Chapter 3

Hospital specialisation in Denmark

This chapter examines recent reforms to drive further specialisation in the Danish hospital sector. It begins by providing an overview of the hospital sector and broader reforms to the structure of government responsibilities in health in Denmark. The key elements of the hospital specialisation reforms are argued to be: greater involvement of central government by setting guidelines for where certain specialist services should be located; a major capital investment programme; and regional governments driving the redesign of hospital services on the ground. The hospital specialisation plan is argued to have an impact on the structure of the hospital sector that is well beyond simply high-specialised services. Though the specialisation plan is still in the process of implementation and thus difficult to evaluate, the decisions of policy makers were driven by the clinical judgements of experts as the scientific literature on quality and volume offers limited insights to guide decision making in practice. Looking ahead, the challenge for the government shall be how to best use the new structure of hospital services to drive improvements in the quality of care in Denmark.

3.1. Introduction

Denmark's pursuit of further specialisation and rationalisation of its hospital sector is an interesting example of a country seeking to improve the quality of care while balancing economic priorities. Beginning in 2007, Denmark has sought to systematically plan the location of specialised hospital services across the country, through a process led by the central government working alongside regional governments. While focused on specialisation, the implications of these reforms have extended beyond, prompting Denmark's regions to re-assess their hospital service planning at large. This has been aided by a commitment to major capital improvements, with a large injection of funding provided to redesign and develop new health and hospital infrastructure.

Denmark's reforms to hospital specialisation are remarkable not only for their scope and size, but for the relatively high levels of co-operation between levels of government, hospital administrators and health professionals. Operating in an environment in which there is a paucity of conclusive international or national evidence to inform decision making – as is often the case in health care policy and planning – Danish health authorities have nonetheless undertaken reforms by drawing extensively on professional input. This chapter shall provide an overview to Denmark's hospital sector, characterise hospital sector reforms and how they were achieved, and finally provide some recommendations on how quality of care in Danish hospitals may be improved as part of this process.

3.2. Overview to the hospitals sector in Denmark

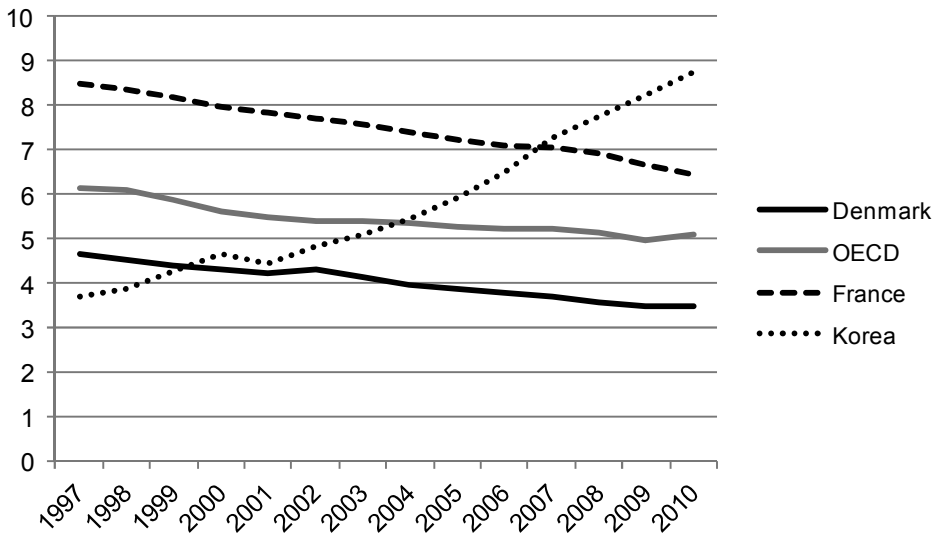
Denmark's hospital sector is dominated by public hospitals and has seen gradual reductions in the number of beds and facilities over time

Denmark's hospital sector primarily consists of publicly owned and operated hospitals that are staffed by salaried doctors, nurses and other health workers. Denmark's five regional governments are the owners and operators of public hospitals, which tend to provide the bulk of secondary and tertiary care for the country, with a significant presence of outpatient services delivered from hospitals. Denmark's hospitals are funded through a mix of global budgets and case-based payments, with the share between these two forms of financing varying across regions.

As in most OECD countries, Denmark has seen a progressive reduction in the number of hospitals over a long period of time, in line with advances in medical technology and the shift to more ambulatory treatments. While

Denmark does not currently submit data on the number of hospitals to the OECD, other sources suggest that over the past 20 years, the number of general acute care hospitals has fallen from 82 hospitals in 1997 to 52 hospitals by 2004 (Bech, 2009). Since 2004, there has been a further reduction to 40 hospitals in 2010. Reforms currently in train are anticipated to result in 21 acute care hospitals in Denmark by 2020. This reduction is mirrored in the number of hospital beds, which has fallen from around 25 000 in 1996 to 18 000 beds by 2009 (Ministry of Health). Denmark has both maintained a lower level of hospital beds relative to its population than most OECD countries and has continued to make reductions in hospital beds in line with reductions seen across all OECD countries. The number of hospital beds in Denmark has fallen to 3.5 per 1 000 population in 2010 from 4.5 hospital beds per 1 000 population in 1997, compared to a fall from 6.1 per 1 000 people to 5.45 per 1 000 people among all OECD countries (excluding Chile, Estonia, Mexico and Turkey) over the same period (Figure 3.1).

Figure 3.1. Number of hospital beds per 1 000 population, 1997-2010



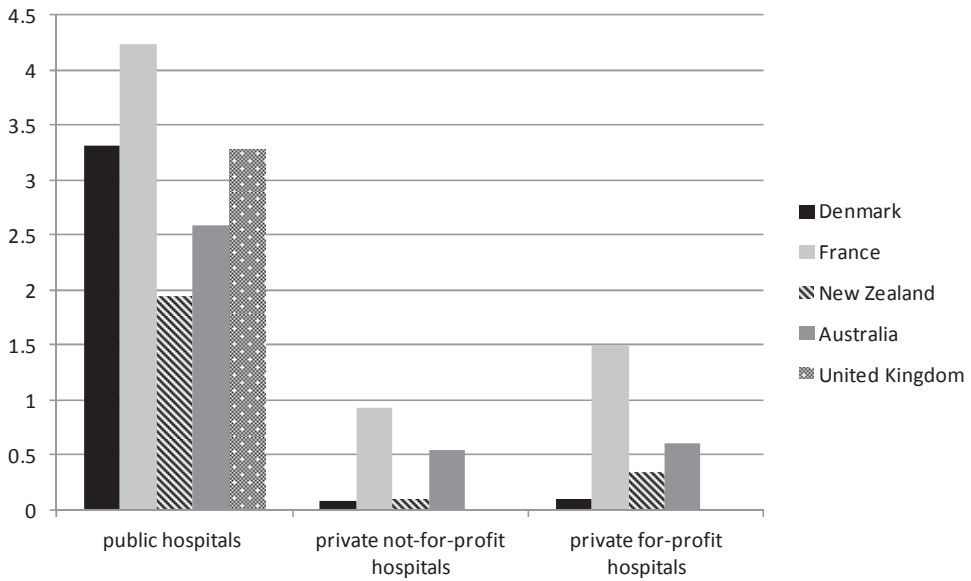
Source: *OECD Health Data 2012.*

While the overall trend across OECD countries has been to reduce the number of beds, many countries have seen reductions in acute care beds accompanied by increases in nursing home (or rehabilitation) beds. More than in many other OECD countries, Denmark has experienced a similar

situation but has emphasised expansions in sheltered housing and social and nursing support to individuals living in their own homes, which could help account for its lower numbers of beds than in several OECD countries (HEN, 2003).

Relative to other OECD countries, Denmark has a smaller private hospital sector. As demonstrated in Figure 3.2 below, there were some 3.4 hospital beds per 1000 population in the public sector in Denmark in 2009. In the same year, there were only 0.1 hospital beds in each of the not-for-profit private and for-profit private sectors respectively, considerably lower than France, New Zealand, Australia and the United Kingdom. The private sector accounted for about 2% of total hospital production across all surgical categories in 2010 and up to 10% of service volumes in some categories (Sundhedsstyrelsen, 2011).

