

**Financing a Small Island Hospital in Estonia**  
**Hiiumaa Hospital Prospective Budget, Global Budget**  
**International Experience, and Recommendations**

A report by the World Bank to the Estonian Health Insurance Fund

February 2019

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## List of Acronyms

CAH	Critical Access Hospital
DRG	Diagnosis-Related Group
ED	Emergency department
EHIF	Estonian Health Insurance Fund
FFS	Fee-for-service
GP	General practitioner
HNDP	Hospital Network Development Plan
HR	Human resources
MoSA	Ministry of Social Affairs
NEC	National Efficient Cost
NWAU	National Weighted Activity Unit
OECD	Organisation for Economic Co-operation and Development
PHC	Primary health care
QBR	Quality-based reimbursement

## Acknowledgments

The authors of this report are Adrien Dozol, Iryna Postolovska, Ian Forde and Marvin Ploetz. The support of Enis Baris and Christoph Kurowski at the World Bank Group is gratefully acknowledged.

We are grateful to the peer reviewers, Ajay Tandon and Michael Mueller, for providing excellent comments. In addition, we would like to thank Katja Grasic, Wilm Quentin, and Prudence Akindo for providing additional inputs.

We thank the patients, clinicians and managers of Hiiumaa, Läänemaa and North Estonia hospitals for welcoming us on working visits to see Estonian EDs in action and to discuss the challenges they face, and the Estonian Hospital Association for feedback on the proposals presented in this report

Most importantly, we thank the board and staff of the Estonian Health Insurance Fund, and the Steering Committee overseeing the World Bank Group's engagement with EHIF. Without their guidance and support, particularly during complex working visits to Estonia in March, June and September 2018, this report would not have been possible. The report has been revised in the light of comments and feedback received from EHIF in December 2018.

## Executive Summary and Key Recommendations

Hiiumaa hospital's unique conditions – limited access and variable travel time - present challenges for service provision and financial sustainability in an environment where hospitals are predominantly financed based on the level of activity. In April 2018, the Estonian Health Insurance Fund (EHIF) introduced a block-grant payment, so-called “readiness fee”, as the main payment mechanism to fund the hospital on the island of Hiiumaa (with a population of 9,377). The objective of the new payment model was to improve the financial sustainability of the hospital in order to ensure access to health services. The revised contract also stipulated a set of indicators to monitor performance. This approach differs from the main payment mechanisms of hospitals in Estonia, which are based on the volume of services provided: fee-for-service (FFS) and Diagnosis-Related Groups (DRGs).

In this report, we assess the design of the new payment mechanism for Hiiumaa hospital, the choice of indicators used to monitor performance, and the opportunity for its extension, making recommendations for improvement based on international experience in paying for health care using global budget in small and rural hospitals.

Global budgeting can be attractive for small, rural hospitals that struggle to survive under fee-for-service reimbursement. Under a global budget, a provider receives a fixed amount of money for a specific period to cover expenditures to enable the provision of a defined set of health services. It provides expenditure predictability for purchaser, with cost containment as the main objective, and predictability of revenue for hospital. However, global budgets carry some risks of under provision, and do not incentivize efficient delivery of care and quality of care.

The Hiiumaa hospital prospective budget is tailored to address the financial sustainability of a hospital in an exceptional environment, therefore should not be rolled out to other hospitals. The scope of the budget is appropriate, as it encompasses inpatient and outpatient activities. Similar to emergency department services, EHIF's main objective is to ensure access and availability of services 24/7, which to some extent justifies the budget calculation largely based on human resources inputs. Marginal adjustments could be made within the existing methodological framework to increase benchmarking and ensure that the budget remains adequate over time, considering cost inflation as well as efficiency gains expected from other general hospitals.

Unlike international experiences, the Hiiumaa model is not calibrated based on past and/or forecast activity and does not alleviate the risk of shirking (e.g., under provision of care, lower quality of care, or shift to other providers outside the scope of the regulated volume). Therefore, the revision of performance indicators in Hiiumaa hospital's contract is needed to expand the current focus on utilization to include accountability for access, quality, safety, and patient experience. EHIF should build on the national hospital performance framework to introduce in the contract indicators on quality of care with validated process and outcome indicators, national benchmark, and relevant for the type of services the hospital is providing. Furthermore, the

contract should include indicators for monitoring access and responsiveness, such as waiting time, and unmet need. Finally, the contract should continue to monitor utilization and referral.

Given the limited evidence on the impact of the new global budget models in other countries and the other ongoing payment reforms in Estonia, global budget should not be implemented in other hospital in the short term. There is opportunity to refine and strengthen the payment system and address some of the pre-requisites in a phased approach until further evidence is available. The global budget should be broad and include emergency care, therefore the ED payment reform should be finalized before any steps are taken to introduce them. Meanwhile, the performance assessment framework should be strengthened as one of the prerequisites for piloting global budgets in general hospital, along the development of a standardized unit to measure activity across setting. Meanwhile, evaluation of the Hiiumaa model could also provide important lessons for the design of the global budget and could help to mitigate some of the unintended consequences. In the medium term, it would also be important to assess the potential effects of other concurrent reforms, such as the piloting of bundled payments, which would not be fully compatible with the implementation of a global budget.

*Table. Recommendations for general hospital payment reforms*

	<b>Short-term recommendations</b>	<b>Medium-term recommendations</b>
<b>Hiiumaa hospital prospective budget</b>	<ul style="list-style-type: none"> <li>• Establish clear eligibility criteria based on population density and travel time to nearest hospital</li> <li>• Adapt budget calculation (HR norms; adjustments for cost-inflation and efficiency gains; average unit prices for general or benchmark hospitals)</li> <li>• Revise the contractual indicators to strengthen accountability on quality, safety, responsiveness, and access</li> <li>• Establish a multi-year framework to allow for predictability</li> </ul>	<ul style="list-style-type: none"> <li>• Investigate the tradeoff between physical access and quality of care</li> <li>• Assess the impact of the prospective budget on access, quality of care, utilization, and hospital financial sustainability</li> </ul>
<b>Global budget</b>	<ul style="list-style-type: none"> <li>• Assess unnecessary care</li> <li>• Expand monitoring of safety and quality of care</li> <li>• Introduce indicators to monitor access and responsiveness</li> <li>• Implement the ED prospective grant</li> </ul>	<ul style="list-style-type: none"> <li>• Consider pilot of new methodology for global budgets for general hospitals if the objective is cost containment and financial sustainability of hospitals</li> </ul>

## Introduction

In April 2018, the Estonian Health Insurance Fund (EHIF) introduced a block-grant payment, so-called “readiness fee”, as the main payment mechanism to fund the hospital on the island of Hiiumaa (with a population of 9,377). To better distinguish the Hiiumaa model from the readiness fee used for other hospitals, we refer to the new model as a prospective budget in this report. The objective of the new payment model was to improve the financial sustainability of the hospital in order to ensure access to health services. To that end, EHIF implemented a fixed prospective budget. In addition, the revised contract stipulated a set of indicators to monitor performance. This approach differs from the main payment mechanisms of hospitals in Estonia, which are based on the volume of services provided (Diagnosis-Related Groups and fee-for-service). Although the new payment method is currently restricted to Hiiumaa hospital, EHIF is assessing pros and cons of global budgets for other hospitals in order to balance financial sustainability of hospitals with overall spending on hospital care.

In this report, we assess the design of the new payment mechanism for Hiiumaa hospital, the choice of indicators used to evaluate the success of the model, and plans for its extension, making recommendations for improvement based on international experience in paying for health care using global budget in small and rural hospitals. Global budget is defined as a payment system where the provider is given a fixed amount of funding for a fixed period of time to cover expenditures to enable the provision of a defined set of health services, rather than fixed rates for individual services or cases. Therefore, the purchaser guarantees the budget or a minimum revenue. The actual payment can be made through various mechanisms, such as block grants or target budgets blended with Diagnosis-Related Groups (DRGs) or fee-for-service (FFS).

The review focuses on the following four areas: (i) eligibility of hospitals for payment; (ii) characteristics and service mix of smaller and rural hospitals; (iii) payment model; and (iv) performance assessment. The report provides an overview of international experience, with a focus on Australia and Maryland that implemented different global budget approaches specifically for small and rural hospitals. More detailed information is presented in the individual case studies. While the primary focus of the report is small and rural hospitals, it also considers other experience in financing smaller but not necessarily rural hospitals.

## Hiiumaa Hospital Within the Estonian Public Hospital Sector

**Estonia’s hospital sector is predominantly public and is divided into four levels of care.** The Hospital Network Development Plan (HNDP) includes 20 acute care hospitals, which are publicly owned, either for profit (limited companies) owned by local government or non-for-profit (foundations) established by the state, municipalities or other public agencies. EHIF also contracts with private hospitals outside the HNDP network. In 2015, non-HNDP hospitals represented 7% of EHIF’s expenditures and 18% of treatments cases (Habicht et al., 2018).

According to the Health Services Organization Act, hospitals are categorized into regional, central, general, and local hospitals. Each hospital category must provide a defined scope of specialties and services and comply with standards on staffing, space, and medical equipment determined by the Ministry of Social Affairs (MoSA). Regional hospitals provide the largest scope of services and clinical complexity, offering the full range of health services, including ambulatory specialist care. A general hospital, like Hiiumaa hospital, offers 24/7 emergency care, intensive care, internal medicine, general surgery, anesthesiology, radiology and laboratory. It may also offer other optional specialties for inpatients and outpatients, such as pediatrics or obstetrics and gynecology, or only for outpatients, such as urology, ophthalmology, otorhinolaryngology, or endocrinology. Since 2014, the MoSA has promoted the networking of regional and general hospitals to share human and technological resources. The objectives are to improve access to technology for diagnostics and treatment for patients in general hospitals and to achieve economies of scale by reducing the incentive for each hospital to buy medical equipment.

**Fee-for-service is the main payment mechanism for hospitals, along with volume and cost caps acting as “soft” global budget.** As in most OECD countries, Estonia uses a blend of payment instruments to purchase hospital services: FFS, DRGs, per diem, and block-grant (readiness fee).

Table 1 summaries the mix of payment methods per type of service

*Table 1. Payment mechanism used by the EHIF to purchase hospital services*

Type of care/ Payment methods	Expensive care (e.g., dialysis, chemotherapy, transfusion, transport)	Outpatient	Day surgery and day care	Inpatient	Emergency department and emergency care	Rehabilitation	Nursing care	Prevention
FFS	X	X	X	x	X	X	X	X
DRG			X	x	X			
Per diem			X	X		X	X	
Readiness fee					X			

Notes: The same payment mechanisms were used to purchase services at Hiiumaa hospital prior to the introduction of the block grant payment in April 2018.

The readiness fee was introduced to compensate hospitals for ensuring access to essential services 24/7. The list of essential services varies depending on the category of hospital (as discussed previously for general hospitals). The readiness fee is only for compensation for non-normal working hours. The value of the readiness fee is calculated by multiplying the additional staff time required to provide services 24/7 (16 hours) by the agreed hourly wage. It is assumed that the normal working hours (8 hours) are included in the volume-based payments. In monetary terms, fee-for-service is the main payment mechanism for outpatient and inpatient

care. In 2017, DRGs accounted for less than 25% of EHIF payments to hospitals and less than 44% of payments for inpatient care. A volume control mechanism is in place to control overall spending and in theory deter the provision of unnecessary services. EHIF annually negotiates individually with each hospital the volume and cost caps per specialty for inpatient, outpatient, and day surgery and day care. Volume caps refer to the number of cases (discharges for inpatients and visits for outpatients), while cost caps refer to the monetary value of the services charged by the hospital to EHIF. The methodology is presented in Table 2. Volume of services and revenues are monitored by broad categories of medical specialties, such as cardiology or internal medicine. The hospital needs to reach the agreed volume of outpatients before being able to bill inpatient care above the volume agreement. After reaching it, and if the generated revenue is above the contractual amount, the hospital payments are reduced with larger payment reductions for inpatient activity exceeding the volume cap. On the other hand, there is no minimum revenue guarantee. This concept is similar to a tapering system implemented in other OECD countries, such as Germany, the Czech Republic, and Israel, or in the State of Maryland before the implementation of global budgets (de Lagasnerie et al., 2015).

Table 2. Volume and cost caps by type of hospital services

	<b>Expensive care</b>	<b>Outpatient</b>	<b>Day surgery and day care</b>	<b>Inpatient</b>
<b>Volume cap measurement</b>	No cap	Number of cases by specialties	Number of discharge by specialties	Number of discharge by specialties
<b>Cost cap measurement</b>	No cap	Amount billed by specialties (Euros)	Amount billed by specialties (Euros)	Amount billed by specialties (Euros)
<b>Payment if cost above cap above agreement and outpatient volume below agreement</b>	No cap	NA	No payment	No payment
<b>Payment if cost above cap above agreement and outpatient volume above agreement</b>	No cap	Payments are reduced by 30% between 100% and 108% of the cost cap; Payments are reduced by 70% above 108% of the cost cap	Payments are reduced by 30% between 100% and 108% of the cost cap; Payments are reduced by 70% above 108% of the cost cap	Payments are reduced by 70%

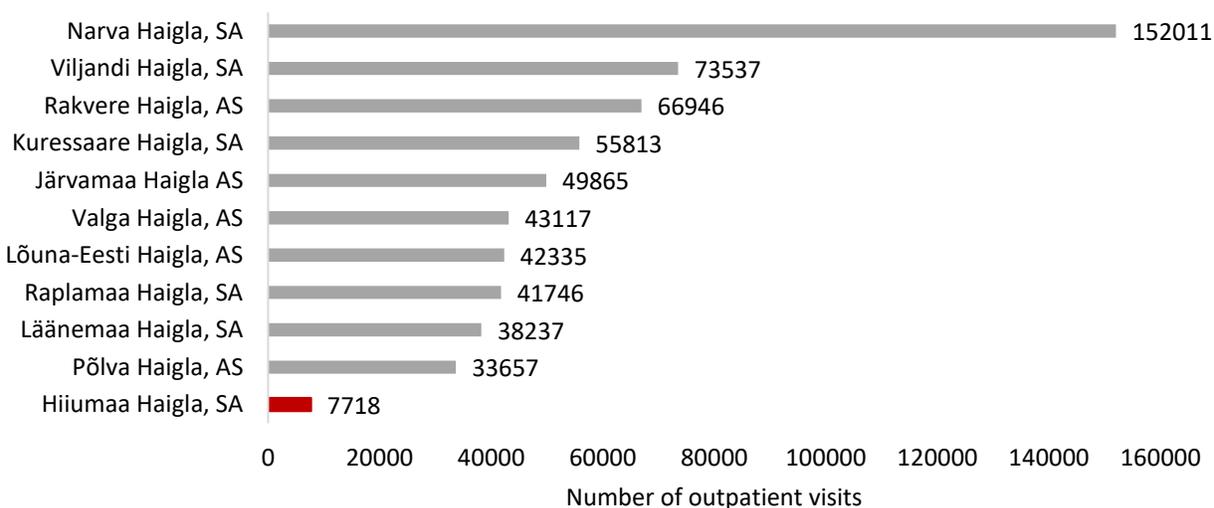
NA: not applicable.

