MINISTRY OF FOREIGN AFFAIRS OF DENMARK

ROYAL DANISH EMBASSY
Paris

INNOVATING BETTER LIFE
Healthcare DENMARK

THE ORGANISATION OF DANISH HEALTHCARE

This report is financed by the Ministry of Foreign Affairs and prepared by COWI

TABLE OF CONTENTS

APPENDIX

1. INTRODUCTION

The Danish healthcare system has universal coverage and is financed by general taxes. Thus, it provides free and equal access to healthcare for all of its 5.8 million citizens.[1]

As in many other countries, the demographic development in Denmark is putting increasing pressure on the healthcare system, calling for new ways of delivering healthcare services as well as new paradigms for collaboration between actors in the healthcare system.

During the past 15 years, the Danish healthcare system has undergone major changes in the effort to meet these challenges. Focus has been on providing the most value for money. Three enabling strategies have been key: 1) structural transformation, 2) cross-organisational collaboration, and 3) digital transformation. The changes made over the past 15 years have resulted in today's healthcare system, which is able to deliver more and better services at regional and municipal levels, and a system in which preventive healthcare and treatment are integrated better.

This paper presents key characteristics of the Danish healthcare, focusing on its institutional and organisational setup. The paper covers the question of how Denmark has succeeded in creating a collaborative healthcare system which is both decentralised and efficient.
Thus, the paper describes:

KEY TO SUCCESS #1.
The organisation and governance of Danish healthcare.

KEY TO SUCCESS #2.
Increased collaboration between organisational levels.

KEY TO SUCCESS #3.
The role played by digitalisation.

Finally, the paper describes selected new initiatives in Danish healthcare, and the paper includes an appendix presenting key quantitative indicators provided for a comparison with France.

The purpose of the paper is to serve as an inspiration to healthcare officials and decision-makers in European countries who are facing demographic and other challenges comparable to the ones which Denmark have successfully dealt with and will continue to have to deal with in future.

2. THE ORGANISATION AND GOVERNANCE OF DANISH HEALTHCARE

A reform in 2007 centralised the planning and regulation, but decentralised the responsibility for primary and secondary care.

On 1 January 2007, an extensive structural reform took place in Denmark which reduced the number of municipalities from 271 to 98, and the number of regions from 14 to 5. Included in the reform was a new division of tasks between the state, regions and municipalities as well as a new financing system.[2]

The reform strongly affected the interfaces between the three levels of government, i.e. state, region and municipality. The reform assigned the state a strengthened role in overall national regulation and planning of the healthcare system. At the same time, the reform led to a complete transfer of management responsibilities for healthcare delivery to regional and municipal levels. Hence, today, regions and municipalities are responsible for delivering all primary and secondary care. Among other things, the municipalities are responsible for delivering healthcare prevention and rehabilitation.

Today, the healthcare sector operates across three political and administrative levels: **the state, the regions and the municipalities** (national, regional and local levels).[3] Each level has different responsibilities, see Figure 1.

Figure 1 *Administrative levels and responsibilities* [4]

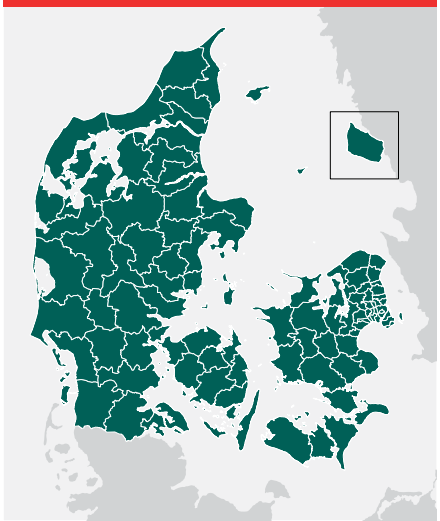
STATE

- Legislation
- National healthcare policy
- The overall framework of the healthcare economy
- Speciality planning.

REGIONS

- Hospital (somatic and psychiatric, in and outpatient)
- Primary healthcare contracts (GP, special practitioners, adult dental services, physiotherapists, psychologists, chiropodist, chiropractor)
- Reimbursement of medicine.

MUNICIPALITIES



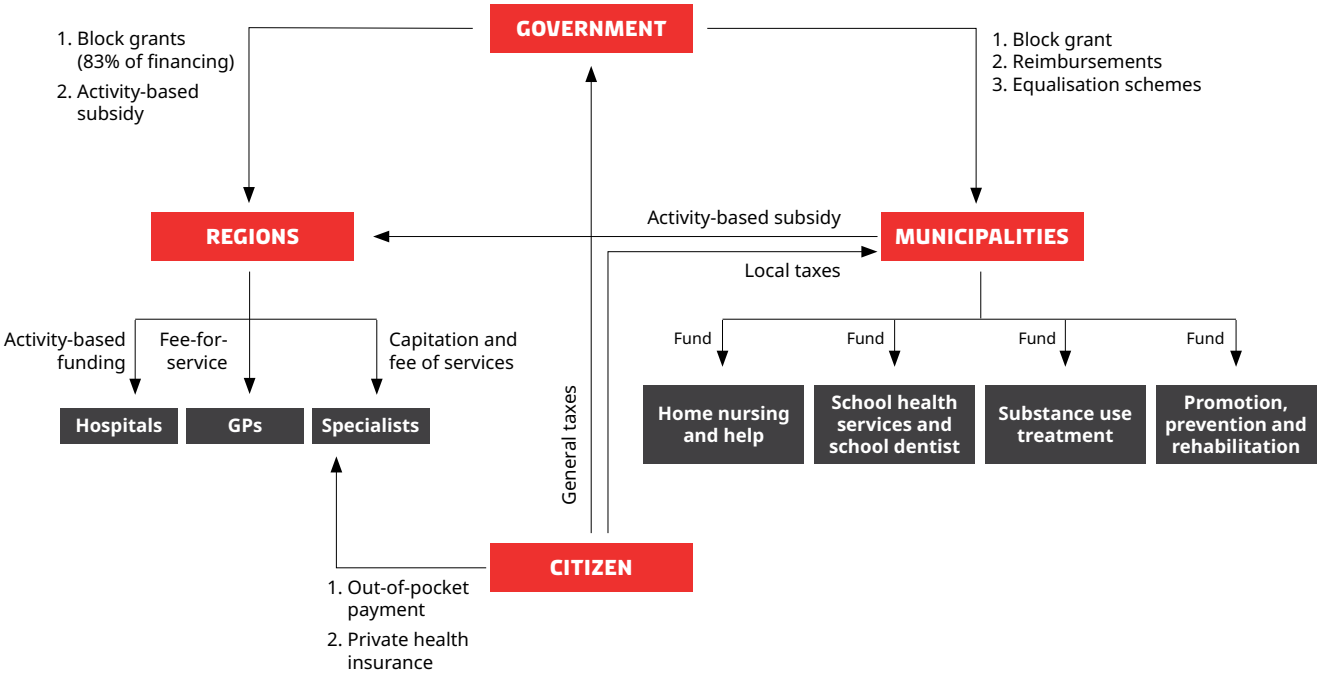
- Homecare
- Rehabilitation services outside hospitals
- Treatment of substance and alcohol abuse
- Prevention and health promotion
- District nurses
- Children's dental services.

The reform also changed the way the healthcare sector is financed. In general, healthcare and social services in Denmark are financed by general taxes raised at national level.[5] This means that public funding accounts for about 80 per cent of all health spending in Denmark (83 per cent in 2019).[6] The remaining share mainly covers households' out-of-pocket expenditure for pharmaceuticals, dental care and private insurance fees for supplementary treatments that are not, or only partly, covered by public financing (e.g., physiotherapy and psychologists).[7]

Public funding accounts for 83 per cent of all health spending and is funded by general taxes.