Figure 3.2. Allocation of hospital beds in 2009, numbers of beds per 1 000 population



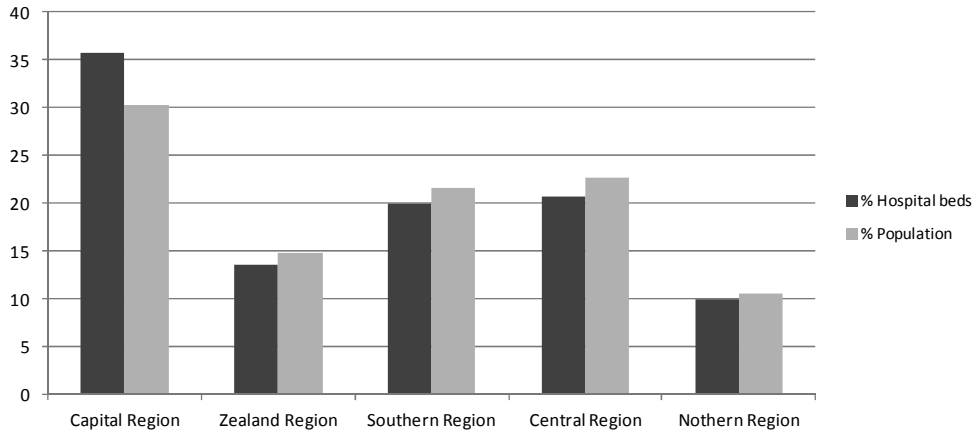
Source: *OECD Health Data 2012.*

The location of hospital beds broadly reflects the location of Denmark's population

Despite being a relatively small country without the large travel times that characterise many other OECD countries, Denmark has maintained hospital bed capacity broadly in line with the location of the country's

population. As demonstrated in Figure 3.3 below, the proportion of hospital beds in each of the five regions created after administrative reforms in 2007 is broadly in line with the populations across Denmark's five regions. While the capital region of Copenhagen contains slightly greater numbers of beds, this is likely to reflect the concentration of major hospitals, private hospitals, and highly specialised functions in the country's most populous city.

Figure 3.3. Allocation of hospital beds across the Danish regions

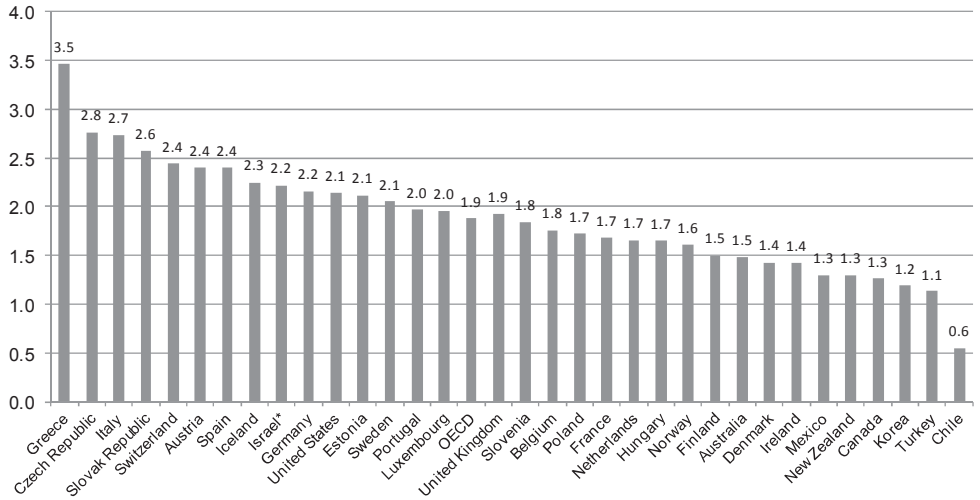


Source: Based on data from SSI and Statistics Denmark.

Denmark has fewer medical specialists relative to its population than other OECD countries

A peculiarity of Denmark is its relatively fewer medical specialists compared to its population than most OECD countries. In 2010, there were 1.4 specialists per 1 000 people compared to an average of 1.9 specialists per 1 000 people across the OECD (Figure 3.4). In addition to excluding GPs (which are counted amongst specialists in Denmark, though separately in OECD data), it is likely that this data reflects international differences in classification and whether certain domains are recognised as specialisations (e.g., emergency medicine is not a speciality in Denmark). These differences are even starker when measured on proportional terms – with medical specialists (not including GPs) accounting for 41% of physicians in Denmark, considerably lower than an average of 60% of physicians across OECD countries – suggesting that Denmark has fewer medical specialists amongst its health workforce.

Figure 3.4. Specialists per 1 000 population across OECD countries, 2010 or earliest year available



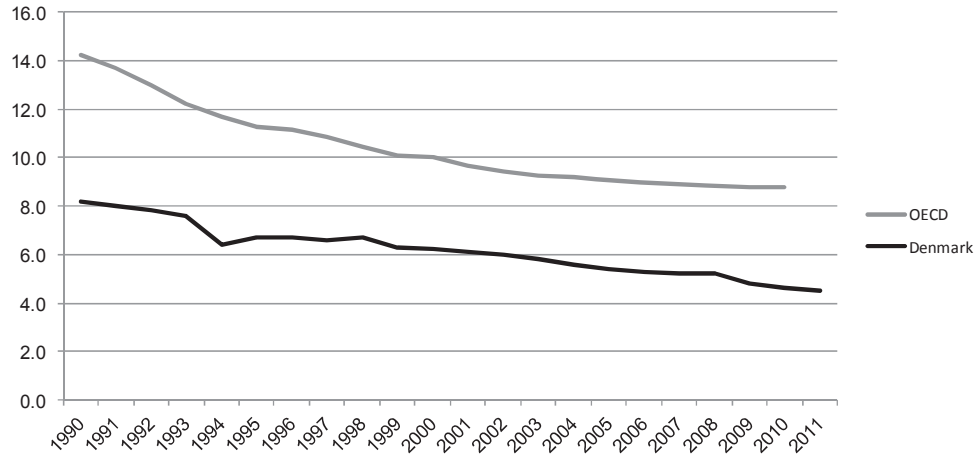
* Information on data for Israel: *http://dx.doi.org/10.1787/888932315602.*

Source: *OECD Health Data 2012.*

The average length of stay in Denmark is considerably lower than other OECD countries, and has continued to decline steeply in recent years

Denmark has one of the lowest average lengths of stay across OECD countries. In 2011, average length of stay in hospital fell to a low of 4.5 days, compared to an average among OECD countries of almost double this amount, at 8.8 days. As well as being at significantly lower levels than most OECD countries, there was a 38% reduction in average lengths of stay in Denmark between 2000 and 2009, compared to a 14% reduction across OECD countries. Denmark's average length of stay has fallen in recent years in particular, to 4.5 days in 2011 from 5.2 days in 2008 (Figure 3.5). Denmark's consistently lower levels of average length of stay may also reflect that more outpatient services (of a shorter duration) are being undertaken in Danish hospitals when compared to most OECD countries.

Figure 3.5. Average length of stay for acute care across OECD countries, 1990-2011 or earliest years available



Source: *OECD Health Data 2012.*

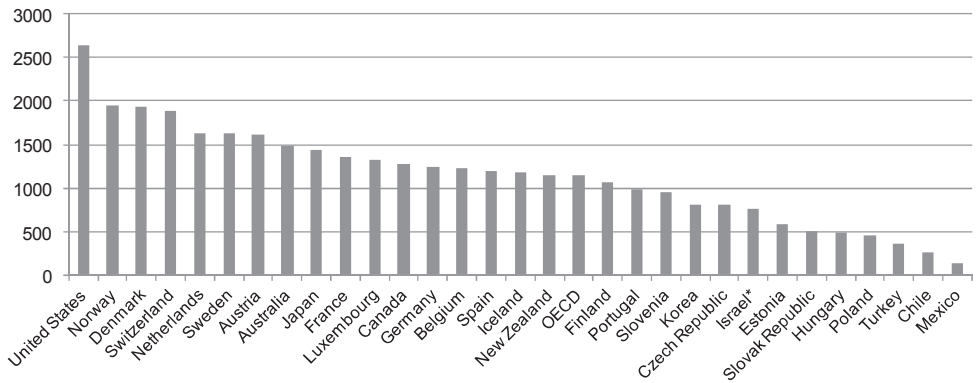
Denmark spends more on hospitals than most other OECD countries

Denmark has the third highest level of spending on hospitals on a per capita basis among OECD countries, after adjusting for differences in price levels between countries. As shown in Figure 3.6, an average of USD PPP 1 937 was spent on hospitals per person in Denmark in 2010, behind only the United States at USD PPP 2 634 and Norway at USD PPP 1 951. This is significantly above the OECD average of USD PPP 1 145 in 2010 though it is on par with Denmark's Scandinavian neighbours, which all count amongst the highest spenders on hospitals among the OECD when measured in per person absolute terms (OECD, 2012a).

