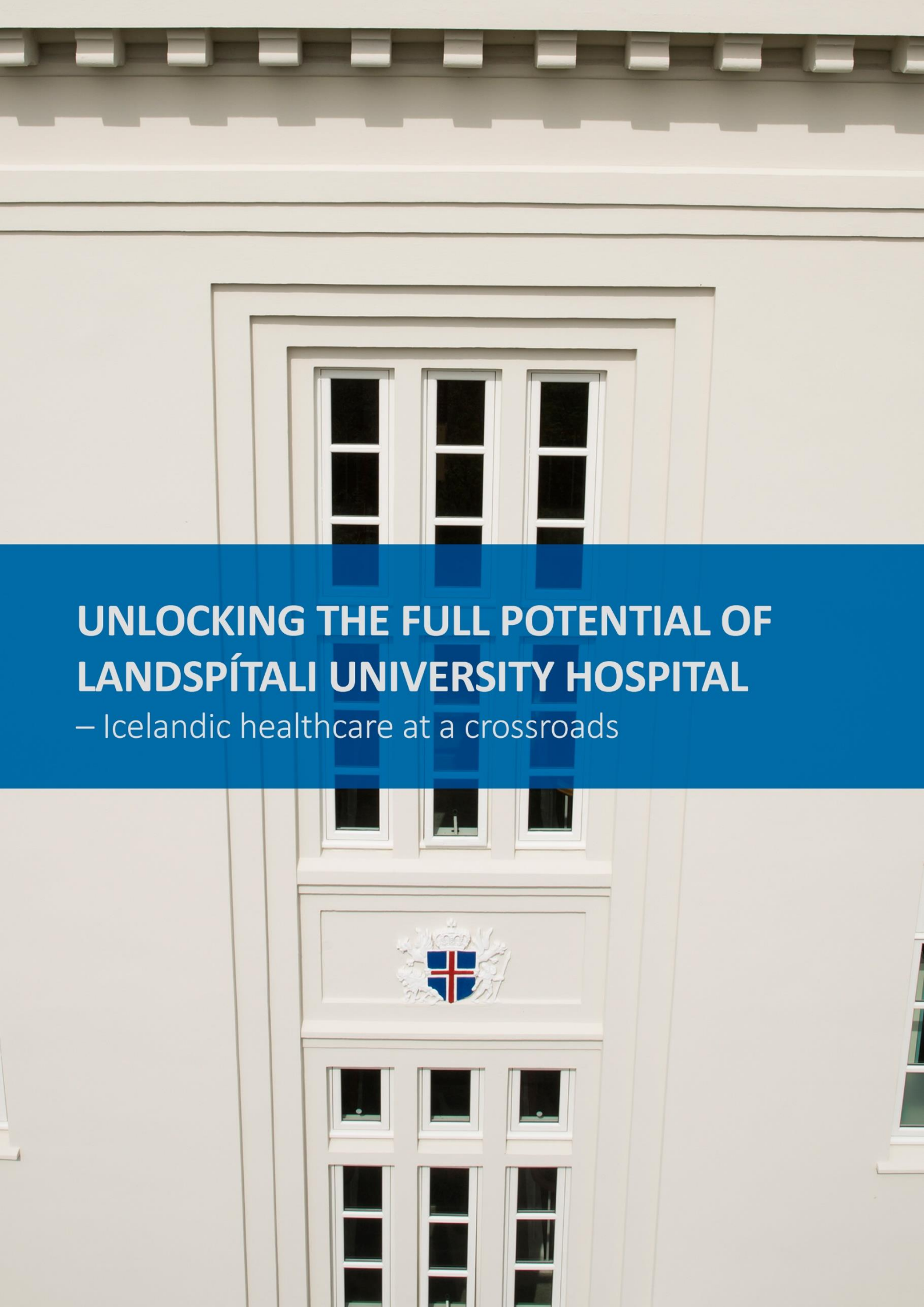


UNLOCKING THE FULL POTENTIAL OF LANDSPÍTALI UNIVERSITY HOSPITAL

– Icelandic healthcare at a crossroads

FOREWORD

After the Icelandic financial crisis in 2008, public spending on healthcare was cut from ISK 153 billion in 2008 to 134 billion in 2012 (at fixed price 2014) due to the state of public finances. As public finances have recovered in recent years, public healthcare costs have increased again, rising from 134 billion in 2012 to 143 billion in 2015 (at fixed price 2014). During this tumultuous time, healthcare cost in general and Landspítali´s financial situation in particular has been a subject of vigorous public debate. The debate intensified in 2015 and as a result, the Icelandic government made a decision in the fall of 2015 to conduct a review of the operational and financial efficiency of Landspítali resulting in this report.

This report has been commissioned by the Ministry of Welfare, with baseline interviews, analysis and synthesis performed by McKinsey & Company in close collaboration with representatives from the Ministry of Welfare, the Directorate of Health and Landspítali National University Hospital. Underlying data regarding Landspítali has been extracted and analyzed in collaboration with the finance department at Landspítali. The review has been performed without any political or financial attachments, and has been conducted on a best-effort basis given the timeline and available data.

The focus of the review has been on Landspítali's production, cost effectiveness, and labor force effectiveness, as well as resource utilization and quality of outcomes. In addition, some of the system dynamics relevant to Landspítali have been considered, such as the interplay with the primary care and private specialist systems. The analysis is structured and presented as four strategic themes most closely related to Landspítali´s performance, and one section that covers the Icelandic healthcare system as a whole. Recommendations are presented for the system as a whole.

Icelandic healthcare is at an exciting time. This report has been designed to clarify the case for change for Icelandic healthcare, and steer the development of a more comprehensive healthcare strategy for the nation. It brings together a fact base on the Icelandic healthcare system that has not previously been in place, and aims to provide a clear view of the path forward for Icelandic Healthcare.

Reykjavik, September 2016

Photos: Landspítali (front cover), Palmi Einarsson (Introduction, chapters 1, 3, 5 and Appendix), Getty Images (chapters 2, 4 and The way forward)

INTRODUCTION

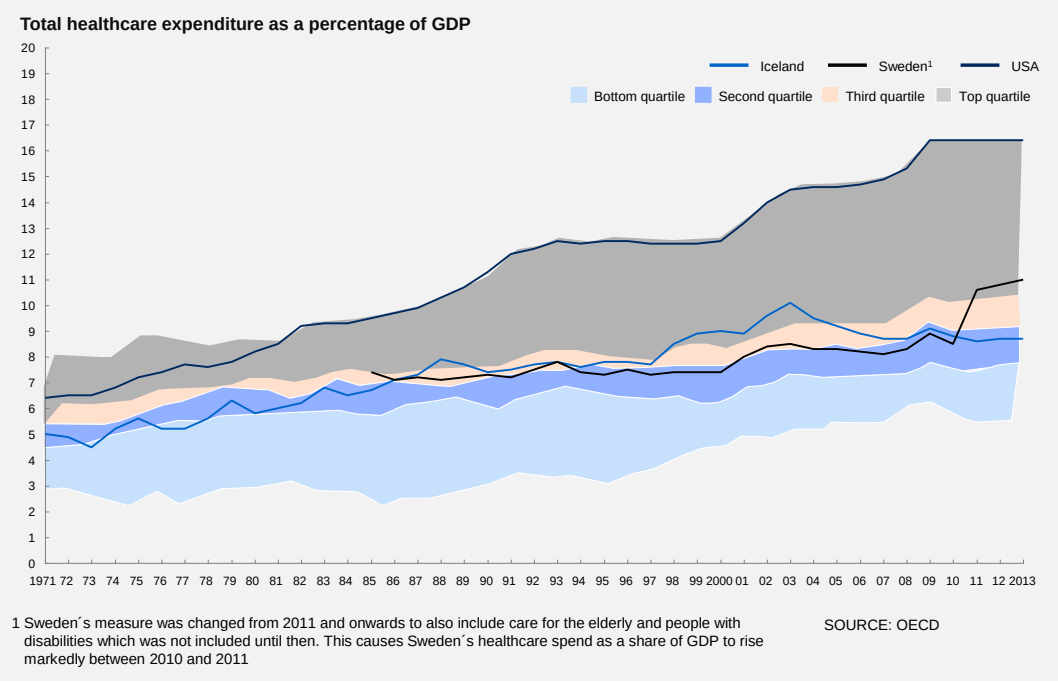
Healthcare costs in developed countries have risen rapidly in recent decades, and the present international trend is unsustainable in the long term. As the largest healthcare provider in Iceland, the operational efficiency at Landspítali University Hospital will have a large influence on the overall efficiency of the Icelandic healthcare system. However, system efficiency is also affected by system structure and national characteristics, with forces driving the need for spending on healthcare both up and down.

Healthcare costs in developed countries have risen rapidly in recent decades, and the present international trend is unsustainable in the long term

Developed countries have experienced rapid changes in the type, quality, and cost of healthcare services in recent decades. Driving these changes are ongoing macro trends including rising living standards, continuous innovation in medical sciences, lifestyle changes, rising life expectancy and increasing demand from healthcare consumers. From 1970 until today, the share of GDP spent on health care doubled in many OECD countries, with a current spend in comparable countries ranging from about 7% to about 16% among the top spenders.

Healthcare in Iceland followed the pattern of rising costs closely between 1970 and 2003 when the proportion of GDP spent on healthcare reached 10.1% of GDP, its highest level to date. However, since 2003, Iceland has been one of a few countries where health care costs as share of GDP have declined overall. Looking at the last 10 years, the healthcare share of GDP has declined followed by a stable level, despite the financial crisis that rocked the country´s finances in 2008 (*exhibit 1)*.

Exhibit 1: Healthcare spending has steadily increased in developed countries in recent decades, but the Icelandic trend has bent in the last ten years



1 Sweden´s measure was changed from 2011 and onwards to also include care for the elderly and people with disabilities which was not included until then. This causes Sweden´s healthcare spend as a share of GDP to rise markedly between 2010 and 2011

SOURCE: OECD

Iceland´s level cost curve has not come about painlessly. After the financial crisis, the Icelandic healthcare system went through one of the greatest cost cutting exercises ever seen, yielding increased efficiency and reduced costs across the board. Landspítali, the National University Hospital of Iceland was at the center of these developments, being responsible for a large share of the cost reductions. While the system carries some benefits from this period, there are also areas that have been neglected as a result as described in more detail in the coming chapters.

Iceland will actively need to continue to ensure the efficient delivery of care to be able to maintain top tier quality while keeping healthcare spend at a reasonable level. Inevitably, this will put significant demands on Landspítali and other healthcare providers to achieve sizable, continuous, and lasting improvements in their operations. This will be important because the need for healthcare will most likely keep increasing. Several supplementary measures give an indication of this trend, most notably a growing and aging population, an increasing number of medical visits, and increasing pharmaceutical consumption.

Landspítali University Hospital is the largest healthcare player in Iceland, and fulfils many different roles in the system

Landspítali University Hospital is the primary provider of tertiary care in Iceland, an important provider of secondary care for the entire country, and acts as the local hospital for the Capital region, where the majority of the Icelandic population resides. The hospital provides specialist care for patients from all of Iceland´s seven healthcare regions but the majority of patients come from the Capital region.

Landspítali operates in a healthcare system with six primary types of healthcare providers:

- Primary care providers that provide primary care locally and are meant to be the first stop for most patients
- Nursing homes that provide care to the elderly
- Elderly and social care provided in the home
- Regional hospitals such as Sjúkrahúsið á Akureyri and Fjórðungssjúkrahúsið í Neskaupsstað. Sjúkrahúsið á Akureyri, the biggest regional hospital, provides secondary care and some tertiary care in addition to teaching and research. Other regional hospitals mainly provide acute care and some secondary care, e.g., for patients with chronic illnesses
- Landspítali, which as the sole university hospital in Iceland serves the threefold role of providing specialized clinical care to the population of Iceland, general hospital care to the Capital region, as well as being the center for medical research and education of health professionals in Iceland
- Private specialists, that provide specialized outpatient services in their own clinics in addition to the specialized services provided in hospitals

Landspítali efficiency has a large influence on the overall efficiency of the Icelandic healthcare system but it is also affected by system structure and national characteristics

Iceland´s total health spending accounted for 8.8% of GDP in 2014, which is close to the OECD average but below the Nordic countries apart from Finland. Recently, the level of spending on healthcare has been a subject of intense public discussion in Iceland. Some have suggested that spending on healthcare should be raised significantly to improve the quality of healthcare in Iceland and close the spending gap to the Nordic average. In principle, there is a correlation between the cost and quality of a healthcare system, i.e., higher spending on healthcare will, other things equal, result in better health outcomes. However, the relationship between quality and cost is not perfect;

a more efficient system can have better outcomes than a less efficient one even if the former spends less than the latter. Furthermore, country and national characteristics will affect the cost level required to achieve top-tier outcomes. A comparison of healthcare spending across countries should therefore take into account not only healthcare costs but outcomes, quality, efficiency, and national characteristics as well, which is not straightforward.

Overall, Iceland comes out well in a comparison of many healthcare quality indicators and even better when relating outcomes to healthcare costs. This cannot be derived from one single factor, but is a result of a combination of underlying characteristics that affect a population's healthcare needs and the system´s overall operational efficiency. In Iceland, several underlying characteristics that affect healthcare efficiency as well as overall system quality, drive down the need for a high level of spending on healthcare. For example, Icelanders are a relatively young nation with relatively healthy lifestyle habits. At the same time, there are inefficiencies affecting Icelandic healthcare at a system level that likely contribute to a higher level of spend than necessary. These include healthcare consumption patterns and the incentive structures that influence these behaviors. Provider effectiveness also has a strong effect on total healthcare spending, and in particular, the operational performance of Landspítali as the largest individual healthcare provider in the system. This topic is reviewed in more detail in the Appendix.

