



The Future of the Danish Healthcare System (2030)



SCENARIO REPORT
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Foreword

Denmark has a strong public health system that promises equal access to all. It is underpinned by broad public support and forms one of the key pillars of the Danish welfare system. The system is seen as a requirement for the solid Danish research position, which has been a driver for the Danish biotech and pharmaceutical industries.

In the coming decade, the Danish healthcare system will face some major challenges. If these challenges are not met proactively, it could have significant negative consequences for citizens as well as our societal structure in general. Among the most important challenges we find:

- Growing health expenses
- Global, transboundary technological advances
- Growing polarisation in access to health services

The Danish healthcare system has historically been characterised by rising health expenses, reflecting increasing wealth and a growing number of treatments available. From 2000 to 2015, healthcare expenses for instance rose from 8.1% to 10.6% of the national GDP.¹ Public expenses for the healthcare system today (2017) make up DKK 155 billion, corresponding to 30% of public expenses.² Without a new approach to Danish healthcare, there is no indication that we can expect the overall health expenses to stabilise. Meanwhile, there is a rising prevalence of lifestyle disorders, including mental disorders, a growing elderly population in need of care, and a gradual shift in the concept of health from being defined as ‘the absence of sickness’ to health being ‘the good life’.

Global advances in technology provide many new opportunities that are already revolutionising the field of health. In the digital world, everything is easily accessible and citizens expect rapid responses. Citizens are both inspired by and influenced by commercial, global health and technology actors that offer services through many channels. Direct and individualised health solutions are supported by new technologies, including apps and wearables, as well as personal medicine and preventive treatment. At the same time, we see the tip of an automation wave in health that promises savings and better treatment for those prepared to capitalise on their potential. All these factors tighten the conditions in Denmark for a smoothly

¹ OECD – 2017

² Danish Ministry of Health – 2017

functioning public healthcare system, and with this, the demand to remain relevant to all sections of Danish society.

Even though the Danish, public healthcare system is fundamentally based on equal access to all, we witness clear polarisation on several fronts. The polarisation in access to healthcare was increased some years ago, especially when employer-paid health insurance provided better access to healthcare for people in employment. We also observe a clear connection between socioeconomic conditions and co-morbidities and lifestyle disorders. The most expensive one percent of Danish patients represent 30% of overall regional healthcare expenses in Denmark, while the most expensive 10% are responsible for 75% of the overall Danish healthcare costs. A large share of the expensive patients has multiple disorders and circulate in the system for years without becoming well. Over time, continued polarisation may well erode the social solidarity that underlies the Danish health system.

For the above reasons, there is a need to make some proactive choices about how future developments in healthcare can be met. There also lies a parallel challenge of articulating these choices, since much of the debate is based on different concepts of health and non-explicit ideas about the future. In this report, we direct the focus to the choices we face in relation to possible futures for the Danish healthcare system. With this, we hope to create a solid basis for the necessary dialogue.

Enjoy reading!

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Introduction

This report was developed to support decision-makers in our society, as well as others with an interest in challenging the assumptions and presumptions about the future of the Danish healthcare system.

We focus on the future of the Danish healthcare system in 2030 and which paths these developments may take. The paths are outlined in four scenarios that each contain both opportunities and challenges for the Danish society, including the public healthcare sector and the Danish life science sector. The report provides recommendations around core issues that should be addressed by the Danish healthcare system to ensure it will remain the best for the Danish society in the future.

The report has been produced in collaboration with 29 participants from the Danish healthcare and life science sector. The participants constitute a broad range of representatives from central public institutions, private actors, professional organisations, and interest groups (see Participants). The Copenhagen Institute for Futures Studies (CIFS) has facilitated the collaboration over four workshops between January and June 2017, including providing research, interviews, methods, scenario process, and regular production of material and iterative results. This comprehensive report reflects the participants' consolidated view of the health environment and future opportunities and challenges for development, including the participants' consolidated evaluations of future trends, themes, and uncertainties, as identified by CIFS and the participants.

During the workshop, the participants consolidated their views of the health environment to develop the scenarios. At the end of the process the participants evaluated what they saw as the most desirable scenario for the future healthcare system and what they saw as the most likely scenario. In general, the participants agreed that they would like to see a future scenario with a strong focus on a proactive approach to healthy growth and innovation, combined with strong national control rather than free organisation. The view, however, was that the most likely future scenario was less proactive and a bit more freely organised than desired. The result was hence a discrepancy between expectations and hopes for the future healthcare system. In light of this, the participants in the report have produced a range of concrete recommendations to create the greatest possible momentum in the healthcare field



From megatrends to future scenarios

To act strategically in the present, we must be conscious of the future. For this, working with megatrends is a good tool (see figure 1). Megatrends are currents that are already present and influence all aspects of society from economy to private lives, making them very solid. Megatrends represent our presumed knowledge about the likely future and have three characteristics: A timeframe of at least 10-15 years, wide-ranging influence, and large effect.

