together to review health needs and available resources from a regional perspective is vital to defining effective referral networks.

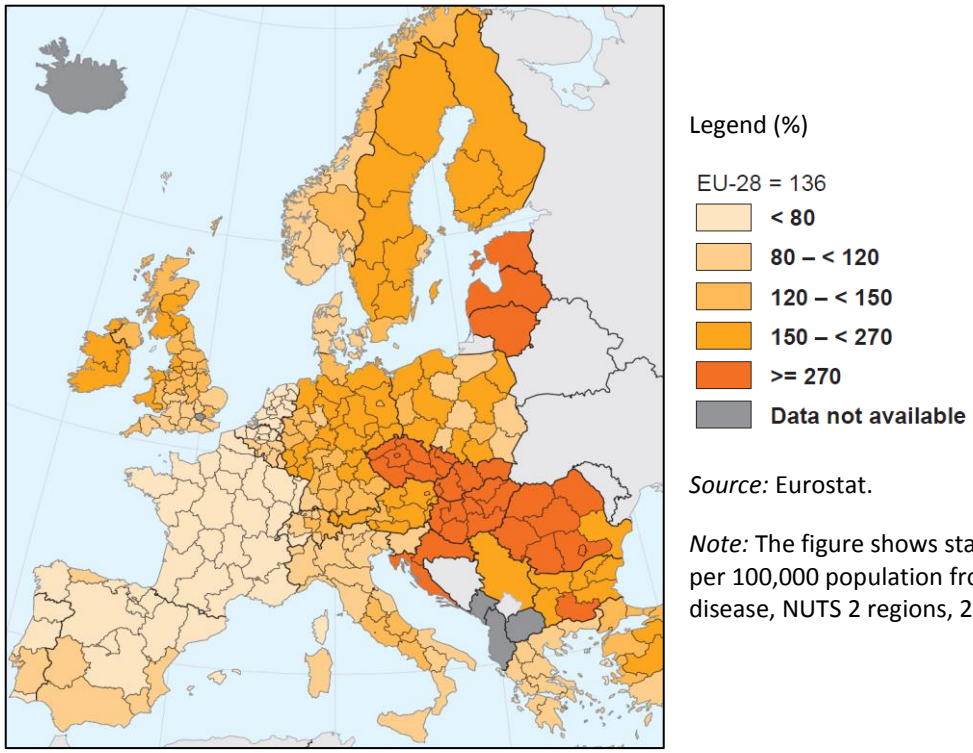
Further recommendations are made to strengthen regional referral networks and thus the role of regional hospitals. Table 8 summarizes the recommendations made in this report, including important further analysis. Here, short-term refers to the next one to two years, medium-term is the period up to the initial construction of the regional hospitals, and long-term is within five to ten years. The entity that would lead each recommendation is identified, along with other important stakeholders for successful implementation.

In conclusion, without as much attention to coordination of care within regional health networks as construction of regional hospitals, the hospitals will not be able to fulfil their promise as flagship providers of complex care. Next steps for the Government of Romania would be to discuss the findings of this report with relevant stakeholders, with agreed actions included in the regional hospital work program.

1. Background

Romania lags behind other European Union (EU) countries in many health outcomes. Life expectancy at birth has been increasing gradually but remains several years lower than the EU average (78.7 years versus 83.3 years for women and 71.5 years versus 77.9 years for men). The main cause of death is heart disease, for which the rate of death adjusted for age is among the worst in Europe (Figure 1). Indeed, heart disease and stroke have been the two major causes of premature deaths in Romania for the last 25 years and share common risk factors such as high blood pressure, high cholesterol, and smoking. Infant mortality remains an enduring challenge in Romania with the highest level in the EU in 2015 at 7.6 deaths per 1,000 live births.

Figure 1. Deaths from heart disease are higher in Romania than elsewhere in Europe

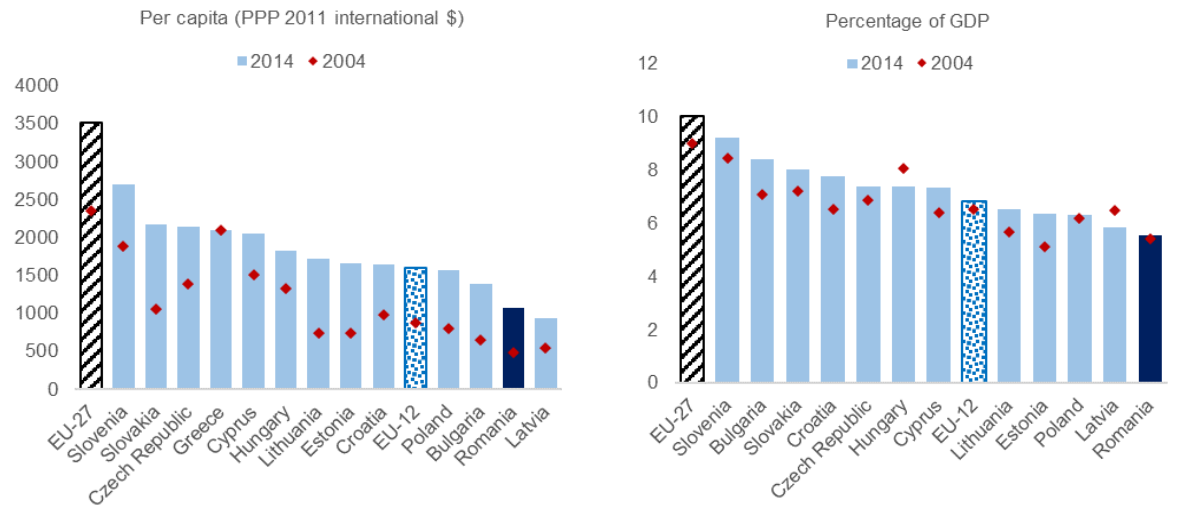


Source: Eurostat.

Note: The figure shows standardized death rates per 100,000 population from ischemic heart disease, NUTS 2 regions, 2011–2013.

A contributory factor to poor outcomes in Romania is the relative underfinancing of the health sector (Figure 2). Spending on health has averaged between 4.5 percent and 5.5 percent of gross domestic product (GDP) over the past decade, half the EU average of 9.9 percent (World Bank 2018a). While substantial outmigration has led to a rise in per capita spending, this remains less than a third of the EU average. Out-of-pocket (OOP) spending accounted for 21 percent of health spending in 2015, compared to an EU average of 15 percent. Romania has a single pool and payer social health insurance system, with employer and employee contributions accounting for 82 percent of the National Health Insurance House (NHIH) revenue in 2017 (World Bank 2018a). This has declined from 97 percent in 2006, with central government transfers and a clawback tax on reimbursed pharmaceuticals increasingly subsidizing the NHIH budget. Insured individuals (around 86 percent of the population) receive a comprehensive benefits package, whereas the uninsured (including vulnerable groups and subsistence farmers) are only entitled to a basic benefits package focused on emergency, communicable diseases, and antenatal care.

Figure 2. Health spending is lower in Romania than in comparator countries



Source: World Bank 2018a from World Development Indicators.
Note: EU-12 = Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain and United Kingdom; EU-27 = All EU Member States except Croatia; PPP = Purchasing power parity.

Available funding is not used efficiently due to an overreliance on inpatient care. A historically large hospital sector, compounded by poor stewardship, has embedded overutilization of acute services and neglect of ambulatory care. In 2015, the number of acute hospital beds was 500 per 100,000 people compared to the EU average of 396 per 100,000, with attempts at reconfiguration of smaller hospitals meeting strong public resistance. Recent pay rises for hospital staff have exacerbated the proportion of the NHIH funding spent on inpatient care (49 percent in 2017). Spending on ambulatory care has never risen above 18 percent since 2006, with primary care accounting for just 5.8 percent of spending in 2017. Just 14 percent of cataract surgeries were carried out in ambulatory care in 2014, compared to an EU average of 82 percent (OECD 2016). The payment system for primary care doctors encourages them to maximize registered patients but not to provide the range of services or care coordination seen in other countries with similar disease burdens. Consequently, patients often bypass primary care to seek care directly at emergency departments or outpatient specialists. This contributes to a high admission rate for conditions that could be better managed outside hospitals, which made up an estimated 8.3 percent of hospital admissions in 2016 (World Bank 2018a).

Fragmentation and weak stewardship compound the inefficiency of the health network. Around two-thirds of the current 567 hospitals in Romania are public, with a quarter managed by the Ministry of Health (MOH) (mainly tertiary hospitals and some secondary hospitals) and three-quarters by local authorities (lower-level hospitals). The remaining 187 hospitals are private, with the number of such facilities (mainly providing day admission only) increasing fourfold between 2008 and 2014. While the MOH classifies hospitals into five tiers (Box 1), there is no central planning or regulation on the services provided at each hospital. The NHIH contracts all providers that meet prespecified structural requirements, with no selective purchasing based on quality or performance indicators. Each provider holds multiple contracts with the NHIH for different services, impeding integration or provider-led reforms. Despite public concerns, there is little publicly available information on quality or safety of providers. A new agency, the National Authority for Quality Management in Health Care (ANMCS, *Autoritatea Naţională de Management al Calităţii în Sănătate*), undertook the first stage of accreditation between 2011 and 2016,

accrediting all 431 hospitals assessed in this round. A second stage is under way and will last until 2021, with plans to assess all public and private hospitals.

While recognized in the national strategy for health, progress on these issues has slowed. The National Health Strategy 2014–2020 set out a vision to reorient the health sector away from an inpatient-dominated model toward strengthened ambulatory, primary, and community care (MOH 2014). To date, however, there has been limited progress on the implementation of the strategy's objectives. Contributory factors included limited political commitment to some reforms, frequent changes of leadership and shifting priorities, poor investment planning, and weak administrative capacity at the MOH (European Commission 2018). The ongoing World Bank Romania Health Sector Reform Project (P145174) aligns with the main goals of the strategy, with support for hospital rationalization, provision of ambulatory services, and the implementation of clinical pathways for the most prevalent noncommunicable diseases. There have been significant delays in the original implementation and disbursement schedules of the project, however, with less than 15 percent of the loan disbursed four years after the project's approval.

Box 1. Types of hospitals in Romania

Hospitals in Romania are classified based on their catchment areas and complexity of provided care. Hospitals can also be classified as general, emergency, specialty, chronic, or clinical hospitals. The five tiers (also known as competencies) are as follows:

Tier I (very high competence). General or specialty (designated as IM) hospitals providing care of very high complexity to a regional catchment area. Cluj, Iaşi, and Craiova county hospitals are classified as Tier I rather than Tier III due to their mandated regional role and are referred to in this report as county regional hospitals.

Tier II (high competence). General or specialty (designated as IIM) hospitals providing care of high complexity to an intercounty catchment area.

Tier III (medium competence). General hospitals providing care of medium complexity to a county catchment area, including cases that cannot be treated locally. Known as county hospitals and located in each county's capital, most have an emergency unit.

Tier IV (low competence). General hospitals providing care of low complexity to a subcounty catchment area. Known as local hospitals, they serve mainly towns and municipalities.

Tier V (limited competence). Long-term care hospitals providing limited medical services, such as low-dependency care for patients with chronic diseases, rehabilitation, palliative care, or medical care in one specialty or disease area (for example, tuberculosis and psychiatry). They are known as chronic hospitals.

Emergency hospitals are Tiers I to III hospitals that are well equipped and geographically accessible and have an emergency unit. Specialty hospitals are Tier I, II, or V hospitals that provide services in one specialty or clinical area, for example, pediatrics, infectious diseases, or cardiovascular disease. Clinical hospitals provide teaching to residency doctors in association with universities.

Source: MOH 2010; Vladescu et al. 2016; World Bank 2018a.

Political attention has shifted to three new regional hospitals, which will replace the current county emergency hospitals and act as tertiary referral hospitals for the North-West (NW), North-East (NE) and South-West (SW) regions.[1] The national strategy proposed regionalization of hospital care as part of

[1] In 1998, eight development regions (seven regions plus Bucharest-Ilfov) were established in Romania to coordinate EU-funded regional development. These regions are not an administrative division, however, and do not have a legislative or executive council. Rather, they are formal collaborations between county and local councils.

quality improvement and service integration efforts. New regional hospitals will replace county emergency hospitals currently performing this role, many of which suffer from outdated and unsound infrastructure. These hospitals will be Tier I emergency hospitals providing highly complex care to patients referred from lower-level hospitals in the region. The locations of the new regional hospitals will be traditional university centers, aligned to existing human and physical resources. In Cluj, Iaşi, and Craiova, new purpose-built buildings are needed to replace the outdated county hospitals currently performing this role. Planning for these latter three hospitals is under way, with a recent government decision to build a further five or six regional hospitals. Figure 3 sets out the original vision for these hospitals, although this has been superseded by more detailed plans. In this report, a regional hospital refers to the new hospitals to be constructed, whereas a county regional hospital refers to the county emergency hospitals currently undertaking a regional referral role.

Figure 3. Vision for regional hospitals and referral network

Source: National Strategy for Health 2014 to 2020.
Note: RU = Regional hospital; SU = Support hospital (no further definition); CH = County hospital. Craiova regional hospital will be located in Dolj county.

The construction of three regional hospitals is planned to be partly financed by the EU. Under the current Operational Programme (2014 to 2020), the EU has allocated €150 million for the construction of these three hospitals against estimated costs of €200 - 500 million per hospital. This will be drawn from Regional Development Funds, dependent on adequate project applications being submitted to the Directorate-General for Regional and Urban Policy (DG REGIO) . The European Investment Bank (EIB), the Structural Reform Support Service (SRSS), and the Joint Assistance to Support Projects in EU Regions (JASPERS) are all involved in developing these project applications, with feasibility studies and technical design expected to last until the end of 2018. Construction is planned for 2020 to 2023.

There is little rationale for further investment in acute care in these regions, although regionalization of specialist care may improve access. All three regional hospitals are located in functional urban areas with high provision of beds from multiple facilities, making it difficult to justify prioritizing acute care over other pressing health needs in the region. Moreover, the marginal benefit of any regional hospital is low as county regional hospitals are already undertaking this role. Indeed, with 90 percent of public hospitals and virtually all private hospitals located in urban areas, further investment directed to large cities risks exacerbating the large disparity in access between urban and rural populations in Romania. Mean urban income is almost 50 percent higher than mean rural income, contributing to one of the largest gaps in unmet medical needs between high- and low-income groups in the EU (OECD/European Observatory on Health Systems and Policies 2017; World Bank 2018b). Financial, distance, and transport barriers are commonly cited as reasons for not seeking care. Regionalization of specialist care can support equity of access when complex care is highly centralized, usually in capital regions. A network of medical universities with associated teaching hospitals means that there is a minimum distribution of specialty services across Romania, although many patients still travel for treatment in Bucharest's dominant hospitals.

The new hospitals do, however, present an opportunity to disrupt entrenched service delivery models. The new hospitals will be configured very differently to the existing county regional hospitals. In place of the pavilion-style facilities in Iaşi and Cluj where each specialty provides care in a separate building, the new hospitals will integrate service delivery in one purpose-built modern block. In Craiova, this will also replace the unsound current building. Rather than simply transferring existing silos and power structures from one building to another, specialty teams will be brought together in multidisciplinary integrated centers. Moreover, teams will need to work with each other to manage shared resources such as general wards, integrated operating rooms, and intensive care capacity. Such a transformational change in service delivery offers the opportunity to disrupt the status quo at the new hospitals, with potential spillover effects in the wider health network.

Regional hospitals also offer potential benefits beyond health in these 'lagging regions'. While Bucharest outperforms many European capitals (including Rome, Madrid, and Berlin) with regard to GDP per capita, Romania's secondary cities underperform other European secondary cities (Cristea et al. 2017). In Cluj, Iaşi, and Craiova, these weaker economies are part of a wider 'lagging regions' phenomenon that is receiving increasing attention from the EU and World Bank (Farole, Goga, and Ionescu-Heroiu 2018). In 2016, the regional GDP per capita[2] was 51 percent of the average of all EU Member States in the NW, 42 percent in the SW, and just 36 percent in the NE (Eurostat). In such low-income regions, rising but still low levels of GDP require strong interventions to avoid graduation into low-growth regions.[3] Analysis suggests that building endowments such as education and skills are important place-based investments for lagging regions (Farole, Goga, and Ionescu-Heroiu 2018). Seen through this lens, better public services such as hospitals can make urban areas more attractive to domestic migrants, attracting human capital to these regions and supporting growth.[4] By becoming clinical 'centers of excellence', the new hospitals may further develop and retain human capital, rebalancing regional inequalities. This includes highly skilled

[2] Purchasing power standard per inhabitant.

[3] Defined as persistent lack of growth for more than a decade.

[4] Recent consultations for the Romania Country Partnership Framework found that poor quality of public health services is a major obstacle in recruiting and consequently retaining young families with children in secondary cities. Concerns about the quality of public health care, alongside the quality of public education, top the list of priorities for young professionals with children. Young and mid-career specialists with children prefer to incur higher living costs in countries like Germany due to the quality of public services, rather than work in Romania for comparable salaries.

health professionals, many of whom are attracted by better conditions in other EU countries.[5] Indeed, Cluj and Iaşi have a strong foundation as 'magnet cities', with their vibrant university centers attracting the largest number of domestic migrants between 2001 and 2011 after Bucharest and Timisoara (Cristea et al. 2017). The development of centers of excellence also offers the opportunity to become a part of European reference networks,[6] providing highly specialized treatment for patients from across the EU with complex or rare conditions.

Work to date has focused on the planning and reconfiguration of individual facilities, rather than the coordination of care across facilities. To guide restructuring of health services as laid out in the National Strategy for Health, regional master plans are being finalized for the NE, NW, and SW regions (Government of Romania 2016). The latest draft master plans map current service provision in each region, then describe strategic objectives and targets for each level of care. While a hospital reconfiguration plan proposes changes to each facility in the region with regard to reductions in bed numbers or repurposing, there are no details on how providers will interact with each other within or across levels of care. For each regional hospital, several planning documents have also been produced as part of the project applications. Demand and options analyses make a broad assessment of the potential demand for medical services in the three regions up to 2040 to provide staff and bed estimates for each hospital. Functional plans describe the design and use of space within each regional hospital, including specific clinical and support services. Approved structures for the NE and NW regional hospitals list the number of beds per specialty. Missing from all these documents, however, is the perspective of a regional hospital as the apex of an interdependent regional network. Indeed, while the master plans note the fragmentation, lack of integration, ineffectual primary care gatekeeping, and weak community care evident in the regional health systems, no concrete measures are proposed to ameliorate these issues.

The benefits of regional hospitals will not be realized without greater attention to coordination of care (Box 2). Given the severe fragmentation of the health network and weak stewardship on quality of care, there is a substantial risk that the new regional hospitals will exacerbate overreliance on acute care, worsen value for money, and increase inequities. As Cluj, Craiova, and Iaşi county hospitals are currently undertaking a regional hospital role, they represent a tangible counterfactual for the continuation of status quo. In these hospitals, emergency departments are overcrowded with patients who have bypassed primary care. For example, over 100,000 people attended the emergency department of Cluj county hospital in 2015/16. A survey of 600 of these patients found that 83 percent had not seen their family doctor before presentation.[7] Admissions for conditions that could be better managed outside of a hospital will also mean that less resources are available for patients requiring complex care. In 2016, Tiers I and II hospitals treated about half of all low-complexity cases and an estimated 12–18 percent of discharges from these hospitals could have been treated in other settings (World Bank 2018a). Indeed, avoidable admissions are already higher than the national average in the counties containing Craiova and Cluj county hospitals (Ciutan et al. 2016). Similarly, delayed discharges due to lack of rehabilitation or long-term care beds in the region will also prevent appropriate use of the new facilities. For example, there are currently 1,900 such beds in the NE region, less than half the target of 4,639 set out in the regional master plan.