Denmark's level of hospital spending remains high as a proportion of the health budget, accounting for 43% of total current expenditure on health in 2010, higher than an average of 35% among OECD countries in the same year. Preliminary results from the OECD's hospital pricing project suggest that after adjusting for hospital specific prices, Denmark maintains the second highest level of expenditure per capita on hospitals, suggesting that high overall levels of spending may have more to do with the volume of activity Denmark's hospitals are undertaking than the prices paid for hospital services. However, this is likely to reflect that hospitals in Denmark

have both inpatient and outpatient clinics (Olejaz et al., 2012), and as a result, a much higher share of overall outpatient spending is in a hospital setting rather than in independent ambulatory settings. The consequence of this is also that outpatient spending in hospitals is much higher as a share of total hospital spending than in other countries.

Figure 3.6. Hospital spending per person (USD PPP), 2010 or earliest year available



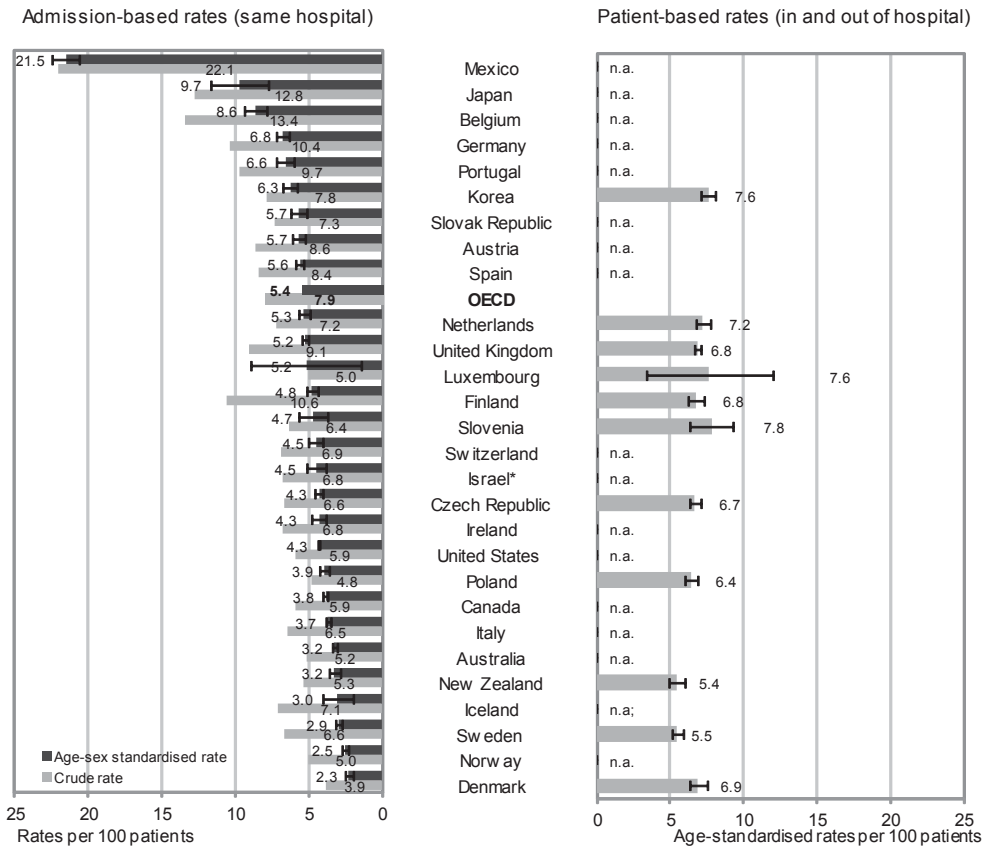
* Information on data for Israel: *http://dx.doi.org/10.1787/888932315602.*

Source: *OECD Health Data 2012.*

Denmark performs well on indicators of quality of acute care but less well on quality of care across the health care system

Denmark performs well on indicators of quality of care in hospitals when compared with other OECD countries. Denmark's in-hospital case-fatality rates within 30 days after admission for acute myocardial infarction was, in 2009, the lowest among all OECD countries with an age-sex standardised rate of 2.3 per 100 patients compared to 5.4 per 100 patients across OECD countries. As in other OECD countries, improvements in quality of care have seen fatality rates reduce from 6.3 per 100 patients in 2000 to 2.3 per 100 patients in 2009 (Figure 3.7).

Figure 3.7. Admission-based and patient-based in-hospital case fatality rates within 30 days after admission for AMI, 2009 or nearest year



Note: Rates age-sex standardised to 2005 OECD population (45+). 96% confidence intervals represented by H.

* Information on data for Israel: *http://dx.doi/org/10.1787.888932315602.*

Source: OECD Health Data 2011.

Similarly, Denmark performs relatively well in regards to in-hospital case-fatality rates within 30 days after admission for both ischemic and hemorrhagic strokes with rates per 100 patients of 2.6 per 100 people and 16.4 per 100 people in 2009. This is significantly lower than OECD averages of 5.6 per 100 people and 19 per 100 people. Along with other OECD countries, process and technological improvements such as in the introduction of dedicated stroke units have seen reductions in in-hospital case fatality rates over the last decade, however with already low levels. Denmark's scope for further reductions has been more limited than that in

other OECD countries. Though subject to significant variations in coding practices across the OECD, Denmark reports low rates of procedural and post-operative complications. In 2009, Denmark ranked among the best OECD countries for all procedural or post-operative patient safety indicators (foreign body left in during procedures, accidental puncture or laceration, post-operative sepsis and post-operative pulmonary embolism or deep vein thrombosis) (OECD, 2012a).

While the indicators may suggest that Denmark provides high quality of care for specific hospital-based interventions, its relatively weaker performance on cancer survival suggests that there may exist room to improve the co-ordination of services across the health system. Denmark's female breast cancer mortality was in 2009 the highest among the OECD with an age-standardised rate per 100 000 females of 28.6, far above the OECD average of 19.8 per 100 000, suggesting that improvements in early detection and treatment of breast cancer ought to be a focus. Denmark is also slightly below OECD averages for survival and mortality rates for colorectal cancer, the third most commonly diagnosed form of cancer worldwide. Over the 2004-09 period, Denmark performed below the OECD average of 59.9 colorectal cancer five-year survival rate with a rate of 55.5. In terms of mortality, Denmark displayed age-standardised rates per 100 000 population of 27 and 25.3 in 2000 and 2009, significantly above the OECD average of 20.4 and 18.5 (OECD, 2012a).

3.3. Recent reforms to drive specialisation and rationalisation in the hospitals sector

The character of the hospital sector described in the previous section reflects years of policy changes, as Denmark has undertaken a number of reforms. In particular, the 1990s saw a number of reforms oriented towards questions of efficiency and targeted at reducing waiting times. Some of these major reforms have been:

- The introduction of patient choice of hospital beyond those in one's county in 1993;
- Linking hospital reimbursement to activity through DRGs from 2000 onwards;
- The introduction of explicit waiting time guarantees which provided the right to publicly funded services in private hospitals if public hospital waiting times exceed pre-defined limits.