Public healthcare funding is distributed from the state to the regions through an annual fixed allocation (block grants) and an activity-based share, based on performance. Municipalities receive their funds through allocations from the state, and through locally raised taxes and reimbursements of costs for services carried out for the regions and the state.[8]

Figure 2 *Financing of the Danish healthcare system*



The overall financial framework is based on an annual financial agreement between the government, regions and municipalities, where the gathered parties agree on a set of objectives for the level of activities and the level of healthcare expenditure for the following year.[9] This joint annual agreement creates a framework, which contributes to the willingness and ability of all parties to live up to the set budget. The block grants finance about 83 per cent of the regions' total healthcare spending.[10] In addition, municipal activity-dependent co-financing accounts for approximately 16 per cent of regional funding. The state's activity-dependent pool constitutes approximately one per cent of the financing.[11] The block grants are defined by a smaller basic amount and two distribution keys. The first distribution key is based on demographic factors, i.e. the population size and age distribution. The second distribution key is based on a combination of economic, social, geographical and health-related variables, e.g., the number of families living on unemployment benefits or the number of diagnosed psychiatric patients.[12]

Activity-based subsidies are used to control productivity and expenditure.

The activity-based financing is used as an instrument to control expenditure and increase productivity in the regions and as an incentive for effective health prevention in the municipalities. Thus, the activity-based funding at the regional level depends on the region's performance in relation to a set of established performance criteria. Municipalities co-finance hospital treatment and treatment by GPs (managed and provided by the regions), based on an activity-based subsidy scheme and depending on how much citizens from a given municipality use regional health services. It gives the municipalities an incentive both to collaborate on coherent patient care pathways and to provide effective prevention, rehabilitation and care efforts.

The national level is responsible for the overall regulatory, planning and supervisory functions.

The national government, i.e. the Ministry of Health, has the overall regulatory responsibility and supervision of healthcare in Denmark.[13]

The Ministry of Health prepares the regulatory framework and plans all healthcare services. The national government/Ministry of Health is responsible for: 1) national planning of specialist services and medical specialists, 2) approval of regional hospital planning and 3) mandatory healthcare agreements between regions and municipalities to coordinate service delivery.[14]

The Danish Health Authority (DHA), a board under the auspice of the Ministry of Health, is responsible for advising and supporting the Ministry of Health, the regions and the municipalities on general health issues. DHA establishes national clinical guidelines and guidelines for the training of specialist doctors and other health professionals.[15]

Furthermore, DHA is responsible for the overall planning, distribution and localisation of medical specialities among the different hospitals and for approving regional hospital plans and mandatory health agreements between regions and municipalities, which coordinate the delivery of healthcare services. The purpose of centralising these tasks is to ensure professional and high-quality treatment and consistency in the patient care pathway, while simultaneously ensuring an efficient utilisation of resources.

Finally, DHA is responsible for issuing preventive packages (targeting the most common health risks) and developing national treatment plans. The national treatment plans and guidelines are implemented in the regions, while preventive packages are used by municipalities as a tool to increase the health status of their citizens.[16 17] Other tasks include regulation of vaccinations, protection of patients' rights and monitoring of the quality of care in hospitals and pharmacies.[18 19]

The monitoring of quality of care in hospitals are based on data on selected quality indicators that are related to 8 national goals (see Box 1).[20]

BOX 1: THE EIGHT NATIONAL GOALS FOR QUALITY MONITORING IN THE HEALTH SECTOR

The quality indicators are part of the Danish Healthcare Quality Programme, which consists of eight national goals:

1. Better continuity of patient care in clinical pathways
2. Stronger measures for chronically ill and elderly patients
3. Higher survival rates and improved patient safety

4. High-quality treatment
5. Quick assessment and treatment
6. Greater patient involvement
7. Additional healthy life years
8. More efficient healthcare system.

These goals are developed to ensure that every health professional or service worker in the health sector (in hospitals, municipalities and regions) work in the same direction to secure an effective health care system with high quality of care, and to make it less complicated to foresee areas in need of quality improvement.[21] Thus, the goals are implemented on a local, regional and national level. The regions follow up on the goals every quarter.

Today, the Danish progress on the eight goals is measured through a total of 40 different quality indicators, which mainly focus on hospital care structure, process of care or treatment and the result of care.

The latest status report shows that there has been a positive development on 13 of the 40 quality indicators from 2019 to 2020 or the most recent year. Among other things, it is worth noticing that Denmark has seen a positive development on all the indicators regarding the goal of *enhanced effort for the chronically ill and elderly*. However, the development in the past few years has also been affected by COVID-19. Since the healthcare system has had to reorganise and reserve capacity and treatment for COVID-19 patients, the work on some of the quality indicators has been put aside for some time. Thus, a stagnant and negative development on some indicators should mainly be seen in the light of the pandemic. Also, 12 indicators are currently not measurable because of a change to the data registry.[22]

While planning and regulation are centralised at a national level, there is a considerable and systematic involvement of regional and municipal actors in planning processes. Consequently, dialogue and coordination between relevant actors precede the issuance of new national plans and regulations. This dialogue process also includes relevant professional medical societies and patient organisations. While this process may at times be time-consuming, it plays a key role in ensuring the actual implementation of plans and regulations by regions and municipalities.

The regions own and operate both somatic and psychiatric public hospitals as well as local community mental healthcare centres.[23][24] The five regions are responsible for both **primary and secondary healthcare services.** These include:

- Hospital care (including emergency care)
- Psychiatry
- Healthcare services provided by general practitioners (GPs) (In Denmark, all GPs are private practitioners)
- Special practitioners (such as rheumatologists), and other specialists such as physiotherapists or psychologists[25]
- Administration of the drug reimbursement plan (based on digital data collected from pharmacies when prescriptions are dispensed).[26]

The regional level is responsible for hospital management and services as well as for agreement with self-employed healthcare professionals.

First, we will describe the management of the hospitals. For information about GPs, please see the bottom of this page and the next page.

The regions cooperate by referring patients to hospitals across regions in case of resource challenges (unavailability of beds) or in case of specialised treatment needs.[27]

If a region cannot guarantee diagnostic treatment at a publicly owned hospital within 30 days after the referral of a patient, the patient has the right to choose treatment at a private hospital. This also applies if the region is unable to provide a diagnostic assessment within 30 days or if treatment for a life-threatening disease is unavailable in the region. Costs are covered by the public health insurance and thus free of charge for the patient.

Since 2002, private hospitals have provided healthcare services to and financed by the regions. The private hospitals are, however, small, and mostly provide specialised care.[28] Thus, in 2017 the market share of private hospitals was 1.25 per cent of all publicly funded activity in the hospital area – a market share that had decreased by 50 per cent from 2008 to 2017.[29]

The number of acute hospitals was reduced from 40 to 21 from 2007 to 2020, and six new super hospitals are being built.

The merging of 14 regions to five in connection with the reform in 2007 allowed for a new public hospital structure with a reduced number of acute hospitals, each covering a population of 200,000 to 400,000.[30] The number of acute hospitals was reduced from 40 to 21.[31] The idea was to increase both the quality of treatment and care (through specialisation) and resource utilisation (through economies of scale).[32] A cornerstone in this strategy is the Super Hospital Programme, which consists of an investment of EUR 6.6 billion (2019 prices) in 16 new hospital projects, of which six are new modern, top-of-the line hospitals and the rest are extensions of existing hospitals.[33] The Super Hospital Programme differs from ordinary Danish hospital construction as the government is involved in the financing (60 per cent of the programme), planning and managing the programme and because the programme has been supported by an Expert Panel established in 2007.[34] The main focus in the Ministry of Health's supervision is the regions' ability to keep the projects within budget and achieve the promised efficiency gains.[35]

In these years, a total of 46 large and small hospital construction projects are underway in the regions, including the 16 that are a part of the Super Hospital Programme.

General practitioners act as 'gatekeepers' in the Danish healthcare system.