METHODOLOGY

Swedish university hospitals are a good base for comparison with Landspítali

To evaluate Landspítali´s performance as a university hospital fairly, relevant benchmarking partners need to be identified. However, Landspítali´s situation as the major tertiary care provider in an isolated country makes it challenging to find completely comparable benchmarking partners. Nevertheless, several structural characteristics point to university hospitals in the other Nordic countries as best suited for benchmarking. A large share of all healthcare in Iceland is provided by the university hospital, a situation that is similar in the other Nordic countries. Care is also structured in a similar fashion as in the other Nordic countries, with relatively few hospital beds in place and lengths of stay on the shorter side of an international scale. For these reasons and the easy access to relevant data for university hospitals in the Swedish system, we have chosen to benchmark Landspítali against two Swedish hospitals: the University Hospital of Umeå and Karolinska University Hospital. These two hospitals resemble Landspítali in different ways:

- ***Umeå University Hospital*** in the north of Sweden is a hospital of similar size and structure as Landspítali. It is also in a relatively isolated location and provides care to patients from a large geographic area. Just like Landspítali, it acts as a regional hospital for the local population as well as a tertiary provider of advanced care.
- ***Karolinska University Hospital*** in Stockholm, while being a much bigger institution, has similarities to Landspítali due to its role as a major provider of advanced of care for the capital area, with few external patient referrals limited to highly specialized procedures (e.g., heart and lung transplantations, low volume advanced surgery). It also has a similar composition of care in terms of major diagnostic categories (MDC).

It is important to note that the comparison with Swedish hospitals should not be considered a comparison with global best practices. Both hospitals have strengths and weaknesses; the Swedish system overall comes out strong on medical outcomes and has very transparent reporting, while access to care and productivity development have presented challenges for the Swedish system. Rather than viewing the Swedish numbers as a standard for Landspítali to aspire to, they should be interpreted in comparison with Landspítali´s numbers as a rough indication of where Landspítali stands, in the context of different national circumstances.

When looking at the efficiency of a medical institution, it is important to consider productivity in terms of produced medical care per unit of labor or cost in relation to the quality of the care provided. At Landspítali, cost and production data is exhaustive and of relatively high quality, while data on care quality and outcomes is more limited and cannot be considered comprehensive. This evaluation has been performed on a best effort basis considering the data available, but gives a strong indication of Landspítali's current performance and development over time.

Methodology notes

The evaluation is based on data from Landspítali, Ministry of Welfare and Iceland Health Insurance. The Swedish comparison are based on data from each university hospital and Sveriges Kommuner och Landsting (SKL). In terms of methodology, a few things should be noted.

- Healthcare production at Landspítali and in Sweden is measured using so-called Diagnosis-related group (DRG) values. Each care episode (inpatient admission or outpatient visit) is assigned a DRG value based on the complexity of care provided in that episode. The total care production is measured as the sum of all individual DRG values. Individual DRG categories are grouped into major diagnosis categories (MDC), which correspond to a single organ system or reason for seeking care. The average DRG weight, or Case mix index (CMI), is a measure of the overall resources consumed at the hospital providing the care, which should reflect the complexity of care
- Both Iceland and Sweden use the same DRG system to measure care (NordDRG), but with a different grouping system and individual weight lists. DRG values are therefore not comparable across the systems, but *changes* in DRG averages can be compared
- Unless otherwise noted, all cost developments have been adjusted for inflation using CPI (as calculated by Hagstofa Íslands in the case of Icelandic prices and by Statistics Sweden in the case of Swedish prices) and are presented as fixed price 2015
- Where costs in Iceland have been compared with costs in other countries, all costs have been converted to ISK using PPP-adjusted (purchasing power parity) exchange rates from OECD
- Production at Landspítali was markedly affected in both 2014 and 2015 by strikes of groups of healthcare professionals working at the hospital. To reflect the production development at Landspítali more accurately, an estimation of the effect of the strikes have been made in this report. All Landspítali production numbers from 2014 and 2015 are presented in real numbers and including a strike effect. The strike effects have been estimated by identifying production anomalies in 2014 and 2015 based on the seasonality of production in those years as compared to the strike-free years of 2011 to 2013.

CHAPTER 1.

PRODUCTION & PLANNING

Landspítali production is declining even when accounting for estimated effect of the strikes in 2014-15. The decline is mostly related to the successful shift of hospital care from inpatient to outpatient settings, with the number of patients admitted to inpatient wards declining and thus production as measured in DRG units. While much of this development is beneficial, there seems to be an overall lack of strategic direction to steer the development of services across the system. Volumes are transferring to the private system also in areas that would benefit from an integrated university hospital setting, waiting lists for surgery are increasing and outpatient services are made up of relatively large share of low complexity often urgent care. To ensure efficient structuring of the healthcare system, more active system-level planning of production development is needed and as a related task Landspítali´s priorities need to be clarified.

SUMMARY OF OBSERVATIONS

As the main provider of tertiary care in Iceland, Landspítali has an important role to fulfil in providing the most advanced tertiary care to the patients with the highest needs. *At the same time, Landspítali acts as the regional and local hospital for the Reykjavik area. While Landspítali should continue to have all three responsibilities, it is important to ensure that the university hospital competence and experience within Landspítali is leveraged and that patients are treated to the highest possible standard in integration with the surrounding system.*

Overall, Landspítali production is declining, even when accounting for the estimated effect of the 2014-15 strikes, mainly driven by a decrease in the number of patients admitted to inpatient wards. *As a general development, this is in line with international trends. In surgical services in particular, the hospital has had a long-term goal to shift inpatient care to outpatient care settings. In internal medicine and women's health services, there has been a shift of care from hospital inpatient settings to private specialist outpatient settings and in some cases an overall decline in the level of care produced in the system as a whole. These developments have led to a number of challenges.*

First, there is an overall lack of strategic direction to steer the development of services across the system, and inpatient volumes are transferring to the private system also in areas that would benefit from an integrated university hospital setting. *Since many years, Landspítali tracks production using NordDRG, but the hospital does not have overall production goals - neither on an overall level from the payer, nor internally defined goals for different services at the hospital. While much of the past development has been beneficial to the system, some transfer of volumes seems to be happening also in areas that would benefit from closer integration with the hospital's inpatient activities. There are also no effective mechanisms in place that enables adjustments to the resource level at Landspítali when volumes change, as have happened in recent years.*

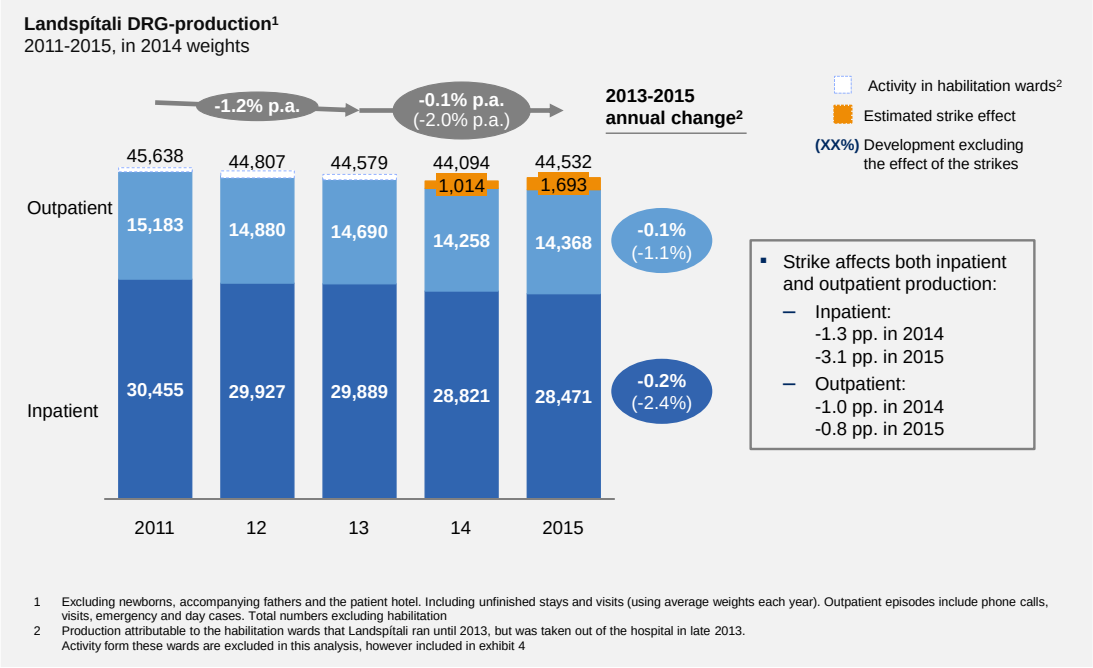
Second, surgical services have successfully shifted activity to outpatient settings, but even so, waiting lists have increased significantly. *Although surgical services were affected by the strikes in 2014 and 2015, this development started following the financial crisis and has been consistent at least since 2011, with the total number of patients waiting for procedures increasing by more than 20% per year. Most of the increase is seen among patients waiting more than 3 months for surgical procedures, and waiting lists are growing both due to reduced production ability of the hospital, and increased demand related to the ageing population of Iceland.*

In outpatient services, while DRG reporting practices differ, there are indications that Landspítali´s activity consists of a larger share of relatively low complexity often urgent care, while the share of more advanced, 'university hospital level' outpatient care is lower. *While there seem to be facilities available for outpatient activity (consulting rooms etc.), interviews with clinical staff indicate that it is difficult to secure the internal resources to further develop outpatient activities. Furthermore, there is little use of more advanced outpatient care forms, such as consultations with multidisciplinary teams. At the same time, Landspítali takes on a large share of the responsibility for urgent care in the Capital area when a significant share of the urgent outpatient activity currently handled by the Landspítali emergency room could probably be dealt with more cost efficiently in primary care.*

The estimated effect of the 2014-15 strikes is 2-4% production loss

Landspítali´s total production of care, measured as the total number of DRG units, has been in decline since 2011. In 2013, habilitation wards making up around 1 % of the hospital's DRG activity was transferred out of the hospital. In 2014-15 most of the production decrease can be attributed to the intermittent strikes among the clinical staff that affected the production levels in those years. The effects of the strikes can be estimated to a 2-4% decline in production, and had effects on the distribution of activity across the year, where the strike periods stand out as evident gaps in production. While the indirect effects of the strikes are difficult to estimate, this provides a rough estimate of effect on care production. In recent years, inpatient production has been decreasing faster than outpatient production, primarily driven by decline in the number of admissions. This development is in line with international trends for university hospitals, driven by the tendency to shift care to outpatient settings and provide a wider range of care out of hospital (*exhibit 2*).

Exhibit 2: Landspítali production is declining, even when accounting for the estimated effect of the strikes



1 Excluding newborns, accompanying fathers and the patient hotel. Including unfinished stays and visits (using average weights each year). Outpatient episodes include phone calls, visits, emergency and day cases. Total numbers excluding habilitation
2 Production attributable to the habilitation wards that Landspítali ran until 2013, but was taken out of the hospital in late 2013. Activity form these wards are excluded in this analysis, however included in exhibit 4

There seems to be an overall lack of strategic direction to steer the development of services across the system

Overall, development of production at Landspítali has been very similar to developments at university hospitals around Northern Europe, with declining overall volumes particularly in inpatient care, and a shift between inpatient and outpatient care. At Landspítali, the overall shift has been driven by the three largest divisions, with some nuances in dynamics:

- In ***Surgical services***, there has been a shift of inpatient care to outpatient formats. The shift is dominated by services within orthopedics, gastrointestinal services, ear nose and throat

- In ***Internal medicine,*** there has been an overall decrease in activity and the average complexity of patients is going down. This shift is playing out differently in different specialties.[1] In cardiology and hematology, Landspítali´s activity is declining in both inpatient and outpatient services, but the slack has been picked up by the private specialist system where outpatient activity is increasing. This indicates an overall shift of activity from inpatient care at Landspítali to outpatient care in the private system. In neurology, overall activity is declining across Landspítali´s inpatient and outpatient services and within the private system. At a system level, there has been a shortage of neurologists in recent years which likely explains the development
- In ***Women's and children's,*** the decline in production has been driven by women's services, where the pattern is similar to internal medicine. Landspítali´s volumes are declining in the inpatient and outpatient settings, but the private system has increased volumes significantly over the same time period.

While a shift from Landspítali to the private specialist system may be beneficial at a system level (e.g., by ensuring easy access to qualified care in the private system while freeing up resources at Landspítali), the development does not seem to be intentional. There is no overall strategic plan for the distribution of services across the system or within Landspítali, and neither Landspítali nor the system has had a pro-active approach to production planning. Moreover, the shift takes place across specialties, also in areas that would benefit from providing the majority of the care in an integrated university hospital setting.

The Icelandic healthcare system is relatively small and the same is true for Landspítali. Therefore, some of the lower volume services at Landspítali are sensitive to volumes dropping beyond a point where the services can be provided efficiently. As the nation´s only university hospital, Landspítali needs to provide 24/7 services across a wide range of services, resulting in a need for a certain staffing level. Therefore, while Landspítali may not be the most cost efficient option for every single visit in isolation, concentrating such services at Landspítali will contribute to overall system quality and efficiency.