In contrast to these reforms, the hospital specialisation reforms that are the subject of this chapter have directly focused on influencing the structure

of supply of hospital services across the country. Indeed, while many OECD countries have undertaken reforms to their hospitals sector that have sought to enhance patient choice, link financing to activity and tackle waiting times, Denmark is one of the few OECD countries that has sought to tackle how their hospitals are arranged and what they do.

Denmark's programme of restructuring its hospital sector began in 2007 and sought to encourage the specialisation of the most complex hospital services across the country into fewer hospitals. By influencing where specialist services were located, this reform also provided an opportunity for the government to drive further rationalisation in the size and location of hospitals across the country. Denmark's hospital specialisation reforms were undertaken through the joint efforts of national government and regional governments. National government took on a more proactive role in regulating the location of certain specialist services as well as allocating capital funds to hospitals. The regions – as the owners of public hospitals – were responsible for developing hospital service plans for their population which were consistent with national regulation, and had the opportunity to compete for capital funding in order to modernise their hospitals.

Broader reforms set the stage for the hospital reform

Prior to considering the details of the hospital specialisation reforms, it is important to locate them within the context of broader structural reforms to Danish governments. In the mid-2000s, the national government sought to drastically rationalise the number and functions of lower levels of government, in what has been described as the largest reform of the public sector since the 1970s.

Denmark's 13 counties and three municipalities with county functions were rationalised to five regions in 2007. The former counties' responsibilities in social and environmental policy were shifted to municipalities and responsibility for high schools to central government. The combination of these changes saw a narrowing of the breadth of the responsibilities of regions, such that they are now principally responsible for running hospitals and contracting with GPs. It was argued that due to their larger size and capacities, regional governments would be able to perform better than smaller government units in the complex task of managing hospitals and driving further quality and efficiency (Andersen and Jensen, 2009).

At the same time, the 271 municipalities were merged into 98 municipalities, who gained responsibilities in health in relation to health promotion, primary prevention, rehabilitation and long-term care. To drive co-ordination between regional and municipal governments it was legislated that municipalities and regions are obliged to agree on health agreements on

how they share and co-operate, particularly on "boundary" issues such as health care for the elderly.

Behind these changes in policy responsibilities were changes in financial relationships between levels of government. Unlike the former counties, the new regions are not allowed to levy taxes themselves and are financially dependent on central government, and to a lesser extent, municipalities. The state levies a "health contribution" (8% of the tax base) from its citizens. Around 79% a region's health spending is provided to them in the form of block grants from central government, with a further 3% based on activity. The remainder of regions' budgets for health come from municipal governments which provide 7% in block grants and a further 11% in activity-based funding. The higher share of activity-based funding provided by municipalities reflects that they are obliged to provide a 34% share of each hospital service delivered by regions. There also exists a ceiling for regions to raise their own funds of DKK 19.3 billion (in 2013) and a ceiling on the municipal co-financing per treatment of DKK 13 750.

The intention behind these financial arrangements is to provide municipalities with an incentive to make efforts to reduce hospitalisations where avoidable through better prevention, rehabilitation and long-term care. However, when the split of responsibilities was negotiated in 2007, municipalities were provided with funding that they would then direct to regions in the form of their share of hospital funding, as municipalities on their own do not have the fiscal resources to underwrite this expenditure. In effect, the central government remains the source of payments for most hospital services, even though part of this is channelled through municipalities.

The 2007 local government reforms also saw a change in the type of payments to lower levels of government. Having reduced the number of conditionalities associated with specific sources of funding and increased the autonomy of regional and municipal governments, the central government became more actively involved in monitoring activities and setting centrally defined standards. This has been most pronounced in the expansion of the role of the Danish Health and Medicines Authority from a body that was traditionally a regulator of health services to one that has now taken on a more proactive role where it seeks to shape the planning of specialist functions across the country's hospitals.

Reforms to drive further specialisation of the hospital sector in Denmark were the first key task presented to the five newly constituted regional governments. While reducing hospital infrastructure in any form has been difficult to deliver across OECD countries in recent years, there was a remarkable level of consensus and goodwill surrounding these efforts in

Denmark. To some extent, this may reflect that these reforms occurred at time when regions found themselves uniquely responsible for health and more financially dependent on the centre, giving them every reason to be highly responsive to the policy ambitions of the centre – even if this meant undertaking difficult reforms.

Key elements of hospital specialisation reforms

Denmark's hospital reforms have been a joint effort of the central government and regional governments. In broad terms, central government provided guidance for where certain specialised services ought to be located and regions undertook the bulk of re-structuring to ensure these national level guidelines could be realised in their respective communities. When initially presented, it was argued that larger and more specialised hospitals would be able to drive quality improvements through the benefits that accrue from more "practice by doing". The key elements of reforms proposed by the Danish government from 2007 were:

1. A focus on *driving further specialisation* in the Danish hospital sector, by classifying some 1 100 specific hospital services as being appropriate only for delivery at a restricted and defined number of hospitals.
2. The *greater involvement of the central government in hospital planning*, with the Danish Health and Medicines Authority (a national statutory body formerly known as the National Board of Health) made responsible for determining which hospitals can deliver certain functions for a "region" and where certain highly specialised services ought to be located across the country.
3. A *major capital investment programme* of more than DKK 40 billion over ten years, which was made available by the central government to flexibly finance upgrades in technology and capital, expanding or refurbishing existing hospitals, the building of new hospitals and locating primary health care clinics.
4. *Regional governments asked to submit hospital service plans* that accord with national guidance on where services ought to be delivered and provide bids for capital funding to help drive the re-design of their hospital services.

To steer these reforms, the Danish Health and Medicines Authority (DHMA) – the central government's medical advisory agency – worked with each medical speciality group to divide different services into one of three groups: "basic", "regional" or "highly specialised". Basic interventions accounted for around 90% of the services within each speciality, though this

varies greatly from one speciality to the next. Services classified as regional often involved diagnostics, treatment, rehabilitation of rarer diseases and health care services of a certain complexity that they demand a pooling of other resources (some examples include. vascular surgery, clinical microbiology, oral and maxofacial surgery, specialised gynaecology and obstetrics and breast cancer surgery). It was planned that regional functions would only be handled by 1-3 hospitals per region. Procedures classified as highly specialised would be those of very high complexity, occur rarely and require lots of co-operation with other specialities (e.g., neurosurgery). It was planned that highly specialised functions would be handled by one to three hospitals across the country.

Regional governments bore the bulk of the responsibility for translating this guidance into changes in hospitals across the country. Following the release of guidance from the DHMA (and in some cases, before this), regional councils took the leadership for evaluating their hospital services and developing new service plans that accorded to national guidance. The regions have then been the principal actors in the management of major changes to multiple hospital facilities as the plan has been implemented.

The DHMA was asked to develop as best a process as possible given the shortage of information on optimal volumes of hospital procedures

The DHMA played a significant role in this hospital reform plan. The DHMA was tasked with assessing regional hospital plans with proposals for locating specialised functions and to approve the number and location of specialised services. In order to undertake this, the DHMA formed expert committees of relevant specialist groups to aid them in the classification of activities into basic, regional or highly specialised categories. Expert groups based their suggestions to the DHMA on the development of appropriate volume thresholds which took into account the rarity of a disease, the complexity of diagnosis and treatment and the technology and people required alongside, such as support from intensive care, specialised nursing staff and other factors. The outcome of these expert groups formed the DHMA's guidance to regional governments, who were asked to submit a hospital plan for their region that was consistent with the DHMA's classification of services into the three categories. In addition to this, the DHMA specified a number of criteria which they indicated they would use to assess regions hospital plans, detailed in Box 3.1 below.

Box 3.1. Key criteria used by the DHMA

Once hospital plans are submitted to the DHMA, the specialised care components are then assessed according to a number of criteria. The criteria currently used in assessing applications in this framework include, but are not limited to:

- Capacity and stability of a centre's clinical services;
- Patient volume, clinical experience and professional expertise;
- Competency in all relevant professional and supportive fields;
- Access to all required technical facilities;
- Documented clinical quality and prospective reporting of results to relevant national databases;
- A multi-disciplinary approach;
- Safeguards to ensure continuity of patient care;
- Active and documented research, development and education;
- Procedures for assessing new technologies and treatments;
- Collaboration with other hospitals and relevant specialised departments.