Figure 1: CIFS's 14 megatrends

Technological advances	Globalisation
The use of science or technology for all sorts of purposes. Covers both the development and use of technology.	Increased interaction between and integration of people, culture, companies, and governments from different countries and regions. Global currents of information, technology, products, labour, services, and capital.
Sustainability	Economic growth
Addressing today's needs without impacting the ability of future generations to address their needs.	Overall growth in productivity and hence growth in wealth at a global level.
Knowledge society	Acceleration and complexity
Increasingly better educated populations and the growing economic value of knowledge, where skills, information, and data become the most important economic assets.	Shorter company life cycles. Constant development in innovation and products as well as greater industry convergence.
Commercialisation	Network society
Areas in society and the public sector are made subject to commercial business.	Increased use of networks in social and organisational structures.
Focus on Health	Demographic development
A global movement towards improving health and physical wellbeing across public, private, and professional spheres.	Measurable changes in demographics and a range of secular trends regarding population characteristics, distribution, and size – age, ethnicity, religion, family structure, education, and ways of living.
Individualisation	Polarisation
A growing desire for personally tailored products and services that are adapted to the individual user's or company's needs and interests.	Diverging health outcomes based on geographic and socio-economic factors.
Immaterialisation	Democratisation
Changes in our perceptions and values towards a greater focus on post-materialism – authenticity through focus on design, aesthetics, fashion, culture, storytelling, values, and experiences.	A transformational process where equality, access, and transparency are strengthened. A lot of democratization is about accountability, decentralisation, empowerment, and openness.

CIFS's megatrends were used in the preliminary process to identify and understand the currents, themes and dynamics that characterise the broader Danish healthcare system. We conducted research and interviews ahead of the process, and identified overarching trends and themes of relevance for the Danish healthcare system towards 2030. Through structured discussions, the participants contributed a wide range of additional insights and nuances regarding the future Danish healthcare system, which through a

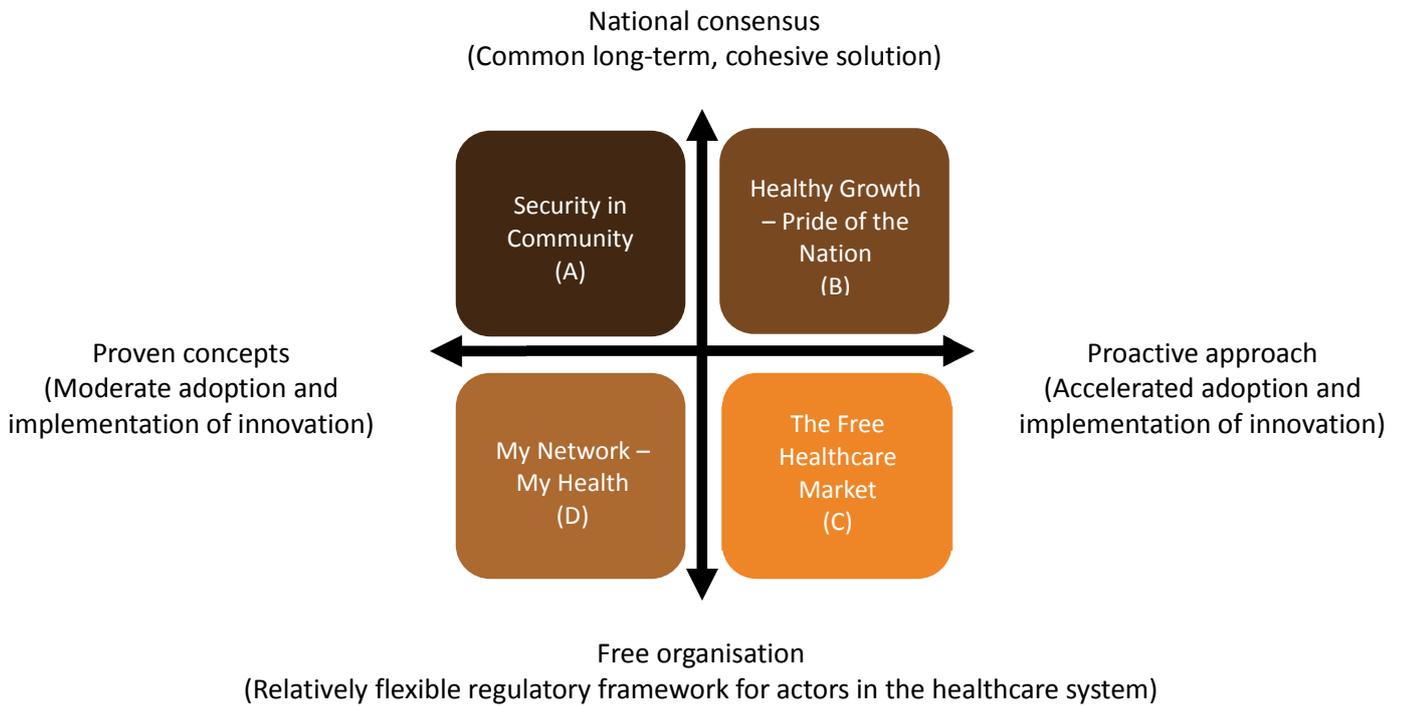
process of consolidation identified the central uncertainty points that can characterise the future of the Danish healthcare system.

Based on the degree of influence and uncertainty, the participants selected two central uncertainties among the many discussed subjects. The two uncertainties can be defined by these questions:

- *Will the Danish healthcare system be characterised by common long-term, cohesive regulatory frameworks – or will it be characterised by relatively flexible regulatory frameworks?*
- *Will the implementation and adoption of innovation happen at a moderate pace – or an accelerated one?*

These central uncertainties form the expanse between the polarities derived from the ‘uncertainty axes’ that frame the developed scenarios. The choice and description of the polarities (See Appendix I) outline the constraints for the four future scenarios. The combination of polarities hence guided the development of the individual scenarios, with a view to enhance the differences and similarities in various paths of development and evaluate future likelihoods and approaches (see figure 2). The scenarios should not be seen as isolated future scenarios, as the future healthcare system will most likely include significant characteristics from several of the scenarios.