[5] From a low stock in comparison to neighboring countries, Romania has seen marked emigration of health professionals before and after the EU accession. For example, the number of Romanian nurses in EU-15 countries increased from 811 in 2003 to 8,481 in 2007. The ratio of doctors to population has declined more than 30 percentage points in all regions except around Bucharest between 2004 to 2014 (Eurostat). This outward flow has been evident particularly in rural areas and certain specialties.

[6] See https://ec.europa.eu/health/ern_en.

[7] Study conducted by Cluj county emergency department.

Coordination of care can be examined through the prism of regional referral networks. A regional referral network is the organized system through which patients are transferred between providers in a region to receive risk-appropriate care. Well-functioning referral networks indicate strong coordination of care, as well as related concepts such as integration and continuity of care (Box 2). The national strategy recognized the need to establish regional referral networks, as well as to redesign patient pathways, reinforce primary care gatekeeping, and integrate health services in Romania. Proposed measures included the revision of the competence-based classification of hospitals to define new levels and treatment categories, as well as establishment of professional collaboration and technical 'patronage' of hospitals at regional, county, and local levels. Planning for the regional hospitals to date has not encompassed these measures or referral networks in general.

Box 2. Concepts underpinning regional referral networks

Regional referral networks encompass a number of related concepts in service delivery, including the following:

Coordinated care. The deliberate organization of patient care activities between two or more participants (including the patient) involved in a patient's care to facilitate the appropriate delivery of health care services. Organizing care involves the marshalling of personnel and other resources needed to carry out all required patient care activities and is often managed by the exchange of information among participants responsible for different aspects of care (McDonald et al. 2007).

Continuity of care. Continuity of care is concerned with the quality of care over time. For providers in vertically integrated systems of care, the goal is the delivery of a 'seamless service' through integration, coordination, and the sharing of information between different providers (Gulliford, Naithani, and Morgan 2006).

Transmural care. This refers to patient-tailored care provided on the basis of close collaboration and joint responsibility between hospitals and home care, such as long-term care facilities (Temmink et al. 2000).

Shared care. This refers to a model of integrated health care delivery in which the collaboration among practitioners of different disciplines or with different skills and knowledge allows for the delivery of patient health care by the most appropriate health care practitioner. This is often used to describe the coordination of care between primary care teams and hospital teams (Kates et al. 1997)

Integrated care. This refers to a complex service innovation where health and care services are redesigned around people's needs. Integrated care should be viewed as an umbrella term covering a set of broader objectives for delivery of care, including the above concepts (World Bank 2018c)

This report presents a stocktaking of regional referral networks in Romania using hospital activity data, key informant interviews, and literature review. Available data on hospital activity were analyzed to examine the current pattern of referrals in the three regions that will host regional hospitals. Interviews with a wide range of stakeholders were simultaneously carried out to gain insight into factors that can support referral networks at local, regional, and national levels. Recent analyses, both by the World Bank and the EU, were also reviewed to incorporate previous findings and policy lessons.

This report is organized as follows. Section 2 outlines why regional referral networks are essential to the vision of regional hospitals and the analytical approach taken in this report. Section 3 describes the current and planned referral networks in the NE, NW, and SW regions. Section 4 presents the assessment of inter- and intra-facility factors that support regional referral networks. Section 5 draws conclusions and makes short- and medium-term recommendations for relevant stakeholders.

2. The importance of regional referral networks

The new regional hospitals are envisaged to be tertiary referral hospitals providing highly complex care to their region. According to an emergency ordinance[8] passed in early 2018, regional hospitals will be clinical emergency hospitals that should "provide medical assistance for complex medical cases that cannot be solved at the county or municipal level, as well as for all cases in the assigned neighboring counties that cannot be definitively solved at the level of the county hospitals, because of the lack of material and/or human resources or because of the complexity of the case, according to the current protocols" (MOH 2018). Indeed, as a Tier I hospital (see Box 1), a regional hospital should have the "highest level of equipment and medical equipment, as well as human resources; to ensure the provision of highly complex medical services; to ensure health care at the regional level, serving the county population in its administrative-territorial area, as well as other counties".[9]

To implement this vision, the first step is defining a hierarchy of complex care in each specialty area. For each specialty area, there will be many conditions that do not require treatment in a regional hospital. Such conditions can be treated just as well by a specialist team in a secondary hospital as in a tertiary hospital. For patients with certain illnesses or severity levels, however, optimal care requires high-tech equipment, concentration of volume, subspecialist care, or specialist units. For each specialty area, clinicians need to distinguish the conditions that require treatment in the new regional hospitals from less-complex cases that can be treated in lower-level hospitals based on best practice. In this way, risk-appropriate care is delivered across the health system, strengthening quality and efficiency.

Secondary hospitals then need to be able to refer to regional hospitals when more complex care is deemed necessary (forward referral). This hierarchy of complex care in each specialty area will form the basis for referral criteria for each condition that requires treatment in a regional hospital. Clinical representatives need to decide the clinical profile that determines whether a patient remains in a secondary hospital or is transferred to a regional hospital. There should be agreement at both sending (secondary) hospitals and receiving (regional) hospitals that patients meeting these criteria will be referred to and accepted at the regional hospital to support better patient outcomes.

Regional hospitals also need to be able to refer patients back to lower-level facilities for rehabilitation so that capacity is freed up to accept new complex cases (counter referral). After treatment at a regional hospital, patients should be transferred back to the referring facility or an appropriate alternative (for example, chronic care hospital or long-term care) for post-acute care. This maintains capacity at the regional hospital to admit patients requiring complex care from other referring hospitals. It also meets patients' common preferences for local provision of care. Counter-referral criteria then need to be agreed between sending (regional) hospitals and receiving hospitals/facilities so that there is no delay in discharge from regional hospitals.

It is important that mechanisms are in place to preserve capacity for complex care at regional hospitals. Finally, capacity at the regional hospitals must be preserved for patients requiring highly complex care from across the region. To conserve the limited resources at these hospitals and use them as equitably as

[8] Health care reforms are often enacted through these mechanisms, which avoid the need for parliamentary approval of legislation (Vladescu et al. 2016).
[9] MOH Order No. 1408 of 12/11/2010.

possible, tools are needed to minimize admissions of conditions that can be managed at lower-level hospitals or in the community.

In summary, three components critical to the vision of regional hospitals are (a) designing a referral network, (b) operationalizing a referral network, and (c) conserving referral capacity. In the following sections, each of these components is described in more detail, followed by the analytical approach taken in this report.

2.1. Designing a referral network

Referral networks can be based on minimum requirements, which may denote patient or procedure volume, specialist staff, or equipment. Regionalization of complex care[10] concentrates specialist expertise, diagnostic and treatment facilities, and/or number of patients. Referral criteria for patients with particular conditions can therefore be constructed from evidence demonstrating better outcomes in facilities with the appropriate resources.

Some specialty services may be naturally regionalized due to the need for high-cost equipment. The provision of some specialty services is dependent on costly equipment, such as renal dialysis, radiotherapy, or cardiopulmonary bypass machines. Budget constraints often therefore lead to a natural concentration of service delivery. In these cases, the referral network is straightforward to design as all patients requiring these services will be referred to the facility with such equipment.

For other clinical areas, there is strong evidence that practice makes perfect. Many specialty services, particularly technical procedures, show a positive relationship between volume and outcomes of patients. This relationship is present both at an individual physician level (mainly surgeons) and at a facility level. An extensive literature has documented the link between volume and outcome, with a recent World Bank report synthesizing evidence from 37 systematic reviews examining this issue (World Bank 2018d). Evidence of better outcomes with higher volumes was found in bariatric surgery, cardiothoracic surgery, pediatric cardiovascular surgery, renal dialysis, endocrine surgery, gynecological surgery, neurosurgery, orthopedic surgery, cancer surgery, and vascular surgery.

Given this body of evidence, some countries have implemented minimum volume standards. These quality standards stipulate that a hospital or clinician must have a minimum number of procedures or patients per year to continue delivering a procedure/service. If the hospital or clinician does not meet this threshold, they should refer up to higher-volume hospitals. Policies based on minimum volume thresholds have been implemented across a range of health system contexts, including France, Germany, the Netherlands, Latvia, Poland, Belgium, and the United Kingdom. Table 1 presents the current minimum volume standards in place in Poland as an example. Caution with arbitrary use of these thresholds is needed, however, as volume-outcome relationships are unlikely to be exclusively causal but reflective of complementary factors such as training, use of guidelines and clinical audit, and peri-surgical care (World Bank 2018d).

Referral networks can also be based on a combination of equipment, specialist staff, and case severity (Table 2). In some specialist areas, referral networks take a more holistic approach, taking into account the contribution of staff, patient volume, technology, equipment, space, and organizational factors to

[10] Regionalization and centralization are often used synonymously in the literature on volume-outcome relationships and hospital networks.

deliver risk-appropriate care. Areas where this approach is used include neonatal care, critical care, and stroke care. For example, neonatal care is regionalized in many countries, following a general pattern of basic care (Level I), specialty care (Level II), and intensive care (Levels III–IV). Table 2 shows how these levels are defined in the United States of America.

Table 1. Minimum volume standards in Poland

Intervention or procedure	Measurement level (hospital, department/ward, or clinician)	Current minimum volume standard	
		Year	Annual thresholds (in number of cases)
Invasive treatment of acute coronary syndrome	Clinician	2016	300 percutaneous coronary interventions (not annually, ever done) 600 coronarographies (not annually, ever done)
Endovascular treatment of aortic aneurysm of visceral and renal artery	Clinician	2016	100 implantations of stent grafts in patients with aortic aneurysm of thoracic and abdominal artery and 10 implantations of stent grafts into visceral and renal artery (not annually, ever done)
Knee replacement surgery	Hospital	2017	40
Hip replacement surgery	Hospital	2017	60
Knee or hip replacement surgery revision	Hospital	2016	20 within the last 3 years
Upper extremity replantation	Ward	2016	20 including at least 5 replantations and 15 revascularizations

Source: World Bank 2018d.

While the most appropriate approach to designing a referral network will depend on the clinical area, the operationalization of regional referral networks shares common elements. These are described in the next section.

2.2. Operationalizing a regional referral network

Regional referral networks require coordination between all facilities in a network. Coordination can be vertical, such as a county hospital referring a patient to a regional hospital in Romania, or horizontal, such as between regional and Tier IM/IIM specialty hospitals for different types of specialist care.[11] For both types of coordination, there needs to be consensus between clinicians and facilities within a network as to referral and counter-referral criteria, as well as the services to be provided at different facilities. Referrals also require strong communication channels between sending and receiving facilities, such as a picture archiving and communication system (PACS) that can transmit imaging between facilities. At secondary hospitals, there needs to be sufficient specialist, diagnostic, and emergency capacity to assess and stabilize patients if necessary before referral/transfer to regional hospitals. Regional hospitals will require the human, physical, and organizational resources to provide complex care for a region. Coordination on counter referral will enable regional hospitals to discharge patients back to referring hospitals or to community facilities as soon as possible.

[11] Or between health care and different types of care, such as social care.

Table 2. Levels of neonatal care

Level (name)	Care provided
I (Well newborn nursery)	• Provide neonatal resuscitation at every delivery. • Evaluate and provide postnatal care to stable term newborn infants. • Stabilize and provide care for infants born at 35 weeks to 37 weeks gestation who remain physiologically stable. • Stabilize newborn infants who are ill and those born before 35 weeks gestation until transfer to a higher level of care.
II (Special care nursery)	Level I care plus the following: • Provide care for infants born at or after 32 weeks gestation and weighing 1,500 g or more who have physiological immaturity or who are moderately ill with problems that are expected to resolve rapidly and are not anticipated to need subspecialty services on an urgent basis. • Provide care for infants convalescing after intensive care. • Provide mechanical ventilation for brief duration (less than 24 hours) or continuous positive airway pressure or both. • Stabilize infants born before 32 weeks gestation and weighing less than 1,500 g until transfer to a neonatal intensive care facility.
III (Neonatal intensive care unit)	Level II care plus the following: • Provide sustained life support. • Provide comprehensive care for infants born before 32 weeks gestation and weighing less than 1,500 g and infants born at all gestational ages and birth weights with critical illness. • Provide prompt and readily available access to a full range of pediatric medical subspecialists, surgical specialists, anesthesiologists, and ophthalmologists. • Provide a full range of respiratory support that may include conventional and/or high-frequency ventilation and inhaled nitric oxide. • Perform advanced imaging, with interpretation on an urgent basis, including computed tomography, magnetic resonance imaging, and echocardiography.
IV (Regional neonatal intensive care unit)	Level III care plus the following: • The facility is located within an institution with the capability to provide surgical repair of complex congenital or acquired conditions. • Maintain a full range of pediatric medical subspecialists, pediatric surgical subspecialists, and pediatric anesthesiologists at the site. • Facilitate transport and provide outreach education.

Source: American Academy of Pediatrics 2012.

Coordination between facilities can be supported through tools such as regional clinical pathways (Box 3). In settings with poor coordination, it is up to individual clinicians to assess whether their facility is the appropriate setting to treat a particular case, which can lead to substantial variation in patient care pathways and outcomes (World Bank 2018a). Tools developed to support clinician decisions include clinical guidelines, which set out evidence-based recommendations for optimal management across levels of care (including primary and community care). Clinical pathways incorporate guideline recommendations into routine practice through locally agreed care plans. While clinical pathways are commonly used within a single facility, regional clinical pathways can be developed to guide care of

patients across a region. These pathways can be used for elective or emergency care. For example, a regional clinical pathway for patients undergoing hip replacements in Canada outlined the care to be received during four stages in different locations: acute (surgery at regional hospital), post-acute (rehabilitation in local community hospital), community care (outpatient physiotherapy), and ambulatory care (follow-up in surgical outpatient clinic) (Meleskie and Wilson 2004). The use of regional clinical pathways for emergency treatment of stroke in Japan was associated with a reduction in the length of inpatient stay of 7.2 days at an individual level and 9.1 days at a hospital level (Fujino et al. 2014). While the impetus for service reorganization into regional clinical pathways usually comes from the government, early involvement of stakeholders to build consensus is essential to implement such pathways (Kastner et al. 2015; Skrove, Bachmann, and Aarseth 2016).

Box 3. Tools to support regional coordination

Clinical guidelines are systematically developed statements, based on a thorough evaluation of the evidence, to assist clinician and patient decisions about appropriate care for specific conditions or symptoms. National guidelines can be based on international guidelines but usually require adaptation to the country context.

Clinical pathways (also known as care pathways or maps) adapt guidelines to provide standardized, multidisciplinary care plans. These describe essential steps in the care of patients with a specific condition or symptom to obtain optimal outcomes.

Regional clinical pathways (also known as integrated care pathways) set out the care that a patient should receive for a specific condition or symptom across a network of providers, including community, primary, secondary, and tertiary care. These can facilitate transfers of patients between providers and reduce variation in care.

Organizational and payment mechanisms can further support regional coordination. To better provide care along a regional clinical pathway, hospitals can be organized into provider networks. For example, in England, groups of hospitals are organized in hospital trusts: these are semiautonomous organizational units that usually include the equivalent of tertiary hospitals, county hospitals, and local hospitals. Services are commissioned for particular patient populations through contracts between trusts and commissioning groups, rather than individual hospitals. Trusts are at liberty to organize services between their hospitals to gain better value from case-based payments. Where individual facilities are reimbursed for services, selective contracting from payers can support regional clinical pathways. For example, only hospitals undertaking greater than a nationally agreed threshold of a particular procedure could be contracted for this service, encouraging referral from lower-volume facilities. An alternative approach is the use of bundled payments, with which many countries are experimenting to improve coordination of care across providers. These pay a single amount for a 'bundle' of care related to a condition or procedure, across all providers and levels of care, during a specified period (for example, 90 days after first admission). Bundled payments are best suited for conditions or procedures where there are very clear clinical pathways. For example, Ontario province in Canada is trialing bundled payments to cover all care provided to patients along regional clinical pathways for total hip and knee replacements. A funding amount for a care episode is set by the payer, with providers absorbing any excess but dividing any savings.

Regional referral networks require strong quality management. At the heart of regional referral networks is improved quality of care for patients. Operationalizing such networks requires oversight of quality indicators. Regional clinical pathways can be supported through national quality standards. These are definable measures against which to compare existing structures, processes, or outcomes. These can help clarify the functions or services to be provided by different facilities, supporting regional coordination. Regular reporting and monitoring of these standards are essential, which could be carried

out by professional associations or government agencies. For example, in the Netherlands, initial government introduction and regulation of minimum volume thresholds was superseded by quality leadership and management by professional associations (Mesman et al. 2017).

Operationalization of a regional referral network should consider the potential adverse effects on access, equity, and skill maintenance. While concentrating particular health services can improve quality, patient safety, and efficiency, there are also trade-offs. For emergency care that will be concentrated in the new regional hospitals, the increase in transfer time needs to be carefully balanced against potential gains in clinical outcomes. For elective care, travel barriers such as the cost of public transport and/or poor transport infrastructure need to be assessed for patients and their families. For some services, satellite units and visiting specialists (specialist outreach) may need to be implemented to ensure equitable access in rural/remote areas of the region. Maintenance of acute care and procedural skills for specialists in lower-level facilities is also a consideration when regionalizing complex care.

Regionalized services can be operationalized in a 'hub-and-spoke' model (Box 4). To mitigate the potential disadvantages of regionalizing complex care, some countries have experimented with 'hub-and-spoke' service delivery models. Here, patients requiring elective care are initially assessed in a peripheral 'spoke' hospital. Those requiring complex treatment are then referred to a central 'hub' facility, which concentrates a high volume of patients. After treatment, patients are transferred back to the referring facility or an appropriate alternative for rehabilitation, ensuring patients have access to their personal support networks. Specialists work across both types of facilities to avoid skill deterioration and improve emergency cover in the hub facility. An example of this model of care is vascular surgery in England (Box 4).

2.3. Conserving referral capacity

To realize the vision of regional hospitals, it is vital that measures are put in place to protect their referral capacity, that is, the ability to accept referrals of patients requiring complex care. Modern, high-tech hospitals are like new roads: without strong measures to discourage traffic, they will quickly become congested. Under the current conditions of weak primary care and poorly coordinated secondary care, it is likely that regional hospitals will receive many patients who do not require complex care. This will greatly impede the function of regional hospitals, as specialist time will be diverted to low-complexity conditions that could be treated equally well in lower-level facilities. Moreover, emergency departments and inpatient wards will be congested with patients that do not require complex or even hospital care. Overall, this will be highly inefficient, as low-complexity conditions will be treated in high-cost environments (Hensher, Price, and Adomakoh 2006).

