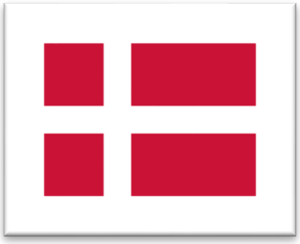
FORUM FÖR HEALTH POLICY

Digital transformation in health care and elderly care – a comparison of three countries



A report on Sweden, United Kingdom and Denmark
– September 2023

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Preface

In this report Forum for Health Policy gives a description of digital transformation in health care, specifically in Sweden, UK and Denmark. The report also gives some examples of how digital transformation are implemented in healthcare and elderly care in Sweden, UK and Denmark.

Many thanks to, **Peace Ojeka**, previously at Stockholm University, trainee at Forum for Health Policy 2022, author of this report.

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Head of Forum for Health Policy, September 2023

What is digital transformation?

Digital transformation refers to the adoption and integration of digital technologies in various aspects of an organization or industry, with the aim of enhancing efficiency, productivity, and service delivery. It involves the integration of technology into an organization's operations, products, and services to optimize business processes, improve customer experience, and create new revenue streams.[1]

In the healthcare sector, digital transformation involves the use of digital technologies to enhance the delivery of healthcare services, improve patient outcomes, and increase the efficiency of healthcare operations. This includes the adoption of electronic health records (EHRs), telemedicine, remote patient monitoring, and other technologies that support data analytics, AI-powered diagnosis, and personalized medicine.

Digital transformation in healthcare has the potential to improve patient outcomes by providing better access to healthcare services, reducing medical errors, and facilitating remote patient monitoring. It also improves the efficiency of healthcare operations by reducing administrative burden, improving communication between healthcare providers, and enhancing the sharing of patient data between different healthcare organizations.[2]

In elderly care, digital transformation involves the use of digital technologies to support the care of the aging population. This includes the use of wearables and remote monitoring devices to monitor vital signs, medication adherence, and mobility. It also includes the use of smart home technologies to enhance safety and security, and the use of telemedicine to facilitate remote consultations with healthcare providers.

Digital transformation in elderly care care has the potential to improve the quality of life for the elderly population by enabling them to age in place, reducing social isolation, and improving access to healthcare services. It also improves the efficiency of elderly care operations by reducing the need for in-person visits, improving communication between caregivers, and enhancing the sharing of patient data between different healthcare organizations.[3]

Overall, digital transformation is a key driver of innovation and competitiveness in various sectors, including healthcare and elderly care. By embracing digital technologies, healthcare organizations and elderly care providers can improve patient outcomes, enhance service delivery, and drive growth and innovation.

[1] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC9963556/
[2] https://health.ec.europa.eu/system/files/2019-11/022_digitaltransformation_en_0.pdf
[3] https://bmcgeriatr.biomedcentral.com/articles/10.1186/s12877-021-02338-z

Importance of digital transformation in today's healthcare

Digital transformation is becoming increasingly important in healthcare as it has the potential to improve the quality of care, enhance patient outcomes, and reduce healthcare costs. Below are some of the key reasons why digital transformation is critical in healthcare today:

- **Improved patient outcomes**: Digital transformation enables healthcare providers to use data-driven insights to make informed decisions about patient care. This includes the use of electronic health records (EHRs), predictive analytics, and artificial intelligence (AI) to provide personalized medicine, early detection of diseases, and more accurate diagnosis
- **Increased efficiency**: Digital technologies such as telemedicine and remote patient monitoring can help to reduce the burden on healthcare providers by allowing patients to receive care from the comfort of their homes. This not only saves time and resources but also helps to reduce the spread of infectious diseases.
- **Better patient experience**: Digital transformation can improve the patient experience by providing easier access to healthcare services, improving communication between patients and healthcare providers, and reducing wait times.
- **Cost savings**: By reducing administrative burden and streamlining healthcare operations, digital transformation can help to reduce healthcare costs. This includes the use of AI to automate administrative tasks, the use of EHRs to reduce paperwork, and the use of telemedicine to reduce the need for in-person visits.
- **Improved collaboration**: Digital transformation enables better collaboration between different healthcare providers and organizations. This includes the sharing of patient data between different healthcare providers, the use of telemedicine to enable remote consultations, and the use of electronic prescriptions to streamline medication management.
- **Better population health**: Digital transformation can help to improve population health by enabling better disease surveillance, early detection of outbreaks, and more effective disease management.