Figure 2: Four scenarios for the Danish healthcare system in 2030



Over the following pages, we present the four future scenarios for the Danish healthcare system:

- A. *“Security in Community”* – a national focus on creating a safe and secure public healthcare system in Denmark.
- B. *“Healthy Growth – Pride of the Nation”* – national investments in making Denmark a technological frontier nation in healthcare, with the public sector as the hub.
- C. *“The Free Healthcare Market”* – many opportunities are offered, and it becomes less important if health offerings are foreign or domestic; public or private.
- D. *“My Network – My Health”* – citizens choose to face the development on their own, including defining the concept of health in personal networks.

The four scenarios are, to various degrees, characterised by the trends and themes that were identified by CIFS and the workshop participants. All scenarios are characterised by accelerating international development in healthcare, driven among other things by

globalisation and technological advances. A choice was made not to let any scenarios develop as a result of sudden or markedly changed conditions in the world, such as ‘wildcards’ like violent epidemics that significantly impact the Danish society, economic collapse of the Danish state, radically worsened international relations, or similar events.

The individual scenario descriptions are written according to a funnel-shaped disposition that visualise the scenario’s core tendencies. They begin with a short summary as a broad introduction, followed by a section about the dominant values and trends that characterise the environment in which the specific scenario plays out. The societal section outlines the political framework, the technological paradigm, ethical considerations, and the use of citizen data. This leads up to the healthcare system’s organisation based on the scenario’s defining health paradigm, suppliers of healthcare services, financing, social cohesion, competition, degree of decentralisation of hospitals, preventive healthcare, genetics, health challenges, etc. The ‘citizen’ section describes the individual citizen’s healthcare demands, democratisation of health, use of technology, etc. This is followed by a short overview of development in the Danish life science sector in the ‘business’ section. To round out each scenario, the individual sections are recapped through an example of ‘a citizen’s experience’, as it could look more concretely.

Overview of the four scenarios



A. Security in Community

In 2030, the Danish society revolves around the community, where the welfare society is regularly adjusted, developed, and updated. Quality of life is very important for Danes.

Denmark is a small country, which makes it possible to centralise most important functions – including healthcare. Over the last decade, cross-sector collaboration has been prioritised and much improved. Collaboration across sectors is still prioritised because the citizen’s experience of closeness is valued highly.

In spite of accelerating global technological advances, the Danish healthcare system is still based on national solutions that are inclusive of all citizens. It is more important that all citizens are reached, than for Denmark to lead in front with technological advances. The healthcare system requires tight control to deliver the desired quality at the desired cost. The system prioritises trust and stability and scrutinises new health solutions carefully before using them. Hence, collaboration and consensus between the political system and professional experts is important.

“Denmark is a small country, which makes it possible to centralise most important functions – including healthcare”

Environment and values

There is a strong, national feeling of community in Denmark and there is broad public support for retaining Denmark as a welfare society with a consensus on a single, national health strategy.

The Danish approach for dealing with international development is to create social cohesion and security, where every citizen is taken care of. As a consequence, not every advanced health service can be offered.

Society

On the political front, long-term, broad welfare solutions are negotiated. Newly implemented solutions in the Danish welfare system have greater success than before because of a greater general trust in their quality and value. National solutions are given more weight than international cooperations, and Scandinavia is given higher weight than the rest of the world.

Technology is a tool for supporting and improving solutions that lie within the national strategy. Care is taken to not implement too many new technological solutions until they are tried and tested. The focus is to give aid to the people who are not able to manage on their own. For this reason, there is moderate adoption of new technology, innovation, and knowledge.

Citizen data is handled in common platforms where data security is prioritised very highly. Data sharing takes place in a closed ecosystem, primarily within the nation's borders.

The ethical priority in 2030 is to be of the greatest benefit to the most people, which in turn deprioritises the most expensive treatments for the few who need them.

Healthcare system

Over the last decade, the healthcare system has developed at a slow but steady pace, while the basic model has been retained. The system primarily consists of Danish public health suppliers and is financed through taxes. In addition, there is some private financing from e.g. larger funds. Commercial and philanthropic actors and interest groups offer some healthcare services that citizens may choose to purchase.

There is wide political agreement and strong public support to maintain the basic Danish welfare values while developing the healthcare system. Great value is given to solutions adapted to Danish conditions. Social cohesion is strengthened for Danish healthcare, and the public health sector's way of tackling pressure from the international private market has inspired confidence.

The concept of health has evolved somewhat over the last decade to have a greater focus on prevention. The gradual, systemic transition from health as a treatment service to preventive care means that the economic savings of the shift are not yet felt.

Denmark is not a frontrunner in the competition between the newest health solutions, but the nation is strong in implementing solutions, with a balance between the value for the individual citizen and the societal benefits. The health system focuses strongly on

realising and implementing good and thoroughly tested solutions. Once the system has found a solution that works, the solution has gained a stamp of approval – in both Danish and international contexts.

The Danish healthcare system has implemented standardized and certified solutions and created a cohesive health ecosystem. The hospital structure is very centralised and the hub for healthcare close to home. Public involvement is important, and the dangers related to hospital centralization have been met through local healthcare centres providing healthcare close to home. Great weight is put on early intervention and preventive measures. The overall public healthcare system has improved since 2017, and the patients' navigation through the healthcare system has also generally improved.

With a closed data infrastructure, the Danish healthcare system struggles to use the wealth of global data sets and knowledge in genetics to optimise and offer genetics-based health services.

Citizen

The public demands broadly accessible public healthcare with guaranteed treatment. Also in demand is the safe and secure use of health data. The most important thing is that there is public support for the implemented healthcare solutions and that citizens have sufficient awareness of their health.