Source: Prepared by OECD based on information from DHMA.

A hallmark of the Danish approach is that it turned to its clinical community to guide judgements about what is practicable and sensible for a country of their size. Reflecting on both the role of the DHMA and the regional governments who executed the hospital specialisation reform, hospital executives were able to influence decisions relating to these reforms. As indicated in Table 3.1, a survey undertaken prior to the hospital reform found that most hospital executives felt as if they had influence on decisions relating to the up or down grading of certain clinical specialities, professional choices relating to treatment and the introduction of local quality systems.

In addition to being a good way to build engagement with the clinical community, it was also difficult for the Danish government to make decisions based on the large and contested literature on the relationship between volumes and quality of care. It is broadly acknowledged that quality gains from increases in service volume tend to concentrate at low numbers of services (Box 3.2), though thresholds of the number of services before which improved quality outcomes are observed vary substantially

from one study to the next, making their practical utility in informing health policy decisions limited for OECD countries. Furthermore, the cost and time associated with undertaking such research specifically for the Danish context could have been prohibitive and incompatible with the window of opportunity presented to pursue hospital reform due to broader changes the structure of local government.

Table 3.1. Hospital executives perceived influence on decisions prior to reform

Category (%)	To a great extent or to some	To a lesser extent or not at	Missing (%)
Up / downgrading of treatment areas	86.1	8.1	5.9
Academic selection of general treatment regimens	91.2	3.7	5.1
Introduction of new medical technology	86	8.9	5.1
Introduction of local quality systems	81.6	13.3	5.1
Standardisation of staff	55.2	40.5	4.4
Staff policy	77.3	18.4	4.4
IT systems	26.4	69.1	4.4
Major financial investments (e.g. in the form of new equipment)	57.4	36.8	5.9
Management structure of the department (e.g. responsibilities)	80.9	14.7	4.4

Source: Nielsen, M.B. and K. Vrangbaek (2006), "Sygehus- og afdelingslederes opfattelse af aktuelle udfordringer på tærskelen til strukturreformen", article presented at the 12th Annual Meeting of the Danish Forum of Public Health, Aarhus 24 November 2006, Faculty of Health Sciences at the University of Denmark, translated to English and available at: *http://sundhedsreform.ku.dk/publikationer/artikler/udfordringer.doc/*.

Box 3.2. The mixed evidence on the relationship between volume and quality in hospital services

There is an extensive academic literature on the relationship between volume and quality in hospital services. Under pressure to drive improvements in quality and reduce costs, OECD countries have often encouraged the concentration of hospital services among fewer and larger hospitals. This has provided scope for studies in this area to explore whether higher hospital volumes truly deliver improvements in quality and patients' outcomes.

Systematic reviews confirm that volumes do make a difference

Studies have shown that patients who receive care from physicians who undertake a type of surgery frequently are less likely to die or have complications. A study of some 135 studies undertaken since 1985 by Halm, Lee and Chassin (2002) found that 70% of studies demonstrated in broad terms that patients have lower mortality rates if a hospital or physician does large

numbers of procedures. This finding was strongest in AIDS treatment, surgery on pancreatic cancer, esophagal cancer, abdominal aortic aneurysms and paediatric heart problems. Weaker relationships were indentified for heart surgery, surgery for other cancers and orthopaedic procedures. Most of the studies examined in this review took into account patient characteristics, but only 28% of studies used statistical techniques to correct for this.

Consistent with these conclusions, a major study that drew on US Medicare data found that admission to hospitals with high volumes was associated with a reduction in AMI, heart failure and pneumonia (Ross et al., 2010). As is often common in such studies "volume thresholds" were identified beyond which the marginal benefit from increasing volumes became small, at 610 procedures for patients with AMI, 500 for heart failure and 210 for pneumonia. This study also found that teaching hospitals demonstrated higher volume thresholds. Other studies looking into a range of procedures in the United States have also demonstrated better results on cardiovascular surgery, major cancer resections and other high risk procedures (Birkmeyer and Phibbs, 2012).

A surgeon's volumes is often more important than the hospital's

Results from the systematic review suggest that surgeon volume was a more important determinant than hospital volume in the case of CABG, carotid endarterectomy, surgery for ruptured abdominal aneurysm and surgery for colorectal cancer. Another study found considerably lower mortality rates for selected cardiovascular operations and cancer resections amongst high volume surgeons than those with less experience (Birkmeyer and Nallamothu, 2007). While limited to a small number of clinical domains, this finding has important policy implications, as it suggests that a low volume surgeon at a high volume hospital could have poorer results than a moderate volume surgeon in a moderate volume hospital (Halm et al., 2002). Untangling the effects of hospitals and physicians is very hard to do as few studies examine results at both of these units simultaneously.

The positive relationship between quality and volume observed in many studies also raises a question about the direction of the causality. Most studies do not monitor changes in volumes over time. The few studies which were able to draw on longitudinal data found that changes in volumes at a hospital over time had little effect on outcomes. This has important policy implications, as it suggests that there is likely to be a complex interaction between the volumes a particular surgeon does and the hospitals where high volume surgeons work in (Halm et al., 2002). Good outcomes may be associated with certain processes of care, such as routine treatment algorithms, reminders for staff and established systems of clinical flows within hospitals. To the extent that there is an observed association of lower surgical mortality at high volume hospitals, this may not necessarily reflect more skilled surgeons and fewer technical errors, but a range of other aspects of care such as patient selection of anesthesia and post-operative care.

Source: Ross, J.S., S.T. Normand, Y. Wang, D.T. Ko, J. Chem, E.E. Dtrye, P.S. Keenan, J.H. Lichtman, H. Bueno, G.C. Scvheiner and H.M. Krumholz (2010), "Hospital Volume and 30-Day Mortality for Three Common Medical Conditions", *New England Journal of Medicine*, Vol. 362, pp. 1110-1118; Birkmeyer, J.D. and B. Nallamothu (2007), "Surgeon Volume", The Leapfrog Group, Factsheet; Birkmeyer, J.D. and C. Phibbs (2012), "Evidence-based Hospital Referral", *The Leapfrog Group*, Factsheet; Halm, E.A., C. Lee and M. Chassin (2002), "Is Volume Related to Outcome in Health Care? A Systematic Review and Methodoligic Critique of the Literature", *American College of Physicians-American Society of Internal Medicine*, Vol. 137, No. 6; Ferguson, B., T. Sheldon and J. Posnett (1997), *Concentration and Choice in Health Care*, Royal Society of Medicine Press; London.

While the DHMA looked to international literature on this topic, it was primarily the clinical judgements of experts in the system working alongside policy makers that drove the decisions behind these reforms. To some extent, Denmark's strong tradition of quality monitoring of hospitals, through information collection on outcomes, volumes and costs, facilitated decision making. Similarly, the Danish medical profession had sufficient professional interest in quality of care to engage in difficult resource allocation decisions rather than resisting reforms that would threaten or dislocate employment in the sector.

Regions undertook an extensive process of re-designing their hospital plans to fit national guidance

The specification of volume thresholds by the DHMA began a multi-year process on the part of regions to re-design their hospital services to be consistent with national guidelines on specialisation. While the process is likely to have varied considerably from one region to another, a stylised summary of the key efforts undertaken by regions is contained in Table 3.2.

Table 3.2. The regions efforts in redesigning hospital services

Phase 1 Dec 2008-Jan 2009	Regional governments requested their medical council representatives (consisting of those from their hospital departments to produce suggestions for locations of specialities). This included facts about volume, patient basis, number of doctors with the specialties concerned and an assessment of whether or not the professional requirements from the Danish Health and Medicine authorities were met.
Phase 2 Feb 2009-May 2009	The suggestions of the region's medical council were discussed with hospital management, and then presented to the executive management of the regions to approve final decisions and resolve areas where the medical council and hospital management may have disagreed.
Phase 3 May 2009	The political council of the region approved their region's plan prior to it being sent to the Danish Health and Medicines Authority.
Phase 4 June 2009-June 2010	Meetings are held between the DHMA and the regions based on applications handed in by regions. The DHMA would provide suggestions to regions on the location of specialities. Following a period of dialogue and an opportunity for regions to formally complain about the DHMA's choice of locations, the DHMA issued the final plan for the location of specialities across Denmark.
Phase 5 June 2010-June 2011	The location advice issued by the DHMA is communicated to hospital management by regional administration.
Phase 6 June 2011 onwards	By law, the regions are obliged to produce an annual report the DHMA on fulfilling the requirements set out in specialisation reforms. The first reports produced are for the year 2011.