Challenges/Disadvantages

At the same time, it is important to be aware of some challenges and disadvantages with digital transformation in healthcare and elderly care. Digital transformation requires careful consideration and planning to ensure that the potential challenges and disadvantages are addressed effectively. Some challenges and disadvantages include:

- **Resistance to change:** Many healthcare providers and elderly care providers may resist the adoption of new technologies due to a lack of understanding, fear of job loss, or reluctance to learn new skills.
- **Privacy and security concerns:** The use of digital technology may pose a risk to the privacy and security of sensitive health information, which can result in data breaches or cyber-attacks.
- **Unequal access:** There may be a digital divide that limits access to technology for certain populations, particularly the elderly or those in low-income communities.
- **Limited interoperability:** Different technology systems may not be compatible with each other, making it difficult to share data and collaborate across different healthcare providers and elderly care providers.
- **Technical difficulties:** The use of digital technology may require technical expertise, maintenance, and troubleshooting, which can be a challenge for some healthcare providers and elderly care providers. On the other hand, implementing digitalization can enable healthcare providers to collaborate more easily with each other, which could improve communication, coordination, and teamwork.
- **Cost:** Implementing and maintaining digital technology can be expensive, which may limit access to certain populations or healthcare providers and elderly care providers with limited resources. On the other hand, without digitalization, cost could be more expensive. Implementing digitalization could help reduce the need for paper records and manual process thus reducing cost and saving money over time.

In conclusion, digital transformation is critical in healthcare today as it has the potential to improve patient outcomes, increase efficiency, enhance the patient experience, reduce healthcare costs, improve collaboration, and improve population health. By embracing digital technologies, healthcare providers can improve the quality of care and deliver better outcomes for patients. It is important to be aware of: integrity, not to increase the burdens of bureaucracy. There are also some challenges with digital transformation for example in Sweden, there are 21 different regions which use 21 different systems in healthcare. These different regions face a challenge of transferring data between the different regions and hospitals.

Healthcare collaborations with other companies in digital transformation

Healthcare providers are increasingly collaborating with non-health companies to achieve digital transformation in healthcare and elderly care. These collaborations bring together the expertise of healthcare providers with the technological expertise of non-health companies to develop innovative digital health solutions. Below are some examples of how healthcare providers are collaborating with other companies to achieve digital transformation in healthcare and elderly care:

- **Collaboration with technology companies:** Healthcare providers are partnering with technology companies such as Google, Apple, and Microsoft to develop new digital health solutions. For example, Google's DeepMind Health is collaborating with healthcare providers to develop AI-powered solutions for disease detection and treatment. Similarly, Apple has developed a range of health and wellness apps that enable users to track their fitness, nutrition and sleep.

- **Collaboration with pharmaceutical companies:** Healthcare providers are partnering with pharmaceutical companies to develop new digital health solutions for disease prevention and treatment. For example, Novartis is collaborating with Microsoft to develop AI-powered solutions for drug discovery and clinical trial optimization.

- **Collaboration with consumer electronics companies:** Healthcare providers are partnering with consumer electronics companies such as Fitbit, Samsung, and Philips to develop wearable devices and other connected health solutions. These devices enable users to monitor their health and wellness, track their fitness, and manage chronic conditions.

- **Collaboration with insurance companies:** Healthcare providers are partnering with insurance companies to develop new digital health solutions that improve patient outcomes and reduce healthcare costs. For example, UnitedHealthcare has developed a range of digital health solutions that enable patients to access healthcare services remotely and manage their health and wellness.

- **Collaboration with transportation companies:** Healthcare providers are partnering with transportation companies such as Lyft and Uber to provide transportation services to patients.[4] This is particularly important for elderly care as many elderly patients may have mobility issues that prevent them from accessing healthcare services.

In conclusion, it is interesting to note the development of healthcare providers with other companies to achieve digital transformation in healthcare and elderly care. These collaborations enable healthcare providers to leverage the technological expertise of other companies to develop innovative digital health solutions that improve patient outcomes, reduce healthcare costs, and enhance the patient experience.