The use of regional hospitals for conditions that can be managed better in primary care should be minimized as far as possible. Ambulatory care-sensitive conditions are conditions for which high-quality outpatient (mainly primary) care can prevent the need for inpatient care. Examples are high blood pressure (hypertension), diabetes mellitus, and chronic obstructive pulmonary disease (COPD).[12] Empowering family doctors to provide more active management of such conditions is essential to conserve regional hospital resources for patients who require complex specialist care. Care or patient navigation may also be useful for individuals who tend to bypass primary or community care for emergency care. Care navigators have been defined as those who help assist patients overcome barriers

[12] A condition associated with smoking and characterized by emphysema and chronic bronchitis.

to care and can help guide people in underserved areas or with chronic conditions to the most appropriate health services (Dohan and Schrag 2005).

Box 4. Integrated vascular networks in England

Since 2012, vascular surgery in England has started to be reconfigured into integrated vascular networks. These networks are constructed around a hub hospital that performs high-volume arterial surgery and complex endovascular interventions. Among other requirements, these hubs must (a) undertake a minimum number of 60 abdominal aortic aneurysm and 40 carotid procedures annually (elective and emergency), (b) cover a minimum catchment area of 800,000 people, (c) have an endovascular theatre and vascular laboratory onsite, and (d) provide continuous emergency cover by trained vascular surgeons and interventional radiologists. The pre- and post-procedure care related to these interventions is carried out at the peripheral (spoke) facilities in the networks, including specialist assessment, diagnostics, and rehabilitation. Spoke hospitals also carry out less complex interventions, such as minor amputations or varicose vein procedures. Travel to the hub hospitals is therefore only for a specific intervention, with all other care provided locally as far as possible. Vascular surgeons in the network have operating and on-call commitments both at the hub and spoke hospitals, and trainee surgeons rotate between facilities. Elective and emergency regional clinical pathways from primary care to spoke to hub hospitals and back for rehabilitation are developed for all vascular procedures and supported by all clinicians and facilities in a network. Patients requiring complex surgery from across the network are reviewed at multidisciplinary team meetings. Outcomes of procedures are submitted to a national vascular registry and are regularly reviewed at mortality and morbidity meetings. Usually both the hub and spoke hospitals belong to the same hospital 'trust', which means that services can be arranged optimally between hospitals in exchange for case-based payments.

Source: Vascular Society of Great Britain and Ireland 2015.

Without strong control mechanisms, patients may attend regional hospitals for treatment rather than local hospitals. Regional hospitals will be high-tech hospitals and centers of clinical excellence and are likely to attract patients who would be appropriately treated in a more local hospital. Encouraging patients to follow referral networks and undergo local treatment as much as possible will be important to maintain referral capacity for more complex care. This can be encouraged through mechanisms aimed at patients (for example, higher co-payments for treatment or prescriptions at regional hospitals without referral) and clinicians (review of primary and secondary care referrals).

Appropriate referrals should be maximized through strong communication systems and specialist outreach. In addition to regional clinical pathways, high-functioning communication channels between sending and regional hospitals can improve the quality of referrals to regional hospitals. For example, PACS enables specialists in regional hospitals to assess the appropriateness of complex interventions in a particular case before accepting a referral. Specialist outreach, whereby specialists in regional hospitals provide training to specialists in sending hospitals and family doctors, can help improve the proportion of appropriate referrals.

Counter referrals should be facilitated through discharge planning and sufficient rehabilitation/long-term care capacity. Delayed discharges can often become a bottleneck to accepting new patients at tertiary referral hospitals. As a countermeasure, early planning of a patient's discharge from hospital—including communication with other care providers—has been developed as an approach to coordinate and expedite counter referrals. Discharge planning has been shown to reduce the length of stay and readmission, particularly for elderly patients with medical conditions, and improve patient satisfaction (Goncalves-Bradley et al. 2016; Wariyapola et al. 2016). However, discharge planning cannot overcome insufficient capacity for rehabilitation and/or long-term care in a region.

2.4. Analytical approach

In conclusion, regional referral networks are supported by a number of inter- and intra-facility factors (Table 3). The factors presented in Table 3 are not an exhaustive list but rather represent the most salient aspects of this issue in the Romanian context.

Table 3. Factors to support regional referral networks

<table>
<tr><td colspan="4">Inter-facility factors</td></tr>
<tr><td colspan="4">Regional clinical pathways</td></tr>
<tr><td colspan="4">Supportive organizational and payment mechanisms</td></tr>
<tr><td colspan="4">Quality management</td></tr>
<tr><td colspan="4">Patient adherence to referral network</td></tr>
<tr><td colspan="4">Communication systems</td></tr>
<tr><td colspan="4">Patient transfer capacity</td></tr>
<tr><td colspan="4">Accessible transport</td></tr>
<tr><td colspan="4">Regional cooperation forum</td></tr>
<tr><td colspan="4">Intra-facility factors by level of care</td></tr>
<tr><td>Tertiary care</td><td>Secondary care</td><td>Primary care</td><td>Community care</td></tr>
<tr><td>Capacity to provide highly complex care</td><td>Capacity for specialist assessment and follow-up</td><td>Management of ambulatory care-sensitive conditions</td><td>Care/patient navigation</td></tr>
<tr><td></td><td>Sufficient rehabilitation capacity</td><td></td><td>Sufficient long-term care capacity</td></tr>
<tr><td></td><td colspan="2">Specialist outreach</td><td></td></tr>
<tr><td colspan="2">Discharge planning</td><td></td><td></td></tr>
</table>

This report assesses the extent to which these factors are in place in Romania using tracer conditions (Table 4). Tracer conditions are common health problems aligned to the country context, for which optimal management involves multiple providers and levels of care. Analysis of qualitative and quantitative data on these conditions makes it possible to identify weaknesses in components of the health system that may require reform (Kessner, Kalk, and Singer 1973). For this analysis, tracer conditions were selected that would shed light on the components of referral networks outlined previously (Table 4). Hospital activity data for these tracer conditions were examined with the help of the National School of Public Health, Management and Professional Development (NSPHMPDB) in the NW, NE, and SW regions (see Appendix 2). Reliable data were not obtainable for other tracer conditions initially included in the analysis, including abdominal aortic aneurysms repair.

Interviews were also carried out with key stakeholders at local, regional, and national levels. These included representatives of the MOH, Ministry of Internal Affairs (MOI), county hospitals, county councils, and territorial administrative units. Relevant MOH specialty commissions were also consulted, including the Cardiology Commission, Cardiovascular Surgery Commission, Neurology Commission, Neonatology Commission, and Family Medicine Commission.

The next section presents a descriptive analysis of the current and future referral networks in the NE, NW, and SW regions.

Table 4. Tracer conditions selected for this analysis and associated referral network components

Tracer condition	Specialty/clinical area	Referral network components
Percutaneous coronary intervention (PCI)	Interventional cardiology	Design and operationalization (evidence for hospital and physician volume-outcome relationship and access considerations due to high mortality)
Coronary artery bypass graft (CABG)	Cardiovascular surgery[a]	Operationalization (high-cost equipment)
Stroke (cerebrovascular accident, CVA)	Emergency stroke care (emergency medicine, neurology, and neurosurgery)	Operationalization (regional clinical pathway and access considerations due to high mortality)
Total knee replacement	Orthopedic surgery	Design (evidence of surgeon volume-outcome relationship)
Premature infants	Neonatal intensive care	Design and operationalization (commonly regionalized service)
High blood pressure (primary hypertension)	Primary care	Conserving capacity (ambulatory care-sensitive condition)

Note: [a]The specialty in Romania that undertakes both vascular and cardiothoracic surgery.

3. Current and future regional referral networks

This section uses the most recent available hospital activity data to examine current and future referral networks. These can be inferred from the catchment areas of the current county regional hospitals, as well as the location of treatment for selected tracer conditions.

3.1. Catchment areas of regional hospitals

Catchment areas of county regional hospitals indicate that the catchment area for the NW regional hospital is likely to extend beyond the region (Figure 4). In 2014, 17 percent of patients admitted to Cluj county regional hospital lived in counties outside the region, primarily Arad and Hunedoara counties. In comparison, extraregional admissions to Iaşi county regional hospital was just 3 percent and just 1 percent for Craiova county regional hospital. As there is no timeline for the construction of a regional hospital in the West region, this flow of patients is likely to remain the same or increase after the construction of the NW regional hospital. Therefore, facilities in Arad and Hunedoara should be considered as part of the NW regional network.

These de facto catchment areas also raise concerns over regional hospitals taking over county emergency functions. When admissions by patients' county of residence are examined, around two-thirds of admissions are from the home county for Iaşi and Cluj county regional hospitals, and nearly four-fifths for Craiova. This indicates that county regional hospitals are primarily fulfilling a county emergency hospital role, with more limited intercounty support. While the greater provision of complex care is likely to increase the proportion of referrals from surrounding counties, taking over the county emergency function may limit the capacity of regional hospitals to accept such referrals.

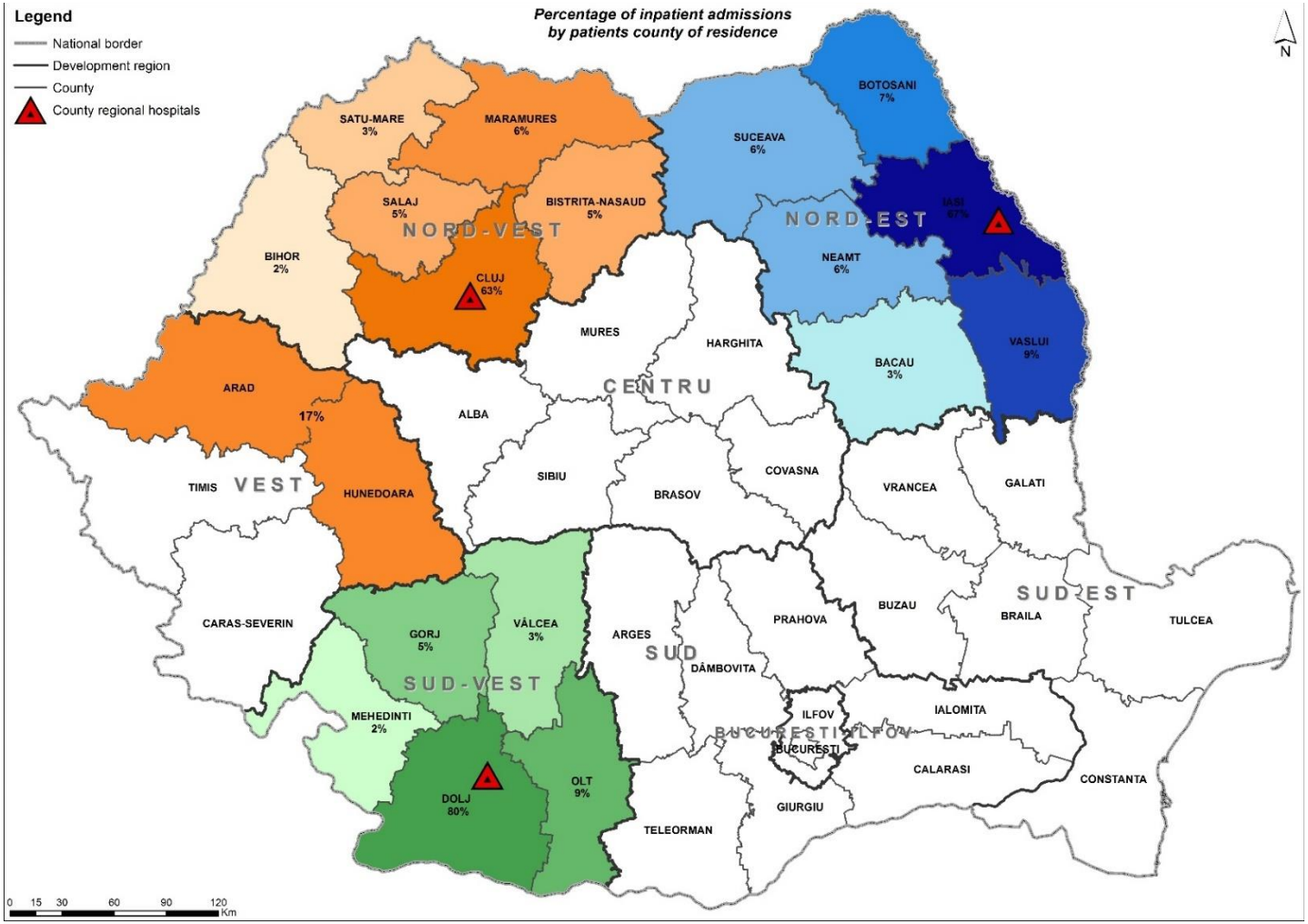
Many residents are being treated at hospitals in Bucharest rather than county regional hospitals. In total, 13 percent of NW residents, 21 percent of NE residents, and 24 percent of SW residents requiring hospital care in 2016 were treated outside the region. In 2014, 21,065 residents of the NE region were admitted in Bucharest hospitals compared to 47,021 at Iaşi county regional hospital, and 36,771 SW residents were admitted to Bucharest hospitals compared to 62,123 at Craiova county regional hospital (European Investment Bank and PLANET 2017). This may be due to patient or clinician bypass of services at county regional hospitals. The greater availability of complex care in regional hospitals is likely to lessen this flow; however, the magnitude of extraregional care also indicates the poor functioning of the regional referral networks.

3.2. Current referral networks

Data to examine referral patterns were not available, limiting the conclusions that can be drawn. Data on referrals at the level of providers were not available. These meant that the flow of referrals and counter referrals between acute care levels (that is, local to county to county regional to national hospitals) could not be examined for this report.

Conclusions are instead drawn from the geographical pattern of admissions for selected tracer conditions. Many of the selected tracer conditions show a volume-outcome relationship, with care for these conditions regionalized in many other countries. If clinicians are treating small numbers of patients with these conditions in lower-level hospitals rather than referring them to higher-level or specialty

Figure 4. Admissions to county regional hospitals by patients' county of residence



Source: European Investment Bank and PLANET 2017.

Note: 2014 data. Orange = admissions to Cluj county regional hospital, Green = admissions to Dolj county regional hospital, Blue = admissions to Iaşi county regional hospital. Extraregional admissions for Cluj regional hospital are predominantly from counties shown.

hospitals, this indicates that regional referral networks need to be strengthened to provide optimal care and fulfil the function of regional hospitals.

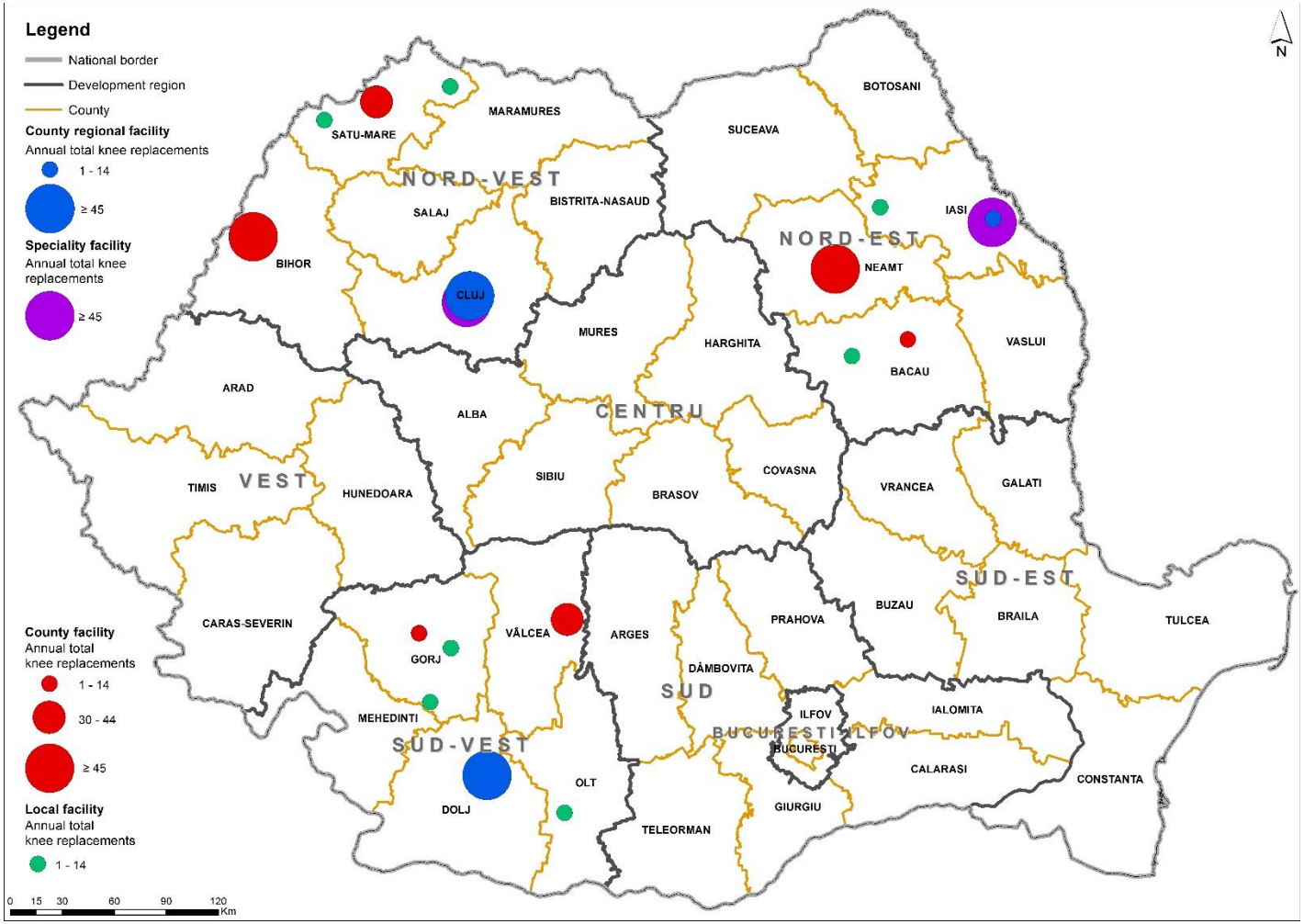
The distribution of total knee replacements indicates that referral networks for complex procedures not dependent on specialist equipment are weak. A total knee replacement is an elective operation that replaces both sides of the knee joint with artificial protheses. As there is good evidence of a relationship between higher volume and better postoperative outcomes, many countries have implemented minimum volume standards. For example, in Poland, hospitals are required to undertake at least 40 procedures per year. Figure 5 shows the volume and type of facility carrying out total knee replacements in the NE, NW, and SW regions. In all three regions, the procedure is being undertaken in local hospitals in small numbers, instead of referral to higher-level hospitals. Some county hospitals are undertaking less than 40 procedures per year, whereas others are undertaking more than double that volume. Six facilities (all Tiers I–III) were undertaking 80 to 100 procedures per year. Coordination tools such as clinical guidelines, regional clinical pathways, and quality standards developed and implemented by clinicians would support referral from currently low-volume facilities.