Source: Authors elaboration based on information communicated from Danish authorities.

While plans were about specialist services, they influenced the structure of the hospital sector

The central government was able to use the specialisation reforms to influence the structure of the hospital sector in Denmark. While it is often noted that the areas directly under review in the specialisation reforms account for only 10% of activity, changes to certain specialisations and wards are likely to have had consequences for other hospitals in a region. Most directly, the establishment of regional centres would have meant that some hospitals had to close or merge specialist departments that were previously delivered across more than one site. As part of these reforms, regional governments submitted hospital plans showing how their plan would accord with the imperative to specialise, and how regions planned to change their other hospital services in the process. While the explicit objectives of the reforms were to provide larger and more specialised hospitals, it was envisaged by the National Board of Health that the number of acute care hospitals should be reduced from around 40 in 2006 to between 20 and 25 in 2015 (Olejaz et al., 2012).

To help realise new hospital plans, a major investment in hospital capital. More than DKK 40 billion was made available for hospital use and related health infrastructure and technology investments between 2010 and 2020 – equating to about 2.5% of total health expenditure per year over a decade – with central government providing 60% and the regions the remaining 40%. In stylised terms, this represents the renewal of just under one third of hospital square meterage in Denmark. Currently, a total of 16 hospital projects are planned (Figure 3.8). Bids to access this funding were made by application to the Government's Expert Committee and with reference to the regions' hospital service plans. By making the funding conditional on hospital plans being consistent with relevant guidelines and recommendations, and through its ability to vary the amount of capital money on offer and what it was deployed towards, the central government could steer the overall capacity of hospitals in regions and influence the balance between specialisation and general services in each region.

Figure 3.8. New hospitals and modernisation projects in Denmark

Note: The circles indicate the location of new hospitals and major hospital modernisation projects in Denmark.

Source: Information provided by Danish regions.

Investments from the capital fund suggest that the national government has been willing to invest heavily in hospitals. The Minister of Health has a broad remit to provide capital funding to upgrade hospitals that supported "objectives" of the plan. In practice, this allowed for investments as wide-ranging as upgrades to facilities to help certain hospitals become major centres, general upgrades to buildings and equipment in hospitals of all sizes and helping old hospitals re-fit themselves as smaller primary health care centres. Indeed, as outlined through the case study of Zealand in Box 3.3, through dialogue and successive re-consideration of funding for new projects, the central government was able to influence the structure of hospital services in individual regions.

Box 3.3. The impact of the specialisation plan on the Region of Zealand

Zealand is a region in the east of Denmark with 820 000 residents across some 17 municipalities (14.7% of the population). The region employs 15 000 workers, most of them in health and hospitals, at an annual budget of around EUR 2.3 billion.

The structure of hospital services will change considerably as a result of the specialisation reforms. Following the issue of the DHMA's guidelines for speciality planning in December 2008, the Regional Council reached an agreement on the distribution of specialist services in the region that was formally submitted to the DHMA in June 2009, flagging that they would be looking to submit a hospital service plan for the region. The hospital service plan submitted in March 2010 sought to close three "rural" hospitals, build a new major university hospital (KØge), continue the development of three other acute care hospitals (Slagelse, Holbaek, Nykobing F.) and change the services delivered at the two major hospitals (Roskilde and Naestved). The small hospitals that were closed accounted for about 90 beds across the three facilities. As sought by the DHMA, these reforms saw cancer services centralised, invasive cardiology moved to a single hospital and maternity limited to fewer hospitals that had paediatrics. A key general principle that was followed in designing the region's new hospital plan is that smaller hospitals ought to at a minimum have everything they need to stabilise a patient before transferring them to a larger hospital if they are a complex case.

Prior to the submission of this plan in March 2010, the region undertook a process of meetings with all specialities on how to understand the guidelines, how to change patients pathways between hospitals, dealing with budgetary changes and consulting on new arrangements for where clinical services ought to be located. By 2020, the region shall have one university hospital with acute care services, three acute care hospitals and two hospitals with planned/outpatient care.

As with other regions, the Region of Zealand faced some difficult decisions at a local level after having already secured local support for the structure of hospital services prior to 2007. Clinicians were initially mixed in their support, many understood the rationale while others resisted certain services being transferred to other facilities. The region faced a situation where they were being asked to specialise some functions in order to keep them at all, and did not want to miss out on the opportunity of significant new funding being offered for hospital re-development. Planning efforts by the region involved considerable analysis on how to redeploy the workforce, including to the extent of where doctors and nurses lived, while specialists working in small hospitals were primarily re-deployed to acute hospitals.

At the same time, the sites of two smaller hospitals which were slated to close were transformed into health centres along with GPs and municipalities and ambulance support to these areas was enhanced. As with other regions in Denmark, Zealand remains in discussions with GPs about how best to adapt their services to reflect changes in the hospital sector, and the extent to which GPs ought to be remunerated for extra activities.

Box 3.3. The impact of the specialisation plan on the Region of Zealand *(cont.)*

Changes to hospitals in Zealand due to the specialisation plan, 2012 and 2020

Hospitals in Region Zealand 2012:

Hospitals in Region Zealand 2020:

Source: Supplied by Region Zealand.

Preliminary studies can only offer indicative insights into whether specialisation and rationalisation will improve the efficiency or quality of Denmark's hospitals

It is difficult to assess the impact of these reforms given their scale, complexity and the changes in behaviour they are likely to trigger amongst those working in the Danish hospital sector. There are few studies of past experiences – even at a more microlevel – of increased specialisation and concentration of hospital services in Denmark. Nonetheless, two recent papers have sought to estimate the impact of an increase in hospital size and reduction in numbers on their efficiency. A study by Kristensen et al. (2008) seeks to identify optimal hospital size and quantify benefits from economies of scale that would result in fewer but larger hospitals. The optimal size of hospitals is suggested to be 275 beds per hospital (with a 95% confidence interval between 130 to 585 beds per hospital). In general terms, the study suggests that economies of scale may be realisable in Denmark's hospital sector, though recognises that other considerations, such as the need for a

local emergency facility, transport costs and opportunity costs from travel time ought to be taken into account in informing policy.

A second and more recent study (Kristensen et al., 2010) seeks to estimate gains from mergers in Danish hospitals. These are then decomposed into efficiency gains, size (scale) effects and mix (scope effects). The results vary substantially across regions and by the specification of the model, demonstrating significant positive effects to some small negative effects. This suggests that while some mergers may lead to cost reductions, there is also scope for some hospitals to become too large and suffer from diseconomies of scale, making decisions made at a regional level about which hospitals are merged very important. This study does not account for quality differences across hospitals, making it difficult to use these results to inform policy.

Closing down highly specialised services in low volume hospitals ought to deliver improvements in quality

At the simplest level, the specialisation plan ought to address the concern amongst surgeons and policy makers in Denmark that there were certain specialist services being delivered in potentially unsafe circumstances. When compared to many OECD countries, Denmark is a small country with a broad dispersion of hospitals. However, hospitals vary considerably in size in Denmark and some 58% of Danish hospitals are likely to be below the informal 275-bed threshold after which the positive relationship between volumes and quality dissipates (Kristensen et al., 2008). Similarly, it is likely that specialists that are attached to small hospitals in Denmark prior to the reforms may not be surpassing volume thresholds suggested by the international literature.

Across many OECD countries, small hospitals often lack the scale and resources to undertake the kind of quality monitoring and management programmes common in larger hospitals. With greater human resources and speciality teams, major hospitals often lead the way in the development of internal clinical pathways and essential checklists for different health care professionals and the treatment of the most common conditions. It is also more difficult to compare quality outcomes between very small hospitals and their larger counterparts due to the influence of patient characteristics accounting for outcomes. Nonetheless, specific efforts on the part of policy makers, hospital managers and clinicians can overcome this norm, for example, as implementation can be simpler in a smaller setting and regional governments focus on driving improvements across a number of hospitals.