Notes: The volume and cost caps only apply to outpatient, day surgery and day care, and inpatient care. Other types of services, such as expensive care, rehabilitation, nursing care, and prevention, are not subject to volume and cost caps.

**Hiiumaa hospital is a general hospital located on the second largest island of the country.** With 9,377 inhabitants on an area of 1032 sq. kilometers, the island has the lowest population density among counties in Estonia: 9 inhabitants per sq. kilometer compared to the average population density of 25.4 inhabitants per sq. kilometer. Compared to Estonia’s population, Hiiumaa’s population is also relatively older, with 21.4% of the population above the age of 65 compared to 19.5% in Estonia.

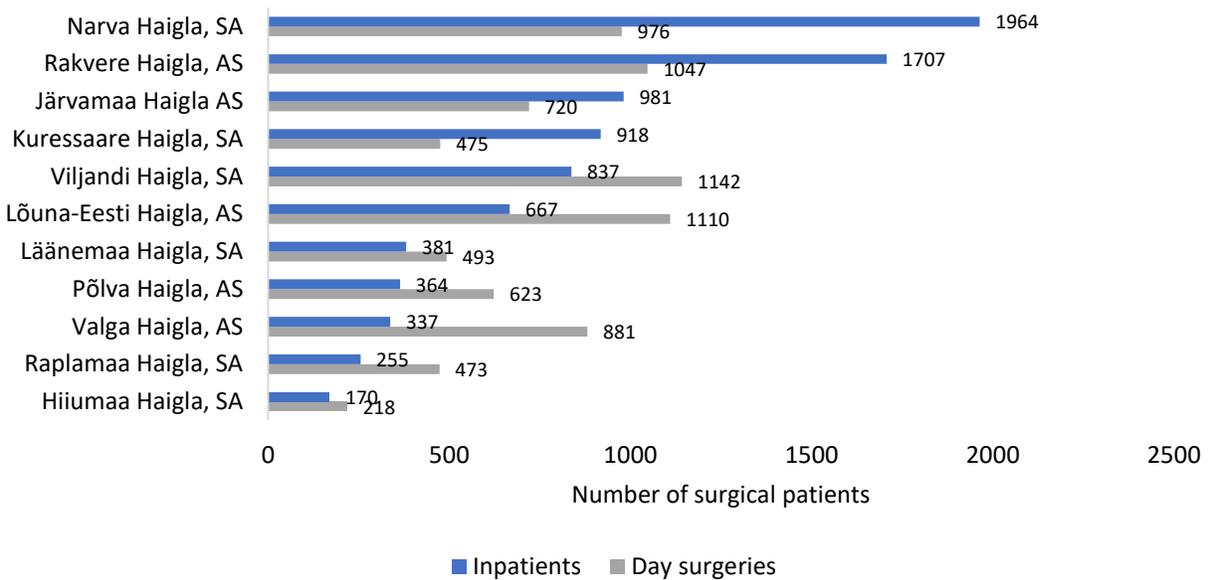
**Hiiumaa hospital’s unique conditions present challenges for service provision and financial sustainability.** The nearest hospital is Laanemaa hospital, located 60 kilometers away but accessible only by ferry, and the travel time varies depending on the season and weather conditions. As a comparator, 94% of Estonians live within a 30-minute drive to a hospital (Habicht et al., 2018). Limited access with longer and variable travel time to other hospitals dictates the need to include the hospital in the HNBP to ensure the island residents access to secondary care. According to the regulation specifying the mandated list of services at general hospitals, Hiiumaa hospital is required to offer a wide scope of services. Furthermore, the hospital provides additional services, such as obstetrics and gynecology. Yet due to low population density and, as a result, low demand for services, Hiiumaa hospital is not able to attain financial sustainability under the volume-driven financing model. The hospital is a clear outlier in terms of volume activity. In 2016, 7,718 outpatient and home visits were performed at Hiiumaa hospital compared to 59,726 on average in other general hospitals (Figure 1). The same year, 170 patients were admitted for surgery at Hiiumaa hospital compared to 841 on average in other general hospitals (Figure 2).

Figure 1. Number of outpatient visits at general hospitals, 2016



Source: Health Statistics and Health Research Database.

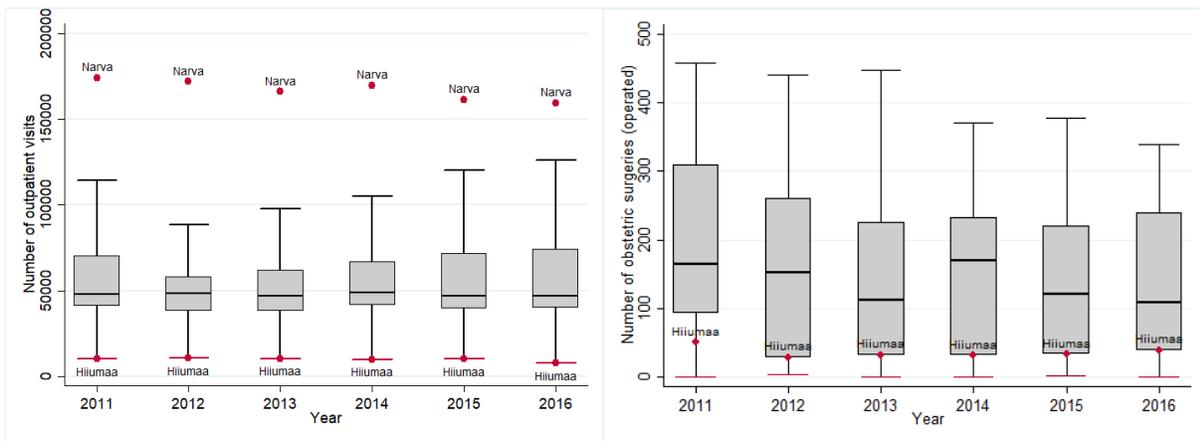
Figure 2. Number of inpatient and day surgical patients at general hospitals, 2016



Source: Health Statistics and Health Research Database.

Between 2011 and 2016, Hiiumaa hospital consistently reported the lowest volume of services among general hospitals. Figure 3 present the box plots for outpatient visits and obstetric surgeries at general hospitals.

Figure 3. Number of outpatient visits and number of obstetric surgery patients, 2011-2016



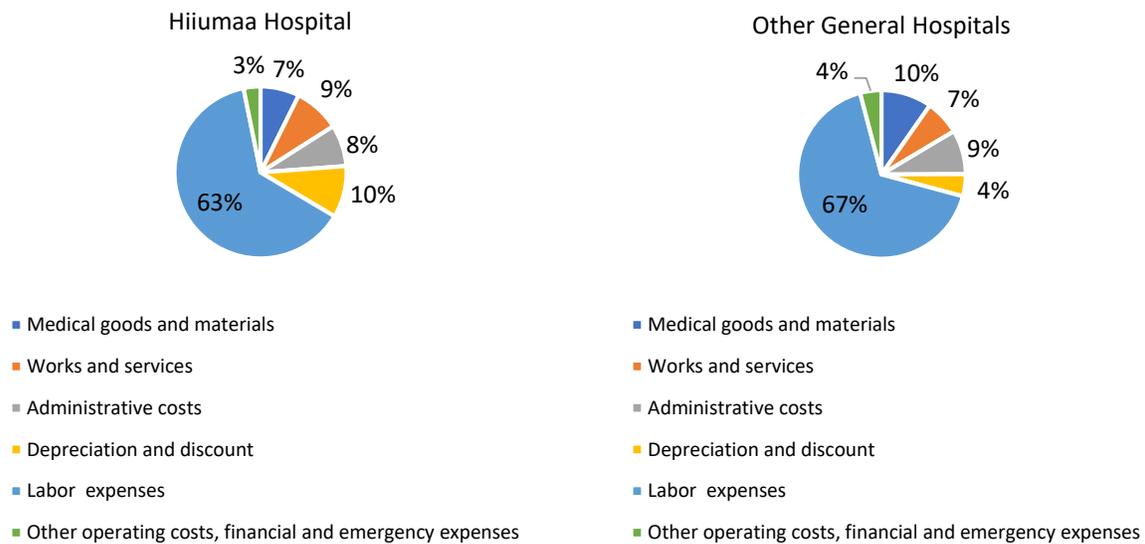
Source: Health Statistics and Health Research Database.

Notes: Läänemaa Hospital reported 0 obstetric surgeries between 2011-2016, and Raplamaa reported 0 obstetric surgeries in 2014 and 2016.

In terms of expenditures, Hiiumaa hospital also differs from other general hospitals. Despite the higher costs of inputs due to its remote location, labor expenses represented a smaller share of expenditures than in other general hospitals in 2016. Figure 4 presents the breakdown of expenditures for Hiiumaa hospital and other general hospitals in 2016. Labor costs accounted for

63% of expenditures at Hiiumaa hospital compared to 67% in other general hospitals, with the share decreasing to 53% at Hiiumaa hospital in 2017. The composition of expenditures at Hiiumaa hospital points to some inefficiencies. Depreciation costs represent 10% of expenditures compared to 4% in other general hospitals. Although the share at Hiiumaa hospital declined to 6% in 2017, it is still above the 2016 average for general hospitals. Meanwhile, medical goods and materials represent 7% of expenditures at Hiiumaa hospital compared to 10% at other general hospitals. Overall, this suggests that a significant portion of expenditures is allocated to upkeep and maintain the facility rather than to deliver health services.

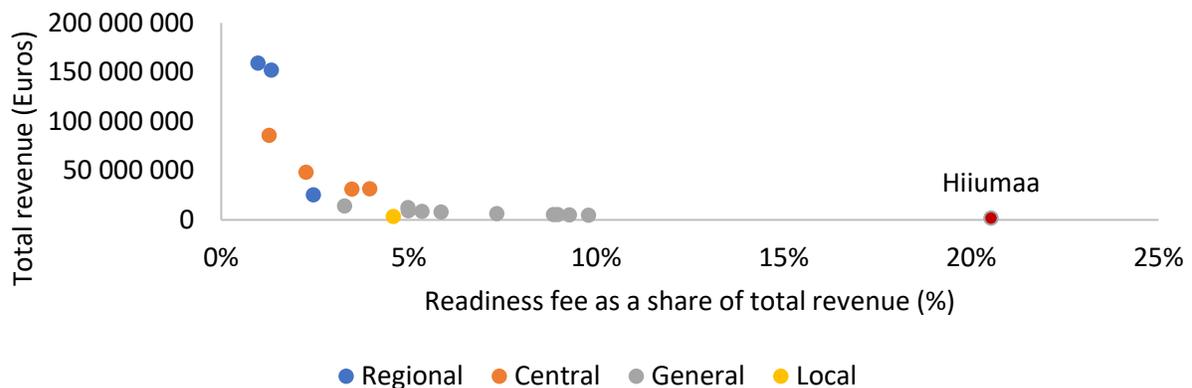
Figure 4. Breakdown of expenditures at Hiiumaa hospital and other general hospitals, 2016



Source: Health Statistics and Health Research Database. Data from 2016.

Prior to the introduction of the global budget, Hiiumaa hospital relied heavily on the readiness fee – the additional payment made by EHIF to ensure the provision of essential services 24/7. In 2017, the readiness fee represented 21% of Hiiumaa hospital’s total revenues, while accounting for less than 10% of the revenues of other general hospitals (Figure 5).

Figure 5. Readiness fee as a share of total revenues, 2017



Source: Health Statistics and Health Research Database. Data from 2016.

Hiiumaa hospital has been facing significant financial difficulties. The profit margin of the hospital has been decreasing steadily since 2012 reaching a low of -11% in 2016, making it evident that Hiiumaa hospital could not sustain its operations based on revenues from EHIF (Figure 6).

Figure 6. Profit margin (%) at general hospitals, 2011-2016



Source: Health Statistics and Health Research Database. Data from 2016.

**The prospective budget was introduced in April 2018 to address the financial sustainability of Hiiumaa hospital and to ensure access to services.** The budget is comprehensive and covers inpatient, outpatient specialist, day-surgery and day-care, rehabilitation, nursing care, and emergency department services. Three services are still paid using FFS: blood products, hemodialysis, and patient transportation. According to the contract, the following providers must be available at Hiiumaa hospital: an emergency care doctor, an internal medicine doctor, a general surgeon, a midwife, a gynecologist, and an anesthesiologist. An emergency care doctor and a midwife must be on call 24/7, while the other providers can be on standby duty at home. In addition, specialized outpatient consultations, such as cardiology and endocrinology, must be available at least one day per month.<sup>1</sup>

**The budget was calculated using a primarily input-based approach that was largely driven by human resource (HR) considerations.** Higher wages were included in the calculation of the global budget based on the agreement between EHIF and Hiiumaa hospital to increase the remuneration of medical staff starting in 2017. The current average hourly wage for doctors from mainland (and for all doctors from 2019) at Hiiumaa hospital, which was used to calculate the

<sup>1</sup> Hiiumaa hospital contracts with North Estonia Medical Center for the provision of specialized outpatient services.

HR-associated costs, is 20 Euros compared to 15.44 Euros at other general hospitals. In addition, the hospital's activity in 2017 was taken as the basis to estimate service volume and overhead expenditures. These were multiplied by the national average resource prices to derive the global budget. The use of national average prices introduces some benchmarking to other hospitals and efficiency measures in an otherwise largely input-based budget.