[4] https://reputation.com/resources/articles/uber-health-and-lyft-service-the-on-demand-generation/

Digital transformation in healthcare in Sweden

According to Business Sweden, Sweden has been at the forefront[5] of digital transformation in healthcare.[6] The business and public sector has made significant investments in digital health infrastructure and technologies to improve patient outcomes and enhance the efficiency of its healthcare system. Below are some examples of digital transformation in healthcare in Sweden:

- **Electronic Health Records (EHRs):** Sweden has a comprehensive EHR system that enables healthcare providers to access patient information in real-time. The system, known as "Din Journal", enables healthcare providers to access patients' medical records in real-time, including their medical history, diagnoses, medications, and lab results. Patients can also access their own medical records and share them with healthcare providers, which improves patient engagement and involvement in their care. Although, there have been reported issues with accessing data in Din journal. These problems may vary from technical glitches to system overloads, causing delays and difficulties for healthcare professionals to access patients records efficiently.

- **Telemedicine:** There has been a development when it comes to telemedicine, which enables patients to receive healthcare services remotely. Telemedicine has been particularly important in rural areas, where access to healthcare services can be limited. The country has developed a range of telemedicine solutions, including video consultations and remote monitoring devices. An example of telemedicine use in Sweden is the app "KRY" (Internationally known as Livi), which allows patients to have online video consultations with healthcare professionals such as doctors, psychologists, and nurses. Patients can receive advice, prescriptions, and referrals without physically going to a healthcare facility.

- **Digital prescriptions:** Sweden has a digital prescription system that enables healthcare providers to issue prescriptions electronically. Patients can access their prescriptions using their mobile phones and present them at any pharmacy in the whole country. This saves time and reduces errors in prescription dispensing.

- **Digital Pathology:** Sweden has developed a digital pathology system that enables pathologists to view and analyze tissue samples remotely. This has improved the speed and accuracy of cancer diagnosis in the country and reduced the need for patients to travel to specialized centers for diagnosis.[7]

- **AI-powered solutions:** Sweden has been using AI to improve the efficiency and quality of healthcare services. One example is the AI-powered tool for diagnosing skin cancer, which has a 90% accuracy rate.[8] AI is also being used to predict disease risks, optimize treatment plans, and improve patient outcomes.

- **Data sharing:** Sweden has a centralized database of health data known as the National Patient Overview (NPÖ). The database contains information on patient diagnoses, treatments, and medications. This information is used to improve patient care and facilitate research. The country has also established a framework for data sharing, which ensures patient privacy and security while enabling the use of health data for research

[5] https://www.oecd.org/health/digital-health.htm
[6] https://www.business-sweden.com/insights/articles/swedens-digital-technologies-ecosystem/
[7] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7698715/
[8] https://www.ncbi.nlm.nih.gov/pmc/articles/PMC10015524/

and innovation. The biggest challenge in Sweden is that healthcare providers cannot share data with each other if they don't have the same medical record system (Take Care or Cosmic or any other) especially not between regions and municipals.[9]

- **Patient empowerment:** Sweden has been empowering patients to take control of their health through digital health solutions. Patients can access health information, track their fitness, and manage chronic conditions using mobile apps and wearable devices. The country has also developed a patient portal, known as 1177, which provides health information, advice, and support to patients. Some challenges with 1177 is that standardized treatment plans are not adapted to individual needs, there is also uncertainty as to if the treatment is the right one, individuals are also treated as diagnosis not as patients, and there is a long wait for diagnosis.[10]

- **Healthcare innovation:** Sweden has a strong culture of innovation and collaboration between academia, industry, and healthcare providers. Some interesting examples includes digital doctors. Swedish startups are setting the worldwide standard for digital healthcare, or health tech, by giving access to various types of healthcare via mobile, artificial intelligence (AI), and other technology. Some examples include KRY, Min Doktor, Flow Neuroscience and Joint academy.[11] In the beginning, online health care was criticized for "over prescription" of antibiotics. A restrictive prescription is important. This study shows however that digital online doctors do not prescribe more antibiotics than physical clinics (https://journals.sagepub.com/doi/10.1177/20552076221142666?icid=int.sj-full-text.similar-articles.1).