The distribution of stroke management indicates that stronger regional coordination is needed to improve outcomes. Discharges where the primary diagnosis was stroke (ischemic, hemorrhagic, and non-specified) were examined across facilities in the NE, NW, and SW regions for 2013 to 2015. On average, 87 facilities admitted at least five cases of stroke over this period. Of these, 14 treated more than 2,000 patients and 38 treated less than 100 patients on average (Figure 6). These findings should be taken cautiously, as the total number of cases of stroke was over 45,000, which appears high for only three regions of Romania (2015 estimated incidence was 191 strokes per 100,000 population, that is, 61,552 strokes). Given the wide distribution of stroke care and likely variation in outcomes, coordination of stroke care in Romania as a regional network is essential. International evidence shows that early treatment to remove clots in blood vessels to the brain and multidisciplinary care in a dedicated stroke unit can reduce mortality, dependency, and treatment costs (Hunter et al. 2013; Morris et al. 2014). Several countries have started regionalizing acute stroke services to improve the provision of effective care, with primary care centers providing emergency and early acute treatment before transfer to local centers for further treatment and rehabilitation (Box 5) (Morris et al. 2014). Those facilities currently treating a very high volume of patients in each region as shown in Figure 6 could be designated as primary stroke centers, with the remaining facilities acting as local stroke centers.

Box 5. Centralization of acute stroke care in Greater Manchester and London, U.K.

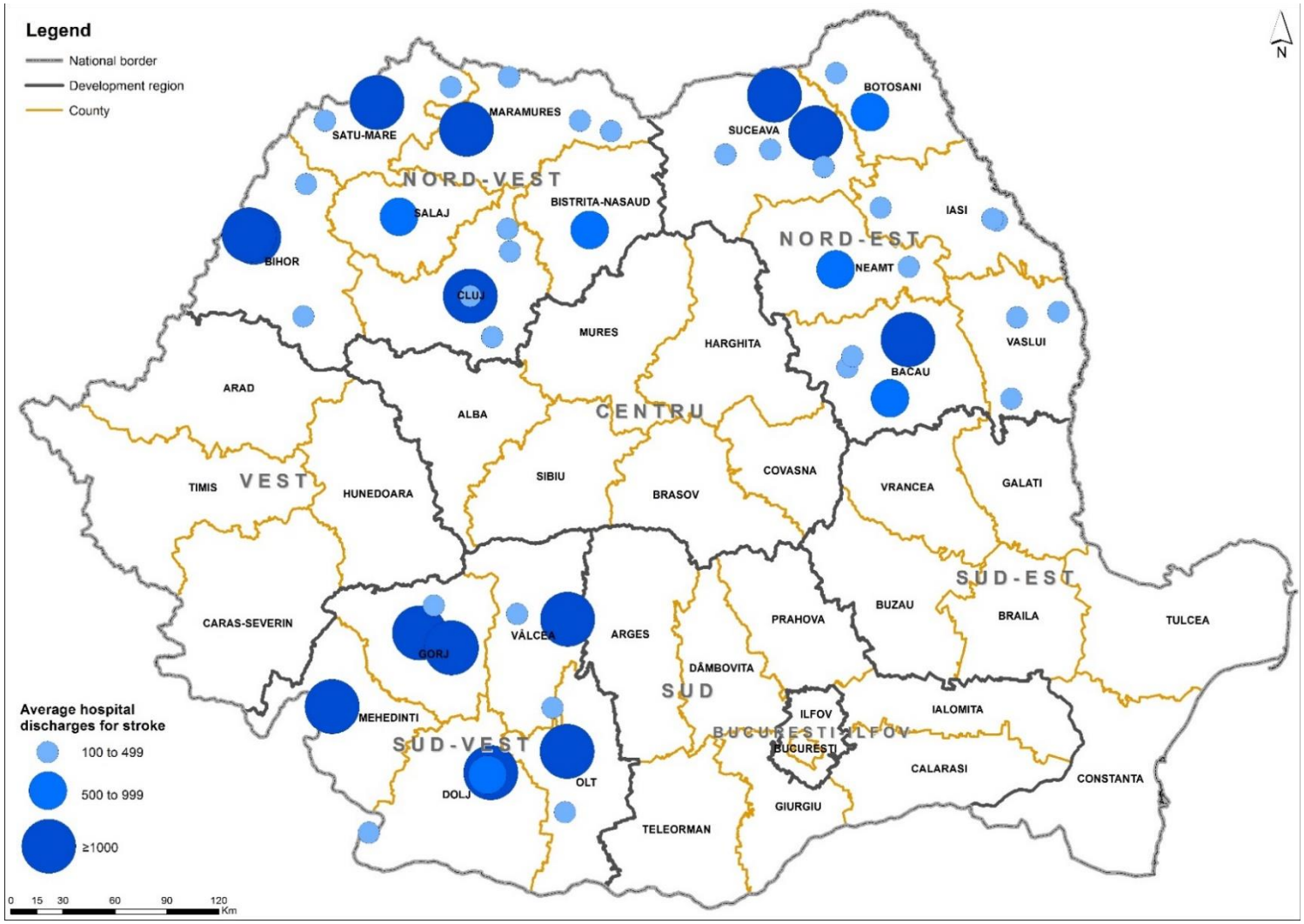
Before the centralization of acute stroke services in both Greater Manchester and London, patients with suspected stroke were taken to the nearest emergency department to receive stroke care. They were then sent to either an acute stroke unit or a regular hospital ward for treatment before being discharged for community rehabilitation. After the reorganization in Greater Manchester, patients presenting within four hours of developing stroke symptoms are sent to the comprehensive stroke center or a primary stroke center for hyperacute care. Once stable, they are repatriated to a district stroke center, a nursing home, or their own home for community rehabilitation. Patients presenting outside the four-hour window are taken to the nearest district stroke center, receiving similar treatment to that provided before the reorganization. After the reorganization in London, patients presenting with stroke symptoms at any time are taken to a hyperacute stroke unit for assessment and treatment, then repatriated to a stroke unit, to a nursing home, or to their own home for community rehabilitation. Analysis has found that while the length of stay significantly decreased in both models compared to precentralization, risk-adjusted mortality at 3, 30, and 90 days after admission was significantly reduced only in London. *Source:* Morris et al. 2014.

Figure 5. Total knee replacements in NE, NW, and SW regions by type of facility



Source: NSPHMPDB.
Note: 2015 data, includes both unilateral and bilateral total knee replacements.

Figure 6. Average hospital discharges for stroke in NE, NW, and SW regions



Source: NSPHMPDB.
Note: Three-year rolling average, 2013 to 2015 data. Only facilities discharging at least 100 patients annually on average shown.

The distribution of facilities treating ischemic heart disease suggests stronger referral networks for procedures requiring specialist equipment, although increased volume and access are needed to tackle this leading cause of death. Ischemic heart disease is due to blockages in the arteries supplying the heart with oxygen, which can manifest as stable angina through to heart attacks. It can be treated with surgery to replace the blocked coronary arteries with clear vessels from the legs (coronary artery bypass graft, CABG) or insertion of a catheter through the skin to open up blocked vessels using a balloon or mesh (percutaneous coronary intervention, PCI). When PCI is carried out to treat a heart attack, it is referred to as primary PCI, which should be undertaken as soon as possible after symptom onset. Both CABG and PCI procedures may require specialized equipment: cardiopulmonary bypass machines for the former and dedicated angiography suites (also known as cath labs) for the latter. Likely due to this, provision of these procedures is undertaken in only six facilities covering the NE and NW regions (Table 5). No facilities undertake these procedures (in substantial numbers) in the SW region. While CABG are sufficiently concentrated in the NE and NW regions, efforts should be made to increase volume at PCI centers as part of the regional network reconfiguration, given population needs and a volume-outcome relationship. The target set by the PCI network (see Table 5) for acceptance into the primary PCI program is at least 200 procedures per year, which is met by all centers except Suceava and Baia Mare. The regional master plans propose strengthening of these PCI centers, with a further center planned in Bacau county.[13] The rationale for the location of these centers is not laid out, which is important as the time taken from call to emergency services to starting PCI (call-to-balloon time) has been shown to affect outcomes after heart attacks. Given population needs, equity in access to primary PCI is extremely important to prevent widening inequalities in cardiovascular mortality.

Table 5. Facilities undertaking interventions for ischemic heart disease in NW and NE regions

Region	County	Type of hospital	Average number of primary PCI per year	Average number of total PCI per year	Average number of CABG per year
NE	Iaşi	Specialty	732	1,300	516
NE	Suceava	County	190	206	—
NE	Bacau	County	Planned	Planned	—
NW	Cluj-Napoca	Specialty	415	466	508
NW	Cluj-Napoca	County regional	277	421	—
NW	Oradea	County	265	375	—
NW	Baia Mare	County	90	113	—

Source: NSPHMPDB.
Note: All values are three-year rolling averages, 2014 to 2016 data.

3.3. Future referral networks

According to the regional master plans, the acute care network in each region will have five levels: regional hub, second regional hub, county, local and subreferral, and local. The current hospital network (Figure 7) can be compared with the future hospital network (Figure 8) outlined in the draft regional master plans. The regional hospitals will replace the current county regional hospitals and take over the county hospital function for their home county. The other county hospitals will function as emergency hospitals for their counties, offering advanced medical and surgical care including intensive care capacity, as well as expanded ambulatory care. The NE and NW regions will each have one county hospital designated as a second regional hub. These second hubs will also provide tertiary specialist care, for

[13] The draft master plan for SW region did not mention any PCI centers.

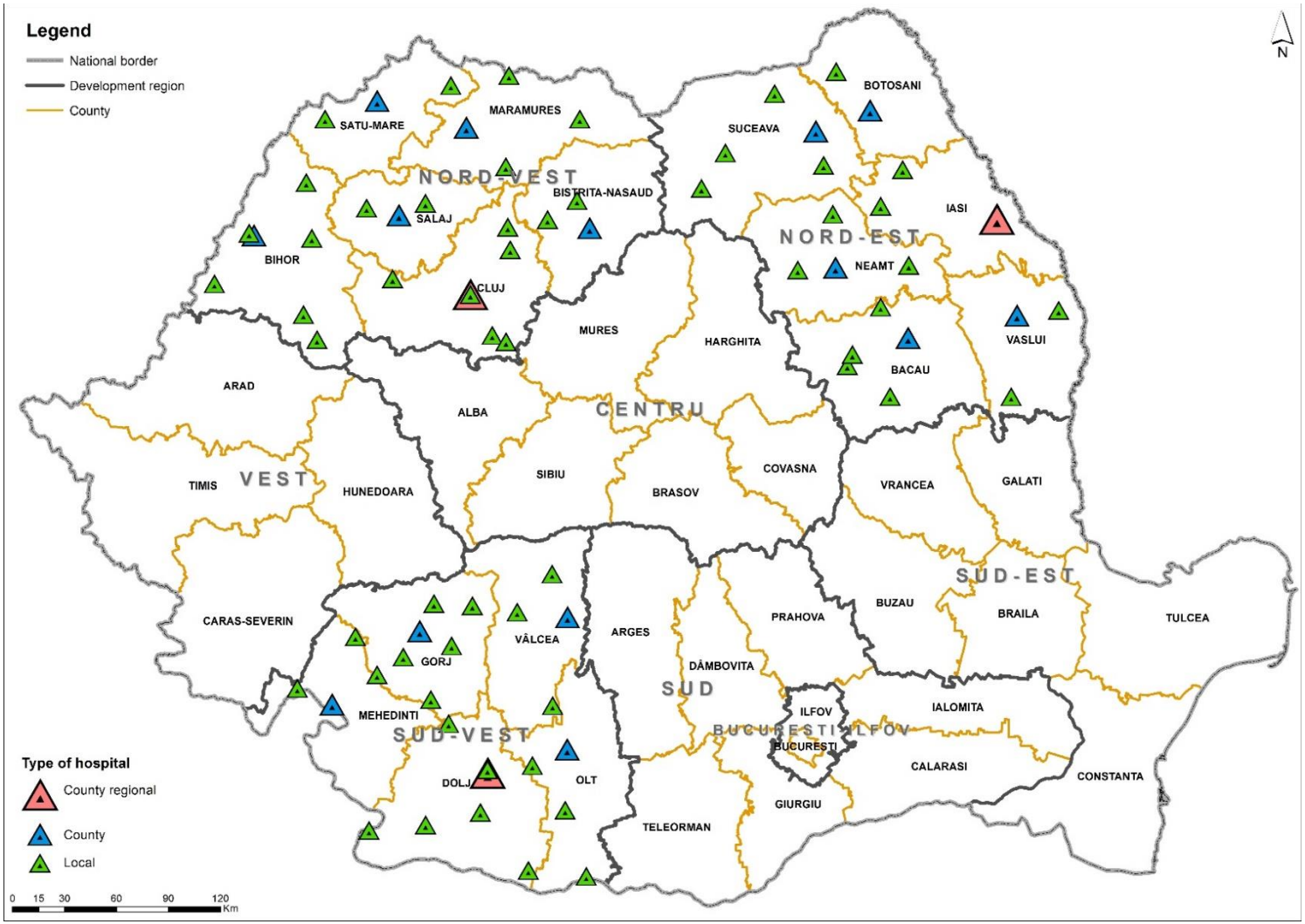
example, radiotherapy, interventional cardiology, and stroke management. Local hospitals in towns and municipalities will continue to serve their communities, offering basic inpatient care, basic diagnostic capacity, and more ambulatory services. Some of these local hospitals will be subreferral hospitals, presumably to improve access to specialist care in more remote areas of the county. Others will be reconfigured for purposes such as long-term care.

The new regional hospitals will act as the hub for a region; however, the referral system for lower-level hospitals is unclear. According to the regional master plans, regional hospitals are expected to become a hub for the hospital network in each region. The direction of referrals for lower-level hospitals is not set out explicitly in these plans, however, nor the specific specialty services to be provided at these hospital levels. For an efficient referral network, local hospitals would refer to their county hospital, and county hospitals would refer to the regional hospital. The location of the second regional hubs in the NW and NE regions seems sensible from an access point of view; however, it is not clear how care will be coordinated between these secondary hubs and the regional hospitals. Further, the catchment area and function of subreferral local hospitals are not clear from the regional master plans. In general, there appears to be overprovision of local hospitals in the future network.

Horizontal coordination with existing specialty institutes is also not explicit in the regional master plans. Several specialty institutes will be retained in the future hospital network, alongside the new regional hospitals. For example, in Cluj, the specialty cardiovascular institute will be absorbed into the new regional hospital. In Iaşi, however, the specialty cardiovascular institute will remain in place, despite the approved structure for the new hospital having 42 cardiology beds, 20 thoracic surgery beds, and 17 cardiovascular beds in its chest center. It is unclear how complex care and human resources will be divided between the two facilities.

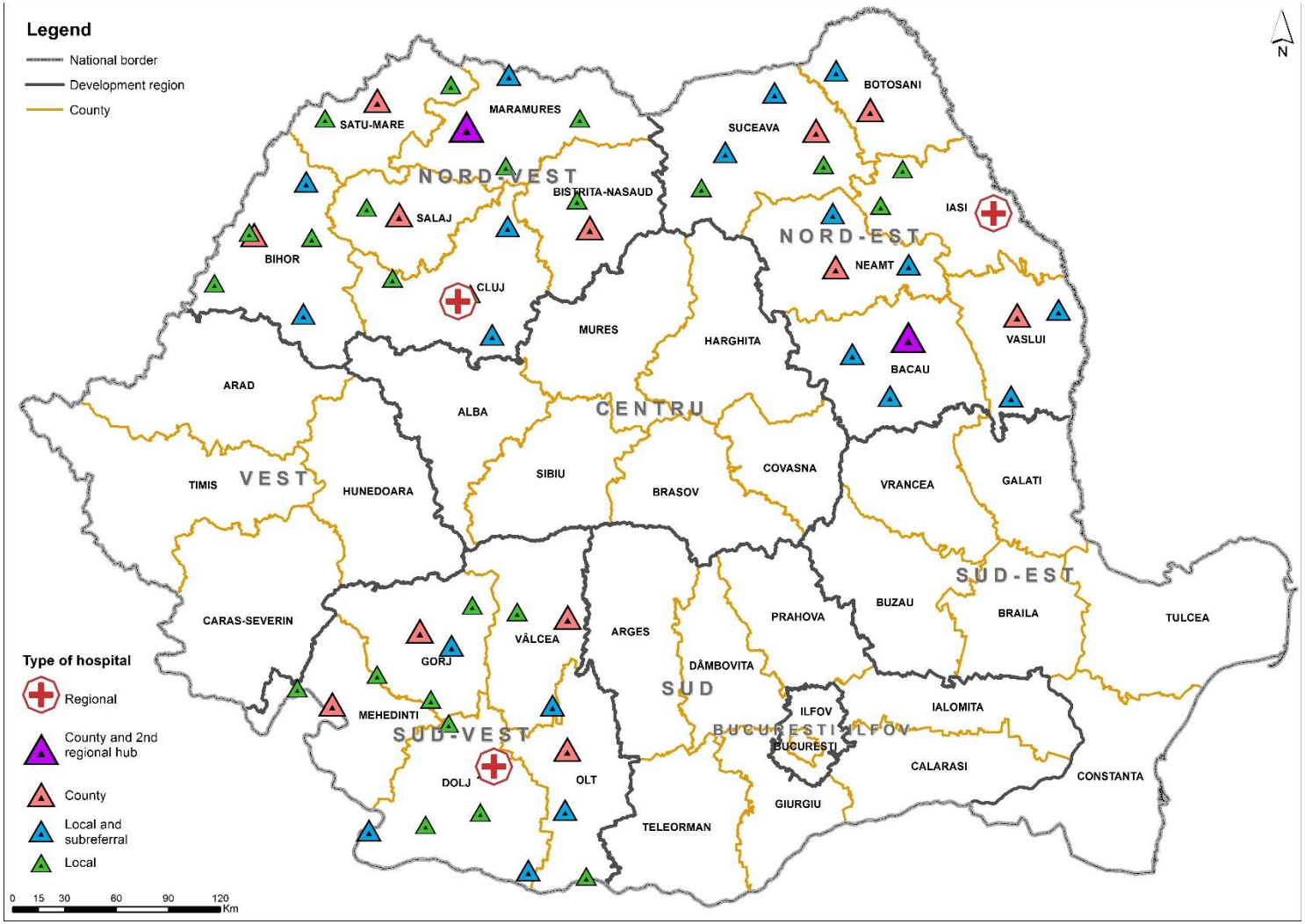
The next section assesses the extent to which factors supportive of regional referral networks are in place in Romania, as well as recommendations to strengthen regional referral networks.

Figure 7. Current hospital network in NE, NW, and SW regions



Source: Draft regional master plans, MOH, 2018.
Note: Only public general hospitals providing acute inpatient care included for clarity. Private, specialty, and Tier IV/V hospitals not shown.

Figure 8. Future hospital network in NE, NW, and SW regions



Source: Draft regional master plans, MOH, 2018.
Note: Only public general hospitals providing acute inpatient care included for clarity. Private, specialty, and Tier IV/V hospitals not shown.

4. Factors supporting regional referral networks

4.1. Interfacility factors

Factors that connect different facilities are as, or even more, important to strong referral networks as conditions within facilities. These factors include

- Regional clinical pathways,
- Quality management,
- Supportive organizational and payment mechanisms,
- Patient adherence to referral network,
- Communication systems,
- Patient transfer capacity,
- Accessible transport, and
- Regional coordination forum.

This section assesses each of these factors in turn.