All citizens have basically equal access to healthcare services and can expect equal treatment, with some influence over the place of treatment and the specific treatment. The system has succeeded in reducing the socio-economic differences that years ago turned out to determine significant differences in access to public healthcare services. Prevention is carried out collectively by many actors and through regulation, but also with health education throughout primary school. Citizens show moderate adoption of technology such as self-monitoring solutions, while the weakest still receive assistance.

In general, Danes have great faith in public treatment and handling of data and feel safe in sharing their information in central registers. There is also a certain expectation that citizens will share their data, just as there is overall consensus about getting vaccinated and donating organs.

Business

The Danish life sciences sector has strengthened. It has successfully implemented both medical and biotechnological solutions built on a strong foundation of data.

A citizen's experience of "Security in Community"

Torben, 76, went to see his doctor after discovering blood in his stools. At a follow-up examination, he was diagnosed with a precursor to cancer in his large intestine. The local healthcare centre initiates early intervention, including regular virtual consultations with Torben and offers him a selection of telemedicine solutions and wearables that send information to the central hospital in the region, allowing Torben to measure and follow his health situation. With his assigned health staff, he puts together a tailored treatment that takes into account his life situation— however, certain new, advanced treatments are not available. Through data sharing, the Danish healthcare system ensures a coherent treatment based on a national treatment guarantee, and Torben's health data is kept in a central, national data registry. Torben has confidence in how his personal health data is used. The hospital to which Torben is assigned collects, shares, and communicates his data from registries and wearables to all involved parties. Torben prefers that most treatments be handled at home, where he can receive support from his wife and family during his daily life. If Torben should desire a different treatment at a later stage, the system will offer an alternative in a public context.

B. Healthy Growth – Pride of the Nation

Denmark is a frontrunner in many fields, including healthcare. Healthcare is a focus area as it benefits citizens, business, and society.

The Danish healthcare system is based on a unified, politically determined, and forward-looking national strategy controlled by the public sector. The strategy contains clearly prioritised healthcare areas, including political prioritisation of research, education, organisation, systems, and public-private partnerships, which all are part of a unique ecosystem with an added focus on attracting international recognition and capital.

With good public systems and a population that shares data in central registers, Denmark is in a unique position to make use of the opportunities offered by new technology. The country demands to set the agenda on the international stage. The rapid pace of change challenges the healthcare system's public and private actors alike – and to some extent it occurs at the expense of those citizens who cannot quite keep up.

“The rapid pace of change challenges the healthcare system’s public and private actors alike”

Environment and values

Globally, technological development is characterised by first-mover successes in a ‘winner takes all’ environment. In Denmark, this development has been met with a consensus for common national strategies in selected areas with new technological opportunities.

Society

Politically, a foundation is laid for dynamic and adaptive frameworks that create good conditions for agile technological advances as well as for Nordic, European and global collaboration. Politicians take responsibility for carrying through these efforts.

Denmark embraces the 4th industrial revolution. A strengthened communication infrastructure, more focus on sustainable solutions, cyber-security, and extensive citizen-centric digitisation have made Denmark a hub for the development of technologically complex solutions in several fields.

The Danish welfare model has gained a more global outlook. The priority is still to take care of everybody, and a basic framework is hence laid where foreign solutions are adapted to Danish conditions. Danish solutions are used where it makes sense, and foreign solutions where Denmark is weaker. The innovative drive in society has created technology-savvy and globally minded groups that carry the nation's innovative capabilities.

Denmark's longstanding capacity and competences with public-private partnerships has inspired the pursuit of strategically selected areas. These are used today in an application-oriented approach to public-private collaboration.

Ethical considerations in 2030 are whether the Danish society has become too tech-optimistic by prioritising and choosing cutting-edge solutions for the individual at the potential cost of both safety and equal access for all.

Healthcare system

In Denmark, the healthcare paradigm is primarily technological and biologically data-driven. The healthcare system is mainly financed through taxes, but is developed further at the intersection between the public sector, the private market, and funds that have a vested interest in constantly improving the Danish healthcare system. More is invested than before in preventive and long-term healthcare solutions, and some of these digital services are developed also for the international market. More than ever, the public system collaborates with commercial and philanthropic actors, as well as interest groups, in a common supply system to capitalise on the many opportunities presented locally and abroad.

The Danish society has embraced technological advances and progress in healthcare. The healthcare system is developing agilely and in some areas in beta. There is a general openness for different and new business and service models. There is strong cohesion in the healthcare system; a result of an active effort to break down silos in a common national healthcare strategy that embraces innovation and patient involvement. Publicly and privately, there is considerable need for further education and a competence boost.

Centralisation has led to a need for offering decentralised solutions close to home in the form of health centres, clinics, and healthcare services in the citizens' home. Tasks are distributed where it makes most sense. The focus on technological solutions have empowered many citizens in their treatment through e.g. self-monitoring and self-medication. A high level of technology adoption is ensured among citizens with a greater focus on health communication. Technology adoption, however, is most pronounced among the people most open to it.

The health system's efficiency is measured by the value it creates, with a greater focus on output than input. Standardised and certified solutions are implemented, and there is a common platform for data processing and pooling various health data at both individual and aggregated levels. Data application is highly prioritised and used to position Denmark in front internationally as 'the Data Goldmine'; a hub for international data-driven healthcare, regulated nationally and internationally by the EU. New healthcare services drive up the cost of some treatments. The large expenses associated with the transition to preventive health and the focus on a more agile and tech-driven system are met by streamlining through automation, the increased use of self-help management, and reimbursement through value-based management.

Denmark is at the front internationally in specific areas, such as the use of genetics for both treatment and preventive healthcare measures. There is a proactive approach to the concept of health with a focus on prevention and early intervention – where information about lifestyle is given equal weight to clinical tests.