Waiting lines for surgical procedures have grown

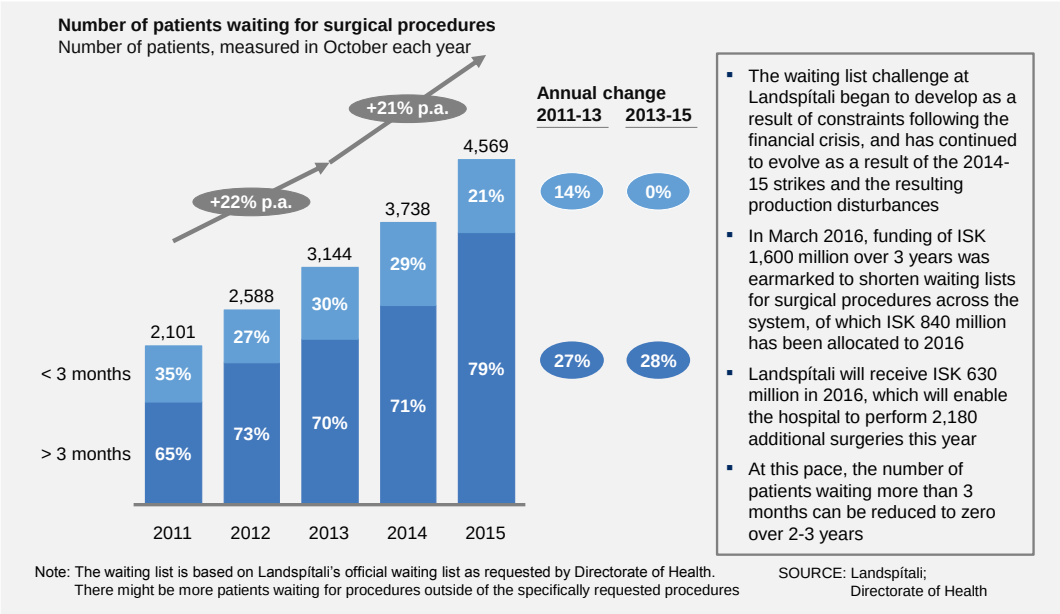
The waiting list challenge at Landspítali began to develop as a result of constraints following the financial crisis, and has continued to evolve as a result of the 2014-15 strikes and the resulting production disturbances. Since 2011, waiting lists for surgical procedures have more than doubled, with the majority of patients waiting more than 3 months for a procedure. Currently, Landspítali

[1] As activity in the private system is not tracked or followed using volume measures that define the type of care provided, volumes have been estimated based on the specialty of the private physician, regardless of what activity has been performed. This is matched to the internal medicine volumes at Landspítali based on the MDC groups of the DRG production. While these methodologies are not directly comparable, it provides a good estimate of the overall development in the system

turns around about ~1,000 patients on waiting lists every 3 months, but the inflow of patients has been larger (*exhibit 3*).

In March 2016, funding of ISK 1,600 million over 3 years was earmarked to shorten waiting lists for selected surgical procedures (hip, knee and cataract surgery) across the system. ISK 840 million will be allocated in 2016 of which Landspítali will receive ISK 630 million. This will enable the hospital to perform 2,180 additional surgeries this year, a pace at which the number of patients waiting more than 3 months can be reduced to zero over 2-3 years. The hospital waiting lists are not limited to these selected surgical areas, and continued focus on shortening waiting lists should be expected over the coming years. Despite these efforts, the development of waiting lists will need to be continuously monitored to ensure they do not start growing again as soon as the current initiative expires.

Exhibit 3: There is a high and increasing share of patients waiting for surgical procedures



Note: The waiting list is based on Landspítali's official waiting list as requested by Directorate of Health. There might be more patients waiting for procedures outside of the specifically requested procedures

SOURCE: Landspítali; Directorate of Health

Outpatient care seems to consist of a large proportion of low complexity urgent care

DRG reporting practices for outpatient services differ significantly between Iceland and Sweden[2]. However, several different comparisons of outpatient activity indicate that Landspítali outpatient services consist of a larger share of low complexity activity than at the Swedish university hospitals.

[2] DRG weights and reporting practices for outpatient services are not comparable between Iceland and Sweden. In Iceland, DRG grouping is based on diagnosis codes, while Sweden group outpatient activity primarily based on procedures. As the Swedish system is used as a base for reimbursement, the incentive to differentiate reporting of more advanced care is higher, which also influences the range of DRG weights.

The ratio between average outpatient and inpatient weights at Landspítali is less than half that of the Swedish hospitals, Landspítali DRG weights are distributed across a more narrow range, and the share of visits coming in through the emergency department is also greater at Landspítali compared to Swedish peers. While only indicative and in part driven by reporting habits, all of these observations indicate that outpatient care at Landspítali are of relatively lower complexity, particularly for somatic care.

With regards to facilities, Landspítali´s outpatient care does not seem to be constrained by a lack of consulting rooms. The number of visits varies a lot by day of the week, and on most days, there is room in the schedule for additional visits.

RECOMMENDATION

The Icelandic healthcare system's strategic direction needs to be clarified and Landspítali production development should to be planned accordingly.

To ensure efficient structuring of the healthcare system, more active system-level planning of production development is needed and the effects on Landspítali's priorities need to be fleshed out. Inpatient and outpatient care at Landspítali should be following a defined direction, with clear principles for what care should be provided at the university hospital. These principles should clearly articulate what services need sufficient scale and integration with university hospital services and thus should be concentrated to Landspítali, and what services can be provided in other settings, e.g., at private specialist clinics. It should also be clear what price, quality or access differentiation are expected in each setting, and what is required to maintain patient safety.

To achieve this Landspítali needs to, in collaboration with the payer, develop a clear roadmap for provision of care across the system, covering both Landspítali and other providers. This roadmap should detail what services are to be provided in integration with the university hospital competence, and what service can and should be provided in other settings (potentially shifting volumes from Landspítali to primary care/private specialists). It should ensure that smaller services are not fragmented beyond the point where productivity or patient safety at each provider is difficult to maintain.

The waiting list situation at Landspítali needs to be addressed urgently. Based on the current situation, conscious choices should be made around acceptable waiting times for different patient groups. To reach these, active investment in shortening waiting times within Landspítali, and/or shifting volumes to the private sector will be required. In 2016, the hospital has been awarded additional funds to address the situation. To reduce waiting lists below 3 months, this effort will need to be continued over the coming 2-3 years.

Following the principles laid out, Landspítali needs to find a way to adapt capacity to follow production development over time and balance resource allocation accordingly. For example, a shift of lower complexity urgent care from the Landspítali emergency room to primary care can free up capacity that can be used for more advanced, university hospital level outpatient services in the hospital.

CHAPTER 2.

COST & LABOR FORCE EFFECTIVENESS

Landspítali comes out of a period of high cost and labor force effectiveness, as the hospital managed significant cost reductions under steady demand in the years following the financial crisis. This period was exceptional, with operational circumstances that were not sustainable over time and required adjustment for the future. As Iceland is again adding funds to the system, the majority of funds have been directed towards higher cost per FTE. Increased funding coupled with a decrease in production volumes has led to declining cost and labor force effectiveness, and at the same time, average length of patient stay has been going up. As Iceland continues to add funds back into the healthcare system following the post-financial crisis cost cutting, there is a unique opportunity to reform the system and make sure investments flow to the areas that give the best return in terms of healthcare value.

SUMMARY OF OBSERVATIONS

Landspítali´s comes out of a period of strong cost and labor force effectiveness, as the hospital managed significant cost reductions under steady demand in the years following the financial crisis. *The hospital worked hard through the crisis, every individual contributing to high productivity.*

Since 2012, Iceland is again adding funds to the hospital, with the majority of funds directed towards higher cost per FTE. *Building maintenance and equipment has also received additional funds. As a result, Landspítali is now back at a higher cost level, very close to where it was in 2008 before the effects of the financial crisis hit the hospital. While cost per FTE has increased, growth in number of FTEs at the hospital has been limited. At the same time, admissions have continued to decline and outpatient growth is largely made up of low complexity activity (phone calls etc.). The development has led to a decline in overall cost and labor force productivity as the hospital is now doing less work with a somewhat larger workforce and at a higher cost per FTE compared to the situation before the financial crisis*

Cost effectiveness metrics such as cost per visit and cost per admission have been growing at 8% per year, which is a high rate. *Cost levels were lower than at comparable Swedish hospitals as of 2014, and while Swedish cost levels are by no means a best-in-class benchmark, the comparison indicates that while cost levels at Landspítali have grown, they are not out of proportion. While increased costs is a natural development following the financial crisis situation, the rate of labor cost increase is higher than what can be sustained over time. Staffing costs have increased primarily as a result of new collective wage agreements with healthcare professionals, and to a limited extent due to more expensive staffing models are being used, e.g., more overtime payments for nursing staff, as the hospital has been needing more nursing staff than available on the market.*

Labor force effectiveness at Landspítali is high but declining. *Landspítali staff still takes care of a large number of visits and admissions per clinical FTE, but compared to the extreme post-financial crisis level, labor force effectiveness has declined. Clinical staff is producing fewer visits and admissions, while staffing levels have increased. This development is expected as a return from the post-crisis situation. At the same time, Landspítali has not proactively adjusted staffing levels to meet the changes in production range and levels that have happened in this period, leading to uneven staffing development in different areas of the hospital.*

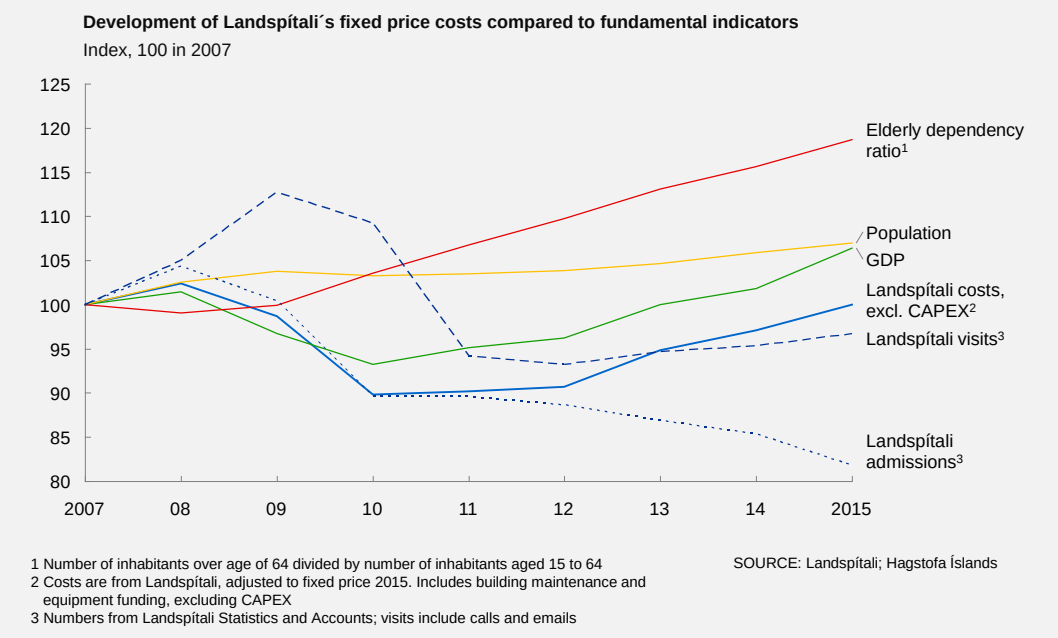
Landspítali has a long average length of stay and the average has risen rapidly relative to the development of complexity of care. *A scarcity of care facilities for patients leaving the hospital, e.g., nursing homes, long-term mental health facilities and home care is often referred to as the key driver of high length of stay. The direct effect of patients waiting for nursing homes can be estimated to a total increase in ALOS by 0.5 days, representing around a quarter of the challenge. Patients waiting for home services add to this, but this challenge is not the only driver of long ALOS. Slow internal process, among those patient discharge processes, are more important drivers of this development.*

The utilization of facilities and equipment at Landspítali is in line with utilization at Swedish hospitals. *Investments in equipment have been relatively high since 2013, addressing needs built up over a lengthy period of low investments. The scope for improved efficiency in capital utilization is probably limited within the current facilities meaning that redundancies are not driving high costs. This review has not covered facility development or gone into the challenges around building a new hospital.*

Landspítali´s cost base was reduced significantly following the financial crisis, but as costs have returned to 2008 levels, production continues to decrease

Spanning the financially constrained years, total costs at fixed price levels at Landspítali have grown slower than some of the basic drivers of healthcare spend; the Icelandic population, elderly dependency ratio and GDP. In 2008 to 2010, Landspítali costs and production went down more than the decrease in GDP. Following a stable, low cost period in 2010-2012, hospital costs have increased and in 2013 and 2014, the hospital's costs grew at a similar pace as GDP. In the period from 2012 and on, personnel cost has been Landspítali's most prominent driver of cost increase, increasing mostly due to increased cost per FTE, and limited growth in personnel volume. As a result of re-negotiated labor contracts with the government, salaries at Landspítali have increased faster than salaries on average in Iceland, and physician salaries in particular have been raised to increase job attractiveness. At the same time as costs have grown, the production at the hospital had continued to decrease (*Exhibit 4*).

Exhibit 4: As Landspítali's costs have returned to 2008 levels, production has not increased

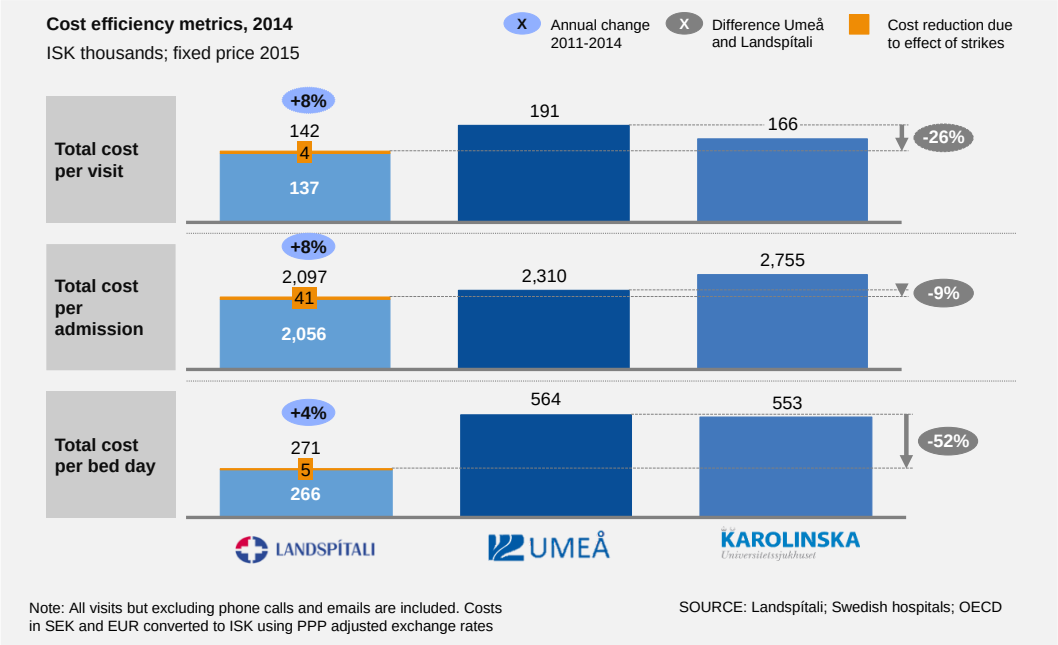


Landspítali´s costs other than personnel costs have grown slower during this period. While limited cost growth outside of personnel costs is an indication that the hospital has managed to maintain the house-holding skills acquired during the crisis, there is a risk of underinvestment in new treatments and technologies. Building maintenance and equipment have however received significant funding, contributing about 1 pp. to the growth rate 2013-15.