4.1.1. Regional clinical pathways

Regional clinical pathways based on national guidelines can support patients receiving high-quality care at the appropriate level. These pathways are particularly useful for emergency or elective conditions where there is evidence that time to treatment or particular service settings can improve quality and efficiency outcomes. While national guidelines have been produced by the MOH Specialty Commissions, these tend to be taken verbatim from European professional association guidelines. The lack of adaptation to the Romanian context limits the uptake of guidelines by clinicians not involved in their development.

Only one such pathway was identified in Romania, with maternal and neonatal care organized according to a formal regional clinical pathway (Box 6). Regional specialist networks to improve maternal and neonatal health were established in the early 2000s (MOH 2002, 2006b). Departments are designated as Level I, II, or III based on available equipment and human resources, with referral from Levels I and II to the regional center for the most complex care. Conditions requiring forward referral are listed for neonatology, as well as service specifications for transfers. Neonatology representatives felt that factors enabling the implementation of this system included the later establishment of this specialty in Romania (from the 1990s onward) and well-established international norms. This meant that this specialty has a different path dependency to other specialties in Romania, with fewer cultural and logistical barriers to cooperation across facilities. As part of technical assistance under the last World Bank project, mapping of existing maternal and neonatal care units was undertaken with the help of international partners. Classification of units was then undertaken with the objective of ensuring equitable regional distribution for each level of care. The allocation of levels to units was based on clear criteria such as number of births or distance to the unit. The national network and referral criteria were laid out in a detailed operational manual. An analysis of training and other human resource needs enabled training and quality improvement programs to be implemented alongside investment in the network infrastructure.

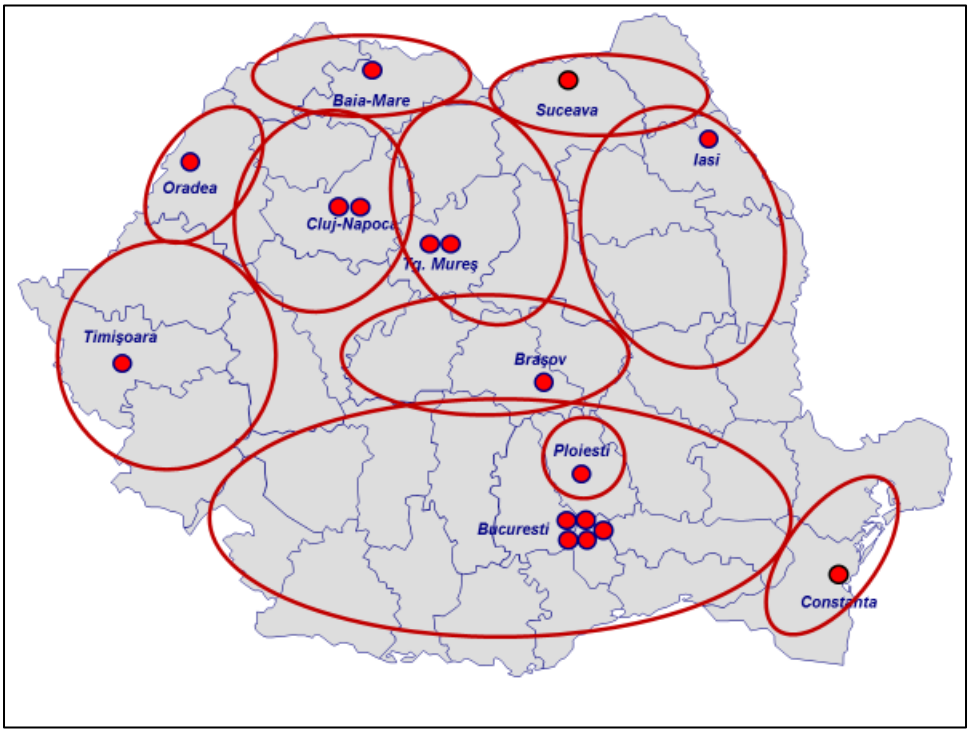
Box 6. Regional obstetrical and neonatal care network in Romania

The regional network is organized in a defined geographic area, where there are about 15,000 to 20,000 births per year (several counties around a third-level regional center). The regional network is the geographical structure organized on three levels of competency of the specialized units to provide the most appropriate care to the pregnant woman and the newborn. The network includes a Level III Regional Center that provides care for the most difficult cases and several Level II and I units. Medical care of the pregnant women and newborns will respect the principle of regionalization and transfer of high-risk cases to a higher level of specialized health care, depending on the level of competency of each department, thus ensuring access for all pregnant women and newborn to a medical care according to the case. According to their severity, the cases are transferred from Levels I and II to the Level III Regional Center. The Regional Center will decide on the appropriateness of the transfer. On the basis of the patient's condition, the Regional Center may decide to transport from Level I to Level II if the transport is carried out through its own neonatal transport unit or by the county ambulance service. The transfer of the pregnant or newborn at risk will always be based on the severity of the case and appropriateness of the receiving unit, which may be based in another region.

Source: MOH 2006b.

Emergency treatment of heart attacks is organized in a national network (Figure 9). A PCI network in Romania was established in 2010, with 17 cath labs established to date. Prehospital telemedicine centers (see Figure 9) direct ambulances with eligible patients to the nearest duty hospital with PCI capacity. According to analysis by the cardiology specialty association, 65 percent of heart attacks (acute myocardial infarctions) are now treated in cath labs, compared to 25 percent in 2010. While residents in the NW region have good coverage with PCI centers, NE and SW residents have to travel further to access PCI, which can affect outcomes after heart attacks. A national audit in 2015 showed that the average call-to-balloon time was 456 minutes (standard deviation 280 minutes), that is, more than seven hours.

Figure 9. National PCI network



Source: Dragos Vinereanu, University of Medicine and Pharmacy Carol Davila, Bucharest.
Note: PCI centers represented by filled red circle, with larger unfilled circle indicating associated catchment area.

Progress on the proposed stroke regional clinical pathways is essential as stroke is a leading cause of death and disability in Romania. Regional clinical pathways are proposed for stroke management in the regional master plans. These will be developed by a special commission or working group with representatives from all counties in a region. The pathways will encompass prevention, diagnosis, management, and rehabilitation of stroke and precursor conditions. The regional hospitals will offer a neurovascular and stroke service, with identification of units in each county that can provide emergency computed tomography (CT) scans and telemedicine. Protocols for facility care and transfers will be developed, along with a stroke rehabilitation organization. If regional hospitals are to be the primary stroke centers, then comprehensive regional clinical pathways are required to guide clinicians' decisions on care.

The successful implementation of the regional clinical pathways requires monitoring and quality improvement. One of the indications for transfer to Level III regional centers is premature infants born before 32 weeks. Ideally, such high-risk pregnancies will be identified early and the expectant mothers will be transferred from Level I/II units to the regional center before delivery. When admissions of such cases are examined, it can be seen that several Level I and II units are treating such cases rather than transferring them before delivery to regional centers (Table 6). Even with a well-developed pathway and a cohesive community of clinicians, referral networks require strong quality management to ensure risk-appropriate care.

Table 6. Facilities treating very low birth weight infants, 2011–2015

Region	County	Level of neonatal care	Cases of premature infants born before 32 weeks
SW	Olt	I	16
NE	Bacau	II	8
SW	Dolj	II	5
NW	Salaj	II	9
NE	Vaslui	II	6
NW	Bihor	III	41
NW	Cluj	III	28
NE	Suceava	III	49

Source: NSPHMPDB database.
Note: 2015 data. Facilities treating less than five cases not shown due to patient confidentiality and possibility of miscoding.

Regional clinical pathways need to take into account travel time and transfer capacity. A barrier to neonatal transfers may be ambulance capacity. Although the regional network should be organized so that the regional center can be reached within two hours from surrounding Level I/II units, travel times based on road conditions were not taken into account during network development. Moreover, many Level III centers are situated in county or local hospitals that do not have a full emergency department and associated ambulance resources like county regional hospitals. As described in Section 4.1.6, the lack of alignment between neonatal care networks and local ambulance services leads to inefficiencies and delays in transfers. It was also reported that the lack of dedicated transport teams leads to staffing problems on neonatal wards. Future regional clinical pathways should take into account travel times between facilities (see Section 4.1.7), with transfer capacity as an integral component of pathway mapping. This should include the mapping of ambulance response times to ensure equity of provision across rural and urban areas.

Recommendations

- Develop regional clinical pathways for all conditions where complex care may be centralized at the regional hospitals (for example, stroke, arterial surgery, trauma), taking into account travel times and capacity for transfers between facilities.
- Audit adherence to neonatal intensive care regional clinical pathway and implement quality improvement measures.
- Expand PCI capacity and volume in NE and NW regions and establish PCI centers in SW region to reduce call-to-balloon time for SW residents.

4.1.2. Quality management

Operationalization of referral networks is undermined by weak stewardship on quality of care. As described earlier, the implementation of referral criteria and/or regional clinical pathways requires monitoring and performance management. To date, no stakeholder has taken a strong role in quality stewardship in Romania. Quality standards issued by the MOH have focused on structural indicators, such as staffing or equipment norms, rather than performance indicators. Despite multiple contracts with each facility, the NHIH employs service and reimbursement caps to control its budget rather than selective contracting or pay-for-performance (World Bank 2018a). Very few professional associations have taken the lead in setting process or outcome indicators for clinicians or units to drive up quality, as well as monitoring outcomes through registries.

The quality of health data impedes the monitoring of referral networks. The recent World Bank public financing review of the health sector made the following conclusions on the strength of health data in Romania: (a) Data on services, payments, patients, and providers are collected and processed separately by various institutions; (b) Integration across institutional databases is difficult as there is no standardized coding system for service providers or disease classification; (c) Little data on clinical outcomes are available as registries are underdeveloped; (d) Data from parallel health providers (for example, military hospitals) are not reported to national databases.; (e) Data on services received by beneficiaries are not available; (f) Little data exist on patient experiences (World Bank 2018a).

A new quality agency offers an opportunity to strengthen referral networks. The ANMCS is currently responsible for hospital accreditation and plans to extend its scope to primary care and other health care providers. Clinical (technical) audit or performance indicators do not currently form part of accreditation, but a quality assurance strategy and health professional training in quality improvement are planned for the future. A stronger mandate and more resources would strengthen the agency's role in the quality management of referral networks.

Recommendations

- Develop quality standards based on national guidelines and/or regional clinical pathways.
- Support implementation of these quality standards through selective purchasing, pay-for-performance and incorporation into accreditation.
- Encourage clinicians to audit and submit outcomes to registries as part of continuous professional development.
- Establish a unified national health care database with publicly available aggregated data, complemented by regular population-based surveys of health needs and patient experiences.

4.1.3. Supportive organizational and payment mechanisms

Collaboration agreements for emergency transfers provide a foundation for regional networks, which could be brought together under one organizational entity. According to a ministerial order issued in 2006, each facility with a level of II, III, or IV requires a collaboration agreement with its nearest county regional hospital (Ministry of Health 2006a). This collaboration agreement then guides the transfers of patients requiring emergency treatment between these hospitals. In practice, however, it was reported that the pressure on specialist beds at county regional hospitals and financial penalties (see Section 4.1.6) makes transfers increasingly difficult. Moreover, lower-tier hospitals can hold collaboration agreements with several county regional hospitals, making the referral network unclear. Finally, the ministerial order covers forward referral of emergency patients, but not counter referral when the patient has been stabilized at the county regional hospital. This system of collaboration agreements could be reviewed and elaborated further by the MOH to support referrals and counter referrals within the future networks as set out in the regional master plans. Building on previous proposals to transform hospitals into foundations, regional networks (based around regional hospitals and subregional hubs) could be brought together into one structural entity (Vladescu et al. 2016). This would enable flexibility in the organization of human, physical, and financial resources across sites.

Current payment mechanisms discourage appropriate inpatient referrals and counter referrals. According to the Framework Contract signed between the NHIH and hospitals, facilities accepting nonemergency transfers of patients for the same type of care (that is, acute, acute or chronic, or chronic) will be reimbursed at only 10 percent of tariff for that case (Government of Romania 2018). Moreover, the sending hospitals are required to provide transportation for nonemergency transfer using hospital vehicles or private contractors. Due to these disincentives, transfers are either not made or patients are classified as emergency rather than elective to avoid supplementary costs. In the future, a trial of bundled payments across regional provider networks could be considered for selected conditions, such as stroke or total knee replacement.

Recommendations

- Revise and elaborate collaboration agreements for referrals and counter referrals according to regional master plans.
- Consider bringing regional networks together as one organizational entity.
- Consider bundled payments for selected conditions/procedures after the development of regional clinical pathways.

4.1.4. Patient adherence to referral network

While payment mechanisms will be important to support referrals of patients between facilities, patient-level mechanisms will also be required to encourage adherence to regional referral networks. Patients in Romania have the right to attend any provider for treatment, meaning that patients often bypass local county or county regional hospitals in favor of tertiary hospitals. Indeed, one in six patients in Romania travels for treatment to hospitals outside their county of residence (particularly in Bucharest), even for low-complexity conditions (World Bank 2018a). The new regional hospitals are likely to attract some of these patients in the future; however, mechanisms to encourage treatment at the appropriate level of hospital will be important to maintain referral capacity.

Co-payments could be designed to encourage adherence to regional networks. To discourage bypassing of primary care, a tiered co-payment system could be introduced for prescriptions. Prescriptions issued in hospital emergency or outpatient care could be subject to higher co-payments than those issued by family doctors. The prescription authority of family doctors may need to be revised to support this approach (see Section 4.2.6). Pharmaceutical co-payments could also be titrated by hospital level, with greater co-payments for prescriptions from higher-level facilities (World Bank 2018a). These charges should be waived if patients have a referral from a family doctor and means-tested for those on low incomes. Hospitals have been charging a small (less than €3) co-payment for admissions since 2013. This could be increased for patients seeking extra-regional care, to a level where it creates a disincentive to bypass regional networks (if appropriate specialist care is available within that network). Patients attending emergency departments with a family doctor referral or from the facility's catchment area could also be fast-tracked ahead of those attending for nonurgent care or outside the catchment area, with an explanation of the rationale (Hensher, Price, and Adomakoh 2006).

A bolder intervention would be to restrict prescriptions in the benefits package to family doctors. For example, primary care reforms in Croatia restricted prescription of medicines in the outpatient benefit package to general practitioners (GPs). Specialists in the U.K. do not prescribe medications for patients, but instead recommend new medications or changes to current medications in their outpatient or discharge letters to GPs, who then prescribe the recommended medications for patients. Emergency departments can issue prescriptions, but only for a few days, forcing patients to return to their GPs for longer prescriptions. In this way, GPs hold an overall list of prescribed medications for that patient, reducing bypassing of primary care and coordination with secondary care.

Recommendations

- Limit prescription authority of outpatient and emergency clinicians to discourage bypassing of family doctors.
- Consider co-payment reforms to encourage patient adherence to referral network.

4.1.5. Communication systems

Effective communication is integral to well-functioning regional referral networks. Proactive communication is needed between (a) sending and receiving hospitals, (b) emergency and hospital staff, and (c) primary and secondary care.

The emerging Romanian telemedicine system provides a strong foundation for interhospital communication, although NW and SW emergency units require incorporation into telemedicine networks. Nine prehospital telemedicine units provide real-time interaction between hospital and emergency crews to assess the patient and direct the patient to the most appropriate facility. For example, patients suffering heart attacks and in need of primary PCI will be directed to the appropriate cath lab. These units are based across the country, including in Craiova, Iaşi, and Cluj. These nine prehospital units are complemented by three interhospital emergency telemedicine networks. These connect emergency and other specialists at a central hospital with staff in surrounding county and local hospitals. The command control room in the central hospital has video, audio, and real-time data connection with resuscitation units in peripheral hospitals. Both types of telemedicine units utilize a national communications system run by the government telecommunications agency. There are currently three interconnected networks, one based in Bucharest and connected to hospitals with direct operational relations with the hospitals in Bucharest, and two based in regional hospitals in Tîrgu Mureș

and Iaşi (Appendix 2). While the NE region receives good coverage from the Iaşi-based interhospital telemedicine system, there is only partial coverage of NW and SW regions. Emergency units in these regions would benefit from inclusion into a network. For the most part, however, requests for telemedicine support are related to procedures and diagnostics, rather than advice on referrals.

To support the quality of referrals to regional hospitals, better coverage with communication systems is required in all three regions. it was reported that many referrals are made by sending photos of imaging and diagnostic results by smartphone. PACS enables the transmission of digital images from different modalities (for example, CT, MRI, and X-ray) through a secure network, as well as test results. PACS would support the quality of referrals to regional hospitals, as specialists can review diagnostic results before deciding whether transfer to a regional hospital for treatment is appropriate. PACS is being supported under a current World Bank project, and 21 facilities across the country should have PACS in place by 2021. However, only four of these locations are sending hospitals in the referral networks for the new regional hospitals, with no PACS capability planned for the NE region at present (Figure 10). As PACS is needed in both sending and receiving facilities, greater coverage of these three regions is needed to ensure high-quality referrals to the regional hospitals. Integration of the telemedicine and PACS systems could also be considered to promote communication.