## Rural Hospitals Across Countries: Definition and Overview of Main Challenges

**The definition of rurality differs across countries and is often linked to low population density and remoteness based on travel time.** There are four broad criteria to define rurality: (i) distance from nearest urban center or hospital; (ii) social representation or geographic concept (e.g. defined based on social construct, such as agricultural areas, or development (e.g. paved roads); (iii) number of people per square mile; and (iv) cost or time to travel to the nearest facility. OECD defines rural areas as those with population densities below 150 inhabitants per square kilometer (OECD, 2011). Australia has three different categorization systems – one of which categorizes settings that are more than 80 kilometers or one hour's travel time from the nearest, most frequently accessed hospital and support services as rural. A similar categorization based on distance is used in Canada, where communities that are more than 400 kilometers from a major hospital are classified as *rural isolated*. Some countries further distinguish between rural and remote areas. The U.S. Oregon Classification System, for example, has three classifications for such settings: (i) rural, with a population density of 10-59.9 per square mile; (ii) frontier, with 0.5-9.9 inhabitants per square mile; and (iii) remote, with fewer than 0.4 inhabitants per square mile. Meanwhile in Australia, remote areas are those that are more than 300 kilometers or 3 hours' travel time from support services.

**Similar to the definition of rurality, the concept of 'rural' hospitals also varies.** Smaller or rural hospitals are often referred to as community hospitals. Such hospitals provide a broad scope of services, including inpatient care. Community hospitals, however, are generally categorized by their size rather than distance or access to other facilities and are not necessarily located in rural or remote settings. Countries use different indicators to categorize smaller or rural hospitals. Australia, for example, classifies hospitals depending on the location, types of services provided, and volume of inpatient admissions.<sup>2</sup> The majority of 'rural facilities' fall under public acute groups B-D, with those in remote areas typically classified as very small hospitals. Very small hospitals on average have 8 beds and less than 200 inpatient discharges per year. Meanwhile, there are four main types of "rural hospitals" in the United States. Critical Access Hospitals (CAHs) most closely resemble the rural hospitals in Estonia. They have fewer than 25 beds, are located more than 35 miles from another hospital, maintain an annual average length of stay of 4 days

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<sup>2</sup> The Australian Institute of Health and Welfare (AIHW) classifies hospitals into the following peer groups: principal referral hospitals; public acute group A, B, C, D hospitals; very small hospitals; specialist hospitals; psychiatric hospitals; same day hospitals; other acute specialized hospitals; sub-acute and non-acute hospitals; and outpatient hospitals. More than 70 percent of hospitals have 50 or fewer beds.

or less, and provide 24/7 emergency care services. In Norway, rural health services are provided by cottage hospitals (sykestue), small general hospitals, municipal acute care beds (kommunale akutte døgnplasser), and local medical centers. A cottage hospital is defined as a “medical institution which admits patients in order to investigate whether they should be admitted to a hospital, or for simple treatment which cannot appropriately take place at the patient’s home but does not warrant admission to a hospital” (Pitchforth et al., 2017). Finnmark county, the northern-most and eastern-most country in Norway with a low population density and only 75,000 inhabitants, for example, has 16 cottage hospitals, which provided a total of 3,000 day and overnight stays in 2013.<sup>3</sup>

**Rural hospitals face a number of challenges due to their location and catchment population.**

Small rural or remote hospitals cater to a different population than hospitals located in more urban regions. The patient mix is typically older with a higher prevalence of chronic conditions and in need of more long-term care options. Longer distances and travel times to larger hospitals entail a larger scope of services for small rural hospitals, including 24/7 emergency care, while low volume of care for some services raises concerns of quality of care. A summary of the evidence on the association between volume and outcomes is presented in Box 1. Several countries have implemented minimum volume thresholds based on the volume-outcome evidence, such as the Netherlands, Germany, France, or more recently Lithuania. However, identifying the services and setting thresholds has proven to be difficult, as there is no international consensus on the appropriate value of minimum thresholds. Such policies thus require a consultative and interactive approach based on country specific data. Pioneers, such as the Netherlands or the Leapfrog Group, for example, do not enforce minimum volume thresholds for delivery. Furthermore, for urgent care, minimum-volume policies typically take into account geographical access and often include exemptions depending on distance or travel time. For example, in Lithuania, a hospital is not contracted by the National Health Insurance Fund if it carries out fewer than 300 births per year or less than 400 major surgeries, unless it is more than 50 kilometers away from another facility (OECD, 2018). Although Hiiumaa hospital is unlikely to provide most of the high-risk and low volume interventions that require a high level of technical specialization and corresponding technical environment, it does have a relatively low volume of deliveries. In 2017, 40 deliveries were performed at Hiiumaa hospital, 8 of which were performed via a caesarean section. Further investigation and monitoring of quality is required for low-volume procedures at Hiiumaa hospital to assess the trade-off between physical access and quality of care. Another aspect to consider is the feasibility to redirect patients to designated facilities. In the specific case of delivery and neonatal care, distance to the nearest neonatal facility is likely to be the main determinant of where the deliveries happen. A study conducted by Watson et al. (2014), for instance, found that in England only 23 percent of high-risk women

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<sup>3</sup> Alta Helsecenter is the largest cottage hospital. With nine beds, in addition to typical cottage hospital services, it provides specialist services, such as chemotherapy. In 2012, the hospital had 470 admissions, 3357 ambulance transports, 97 deliveries, 132 day surgeries, and 4803 radiology examinations (Pitchforth et al., 2017).

had delivered in tertiary care facilities, when the tertiary care facility was not the nearest neonatal facility.

*Box 1. Evidence on the relationship between volume of care and outcomes*

The first empirical study exploring the relation between volume and outcomes was published in 1979 (Luft et al., 1979). In their seminal work, Luft and colleagues found an inverse relation between mortality and case volume in 10 out of 12 surgical procedures. Since then, the association between case volume and health outcomes has been documented extensively (Amato et al., 2013; Begg, 1998; Birkmeyer et al., 2002, 2003; Pieper et al., 2013). The available literature confirms an association between surgical volume (surgeon and/or hospital) and outcomes, particularly for high-risk and low-volume procedures, such as aortic abdominal aneurysm repair (Phillips et al., 2017), esophagectomy (Brusselaers et al., 2014; Wouters et al., 2012), pancreaticoduodenectomy (Hata et al., 2016; Macedo et al., 2017), bariatric surgery (Zevin et al., 2012), or cardiac transplant (Pettit et al., 2012). Regarding the association between volume of services and neonatal outcomes, the evidence is more mixed, and the transferability of the results is less straightforward. Multiple studies suggest that there is a negative association between volume and adverse outcomes for neonates (Chung et al., 2010; Phibbs et al., 2007). However, other factors beyond volume have also been found to reduce neonatal mortality. Availability of specialty equipment and trained staff, for example, play a critical role in shaping care outcomes (Barfield et al., 2012; Hallsworth et al., 2008; Lasswell et al., 2010).

**Another major issue facing rural and remote hospitals is related to the recruitment and retention of staff with required skills.** While most countries have staffing and training requirements for hospitals, these are often difficult to meet in rural areas. Many countries have experimented with various interventions aimed at recruiting and retaining health workers in rural areas, but the evidence of the impact of these measures remains limited. The four main categories of interventions are: (i) education, including the selection of students in entry to medical schools and the design and geographic distribution of post-graduate clinical training programs; (ii) regulation (e.g., compulsory community service in underserved areas as a pre-requisite for specialization or for recently graduated doctors); (iii) financial incentives, (e.g., scholarships at entry to medical schools or higher salaries in underserved areas); and (iv) personal and professional support (e.g., better living conditions and career development programs). Recruitment of students from rural areas appears to be the factor most strongly associated with rural practice (Grobler et al., 2009). Although the evidence is weaker for other interventions, most OECD countries use financial incentives to foster better geographic distribution of physicians (Ono et al., 2016). New Zealand, for example, uses a Rural Ranking Score (RRS) to identify general practitioners (GPs) working in rural areas to pay them a bonus. The RRS includes items, such as travel time from the surgery to the nearest major hospital, on-call duty, responsibility for major trauma, travel time to nearest GP colleague, and travel time to most distant practice boundary where the GP holds regular peripheral (off-site) clinics. A similar system is used in the Canadian province of British Columbia. The Rural Retention Program grants

physicians an annual bonus based on isolation points that take into account the presence of other physicians in the area and the community's geographic characteristics. Overall, the evidence, however, suggests that while financial incentives can be an important tool for retaining health workers, they are less effective at attracting new recruits (Dolea et al., 2010; World Health Organization, 2010; Ono et al., 2016).

**The financial sustainability of small hospitals in rural or remote settings is of increasing concern, particularly in countries with low population density and dispersed communities.** Such hospitals often have fluctuating activity and low volume of services, resulting in unpredictable revenue if they operate under a purely activity-based payment model. Hospitals have a relatively high fixed cost, making services with low volumes disproportionately expensive and offering little opportunity to attract additional patients or provide more services to defray costs. Recognizing the financial vulnerability of small rural or remote hospitals, some countries have introduced separate financing provisions for such hospitals. For example, the CAH designation in the United States was created in 1997 to reduce the financial vulnerability of rural hospitals and to improve access to health services by maintaining essential services in rural communities. To do this, CAHs are reimbursed at a higher rate than other facilities – 101 percent of the Medicare average cost (Johnson, 2015).

### Service Delivery in Smaller and Rural Hospitals

**Remoteness, rather than size and rurality, entails the provision of a broad range of acute care services.** Due to geographical needs, in Australia, New Zealand, and Canada, rural hospitals tend to provide a more comprehensive set of services, including primary, secondary, and emergency care. Conversely, in the UK, Scotland, and Italy, due to relatively higher population density, rural or community hospitals provide more non-acute care, such as post-acute geriatric care, rehabilitation services, and palliative care. Rather than serving a geographic purpose, such hospitals tend to cater to specific groups of the population and are typically geared towards the elderly. One exception in Italy are community hospitals in the Marche region, which also offer 24-hour emergency care and a wide range of specialist services, such as dialysis. While small general hospitals in Norway provide sub- and post-acute intermediate care, rehabilitation, and palliative care, more rural cottage hospitals provide a wider range of services, including obstetrics and day surgery. Since hospitals in Norway are separated into hospital trusts, smaller rural hospitals are managed and funded by regional hospitals, leading to a system referred to as “decentralized specialist healthcare services” (Pitchforth et al., 2017). In general, while smaller hospitals typically focus on long-term care and rehabilitation, due to distance and access concerns, rural hospitals are often required to provide inpatient and emergency care 24/7.

**GPs are the main providers of care at rural facilities, and service delivery typically involves multi-professional teams, comprised of nurses, health-care assistants, and allied health professionals.** Medical doctors represent a small share of rural hospital staff and are typically not available on site at all times, although this varies depending on the size and location of the

hospital. Specialists often play an intermittent or remote supervisory role, and most rural hospitals rely on visiting specialists from larger hospitals nearby. In the Northern Territory of Australia, local GPs can telephone a network of specialists assigned to the rural hospital for specialist advice or for evacuating patients. Serving a population of 20,000 across six municipalities, Hallingdal hospital in Norway, for example, is run by GPs who are supervised by telephone by specialists at Ringerike general hospital – the managing hospital located 170 kilometers away (Pitchforth et al., 2017).<sup>4</sup> Faced with the challenge of recruiting and retaining physicians, many countries are increasingly relying on task-shifting in rural areas, and GPs and nurses increasingly need to demonstrate a broad spectrum of skills and flexibility. In Australia, for example, so-called ‘procedural GPs’ are allowed to perform basic surgery after some additional training. Eleven OECD countries, including Canada, Finland, the Netherlands, New Zealand, and Sweden, have also recently introduced or expanded mid-level providers, such as nurse practitioners or physician assistants, to ensure access and improve the distribution of health workers (Ono et al., 2016).

**Rural hospitals often have a higher degree of integration and collaboration with other services.** Acute care is increasingly co-located with primary care, community care, and social care services within the rural hospital. Recognizing the indispensable nature of acute care in very remote settings, to improve financial sustainability of rural hospitals, many states in Australia have begun to transform rural hospitals into multipurpose health centers (OECD, 2015).

**Provision of comprehensive services, however, is often challenging due to limited capacity or access to specialist expertise.** A study from New Zealand, for example, showed that of the 35 selected medical conditions and procedures needed for acute admissions, only 70% could be performed in rural hospitals. More remote facilities (>90 minutes from a base hospital) and those serving larger populations (>10,000), however, were more likely to manage the selected conditions (Williamson et al., 2010). Conversely, a study of emergency departments in Canadian rural hospitals found that they often lacked access to services apart from basic laboratory and radiography services (Fleet et al., 2013).<sup>5</sup>

**Countries are increasingly relying on telemedicine to ensure access to essential services for citizens in rural areas and to offer support to GPs for more specialized care.** In Australia, telehealth has been used to improve access to certain services, such as mental health and dermatology, by linking rural GPs or patients directly to specialists in other hospitals. An online platform Tele-Derm, developed by the Australian College of Rural and Remote Medicine, for example, allows rural GPs to submit photos of skin conditions along with the patient’s history and possible diagnosis. The information is reviewed by dermatologists, who typically provide a diagnosis and treatment options within two days (OECD, 2015). Telehealth is also often used to

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<sup>4</sup> With 14 beds, Hallingdal hospital is similar to the Alta helsesenter cottage hospital. In 2009-10, it reported 605 inpatient admissions with an average length of stay of 6.3 days (Pitchforth et al., 2017).

<sup>5</sup> Only 5% of emergency departments in rural hospitals had access to a pediatrician, 26% had access to a surgeon, 28% had access to ultrasound equipment, 20% to a CT, and 17% to an intensive care unit (Fleet et al., 2013).

help patients monitor long term-term chronic conditions (OECD, 2017), and studies have found that telemedicine is associated with fewer emergency department visits and hospital admissions for heart disease, diabetes, and hypertension (Purdy, 2010; McLean et al., 2012; Steventon et al., 2012; Bashur et al., 2014). It could also serve as a cost-containment policy. Evidence from Brazil, for example, suggests that the use of telehealth to link cardiologists and other specialists to primary care professionals significantly lowered the costs of service provision (Alkim et al., 2012).