Status of digital transformation in Sweden's healthcare today

Sweden is considered a global leader in digital transformation in healthcare[12] with a strong focus on patient-centricity, collaboration, and innovation. Digital transformation in healthcare in Sweden has been driven by a range of companies and collaborations, each with their own innovative solutions and technologies. The partnerships between healthcare providers, IT companies, and pharmaceutical companies have helped to improve the efficiency, quality, and accessibility of healthcare services in Sweden. The examples below demonstrate the potential of digital technologies to transform healthcare and improve patient outcomes in Sweden:

- **Online healthcare:** KRY (Livi) is an example of an online healthcare. KRY (Livi) is a digital healthcare provider in Sweden that offers online consultations with healthcare professionals, including doctors, psychologists, and nurses. KRY uses a mobile app that enables patients to book appointments, receive medical advice, and access prescriptions remotely. KRY has been instrumental in expanding digital access to healthcare services in Sweden, particularly in remote or underserved areas. Apart from KRY, it is worth knowing that there are other interesting digital healthcare providers in Sweden such as MinDoktor, Doktor.se and other more are coming such as Mindler.

[9] https://www.regeringen.se/rattsliga-dokument/kommittedirektiv/2022/05/dir.-202241
[10] https://healthpolicy.se/wp-content/uploads/2022/05/Policy_Brief_patientorganisationer_prioriteringar_valet_final.pdf
[11] https://sweden.se/work-business/business-in-sweden/10-swedish-innovations
[12] https://www.business-sweden.com/insights/articles/swedens-digital-technologies-ecosystem/

- **Swedavia and GE Healthcare:** Swedavia, which manages airports in Sweden, has partnered with GE Healthcare to develop a COVID-19 testing facility at Stockholm Arlanda Airport. The facility uses GE Healthcare's mobile COVID-19 testing lab, which enables rapid testing and diagnosis of the virus. The collaboration between Swedavia and GE Healthcare has helped to improve access to COVID-19 testing and reduce the spread of the virus in Sweden.

- **Region Skåne and Sectra:** Region Skåne, a regional healthcare provider in Sweden, has collaborated with Sectra, a healthcare IT company, to develop a digital pathology solution. The solution enables healthcare providers to share and analyze digital images of tissue samples, which improves the accuracy and speed of cancer diagnosis. The collaboration between Region Skåne and Sectra has helped to improve the quality of cancer care in Sweden.

- **Intraface and Danderyd Hospital:** Intraface, a healthcare IT company, has collaborated with Danderyd Hospital to develop a virtual assistant for patient communication. The virtual assistant uses natural language processing and machine learning to answer patients' questions and provide information about their care. The collaboration between Intraface and Danderyd Hospital has helped to improve patient engagement and satisfaction in Sweden.

- **AstraZeneca and Elekta:** AstraZeneca, a pharmaceutical company, has partnered with Elekta, a medical technology company, to develop a digital platform for cancer care. The platform uses AI and big data analytics to improve the accuracy and efficiency of cancer treatment. The collaboration between AstraZeneca and Elekta has helped to advance precision medicine in Sweden.

- **eHealth for Regions:** eHealth for Regions is a collaboration between several Swedish regions to develop and implement digital solutions for healthcare. The collaboration has led to the development of several digital health solutions, including a national patient portal, a digital vaccination register, and a digital maternity record. eHealth for Regions has helped to improve healthcare access and quality in Sweden.[13]

Status of digital transformation in Sweden's elderly care today

Sweden is known for its advanced elderly care system, and digital transformation has played an important role in improving the quality of care for older adults. Elderly care is however considered to be far behind health care when it comes to digital transformation. The beginning of partnerships between municipalities, startups, and technology companies can help to improve the efficiency, quality, and accessibility of elderly care services in Sweden. The examples below demonstrate the potential of digital technologies to transform elderly care and improve the lives of older adults:

- **Doro Care:** Doro Care is a Swedish company that provides technology solutions for elderly care. Their products include a digital alarm clock that reminds seniors to take their medication, a GPS tracker that helps caregivers locate seniors who may be lost, and a tablet that enables video communication between seniors and their families. Doro

[13] https://www.ehalsomyndigheten.se/globalassets/ehm/3_om-oss/rapporter/follow-up-vision-for-ehealth-2025-report-on-the-year-2021.pdf

Care has been instrumental in improving communication and safety for seniors in Sweden. The Doro telephone was also known to be especially designed for elderly.