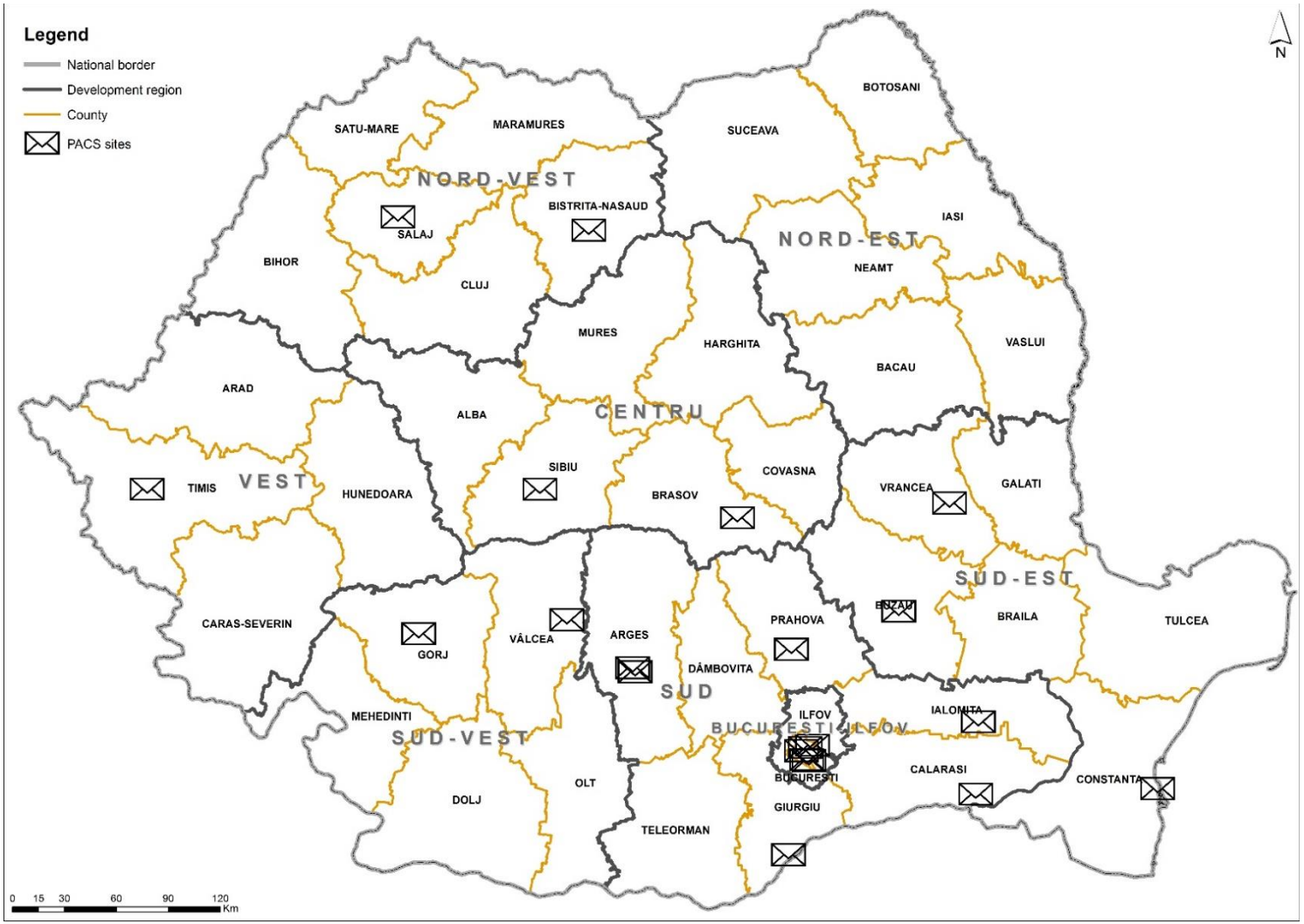
More systematic communication between primary and secondary care is also needed. For hospital admissions and outpatient clinic visits, patients are given a discharge summary[14] or clinic letter by the relevant team with the expectation that patients will deliver this by hand to their family doctor. Family doctors are not routinely informed about episodes of emergency care, whether this is resolved by paramedics or in the emergency departments. Family doctors would rarely communicate with specialists ahead of a referral to emergency or elective care. These are missed opportunities to provide feedback to family doctors, which may improve the quality of referrals, as well as support family doctors in resolving more cases without referral. While a planned nationwide electronic health record will improve this communication channel, it is still under implementation. In the meantime, a secure e-mail system for all clinicians in each regional referral network could be created for the encrypted transmission of patient information, including summaries of admissions or emergency care, outpatient clinic letters, and diagnostic results.

Recommendations

- Extend interhospital telemedicine network to all NW and SW emergency units.
- Expand PACS capacity to all sending facilities in NE, NW, and SW regions and consider integration with telemedicine system.
- Create a secure e-mail system for all clinicians in the regional referral network, for the encrypted transmission of patient information.

[14] A discharge summary contains information on the patient's admission, including clinical history, diagnosis, important test results, and treatment plan (including medication).

Figure 10. Current and planned PACS sites



Source: MOH (Project Management Unit) data.

4.1.6. Patient transfer capacity

The regionalization of complex care will create greater demand for patient transfers. For complex care at the new regional hospitals, patients will need to be transported either from the community (prehospital transfer) or from lower-level hospitals (interhospital transfer). These patients are likely to be sicker and have multiple co-morbidities, requiring more support from trained health professionals during transfers (critical patient transfer). For acute conditions that will be organized in a regional network such as stroke, patients will need to be transported to regional hospitals for emergency treatment (emergency patient transfer). There will also be more demand for noncritical, nonemergency transfers both to regional hospitals for specialist assessment and investigations and from regional hospitals to other facilities for rehabilitation.

The responsibility for patient transfers in Romania is fragmented. In Romania, the responsibility for both prehospital and interhospital transfers is shared between the MOH and the General Inspectorate of Emergency Affairs in the MOI. The former funds local ambulances, whereas the latter funds the Mobile Emergency Service for Resuscitation (*Serviciul mobil de urgenţă, reanimare şi Descarcerare*, SMURD). SMURD is the emergency rescue service, which includes resuscitation teams specialized in the provision of emergency medical and technical assistance, as well as first responder paramedical teams. Noncritical patient transfers are undertaken by county ambulances. Critical patient transfers are undertaken by better-equipped county ambulance units or mobile intensive care teams from SMURD.

Due to this fragmentation, it is difficult to assess the overall transfer capacity. Very limited data were available to assess transfer capacity. In NW and SW regions, a very high proportion of callouts for the MOH ambulances in 2017 were resolved without transport to hospital (Table 7). This indicates that the MOH ambulance capacity is being used for nonurgent care, probably due to weak primary care (see Section 4.2.6). It was reported that hospitals are increasingly resorting to private ambulance services to undertake noncritical transfers, at increasing cost to the MOH. For critical patient transfers, it was reported that SMURD services are often used to cover insufficiencies in the MOH ambulance capacity. With regard to critical patient transfers, SMURD has only one mobile intensive care team in the SW region compared to six in NE and NW regions. First-responder teams are more equally distributed, with 27 in SW, 35 in NE, and 43 in NW regions. There is one neonatal mobile intensive care team in all three regions. The master plans note plans for strengthened capacity with regard to the number of ambulances[15] and integration with SMURD; however, there are no further details nor assessments of future demand.

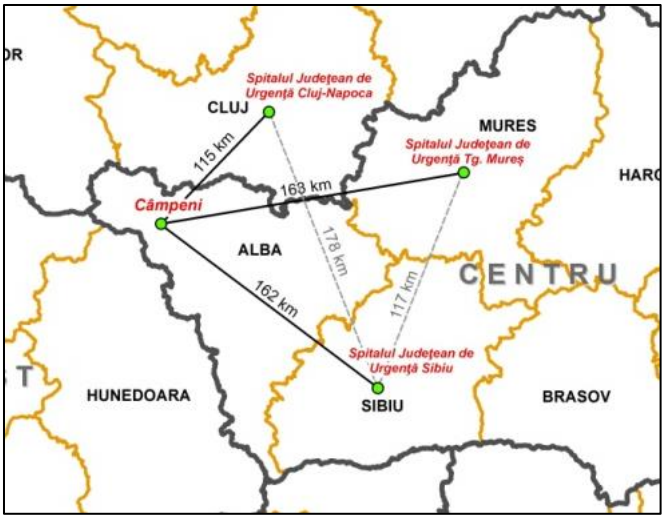
Table 7. MOH ambulance callouts and results, 2017

Region	Total annual number of patients assisted	Total number of patients transported to emergency departments	Total number of patients not transported to emergency departments	Percentage of patients not transported to emergency departments
SW	243,883	162,030	81,853	33.6
NE	435,165	366,742	68,423	15.7
NW	345,604	190,081	155,523	45.0

[15] The General Inspectorate of Emergency Affairs has been tasked with procuring an extra 2,200 ambulances nationally to be shared between the MOH and SMURD.

Without greater integration, transfer capacity is likely to become a bottleneck to regionalized complex care. Neonatal transfers provide a case study for the inefficiency of the currently fragmented transfer system. According to current legislation, Level III neonatal units must have a neonatal transfer team (ambulance and skilled staff) to retrieve patients from Levels I and II units. However, many Level III units that are not county regional hospitals do not have transfer teams. In these cases, a transfer team from another Level III unit must retrieve the patient and transport to the original Level III team. For example, the neonatal Level I unit in Campeni local hospital is assigned to the Level III unit in Sibiu County Emergency Hospital. However, as this unit does not have a neonatal transfer team, any newborns requiring transfer from Campeni to Sibiu will require a transfer team from Cluj or Târgu Mureş county regional hospitals. Due to such long roundtrips (Figure 11) with heightened risks for the patient, SMURD teams are mostly used for neonatal transfers, despite legislation on critical patient transfers contradicting legislation on transfers of neonates.

Figure 11. Example neonatal transfer



Source: MOI

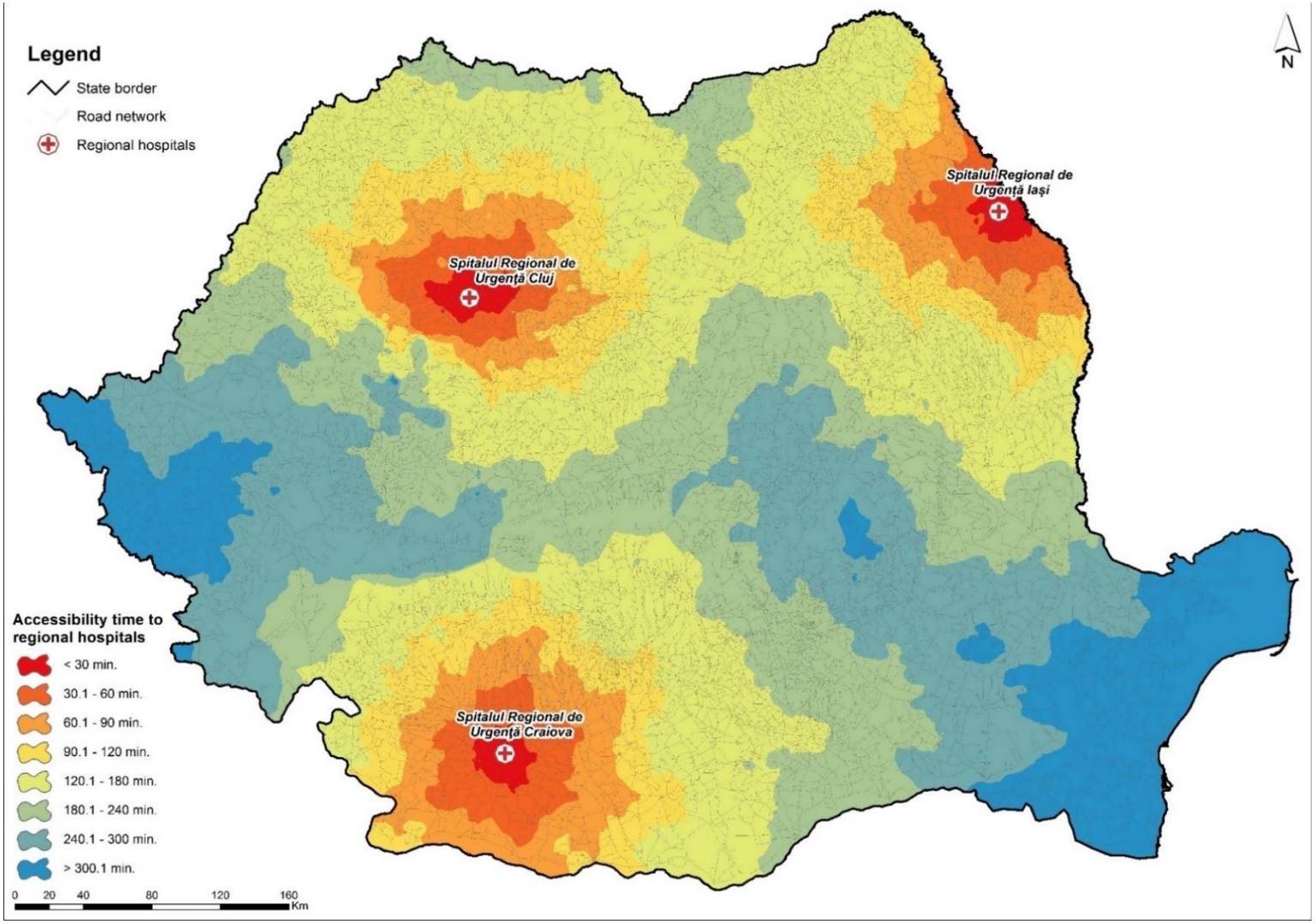
Recommendations

- Develop an integrated procedure on critical patient transfers including neonates and related actions on root causes of nonurgent callouts.
- Undertake a thorough assessment of current transfer capacity and future demand in all three regions, including ambulance response times in rural and urban areas.

4.1.7. Accessible transport

Any drive to regionalize complex care to improve quality and efficiency must be balanced against maintaining equitable access for all residents in a region. This is particularly so in Romania, where 90 percent of public hospitals are already located in urban areas. Figure 12 displays the time it would take patients to travel to regional hospitals from across the three regions. For example, a patient referred for complex elective care at the regional hospital in Cluj could travel up to five hours on the current road network if living in the most remote areas of the NW region. Duration of travel, however, is just one aspect of transport, with a comprehensive evaluation also taking into account affordability, availability, acceptability, and accommodation, that is, responsiveness to users' needs (Penchansky and Thomas 1981; World Bank 2017). An area with inaccessible transport to regional hospitals may lead to patients going without treatment. Indeed, the levels of unmet needs due to geographical barriers are some of the highest in the EU for the lowest income groups (0.8 percent compared to an average of 0.2 percent in the EU). For specialty services where there is a strong rationale for concentration, for example, hyperacute stroke care or arterial surgery, second regional hubs may be necessary to ensure equitable access to acute treatment. Discharge to designated spoke services in the postacute phase should be considered to minimize the travel burden on patients and care givers.

Figure 12. Travel time to regional hospitals



Source: World Bank 2013a, 2013b.

Recommendations

- Undertake an assessment of transport accessibility to the new regional hospitals for residents of NW, NE, and SW regions, disaggregated by income level.
- Consider means-tested reimbursement of travel costs and time for patients referred to regional hospitals.
- Consider hub-and-spoke models of service delivery where possible to minimize the travel time for patients and care givers.

4.1.8. Regional coordination forum

A forum in which stakeholders can come together to review the health needs and available resources from a regional perspective is vital to define effective referral networks. Such platforms will also strengthen communication between different clinicians and facilities, as well as local authorities, which is a key component of any referral network. The implementation of integrated care pathways in Norway found that municipal managers had a wider understanding of integrated care than hospital staff but recognized the potential for improved coordination with generic, flexible regional clinical pathways (Skrove, Bachmann, and Aarseth 2016). Fear of status loss may be a barrier to engagement from clinicians, which may be overcome by technical working groups led by respected specialists.

While some technical working groups at the MOH have been set up, regional steering committees have not yet been established. The regional master plans outline plans for regional steering committees, which would be responsible for leading, coordinating, and monitoring the implementation of the plans. The regional master plans also stated that "central management capacities of the regional care system will be created with a focus on capacity and patient pathway management, division of responsibilities and prioritization of health care delivery areas to the regional centers that can have critical impact on major public health issues." Recent MOH planning documents show the regional committees and undefined technical groups to be established in mid-2018, along with a national committee and technical group. A communication/information plan including public consultations and engagement with local authorities and stakeholders are also planned from mid-2018 to end of 2019.

Recommendations

- Establish a regional steering committee to define the regional referral networks, with technical working groups for each clinical area led by regional representatives of the MOH Specialty Commissions, with the inclusion of family doctors, SMURD, and local authorities.
- Launch information campaign for public and health professionals on motivation and vision of regional master plans.

4.2. Intra-facility factors

Regional referral networks also depend on a number of factors at each level of the health system. These include

- Capacity to provide highly complex care (tertiary care),
- Discharge planning (tertiary and secondary care),
- Capacity for specialist assessment and follow-up (secondary care),
- Sufficient rehabilitation capacity (secondary care),
- Specialist outreach (secondary and primary care),
- Management of ambulatory care-sensitive conditions (primary care), and
- Sufficient long-term care capacity (community care)
- Care/patient navigation (community care).

This section assesses each of these factors (in combination where appropriate).

4.2.1. Capacity to provide highly complex care

As the apex of the regional referral network, regional hospitals will need to provide multidisciplinary complex care to patients from across the region. Treatment for complex conditions requires multidisciplinary teams working across traditional professional silos. Many of these conditions will require major complex surgery, which usually requires reservation of an intensive care bed preprocedure. A substantial proportion of patients will end up requiring these beds due to complications during surgery. Indeed, in many tertiary referral hospitals, intensive care capacity becomes the bottleneck on the volume of complex procedures, rather than clinician or operating room availability.

The regional hospitals will provide multidisciplinary care in a model that is innovative for Romania. The planning documents for the regional hospitals propose that multiple specialties be grouped together in centers of excellence orientated around body areas, for example, gastroenterology and general surgery will form the Abdominal Center. Further, there will be one central operating theatre rather than separate theatres for each specialty, where operating rooms shall not be distributed by specialties but by functions to maximize efficiency. The use of beds will be flexible, rather than strictly allocated to individual specialties. This new service delivery model will support the delivery of highly complex care.

Estimated demand for resources does not appear to factor in an increase in tertiary referrals. While the concentration of tertiary referral activities is acknowledged in the functional planning for outpatient services, the estimates for beds and workforce are based on current hospital activity for the county regional hospitals adjusted for demographic changes. Yet, as Tier I hospitals, regional hospitals should be handling more complex and severe cases than the current county regional hospitals. In particular, estimates for intensive care beds and allied health professionals (for example, physiotherapists) appear low for a tertiary referral hospital.

Recommendation

- Review resource estimates for regional hospitals, particularly intensive care capacity, in view of likely increase in tertiary referrals.

4.2.2. Discharge planning

Early planning for patients' discharges can help to conserve referral capacity at regional hospitals. Regional hospitals will provide complex treatment, for example, major surgery, to patients with multiple conditions and needs. It is likely that such patients will require extended periods of rehabilitation, as well as possible adaptation to return home. Early identification of such patients and planning for their counter referral to secondary hospitals or discharge home from the start of their admission can facilitate timely discharge. Formal discharge planning is a multidisciplinary approach that includes the medical team, allied health professionals such as physiotherapists and occupational therapists, social care, and patient caregivers. County-level managers in Norway identified discharge as the weakest part of coordination across services, with standardized procedures for discharge a useful tool to improve this transition (Skrove, Bachmann, and Aarseth 2016).

No training in discharge planning was identified in Romania. The regional master plans note the need to strengthen the interface between rehabilitation facilities and sending hospitals, but without detailed plans on how to achieve this objective.

Recommendation

- Develop and undertake training on discharge planning for multidisciplinary teams at county regional hospitals ahead of the transfer of expertise to regional hospitals.

4.2.3. Capacity for specialist assessment and follow-up

While specialists at regional hospitals will provide the most complex care, specialists at lower-level hospitals are still needed to assess the need for referral when patients first present and provide follow-up care. For emergency cases, this could be specialists in emergency medicine or other specialties, such as neurologists or vascular surgeons. For nonemergency patients, sufficient 'spoke' specialists are needed to assess if a referral is needed to the regional 'hub' hospital. To investigate this aspect, the distribution of specialists was examined for two clinical areas that are likely to be regionalized in the NE, NW, and SW regions: stroke care and vascular surgery.