Citizen

Most Danish citizens expect and demand the latest solutions for treating and preventing illnesses.

The healthcare system focuses on increasing patient quality of life through patient involvement and support in decision making. This has contributed to a more coherent healthcare system where units and specialists work close together to tailor patient treatment. A significant amount of self-monitoring and data application is performed by the individual citizen, who has a large responsibility as co-creator of a healthy life. The healthcare system has an informed, educated, and interactive close-to-home approach for its users, supported by local health centres and advanced home care.

The concept of health is very broad and to some extent also covers wellbeing and quality of life. Healthcare service at home is regularly expanded through the citizens' personal devices. Most people are comfortable with sharing their personal data with the

relevant health actors' data systems, as well as health services at home. However, major socio-economic differences remain between those who can handle the dynamic technology adoption and those who cannot. The weakest citizens are supported through expanded welfare services.

Business

The Danish life science sector benefits from the strategic public efforts and has led to the establishment of powerful business clusters, underpinned by a dynamic regulatory framework for the use of citizens' personal as well as aggregated health data. Both the public healthcare sector and the private life sciences sector benefit through public-private partnerships from a high degree of mutual trust, as well as trust from the citizens.

A citizen's experience of "Healthy Growth – Pride of the Nation"

At age 76, Torben has an automated gene test done at the nearest hospital, which is correlated with Torben's dynamic health-related data. This shows a high risk of developing cancer in the large intestine. Hence, Torben is invited to take part in a Danish-developed trial for people in the risk category for developing bowel cancer, to which he consents. His health-related data is stored in a national data registry, which certified public, private, and global actors may access. Torben trusts the healthcare system's handling of his data, but he finds it difficult to grasp possible risks related to the trial. On the days where Torben has follow up hospital appointments, his wife comes along and assists him in understanding and delivering the health data required for the trial. As part of the strategy for data-driven solutions in home-based care, Torben is assigned a private healthcare navigator to help him start using his wearables, which measure, test, and register his health stats and health-related behaviour during his everyday life while the trial lasts.

C. The Free Healthcare Market

Global, technological advances are made every day and offer many new and interesting opportunities. The various opportunities are welcomed in Denmark, where they create a healthy competition about creating the most value.

In 2030, it has become less important, both politically and individually, if the new health services are foreign or domestic; private or public. The opportunities for the individual are valued higher than those for the community as a whole.

Citizens have generally become more demanding in all parameters. Presented with many competing health services, loyalty and patience are eroding. More space is given to private, global actors, while digital actors gain ground with business and service models that are individualised and tailored to the unique citizen.

In 2030, the field of healthcare has become more polarised than ever.

“Citizens have generally become more demanding in all parameters. Presented with many competing health services, loyalty and patience are eroding”

Environment and values

Through commercialisation, global technological advances offer many diverse solutions. In some areas, these global solutions outperform the nationally developed or adapted solutions in Denmark. Hence, the global solutions are in demand as a good supplement for the national offerings. It has generally become accepted to use and pay for globally developed, individually tailored solutions. However, not all have access to the new opportunities.

Society

Competition and a relatively free market facilitate innovation. The 4th industrial revolution has been embraced and made its mark in 2030. There is a state of international, ‘glocal’, and local collaboration between global companies, the state, and citizens. Major global actors and less specialised companies have a wide scope to offer and test new solutions in Denmark. Legal guidelines have made the handling and sharing of data easier and up to individual choice, allowing data to be easily shared between service provider and citizens on a case-by-case basis.

Free choice for the individual is highly valued, but institutions and citizens alike may find it hard to keep up with the rapid technological advances and navigate between the various offers by many actors.

Ethical considerations in 2030 are about unequal access to healthcare, based heavily on an individual’s technological, social, and economic resources.

Healthcare system

The political and administrative healthcare system have continually expanded the opportunities for freer competition between public and private actors to give citizens a greater range of more customised healthcare services in a global ecosystem. Prevention is seen as a personal, not political, responsibility. The main bulk of the public healthcare budget is channelled towards treating the chronically ill, those with multiple co-morbidities, and lifestyle diseases. Personal health is emphasized with services tailored to the individual and is driven by a new, value-based healthcare paradigm. Despite this, user charges for healthcare services have risen over the last decade and purchasing additional services and insurances have become common. Overall, the total Danish healthcare expenditure has risen.

Being part of a globally connected and digital world with open and internationalised healthcare systems, healthcare services in 2030 are offered and executed worldwide with increasing hyper-specialisation. The perception of health includes wellness in the broadest sense, whereby global tech and food companies, for example, are included as constituents of the new healthcare system. Health is so wide a concept that it ceases to be meaningful to speak of a single healthcare sector. A myriad of new actors offers healthcare solutions: global, national, local, private, public, small, big, new, and old actors, often coming from other industries, collectively form a healthcare ecosystem where services and solutions are offered to and from many different sectors. Besides

what is offered through the traditional public healthcare service, many kinds of new healthcare services contribute to cover citizen needs.

As such, there is fierce competition and pronounced blurring of sector barriers, where it is often hard to distinguish when an actor is a healthcare actor or not. This development and fragmentation, along with increased risks of overtreatment or malpractice, form some of the challenges of the free healthcare market. Technological and resource-related competences at the individual level crucially determine one's ability to make use of the possibilities, hence increasing the socio-economic polarisation between the unwell and the healthy. The evolution of perspectives on health, diagnosis, and treatment based on genetics is not uniform, but is widely used by different actors, particularly on the basis of a growing demand for personalised medicine.