## Global Budget Theory

**Under a global budget, a provider receives a fixed amount of money for a specific period to cover expenditures to enable the provision of a defined set of health services.** The main objective is cost containment. The entire budget or a minimum revenue is guaranteed. However, the provider bears some financial risks if utilization (or volume of services provided) is higher than expected. Compared to activity-based financing or line-item budget, this payment method presents several strengths. It provides expenditure predictability for purchaser and provider and is relatively straightforward to administer. It creates strong incentives for providers to control volume and cost and to reduce unnecessary utilization. Unlike line-item budgeting, it provides autonomy and flexibility to hospital management to allocate resources and improve efficiency (Berenson et al., 2016). The actual payment can be made through various mechanisms, such as DRGs, block grants, or fee-for-service. In the case of a block grant, the hospital receives a fixed amount, determined prospectively, for a given period of time. The global budget can also be implemented as a budget target, with the hospital billing the purchaser based on activity until the budget target is reached. The budget can be soft or hard. Under a soft budget, the hospital shares some of the financial responsibility for the overrun, while, under a hard budget, the facility is held accountable for the full amount of overrun. Conversely, the hospital revenue can be partially or fully guaranteed if the activity is lower than planned. In Estonia, the volume and cost caps create a “soft” maximum budget without a minimum revenue guarantee.

**Three approaches can be used separately or in combination to set a global budget: historical, capitation, or normative.** The historical approach uses the first-year budget, which is typically based on activity, or historical activity, as the base for calculating the global budget. It is the easiest and most commonly used approach for calculating global budgets. With capitation, the budget is commensurate to the need of the population the hospital serves. It is more complex and data intensive, as it requires adjusting the budget according to the health-status risk of the catchment population. This approach is not commonly used on its own to set global budgets, but demographic and health status factors are often used for adjusting the budget amount. The normative approach entails the use of external rate-setting to set the unit prices of services and to multiply those prices by the volume of services desired or forecast. This approach does not necessarily take into account the previous budget, level of activity, access, or cost of services (Berenson et al., 2016).

**Similar to other payment models, global budgets carry some risks.** They do not explicitly promote competition. Unless benchmarking or performance-based incentives are introduced, under a global budget, hospitals do not have an incentive to improve performance and deliver better quality of care. On the contrary, the introduction of global budgets may result in under-provision of services and an increase in referrals to other providers. If demand for services exceeds the budgeted amount, hospitals may delay the provision of care, leading to longer waiting lists. Unlike activity -based payment, such as FFS, global budgets can not only disincentivize unnecessary care but may also reduce necessary care unless regulated carefully. The method used to calculate the global budget is key in ensuring its effectiveness. If the global budget is calculated based on historical expenditures, it may reinforce current resource flows. Meanwhile, if the global budget is set too low, hospitals may face financial arrears (Berenson et al., 2016). The introduction of DRGs in European countries was a response to the inherent flaws of historic block-grant global budget that did not incentivize efficient delivery of care, quality of care, and lacked transparency in allocation of resources among providers (Busse, 2011). Most of the risks, however, can be mitigated with the introduction of proper monitoring and accountability mechanisms. To address the risk of shirking, for example, countries can introduce penalties for unnecessary referrals and strengthen gate-keeping.

**Global budgeting can be attractive for small, rural hospitals that struggle to survive under fee-for-service reimbursement.** Under a global budget, such hospitals can plan for an annual amount of revenue and invest in activities to reduce hospitalization, which might be difficult to do under a volume-based payment model due to the variability of activity. In addition, global budgets are well suited for rural facilities with easily identifiable catchment or reference populations, which makes it easier to forecast utilization patterns for the following year. In addition, under global budgets, rural hospitals may have stronger incentives to implement population health management programs and stronger coordination with PHC providers because they are likely to capture the majority of any associated savings (for example, from fewer admissions or shorter stays).

## Global Budget for Rural Hospitals in Practice

**This section builds on the experiences of Australia and the State of Maryland in the United States with introducing global budgets.** Key characteristics of payment model for small and rural hospitals are presented in Table 3. More details can be found in the case studies in Annex 1 and 2 and a snapshot on the French financing model for community – or so called “proximity”-hospital in Box 2 .

Table 3. Key characteristics of a sample of payment models for mall and rural hospitals

Country	Type of rural hospitals	Predominant payment model	Service mix	Number of beds (or number of stays)
Australia	Public acute group B-D hospitals; small rural and remote hospitals	Block grants based on “national efficient cost”	‘Geographic purpose’, most typically providing obstetric care, emergency care, minor surgery and/or emergency stabilization, management of simple conditions, hospitalization for uncomplicated general medical patients, subacute care or step-down care	≤ 75 beds
France	Public, Private non-for-profit, Private for profit	Minimum revenue guarantee based on previous activity (80%) and add-on function of community characteristics, complemented by activity-based financing using DRGs	Only medicine, cannot perform surgery or delivery Interface between primary care, secondary and social care	<5500 stays
United States - Maryland	Private non-for-profit; sole community hospital	Global budget revenue – cap on total hospital revenues	Short term acute care	Average number of beds: 100
Norway	Cottage hospitals (Sykestue) Small general hospitals	Block grants (60%), complemented by activity-based financing from the central government using DRGs	Typically sub- and post-acute care, intermediate care, rehabilitation, palliative care Cottage hospitals provide wider range of services, including obstetrics, day surgery, some specialist services (e.g. chemotherapy)	Cottage hospitals ≤ 10 beds

**Eligibility of hospitals for global budgets is typically determined once every few years.** One of the main objectives of introducing global budgets for small and rural hospitals is to provide revenue stability in addition to promoting greater involvement in population health. Financial predictability is required to design and implement changes, thus necessitating a longer eligibility time frame. For example, the Maryland program was implemented for an initial period of five years. Hospitals in France are eligible for a period of at least two years, while in Australia this determination is made once every six years (or more frequently at the states' discretion).

**The scope of the global budget is generally broad and covers outpatient, inpatient, and emergency care.** Some expensive services, however, can be excluded to reduce the financial risk for providers. In Australia, the block-grant for the global budget pays for all types of services provided by the hospital. Meanwhile, Maryland's global budget accounts for inpatient, outpatient, and emergency department services, but excludes some specialized services that are paid separately (e.g., home health, outpatient renal dialysis, skilled nursing facility services, some cancer care).

**The global budget acts as a constraint on total expenditures, but the flow of funds can differ.** Within a global budget, funds can flow through prospective block-grants, DRGs with expenditure targets, or a mixed model. In Australia, small rural or remote hospitals are funded exclusively by block grants, the amount of which varies depending on the hospital's volume of services, location, and type of services provided. Other countries usually use a mixed model. In the State of Maryland, the global budget is implemented as a cap on the annual hospital's revenue rather than a fixed monthly payment. Hospitals send invoices to health insurance providers for the services provided. The global budget specifies the total amount of revenue that a hospital can receive each year. Each hospital is permitted to raise or lower its prices by up to  $\pm 5\%$  throughout the year in order to stay within the budget. Hospitals face penalties if the total of the invoices is over or under-budget by more than 0.5%. In Norway, on the other hand, block grants represent 60 percent of the hospital's budget, with the remainder funded by the central government based on DRGs and a small portion of the budget (0.5%) dependent on quality-based financing.<sup>6</sup> In France, community hospitals are financed for in-patient based on DRGs with a minimum revenue guarantee of 80% of the historical revenue.

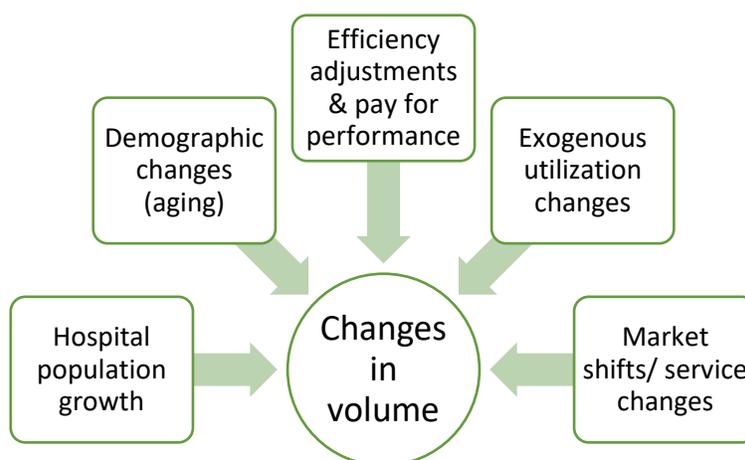
**Global budgets are often set based on previous or forecasted activity.** In Maryland, the budgets are calculated based on the facility's revenue in the base period (2013) and are adjusted for inflation, demographics, market changes, and quality performance. In addition, the budgets included a one-time "seed revenue," representing 1.05 percent of hospital base revenue, for improving infrastructure and introducing new services in rural hospitals. The budgets reflect the forecasted utilization, including case-mix, and regulated prices. The forecasted utilization is calculated based on hospitals' historical volume, case mix, and projected changes in utilization

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<sup>6</sup> Certain types of specialist services, such as mental health, are exclusively funded by block grants.

due, for example, to demographic or economic changes in the hospital service area. The budget can also be adjusted to account for exogenous changes in utilization of health services (e.g. flu outbreak) (Figure 7). Hospitals' revenues are capped, but hospitals can adjust rates, as volumes vary, to stay within the global budget. In Norway, the size of the block grant is determined based on the type of services the hospital provides<sup>7</sup> and other factors, including the number of residents in the catchment area, the socio-demographic composition of the population, and the case-mix. In France, the global budget for inpatients is based on the average revenue of the two previous years, which in a DRG system is a function of volume of services and case-mix.

Figure 7. Factors affecting changes in volume in Maryland



In Australia, the global budget for small or remote hospitals is a function of the National Efficient Cost (NEC) – a set amount that represents the average cost of block funded hospitals across Australia – and the relative weight that is determined based on the hospital's volume, location, and service mix. Facilities are grouped based on the volume of services using a standardized unit, the National Weighted Activity Unit (NWAU), which allows to compare different services (e.g., inpatient, outpatient, and emergency care). The amount of block funding for each hospital is determined by multiplying the cost weight of the appropriate category by the NEC. The Independent Hospital Pricing Authority receives guidance and advice from a Small Rural Hospital Working Group about setting an effective NEC for block funding annually.

**Global budgets are effective at curtailing costs, but there is limited empirical evidence of their impact on provider behaviour and other measures of health systems performance.** Countries usually use a blend of different systems, and several EU countries rely on global budgets with an activity-based financing component to control costs, while at the same time introducing incentives for efficiency. However, few of them have conducted rigorous evaluations of the impact of introducing global budgets on quality and utilization of health services (Schwierz,

<sup>7</sup> In 2010, inpatient care represented 73 percent, psychiatric care 18 percent, 6 percent was for ambulance/patient transport, and 3 percent was for substance abuse treatment (Pitchforth et al., 2017).

2016). There is evidence that the introduction of global budgets reduces spending (Yip and Eggleston, 2004; Tan and Melendez-Torres, 2018). The evidence, however, is limited and mixed in terms of other performance dimensions. In a systematic review of prospective payment systems, including global budgets, Tan and Melendez -Torres (2018) found that prospective payments not only reduced health expenditures, but also resulted in lower length of stay and readmission rates. On the other hand, global budgets without explicit incentives for quality can lead to sub-standard care as seen in Taiwan (Chang and Hung, 2008). However, the design of the policies and the context in which they were implemented vary greatly. Using the framework for global budget payment proposed by Chen and Fan (2016), the Hiiumaa prospective can be categorized as a global budget with a hard financial constraint at the facility level defined by a contract with the individual hospital under a single payer with no price adjustment. Other European countries implemented similar global budgets prior to introduction of DRGs, for example in the Netherlands and France in the 1980's. These policies were effective in controlling overall spending on health but were found to have a negative impact on utilization. In the Netherlands, a growing waiting list and public pressure led to the abolition of global budgets in 2001 and the introduction of a DRG-based system in 2005 (Schut and Van de Ven, 2005). Similarly, the French system of block-grants based on historical revenue raised concerns regarding inefficiencies and inequalities in budget allocation (Redmon and Yakobosk, 1995; Dormont and Milcent, 2002). This led to the implementation of DRGs, initially to monitor activity and increase transparency and beginning 2004/2005 for activity-based hospital payment in 2004/2005. (Busse, 2011). In Maryland, the evidence suggests that the introduction of global budgets reduced overall spending growth of hospitals at the State level and improved the financial sustainability of hospitals, particularly in rural areas, while no consistent changes were found in utilization of inpatient, outpatient, and emergency department services, or quality of care (as measured by 30-day readmissions) (Haber et al., 2018; Roberts et al., 2018a; Roberts et al., 2018b).

*Box 2. Proximity hospitals in France: introducing global budget to promote integrated care*

France has a population of 66.9 million inhabitants, 20% of which live in rural areas. Coverage by noncompetitive publicly financed health insurance is universal and compulsory, and includes services provided by public and private facilities. DRGs are the main payment method for hospital acute care.

In 2016, the French government implemented a financing reform called “proximity hospitals” to address specific challenges faced by small hospitals, namely: the variability of revenues under a volume-based system and the promotion of greater integration with PHC and social care) (given the older catchment population). Under the reform, community hospitals were eligible to receive a minimum revenue guarantee.

The reform was triggered by the end of the waiver for a specific category of hospitals that remained financed by historical budget after the introduction of DRGs. The reform was aligned with a political commitment to strengthen local hospitals in areas facing medical human resource challenges, specifically related to shortages (or risk thereof) of general practitioners and specialists. The objectives of the new financing mechanism were to mitigate the variability of financial flows while promoting responsiveness to population needs and (ii) to account for the specificity of the care delivery and environment. The scope is limited to inpatient services.

The eligibility of the hospital is based on the type of services provided (only medicine, no surgery or delivery), volume of activity (less than 5,500 discharges per year), and environment in which the hospital operates (older population, poorer, rural, and lower density of medical providers). The eligibility is not automatic. The regional health agency can exclude hospitals that will not comply with the mission of the “proximity hospitals” (i.e. to strengthen integration of primary, hospital, and social care). The minimum revenue guarantee is based on historical revenue, with a top up to account for the challenging environment based on the same indicators as for the eligibility. The reporting of activity remains unchanged. The hospital sends individual invoices for each discharge to the health insurance, which pays the sum of the invoices or the minimum guarantee, whichever is higher.

No evaluation of the impact is currently available.

## Monitoring and Evaluation

**Few countries have separate indicators to monitor performance of rural hospitals.** Our rapid review found examples of monitoring frameworks for the implementation of global budgets but not specific to rural hospitals. Oftentimes, the same indicators are tracked across all types of facilities, but data are disaggregated by region/type of facility. For example, Maryland monitors potentially avoidable utilization (using indicators on effectiveness and safety) and quality of care (using indicators on effectiveness, safety, and responsiveness<sup>8</sup>), both of which are used in the global budget calculation for each hospital (Table 4).