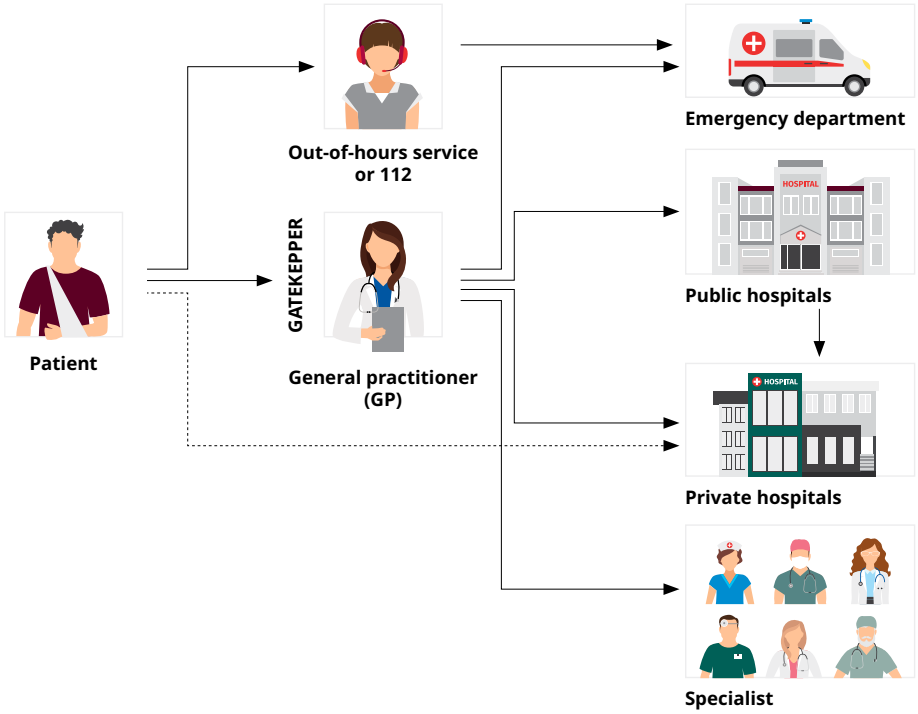
Other private actors in the healthcare sector, in addition to private hospitals, are the GPs and special practitioners. Patients first need a referral from a GP to:

- see a special practitioner
- be entitled to home-nursing care
- be admitted to a hospice
- be admitted to a hospital and/or an emergency clinic. Although it is also possible to be admitted to an emergency clinic via the medical hotline or via the emergency medical service (112).[36]

Hence, GPs play an important role as 'gatekeepers' between the primary and the secondary level.[37] On average, GPs manage approximately 1,600 patients. Most treatments are handled by the GP without having to refer to a specialised unit at the secondary level.[38] This is found to reduce the total costs of the healthcare system, since treatments at the primary level are less expensive than at the secondary level.

The special fee for treating patients with a chronic disease is an example of how the relationship between the primary and secondary levels is constantly monitored and strengthened. To provide GPs with an incentive to manage an increasing caseload of patients with chronic diseases, in January 2018, it was agreed that GPs can invoice an added premium to the fee for treating patients with chronic diseases. This has been found to keep patients with chronic diseases out of hospitals – with the added benefit for patients that the GP is often located closer to the patient than the nearest hospital.

Figure 3 *The function of the GPs*



GPs and special practitioners run their own private businesses. Their fees are invoiced to the regions based on agreed and detailed price schedules and the number of patients attended to.

Other services which are administrated by the region are **out-of-hours primary care** (the medical hotline) and the **emergency medical service** (112).

The out-of-hours primary care is operated by specialised nurses and/or GPs, who can refer a patient to an emergency room or an after-hour clinic, depending on the patient's situation.[39]

Emergency medical services are central to the modernisation of the Danish hospital structure. Emergency calls (112 calls) are received by the police and forwarded to a health professional, who assesses the need for an ambulance

Emergency healthcare services play an important role as treatment starts from the moment of their arrival.

or other pre-hospital services. Paramedics, medical doctors or specialised nurses can be sent by car or helicopter to the emergency scene to help. Following this, emergency care is provided in the ambulance or a specially equipped helicopter, which means that patient treatment starts upon the arrival of the ambulance or the helicopter. Most regions cooperate with private contractors for ambulance services, making this an example of the successful cooperation between private actors and the public healthcare system.[40]

The municipalities are responsible for disease prevention and health promotion.

With the 2007 reform, the government wished to move healthcare services closer to the citizens. Thus, the 98 municipalities are responsible for facilities and activities which prevent disease and promote health.[41] These include:

- Pre- and postnatal home visits
- Dental services for children
- School health services
- Rehabilitation (both physical and mental)
- Home nursing care and nursing home
- Preventive measures against common health risks
- Treatments for alcohol or substance abuse and housing for the mentally disabled or homeless.[42]

The municipalities' co-financing of hospital treatment gives them incentives to invest in health prevention and health promotion.

Municipalities co-finance hospital treatment and treatment by GPs (managed and provided by the regions), based on an activity-based subsidy scheme, and depending on how much citizens from a given municipality use regional health services. The previously mentioned co-financing of the municipalities provides them with an incentive to implement effective prevention and health-promoting efforts, as it will reduce costs of hospitalisation and GP services.[43] Furthermore, municipalities which are not ready to receive a citizen and provide them with the appropriate home care after they are ready for discharge from the hospital will face financial penalties for every additional day a patient spends in the hospital. The penalties for the days of delay sharply increased in January 2017 (from EUR 265 to EUR 530 pr. day of delay), which can be associated with the reduction of delayed discharges and reduced bed-days.[44] [45]

The "A Good Start in Life" initiative exemplifies a successful prevention effort.

An example of a successful initiative on prevention is the case "A Good Start in Life". Despite a joint pregnancy journal, the collaboration between hospital, municipality and general practice has been characterised by a lack of information and knowledge sharing between different actors. For this reason, this initiative between a municipality, a hospital and general practice in the Southern Region of Denmark has sought to create better joint care for the pregnant and the new-born child in the collaboration between hospital, municipality and general practitioner. This has been done by mapping best practice and by ensuring that best practice is followed every time through dialogue and joint training. Likewise, joint data has been ensured for documenting the process, which renders quality assurance of the activities possible. This has created a better overview of the overall offers, better digital communication between general practice, midwives and nurses, as well as better relations between these parties, so that future problems can be solved quicker and by joined efforts. The initiative has been made permanent and is today used in all municipalities in the Southern Region of Denmark. Over the coming years, the physical maternity record will be replaced by the new national electronic maternity record.

To set out a joint political direction for the collaboration between regions, municipalities and the primary sector (GPs), a health agreement is developed every four years, starting in 2007. Regional and municipal councils set up a health coordinator committee within each of the regions, consisting of representatives from the region, the municipality and general practice. They come together to discuss subjects such as future visions, guiding principles of cooperation, prioritised areas and current and future objectives in the health sector. The health agreement covers both the somatic and psychiatric sector in at least four areas:

- Prevention
- Treatment and care
- Rehabilitation
- IT and digital solutions targeting daily workflow.

The agreement is a political tool that binds the three levels together and forms the framework for collaboration within the health sector. The political health agreement is submitted to the DHA, which is responsible for its approval.[46 47 48]

A health agreement sets the overall framework for collaboration between the organisational levels for a four-year period.

3. INCREASED COLLABORATION BETWEEN ORGANISATIONAL LEVELS

The changes to the division of tasks and responsibilities have created new interfaces and increasing demand for sectoral collaboration.

The change to the distribution of tasks and responsibilities between state, regions and municipalities has created new interfaces and placed demands for further collaboration across authority and sector boundaries. The demand is reinforced by the fact that, in the future, the healthcare system will see an increasing pressure due to the ageing population, more patients with chronic illnesses and, not least, the political objective to ensure coherent patient pathways.

This is an area where Denmark has not quite reached its goal yet, but in which new solutions are constantly developing. Increasingly so, in the form of private-public partnerships with the involvement of patients and relatives.

For instance, focus has been on securing close sectoral collaboration in the areas of cancer and heart diseases, since cancer and heart diseases are the two leading causes of death in Denmark.

Denmark has introduced 30 cancer patient pathways to increase and ensure the quality and outcome of treatment.

The Ministry of Health has introduced **Cancer Patient Pathways** linking GPs, hospitals and specialist diagnostic centres to improve the diagnostic process. When a GP suspects cancer, they can refer patients through one of the clear referral pathways, based on the severity of symptoms.[49] 30 packages cover around 40 different cancer diseases. The packages are issued by authorities at the national level and used at both regional and municipal levels. The packages aim to increase and ensure quality of care and swift clarification of diagnosis and treatment. Each cancer package consists of a standardised description of a patient's treatment pathway from the moment the disease is first suspected to the time of rehabilitation or, in some cases, palliation.