3.4. Using the specialisation plan to drive improvements in quality

With the specialisation plan being implemented at the time of this report's writing, it is too early to evaluate its impact on the hospital sector and the Danish health care system. Evidently, the reforms will lead to a Danish hospital sector with fewer units for highly specialised hospital services and will accelerate the long-term trend towards a reduction in general hospital infrastructure. With long lead times involved in changing complex hospital infrastructure and that capital funding comes into effect from 2010 is likely to mean that even though the number of hospital beds and average lengths of stay in Denmark have continued to decline in recent years to among the lowest in the OECD, it is too early to attribute to these to the effects of recent specialisation reforms. Nonetheless, as policy makers continue about the implementation of hospital specialisation, they ought to focus on how changes in the supply of hospital services could be used to drive improvements in quality of care. This last section discusses some potential areas.

Denmark ought to be commended for ensuring that the plan is monitored and evaluated, and may wish to pay attention to individual clinician performance

The DHMA has been undertaking a range of ad-hoc studies of individual surgical specialities and put in place the infrastructure to monitor the effects of hospital specialisation reforms. For the last ten years, the DHMA has undertaken a number of studies of specific hospital services as part of its "surgical project". The surgical project seeks to analyse data from the national patient register and make suggestions for improving quality of care in a particular speciality field, including whether there is a need for specialisation or the use of specific procedures or techniques. Some of the surgical project's studies have looked at volume and quality – through examining procedures per year, patient age group composition and variations across regions. Ongoing support for the surgical project – across topics such as knee and hip replacement surgery, paediatric surgery, appendectomies in children – will make them a continued means for assessing whether the quality of care has improved in the context of specialisation reforms (DHMA, *www.sst.dk/Planlaegning%20og%20kvalitet/Kirurgiprojektet/Igangvaerende_projekter.aspx*).

This will be supplemented through formal follow up studies on speciality functions that have recently changed. Participation in this follow up study is mandatory for hospitals licensed by the DHMA to deliver specialised services. It is also anticipated that the results of this follow up analysis will be used to inform future decisions on the list of services designated for "regional" and "specialised" hospitals, which is subject to review by the DHMA every

three years. The efforts of the DHMA to collect information such as volumes, processes undertaken and patient outcomes (from patient registries) are commendable. By obliging hospitals with specialised functions to collect and return information, the DHMA will be able not only to compare and evaluate differences in patient outcomes across hospitals, but ensure future adjustments to which level services ought to be delivered are aided by more evidence. This will become particularly important as technological changes and surgical process innovations require the DHMA to revise its guidelines. It will also provide an important evidence base for other countries seeking to learn from Denmark's experience.

In evaluating the success of the plan and monitoring ongoing quality, the DHMA should seek data on the performance of individual physicians as well as the hospitals in which they work. As demonstrated in systematic reviews of the literature between volume and quality (see Box 3.2), surgeon volume is often a more important determinant of better patient outcomes than hospital volumes across a range of key procedures. While it may not be optimal to publish volumes of services undertaken by individual physicians (given the effect of patient specific factors), the DHMA ought to receive information from the regions to verify whether their desirable volume thresholds are being met.

Given that volume thresholds are likely to have been developed in circumstances where there was weak conclusive literature available to guide decision making, this information would help ensure that volume thresholds can be refined in the future. Furthermore, by linking information on volumes undertaken by individual clinicians with other information on patient outcomes and whether process associated with good quality care are being met, the DHMA and regions will be able to better inform future surgical projects and make a more sophisticated assessment of whether clinicians or hospitals drive better patient outcomes.

Increased travel for patients ought to be closely monitored

A significant immediate concern for Denmark from specialising certain services at a higher level is that patients will have to travel further for care. Danish patients are currently offered a free choice of hospital across the country, and have a series of entitlements relating to private hospitals if they have waited beyond specified times. Reviews of the relationship between distance and utilisation find that while there is often a distance decay in patients willing to travel for primary care and screening services, this might not be the case for acute hospitals (Ferguson et al., 1997). With distances faced by those in rural areas of Denmark being less significant that experienced by larger OECD countries such as Canada, the United States and Australia, the strong growth in people willing to undertake hospital

treatment outside of their region suggests that Danes are often willing and able to travel for care.

In the Danish health care system general practitioners can play an influential role in the choice of a patient's hospital. Other than those which occur through the emergency department, referrals to hospitals in Denmark are likely to be made by a GP, with the extent of a patient's travel time most influenced by the GP's suggestion. Similarly, highly specialised services that may not be available at a local hospital level are only likely to accept patients who have previously seen a specialist doctor and secured a referral. With unclear evidence on distance-decay in accessing hospitals and the likelihood that there are benefits from GP review prior to referral to a major hospital, Denmark's decision to accept higher travel times in order to ensure patients receive care in safer circumstances is a worthwhile policy.

Nonetheless, managing the balance between which services are available locally and which are available centrally ought to remain an ongoing issue of surveillance for policy makers. In determining which services were to be specialised, the DHMA took into account the patient travel burden by avoiding the specialisation of conditions requiring frequent treatment except for where considerations of clinical safety prevailed (i.e., certain cancer procedures). An area that will remain of concern will be access to emergency services, where there exists evidence of a negative association with attending an emergency department and distance (Ferguson et al., 1997). To their credit, regions have undertaken measures to strengthen pre-hospital care, such as through further investments in ambulances, physician manned mobile emergency units and working with central government to establish a national helicopter emergency medical service. While the closure of certain small hospitals is a worthwhile policy from the perspective of patient safety, regions ought to review whether the combination of after-hours GP access and ambulance services are equipped to ensure that patients are able to access care when they need it.

With information architecture that links unique patient identifiers to social security information, policy makers in Denmark ought to be able to map the travel burden faced by patients. In this domain, Denmark should follow the lead of the Netherlands, which currently reports annually on average travel times to the nearest hospital and the extent to which patients have had to travel to reach primary care or emergency services (NIPHE, 2012). While the distances involved in Denmark are small, mobile medical teams in the Netherlands and the SAMU in France (Box 3.4) provide examples of services that are able to deploy a deep skill set of medical services in emergency situations, though they often come at high costs. Denmark should assess whether similar types of services ought to be set up by trading costs with safety considerations.

Box 3.4. France's emergency health services ("Service d'Aide Médicale d'Urgence")

The French emergency service Service d'Aide Medicale d'Urgence (SAMU) may serve as a useful model for Denmark as part of its process of consolidating hospitals. The SAMU is organised as a mobile system of intensive care units ("unités mobiles hospitalières"), that have the capacity to provide intensive treatment in the field, with care provided by physicians trained in emergency medicine.

The SAMU intensive care units are housed individual hospitals and co-ordinated by a central dispatch centre. The intensive care units are not necessarily functionally integrated with hospital services, but are equipped so as to be able to ensure that the patient is fully stable before transporting them to the most appropriate hospital, thereby providing a model of emergency care that is not dependent on local hospital emergency service departments, but rather integrates the whole hospital network.

One of the guiding principles of the SAMU is that the most appropriate care be provided for each case, as part of an optimisation of resources: intensive, highly skilled, extensively equipped services are provided to those cases with the most acute need, whist lower intensity care is provided to less severe cases. There are separate mobile intensive care units for both adults and children, the dispatch of which is managed by trained operators fielding emergency calls, who are backed up by physicians (emergency medicine and paediatricians). Operators are trained to assess the severity of the emergency, and would either send a mobile intensive care unit with a doctor and a nurse anesthetist or, if the patient's condition is assessed to be less severe, a nurse in a less comprehensively equipped mobile ICU. If the call is assessed not to be an emergency, a general practitioner is sent through SOS/UMP private companies that employ GPs who are then reimbursed by the insurance fund.

Source: SAMU France (*www.samu-de-france.fr*).