Citizen

Citizens demand individualised healthcare services, and various solutions are combined – including preventive solutions. The individual citizen has the main responsibility for their own data, which can be used in many contexts. This provides great opportunities for the citizens who can make optimal use of their data.

The challenge for some citizens lies in gathering and acting on healthcare knowledge. This not only includes making sense of the many healthcare offerings, but also taking personal responsibility, and deciding on the right solution in the given situation.

The increased and partly uncoordinated purchase of new, self-financed, and individualised treatments has overall led to increased total healthcare expenses.

Responsibility for prevention lies with the individual together with their communities such as their workplaces. The insurance industry has become an influential actor that succeeded in raising the general state of health in parts of the population, by focusing on preventive health through direct contact with individual citizens.

Business

The liberalised Danish healthcare market attracts actors from around the world and creates symbioses of major global and lesser national actors that work with and across each other. Danish actors are, to an extent, subcontractors and niche suppliers for the major global actors, but because of its high technology level and value-based healthcare approach, Denmark has also succeeded in creating major independent commercial successes, including within personally adapted digital healthcare solutions.

A citizen's experience of "The Free Healthcare Market"

At 76 years of age, Torben has selected to undergo a gene test performed by a web-based private actor to detect any diseases he may be at risk of developing at a later stage and hence minimise possible private expenses for future treatment. The automatically generated results show a risk of Torben developing cancer in the large intestine. He then examines what his opportunities are to prevent this type of cancer. In 2030, it is difficult to get an overview of the multitude of health services from private, public, national, and international actors, and he thus seeks out a healthcare consultancy at his own expense. A healthcare navigator helps him gain insight into the quality and compatibility of the many services on the basis of his health data, which he shares directly with the consultancy. Torben is familiar with, but selective about, sharing his health data with various insurance brokers and the public data registry, since there generally is increased distrust in data security. Based on the healthcare navigator's advice, and through a family tip, he decides to fly to Stuttgart to visit a private company, which allows him to bring his wife and children and receive a gene therapy treatment to reduce his risk of cancer. The offering only includes treatment for cancer of the large intestine, since Torben cannot afford other, broader preventive measures.

D. My Network – My Health

In 2030, citizens have taken greater responsibility for attaining personal health. Diverse networks define the individual concept of health. Here, the view of health is constructed depending on the networks' aggregated opinions, knowledge, answers, and beliefs in the good life. Citizens organise themselves freely, globally as well as locally, according to their interests and values.

In the context of the Danish tradition for associations, local communities have flourished. They fill a space left open by the healthcare system, where the networks mainly cater to the social health challenges. Both citizens and the healthcare system shop around in the various networks that crop up. To many, the network they belong to has become a means to navigate in a complex landscape of health. In some networks, valuable knowledge is produced and shared – not just for the sake of the individual, but also for the overall understanding of health, which in turn forms the basis for personally tailored healthcare solutions. In some networks, opinions are developed that very much challenge other networks, not least the established healthcare system. There is fierce competition between the different networks and their often very diverse approaches to healthcare.

“In 2030, citizens have taken greater responsibility for attaining personal health”

Environment and values

As a counterpoint to global, technological advances and established elites, including centralised technocrats, the new technology supports the establishment of the network society. Besides creating expanded opportunities for democratising information, the new networks also address the basic needs of solidarity, security, and quality of life.

‘Glocal’ and local community patterns are valued highly. Their agendas are driven by diverse interest networks, trends, and technological services. Previously overlooked groups make demands on society by gathering in new, strong communities.

Society

In 2030, fewer state resources are spent on establishing uniform national strategies than was the case 10 years prior. Politically, very basic national frameworks and standards are provided for a vast undergrowth of local and glocal solutions with a large emphasis on local control. Volunteerism and active participation in networks are common in all aspects of society.

A certain level of system scepticism can be found in parts of the population. There is a desire to prioritise local solutions based on network-dependent and individual preferences. Hence, the adoption of technology in the population and in various industries is dependent on the networks to which one belongs.

The Danish society is rather heterogeneous. People organise in local and 'glocal' networks and proactively use local and spontaneously created solutions and structures. This is reflected in the population's views on life, which are based on values, opinions, experience, and fashion trends. Hence, solutions and structures are varied and diverse according to segments and associated needs. This constitutes a risk for silos and differentiation between networks.

The same goes for the use and handling of data, which takes place on a case-by-case basis between the individual citizen and local entities such as municipalities or networks. Citizens feel strong ownership over their personal data and share them carefully – mainly locally or through interest communities that they are part of and trust.

Ethical considerations in 2030 are about respecting and protecting the right of subcultures, and for individuals to choose their own services, and whether this right should take precedence over national strategies.

Healthcare system

The healthcare system is fragmented, with many new services and business models carried out by diverse networks and initiatives. A common factor among all of them is that they are locally based. While the public healthcare system provides and finances basic national healthcare services, flexible actors and organisations flood the healthcare market with individually tailored solutions through the locally anchored networks. Thus, the field of healthcare has become decentralised and diversified. Healthcare services are established in various management units, partly driven by networks and their healthcare measures and interests. This is also reflected in the financing of healthcare services, some of which are financed by philanthropy and volunteerism, while others are financed by local economic units and yet others by user charges. Overall, this heter-

ogeneous healthcare market has increased total healthcare expenses for both the citizen and the State.