Figure 4

The packages target specified actors in the healthcare system. They provide a clear distribution of responsibilities and tasks regarding a given patient. The role of each actor is specified as is the required collaboration between actors. Consequently, the packages have contributed to an increase in early detection of diseases, better collaboration between sectors as well as continuity and uniform treatments for cancer patients across the country.[50 51]

Denmark has introduced cardiac rehabilitation programmes to reduce the number of re-admissions.

In 2017, the National Board of Health prepared new programme packages outlining the patient pathway for patients with a **heart disease.** These packages cover the entire treatment flow from the time the patient experiences symptoms and sees their doctor, to assessment and treatment and subsequent follow-up, including cardiac rehabilitation and palliation.[52]

Cardiac rehabilitation is a term covering post-treatment of patients with heart disease and is recommended for patients with ischemic heart disease, heart

failure, heart valve surgery and heart rhythm disorder.[53] Cardiac rehabilitation comes with a comprehensive package, which includes:

- Physical exercise
- Patient information and education
- Psychosocial interventions including work retention
- Dietary change support
- Support to quit smoking
- Optimisation of drug treatment
- Clinical follow-up and maintenance of goals.

Cardiac rehabilitation is offered in continuation of diagnostics and treatment and can be carried out exclusively in hospitals and/or in the primary sector or be a shared process between the two.[54]

Early detection and treatment of complications after hospitalisation for hip fracture through a collaboration between the municipal nurse and the hospital.

A concrete example of how different health professionals cooperate within different organisational levels of the healthcare system in Denmark is the initiative of early detection and treatment of complications in the elderly after a hip fracture hospitalisation. A broken hip of an elderly debilitated citizen can be the start of a long and often fatal process. It is very important that the patient is trained and monitored – even after discharge. The elderly are known to often fall between two chairs, thus an initiative was started as a collaboration between a hospital and two municipalities in the Southern Region of Denmark. The purpose has been to detect and treat complications in the elderly after hospitalisation for a hip fracture. This has been done by having a municipal nurse visit the elderly three days after discharge. The nurse focuses on systematic observation and measurement of vital values. Through a systematic review, the nurse is able to react when the progress has not been satisfactory. The municipal nurse has been able to contact the hospital doctor responsible for treatment up to 14 days after discharge. The initiative has been carried out as a blind study. The effect was a fall in re-admissions of 50 per cent and a significant reduction in mortality. It has now been made permanent and expanded to several municipalities.

A public-private partnership between the Danish healthcare system and the Novo Nordisk Foundation has established five Danish Steno Diabetes Centers.

An additional example is the five Steno Diabetes Centres that have been established in a public-private partnership between the healthcare authorities and the Novo Nordisk Foundation.[55] The centres are owned and operated by the public health authorities (the regions). The Novo Nordisk Foundation supports the centres with a donation to modernise and systematise the current treatment options for people with diabetes. The donation covers treatment, research, education and cross-sectoral cooperation as well as new buildings. The vision of the centres is to establish the conditions for fewer new cases of diabetes, as well as higher quality of life and longer life for people with diabetes. With the centres, the Novo Nordisk Foundation wants to strengthen the quality of diabetes treatment and improve the prevention of complications, for the benefit of both the individual with diabetes and society.[56]

4. THE ROLE PLAYED BY DIGITALISATION

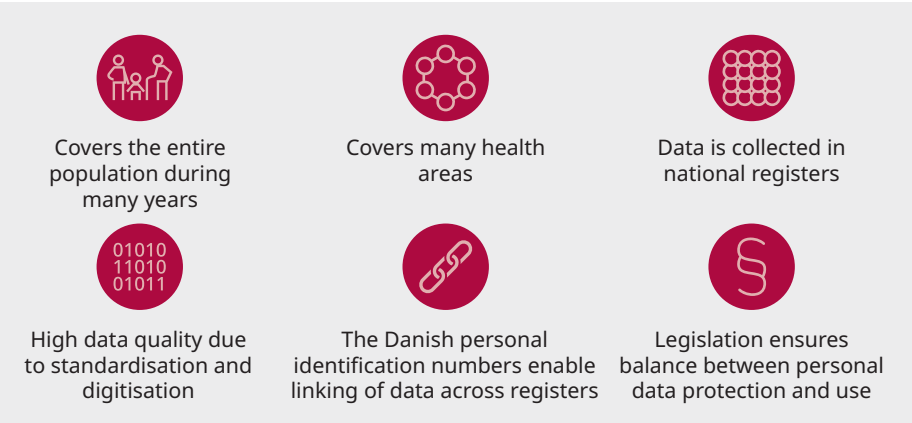
Denmark has been at the forefront for 20 years, and today, the Danish health service is among the most digitalised in the world.

Denmark has prioritised digitalisation for at least 20 years, and today, the Danish healthcare system is among the most digitalised in the world. The foundation was laid more than 50 years ago with the integration of a unique personalised ID number issued at birth to all inhabitants. Later, several other initiatives followed, including national IT strategies and national classifications and terminology.[57] A solid digital infrastructure in the healthcare system and high digital literacy among healthcare providers as well as a culture rooted in trust have also been important factors.[58]

At the same time and in connection with this, Denmark has a long-standing tradition of digital monitoring and registration of patients in contact with the healthcare system. Thus, the healthcare system is characterised by its digital communication between different levels as well as between health professionals, and by digitalised working procedures. Systematic and digital collection of data enables large-scale monitoring and analysis of health data as well as of patients in contact with the healthcare system. Even though health professionals can use different IT systems, they all use the same language and data format. In Denmark, standards for integration between IT systems in the healthcare sector are prepared and maintained by a joint public, non-profit organisation (MedCom), which is owned jointly by the Ministry of Health, Danish Regions and the National Association of Municipalities. The standards make it possible to communicate between IT systems, including across sectors, and ensure data quality.

Figure 5 illustrates the interconnection of different types of health data as a common platform across healthcare actors at different levels:

Figure 5 *Why is our health data unique?*



Source: Danish Health Data Authority

IT solutions have not only had a significant positive impact on cross-sectoral collaboration in healthcare (e.g., between GPs and hospitals), but also in improved continuity of care.

The Danish Health Data Authority's comprehensive data programme and existing technology also became a cornerstone in the Danish healthcare response to COVID-19.[59] For example, a vaccination database used to record childhood vaccinations was further developed and used to register the results of SARS-COV-2 field tests. This meant that Denmark was able to get physical solutions on the market extremely fast. At the same time, Denmark was able to develop and evolve our existing infrastructure, booking systems and databases, and rely on existing data security measures. Consequently, Denmark could formulate solutions to any data collection issue without having to spend months developing new systems and could relatively quickly create a strong data infrastructure to accurately record a high influx of COVID-19 test results.[60]

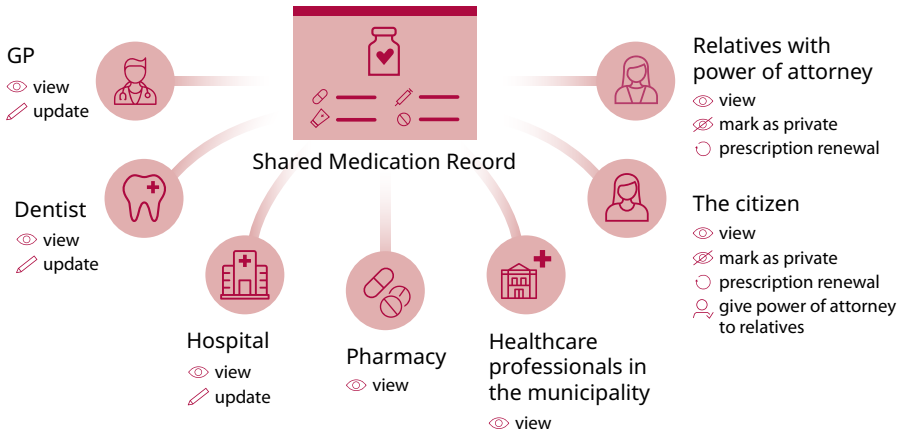
Well-functioning national IT infrastructure and databases made it possible to set up new IT solutions quickly.