As costs increase and production decreases, Landspítali's cost effectiveness has gone down relative to the immediate post-crisis level

As funds have been added to the hospital, costs have grown faster than the number of visits and admissions to the hospital, leading to negative development of basic cost effectiveness metrics such as cost per visit and cost per admission. Both have grown at 8% per annum since 2011. Cost per bed day has grown somewhat slower due to a rising average length of stay. Following the constrained years after the crisis, this is an expected development. While a comparison to Swedish university hospitals is interesting to understand how Landspítali's current cost level compares on an international scale, it should be noted that Swedish cost levels should not be seen as a standard to live up to. Both Karolinska and Umeå have seen a very challenging staffing situation in the past few years – similar to the challenged faced at Landspítali. With this in consideration, it can be noted that Landspítali´s cost efficiency levels have been lower up until 2014, but increasing at a faster rate (*exhibit 5*).

Exhibit 5: Cost per visit, admission and bed day is lower at Landspítali than at Swedish university hospitals, reflecting both efficiency and differences in case mix



One driver of cost effectiveness difference between countries is the underlying salary levels of clinical staff, which varies widely across countries. Comparing physician and nurse salary levels to the national average salary level, Iceland is somewhat higher than Nordic peer. While this is likely also a reflection of the average salary level being a bit lower in Iceland, the difference is small and the effect of differences in staffing levels and staff composition between the systems has a much larger effect on cost per unit.

To counter the negative cost effectiveness development, Landspítali would need to return to a higher production level in 2016 without significantly increasing costs. As union negotiations in 2015 have led

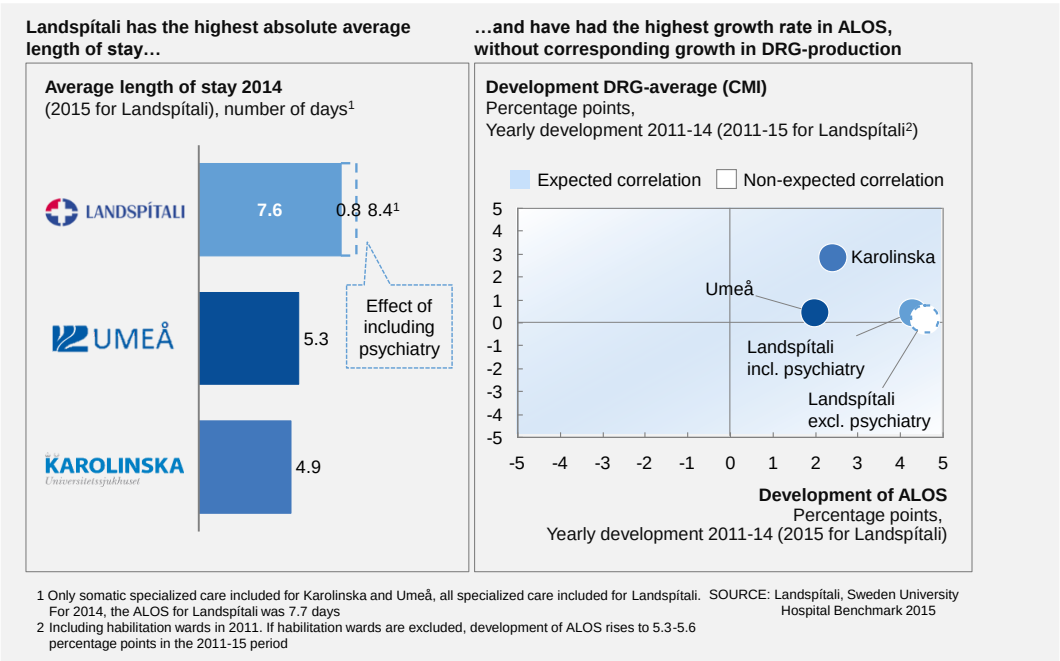
to higher salary levels across the spectrum of health care professionals, this is unlikely to happen. Therefore, 2016 costs per produced unit of care are likely to be higher. At the same time, production should be expected to return to a higher level than the hospital managed during the strike years as no disruptions to services are expected and operations will be easier to plan.

Looking at staff productivity, Landspítali staff is responsible for a large number of visits and admissions per clinical FTE. This is a function of several factors, including the fact that complexity of care provided is lower than at most university hospitals. Nevertheless, hospital staffing levels are very low. Staff productivity development has been negative over time, and while this is a rebound from the extremely high production levels the hospital managed during the financial crisis, the trend is fast.

Average length of stay (ALOS) is long and has increased over the past few years

Despite decreasing DRG-production, the total number of bed days has increased, driven by a rising ALOS. Compared to peers, Landspítali has the highest ALOS in absolute terms and highest growth in ALOS relative to the development of care complexity (*exhibit 6*).

Exhibit 6: Compared to other university hospitals, Landspítali has the highest ALOS in absolute terms and highest growth in ALOS relative to CMI development



Average length of stay is affected by a large number of factors. The shift of activity from inpatient to outpatient care will have an effect, as the number of relatively healthy short-stay patients decline. This shift started earlier in Sweden, but it is still ongoing and affects the development in both countries. Landspítali´s relative decrease in short admissions (<2 days) does not seem to be explained by a shift to daycases. The relative increase in long stays (>10 days) is driven by an increasing share of

patients 80+ years, that now make up 26% of total bed days. A scarcity of nursing homes, long-term mental health facilities and home help (nursing care and social visits) is often referred to as the key driver of high ALOS. Around 7.5% of the total bed days can be explained by patients waiting for such care, corresponding to a potential decrease in ALOS of 0.5 days. This is therefore not the key Patients waiting for home services add to this, but waiting patients only make up one driver of long ALOS. Lack of coordination and slow processes at Landspítali as well as in the surrounding system are probably more important drivers of the long ALOS.

The utilization of Landspítali´s existing capital stock is in line with benchmarks, with relatively high equipment investments in recent years

Utilization of the existing capital stock at Landspítali has been assessed by looking at housing space per clinical FTE, bed utilization, operating theatre utilization, and advanced equipment utilization. Together, these indicators point towards an overall utilization level that is not out of line with Swedish or other international benchmarks. Landspítali has slightly less space for its operations than Swedish and British hospitals (note that the state or quality of facilities has not been assessed). Bed utilization is high at Landspítali, 97% in 2015, which is close to the Swedish average of 96% but considerably higher than the British and German averages of 85% and 81% respectively. The average utilization of operating rooms at Landspítali is in line with Karolinska. Looking at the utilization of MRI and CT scanners, OECD numbers indicate that exams per MRI scanner are many in Iceland whereas exams per CT scanner are few. However, utilization at Landspítali is considerably higher as low utilization scanners around the country drag the country rate down in the OECD numbers. Therefore, utilization of scanners at Landspítali seems to be somewhere between high and in line with benchmarks. Overall, there is therefore no indication that cost efficiency can be significantly improved through reduction of redundancies and higher utilization of assets.

The investment level at Landspítali has been high in recent years. However, this follows a lengthy period with an under-addressed need for investment. The state of equipment at Landspítali is roughly in line with the state at Karolinska; the average age of MRI and CT scanners is 11.5 and 6.5 years respectively compared to averages of 7.9 and 8.3 years at Karolinska in Sweden. Landspítali´s buildings and facilities in use are generally considered dated with some being in poor condition.

RECOMMENDATION

As Iceland is again adding funds to Landspítali and the surrounding healthcare system following the post-financial crisis cost cutting, there is a unique opportunity to reform the system and make sure investments flow to the areas that give the best return in terms of healthcare value.

To date, most of the growth in personnel funding at Landspítali have been addressing cost per FTE. Going forward, funds are likely to have the greatest effect if directed to address staffing levels, improve working conditions and develop care concepts.

Based on a clarified strategic direction (as described in the previous chapter), Landspítali overall funding should be adapted to match yearly changes in the volume of care the hospital is expected to provide. Based on that frame, the hospital needs to find ways to adjust resources to match strategic priorities, demand development and the subsequent development of volumes. In practice, this means that Landspítali needs to define clear productivity metrics and targets (e.g., target level of DRG/ visits/ admissions per physician and nurse, and actual cost per hour worked) and develop mechanisms to act with agility to changes in either production, cost, or labor force, making sure development is well aligned (i.e., should production decline, there should be a plan to reduce cost accordingly and vice versa). With no strikes expected in 2016, the hospital is in a better position to manage production volumes and match resource levels accordingly.

In addition, the hospital should work to improve pockets of lower productivity. This could mean finding more cost effective staffing models (more stable models with less expensive overtime solutions), and most importantly, addressing the long length of stay. While the constrained patient outflow to elderly care/nursing homes, long term psychiatric facilities and home help needs to be addressed in collaboration with the surrounding system, the internal focus should be directed towards processes within the hospital. Going forward it will be important to streamline internal processes, make sure patients are discharged effectively, and rebalance access to hospital beds as the inpatient production level changes. This is also a key to opening up capacity to handle waiting lists.

CHAPTER 3.

STAFF STRUCTURE

Landspítali operates with a relatively low staffing level across clinical staff groups. Among the clinical staff, Landspítali has a very low share of physicians, the physician group is very junior and many senior physicians work part-time. This results in a lack of experienced clinical decision-making ability at the hospital. There is a need to rebalance staffing levels, with a top priority to increase senior clinical decision-making capacity, and to see a larger number of senior physicians present in daily operations at the hospital. This should contribute to addressing waiting lists and decreasing average length of stay.

SUMMARY OF OBSERVATIONS

Landspítali operates with a low staffing level across clinical staff groups. *The total number of clinical FTEs per visit and admission is significantly lower than at Swedish hospitals. However, this can be partly warranted by a lower complexity case mix and a relatively large group of administrative support staff.*

In terms of staff distribution, Landspítali has a very low share of physicians, and the physician group is very junior. *As the majority of physicians go abroad for specialist training, Landspítali has a low share of physicians at their most productive tenure (residency and right afterwards). This is compensated for by a large group of junior physicians under the age of 30, with limited experience and decision-making capability. The senior physician group (above the age of 50) is of comparable size to peer hospitals, but many specialists work part-time at Landspítali, resulting in a large number of hand-overs and discontinuity of patient care. Landspítali is likely to be suffering from a lack of experienced clinical decision-making ability at the hospital meaning that more experienced physicians are needed in the day-to-da operations of the hospital.*

The Landspítali staffing mix is closely connected to *several of the hospitals challenges;* ***the long average length of stay in the hospital,*** *waiting lists and the hospital's ability to provide more advanced outpatient care. Low senior decision-making capacity is likely a driver behind the relatively long lead-time to vital decisions at the hospital, such as decisions on treatment choices and patient discharge. Senior physicians are also required to work through waiting lists and to be able to run the more advanced, 'university level' outpatient activity previously discussed.*

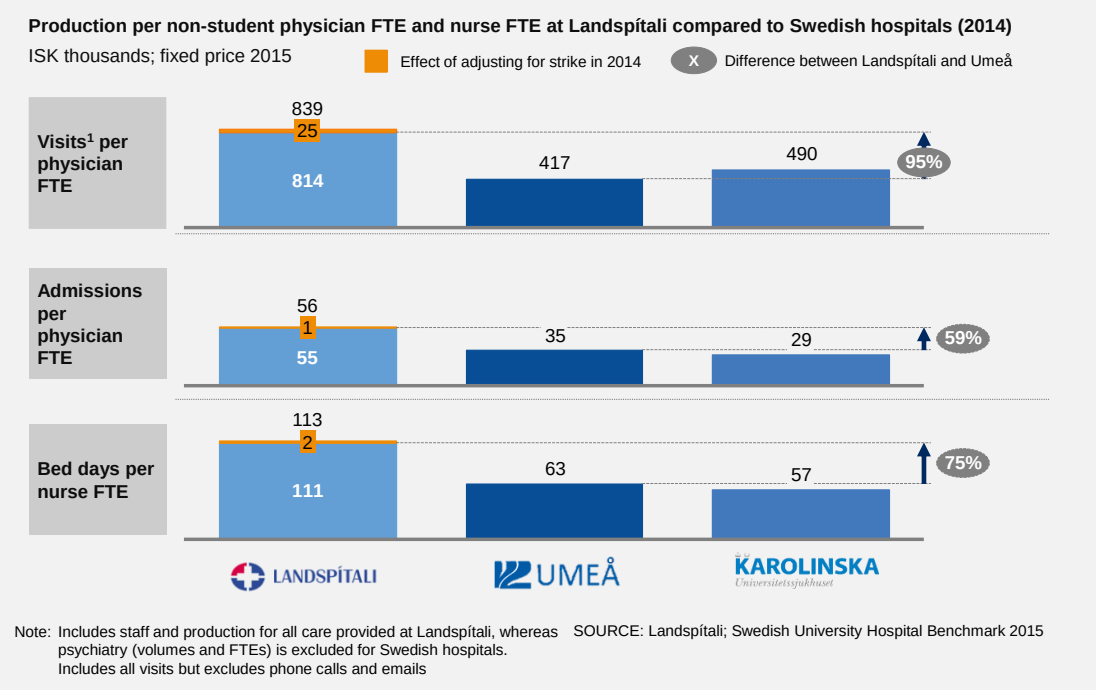
Landspítali has struggled to attract fully trained specialist physicians back to Iceland. *The physician wage level in Iceland, which previously has been named as a reason for not returning, is now comparable to the Nordic countries. Physicians are now naming working conditions as the main reason to stay abroad; physicians in Iceland work hard, often split their time between the public and private sectors, are required to do a large number of on-call hours and see little opportunity to care for patients in a comprehensive manner through the combination of inpatient and outpatient care. The current incentive structure for specialist physicians with significant income differences between the public and private systems, also contributes to the number of physicians working part time and would need to be addressed in order for Landspítali to increase the share of physicians working full time.*

Long average length of stay at Landspítali drives up the need for nursing staff at the hospital. *Long lengths of stay primarily contribute to an increased workload for nursing staff that care for a large group of patients with a varying, sometimes low care need. Looking ahead, Landspítali is expecting a significant share of nursing staff to retire over the coming years. Nursing staff also find attractive employment opportunities within other industries, e.g., tourism, making it important to ensure sufficient supply of trained nurses to the healthcare system.*

Landspítali´s clinical work force stands out with a low number of physicians and a high share of physicians working part-time

Overall, Landspítali´s clinical staffing mix is relatively similar to the Swedish hospitals, but with a lower staffing level and most importantly, a relatively small share of physicians. This can be explained by Landspítali being more of an acute hospital in practice, with a larger share of lower complexity cases. At the same time, the Landspítali physician mix is very junior, due to the lack of specialists in training and in their first years as licensed specialists - typically some of the most productive years in physician's career. This is made up for by employing a large number of junior physicians under the age of 30. In addition, many in the senior physician group are working part-time at Landspítali, contributing to frequent handovers and discontinuities in patient care. This situation most likely manifests itself in low clinical decision-making capability being present at the hospital at most times but particularly outside of office hours. Physicians at Landspítali take care of significantly more visits and admissions per FTE than Swedish peers (*exhibit 7*).