**Health care performance measurement for rural providers presents specific challenges.** The National Quality Forum in the United States identified a set of issues related to monitoring of performance of rural providers (National Quality Forum, 2015). While the identified issues are context dependent, some are relevant for the Estonian health system. First, the clinical indicators reported by all hospitals tend to focus on specialized care and may not be relevant for the type of patients and diseases treated in smaller hospitals catering to an older population with a higher prevalence of comorbidities. Second, many rural areas have a disproportionate number of vulnerable residents, and measurement should adjust for patient characteristics that could impact outcome. Third, the limited number of observations impairs the reliability and validity of measurements. In case of Hiiumaa hospital, for example, the confidence intervals are very large compared to other hospitals. Therefore, it is more challenging to measure evolution and/or achievement of a specific target.

*Table 4. Monitoring indicators used in the global budget calculation in Maryland*

Factor	Description
Potentially avoidable utilization	Including 30-day all cause readmissions, emergency department (ED) and observation visits within 30 days of admission, potentially avoidable admissions based on Agency for Healthcare Research and Quality prevention quality indicators, and admissions for potentially preventable conditions (PPCs) defined by Maryland Hospital Acquired Conditions (MHAC) policy. The definition of PAU is updated annually.
Quality performance	Facilities receive a quality-based reimbursement (QBR) score. The QBR score is based on a weighted average of total scores across three domains: (i) clinical process of care measures, (ii) patient experience, and (iii) mortality. Hospitals have a maximum revenue at-risk for the QBR program of 2% of inpatient revenue and are rewarded or penalized in accordance with these pre-established standards.

Source: Haber et al. (2016). Evaluation of the Maryland All-Payer Model. First Annual Report.

**The Hiiumaa hospital prospective budget contract includes specific provisions for performance monitoring without establishing a clear accountability mechanism.** According to the new

<sup>8</sup> The dimensions of 'effectiveness', 'patient safety' and 'responsiveness/patient-centeredness' are based on the OECD Framework and quality indicators (Carinci, 2015)

contract between EHIF and Hiiumaa hospital, the performance indicators presented in Table 5 measure utilization of inpatient and outpatient hospital services, efficiency (length of stay), outcome (emergency readmission), and might include responsiveness (patient perceived access – not yet available). As stipulated in the contract, Hiiumaa hospital is expected to maintain the same level of service provision or decrease after discounting for unnecessary care. However, targets or methodology to assess change are lacking. In addition, some indicators are sensitive to patients’ or primary health care providers’ behaviors, such as changes in the number of appointments of family physicians. While such indicators may be relevant for assessing the success of the policy in improving coordination and population health, the hospital should not be held accountable for the observed changes in these domains. For example, the increase in utilization of general practitioner services cannot be directly attributed to the hospital. This might, however, be an outcome of the shift of care from hospital to primary health care (PHC).

*Table 5. Quality and activity indicators included in the financing contract between EHIF and Foundation Hiiumaa Hospital*

Indicators	Hiiumaa hospital only or national indicator
Movement of residents of Hiiumaa as compared to previous years – proportion of treatment cases in Hiiumaa Hospital or outside Hiiu county	Hiiumaa
Use of services described in clauses 1 and 2 as compared to previous years	Hiiumaa
Change in the number of referrals to other providers of health care service (referral marker on treatment invoice) as compared to previous years	Hiiumaa
Change in the number ambulance calls and appointments of family physicians in Hiiumaa as compared to previous years	Hiiumaa
Change in inpatient treatment cases as compared to previous years	Hiiumaa
Change in the duration of inpatient treatment case in active treatment, follow-up treatment, and nursing care as compared to previous years	Hiiumaa
Emergency rehospitalization 30 days after operation as compared to previous years	National
Change in the number of outpatient appointments as compared to previous years	Hiiumaa
Opinion of residents of Hiiumaa about the availability of health care services shall remain the same or improve	Hiiumaa

**The contract could focus on preventing shirking (e.g., under provision of care, lower quality of care, or shift to other providers outside the scope of the regulated volume).** Unless benchmarking or performance-based incentives are introduced, under a global budget, hospitals do not have an incentive to improve performance and deliver better quality of care. On the contrary, the introduction of global budgets may theoretically result in under-provision of services and an increase in referrals to other providers. EHIF could alleviate some of the weaknesses of a global budget by strengthening the role of performance monitoring. As a reference, Table 6 presents the dimensions targeted in countries with a pay-for-performance scheme for inpatient care provision in other OECD countries. Maryland, Australia, France, and Norway (since 2014), implement financial incentives to promote quality improvement. Maryland rewards performance using indicators on clinical outcomes (30-day mortality), safety (adverse

events), and patient experience. Furthermore, incentives to reduce unnecessary care and adverse events are built in the global budget, with the revenue from potentially avoidable utilization deducted from the hospital's global budget. In Australia, the cost of sentinel events (e.g., procedures involving the wrong patient or body part resulting in death or major permanent loss of function) are deducted from the block grant payment for small rural and remote hospitals. For other hospitals, in addition to sentinel events, there is an adjustment for hospital acquired complications. Estonia, currently, does not have similar indicators available on patient safety. Therefore, the indicators in the contract could focus on quality of care with validated process and outcome indicators with national benchmark and relevant for the type of services the hospital is providing (e.g. 30-day emergency hospitalization; 30-day mortality; perineal tear, III and IV degree). Furthermore, the contract should include indicators for monitoring access and responsiveness. Existing data and methodology to assess waiting time could be mobilized and complemented by the assessment of unmet need for outpatient and inpatient care and patient experience (using the patient survey that is being developed). Finally, the contract could include indicators on utilization and on referral, such as the ratio of patients referred to other general or higher-level hospitals, adjusted for the case mix, to prevent shifting patients to other providers.

**Further work is needed to select the targets and benchmarks for Hiiumaa specific indicators.** Absolute thresholds could be established, or the hospital's relative performance could be monitored over time. In relative terms, the hospital could be monitored based on its individual performance or compared to peers (hospitals of similar characteristics). In addition, it is important to refine the indicators on quality and safety, accounting for the potential difficulties involved in measurement for small sample sizes. Although the current indicators focus primarily on surgery, Hiiumaa hospital's activity is mostly medical, requiring a different set of indicators. If necessary, EHIF could adapt the scope of performance assessment framework for rural and small hospitals.

Table 6. Payment for performance activities in inpatient care in 2012

Participation of health providers	Country	P4P target typically relate to					Performance measurement		
		Clinical outcomes of care	Use of appropriate processes	Patient satisfaction	Patient experience	Other	Absolute measurement	Change over time	Relative ranking
Mandatory participation	Australia				X			X	
	France					X			
	Korea	X	X				X	X	X
	Spain	X	X		X		X	X	
	Sweden	X	X		X		X	X	X
	Portugal	X	X	X	X		X		
	Turkey		X		X		X		
Voluntary open participation	Luxembourg					X	X		
	United Kingdom	X	X	X	X		X	X	
Mandatory and voluntary	United States	X	X	X	X		X	X	X

Source: OECD (2016).

The conceptual framework to assess the impact the Hiiumaa hospital prospective budget should capture intended – improving financial sustainability and efficiency with a shift from inpatient to outpatient and greater coordination with PHC – and unintended consequences (e.g. risk of shirking). Regarding financial sustainability, the evaluation could assess changes in the hospital's operating expenses and profit margin. Regarding healthcare utilization, the evaluation could assess changes in the provision of unnecessary care, hospital average length of stay, outpatient care, and unwarranted referrals. Regarding responsiveness and access, the proposed indicators discussed earlier could be used for monitoring quality and responsiveness.

## Conclusion and Recommendations

The Hiiumaa hospital prospective budget is tailored to address the financial sustainability of a hospital in an exceptional environment. The analysis indicates that Hiiumaa hospital is a clear outlier among the HDNP general hospitals. Its unique conditions and characteristics thus merit a different financing approach that guarantees a certain amount of financial resources. This is in line with the approach taken by other high-income countries, such as Australia and France. Similar to emergency department services, EHIF's main objective for Hiiumaa hospital is to ensure access and availability of services 24/7, which to some extent justifies the budget calculation largely based on human resources. While there is limited scope for benchmarking against other facilities, the use of national average prices in the budget calculation is one way of promoting some efficiency gains.

**The scope of the budget is appropriate, as it encompasses inpatient and outpatient activities, while excluding expensive services.** The model covers most fixed costs, including the costs associated with required HR.

**Marginal adjustments could be made within the existing methodological framework to ensure that the budget remains relevant.** First, the calculation of HR-associated costs should be made based on norms rather than existing personnel. Although the number of employed health workers at Hiiumaa hospital in 2017 coincided with the requirements, this will not always hold. It would be important to ensure that the budget accurately reflects the resources required to deliver the mandated services, particularly since recruitment and retainment of health workers is one of biggest challenges facing Hiiumaa hospital. Second, for non-HR inputs, such as equipment, it is important to cover the fixed cost and at the same introduce some incentive for efficiency improvement, linking financing to output. EHIF may consider using a mixed approach for the equipment-related budget calculations: minimum amount to cover the fixed cost of the equipment and a variable amount using a similar approach to the one used in other hospitals based on the average minute price per equipment. Third, the budget should take into account cost inflation, as well as efficiency gains expected from other general hospitals, to ensure that it remains adequate over time.

**Revision of performance indicators in Hiiumaa hospital's contract is needed to current focus on utilization to include other dimensions of hospital accountability: access, quality, safety, and patient experience.** The current list of indicators combines population-based indicators with hospital-based indicators. The hospital should not be held accountable for patients' or general practitioners' behavior (e.g., number of family physician appointments). Rather, the list of indicators should be directly linked to the hospital's performance. In the medium term (over the next five years), Estonia could also experiment with introducing financial incentives for the achievement of quality indicators. Given the financial sustainability objective, positive financial incentives would be more appropriate than negative incentives. Globally, the share of performance-based incentives for inpatient care is typically quite small, ranging from 0.1% to 4% of the hospital's budget (Milstein and Schreyögg, 2015).

**It is premature to assess the impact of the new payment model for Hiiumaa hospital.** Due to Hiiumaa hospital's low volume of care and some seasonality of activity, there is likely to be high variance in observed performance over a short time period. In addition, it will be difficult to disentangle the impact of the payment reform from the impact of the hospital network reform that was implemented concurrently. The implementation of the reform should be closely monitored and adapted if there is evidence of any unintended consequences, but the full impact should be assessed at least two years after implementation.

**It is important to establish a multi-year global budget contract to ensure predictability of revenues after the assessment of the pilot.** This would enable Hiiumaa hospital to plan investment and have time to introduce population health interventions. Both Australia and Maryland, for example, determine hospitals' eligibility for a period of six and five years,

respectively, – the same duration as the framework contracts. The annual global budget, however, can be adjusted for inflation and unit price of salary (if higher than inflation), demographic changes, risk profile of the catchment population, and market share (for hospitals located in areas with more than one hospital). Meanwhile, the hospital should continue to report to EHIF on activity using the current billing system to allow EHIF to monitor the effects of the reform.

**The current model should not be rolled-out to other hospitals.** Hiiumaa hospital’s prospective budget was specifically designed to address the hospital’s financial sustainability due to its remote location and low population density. To this end, the budget is input-oriented and has certain staffing requirements to ensure access. Given a different set of objectives and conditions, the approach is not justifiable for other HDNP hospitals. Moving to a similar model for other hospitals would require introducing additional measures to mitigate the weaknesses of a global budget, including lack of incentives to improve quality and to prevent the risk of shirking. Indeed, in other countries, global budgets are often set based on previous or forecasted activity, which is not the case for the Hiiumaa hospital’s prospective budget, and have specific financial incentives to improve quality of care. For other hospitals, the budget should be primarily output based with some adjustments for changing demographics (e.g. in Maryland). To ensure that other hospitals do not evoke the same model, it is important to establish clear eligibility criteria. Two indicators that could be used to define eligibility are access (travel time to nearest hospital) and population density. Although the Hiiumaa hospital contract states that the model applies to “a general hospital on a small island with low population density,” there are no clear thresholds to define what constitutes low population density. Moving forward, it would be important to quantify the eligibility criteria for the payment waiver.

**Given the limited evidence on the impact of the new global budget models in other countries and the other ongoing payment reforms in Estonia, global budget should not be implemented in other hospital in the short term.** While EHIF may consider moving towards a global budget for other general hospitals if the main objective is cost containment, several prerequisites will have to be met. There is opportunity to refine and strengthen the payment system and address some of the pre-requisites in a phased approach until further evidence is available. The global budget should have a large scope and encompass outpatient, inpatient and emergency care to prevent shift of patients toward unregulated sector of activity. The introduction of an ED prospective grant could be the first step towards the introduction of a global budget, and the ED payment reform should be finalized before any steps are taken to introduce global budgets. Furthermore, EHIF already implements a soft volume cap. EHIF could consider reducing the volume cap, as recommended in the 2017 World Bank review of payment system, particularly for services with unnecessarily high caps, and introduce a minimum revenue guarantee as a transition toward global budget. The objective of a minimum revenue guarantee is primarily financial sustainability, as it specifies a guaranteed annual revenue for hospitals. However, it would be important to monitor and assess the volume thresholds prior to shifting towards a hard cap to ensure access to care and financial sustainability of the model. It would also be important to assess the potential

effects of other concurrent reforms. For example, EHIF is considering the piloting of bundled payments, which would not be fully compatible with the implementation of a global budget. Meanwhile, evaluation of the Hiiumaa model could also provide important lessons for the design of the global budget and could help to mitigate some of the unintended consequences. Notably, there are other ways to contain costs, including through enforcement of hard volume and cost caps. To ensure the appropriateness of the current volume and cost caps, EHIF would need to undertake analysis of the existing caps to determine which services should be included and to identify variation across hospitals.