IT solutions such as the **Shared Medication Record** and the **Danish e-Health Portal** (sundhed.dk) are highly acclaimed outside Denmark.

The **Shared Medication Record** gives healthcare professionals access to a complete, up-to-date prescription-medicine overview for the patient across the entire healthcare system. The shared medication record prevents incorrect medications and increases patient safety by ensuring that information about the citizen's current medication is always available to the health personnel treating the citizen – and to the citizen.

The Shared Medication Record contains up-to-date information on every Danish citizen, which is shared across all local systems in the healthcare sector.

Figure 6 *The Shared Medication Record*



Source: Danish Health Data Authority

The Danish **E-Health Portal** (Sundhed.dk) is the official Danish health website providing access to information for citizens and healthcare professionals. The portal was launched in 2003 as a collaboration between the state, the regions and the municipalities. The purpose of the E-Health Portal is to: a) bring together relevant information from all parts of the health service, b) offer a shared platform of communication, c) empower citizens by offering maximum insight and transparency in the healthcare sector, and d) offer healthcare providers easy access to clinical information about their patients' medical history. Currently, citizens can go to the National Health Record via the Danish E-Health Portal to see their medical records from the hospital, e-journals, medication data, vaccinations, laboratory results, COVID-19 test results as well as a log of when this data has been accessed.[61] This makes sundhed.dk a globally unique e-health portal for citizens and health professionals, and it is the largest electronic patient portal in Europe with nearly 1.8 million Danes visiting the portal every month.[62]

The Danish E-Health Portal is the largest electronic patient portal in Europe.

E-health solutions enable more individualised treatment by empowering patients and involving them in their treatment and are therefore seen as an important tool to be able to meet the challenges posed by the ageing population.

A regional telehealth initiative made large-scale and nationwide after the success.

Denmark has a tradition of testing new healthcare initiatives in a region or municipality before implementing them nationally. A successful example of this is the now national implementation of the telehealth project TeleCare North. The project was first implemented in the North Denmark Region, the smallest of the Danish regions. TeleCare North was an ambitious experiment offered to all patients with COPD. Like other chronically ill, COPD patients are in dialogue with several health professionals: hospital staff, GP, home nurses etc. However, not every health professional has the same information about the patient, the course of the illness or COPD. For this reason, some patients experienced the treatment as fragmented. The purpose of the TeleCare North project was to establish routines to make collaboration between various health professionals more effective, to establish new communication channels, and to ensure that all health professionals could share information and more treatment in the patient's home without the need for physical meetings. This was done by telemedical home monitoring, where COPD patients were given tablets to register their health information and through which questions could be sent to a health database, which enabled all health staff to monitor patients and answer questions. The project set high demands for openness among health professionals, which were met by all the involved actors because of the benefits for the patients. The project included patients from all 11 municipalities in the North Denmark Region, from hospitals as well as GPs. Thus, the project managed to roll out telehealth support to all 1,256 COPD patients within the region who were able to use telehealth support. The evaluation of the project showed more effective collaboration between levels and health professionals. Because of the big success of the project, it has been decided to implement the initiative nationally. The implementation started in 2021 and is intended to also include other chronically ill patients.

5. NEW INITIATIVES

The Danish healthcare system has undergone major changes and improvements since the reform in 2007 and the implementation of the first national IT strategy, and is today far better positioned for dealing with the challenges related to the demographic development, compared to other European countries.

Still, the growing proportion of elderly as well as a higher life expectancy pose a challenge that needs attention over the following years.[63] The ageing population means an increase in the number of individuals with comorbidity and chronic diseases such as cancer, COPD, diabetes and coronary heart diseases. Additionally, Denmark faces challenges with several health risks such as obesity, tobacco use and alcohol consumption, which contribute to an increase in lifestyle-related diseases.[64] Furthermore, the number of individuals with mental health disorders has been increasing in the Danish population, especially among young individuals.[65] In combination with a rising shortage of healthcare workers,[66] these factors are putting increasing pressure on the healthcare sector in Denmark, both financially and organisationally. Therefore, a focus on strengthening and accelerating the cohesive, collaborative and digital healthcare system will continue in the future years.

Two examples of planned initiatives to address the challenges are reviewed in the following.

21 health clusters are planned to be established to strengthen local health services.

One initiative to deal with the demographic challenges in Denmark is the gradual rearrangement so **more citizens will receive offers of treatment, rehabilitation, prevention and nursing care in their immediate environment** instead of in specialised hospitals. The goal is to solve more treatment and follow-up on patients in the primary sector (incl. GPs, special practitioners, the municipality and in the patient's home). As a part of the solution, a new political agreement is to be implemented in 2022, which will simplify and strengthen the current structure in each region and establish new binding and formalised '**Health Clusters**' around each of the 21 emergency departments in Denmark. The health clusters will consist of representatives from all sectors, i.e. from the hospitals/regions, municipality and general practice from the coverage area of the emergency department. The health clusters are a necessary step for a sustainable Danish healthcare system in the future and an instrument to support the collaboration across the healthcare system and to create coherence for the patients and relatives.[67] Moreover, the Danish government has recently proposed to establish 20 local health centres with hospital functions, municipal healthcare services and possibly GPs to ensure that patients have access to coherent treatment closer to their homes.[68]

COVID-19 has highlighted the importance of a world-class healthcare system and a strong and innovative life science industry, as well as the interaction between the two. A new broad agreement between the Danish government and different parties on a **Danish Life Science Strategy** in 2021 builds on

A Danish Life Science Strategy and a public-private task force have been established.

these experiences to address other healthcare challenges, one of which is the increase in elderly and people with chronic conditions. Thus, part of the Danish Life Science Strategy focuses on the need to strengthen the quality of prevention, treatment and rehabilitation of chronic diseases, to support coherence across sectors and to reduce inequality in chronic disease. For this reason, the strategy, among other things, allocates EUR 550,000 in 2021 and 2022, and EUR 520,000 in 2023 to a **task force for initiatives targeting chronic disease and inequality in health.** The task force involves a broad participation of both public and private actors, including the Ministry of Health, the Danish Health Authority, the Danish Health Data Authority, the Ministry of Industry, Business and Financial Affairs, Danish Regions and Local Government Denmark (KL), as well as the life science industry. The task force will create a base for strengthening the quality of prevention, treatment and rehabilitation, supporting coherence across sectors and reducing inequality in chronic disease. A central part of the initiative is to support the development of the systematic collection, use and sharing of data in the municipal efforts and in processes across municipalities, general practice and hospitals. Furthermore, a framework analysis of where new technologies can support good treatment of patients and increased involvement of healthcare professionals will be conducted by the task force.[69 70]

APPENDIX A: HEALTH INDICATORS

Demography

As many other European countries, Denmark has a **growing proportion of ageing individuals**, as seen in the rising share of the population over the age of 65 (cf. Figure 7). This development is very similar to that of France.