In this network-based market, healthcare services are offered by municipalities, networks, companies, and organisations. In a society where healthcare offerings aren't joined in a single national healthcare strategy, the healthcare market is dominated by peer-to-peer solutions and relationships. Groups mobilise outside public healthcare and form strong communities. New and different types of treatment put pressure on the established system. Among healthcare actors and networks, many diverse and competing ideas of health exist, from one extreme to another. It is up to the individual citizen to decide which healthcare service is best. The big challenge for the healthcare system is thus to ensure individually adapted solutions while also ensuring an adequate standard level for all citizens.

The public healthcare system takes responsibility for setting and updating guidelines and advice. The expanded concept of health is embraced by training local general practitioners and health personnel in coaching individuals and meeting the citizens eye to eye. There is a pronounced effort on local solutions and health centres close to home that reflect citizens' values and opinions regarding health – which can be rather changeable. There are competing views in networks and geographical areas as well as a general distrust towards major actors and centralised systems, and hence, healthcare actors tend to be small and flexible. However, global actors offer services through locally anchored networks. Private health actors therefore consist of small companies and start-ups as well as global companies and networks.

Technological advances tend to be fragmented and diverse. Technology adoption is moderate, with many diverse technology solutions on the healthcare market. Smart solutions at home, mobile health, and automated assistance handle routine tasks. Some places show radical innovation.

The hyper-digital world is however not necessarily seen as positive unless, for example, data-driven health contributes directly to the individual citizen. Some networks are based on the many healthcare solutions offered by genetic research, diagnosis, and treatment, while other networks are sceptical about the use of genetics.

Since each network demands its own solutions be prioritized, there is an overall increased pressure to adopt technology in the healthcare system. Due to spiralling costs and competing agendas, it is a challenge to standardize health services and maintain

equal access for all. It has hence become harder for the State to take responsibility for public health.

Citizen

Citizens define their own health. This is done in collaboration with their networks and the local environment, where there is a demand for dialogue-based, bottom-up solutions and human closeness, local communities, and carers roles are prioritised. As public services find it harder to meet these healthcare service demands, it is normal for the individual to resort to patient networks and interest communities to find information and seek alternatives if desired.

You co-create your own health by looking for information and defining and sharing knowledge about health with your network. Here, volunteerism plays an important role for solutions close to home and preventive healthcare measures. Citizens often value local solutions for utility, opportunities, and preferences, but many also find treatments around the world through their network and attitude to health. One may co-finance research projects and, as a dedicated user of one's network, drive the development of new treatments. The values and existing knowledge of networks are used actively as support for decision-making in all aspects of the individual's health practices, and hence both citizens and suppliers must be willing to mobilise according to the necessary expertise. Technology adoption depends on the network, which may be sceptical or enthusiastic about the technological opportunities.

Access to healthcare solutions depends on the strength of the individual citizen's network, and hence, access has become somewhat unequal. However, even though there is a trend towards polarisation between the different segments, networks, and geographical areas, there is strong cohesion and a philosophy about equal access to health, since the communities are organised by a mentality of 'pulling together'.

Business

The Danish healthcare market consists of a multitude of submarkets and networks, which can be local, glocal, or international. The trend is for the commercial market to assume control of and professionalise successful networks. Denmark is seen as one of the world's most flexible healthcare markets. The market has forced healthcare providers to sharpen their solutions tailored to groups and individuals, and this has led to a Danish position of strength.

The rise of networks that support genetic research and new treatments using biomarkers also mean that more research is being done in this field. While some citizens

take active part by co-financing major research projects, others remain sceptical regarding genetic knowledge and diagnosis and treatments based on genetics.

A citizen's experience of "My Network – My Health"

After months of stomach pain and weight loss, Torben was diagnosed with Crohn's disease affecting the small bowel. Following a period of aggressive therapy, the local hospital suggests a trial of early intervention based on dietary and stress modification. Data on Torben's individual habits is already collected through his personal wearable. The data is kept in a local data registry, but he has chosen not to share it with the hospital as he is sceptical about data security. Torben is generally critical of the public healthcare sector and has his own view on health, and opinions on what is best for him. Besides the publically offered treatment, Torben seeks out various network groups that provide him with information and advice about Crohn's disease, including its supposed causes and triggers. Here, he finds like-minded people and chooses to donate part of his monthly income, and health data, to crowdfund a major treatment project set up by one of his new networks. Most recently, based on advice from his global network, Torben has researched about a new drug that was recently approved by the FDA in the USA. Torben and his local network strategically pressure the local hospital to offer the same therapy through the public health system, but due to a weakened national system, this cannot occur. Torben decides to order the treatment from overseas himself. Even though it costs more than he can afford, his network manages to cover the costs through crowd-funding.

The most desirable and the most likely scenario, and recommendations

On the basis of the scenario process, the workshop participants engaged in stimulating discussions regarding the future choices and challenges faced by the Danish healthcare system. At the end of the process, the participants were asked to relate to what they saw as the most desirable and the most likely future scenario, respectively. In addition, the participants had formulated a range of consensus recommendations based on the process. As such, these recommendations have broad backing in the Danish healthcare and life science sector, including public institutions, private actors, professional organisations, and interest groups.

Of the four scenarios for the Danish healthcare system in 2030, the participants generally agreed that scenario B, “Healthy Growth – Pride of the Nation” was the most desirable.³ There was a general desire that the healthcare system of the future mainly should be nationally managed rather than freely organised (79% to 21%) and a desire for a more proactive approach rather than an approach characterised by proven concepts (67% to 33%).

The participants considered the most likely scenario for 2030 mainly to be scenario A, “Security in Community”, though scenario B wasn’t entirely rejected.⁴ Among participants there thus is an expectation that healthcare system develops with freer organisation than is desirable and less proactively than desirable.⁵

From these results, the desirable scenario B was thus viewed to be roughly half as likely as desirable, which shows the relevance of continued debate.