Exhibit 7: Clinical staff at Landspítali is on average responsible for considerably more production than their peers at Umeå and Karolinska



Note: Includes staff and production for all care provided at Landspítali, whereas psychiatry (volumes and FTEs) is excluded for Swedish hospitals.
Includes all visits but excludes phone calls and emails

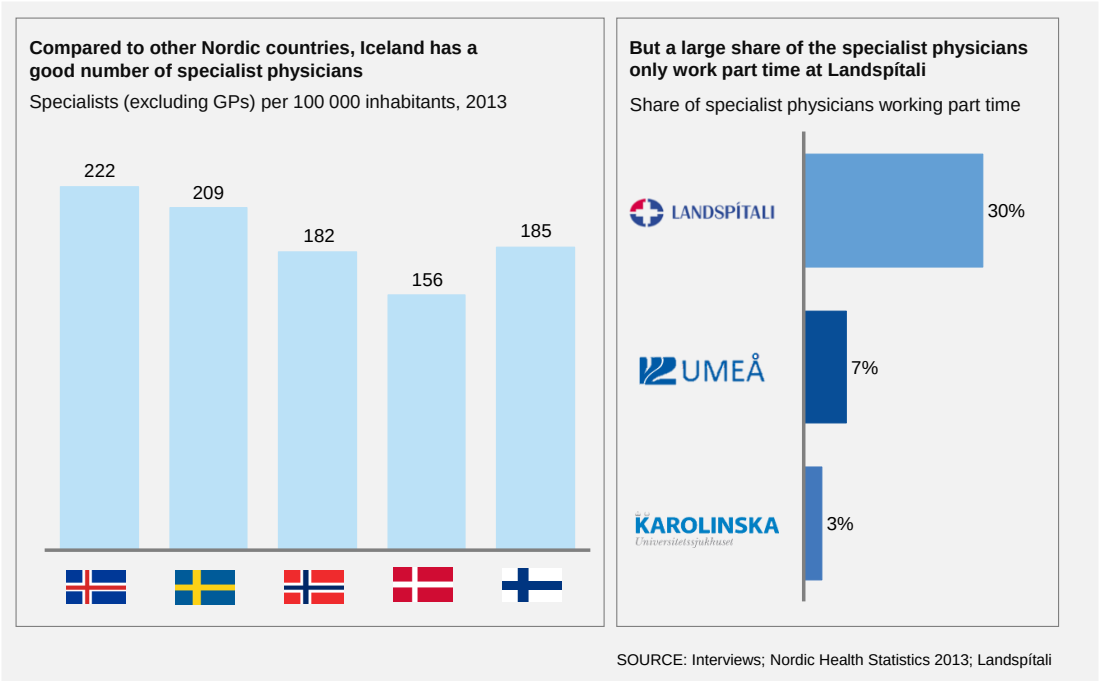
SOURCE: Landspítali; Swedish University Hospital Benchmark 2015

Interestingly, Iceland has a high prevalence of specialist doctors in the country, with many licensed specialists per inhabitant (and the same is true for GPs as discussed in chapter 5). Given the country's special circumstances, with a small population and large geographic, utilization of specialists is likely to be below that of other countries, making the current level seem in range of reason. While the availability of specialist capacity across the range of specialty areas may be skewed, on an overall level the competence is present in Iceland (*exhibit 8*). The current incentive structure, with

significantly different remuneration structures in the public and private parts of the system, contributes to many physicians working part or full-time in the private sector.

A unique aspect of the Icelandic healthcare system is the fact that almost all Icelandic specialist physicians do their residency abroad. Historically, most specialist physicians have returned to Iceland as more experienced specialists. However, the set-up poses a risk for the system overall and Landspítali in particular as individual physicians are free to choose when and if to return to Iceland, making it challenging to estimate what volume of physicians need to be trained to provide the system with sufficient capacity for the future. The risk can be actively managed, e.g., by ensuring compensation levels and working conditions of specialist physicians are in line with international standards, or by ensuring the pool of Icelandic physicians is large enough to withstand a lower rate of return to the Icelandic healthcare system.

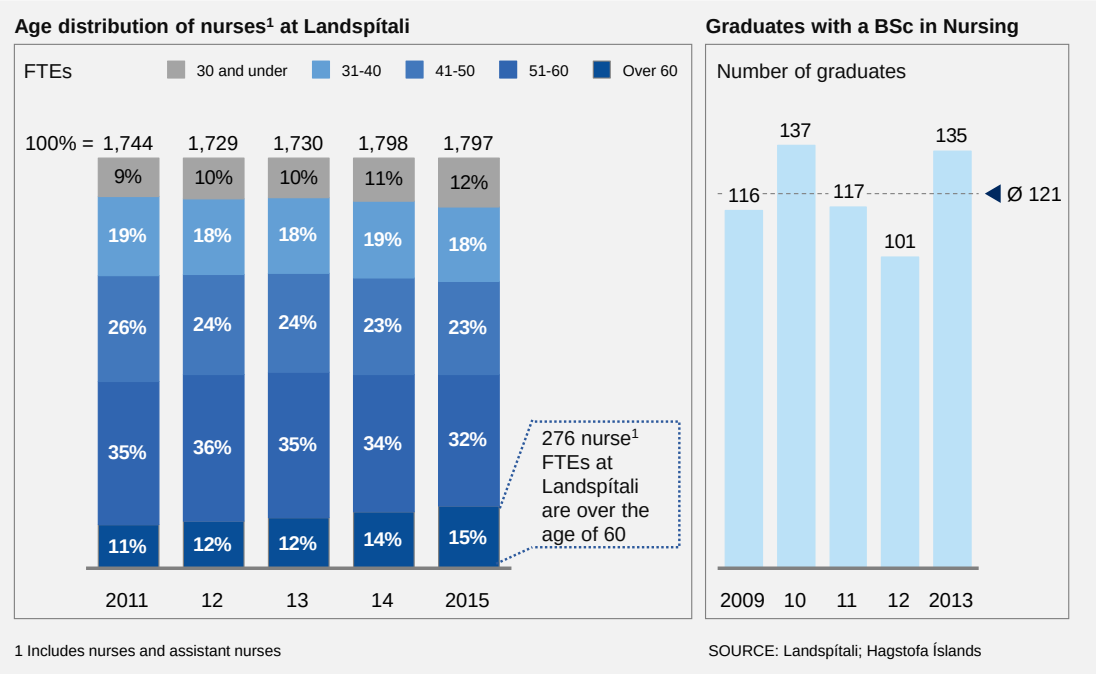
Exhibit 8: Iceland has a high prevalence of specialists, most of which work both in private and public care



SOURCE: Interviews; Nordic Health Statistics 2013; Landspítali

Besides physician staffing, nursing staff is an area where Landspítali have been experiencing a difficult situation in the past few years. Looking at staffing levels, these are more comparable to the situation at Swedish hospitals. The long average length of stay drives up the need for nursing staff, at the same time as the care need for each patient is somewhat lower. Looking ahead, close to 300 of the 1 800 nurses at Landspítali are above the age of 60 and due to retire in the coming years. Currently, Iceland produces around 120 newly trained nurses each year, some of which are attracted to employment in other sectors. It will be important to monitor this situation closely to ensure there is sufficient nursing staff capacity across the Icelandic healthcare system (*exhibit 9*).

Exhibit 9: The nurse group at Landspítali is growing older and need to be replaced by new nursing graduates



The non-clinical work force is large, but can still operate effectively

Landspítali has a significantly higher share of non-patient care related staff than Swedish peers. This is partly a result of the fact that many hospital support services (laundry, patient meals etc.) are performed in-house, as opposed to outsourced. The efficiency of these services needs to be regularly evaluated and the best solution chosen. Pure administrative staff, like the finance and HR departments, are large in relation to Swedish standards. This is explained by the fact that Landspítali takes on a large administrative responsibility relative to most other systems, where payer organizations often handle follow-up, IT support, etc. This need not be a problem in terms of system effectiveness, but requires significant management attention at Landspítali. From the payer perspective, the balance of tasks results in a skewed power balance between hospital and payer, as well as little strategic control over cost distribution (admin vs. clinical care).

RECOMMENDATION

Landspítali´s staffing levels need to be rebalanced, with a top priority to increase senior clinical decision-making capacity. There is a need to see a larger number of senior physicians present in daily operations at the hospital.

There is a lack of senior decision-making capacity at the hospital that needs to be addressed. In doing so, Landspítali should focus on increasing the day-to-day availability of staff. Increased clinical decision-making capacity should be leveraged to improve internal processes at the hospital. The aim should be to address waiting lists, decrease the average length of stay and strengthen the hospital´s outpatient capabilities. Decreasing length of stay would also free up bed capacity at the hospital, making it possible to address waiting lists, and subsequently, close beds and reallocate nursing staff (indirectly enabling lower cost staffing models with less overtime hours).

While it will likely be possible to rebalance staffing levels to some extent over time, as length of stay goes down and the need for nursing staff therefore declines, the development is difficult to initiate without an initial investment in a higher staffing level for senior physicians. Overall, Landspítali operates with a lower staffing levels than Swedish peers, and a higher investment than the current level can be motivated. To improve the access to more clinical decision-making capacity at the hospital, it would also be beneficial to see a larger share of senior physicians working full-time (or a larger share of their time) at Landspítali. This would also enable a larger group to share on-call responsibilities. It is also continuously important to make sure licensed Icelandic specialists find it attractive to return from residency abroad. This requires appealing compensation levels (which are now at a level comparable to other Nordic countries) and good working conditions at the hospital. On a system level, the remuneration differences between the private and public systems need to be evened out, and Landspítali needs to hire more specialist physicians on a full time basis.

CHAPTER 4.

QUALITY

As Landspítali´s cost and production levels have varied since the financial crisis, there has been little effect on quality outcomes as measured today. However, Landspítali is measuring and tracking a relatively small set of quality metrics, limiting the transparency on quality development. The increase of patients waiting more than 3 months for procedures is a quality concern, but patient satisfaction is on a high and stable level. Landspítali needs to increase quality reporting, increasingly use internationally comparable metrics, and report results in a more transparent way.

SUMMARY OF OBSERVATIONS

While Landspítali´s cost and production levels have varied since the financial crisis, there has been little effect on quality outcomes as measured today. *The cost effectiveness of a healthcare system needs to be related to the healthcare value that the system delivers, in part measured by quality metrics. For Landspítali, this means that cost effectiveness must be viewed in in relation to the ability to fulfil goals related to medical outcome, patient safety and access to care, as well as patient and employee satisfaction. As Landspítali´s costs went down post the financial crisis, the goal of the hospital was to get through the challenging time without reducing quality. As costs have risen in recent years, some of the available quality metrics show positive trends, others remain stable, and a few are declining.*

In the last few years, patient satisfaction has been high and stable. *Patient satisfaction surveys have been performed yearly for the past four years. The latest such survey is from 2015 and shows that patients feel that they are treated with respect (scoring 2.9/3) and that the overall satisfaction level is high (average across categories is 2.6/3).*

Landspítali is measuring and tracking a small set of quality metrics, which limits the transparency on quality development. *Landspítali uses a limited set of metrics to monitor outcomes and also lacks more patient safety and quality measures. The outcome measures that are in place are in many cases specific to Landspítali or Iceland, making it very difficult to compare outcomes with other providers similar to Landspítali. The reporting requirements set upon Landspítali by the government is limited and quite different from the situation in the other Nordic countries, and most of the current quality reporting is done on the initiative of the hospital. In addition, there is no comprehensive, transparent quality reporting outside of the hospital, and Landspítali probably has the most developed quality reporting in Iceland.*

The increase of patients waiting more than 3 months for procedures is a large quality concern. *Waiting lists have increased at a steady pace at least since 2011 as discussed in chapter 2. While the strikes in 2014-15 have had a significant impact on production over the past couple of years, the rate of growth of waiting lists was the same in 2014-15 as before the strikes.*

There is no clear trend in available quality metrics

During the challenging times after the financial crisis, the goal of the hospital was to get through without reducing quality of care, something the hospital accomplished. Following this time period, as funds have again been added to the system, quality has remained relatively stable. Landspítali is tracking a relatively limited number of outcome or quality metrics, and the available metrics do not show a clear trend over the past few years (*exhibit 10*).However, it should be noted that because of the small scale of services at Landspítali some common metrics might not be particularly meaningful for the hospital due to a limited number of cases. Landspítali has defined explicit goals for a number of quality metrics related to patient safety, work environment, and the efficiency of processes. Development of these metrics has varied, and as the hospital was challenged by strikes and production disturbances in 2015, few of these goals were met (*exhibit 11*).