Figure 7 *Share of population over age 65* [71]

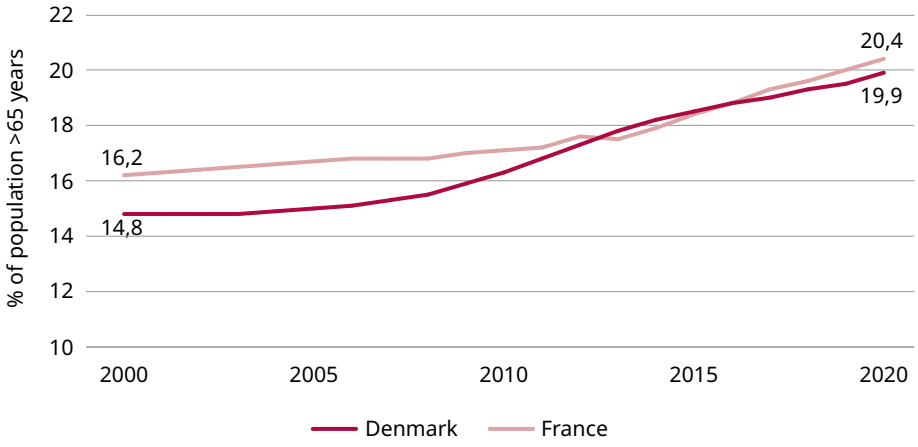
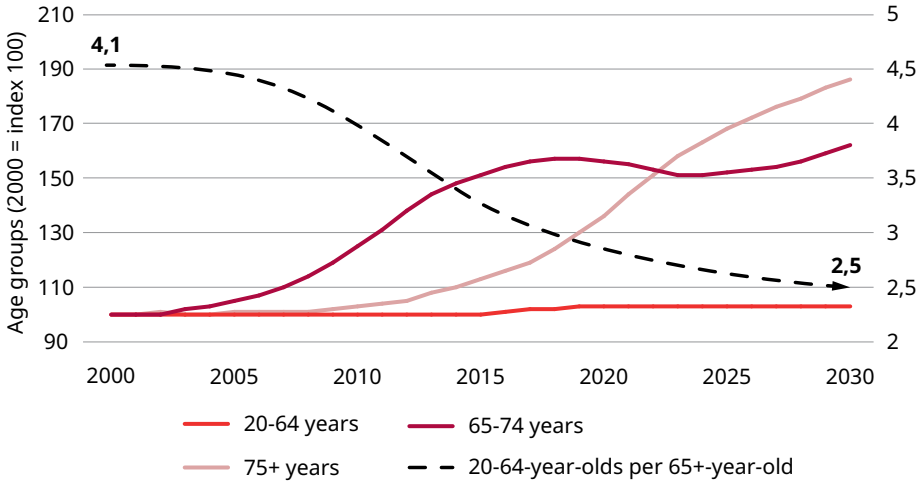


Figure 8 shows more nuances of the demographic development in Denmark. While the share of the population older than the age of 65 is rising, the share of 20-64-year-olds, who are part of the Danish workforce, remains relatively consistent. Thus, the ratio of 20-64-year-olds per 65+year old is steadily decreasing, which means that there will be fewer and fewer tax payers and potential health workers to pay for and take care of the ageing population.

Figure 8 *Demographic development in Denmark – development in tax payers and potential health workers* [72]



At the same time, **life expectancy** at birth in Denmark has increased by almost five years from 76.9 years in 2000 to 81.6 years in 2020. In the same years, life expectancy in France increased by three years from 79.2 in 2000 to 82.3 in 2020.

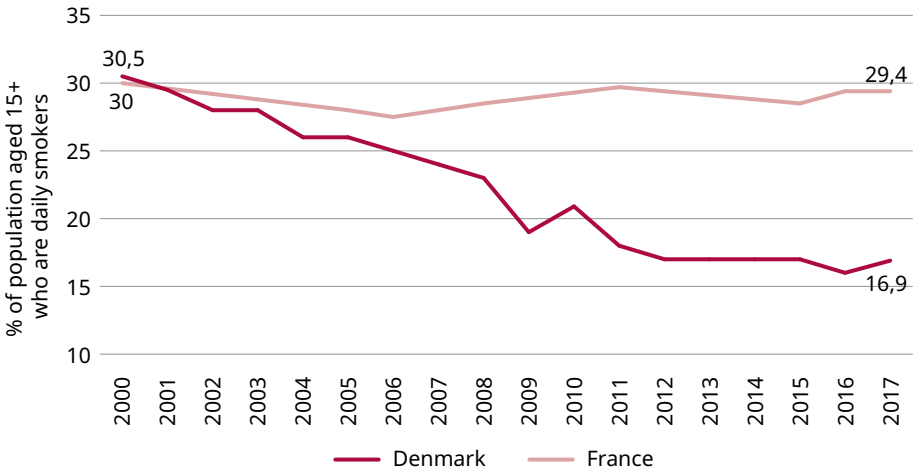
Danish women have a higher life expectancy (83.6 years in 2020) than Danish men (79.6 years in 2020).[73] The same goes for France with a life expectancy in 2020 at 85.3 years for women and 79.2 for men.

Health risk factors

Internationally, the Danish health status is characterised as relatively good. However, several risk factors affect the health status in Denmark, the most common being **obesity, tobacco and alcohol** consumption.

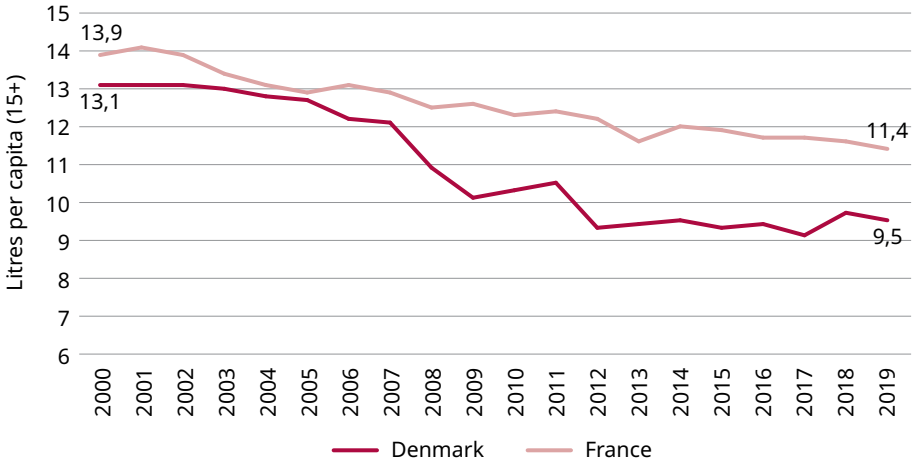
17 per cent of Danish adults were **daily smokers** in 2017. The prevalence was down from 30 per cent in 2000.[74] In contrast, while starting at approximately the same number in 2000, France has seen a rise in the number of daily smokers and is now at a significantly higher level than Denmark (cf. Figure 9).

Figure 9 *Development in prevalence of daily smokers* [75]



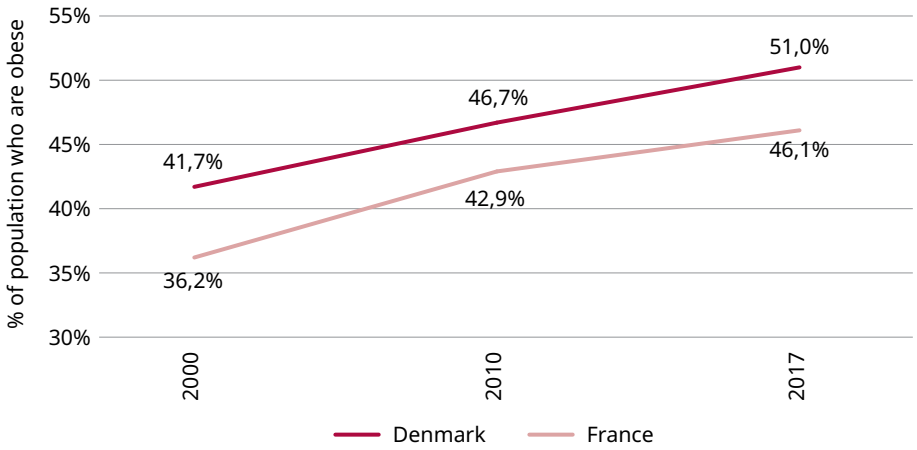
In 2017, 37 per cent of Danish adults reported **regular heavy alcohol consumption.** This makes alcohol consumption an important public health issue in Denmark.[76] However, alcohol consumption has decreased since 2000, and in 2019, the consumption amounted to 9.5 litres per capita (15+). This is lower than that of France, which was at 11.4 litres per capita in 2020 (cf. Figure 10).

Figure 10 *Development in prevalence of alcohol consumption* [77]



The **obesity rate** in Denmark was 51 per cent in 2017. As in many other countries, the prevalence is rising, which is also the case in France. However, the obesity rate in Denmark is higher than that of France (cf. Figure 11).[78]

Figure 11 *Development in prevalence of obesity* [79]



The leading causes of death in Denmark are **cancer and cardiovascular and respiratory diseases**, which are linked to the above-mentioned behavioural health risk factors. For instance, lung cancer remains the most frequent cause of cancer death among the Danish population.