- **CareTech:** CareTech is a Swedish company that provides a digital platform for elderly care management. The platform includes features such as medication management, digital care plans, and real-time monitoring of vital signs. CareTech's platform has been adopted by several municipalities in Sweden and has helped to improve the quality of care for the elderly.[14]

- **Digital Health Hub:** The Digital Health Hub is a collaboration between several Swedish municipalities and companies to develop and implement digital solutions for elderly care. The collaboration has led to the development of several innovative solutions, including a digital platform for caregiver communication and collaboration, a virtual reality system for the elderly with dementia, and a chatbot for answering questions. The Digital Health Hub has been instrumental in driving digital transformation in elderly care in Sweden.[15]

Challenges with digital healthcare transformation in Sweden

One main challenge in Sweden is that 21 different regions use 21 different healthcare systems, which makes it difficult to transfer data between the different regions and hospitals. There is also a need for ongoing investment and innovation to ensure that digital healthcare in Sweden continues to evolve and improve over time. This may involve collaboration between public and private sectors to develop new technologies and drive innovation in healthcare.

[14] https://www.careium.com/sv-se/om-careium/om-oss/
[15] https://www.business-sweden.com/insights/articles/health--a-brave-new-digital-world/

Digital transformation in healthcare in UK

Digital transformation in healthcare in UK has been a priority for the government and healthcare providers in recent years. The aim has been to improve patient outcomes, increase efficiency, and reduce costs by leveraging digital technologies. Here are some examples of digital transformation in healthcare in the UK:

- **NHS Digital:** NHS Digital is the national provider of information, data, and IT systems for the National Health Service (NHS) in England. The organization has been instrumental in driving digital transformation in healthcare in the UK. It has developed several digital tools and platforms, including the NHS App, which enables patients to book appointments, order prescriptions, and view their medical records online. The NHS App seems to be working as of today,16 although NHS is facing some challenges such as issues with data security and breaches, difficulties with implementing digital systems across the country, and concerns over the interoperability of different IT systems used by healthcare providers. These challenges have raised concerns about patient privacy, access to care, and the overall effectiveness of digital systems in improving healthcare outcomes.[17]

- **Digital health startups:** The UK has a thriving digital health startup scene, with several companies developing innovative digital solutions for healthcare. One example is Babylon Health, which offers a digital health service that includes remote consultations with doctors, online pharmacies, AI-powered symptom checking, and health monitoring using wearable devices. Some other examples include; Oxehealth, Healthily and Huma.[18]

- **Electronic health records (EHRs):** EHRs have been introduced in many healthcare organizations in England, enabling healthcare providers to access and share patient data electronically. This has led to improved efficiency and patient safety, as healthcare providers can access up-to-date patient information regardless of their location. One example is the Greater Manchester Shared Care Record, which enables healthcare providers across the region to access patient data from multiple organizations, such as primary and secondary care hospitals, Mental health clinics, and social care organizations.[19]

- **AI and machine learning:** The UK has been investing in AI and machine learning in healthcare, with several initiatives aimed at developing and implementing these technologies. For example, the NHS has launched the AI Lab, which aims to develop AI-powered tools and solutions to improve healthcare outcomes. Another example is the AI in Health and Care Award, which provides funding for innovative AI solutions in healthcare.[20]

[16] https://digital.nhs.uk/services/nhs-app/future-developments
[17] https://blogs.deloitte.co.uk/health/2023/01/the-facts-and-figures-about-the-challenges-facing-the-nhs-in-2023.html
[18] https://www.beauhurst.com/blog/top-healthtech-companies-uk/
[19] https://healthinnovationmanchester.com/wp-content/uploads/2021/06/GP-GMCR-Information-Pack-FINAL.pdf
[20] https://transform.england.nhs.uk/ai-lab/