Landspítali also monitors patient satisfaction through yearly satisfaction surveys. Since 2012, there has been little change to the results of this survey, satisfaction remains high across all indicators (*exhibit 12*) – something that is not easy to achieve during challenging times.

Exhibit 10: While productivity has decreased, Landspítali does not seem to have compensated that with overall increased quality of outcomes

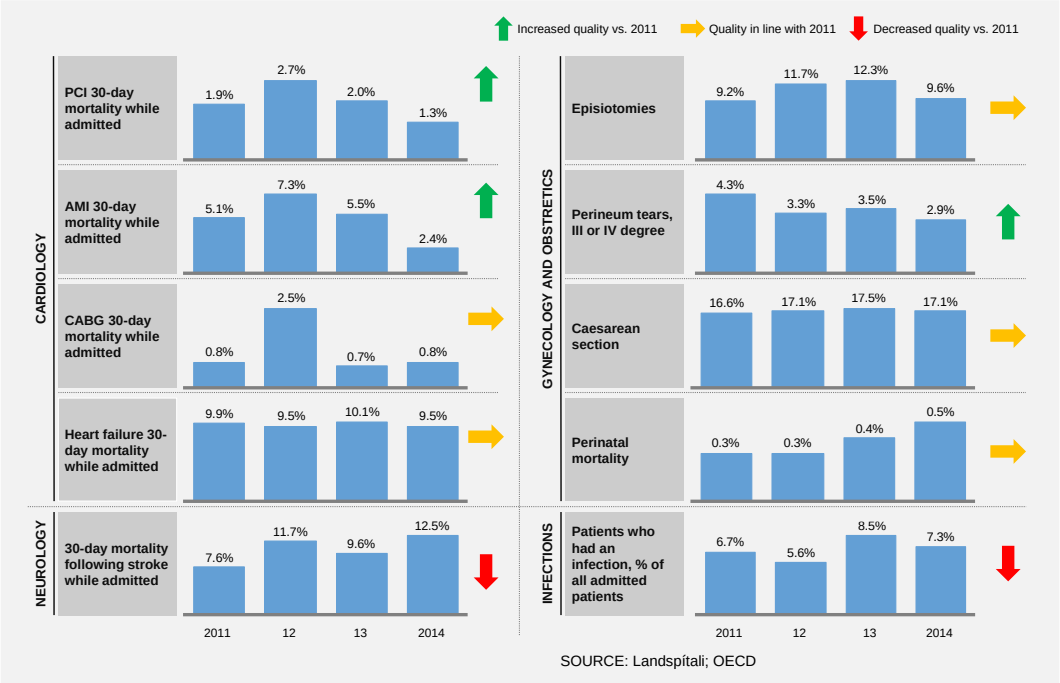
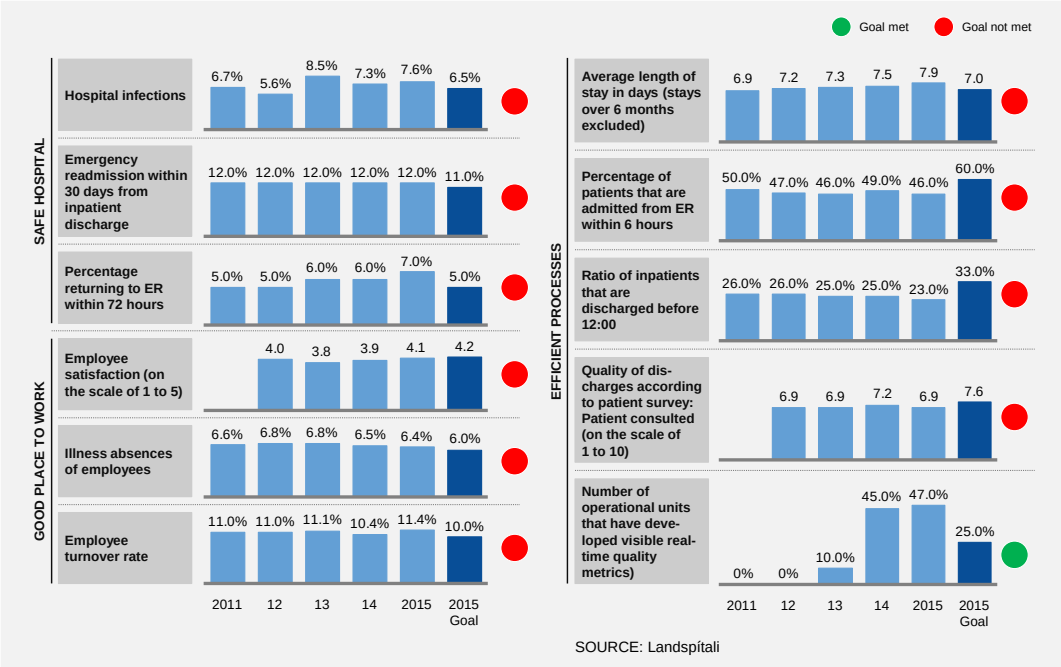
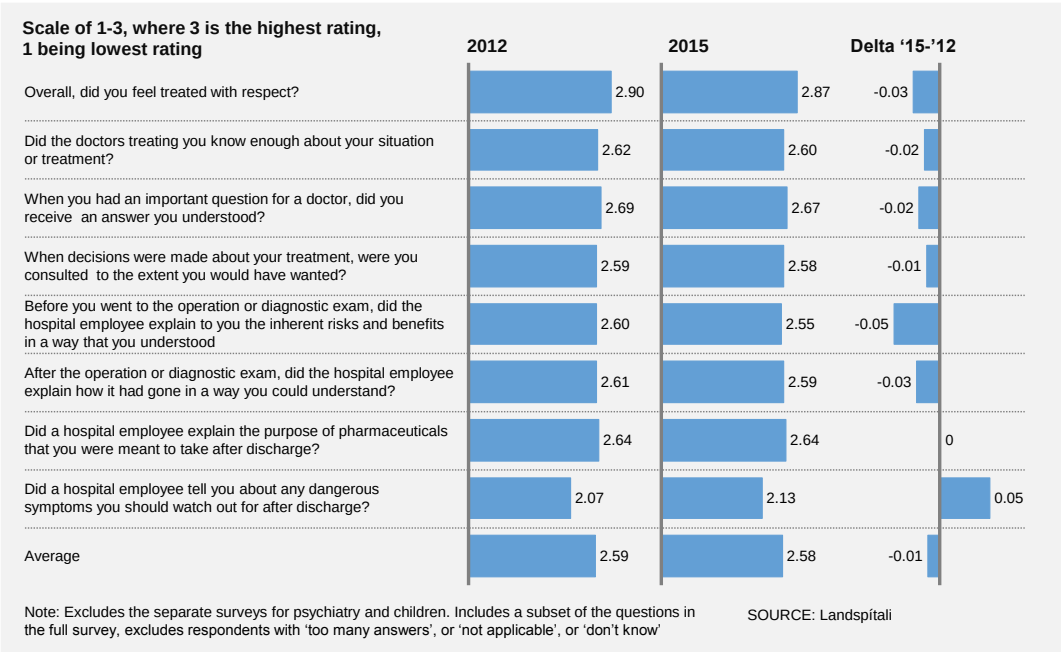


Exhibit 11: Few of Landspítali quality targets relating to safety, work environment and efficiency of processes have been met



SOURCE: Landspítali

Exhibit 12: In the last few years, patient satisfaction has remained stable at a high level of satisfaction



Note: Excludes the separate surveys for psychiatry and children. Includes a subset of the questions in the full survey, excludes respondents with 'too many answers', or 'not applicable', or 'don't know'

SOURCE: Landspítali

RECOMMENDATION

Landspítali, and the surrounding healthcare system, needs to increase quality reporting, increasingly use internationally comparable metrics, and report results in a transparent way.

Outcome measurements do not need to be complex. Simply using the most widely used outcome metrics across the range of services, and making sure these metrics are harmonized with a selection of peers or international standards (e.g., OECD definitions) will go a long way. Other Nordic university hospitals regularly track medical outcomes, patient safety, access to care, and patient/employee satisfaction.

Once a comprehensive set of metrics is in place, Landspítali should develop performance goals based on these, and use them to manage performance across divisions and departments. Performance goals can be introduced in small steps, e.g., as a first step by aiming for a 'positive trend' or 'at least 1% improvement'.

Finally, Landspítali should increase the transparency of quality outcomes, e.g., by introducing an annual quality report that displays a dashboard of available metrics and summarizes results. Some metrics are well suited to be followed in real time, at least for internal purposes; examples include waiting times at ER and bed occupancy rate.

To emphasize the importance of quality metrics, a clear requirement from the Directorate of Health on what indicators should be reported as a minimum would be beneficial, for Landspítali as well as for the surrounding system.

CHAPTER 5.

ROLES IN THE SYSTEM

While the Icelandic healthcare system has developed a set-up that enables the Icelandic population to have access to a wide range of medical specialties, many of the challenges Landspítali is facing stem from structural root causes within the surrounding system. This is related to a lack of clarity regarding roles of different providers in the system, and the distribution and development of volumes within the system. The Icelandic healthcare system's strategic direction needs to be clarified and the roles of the different type of providers should be more clearly defined. Based on this, DRG reporting, target based financing and more stringent quality reporting should be introduced.

SUMMARY OF OBSERVATIONS

The Icelandic healthcare system is operating under unique circumstances and has developed a set-up that enables the Icelandic population to have access to a wide range of medical specialties. *From the outside view - with the caveat that quality reporting is not exhaustive - the system seems to be delivering good quality outcomes at a limited cost. Moreover, quality outcomes at Landspítali did not decline during the financially challenging time following the financial crisis. However, many of the challenges Landspítali is facing stem from structural root causes within the surrounding system, and need to be addressed at a system-level. This is primarily related to a lack of clarity regarding the roles of different providers in the system, and the distribution and development of volumes within the system.*

Private specialist outpatient activity is growing at a fast rate without clear strategic planning, control, or supervision of volumes and quality of care provided. *With the right division of responsibilities, the private provider system could be part of a well-integrated patient pathway with Landspítali, providing high quality care at a reasonable cost. However, in recent years volumes have developed without a strong strategic direction. Volume shifts from Landspítali towards the private system do not seem to be based on strategic considerations or active decisions. Free establishment, little or no volume control nor tracking of tasks performed as well as a fee-for-service reimbursement system have led to high productivity but an uncertainty around whether private specialists are focusing on the right services and the right patient groups.*

While the review has not gone deep into primary care, the primary care systems seems to have challenges providing the care needed to relieve Landspítali from low complexity cases, particularly in urgent care. *The primary care system is said to be inefficient, in part confirmed by comparing the relatively high number of primary care physicians to the long waiting times. There is little production data, cost or quality reporting available to follow up on system performance.*

Capacity of nursing homes and care for the elderly is unevenly distributed and services are not run in the most efficient way. *Nursing homes are often described as a bottleneck for discharging patients from Landspítali, and access in the capital area is significantly below the rest of the country although curiously, as is access to home help. Yet, waiting times are shorter in the capital area than in many other parts or the country.*

Information flow between providers is difficult, and the system does not have sufficient transparency on patient information to act in an integrated way. *As patients flow between providers in the system, the need for information to flow with the patient is growing. Iceland is currently not sufficiently leveraging electronic health records or other digital tools to enable information flow and integrating care provided in different parts of the system.*

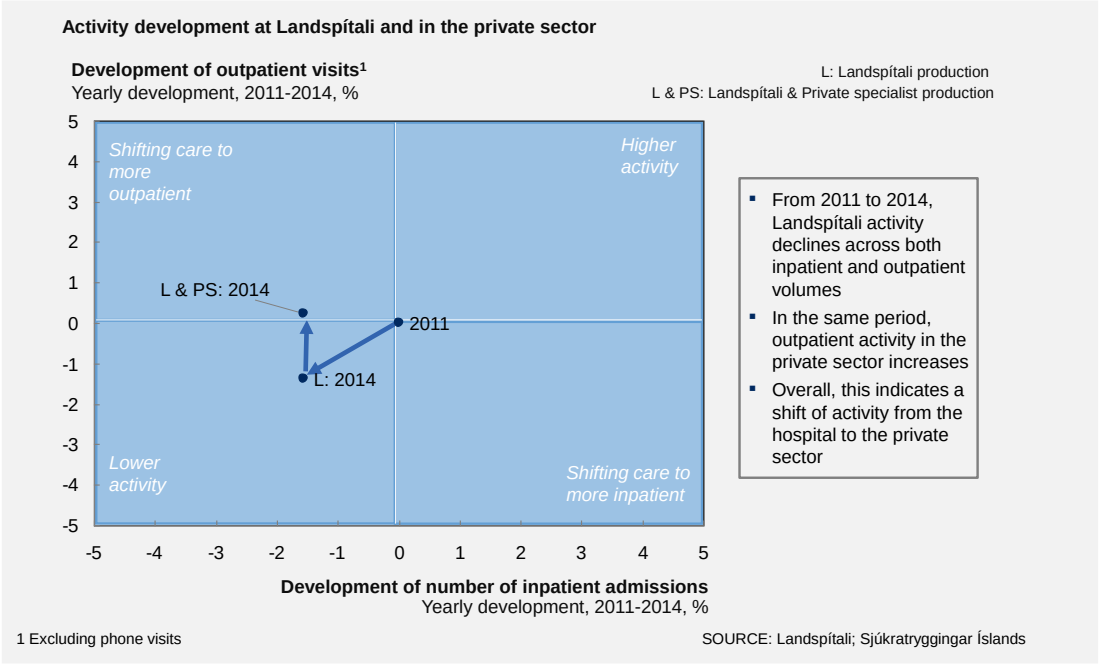
Steering of the system is split across several entities, where division of responsibilities is sometimes unclear and no entity has a comprehensive view on development of the system overall. *The Ministry of Welfare, Directorate of Health, Icelandic Health Insurance and the seven health regions are all involved with steering the system, but the responsibility for monitoring outcomes is not directly connected to the respective commissioning entities.*

Private specialist activity has grown fast over the past few years, and there is a need for more control of the activity provided

The private specialist system in Iceland has grown significantly over the past few years, with both increasing volumes and an increasing scope of what type of care is provided. While overall system volumes and a rough breakdown of the type of activity (by specialty and procedure type), are registered, private activity is not monitored on the same level of detail as Landspítali volumes – there is no DRG-registration nor use of other more detailed production measures.