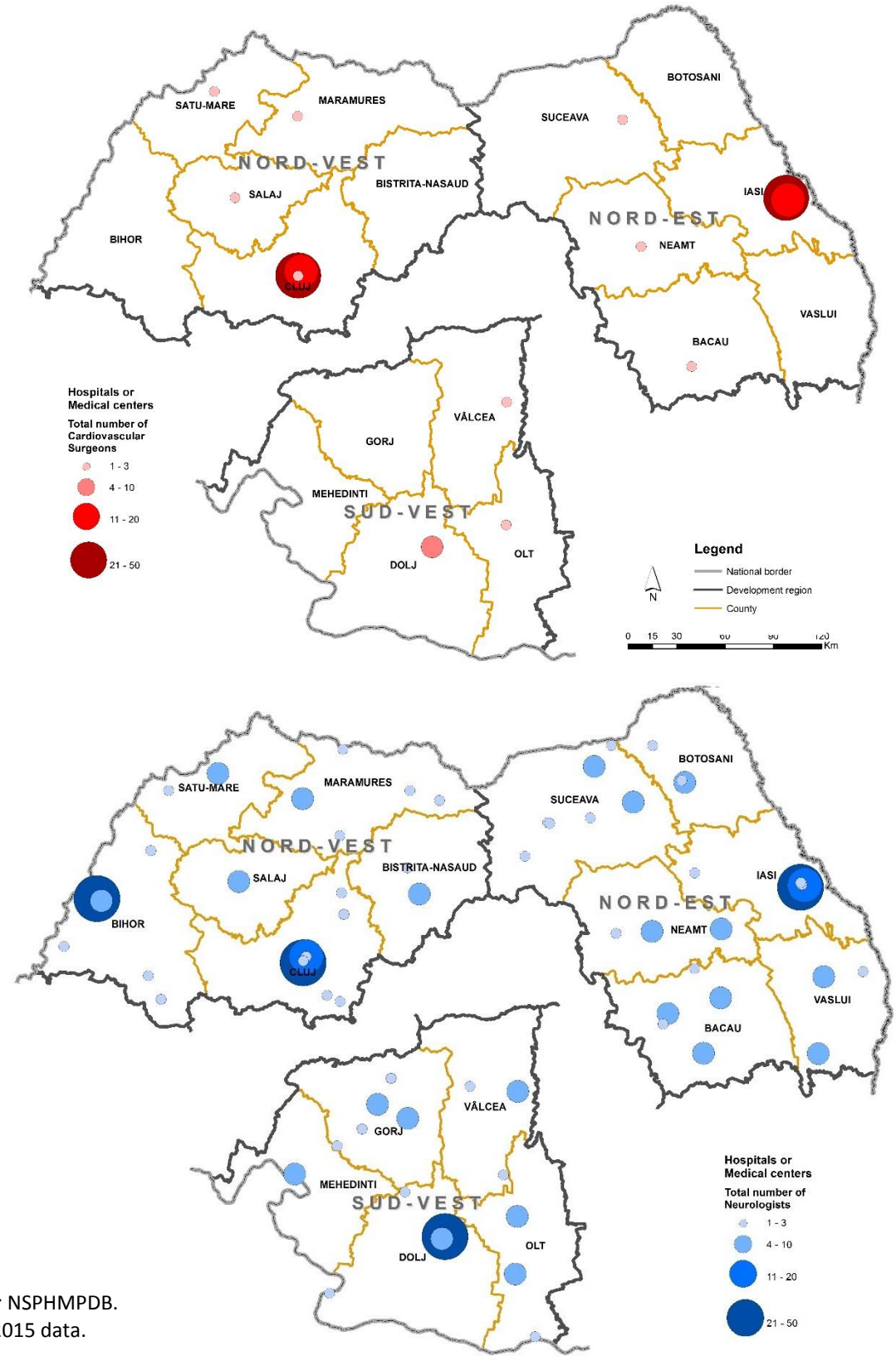
As an example, cardiovascular surgeons are already fairly regionalized in the three regions, with the greatest concentration of surgeons in the three cities hosting regional hospitals (Figure 13). Greater provision of noncomplex 'spoke' services to avoid self-referral to the regional hubs should be considered in Mehedenti, Bistrita, and Vaslui counties. Redeployment of some surgeons to Craiova regional hospital will also be necessary, as there is relative underprovision there compared to Iaşi and Cluj. If arterial surgery is only undertaken in the regional hospitals, maintaining the skills of all the regional workforce needs to be considered, for example, hub operating and on-call duties for all surgeons in the region and rotation of spoke service delivery.

In contrast, neurologists are far more dispersed across all three regions (Figure 13). When the stroke regional clinical pathways are developed, facilities with greater concentration of neurologists should be considered for district stroke centers. Neurologists in other facilities should transfer any patients with stroke to the regional hospitals for acute treatment, rather than managing cases in their facilities.

Recommendation

- Assess capacity for specialist assessment and follow-up in sending facilities for all clinical areas with regionalized services.

Figure 13. Distribution of specialists at different hospital levels in NE, NW, and SW regions



Source: NSPHMPDB.
Note: 2015 data.

4.2.4. Sufficient rehabilitation/long-term care capacity

Rehabilitation/long-term care capacity is insufficient, particularly outside the regional centers (Figure 14). Without sufficient beds in each region to which regional hospitals can discharge patients for rehabilitation or long-term care, the regional hospitals will quickly be unable to accept new referrals for complex care. Indeed, clinicians across specialties described difficulties in counter referral due to a shortage of rehabilitation and/or long-term care beds. This type of care needs to be equally distributed across the region as patients and caregivers usually prefer for such care to be locally provided. When chronic care beds[16] are mapped across the three regions, however, capacity is concentrated in regional centers (Figure 14).

More detail is needed on the expansion in capacity, as well as formal counter-referral pathways. The latest draft of the regional master plans sets a target of 30 beds per 100,000 general population for rehabilitation and 600 beds per 100,000 people ages 65 and above for long-term care. To meet these targets, conversion of some or all beds in selected acute care facilities is planned but not new construction of facilities. While reconfigured acute care facilities may be appropriate for rehabilitation care, they may be less suitable for the range of care needs seen in long-term care. For example, many elderly people may only require support with activities of daily living, such as cooking and dressing, but not nursing care. Further, counter-referral pathways from regional and county hospitals to existing and planned facilities should be set out, informed by transfer and length of stay data, as well as patients' county of residence.

Recommendations

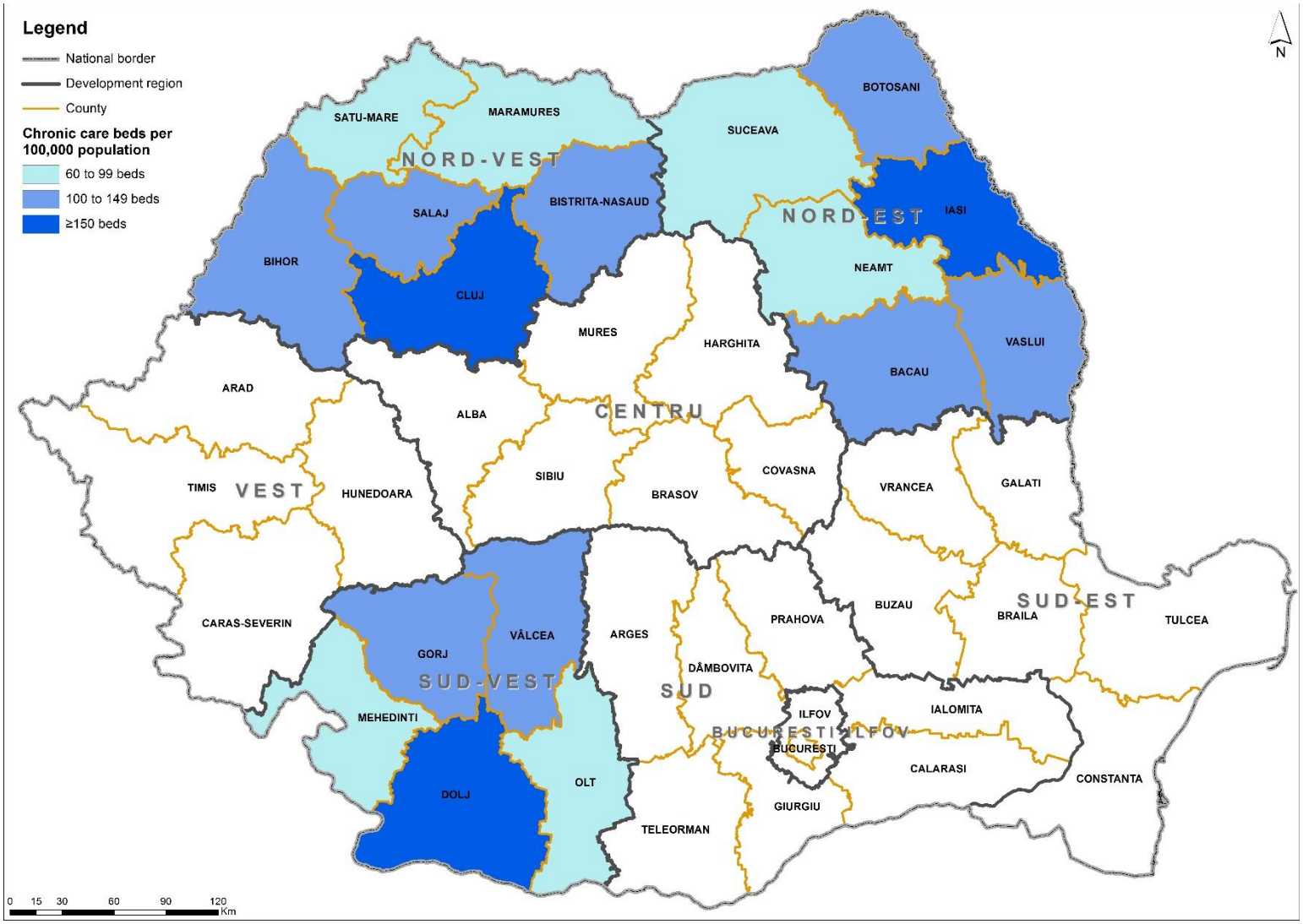
- Develop costed, time-bound plan to reconfigure all planned rehabilitation and long-term care beds, as well as consideration of construction of purpose-built facilities.
- Develop counter-referral pathways from sending hospitals to all existing and planned facilities, informed by an analysis of current transfer, length of stay, and residence data.

4.2.5. Specialist outreach

Outreach by specialist doctors usually refers to clinical care or training outside their usual workplaces, or 'visiting specialist services'. In many countries, specialist outreach has been developed to improve access to specialist care in rural or underserved areas, enhance primary-specialist care relationships, reduce pressures on hospitals, shift the balance of care to community-based services, or reduce health service cost (Gruen et al. 2004). A systematic review found that specialist outreach as part of multifaceted interventions involving collaboration with primary care, education, or other services was associated with improved health outcomes, more efficient and guideline-consistent care, and less use of inpatient services. Although specialist outreach programs incur additional costs, these may be balanced by improved health outcomes. With regard to regional referral networks, specialist outreach can strengthen the quality of referrals between facilities, as well as communication between clinicians at different levels of care. For example, specialists in tertiary hospitals may undertake ward rounds with colleagues from secondary hospitals, highlighting where referrals would be appropriate or suitable clinical care in the absence of referral. It may also be a way to maintain equity of access to specialist care in the context of regionalized services.

[16] These include long-term psychiatry, palliative care, and long-term care beds.

Figure 14. Chronic care bed capacity per 100,000 population in NE, NW, and SW regions



Source: Draft regional master plans, MOH, 2018.
Note: 2014 population data, 2017 bed data.

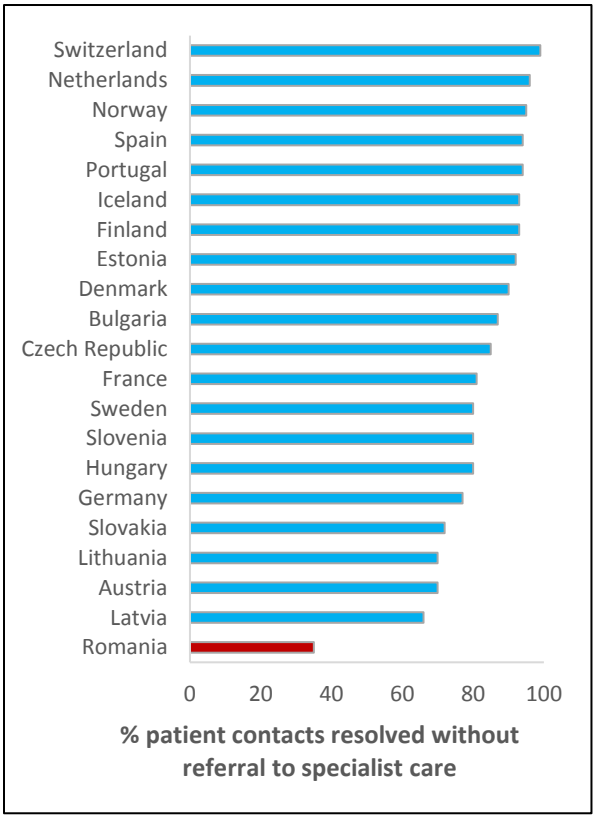
Specialist outreach in Romania is rare at present. Consultations revealed that few specialists were currently providing outreach to lower-level facilities or family doctors. The exception is cardiology, where specialist leaders attend primary care conferences to run training sessions on common cardiology problems in primary care and emergency medicine, which uses the interhospital telemedicine system described earlier to provide specialist outreach (Boeriu, Arafat, and Gordon 2011). A previous MOH project linked 198 family doctors and 512 specialists at emergency county hospitals for teleconsultations; however, this ended in 2015.

Recommendations

- Create incentives for regional hospital specialists to undertake outreach (physical or remote) to referring hospitals and primary care, for example, as part of continuous professional development.

4.2.6. Management of ambulatory care-sensitive conditions

If a high proportion of patients seen at regional hospitals has ambulatory care-sensitive conditions, this will reduce capacity to treat patients who need complex care. As described earlier, ambulatory care-sensitive conditions are problems for which high-quality outpatient (mainly primary) care can prevent the need for inpatient care. While some health issues will always require specialist input and management, many common health problems in the community only require basic medical care. It is generally accepted that more than 90 percent of consultations with GPs could be resolved entirely within primary care, without recourse to emergency or elective secondary care (Kringos et al. 2015).

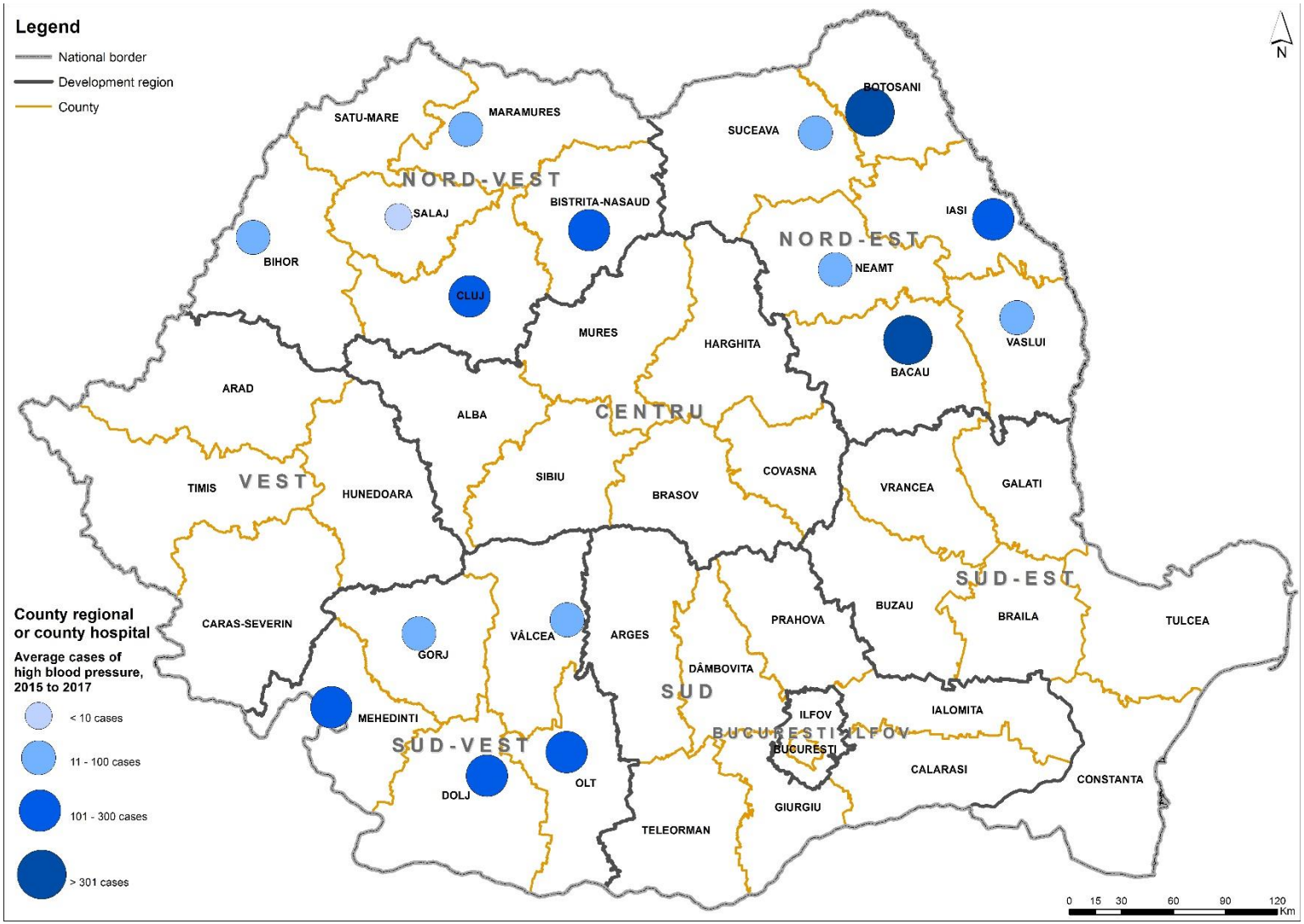


Hospitals are absorbing the impact of weak primary care. In 2009/10, family doctors in Romania resolved only 35 percent of consultations, the lowest in Europe by far (Figure 15). This impact of this extremely weak gatekeeping is absorbed at the hospital level. Figure 16 shows cases of high blood pressure handled at county regional and county hospitals in the NE, NW, and SW regions. High blood pressure and uncomplicated diabetes mellitus were the joint sixth top reason for day admissions at a national level (World Bank 2018a). An average of 2 percent of adult cases at Craiova county regional hospital, 4 percent at Iaşi, and 5 percent at Cluj were due to ambulatory care-sensitive conditions over the last five years. Without change, this is capacity diverted away from treating patients who need complex care in the regional hospitals.

Figure 15. Family doctors in Romania refer more patients to specialists than other countries in Europe

Source: Kringos et al. 2015.
Note: Data collected in 2009/10.

Figure 16. Treatment of high blood pressure in county regional and county hospitals



Source: NSPHMPDB.
Note: Three-year rolling average of 2015–2017 data. No data for Satu-Mare county hospital.

It has long been recognized that primary care is underperforming in Romania, for a number of interdependent reasons. Only one in five doctors chose to specialize in family medicine, contributing to underprovision of family doctors in rural areas (Vladescu et al. 2016). Family doctors are not required to provide primary care out of hours. Reimbursement caps imposed by the NHIH for budgetary control restricts family doctors' workloads, with insufficient incentives for preventive activities and disease management for conditions such as diabetes mellitus and cardiovascular disease. Even if such conditions are detected, family doctors have severely restricted prescription authority and usually have to send a patient to a specialist to initiate or change medications. As a result, patients end up using ambulances and/or hospital emergency departments for more accessible care, including prescriptions. A notable exception here is cardiology, where the latest guidelines for high blood pressure include provision for family doctors to initiate blood pressure lowering drugs without recourse to a specialist. Despite family doctors holding a nominal gatekeeping role, the NHIH allows patients to directly access specialists for numerous conditions, such as diabetes mellitus.