³ This consensus is further nuanced as a desirable scenario that was a combination of scenarios A, B, C, and D with the respective weights of 22%, 57%, 10% og 11%

⁴ This consensus was also nuanced as a likely scenario combined of scenarios A, B, C, and D with the respective weights of 38%, 31%, 14% og 17%

⁵ Since scenario D, in particular, can be seen as lying somewhere between the two polarities, the difference between likelihood and desirability could be smaller.

Based on the entire scenario process, in combination with the individual participants' personal experiences and positions, the range of participants provided the following general recommendations:

- **Develop better political understanding and real recognition of the challenges facing the future Danish healthcare system**, by further supporting a common national vision and strategy initiated through collaboration between the state, regions, municipalities, and private actors, where Danish health is seen more as an *investment* than an *expense* for the society.
- **Initiate a culture change from local actor/department-strategic thinking to national-strategic thinking** with more openness to innovation, including upgrading the competence level at all levels.
- **Improve the opportunities for national execution of new measures, including knowledge sharing and competence development**, for example through better organisational clarification or better coordination and collection of initiatives, possibly with a neutral foundation/board structure or by having the regions establishing 'swot teams' to develop e.g. telemedicine in all their respective municipalities.
- **Clarify access to personal medicine**, including regulatory and ethical frameworks for clinical use and research.
- **Clarify the regulatory framework for handling and sharing data**, including the articulation of how society and citizens benefit from data sharing.
- **Clarify (the limits for) inequality in the Danish healthcare system**, including socio-economy, geography, and therapeutic areas.
- **Establish a common incentive-system across all healthcare actors**, capable of handling the remuneration of preventive early measures and personally tailored healthcare offerings – where reimbursement is shifted from 'fee for service' to 'fee for outcome'.
- **Establish a Ministry of Health and Growth** to support and drive the above agendas, with a view to harmonizing society's healthcare challenges, research, and growth potentials in business and the life science sector.



APPENDIX I – Description of polarities

National consensus (common long-term, cohesive solutions)

Denmark has in the period 2017-2030 been characterised by successful attempts to further develop and modernise the welfare society. Negotiation and collaboration between various stakeholders to agree upon common solutions, is considered very Danish. The political climate has been characterised by a desire to find durable solutions, rather than allowing present, short-term needs to overshadow the long haul. The underlying value is to carry everyone in the nation. Consensus and the ability to compromise are balanced against the need for visionary thinking for the long term. Special local solutions are not accepted; in turn, national solution and systems have gained ground. This has led to more management and centralisation of the systems. Innovation and original thinking are seen as something that should happen inside the system. It is seen as important that the secure framework in Denmark is expanded and that trust in the system and the system's solutions are maintained. Additionally, it is seen as an important criterion of success that citizens are treated equally so that it is not the citizen's personal position and resources that determine the quality of service they receive.

Free organisation (Relatively flexible framework for actors in the healthcare system)

The welfare system has been constructed with a view to all citizens being equal, but a single solution is not seen as fitting everyone. Many different solutions are received – with many different paths to achieving the desired goals. Hence, the system doesn't operate from a single, common welfare paradigm characterised by common management systems and rules. On the contrary, the period 2017-2030 has been characterised by a liberation of institutions and systems, with the opportunity to create different solutions for different needs. The innovative urge and the ability for original thinking are seen as more important than broad, unified collaboration, which means that cohesion and cooperation may suffer. Private, public, local, and international systems compete against each other to deliver the best solutions and services. Great emphasis is directed to provide the necessary conditions for people and organisations to deliver innovative solutions. Collaboration flourishes widely. How much the individual citizen benefits from the innovative solutions varies widely, and there is a trend towards clearer and greater inequality in society. The winners are those with the strongest networks, the best contacts and the most resources. The losers lack both networks and resources.

Proven concepts (Moderate adoption and implementation of innovation)

When Danes and Denmark look to the future, it happens from a pragmatic desire to find solutions that work well. This is also the case for using new technology. Safe and reliable service delivery is important, and hence adoption and implementation are moderate. Good solutions are seen as ones that arise when using technology, innovative business models, and new concepts after they have matured, beyond the teething troubles. This ensures evidence-based solutions and a financially sustainable healthcare system. There is a 'wait and see' approach to how quickly knowledge and innovation is adopted. The attitude towards proven concepts fits with the healthy scepticism of Danes before launching into new, unknown territory. Development hasn't stopped but using new things just because they are new is seen as meaningless. Using new things for efficiency and effect is on the other hand seen as meaningful for the mainly publicly financed healthcare. Healthcare services are perceived economically as a necessary expense, however this also means the public demands maximum benefit in return, including a steady development of the healthcare system. Hence, long-term preventive measures have not yet led to economic savings, but this is balanced by avoiding new, not thoroughly tested implementations.

Proactive approach (accelerated adoption and implementation of innovation)

Robots, AI, VR, AR, the Internet of Things, nanotechnology, big data, automated transport solutions, etc., were all once pure science fiction, but have now become reality. Technology, research and development are the most important drivers and form the basis for society's acceleration. Some people need to be nudged, while others simply need to be presented with new technological solutions, while yet others invent their own future and create their own solutions.

Changes and experimentation are a part of Danish lives. You live in a permanent beta version of your own life; an expression of a high adoption rate for knowledge and innovation with higher risk tolerance of the unproven. There is faith in that new preventive measures are implemented quickly and cover the population's need in a broad sense and contribute to improving public health.

The Danish society is one of the most digitised in the world, where data is processed intensively at an aggregated, stratified, and individualised level, where resources used for health are seen as an investment in the future.

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