As previously described, there has been a system level shift from inpatient care at Landspítali towards outpatient care at Landspítali as well as in the private specialist system. As volumes at Landspítali declined from 2012 to 2015, volumes in the private specialist system increased, and at a much faster rate. Mapping the private sector development relative to Landspítali´s shows that there is a correlation between decreasing volumes at Landspítali and increasing outpatient activity in the private system (*exhibit 13*).

Exhibit 13: On system level there is a shift to outpatient care in private specialist settings



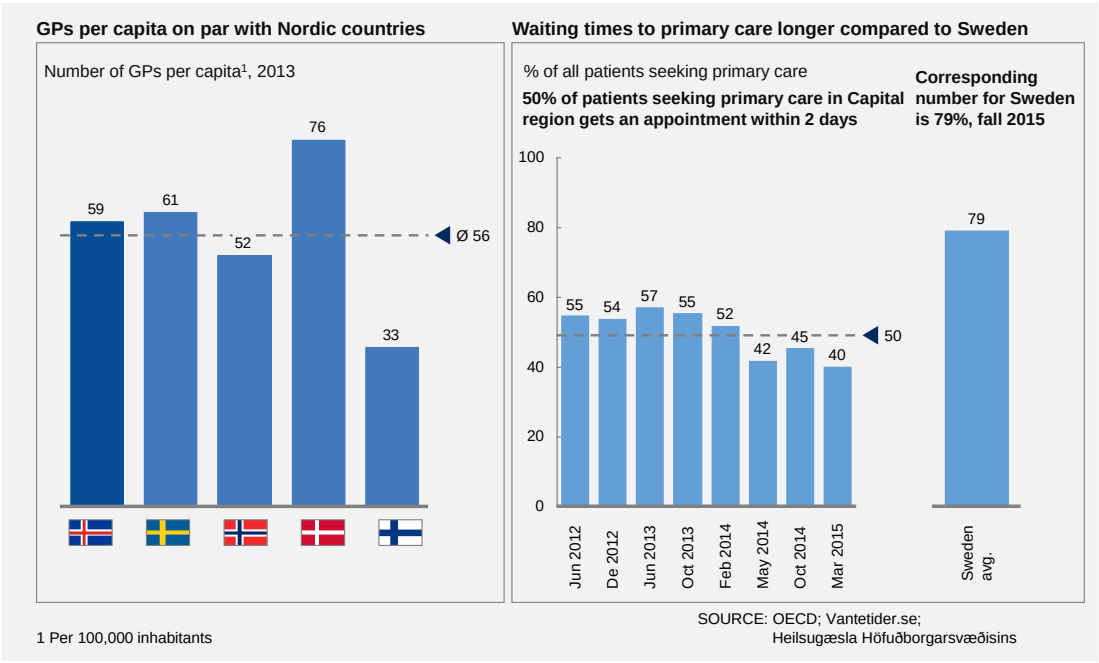
During this periods, costs in the private system have increased significantly. This has primarily been driven by increased activity and a renegotiation of the reimbursement contracts, but there is also a trend towards more advanced procedures that are reimbursed at a higher rate. Given the lack of detailed production data in the private system, it is not possible to monitor the overall efficiency of the private specialists. Iceland does however have a high consumption of outpatient visits. Moreover, the way the private specialist system is structured, there are several incentives in place that push the system towards high consumption. These include the principle of free establishment, reimbursement based on fee-for-service without volume or quality control, a lack of monitoring and easy access to

individual specialists, i.e. no gate-keeping/referral requirements from primary care. Without production data that is harmonized at a system level it is hard to assess whether the private specialist system as a whole is providing the right type and amount of care. However, there are some indications of challenges in the system. As an example, the supply of private specialist care is largely concentrated in the Capital region with little supply in some areas of the country, and there are areas with clear overconsumption of services, such as the number of tonsillectomies performed on Iceland vs. other countries.

While number of GPs seem to be in line with the Nordic countries, waiting times for visits to primary care are longer

This review has not included a thorough analysis of the primary care system. However, the quality of and access to primary care has a large effect on Landspítali and the surrounding system. Interviews indicate that the primary care system is struggling in some areas, and does not adequately fulfill its role as the first stop for most patients. An undesirably high number of patients turn to Landspítali and private specialist clinics where access to care is better and quality is perceived as higher.

Exhibit 14: Iceland's GP per capita on par with Nordic countries, but access to primary care is lower compared to Sweden

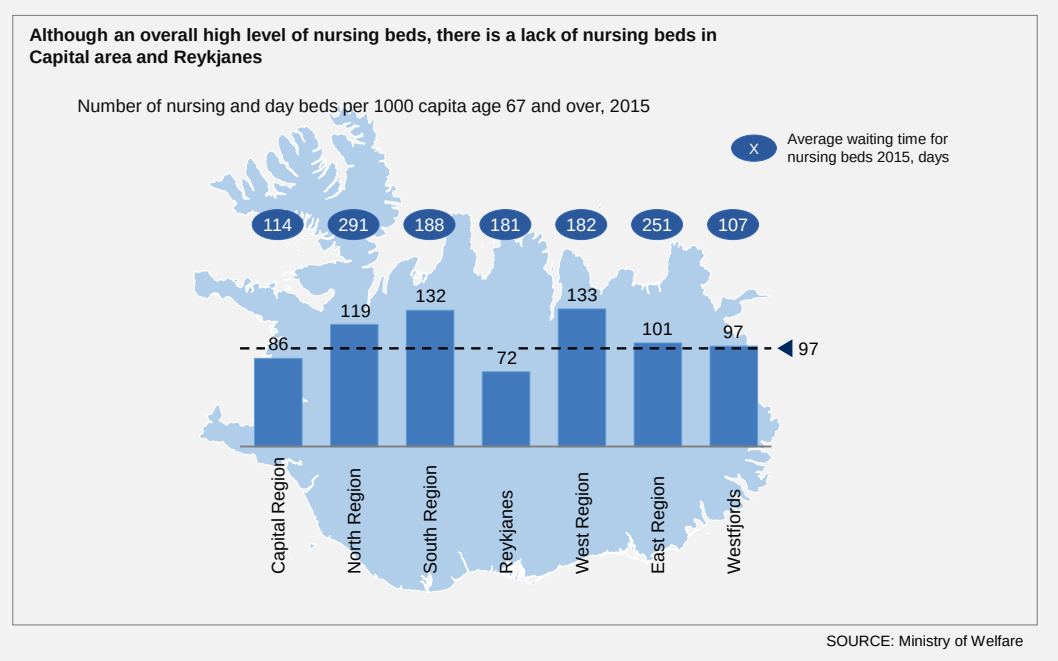


Looking at the fact base, the number of primary care physicians (general practitioners) per capita in Iceland is on par with Nordic countries. At the same time, waiting times to primary care are longer compared to Sweden, indicating challenges around operational effectiveness (*exhibit 14*). Landspítali reports that many patients coming to the hospital's emergency room could have received care in a primary care setting, but choose to come to Landspítali because of same day access and longer opening hours.

Nursing homes and elderly care facilities are unevenly distributed, with a bottle neck in the capital area

There has been a change in the pattern of long-term care for elderly in Iceland, with institutional care becoming less widespread and home care becoming more common. Beds in retirement homes are being shifted to nursing home settings, and the number of elderly receiving home help from the municipalities is increasing at a fast rate. While this development is favorable, there is a challenge around capacity and the distribution thereof. The number of beds per person over the age of 65 is lower in the Capital Area and the Reykjanes peninsula, while other regions have better access (*exhibit 15*). Curiously, looking at waiting times for nursing beds shows a different picture with relatively short waiting time in the Capital Area and Westfjords but longer waiting times in the North and East regions. Additionally, there is no clear responsibility for nursing homes to provide a certain capacity to secure efficient outflow of patients from Landspítali and other hospitals.

Exhibit 15: Nursing home beds are unevenly distributed, with low access in the Capital Area, Westfjords and the Reykjanes peninsula



Steering of the system is split across several entities, where division of responsibilities is sometimes unclear

Responsibility for steering the healthcare system is split across a number of entities; the Ministry of Welfare, Directorate of Health (Embætti landlæknis), Icelandic Health Insurance (Sjúkratryggingar Íslands) as well as the seven health regions are involved. The division of responsibilities between the different administrative entities is not very clear, and no entity in the healthcare sphere is capable of providing an independent perspective on overall financing needs in the system. To enable better control of the system, the entities procuring healthcare should have the required competencies to monitor and provide quality checks on the services provided, and the information flow between each entity needs to be well functioning.

RECOMMENDATION

The Icelandic healthcare system's strategic direction needs to be clarified and the roles of the different type of providers should be more clearly defined. Based on this, DRG reporting, target based financing and more stringent quality reporting should be introduced.

To address the current lack of strategic direction, all significant players in the system (Ministry of Welfare, Directorate of Health, Icelandic Health Insurance, Landspítali and representatives from private specialist providers and primary care) should come together and align on what services are suitable for provision in each part of the system. This piece needs to cover university hospital and private specialist care, as well as what care is to be provided by primary care and what types of patients nursing homes and other elderly/long term care services should cater for.

In specialist care, the focus needs to be on the split of services between private specialist clinics and the hospitals, in particular Landspítali. In primary care, the need for a (more or less strict) gatekeeping function should be evaluated, and thresholds for access and waiting times defined. For nursing homes and elderly care, focus should be on identifying ways to harmonize access across the country and ensure nursing homes are not a bottleneck to discharging patients from Landspítali. To complement the above steps, patient education should be bolstered as it is an important element to help patients seek care at the right time and in the right setting (e.g., through a medical information service which is well underway to get established in Iceland).

Reimbursement is the strongest tool available to steer volume distribution in the system. The freedom of activity within the system needs to be directed by clear incentive structures that encourage the efficient provision of quality care in the right place at the right time. To enable this, system performance needs to be measured, clear targets need to be defined, and reimbursement needs to drive the right incentives. Implementing production tracking across both Landspítali and the private specialist system is one way to harmonize the way production is reported and monitored in the system. With harmonized reporting it would be possible to define production targets and steer reimbursement based on the fulfilment of assigned goals.

In addition, quality reporting needs to be strengthened to allow further transparency of the quality of care provided. All providers should have clearly defined standards on what, how, and when to report, and publish outcome metrics and set goals based on this. With such a structure in place, reimbursement can be connected to quality of outcomes, e.g., by introducing a quality 'bonus' as part of reimbursement or limiting reimbursement for readmissions.

THE WAY FORWARD

The Icelandic healthcare system is facing a number of structural challenges, which need to be addressed urgently to improve system efficiency and more importantly, ensure safe and high quality care for all patients. To seize the unique opportunity that is in place now that Iceland is again adding funds to the healthcare system, we propose seven action-areas for Icelandic healthcare going forward.

SEVEN ACTION AREAS

We see seven action-areas for Icelandic healthcare going forward.

1. ***Focus work on reducing length of stay - a proxy for a range of challenges***.
   Reducing length of stay will require a number of actions within Landspítali that will address a range of current issues; the hospital will need to invest in clinical decision capabilities, address processes and free up resources in wards to fund this.
2. ***Invest in "specialist enabled" primary and elderly care/rehab structures.***
   Health provision structures outside of Landspítali need to be closer linked to the hospital, and specialist capacity in Landspítali should be leveraged also in out-of-hospital settings, e.g. by leveraging hospital specialists in serving primary care units.
3. ***Make a conscious and fact-based decision on where to focus private provision.***
   Private provision should be focused in areas where the benefits are clear – this will not be for all specialties, and scale and quality requirements will define what services are best provided for by the university hospital.
4. ***Introduce a joint and mandatory registration system and new reimbursement models.***
   Introduce a joint (DRG-based) registration system covering private and public activity ranging from primary to specialist care, and leverage this to set open and transparent prices – with quality outcome linkages – based on e.g., bundled DRGs, capitation and fixed assignments.
5. ***Consider a joint "vertical" governance structure***.
   Restructure the healthcare system into a vertical governance structure with common leadership for Landspítali, regional hospitals, primary and geriatric care; with care pathways as the leading structure one level below the managing director.
6. ***Aim for a full digital health transformation.***
   Utilize the relatively small size and high technology literacy of the Icelandic system to drive the digital health agenda in line with the governance structure outlined above.
7. ***Use new investments to drive change in these action-areas.***
   Create a clear program with milestones and link extra funds to the healthcare system with this program.

1. Focus work on reducing length of stay - a proxy for a range of challenges

Landspítali has a long average length of stay today, also by international comparison. While most systems see a decline in length of stay, Landspítali has seen an increase in the past years. Long length of stay is a proxy for a range of underlying challenges, such as the lack of senior clinical decision bandwidth, growing waiting times, lack of receiving structures outside Landspítali and a fragmented workforce with many senior physicians working part-time. As Landspítali inpatient volumes have been declining (a steady development since 2008), a large part of this positive development has been absorbed as longer length of stay. The effect is lower productivity, especially on the nursing side, where the same or a somewhat larger staff group cares for a lower number of patients/episodes.

This is compounded by a lack of receiving structures outside the hospital, e.g., nursing homes, social and elderly care structures.

A key action in addressing this is to invest in the right clinical decision capabilities. The hospital is in need of more senior doctor capacity, which can be achieved through

i. Investing in a higher staffing level for senior physicians and leveraging this to improve decision making processes within the hospital
ii. Raising the share of senior physicians working full time at Landspítali
iii. Freeing up time from low complexity outpatient care

In addition to clinical decision making, the surrounding system needs to provide good receiving structures outside of the hospital.