**The performance assessment framework should be strengthened as one of the prerequisites for piloting global budgets in general hospitals.** To prevent a negative impact on quality and access, EHIF should build on the current ongoing work on quality indicators and patient survey to expand the scope and build specific incentives to ensure quality and accessible care. Furthermore, to steer the expected reductions of services toward a reduction of unnecessary care, EHIF should further investigate opportunities for delivering certain procedures in non-hospital settings. In addition, EHIF should monitor unnecessary care for inpatients to ensure that the volume reduction is well targeted. As an example, Maryland has financial disincentives to limit unnecessary and avoidable services and to promote quality improvement. To implement a global budget, a standardized measurement of volume is also needed to measure outputs. A method to measure all activity covered by the global budget could be used either to group hospitals among peers or to set the initial global budget based on outputs rather than inputs. As discussed earlier, Australia, for example, uses the NWAU – a standardized unit to measure inpatient, outpatient, and ED services. If such a measure is not feasible in Estonia and the DRGs weights are not sufficiently correlated with the cost of providing care, an alternative would be to use a monetary volume equivalent, i.e. historical total revenues, as a proxy for activity adjusted by severity of cases.

**Hospital payment is only one factor in ensuring viability of rural hospitals.** Other policies should be enacted to improve recruitment and retainment of health workers, such as professional development programs or recruitment of students from rural areas, as well as to introduce innovative service delivery models (e.g. telemedicine to improve access to specialized care). Importantly, further strengthening and promoting the use of hospital networks could address some of the human resource issues and improve access to care

Table 7 summarizes the short-term (to be implemented in 2019 - 20) and medium-term recommendations for EHIF based on the assessment of Hiiumaa hospital and review of international experience.

Table 7. Recommendations for general hospital payment reforms

	<b>Short-term recommendations</b>	<b>Medium-term recommendations</b>
<b>Hiiumaa hospital prospective budget</b>	<ul style="list-style-type: none"> <li>• Establish clear eligibility criteria based on population density and travel time to nearest hospital</li> <li>• Adapt budget calculation (HR norms; adjustments for cost-inflation and efficiency gains; average unit prices for general or benchmark hospitals)</li> <li>• Revise the contractual indicators to strengthen accountability on quality, safety, responsiveness, and access</li> <li>• Establish a multi-year framework to allow for predictability</li> </ul>	<ul style="list-style-type: none"> <li>• Investigate the tradeoff between physical access and quality of care</li> <li>• Assess the impact of the prospective budget on access, quality of care, utilization, and hospital financial sustainability</li> </ul>
<b>Global budget</b>	<ul style="list-style-type: none"> <li>• Assess unnecessary care</li> <li>• Expand monitoring of safety and quality of care</li> <li>• Introduce indicators to monitor access and responsiveness</li> <li>• Pilot the ED prospective grant</li> </ul>	<ul style="list-style-type: none"> <li>• Consider pilot of new methodology for global budgets for general hospitals if the objective is cost containment and financial sustainability of hospitals</li> </ul>

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## Annex 1 Australia

### Overview

Australia is a high-income OECD country, with a population of 24.6 million and a GDP per capita of 53,800 US\$ in 2017 (World Bank, 2018). Australia has achieved universal health coverage through Medicare – the national health insurance scheme that is publicly funded through general taxation.<sup>9,10</sup> It spends about 9.5 percent of GDP on health (or 4934 US\$ per capita), of which 67.4 percent is publicly financed. Given the federal structure of the Australian government, the responsibilities for the health system are delineated between the federal and state governments.<sup>11</sup> In 2015-16, State governments funded 53 percent of public hospital services, with the Commonwealth funding approximately 39 percent (AIHW, 2018).<sup>12</sup>

Australia has the world's 10<sup>th</sup> highest life expectancy (82.5 years) (World Bank, 2018), but there are significant differences between urban and rural settings. Life expectancy is 2.3 years higher for men living in major cities and inner regional areas than men living in outer regional, remote, and very remote areas; while for women this difference is 1.4 years (OECD, 2015).

Table 8. Key indicators, 2017 or latest available year

Population (million)	24.1
Population in rural areas (%)	10.3
Population ages 65 and older (%)	15.4
GDP per capita (US\$)	53,800
Current health spending (% of GDP)	9.5
Government health spending (% of total health spending)	67.4
Hospital beds per 1,000 population*	3.9
Life expectancy (years)	82.5

Source: World Development Indicators and OECD

\*Latest year available is 2015 from the OECD. <https://data.oecd.org/healthqt/hospital-beds.htm>

### Service Delivery

Hospital services are provided by both public and private hospitals. The majority of public hospitals are owned and managed by State and Territory governments. In 2016-17, Australia had 695 public hospitals and 630 private hospitals. Compared to 2012-13, there are 49 fewer public

<sup>9</sup> In addition, a small compulsory tax-based health insurance levy is collected. The levy is set at 1.5 percent of taxable income for those above a certain income threshold, with an additional 1 percent surcharge for high-income individuals who are not covered by private insurance for hospital treatment. Low-income individuals are exempt.

<sup>10</sup> Medicare guarantees free treatment in public hospitals and subsidized access to primary care general practitioners, private specialist care, and medicines.

<sup>11</sup> Australia is a constitutional monarchy and has a federal system of government with three political and administrative tiers: the Commonwealth, the States and Territories and local government

<sup>12</sup> The share of Commonwealth funding is expected to increase to 50 percent.

hospitals as a result of some very small hospitals being reclassified as non-hospital services between 2013-15 (AIHW, 2018).

The Australian Institute of Health and Welfare (AIHW) classifies hospitals into peer groups for the purposes of comparing information across similar types of facilities. The following groups are used for acute care hospitals: principal referral hospitals; public acute group A, B, C, D hospitals; very small hospitals; specialist hospitals; psychiatric hospitals; same day hospitals; other acute specialized hospitals; sub-acute and non-acute hospitals; and outpatient hospitals (Table 9). The majority of rural facilities fall under public acute groups B-D, with those in remote areas classified as very small hospitals. Very small hospitals typically have less than 200 inpatient discharges per year. In 2016-17, there were 123 very small hospitals with an average of 8 beds (AIHW, 2018). Annex 1. Key indicators for public hospital peer groups, 2016-17 Annex 1 presents key statistics for each peer group.

Table 9. Description of acute public hospital peer group

Group	Description
<b>Acute public hospitals</b>	<b>Are identified according to the hospital's service profile:</b>
<b>Principal referral hospitals</b>	Provide a very broad range of services, including some very sophisticated services, and have very large patient volumes. Most include an intensive care unit, a cardiac surgery unit, a neurosurgery unit, an Infectious diseases unit and a 24-hour emergency department.
<b>Public acute group A hospitals</b>	Provide a wide range of services to a large number of patients and are usually in metropolitan centres or inner regional areas. Most have an intensive care unit and a 24-hour emergency department. They are among the largest hospitals, but provide a narrower range of services than <i>Principal referral</i> hospitals. They have a range of specialist units, potentially including bone marrow transplant, coronary care and oncology units.
<b>Public acute group B hospitals</b>	Most have a 24-hour emergency department and perform elective surgery. They provide a narrower range of services than <i>Principal referral</i> and <i>Public acute group A</i> hospitals. They have a range of specialist units, potentially including obstetrics, paediatrics, psychiatric and oncology units.
<b>Public acute group C hospitals</b>	These hospitals usually provide an obstetric unit, surgical services and some form of emergency facility. Generally smaller than the <i>Public acute group B</i> hospitals.
<b>Public acute group D hospitals</b>	Often situated in regional and remote areas and offer a smaller range of services relative to the other public acute hospitals (groups A-C). Hospitals in this group tend to have a greater proportion of non-acute separations compared with the larger acute public hospitals.
<b>Very small hospitals</b>	Generally provide less than 200 admitted patient separations each year.

Source: Australian Institute of Health and Welfare (2018). Hospital resources 2016-17: Australian hospital statistics. Health services series no. 86.

There are considerable differences in the density of health workers across the country. Workforce shortages represent significant challenges in rural and remote areas. Australia relies

heavily on overseas-trained doctors to meet rural health needs – almost 50 percent of the rural workforce obtained their medical qualification in another country, compared to 30 percent nationally. Federal government policy has explicitly attempted to recruit overseas-trained GPs to work in remote settings. In addition, financial incentives have been introduced to attract doctors to work in rural areas, but the uptake of such positions has remained low (OECD, 2015).<sup>13</sup>

In the past, GPs working in small rural hospitals had a wider range of skills and were able to perform basic surgery following some additional training, but closures of small rural hospitals have resulted in a decline of such GPs. There is, however, a renewed focus on *rural generalists* (GPs with additional skills, such as in anesthesia or surgery or obstetrics) (OECD, 2015).

In addition, there is a move to transform small rural hospitals into alternative settings, such as residential aged care facilities and community medical centers. In Victoria, for example, public hospitals have a relatively high number of residential care beds with community health visiting specialists. In addition, hospitals can participate in the Multipurpose Service Program - a joint initiative of the federal and state governments to ensure access for rural and remote communities to hospitals and aged-care homes that would not be financially viable as stand-alone facilities. By pooling funds across program boundaries, multipurpose service (MPS) health centers offer a range of health and residential aged care services in one location, including GP and ambulance services (OECD, 2015).

Telehealth has been used to improve access to certain services, such as mental health and dermatology, by linking rural GPs or patients directly to specialists in other hospitals. An online platform Tele-Derm, developed by the Australian College of Rural and Remote Medicine, for example, allows rural GPs to submit photos of skin conditions along with the patient's history and possible diagnosis. The information is reviewed by dermatologists, who typically provide a diagnosis and treatment options within two days (OECD, 2015).

## Payment

In 2011, the Council of Australian Governments adopted the National Health Reform Agreement (NHRA), introducing new financial arrangements to improve the coordination between federal, state, and territory governments. One of the goals of the NHRA was to “improve patient access to services and public hospital efficiency through the use of activity-based funding based on a national efficient price” (Council of Australian Governments, 2011). The NHRA established the Independent Hospital Pricing Authority (IHPA), which is responsible for the pricing framework for public hospitals in Australia using data from the National Hospital Cost Data Collection and the National Public Hospital Establishments (IHPA, 2018a).

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<sup>13</sup> This is consistent with the global evidence demonstrating that financial incentives have a limited impact on changing health worker's location preferences (Humphreys et al., 2009).

Most hospitals, excluding those with low activity levels or located in remote areas, are paid based on their volume of services through case-based payments using Diagnosis Related Groups (DRGs). Australia uses the Australian Refined Diagnosis Related Groups (AR-DRG) Version 9 classification for pricing acute inpatient services, which is based on the tenth edition of the International Statistical Classification of Diseases and Related Health Problem Australian Modification (ICD-10-AM) and the Australian Classification of Health Interventions (ACHI). It contains 399 Adjacent DRGs (ADRGs) and 803 DRGs.<sup>14</sup> The development of the Eleventh Edition of ICD-10-AM/ACHI and Version 10 of the AR-DRG is currently underway.

Activity based funding (ABF) is calculated based on the number of services provided to patients and the efficient cost of delivering those services. ABF uses national classifications, cost weights, and nationally efficient prices to determine the funding for each activity or service. The cost weights are determined by the National Weighted Activity Unit (NWAU) – a standardized unit that allows to compare different services (e.g. inpatient, outpatient, and emergency care) and to value each service by weighing it for its clinical complexity. The average hospital service represents one NWAU. More intensive and expensive activities are worth multiple NWAUs, while simpler activities are worth a fraction of the NWAU. The IHPA determines the National Efficient Price (NEP) for public hospitals that can be funded on an activity basis. The NEP represents the price per NWAU. To obtain the price per service, the NWAU is multiplied by the NEP (IHPA, 2018b).

Small rural and remote hospitals are funded through block grants (i.e. fixed amount) that are based on the volume of services, location, and type of services provided. Based on discussions with the Small Rural Hospital Working Group,<sup>15</sup> IHPA determines which hospital services are eligible for federal government funding on block grant basis only or a combination of activity-based funding and block funding. This determination is made once every six years (or more frequently at the states' discretion). Block funding applies to approximately 400 small rural and remote hospitals.

## Eligibility

**Hospitals that are not financially viable under an activity-based financing model are eligible to the prospective global budget.** Public hospitals are eligible for block funding if they are not able to satisfy the technical requirements for applying ABF or there is an absence of economies of

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<sup>14</sup> <https://www.accd.net.au/ArDrg.aspx?page=6>

<sup>15</sup> The Small Rural Hospitals Working Group advises IHPA on the design of the framework for establishing an efficient cost for small rural and remote hospitals and helps to identify the cost drivers for such hospitals.

scale, resulting in some services not being financially viable under ABF.<sup>16,17</sup> Recognizing that small rural or remote hospitals have significant fixed costs, block funded hospitals are divided into volume groups based on established thresholds of activity. Hospitals can receive block funding if:

1. they are located in a metropolitan area<sup>18</sup> and have fewer than 1800 acute inpatient NWAU per year;

*or*

2. they are located in a rural area<sup>19</sup> and have fewer than 3500 NWAU per year.

To determine eligibility, IHPA uses the three-year average annual total NWAU (IHPA, 2018a).

## **Scope of the global budget**

The scope of the budget is comprehensive and covers inpatient, outpatient, and emergency department services.

## **Budget setting and adjustment factors**

**The budget is based on average reported expenditure of small rural and remote hospitals.** The IHPA calculates a National Efficient Cost (NEC) using the average in-scope expenditure data reported by eligible hospitals, accounting for price and activity growth. The NEC represents the average cost of a block funded small rural hospital. In 2018-2019, the NEC is 5.171 million AUD.

**The budget allocation varies based on the hospital's volume, location, and service mix.** Small rural or remote hospitals that are eligible for block funding are categorized into eight groups (Group 0 and Groups A-G). Group 0 is determined based on the hospital's in-scope expenditure (< \$0.5 million AUD), while Groups A-G are determined based on the total reported NWAU activity. In addition, groups are divided according to the hospital's Australian Statistical Geography Standard (ASGS) region. Hospitals in inner regional, outer regional, and remote areas are classified as Region 1 hospitals and are further divided into three types depending on the services they provide.

- Type A hospitals have more than 30 NWAUs of surgical or obstetric episodes;
- Type B hospitals do not classify as Type A hospitals, but their acute inpatient activity represents more than 40 percent of their total NWAU;
- Type C hospitals are remaining Region 1 facilities that do not meet Type A or B criteria.

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<sup>16</sup> Clause 30 of the Heads of Agreement – National Health Reform states that “some small rural hospitals will continue to be funded by block grants where ABF alone would not enable these hospitals to maintain community services obligations (CSOs)”. Rural hospitals were termed as community service obligation (CSO) hospitals, “...a public hospital that, due to factors outside the control of local management, is unlikely to be financially viable under an activity-based funding arrangement that reflects an efficient price set at the national or jurisdictional level.”