Hospital-based research in Denmark will change as a result of further specialisation

Regional and national hospitals that will be deemed as specialist centres are likely to have better opportunities to conduct medical research. With its smaller population, Denmark faces some natural disadvantages compared to other OECD countries when having to undertake medical research. A key variable for medical researchers is the number of patient observations, with researchers often requiring a certain scale. Specialisation reforms ought to increase the possibilities for hospitals to do more and bigger clinical trials. Similarly, rare and highly complex patients are often the subject of medical research, and greater concentration of the most highly specialised services at a national and regional level is likely to provide greater exposure of the more complex cases to the specialists most likely to be undertaking research. As has done for medical education, the government ought to work with

universities, speciality groups and regions to review whether the structure of medical research facilities make the most of the new structure of the hospital sector in Denmark.

Efforts ought to be undertaken by policy makers to ensure that the new specialist hospitals also proactively work to support system wide improvements. Major teaching hospitals that are also centres of excellence for particular specialisations can often be the source of innovations in new medical procedures and processes. Danish government at a national and regional level ought to support specialists in maintaining a continual dialogue across hospitals of different sizes to support the dissemination of best practices. Particularly in a country where continuous professional development is not obligatory, regional specialist centres and national specialist hospitals could play a major role in assisting with continuous professional development of doctors working in general hospitals. These hospitals – who are likely to house research leaders across various specialisations – could allow their staff to either lead continuous professional development or to occasionally work in specialist centres in order to gain specific competencies. These reforms will also impart to national government a detailed understanding of the location of specific specialist services across the country, which often does not occur in federal systems. The national government ought to ensure that this valuable information is proactively used to help inform future decisions on the number and specialisation of Denmark's health workforce in the future.

Specialisation reforms can inform clinical guidelines that are better tailored to a doctor's needs

Alongside the specialisation plan, the DHMA is currently engaging with regions and clinical specialities to develop national clinical guidelines. The DHMA was co-ordinating work on five clinical guidelines in 2012 with plans to develop fifteen more in each of the following years from 2013 to 2015. At the same time, there are a number of initiatives underway to improve pathways for patients, particular in cancer, heart disease and psychiatry.

With the benefit of its workforce being divided by their level of specialisation, the DHMA should seek to tailor its guidelines to specific clinical audiences in terms of the facilities in which they work. For example, a guideline for a specialist working in a general hospital ought to provide additional support on identifying which patients should be referred to a "regional" hospital or a "specialised" hospital. Similarly, guidelines for the regional hospitals could be customised to reflect the greater range and more sophisticated clinical services they are able to offer.

Denmark has the opportunity to ensure that clinical guidelines build in "real time" practical information for doctors seeking to refer complex patients. The current clinical guideline project by the DHMA is seeking to make sure these guidelines are available electronically. In addition to aiding doctors with diagnosis and evidence-based treatment options, electronic guidelines could include contact details of key specialists in hospitals with "regional" and "specialised" functions, to make it easier for a hospital doctor identify the responsible person and communicate with them in order to co-ordinate care across multiple sites. While such networks undoubtedly exist in Denmark today, they place the onus on the doctor to have a network of people to whom they can refer rather than systematically provide this information to doctors so as to encourage better co-ordination of care for complex patients.

Hospital managers and administrators will benefit from greater certainty of operations and funding once reforms have been implemented

The significant amount of change that has been undertaken in the Danish health care system in recent years has elevated the role of competition and choice in the hospital sector. A survey taken on the eve of the implementation of hospital specialisations reforms found that hospital managers and the heads of hospital departments were most concerned about competition from other hospitals and departments outside of their county but within their region (71% of hospital leaders and 49% of departmental leaders). Interestingly, fewer were worried about the prospect of a substantial change to their hospital or department's functions (48% of hospital leaders and 46% of department leaders) and some 19% of both hospital leaders and department leaders were worried about the closure of hospitals (Nielsen and Vrangbaek, 2006).

The specification of certain services being undertaken at regional or national level ought to more clearly clarify the basis for competition between hospitals once fully implemented. At a basic level, it will provide clarity to hospital managers on which services they will be expected to compete. Those hospitals providing "regional" and "specialised" functions will be able to clearly identify the other hospitals with which they are competing with and which they ought to compare themselves in relation to their performance on national programmes such as the National Quality Improvement Programme (detailed in Chapter 1). Furthermore, the specification of specialist services in certain centres provides the opportunity for Denmark's hospitals to be able to refine activity-based (or flat) payments to ensure they reflect the complexity of their activities. A constant challenge in administering the financing of hospital is the extent to

which payors refine diagnostic group payments to pay for highly complex services such as trauma, neurology, certain paediatric surgeries and mental health. Locating the most specialised and difficult to code hospital procedures in fewer facilities provides the ability to selectively finance these services, such as through fixed payments.

By having specified the clinical priority areas for hospitals, the government will also be able to reduce the implicit competition that can occur between hospitals as they try and distinguish themselves for a particular specialisation. Other publicly managed hospital systems across the OECD such as the United Kingdom, France, Australia and New Zealand have often seen financial resources shifted between departments at a hospital level as hospital management make a decision to run certain services at a loss in order to hold onto the prestige of a particular speciality department. These hospitals finance such strategies through driving down costs in other areas. This kind of competition can confound attempts to compare quality across hospitals. The establishment of institutional priorities by regulation will reduce the pressure on Danish hospitals to each distinguish themselves within a particular clinical domain, which in time ought to reduce differences in funding for individual procedures from hospital to hospital, and facilitate like for like comparisons of quality of care.

The national government should turn its focus to supporting the diffusion of best practices amongst the most specialised hospitals across the country

At a broader governance level, the categorisation of the hospital sector into levels of complexity ought to see national government take a greater role in supporting the diffusion of best practice in regional level hospitals across the country. The further concentration of facilities can create a risk that higher-volume specialist hospitals become high profile silos. With regions now limited to one to three facilities for certain clinical specialisations, there exists a case for national government to ensure that the most specialised hospitals engage in regular dialogue to support the exchange of best practice processes between highly specialised hospitals.

Such an exchange ought to engage the medical specialities and be informed by a combination of performance indicators for individual hospitals (as detailed in Chapter 1), surgical projects in specific areas, and new information collected as part of evaluation of the hospital specialisation reform. Over the longer term, establishing closer exchange between highly specialised hospitals could lead to the establishment of a forum that helps ensure that system wide quality of care activities such as accreditation and

patient experience measurement can be customised to suit the unique needs of the most specialised hospitals.

3.5. Conclusions

Denmark has managed to undertake very large reforms to the structure of its hospital sector while many OECD countries have struggled with more modest reforms of the same ilk. The hallmark of Denmark's reforms has been the balance struck between national guidance and regional planning, along with extensive engagement of health professionals in helping set guide key parameters for decision making. With these reforms now in train, the focus of policy makers, hospital administrators, and health care professionals has been squarely on their direct consequences. It is likely that there will be improvements in quality from no longer allowing highly specialised services to occur in unsafe circumstances. Technological and capital improvements should help lift quality, and there will be new opportunities to train students by rotating them through specialist centres. The reforms will also require careful monitoring to ensure that it does not adversely affect patients or lead to diseconomies of scale amongst the largest institutions.

The challenge for the future, and where Denmark ought to invest more effort as they roll out these reforms is to identify the key quality improvements that fewer, larger and more specialised hospitals can deliver. To begin with, Danish policy makers ought to:

- Track individual clinician volumes as part of evaluating the effects of the reforms and contributing to ongoing quality monitoring and assessment.
- Continue on efforts already being undertaken to strengthen pre-hospital care, such as ambulances, physician manned mobile emergency units and monitor travel times faced by patients.
- Ensure that specialised hospitals support medical training and the dissemination of best practices across the system.
- Tailor clinical guidelines by the level of specialisation in a hospital, and build in practical information to co-ordination of patient care across hospitals.
- Support the regular exchange of best practices among highly specialised hospitals throughout the country.

While each of these specific reforms build on the more strictly defined and leaner hospital sector that ought to emerge from the hospital

specialisation reforms, their potential to improve quality of care across the system will require complementary reforms across the system. In particular, an overarching priority ought to be the strengthening of primary and community care services – explored in detail in Chapter 2 – to ensure it is able to take on the greater demands that shall be placed on it in the future.

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