Looking closer at the ageing Danish population, almost half of the population over age 65 have at least one chronic disease. Furthermore, life expectancy at the age of 65 is 19.6 years, of which 8.1 years are with disability.[80] The number of deaths due to behavioural or mental health disorders has risen in Denmark since 2000 (cf. Figure 12). It has been relatively consistent in France.[81]

Figure 12 *Development in deaths per 100,000 due to mental health and behavioural disorders in Denmark and France* [82]

Year	2000	2008	2016
Denmark	29,3	52,2	54,8
France	27,6	23,3	27,0

Healthcare expenditure

It appears that the ageing population, the behavioural health risks and the growing challenge of poor mental health post considerable challenges to the health authorities, also cost-driving challenges. The accomplishments in terms of effectiveness and cost-effectiveness of the healthcare system should be seen in relation to these considerable challenges – challenges that are very much like those of other European countries. In some areas (tobacco and alcohol consumption – and accompanying diseases), the Danish society faces bigger challenges than many other countries.

Compared to other European countries, **the average bed days** per population in Denmark is very low at five bed days per 1000.[83] This has been achieved, because Denmark has reduced the number of delayed discharges from hospitals (i.e. the length of stay for patients who no longer need to remain in hospital has been reduced). This also means that the amount of hospital beds per population in Denmark is low compared to other OECD countries, such as France (cf. Figure 13). Furthermore, the average length of stay (ALOS) in hospitals is relatively low in Denmark (cf. Figure 14). These numbers have decreased over the past decade with no discernible reduction in quality.[84] This indicates that the Danish hospital system is functioning more efficiently than earlier.[85]

Figure 13 *Development in number of hospital beds per population* [86]

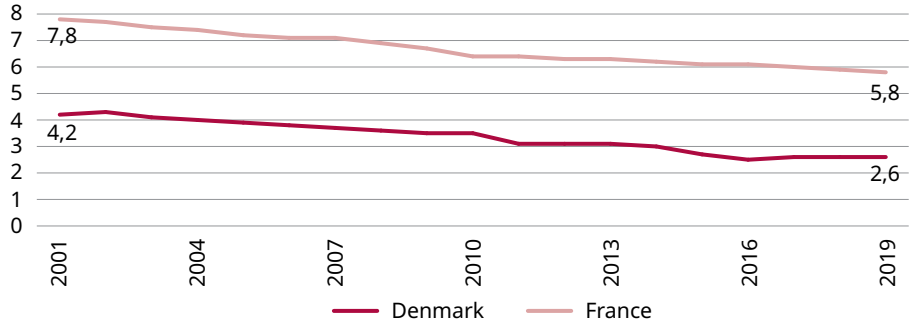
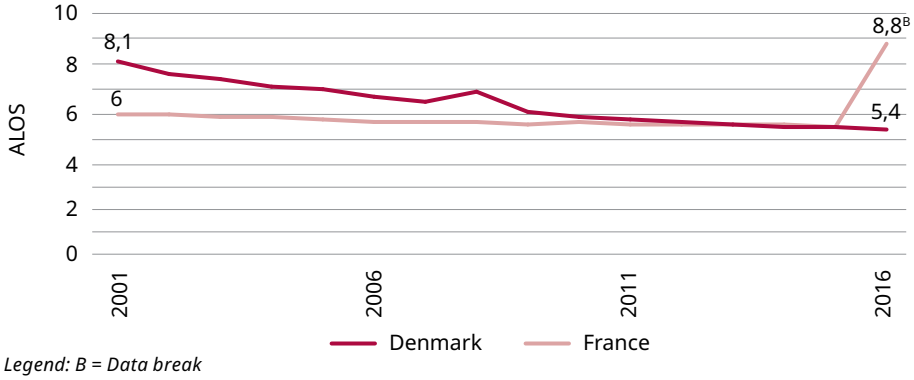


Figure 14 *Development in average length of stay* [87]



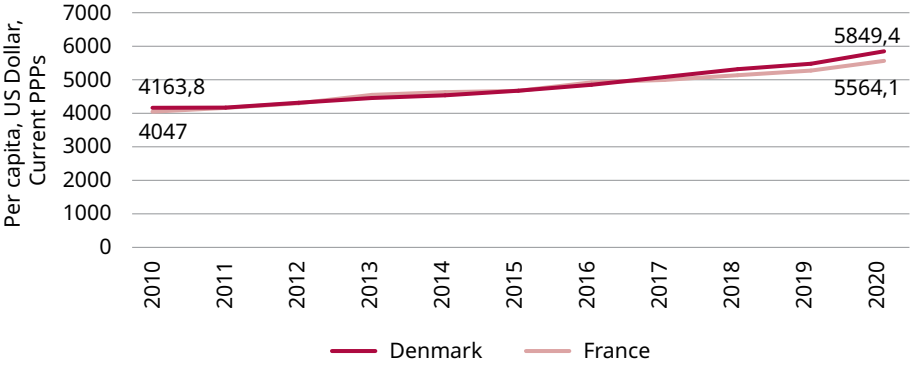
Legend: B = Data break

The number of employees in hospitals per bed is on the other hand almost 2.5 times as high in Denmark as in France.[88] In 2018, there were almost 7.9 employees per bed in Denmark against 3.3 in France.

As more and more activity takes place on an outpatient basis in Danish hospitals, the calculation of both the number of beds and the average length of stay has become less relevant. Consequently, Denmark has changed the definition of a hospital stay. Previously, a bed day was defined as an admission to a prescribed bed. Today, the statistics distinguish between inpatients and outpatients. An inpatient stay is defined as a hospital stay of 12 hours or more, while an outpatient stay is defined as a hospital stay of less than 12 hours duration.[89] From 2009 to 2018, the number of somatic outpatient stays in Danish hospitals increased by 40 per cent.[90]

The **cost per capita health spending** amounted to USD 5,849.4 in Denmark in 2020 (cf. Figure 15). In total, health spending constituted 10.6 per cent of the GDP in Denmark and 12.4 per cent of the GDP in France in 2020.[91] Health spending in Denmark has increased at a moderate rate over the past 10 years, comparable to that of France. In general, the health expenditure of the two countries is relatively similar.

Figure 15 *Development of cost per capita health spending* [92]



REFERENCES

[1] Ministry of Health and Healthcare Denmark, 2017: Healthcare in Denmark. An Overview.

[2] Indenrigs- og Økonomiministeriet, 2013: Evaluation of the Local Government Reform March 2013

[3] Ministry of Health and Healthcare Denmark, 2017: Healthcare in Denmark. An Overview.

[4] Ministry of Health and Healthcare Denmark, 2017: Healthcare in Denmark. An Overview.

[5] Ministry of Health and Healthcare Denmark, 2017: Healthcare in Denmark. An Overview.

[6] State of Health in the EU. Denmark. Country Health Profile. 2021. Pp. 8.

[7] State of Health in the EU. Denmark. Country Health Profile. 2021. Pp. 10.

[8] The Commonwealth Fund, 2020. International Health Care System Profiles.

[9] VIVE, Tange Larsen, A., Bonde Klausen M. and Højgaard, B., 2020: Primary Health Care in the Nordic Countries. Comparative Analysis and Identification of Challenges.

[10] Social- og Indenrigsministeriet, 2020: Generelle tilskud til regionerne 2021. Juni 2021

[11] Social- og Indenrigsministeriet, 2020: Generelle tilskud til regionerne 2021. Juni 2021

[12] Vallgårda, S & Krasnik, A (red), 2016, Sundhedsvæsen og sundhedspolitik. 3 udgave, Munksgaard, København.

[13] Ministry of Health and Healthcare Denmark, 2017: Healthcare in Denmark. An Overview.

[14] The Commonwealth Fund, 2020. International Health Care System Profiles.

[15] Ministry of Health and Healthcare Denmark, 2017: Healthcare in Denmark. An Overview.

[16] The Danish Health Authority, 2022: Responsibilities.

[17] Sundhedsstyrelsen, 2007. Forebyggelse og sundhedsfremme i kommunen – en vejledning til Sundhedslovens §119 stk. 1 og 2

[18] Ministry of Health and Healthcare Denmark, 2017: Healthcare in Denmark. An Overview.