Recommendation

- Develop a strategy to reduce admissions for ambulatory care-sensitive conditions in county and county regional hospitals ahead of regional hospital functioning, including reform of (a) in-hours service cap, (b) out-of-hours care provision, (c) family doctors' prescription authority, (d) incentives for disease management and preventive activities, and (e) gatekeeping exceptions.

4.2.7. Care/patient navigation

Care navigators can help guide marginalized groups along regional referral networks. A care navigator has been defined as someone who helps assist patients overcome barriers to care. Most frequently described in cancer care, they can help people in underserved areas or with chronic conditions to engage with the most appropriate health services (Dohan and Schrag 2005). In this way, strong community care and patient navigation can ameliorate the overuse of emergency care and the underuse of preventive and primary care.

In Romania, this function is carried out by community nurses and Roma health mediators. Under the former centralized state system, community health care in Romania was provided by nurses and oriented primarily to mother and child health. After 1989, community care services declined, with some responsibilities being taken over by family doctors. However, the continued need for these services—particularly among Roma communities and patients with chronic conditions—was recognized in 2002, when the MOH created a national health program to train and employ community nurses and health mediators. These professionals are paid by local authorities, although formally employed by hospitals and coordinated by the MOH local branches (public health directorates). Renewed emphasis on community care in the National Strategy for Health led to the establishment of an MOH working group to develop new policies; revise existing legislation; and elaborate standards, norms, and guidelines necessary to put in place a national network of community nurses and health mediators (Vladescu et al. 2016). The main role of these professionals is identifying and monitoring the health status of disadvantaged and vulnerable groups[17] (particularly in rural areas), providing information and support to access health services, and undertaking home visits for patients with chronic conditions and elderly people. The legislation passed in

[17] These include people who are living below the poverty line or unemployed; people with low education levels, disabilities, or chronic diseases; patients requiring palliative care; pregnant women; children; single-parent families; the elderly; and people at risk of social exclusion.

2017 proposed new integrated community centers, which will host community nurses, social workers, and other local services for vulnerable groups.

Community care programs in NW, NE, and SW regions should be strengthened in anticipation of regional hospitals. Although a good network of community care professionals exists, no indicators are currently used to assess whether the performance is meeting the program objectives. The responsibilities of community nurses are heavily weighted toward monitoring and surveillance. This prevents the realization of the full benefits of strong community care for regional referral networks, as these patients are likely to then turn to higher levels of care (including primary care) for treatment. Coordination mechanisms between family doctors and community care professionals are underdeveloped, leading to fragmentation and duplication of responsibilities.

Recommendations

- Expedite the development of community nurse and health mediator programs in NE, NW, and SW regions ahead of regional hospital construction.
- Expand competencies of community nurses, so that care can be provided in the community when needs are identified, rather than at higher levels of care.
- Develop a coordination framework for community care professionals and family doctors that delineates roles and responsibilities, particularly in rehabilitation, long-term care, and palliative care.

5. Conclusions and recommendations

Regional hospitals offer many potential benefits to the citizens of their regions. Further investment in acute care is difficult to justify in Romania's hospital-dominated health sector. However, with very different configurations to the county emergency hospitals they will replace, regional hospitals offer an opportunity to disrupt entrenched service delivery models. Greater access to complex specialist care outside Bucharest may also improve equity for residents in these regions. Moreover, there are potential benefits beyond health in these lagging regions, where place-based investments and better public services can attract human capital and support growth.

These benefits will not be realized, however, with 'business as usual'. Weak stewardship, particularly on quality of care, often means there is little consideration of the integration and added value of new health facilities in Romania. Yet, no hospital exists in isolation. Additional hospitals, however sophisticated, will not improve the outcomes for patients without consideration of their function in the surrounding health system. Indeed, given current conditions, regional hospitals will quickly become congested with patients bypassing primary care, receiving treatment for low-complexity conditions, or unable to be discharged to lower-level facilities. Ultimately, this will diminish the resources available for patients who do require complex care: the raison d'être of the new hospitals.

Regional hospitals are not just bricks and mortar, but the apex of a complex regional ecosystem. As flagship public hospitals, regional hospitals are planned to be the hubs of each regional health system. Work to date has focused on design and construction, however, rather than how regional hospitals will interact and coordinate with other facilities. This is a missed opportunity. Regional hospitals offer the potential to not only disrupt service delivery within their walls, but also across their region.

This report assessed the likely integration of regional hospitals into this system through the prism of regional referral networks, concluding that many factors require strengthening as part of the overall work program. Such networks are essential to the proposed function of regional hospitals by ensuring risk-appropriate care is delivered across the health system. A comprehensive assessment of regional referral networks in Romania was undertaken using available hospital activity data, stakeholder interviews, and literature review. While some conditions are in place to support regional referral networks, many more require strengthening as part of the regional hospital work program. For example, regional clinical pathways for maternal and neonatal care offer a model for other clinical areas. The emerging telemedicine system encourages the norm of interhospital communication. Yet, many more inter- and intra-facility factors essential to regional referral networks are absent or weak.

Some aspects of this assessment were limited by data availability, and follow-up analysis would be useful. Data on referrals at the level of providers were not available. These meant that the flow of referrals and counter referrals between levels of care could not be examined for this report. Reliable data on some intended tracer conditions were also not available. Given this, follow-up analysis would be beneficial to make informed policy decisions. For example, analysis of the current provision of cancer and trauma care in the three regions. These are commonly regionalized in many countries to improve outcomes for patients. The distribution of medical imaging systems can also be a useful tool to support regional networks.

Regional master plans need to elaborate the vision of regional referral networks, which could be achieved through thematic master plans. As described earlier, the need to establish regional referral

networks and redesign patient pathways is recognized in the National Strategy for Health. The proposed measures include the creation of professional collaboration and technical 'patronage' of hospitals at the regional, county, and local levels. While regional master plans map current and future service provision in each region by level of care, there are no details on these measures or how providers will interact with each other. Greater elaboration of the vision and functioning of regional referral networks, both forward and counter referral, would support the ultimate functioning of regional hospitals. This could be achieved through thematic master plans, for example in cardiology or emergency care. These were used in France to improve coordination within their regional health networks.

Consideration of management capacity at a regional level is also needed. While technical working groups have been set up at a central level for regional hospitals, performance management of the regional health network will be required on an ongoing basis. As described earlier, an initial step is a regional coordination forum to bring together stakeholders and build consensus on health needs and clinical pathways. However, the MOH oversight and stewardship at a regional level will be needed to implement and manage these networks in the long-term. For example, in France, regional branches of the MOH were established to better manage regional networks as defined in thematic regional masterplans. Moreover, the national health insurance agency and MOH fund provider networks, in which professionals develop pathways, establish best practice, and have access to a common health record.

Table 8 summarizes the recommendations made in this report to strengthen regional referral networks, including further analysis. In the table, short-term refers to the next one to two years, medium-term is the period up to the initial construction of the regional hospitals, and long-term is within five to ten years. The entity that would lead each recommendation is identified, along with other important stakeholders for successful implementation.

In conclusion, without as much attention to coordination of care within regional health networks as construction of regional hospitals, the hospitals will not be able to fulfil their promise as flagship providers of complex care. Next steps for the Government of Romania would be to discuss the findings of this report with relevant stakeholders, with agreed actions included in the regional hospital work program.

Table 8. Summary of recommendations

Factor	Recommendation	Time Frame	Lead	Stakeholders
Overall	Elaborate regional masterplans, including the development of thematic masterplans for selected clinical areas such as cardiology or emergency care	Short-term	MOH	Specialty Commissions, professional associations, local authorities, MOI
	Follow-up analysis of provision of cancer care, trauma care and imaging systems	Short-term	MOH	Specialty Commissions, MOI
	Consider mechanisms to strengthen stewardship of regional networks	Short-term	MOH	NHIH, local authorities, ANMCS
Regional clinical pathways	Develop regional clinical pathways for all conditions where complex care is to be centralized at regional hospitals, taking into account travel times and capacity for transfers between facilities.	Short-term	Specialty Commissions	MOI, professional associations, and local authorities
	Audit adherence to neonatal intensive care regional clinical pathway and implement quality improvement measures.	Short-term	Neonatology Specialty Commission	Neonatology professional association and ANMCS
	Expand PCI capacity and volume in NE and NW regions and establish PCI centers in SW region to reduce call-to-balloon time for SW residents.	Short-term	MOH	NHIH, MOI, Specialty Commissions, professional associations, and local authorities
Quality management	Develop quality standards based on national guidelines and/or regional clinical pathways.	Mid-term	MOH	Specialty Commissions, ANMCS, professional associations
	Support implementation of these quality standards through selective purchasing, pay-for-performance and incorporation into accreditation.	Mid-term	NHIH/ANMCS	MOH
	Encourage clinicians to audit and submit outcomes to registries as part of continuous professional development.	Mid-term	College of Physicians	MOH; Specialty Commissions; ANMCS; professional associations
	Establish a unified national health care database with publicly available aggregated data, complemented by regular population-based surveys of health needs and patient experiences.	Mid-term	MOH	NHIH, NSPHMPDB, National Institute of Public Health, and National Institute of Statistics

Factor	Recommendation	Time Frame	Lead	Stakeholders
Supportive organizational and payment mechanisms	Revise and elaborate collaboration agreements for referrals and counter referrals according to the regional master plans.	Mid-term	MOH	NHIH, professional associations, and local authorities
	Consider bringing regional networks together as one organizational entity.	Long-term	MOH	NHIH and local authorities
	Consider bundled payments for selected conditions/procedures after the development of regional clinical pathways.	Long-term	NHIH	MOH, Specialty Commissions, professional associations, and local authorities
Patient adherence to referral network	Limit prescription authority of outpatient and emergency clinicians to discourage bypassing of family doctors.	Mid-term	MOH	Specialty Commissions and professional associations
	Consider co-payment reforms to encourage patient adherence to referral network, for example, tiered cost-sharing.	Mid-term	NHIH and MOH	Patient associations
Communication channels	Extend interhospital telemedicine network to all NW and SW emergency units.	Mid-term	MOI	MOH, Specialty Commissions, professional associations, and local authorities
	Expand PACS capacity to all the sending facilities in NE, NW, and SW regions and consider integration with the telemedicine system.	Mid-term	MOH	Specialty Commissions and local authorities
	Create a secure e-mail system for all clinicians in the regional referral network, for encrypted transmission of patient information.	Mid-term	MOH	Specialty Commissions, professional associations, and local authorities
Skilled emergency transfer capacity	Develop an integrated procedure on critical patient transfers including neonates and related actions on root causes of nonurgent callouts.	Mid-term	MOH and MOI	Specialty Commissions, professional associations, and local authorities
	Undertake a thorough assessment of current transfer capacity and future demand in all three regions, including ambulance response times in rural and urban areas.	Mid-term	MOH and MOI	Ministry of Transport and Ministry of Regional Development and Public Administration

Factor	Recommendation	Time Frame	Lead	Stakeholders
Accessible transport	Undertake an assessment of transport accessibility to the new regional hospitals for residents of NW, NE, and SW regions, disaggregated by income level.	Mid-term	MOH	Ministry of Transport and Ministry of Regional Development and Public Administration
	Consider means-tested reimbursement of travel costs and time for patients referred to regional hospitals.	Mid-term	MOH and NHIH	Ministry of Public Finance; Ministry of Labor, Family, Social Protection and Elderly; and local authorities
	Consider hub-and-spoke models of service delivery where possible to minimize the travel time for patients and care givers.	Mid-term	MOH	Specialty Commissions
Regional coordination forum	Establish a regional steering committee to define regional referral networks, with technical working groups for each clinical area led by regional representatives of the MOH Specialty Commissions, with the inclusion of family doctors and local authorities.	Short-term	MOH	MOI, Specialty Commissions, professional associations, and local authorities
	Launch information campaign for public and health professionals on the motivation and vision of regional master plans.	Mid-term	MOH	Professional and patient associations
Capacity to provide highly complex care	Review resource estimates for regional hospitals, particularly intensive care capacity, in view of likely increase in tertiary referrals.	Short-term	MOH	Ministry of Finance, MOI, Specialty Commissions, EIB, and SRSS
Discharge planning	Develop and undertake training on discharge planning for multidisciplinary teams at county regional hospitals ahead of the transfer of expertise to regional hospitals.	Mid-term	MOH	Professional associations and local authorities
Capacity for specialist assessment and follow-up	Assess capacity for specialist assessment and follow-up in sending facilities for all clinical areas with regionalized services.	Short-term	MOH	Specialty Commissions, professional associations, and local authorities

Factor	Recommendation	Time Frame	Lead	Stakeholders
Sufficient rehabilitation/long-term care capacity	Develop costed, time-bound plan to reconfigure all planned rehabilitation and long-term care beds, as well as consideration of construction of purpose-built facilities.	Short-term	MOH	NHIH, local authorities, professional associations, EU, and World Bank
	Develop counter-referral pathways from sending hospitals to all existing and planned facilities, informed by an analysis of current transfer, length of stay, and residence data.	Mid-term	MOH	NHIH, Specialty Commissions, professional associations, local authorities, and ANMCS
Specialist outreach	Create incentives for regional hospital specialists to undertake outreach (physical or remote) to referring hospitals and primary care, for example, as part of continuous professional development.	Mid-term	MOH/NHIH	Specialty Commissions and professional associations
Management of ambulatory care-sensitive conditions	Develop a strategy to reduce admissions for ambulatory care-sensitive conditions in county and county regional hospitals ahead of regional hospital functioning, including reform of (a) in-hours service cap, (b) out-of-hours care provision, (c) family doctors' prescription authority, (d) incentives for disease management and preventive activities, and (e) gatekeeping exceptions.	Short-term	MOH/NHIH	Family medicine specialty commission, professional associations, and local authorities
Care/patient navigation	Expedite the development of community nurse and health mediator programs in NE, NW, and SW regions ahead of regional hospital construction.	Mid-term	MOH	Order of Nurses and Midwives and local authorities
	Expand competencies of community nurses, so that care can be provided in the community when needs are identified, rather than at higher levels of care.	Mid-term	MOH	Professional associations
	Develop a coordination framework for community care professionals and family doctors that delineates roles and responsibilities, particularly in rehabilitation, long-term care, and palliative care.	Mid-term	MOH	Family Medicine Specialty Commission and professional associations

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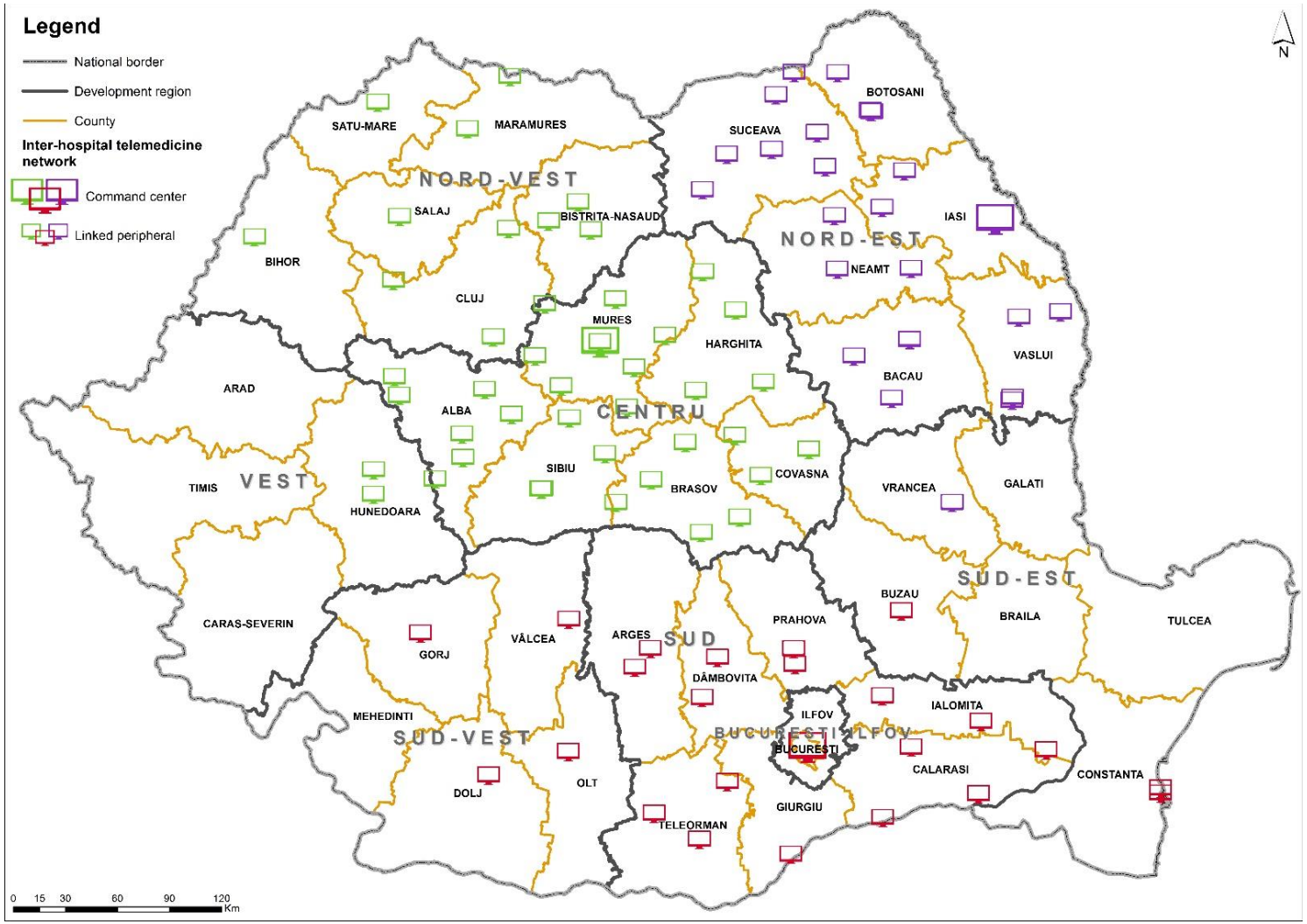
Appendix 1. Tracer conditions and codes

In this analysis, six tracer conditions were used, with the ICD-10 code(s) or Romanian diagnosis-related group (DRG) procedural code(s) used for each condition given in the table below. Reliable data on three other tracer conditions (abdominal aortic aneurysm repair, very low birth weight infants, and COPD) were not available.

Condition	**ICD-10/Romanian DRG procedural code**
PCI	H070%, H071%
CABG	H072%, H073%, H074%, H075%, H076%, H077%, H078%, H079%
CVA (stroke)	I61%, I63%, I64% (exclude I60% and I62%)
Total knee arthroplasty (replacement)	49518-00, 49519-00
Premature newborn with gestational age of less than 32 weeks	P07.21, P07.22, P07.23, P07.24, P07.25, P07.26, P07.31, P07.32, P07.33, P07.34
Primary/essential hypertension (high blood pressure)	I10%

Note: ICD = International Classification of Diseases; % = any number thereafter.

Appendix 2. Inter-hospital telemedicine networks



Source: MOI data.