<sup>17</sup> To determine a hospital's financial viability, several factors were considered. These included the volume of services, variability in acute-patient discharges and bed-days, number of DRGs with five or more acute patients per year, differences in the average cost per weighted admission, road distance to nearest regional hospital, and remoteness region in which the hospital is located. These factors were chosen based on relevance and data availability.

<sup>18</sup> Defined as “major city” in the Australian Statistical Geography Standard (ASGS).

<sup>19</sup> Other non-metropolitan areas, including inner regional, outer regional, remote, and very remote in the ASGS.

Hospitals in very remote areas fall under Region 2.

The amount of block funding for each hospital is determined by multiplying the cost weight of the appropriate category in Table 10 by the NEC (IHPA, 2018a). For example, a hospital located in an inner regional area (Region 1) that had more than 30 NWAU of surgical and obstetric care (Type A) and whose total volume of services was 460 NWAU (Group C) would receive a block grant of 8.315 million AUD (5.171 million AUD \* 1.608) in 2018-19. Meanwhile, a Region 1, Type B, Group D hospital would receive a grant of 5.176 million AUD (5.171 million AUD \* 1.001) – comparable to the national efficient cost.

Table 10. Groupings for small rural hospitals by service volume, ASGS region, and type (2018-19)

		<b>Service Volume Grouping</b>							
<b>ASGS Region</b>	<b>Type</b>	<b>Group 0</b> <\$0.5 million	<b>Group A</b> 0-259.9 NWAU	<b>Group B</b> 260-459.9 NWAU	<b>Group C</b> 460-659.9 NWAU	<b>Group D</b> 660-1049.9 NWAU	<b>Group E</b> 1050-1699.9 NWAU	<b>Group F</b> 1700-2499.9 NWAU	<b>Group G</b> 2500-3500 NWAU
<b>Region 1</b> Inner regional, outer regional, and remote areas	<b>Type A</b> > 30 NWAUs of surgical or obstetric episodes	NA	NA	0.793	1.608	1.234	1.699	2.506	3.398
	<b>Type B</b> Do not classify as Type A but acute inpatient activity represents >40% of total NWAU	NA	NA	0.644	0.866	1.001	1.378	2.033	2.757
	<b>Type C</b> Remaining Region 1 block funded small hospitals that do not meet Type A or Type B criteria	0.072	0.380	0.629	0.846	0.978	1.346	1.986	2.692
<b>Region 2</b> (very remote areas)		NA	0.338	0.603	0.998	1.519	1.876	3.670	NA

Source: Independent Hospital Pricing Authority (2018a). National Efficient Cost Determination 2018-19.

Notes: NA if no hospital has the combination of service volume, ASGS region, and type.

## Performance Monitoring and Evaluation

The 2011 National Health Reform Act established the National Health Performance Authority (NHPA), which was subsequently merged with the Australia Institute of Health and Welfare. NHPA annually reviews its Performance and Accountability Framework (PAF) the objectives of which is “to support a safe, high quality Australian health system, through improved transparency and accountability.”<sup>20</sup> The Framework covers the domains of equity, effectiveness and efficiency of service delivery and is comprised of 48 national indicators: 31 indicators for primary health care networks and 17 indicators for public and private hospitals. Figure 8 presents the hospital indicators. There are no separate indicators for small rural or remote hospitals. On the contrary, due to the small volumes observed at such facilities, they are often excluded from the indicators.

Beginning July 2017, financial penalties are in place for sentinel events at public hospitals. For small rural and remote hospitals, the cost of sentinel events is deducted from the block funding (the amount is determined by multiplying the NEP for the NWAU associated with the sentinel event) (Table 11).

*Table 11. List of sentinel events in Australia*

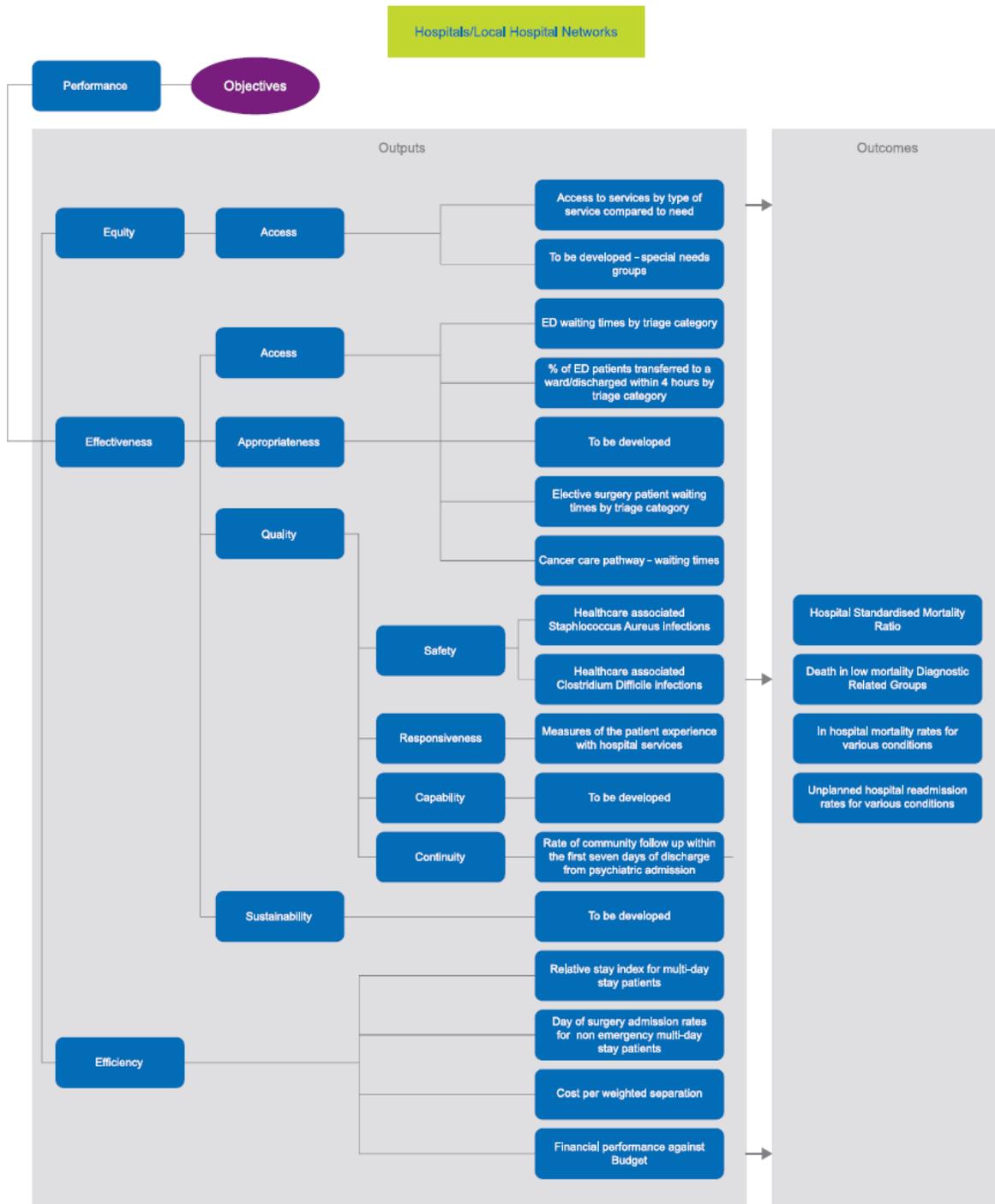
- Procedures involving the wrong patient or body part resulting in death or major permanent loss of function
- Suicide of a patient in an inpatient unit
- Retained instruments or other material after surgery requiring re-operation or further surgical procedure
- Intravascular gas embolism resulting in death or neurological damage
- Haemolytic blood transfusion reaction resulting from ABO [blood type] incompatibility
- Medication error leading to the death of a patient reasonably believed to be due to incorrect administration of drugs
- Maternal death associated with pregnancy, birth and the puerperium
- Infant discharged to the wrong family

For hospitals funded by activity-based funding, in addition to sentinel events, there is an adjustment for hospital acquired complications (HACs). Funding is reduced by the amount of additional costs of providing hospital care due to a HAC, which is weighted by the patient’s likelihood of experiencing a HAC. For low HAC risk patients, funding is reduced by the full incremental cost of the HAC, whereas for high risk patients, only a fraction of the HAC cost is deducted (IHPAc, 2018).

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<sup>20</sup> <http://meteor.aihw.gov.au/content/index.phtml/itemId/554919>

Figure 8. Hospital indicators under the Performance and Accountability Framework



Source: Australia National Health Reform. Performance and Accountability Framework. <https://www.aihw.gov.au/getmedia/ea9b2361-38de-43f3-9426-8705fcc8f1da/performance-and-accountability-framework.pdf.aspx>

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Annex 1. Key indicators for public hospital peer groups, 2016-17

	Location			Services provided					Average available beds	Separations <sup>(e)</sup> (average)	Average length of stay (days)	Non-acute care patient days (%)	AR-DRGs(5+) <sup>(f)</sup>
	Major cities	Total regional	Total remote	Total	Emergency department <sup>(a)</sup>	Non-admitted patient clinic <sup>(b)</sup>	Elective surgery <sup>(c)</sup>	Intensive care hours reported <sup>(d)</sup>					
Principal referral	28	3	0	<b>31</b>	31	31	31	30	660	77,533	3.1	7.9	616
Women's and children's	12	0	0	<b>12</b>	9	12	12	9	211	23,733	2.9	1.6	253
Public acute group A	34	28	1	<b>63</b>	60	63	59	49	276	35,123	2.9	10.7	425
Public acute group B	23	20	1	<b>44</b>	44	44	42	12	138	18,499	2.6	15.7	277
Public acute group C	9	115	18	<b>142</b>	55	140	98	2	41	3,867	2.6	22.9	106
Public acute group D	4	133	52	<b>189</b>	58	167	10	0	16	563	4.2	32.8	24
Very small	0	84	39	<b>123</b>	24	87	0	0	8	81	11.2	51.6	2
Psychiatric	17	5	0	<b>22</b>	0	3	0	2	99	750	78.4	1.7	12
Subacute and non-acute <sup>(g)</sup>	27	11	0	<b>38</b>	0	33	0	1	66	1,724	13.3	89.9	41
Outpatient	0	3	4	<b>7</b>	5	6	0	0	2	46	3.8	0.2	1
Other <sup>(h)</sup>	22	2	0	<b>24</b>	1	15	4	1	35	5,182	2.0	8.3	29
<b>Total</b>	<b>176</b>	<b>404</b>	<b>115</b>	<b>695</b>	<b>287</b>	<b>601</b>	<b>256</b>	<b>106</b>	<b>89</b>	<b>9,478</b>	<b>3.2</b>	<b>14.1</b>	<b>120</b>

Source: AIHW (2018). Hospital resources 2016-17: Australian hospital statistics. Health services series no. 86.

## Annex 2 Maryland

### Overview

Maryland, a state in the Mid-Atlantic region of the United States, has a population of 6.1 million and a GDP per capita of 56,375 US\$ in 2017. According to the 2010 Census, approximately 13% of the population resides in rural areas (US Census Bureau, 2011). Public funding for health is channeled through two federal programs – Medicare and Medicaid, which cover senior citizens and the poor, respectively. Almost 28% of the population is covered by Medicaid or Medicare, with the majority of the population covered by private health insurance plans (Kaiser, 2017).<sup>21</sup>

Table 12. Key indicators, 2017 or latest available year, State of Maryland

Population (million) <sup>22</sup>	6.1
Population in rural areas (%) <sup>2</sup>	12.8
Population ages 65 and older (%) <sup>2</sup>	14.9
GDP per capita (US\$) <sup>23</sup>	56,375
Current health spending (% of GDP) <sup>24</sup>	14.6
Hospital beds per 1,000 population <sup>3</sup>	1.9
Life expectancy (years) <sup>3</sup>	79.6

Maryland is the only state in the U.S. that has operated an all-payer hospital rate-setting system, which means all insurance schemes, public or private, have to apply the same payment system. To maintain the waiver on hospital payment from Medicare/Medicaid, Maryland had to ensure that cumulative growth in Medicare inpatient payments per admission since January 1981 remain below the national cumulative growth. The hospital payment was based on a complex system, with a blend of unit rates per cost item,<sup>25</sup> DRGs constraint per case, and a volume control mechanism for the total inpatient and outpatient volume (de Lagasnerie et al., 2015). Triggered by the higher growth in the cost per admission in the late 2000s and the objective of delivering comprehensive, coordinated care, the State introduced global budgets for hospitals in 2010. This new model, which controls total revenue rather than cost per case, was implemented within a larger discussion between the State and Medicare to move from per case growth limitation to per capita limitation. The global budget is the first move towards a population-based model.

<sup>21</sup> Seven percent of the population is uninsured (Kaiser, 2017).

<sup>22</sup> United States Census Bureau: <https://www.census.gov/quickfacts/fact/table/md/PST045217>

<sup>23</sup> Maryland Open Data Portal: <https://data.maryland.gov/Business-and-Economy/Choose-Maryland-Compare-States-Economy/gv8w-7mdg/data>

<sup>24</sup> Kaiser State Health Facts: <https://www.kff.org/statedata/>

<sup>25</sup> Each hospital has approximately 50 revenue centers, including intensive-care units, operating theaters, emergency departments, laboratories, and radiology.

## Maryland's Global Budget Program

The global budgeting program for hospitals was implemented in two phases. First, in July 2010, the State introduced a Total Patient Revenue (TPR) program for eight rural hospitals.<sup>26</sup> The TPR system was only available to hospitals “operating in regions of the State characterized by an absence of densely overlapping service areas” (Mortensen et al., 2014). The system was developed as a way to bring rural health into focus and ensure that rural areas had the tools and resources necessary to achieve quality of care and improve cost efficiency. In the first year of implementation, the budgets included a “seed revenue” representing 1.05 percent of hospital base revenue, for improving infrastructure and introducing new services (Murray, 2018). Rural hospitals formed a transformation collaborative to design strategies for delivering services outside the hospital setting, reducing readmission, and sharing experiences. A stable and predictable source of funding under the global budget allowed hospitals to invest in care management strategies, while being financially viable (Maryland Department of Health, 2016). Western Maryland Regional Medical Center, for example, offers discharged patients 30 days of free medications; uses telemonitoring for blood glucose, blood pressure, and weight; assigns doctors and nurse practitioners to skilled nursing homes; and offers other social services, such as food security and transportation (Sharfstein, 2016).