[19] Schmidt, Morten et al, 2019. The Danish health care system and epidemiological research: from health care contacts to database records." Clinical epidemiology vol. 11, 563-591.

[20] Ministry of Health, 2018: National goals of the Danish Healthcare System

[21] Sundhedsministeriet, Danske Regioner, Kommunernes Landsforening, 2021. Nationale mål for sundhedsvæsenet.

[22] The Ministry og Health's homepage 2021: https://sum.dk/temaer/8-nationale-maal-for-sundhedsvaesenet

[23] Schmidt, Morten et al, 2019. The Danish healthcare system and epidemiological research: from health care contacts to database records." Clinical epidemiology vol. 11, 563-591.

[24] The Commonwealth Fund, 2020. International Health Care System Profiles.

[25] Ministry of Health and Healthcare Denmark, 2017: Healthcare in Denmark. An Overview.

[26] Schmidt, Morten et al, 2019. The Danish health care system and epidemiological research: from health care contacts to database records." Clinical epidemiology vol. 11, 563-591.

[27] Ministry of Health and Healthcare Denmark, 2017: Healthcare in Denmark. An Overview.

[28] OECD, 2021. State of Health in the EU. Denmark. Country Health Profile 2019.

[29] CEPOS, 2019: Privathospitalernes markedsandele er halveret på 10 år. Notat. Af Mia Amalie Holstein. Link til artikel: https://cepos.dk/artikler/privathospitalernes-markedsandel-er-halveret-paa-10-aar

[30] Christiansen, T, 2012: Ten years of structural reforms in Danish healthcare. Health Policy, Volume 106, Issue 2, July 2012, Pages 114-119

[31] Christiansen, T., Vrangbæk, K. Hospital centralization and performance in Denmark – ten years on. COHERE discussion paper No.7/2017. University of Southern Denmark.

[32] State of Health in the EU. Denmark. Country Health Profile 2019.

[33] Ministry of Health, 2021: The Danish Super Hospital Programme

[34] Ministry of Health, 2021: The Danish Super Hospital Programme

[35] Ministry of Health, 2021: The Danish Super Hospital Programme

[36] The Commonwealth Fund, 2020. International Health Care System Profiles.

[37] Ministry of Health and Healthcare Denmark, 2017: Healthcare in Denmark. An Overview.

[38] Ministry of Health and Healthcare Denmark, 2017: Healthcare in Denmark. An Overview.

[39] Schmidt, Morten et al, 2019. The Danish health care system and epidemiological research: from health care contacts to database records." Clinical epidemiology vol. 11, 563-591

[40] Ministry of Health and Healthcare Denmark, 2017: Healthcare in Denmark. An Overview.

[41] Schmidt, Morten et al, 2019. The Danish health care system and epidemiological research: from health care contacts to database records." Clinical epidemiology vol. 11, 563-591

[42] Schmidt, Morten et al, 2019. The Danish health care system and epidemiological research: from health care contacts to database records." Clinical epidemiology vol. 11, 563-591.

[43] Ministry of Health and Healthcare Denmark, 2017: Healthcare in Denmark. An Overview.

[44] State of Health in the EU. Denmark. Country Health Profile 2019.

[45] OECD, 2021: State of Health in the EU Denmark Country Health Profile 2021

[46] Danish Health Authority, 2021. Health agreements.

[47] Ministry of Health, 2018. Executive order on health coordination committees and health agreements – legal information.

[48] Region Midtjylland, 2019. Et nært og sammenhængende sundhedsvæsen i balance

[49] All Can, 2021. Danish Cancer Patient Pathways: three-legged strategy for faster referral and diagnosis of cancer.

[50] Sundhedsstyrelsen, 2020. Kræftpakkeforløb og opfølgningsprogrammer for fagfolk. Materiale til fagfolk

[51] Sundhedsstyrelsen, 2020. Kræftpakkeforløb.

[52] Sundhedsstyrelsen, 2020. Hjertesygdom. Anbefalinger og vejledninger

[53] Dansk Cardiologisk selskab, 2021. Hjerterehabilitering

[54] Dansk Cardiologisk selskab, 2021. Hjerterehabilitering

[55] Steno Diabetes Centre, 2021. Establishment of five danish steno diabetes centres.

[56] Novo Nordisk Fonden, 2021. Steno Diabetes Centre.

[57] Ministry of Foreign Affairs of Denmark, 2021. Denmark sets the agenda for digital healthcare.

[58] Ministry of Foreign Affairs of Denmark, 2021. Denmark sets the agenda for digital healthcare.

[59] Health EUROPA, 2021: COVID-19's influence on digital healthcare in Denmark. Health Policy News, 8th July 2021: https: //www.healtheuropa.eu/covid-and-digital-healthcare-in-denmark/109800/

[60] Health Europa, 2021. COVID-19's influence on digital healthcare in Denmark.

[61] Danish Ministry of Health Danish Ministry of Finance Danish Regions Local Government Denmark, 2018: A Coherent and Trustworthy Health Network for All DIGITAL HEALTH STRATEGY 2018–2022.

[62] Healthcare Denmark, 2021. Danish e-health portal sets a new record with high visitor numbers.

[63] Statistic Denmark, 2019-2020. Life expectancy.

[64] Olejaz M, Juul Nielsen A, Rudkjøbing A, Okkels Birk H, Krasnik A, Hernández-Quevedo C, 2012. Health system review. Health Systems in Transition, 14(2):1 – 192.

[65] Healthcare Denmark, 2021. The Danish Approach to Mental Health.

[66] Region Midtjylland, 2018. Behovet for velfærdsuddannede i Region Midtjylland

[67] Regeringen, Danske Regioner, Kommunernes Landsforening, 2021. Aftale om sammenhæng og nærhed (sundhedsklynger).

[68] Regeringen, 2021. Tættere på II. Sundhed, uddannelse og lokal udvikling.

[69] Ministry of Industry, Business and Financial Affairs, 2021 Agreement on a strategy for life science.

[70] Sundhedsministeriets, 2021. Ny task force målrettet kronisk sygdom og ulighed i sundhed skal styrke kvalitet og sammenhæng og på samme tid styrke dansk life science: https://sum.dk/nyheder/2021/april/ny-task-force-maalrettet-kronisk-sygdom-og-ulighed-i-sundhed-skal-styrke-kvalitet-og-sammenhaeng-og-paa-samme-tid-styrke-dansk-life-science

[71] OECD Statistics. Demographic References: Population age structure.

[72] Danmarks Statistik, 2021. Statistikbanken.dk, FOLK2 og FRDK117.

[73] OECD Statistics. Health Status: Life expectancy.

[74] State of Health in the EU. Denmark. Country Health Profile 2019.

[75] OECD Statistics. Health Status – Non-medical Determinants of Health: Tobacco consumption.

[76] State of Health in the EU. Denmark. Country Health Profile 2019.

[77] OECD Statistics. Health Status – Non-medical Determinants of Health: Alcohol consumption.

[78] OECD Statistics. Health Indicators, Non-Medical Determinants of Health, Overweight population, self-reported.

[79] OECD Statistics. Health Status – Non-medical Determinants of Health: Body weight.

[80] State of Health in the EU. Denmark. Country Health Profile 2019.

[81] OECD Statistics. Health Status: Mortality.

[82] OECD Statistics. Health Status: Mortality.

[83] State of Health in the EU. Denmark. Country Health Profile 2019.

[84] State of Health in the EU. Denmark. Country Health Profile 2019.

[85] State of Health in the EU. Denmark. Country Health Profile 2019.

[86] OECD Statistics. Health Care Resources: Hospital beds.

[87] OECD Statistics. Health Care Resources.

[88] OECD Statistics. Health Care Resources. Hospital beds and Total hospital employment

[89] Sundhedsdatastyrelsen, 2019: Nye nøgletal for indlagte og ambulante patienter på sygehuse. 19. december 2019

[90] Sundhedsdatastyrelsen, 2019: Nye nøgletal for indlagte og ambulante patienter på sygehuse. 19. december 2019

[91] OECD Statistics. Health expenditure and financing.

[92] OECD Statistics. Health expenditure and financing.

www.um.dk/da/danida