With lower inpatient volumes and shorter average length of stay, nursing capacity will be freed up and better utilized for the patients who really need it. This will enable the hospital to limit the use of expensive staffing models (overtime, temporary staff solutions etc.) and shift the focus away from a lack of qualified nursing capacity. To create a positive spiral driving continued reduction of length of stay, bed and nursing capacity needs to be continuously reduced or reallocated as length of stay goes down.

2. Invest in "specialist enabled" primary and elderly care/rehab structures outside of Landspítali

Today, Landspítali sees a relatively large number of low complexity urgent care patients, who could be provided for in primary care. Overall, the health provision structures outside of Landspítali are not well linked to the hospital and the relative size of Landspítali activity vs. the surrounding system is skewed. As a university hospital, Landspítali will always operate at a "cost premium" or higher cost per individual episode, driven by complexity of processes, research, education and the access to advanced technology and treatment procedures. This will be transferred to all activity provided at the university hospital, including the lower complexity care that can be provided at a high quality in primary care, to the benefit of both patients and system efficiency.

As a first step, system leaders have to be clear on what levels of care we want to have in each part of the system - while recognizing that we should work along a continuum of complexity rather than by the artificial cuts presented by today's setup (see action 5, governance for more detail). Once a baseline is established, there is a need to invest in primary, elderly and social care, but also to leverage specialist capacity in Landspítali, e.g. by having hospital specialist serving primary care units certain days and/or enable access to specialist through e-consultations. As a consequence, the return on investment in Landspítali will be highest once the outside structures exist, which should be considered when phasing potential future investments.

Going forward, these services can in parts be co-located within the Landspítali campus to leverage common infrastructure. Tertiary specialist care and primary care does not necessarily need to be in different buildings, but need to have operating models that are "culturally" different. In this context, the concept of giving primary care a gate-keeping role for access to specialist care fits in well.

3. Make a conscious and fact-based decision on where to focus private provision

Private provision in Iceland today is largely unregulated and in-transparent in terms of cost and outcomes. There are signs of poorly functioning areas, e.g. over-treatment, lack of transparency on productivity and it is possible for doctors working both in Landspítali and the private sector to self-refer patients across the two systems or within the private system. In many publically funded healthcare systems, private provision has many times proven to deliver advantages; e.g. managing high quality care at a lower unit price, providing better access and doing so with more content staff and higher patient satisfaction. However, necessary public structures, often driven by the need of the acute sector, sets a certain capacity level that is essential to serve this acute flow. In almost all instances, "filling up" this structure first, before investing in separate private provision, is beneficial from a cost perspective. Furthermore – regardless of the private/public split – smaller systems need to adjust to the volume-quality thresholds that exist, driving a need to avoid fragmentation and keep care together in one unit at sufficient scale.

In Iceland, private provision should be focused in areas where the benefits are clear - this will not be for all specialties. In areas where the need for private provision that can be defined and described, where there are clearly specified indications for intervention, where public sector structures already are at capacity etc., private provision should be considered, but with a strong need for registration of both production and outcomes. This will require that free establishment is replaced by a structured tendering for defined volumes, indications or outcomes, with a joint price level for public and private sector and a reflection of quality outcomes. Treating a patient that gets marginal value should only get marginal pay, and for certain procedures, volume thresholds should be considered.

4. Introduce a joint and mandatory registration system and new reimbursement models

DRG-based registration of hospital care in Iceland is being implemented but is still not in fully in place. Landspítali is measuring and following DRG development, but as reporting is not linked to reimbursement, the quality is not fully to the standard of other systems. Outside of Landspítali there is no detailed production/volume registration, neither in primary care nor in the private sector. On the outcome side, quality metrics (medical outcome, PROM, PREM, patient safety etc.) are only very scarcely used, and hardly present outside of hospitals.

Regardless of the reimbursement model in place, a joint "language" is needed to manage and drive improvements across the system. This language could be a combination of fully implemented DRG coding, agreed upon national metrics for quality and a system-wide patient survey. Practically, high quality registration is best achieved by explicitly linking payment to what is registered.

With functioning registration in place, it is possible to create transparent prices. National cost weights for same type of services should aim to be set on a joint level for all of Iceland, making is possible to calculate budgets clearly separating volume and price. This will also make it possible to explain price-premiums to care provided in the university hospital setting as well as expectations of lower price levels in the private sector. Reimbursement – both public and private – should be based on a mix of outcome specified bundled-DRGs (e.g. for hips/knees), outcome defined capitation (e.g. for stable dialysis patients) and fixed assignments (e.g. advanced burn-care).

5. Consider a joint "vertical" governance structure

Iceland is a small country and many of the current challenges can be traced back to a detrimental split of care structures. There is a large gap between levels of care, public and private provision are commissioned separately and in many cases, structures are split in a way that leads to very small operating units. Internationally, there are many examples of the values coming from taking a holistic patient view and integrating care structures vertically, i.e. having tertiary care, specialist care, primary care and elderly care managed jointly – also on a budget and staff level. Given the combination of the current challenges and the benefit of being a small country, a vertical governance structure would likely be hugely beneficial while still being implementable with manageable scope of control. With joint governance on a vertical level, the substructure should be divided into care pathways, e.g., planned care, end-of-life care, acute care, chronic care management, birth and maternity care. With a vertical governance structure Iceland can invest in even more advanced competencies that could serve the whole country in a distributed way.

6. Drive digital health agenda

While digital health solutions have been the agenda for several years in Iceland, digital solutions are still only used to a limited extent in today's delivery of healthcare. At the same time, the country has a very high digital literacy and infrastructure. There are several needs that strongly support the case for digital health in Iceland; the need to invest in healthcare settings outside of Landspítali that still can access hospital competencies, the need for low acuity settings outside of hospitals (allowing earlier discharge) and the overall shift towards a large share of elderly and a larger chronically ill population. Digital health solutions can enable this development to function in integration with the university hospital. In addition, transparency of data and outcomes is a value in itself: making data openly available to drive equality, "population pressure" and general performance, but also allowing innovation to create patient service development.

The vertical governance structure described above will enable and support this action; the small population of Iceland combined with the geographic breadth, good population knowledge and need to reform vertical structures together make a strong case for successful implementation of digital solutions. Over time, Iceland could become leading in this field.

7. Use new investments to drive change in action-areas

As discussed, Iceland spends relatively little on healthcare, and while output from the system is debated, it is still on a high level internationally. Over the last years, additional funds have been added to the system and to Landspítali, without associated requirements on production increase. This development has led to lower productivity but has probably been an unavoidable development to address the very low cost-base after financial crisis.

While the years following the financial crisis should not be seen as a standard to live up to, Iceland should value and preserve the strong "value position" this process placed you in. Though the financial crisis had very negative consequences few systems ever have an opportunity to shed excess weight and incentives to drive fundamental changes the way you experienced. At this point, it is

important not to just continue to invest following the current trajectory without parallel reforms that guarantee substantial return on investment. The system is back in a reasonably stable position in terms of financing, and susceptible to strategic changes.

Given the clear development areas of the system and the small number of decision makers, continued funding should be linked to a clear reform agenda along the lines outlined in previous action points. In practice this means that the majority of funds added to the system cannot be set as 'blanket budgets', but must be linked to clear milestones and outcomes. Overall these reforms are self-funding over time, meaning a contained cost-development versus GDP is possible, but with significantly higher patient/tax-payer value. Should the government choose to invest above the current level of GDP, this agenda will help get the best value out of that investment.

□ □ □

These reforms can be fully implemented within 4 years. A clear mandate from the government and a thought through governance structure to drive these reforms over time is critical for success. Furthermore, the reform plan would need protection from e.g., frequent political interference which can be best ensured by making sure all key stakeholders have a say in the process.

FINAL CONCLUSIONS

Icelandic healthcare is at an exciting time. The healthcare system faced tough challenges following the Icelandic financial crisis, as funding for the system was cut markedly, but managed to withstand them and continue to deliver good quality care overall. The development at Landspítali was in many ways emblematic of this period, the hospital managed to reduce costs significantly without sacrificing quality of care, under steady demand growth. However, despite admirable performance in the last few years, all is not well in the Icelandic healthcare system. There is a lack of clarity about the roles of different providers and mechanisms to steer the development of services are missing. Moreover, several structural challenges have been identified in this report that limit cost efficiency and others raise concerns about quality of care in pockets of the system.

As funding for healthcare in Iceland is again on the rise, there is a unique opportunity to deal with these challenges and ensure that the Icelandic healthcare system provides excellent care across the board in a cost efficient manner. Clarifying the strategic direction of the healthcare system and making sure new funds flow to where they are needed will ensure a good return on investment and result in a stronger and more cost efficient system.

APPENDIX.

HEALTHCARE SPENDING IN ICELAND

Iceland´s total healthcare expenditures accounted for 8.8% of GDP in 2014, which is close to the OECD average but below the Nordic countries other than Finland. An evaluation of the level of healthcare spending in Iceland needs to consider the efficiency of each healthcare system as well as underlying characteristics that affect a population´s healthcare needs. In Iceland, several underlying characteristics that affect healthcare efficiency as well as overall system quality drive down the need for high spending on healthcare. At the same time, the Icelandic healthcare system has inefficiencies that likely contribute to a higher need for spend.

SUMMARY OF OBSERVATIONS

Iceland´s total healthcare expenditures accounted for 8.8% of GDP in 2014 which is close to the OECD average but below the Nordic countries other than Finland. *To evaluate the level of healthcare spending in Iceland a comparison with other countries is needed. However, for that comparison to be meaningful it is necessary to assess not only the level of healthcare spending but also the efficiency of different healthcare systems as well as underlying characteristics that affect a population´s healthcare needs.*

Several underlying characteristics that affect healthcare efficiency as well as overall system quality drive down the need for high spending on healthcare. *Iceland has a relatively young population with healthy lifestyle habits in terms of e.g., smoking and alcohol consumption. Cost levels are comparable to the Nordics. Health perception and life expectancy are high, and infant mortality is the lowest in OECD. All of these factors would, other things equal, lower the need for Iceland to spend a high share of GDP on healthcare.*

At the same time, the Icelandic healthcare system has inefficiencies that likely contribute to a higher need for spend*. Healthcare consumption patterns, which may be driven both by the population's proneness to consume healthcare and by the level and volume of care provided by healthcare professionals, contribute to higher spend as compared to other Nordic countries. Moreover, while several individual providers seem to operate in an efficient way, operational effectiveness metrics at a system level show significant inefficiencies related to the division of tasks, lowering overall system effectiveness.*

Iceland ranks high on population health metrics, but Icelanders have lower access to care and medical outcomes are mixed

Evaluation of what Iceland gets out of its healthcare spend requires an assessment of a combination of the system´s operational efficiency, and underlying characteristics that affect a population's healthcare needs, i.e. factors that have a strong influence on healthcare outcomes without being a direct result of the healthcare provided to that population. If one were to only take these factors into account, one could argue that Iceland's healthcare expenses as share of GDP should be even lower than they are today.

- ***Demographics***: Iceland has a relatively young population (10.4% of the population are above 65 years old as compared to an average of 14.6% in the other Nordic countries)
- ***Lifestyle factors***: Iceland's population has relatively healthy lifestyle habits when looking at smoking and alcohol consumption, though they tend to exercise slightly less and have higher obesity levels than the other Nordic countries
- ***Population's proneness to healthcare consumption***: Icelanders consume more healthcare than other Nordic people, which may be driven both by the people being and by the incentives of the system.
- ***System cost levels***: cost levels, e.g., healthcare professionals wage levels, are at comparable levels with the other Nordic countries
- ***Geographical distribution of population***: while the majority of Iceland's population is concentrated in the Capital area, the remaining population is spread over a large area. This

creates an expensive need to provide urgent care services at a small scale across a large number of remote locations. Iceland has a very low number of inhabitants per square meter, and a long distance to neighboring countries.

On the other hand, there are the system operational efficiency factors that are directly related to the performance of the system's providers. These include quality outcomes and the level or volume of care that is provided by healthcare professionals, as well as the direct operational efficiency of providers in the system. Although Iceland performs well on population health metrics, the country is behind on some of the quality metrics that can be directly connected to healthcare provider performance. In addition, incentive structures in the system drive high consumption in the system as the utilization of e.g., imaging equipment pharmaceuticals is high. In combination with an average length of stay that exceeds Nordic peers´, Iceland has room to improve operational efficiency.

- ***Quality:*** There is a lack of a comprehensive set of quality parameters that can be directly compared with international benchmarks, but given the available metrics, Iceland ranks high compared to Nordic neighbors and OECD overall – health perception as well as life expectancy is high and infant mortality is the lowest in OECD. However, quality that can be directly connected to individual healthcare providers is lower – Iceland is still behind Nordic neighbors on medical outcomes (Asthma COPD hospital admission, Case-fatality for AMI, Case-fatality for ischemic stroke, Breast cancer survival)
- ***Level/volume of care provided by healthcare professionals:*** Access to healthcare personnel (physicians and nurses) is on an overall level at comparable or slightly higher levels to other Nordic countries. Iceland also has high access to imaging equipment. Healthcare personnel has a tendency of referring patients to diagnostic examinations and surgical procedures more frequently than Nordic peers (MRI and CT exams/ capita, pharma cost/ capita, surgeries/ capita), and pharmaceutical use is at high levels. This is, at least in part, driven by reimbursement structures rewarding volume of work. On the other hand, the number of hospitals admissions is lower in Iceland than comparable countries.
- ***Operational effectiveness***: Staff efficiency and resource utilization is in line with other Nordic countries (visits/MD, exams/camera). Looking at effectiveness of specific providers, there are forces acting in both directions. In the case of Landspítali, healthcare staff produce a lot of inpatient episodes and outpatients visits per FTE, but at the same time, average length of stay is high suggesting that the efficiency of inpatient care could be improved. On a system level, several individual performers seem to be operating effectively within the boundaries of their allocated tasks, but a redistribution of tasks and resources could make the system more operationally efficient, and most importantly lead to better quality of care. Overall, provider performance is likely driving up the need for spend in the system.