Based on the initial results of the TPR program, the State decided to expand the global budget model to the remaining 36 hospitals in the State in July 2014 under the Global Budget Revenue (GBR) program. A number of policy changes were made, including the addition of value-based purchasing program elements, readmission reduction targets, and other quality-based targets. GBR also adjusts for market shifts amongst hospitals. The global budget for rural hospitals by design targeted hospitals operating in an environment with limited overlap of catchment areas. As a result, administrative delineation (county level) could be used. The general model, however, had to be tailored to take into account hospitals with overlapping market areas, and therefore uses a virtual patient service area.

The objective of introducing the global budget was to slow down cost increases, while preserving the quality of care. The introduction of the global budget model marked a shift from regulating the cost per discharge to regulating total cost per capita. Under the new model, hospitals have an incentive to improve care and manage health at the community level, while at the same time improving efficiency by reducing emergency department use, unnecessary laboratory tests and diagnostics, inappropriate admissions, and readmissions. Facilities also have a financial incentive to develop community-based services in order to achieve population health management outside of the hospital setting. To recoup revenue that would otherwise be lost from reductions in

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<sup>26</sup> Although Total Patient Revenue (TPR) model had been available for small rural hospitals since the 1980s, only one hospital (Garrett County Regional Medical Center) had signed up for it. In 2008, a second hospital joined the TPR system, with the remaining 8 rural hospitals joining in 2011.

utilization, hospitals can adjust their payment rates. Therefore, hospital expenditures would decrease, but the revenue would remain constant.

### **Eligibility**

All general acute-care hospitals in the State of Maryland are eligible for the GBR program. The participation is compulsory.

### **Scope of the global budget**

The scope of the budget is comprehensive and covers inpatient, outpatient, and ED services. Some specified services are not regulated by the global budget, for example, home health, outpatient renal dialysis, and skilled nursing facility services (Haber et al., 2018). Most importantly, physicians' fees, which were excluded under the previous volume-cap model, are included in the global budget. This ensures the alignment of incentives for hospitals and physicians.

### **Budget setting and adjustment factors**

The budget for the base period is equivalent to the total revenue of the hospital, for outpatient and inpatients services, in 2013. Each year, the budget is adjusted to take into account change in cost of inputs, expected efficiency gains and reduction of unnecessary care, population demographics changes, market shift, and quality performance. The budget reflects the forecasted demographic changes in the hospital service area and associated changes in demand and cost of care, the share of total volume treated at the hospital (i.e. market shift), and the reduction of potentially avoidable utilization (PAU). The adjustment factors are presented in more detail in Table 4. The budget can also be adjusted to account for exogenous changes in utilization of health services (e.g. flu outbreak). Hospitals can negotiate at any point during the year to adjust their Global Budgets based on discontinuation or addition of services and other factors.

The following equation is a simplified representation of the All-Payer model:

$$\sum_s (1 - d_g) P_{hst} U_{hst} = TR_{hb} [(1 + I_t + Adj_t)(1 + \Delta V_{ht})];$$

where  $d_g$  is the discount rate on allowed charges of payer  $g$  (for Medicare and Medicaid  $g=0.06$ ; 0 otherwise);  $P_{hst}$  is the price per unit in the  $s^{\text{th}}$  revenue center in hospital  $h$  in year  $t$ ;  $U_{hst}$  is the number  $s^{\text{th}}$  revenue center in hospital  $h$  in year  $t$ ;  $TR_{hb}$  is the total allowed revenue for inpatient and outpatient revenue in the base period  $b$  (2013) for hospital  $h$ ;  $I_t$  is the rate of inflation in the cost of producing hospital services from the base period to year  $t$ ;  $Adj_t$  is the additional adjustments for hospital revenues; and  $\Delta V_{ht}$  is the projected rate of growth in hospital  $h$  volumes, based on population demographics, changes in market share, and reductions in PAU (Haber et al., 2016).

Table 13. Factors included in the global budget calculation

Factor	Description
Inflation	The rate of inflation is calculated annually based on a weighted average of the estimated growth in the price of hospital inputs and capital costs (market basket index). The weighted average growth is then reduced by expected productivity gains.
Volume adjustment	<ul style="list-style-type: none"> <li>• <i>Population demographics</i>, accounting for forecasted changes in the age profile of the population in the hospital’s market area and relative cost per age groups.<sup>27</sup></li> <li>• <i>Market shift</i>, accounting for redistribution of volume among hospital to incentivize gaining market share rather than increasing volume.</li> <li>• <i>Reductions in PAU</i>, including 30-day all cause readmissions, emergency department (ED) and observation visits within 30 days of admission, potentially avoidable admissions based on Agency for Healthcare Research and Quality prevention quality indicators, and admissions for potentially preventable conditions (PPCs) defined by Maryland Hospital Acquired Conditions (MHAC) policy. The definition of PAU is updated annually.</li> </ul>
Quality performance	Facilities receive a quality-based reimbursement (QBR) score. The QBR score is based on a weighted average of total scores across three domains: 1) clinical process of care measures, 2) patient experience, and 3) mortality. Hospitals have a maximum revenue at-risk for the QBR program of 2% of inpatient revenue and are rewarded or penalized in accordance with these pre-established standards.
Uncompensated care (UCC)	To ensure that nonpaying patients are treated and to cover charity care and bad debts in hospitals, each hospital receives an allowable uncompensated care percentage. This is based on a 2-year average of the hospital’s UCC percentage, as well as the hospital’s predicted UCC percentage based on a linear regression model.

### Global budget enforcement and flow of funds

The global budget is not implemented as a fixed monthly payment but as a cap on the annual hospital revenues. The Maryland Health Services Cost Review Commission (HSCRC) establishes the annual budget for each hospital and the rates for services. All payers (e.g. Medicare, Medicaid, private insurers) at a given hospital are subject to the same prices, but Medicare and Medicaid are eligible to receive a 6% discount on charges (Haber et al., 2016).<sup>28</sup> Hospitals are permitted to raise or lower their prices by up to ±5% (±10% based on the review and approval of

<sup>27</sup> Since hospitals have overlapping service areas, Maryland defines a virtual patient service area (VPSA), which is based on aggregate inpatient and outpatient utilization in the ZIP code area.

<sup>28</sup> The 6% discount for public payers (Medicare and Medicaid) was in place prior to the introduction of the global budget.

state regulators) throughout the year in order to stay within the budget. A hospital with higher than predicted utilization, for example, would reduce its prices, while a hospital that achieved a lower rate of admission could increase its prices, thereby improving its operating margin. Hospitals that are over- or under-budget by up to 0.5% have the full amount credited or debited to the budget for the following year. Above those margins, penalties will be applied (Table 14) (Haber et al., 2016). For example, if a facility charged 60,000 USD above the budget, equivalent to 0.6% of the global budget, 72,000 USD (60,000+(20%\*60.000)) will be deducted from the budget the following year.

Table 14. Penalty if hospital revenues differ from the approved global budget

Portion of revenue variation that differs from approved budget by	Penalty, revenue-approved budget	
	Less (underage)	Greater (overage)
0.0-0.5%	No penalty; full amount carried over to the following year budget	No penalty; full amount deducted from the following year budget
0.51-1.0%	20% penalty; 80% carried over to following year budget	Full amount plus 20% penalty deducted from following year budget
1.01-2.0%	50% penalty; 50% carried over to following year budget	Full amount plus 50% penalty deducted from following year budget
>2%	100% penalty; no carryover to following year budget	Full amount plus 50% penalty; deducted from following year budget

Source: Haber et al. (2016). Evaluation of the Maryland All-Payer Model. First Annual Report.

## Performance Monitoring and Evaluation

At the facility level, the State monitors the quality and safety of the care provided by the hospital and take these into account in the budget calculation. Firstly, unnecessary care (i.e., PAU) – either unnecessary admission or inappropriate care provided during hospitalization - is monitored. The budget of the hospital is reduced proportionally to the share of the revenue derived from the PAU. Secondly, as in other states, a pay-for-performance scheme, the Quality Based Reimbursement (QBR), incentivizes improvements in the quality of care with 2% of the hospital revenue at risk. The indicators are grouped into three domains: person and community engagement, clinical care, and patient safety.<sup>29</sup> The indicators are presented in more detail in Table 15. One notable difference from the national program – the CMS Hospital Value-Based

<sup>29</sup>

[http://www.hscrc.state.md.us/Documents/Quality\\_Documents/QBR/Ry2020/Ry%202020%20QBR%20Memo%20-%20Updated%202018-03-01.pdf](http://www.hscrc.state.md.us/Documents/Quality_Documents/QBR/Ry2020/Ry%202020%20QBR%20Memo%20-%20Updated%202018-03-01.pdf)

Purchasing (VBP) – is that unlike the VBP, which takes into account mortality rate separately for three conditions (acute myocardial infraction, heart failure, and pneumonia), under QBR clinical care is measure by a single indicator. Furthermore, the QBR does not include an efficiency indicator, since the potential avoidable utilization and expected efficiency gain are accounted for in the global budget calculation. It is worth noting the Maryland is transitioning from clinical process indicators to results indicators.

Table 15. Domains and Measures Maryland Quality Based Reimbursement in 2018

Domain	Weighting	Measures
Clinical care	15%	<ul style="list-style-type: none"> <li>All-cause mortality</li> </ul>
Safety	35%	<ul style="list-style-type: none"> <li>Central Line-Associated Blood Stream Infection</li> <li>Catheter-Associated Urinary Tract Infection</li> <li>Surgical Site Infection: Colon</li> <li>Surgical Site Infection: Abdominal Hysterectomy</li> <li>Methicillin-Resistant Staphylococcus Aureus Bacteremia</li> <li>Clostridium difficile Infection (C. difficile)</li> <li>Perinatal care – Elective deliveries &lt; 39 week</li> </ul>
Person and Community Engagements	50%	<ul style="list-style-type: none"> <li>Communication with Nurses</li> <li>Communication with Doctors</li> <li>Responsiveness of Hospital Staff</li> <li>Communication about Medicines</li> <li>Hospital Cleanliness and Quietness</li> <li>Discharge Information</li> <li>3-Item Care Transition*</li> <li>Overall Rating of Hospital</li> </ul>

Sources: Health Services Cost Review Commission (2017). Final Recommendations for Updating the Quality-Based Reimbursement Program for Rate Year 2020. Hospital Value-Based Purchasing MLN Booklet. CMS.

At the State level, Maryland is required to generate at least \$330 million in savings for Medicare beneficiaries over 5 years and to limit its annual all-payer total hospital per capita revenue growth to 3.58% - the State’s long-term growth rate of gross state product (GSP) per capita. All hospitals are expected to be fully funded by global budgets. In addition, the Centers for Medicare and Medicaid Services (CMS) has established the following quality targets:

- To reduce aggregate Medicare 30-day unadjusted all-cause, all-site hospital readmissions rate over 5 years to or below the national Medicare rate.
- To reduce potentially preventable complications (PPCs) for 65 conditions by 6.89% annually (for a cumulative reduction of 30% over 5 years).

To date, Maryland has met all specified targets (Figure 9). In addition to being monitored on the specific indicators, the State must also submit an annual report outlining performance on key population health measures.

A rigorous evaluation of the overall performance of the program is also underway. Some changes have been observed in the composition of spending and hospital's financial performance. Outpatient services now represent a higher share of hospital revenues, with revenues almost equally split between outpatient and inpatient services (inpatient care represented 53% of total revenues in 2016 compared to 59% in 2012). As expected, hospitals have been found to frequently adjust their rates throughout the year to stay within the global budget. Importantly, despite constraints on hospital revenues, operating margins have improved across all hospitals (from 2.5% in 2012 to 3.3% in 2015). The greatest increase in operating margins was observed at small hospitals, where operating margins increased from 0% in 2012 to 3.9% in 2016 (Haber et al., 2018). This indicates that global budgets have been successful in ensuring financial sustainability of Maryland hospitals, particularly in rural areas.

In terms of the impact on utilization, the evidence to date is mixed. Patel and colleagues (2015) found a decline in hospitalization and readmission rates among Medical beneficiaries during the first year of implementation, and Haber and colleagues (2017) reported reductions in hospital admissions, increases in emergency department visits, and no changes in primary care. A recent study conducted by Roberts and colleagues (2018) comparing eight Maryland counties to 27 non-Maryland control counties, however, did not find consistent evidence of changes in hospital or primary care utilization. Similarly, results from a study that focused exclusively on rural hospitals suggest that global budgets did not result in reductions in hospital utilization or price-standardized spending during the initial implementation of the TPR between 2011 and 2013 (Roberts et al., 2018).

Figure 9. Performance indicators under Maryland's All-Payer Model, 2014-2017

Performance Measures	Targets	2014 Results	2015 Results	2016 Results <sup>f</sup>	2017 Results
All-Payer Hospital Revenue Growth	≤ 3.58% per capita annually	1.47% growth per capita	2.31% growth per capita	0.80% growth per capita	3.54% growth per capita
Medicare Savings in Hospital Expenditures	≥ \$330m cumulative over 5 years (Lower than national average growth rate from 2013 base year)	\$120m (2.15% below national average growth)	\$135m \$251 cumulative (2.63% below national average growth since 2013)	\$311m \$586m cumulative (5.50% below national average growth since 2013)	\$330m \$916m cumulative (5.63% below national average growth since 2013)
Medicare Savings in Total Cost of Care	Lower than the national average growth rate for total cost of care from 2013 base year	\$142m (1.62% below national average growth)	\$121m \$263m cumulative (1.31% below national average growth since 2013)	\$198m \$461m cumulative (2.08% below national average growth since 2013)	\$118m \$599m cumulative (2.08% below national average growth since 2013)
All-Payer Quality Improvement Reductions in PPCs under MHAC Program	30% reduction over 5 years	25% reduction	34% reduction since 2013	44% reduction since 2013	53% reduction since 2013
Readmissions Reductions for Medicare	≤ National average over 5 years	19% reduction in gap above nation	58% reduction in gap above nation since 2013	79% reduction in gap above nation since 2013	116% reduction in gap above nation since 2013 (Currently 0.19% lower than National RR)
Hospital Revenue to Global or Population-Based	≥ 80% by year 5	95%	96%	100%	100%

Source: Maryland Department of Health (2018)

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