Status of digital transformation in UK's healthcare today

Digital transformation in healthcare in the UK is still in its early stages. But it is growing rapidly in recent years, as the industry looks for new and innovative ways to improve patient care, increase efficiency, and reduce costs. As the industry continues to evolve, we can expect to see more collaboration between healthcare providers and digital health startups, which will help to drive further innovation and improve patient Here are some examples of digital transformation in healthcare in the UK:

- **Babylon Health:** Babylon Health is a UK-based digital health startup that provides telemedicine services to patients. The company's AI-powered chatbot can diagnose symptoms and recommend treatment options to patients, and it also offers virtual consultations with doctors. Babylon Health has collaborated with the NHS to provide free virtual consultations to patients in certain regions of the UK, which has helped to reduce the burden on healthcare providers and improve patient access to care. Babylon Health has also collaborated with Bupa, to deliver digital health care services to Bupa's health insurance customers.[21]

- **Patients Know Best:** Patients Know Best is a UK-based digital health company that provides a patient-controlled medical record platform. The platform allows patients to access their medical records, share them with healthcare providers, and communicate with their care team. Patients Know Best has partnered with several NHS Trusts to provide its platform to patients, which has helped to improve patient engagement and self-management.

- **Philips:** Philips is a global healthcare technology company that has a strong presence in the UK. The company offers a range of digital health solutions, including telemedicine services, remote monitoring devices, and data analytics tools. Philips has collaborated with several NHS Trusts to implement these solutions, which have helped to improve patient outcomes and reduce costs.[22]

- **Sensyne Health:** Sensyne Health is a UK-based clinical AI company that uses machine learning algorithms to analyze patient data and develop insights that can be used to improve patient care. The company has partnerships with several NHS Trusts and academic institutions, which have provided it with access to large datasets for analysis. Sensyne Health's AI tools have been used to develop predictive models for identifying patients at risk of developing certain conditions, which can help to prevent illness and improve outcomes.

- **OurPath:** OurPath is a UK-based digital health startup that provides a personalized digital health coaching program for patients with chronic conditions such as type 2 diabetes. The program includes a range of tools and resources, such as a digital health tracker, personalized meal plans, and virtual coaching sessions. OurPath has collaborated with several NHS Trusts to provide its program to patients, which has helped to improve patient outcomes and reduce healthcare costs.[23]

[21] https://www.lifeinsuranceinternational.com/news/bupa-uk-deal-with-babylon/
[22] https://www.philips.com/a-w/about/news/archive/standard/news/articles/2022/20220922-expanding-global-access-to-care-how-philips-innovative-telehealth-solutions-can-help-save-lives.html
[23] https://www.nsmedicaldevices.com/news/ourpath-first-app-nhs-type-2-diabetes/

Status of digital transformation in UK's elderly care today

Digital transformation in elderly care in the UK is an area that is gaining increasing attention, as the population ages and the demand for elderly care services continues to grow. Here are some examples of digital transformation in elderly care in the UK:

- **Birdie:** Birdie is a UK-based startup that provides a digital platform for elderly care providers. The platform includes a range of tools and resources, such as a care management dashboard, a family portal, and a mobile app for care workers. Birdie has collaborated with several elderly care providers in the UK to implement its platform, which has helped to improve communication and coordination between care providers, families, and patients.[24]

- **Oxehealth:** Oxehealth is a UK-based digital health company that uses computer vision and AI algorithms to monitor elderly patients in care homes. The company's technology can detect movement, sleep patterns, and other vital signs, and it alerts care providers if there are any abnormalities. Oxehealth has partnered with several care homes in the UK to implement its technology, which has helped to improve patient safety and reduce the risk of falls.[25]

- **CareLineLive:** CareLineLive is a UK-based digital platform for home care providers. The platform includes a range of features, such as scheduling tools, care plans, and a mobile app for care workers. CareLineLive has partnered with several home care providers in the UK to implement its platform, which has helped to improve efficiency and reduce administrative burden.[26]

- **SuperCarers:** SuperCarers is a UK-based online marketplace that connects elderly patients with local care providers. The platform includes a range of features, such as background checks, ratings, and reviews of care providers. SuperCarers has partnered with several elderly care providers in the UK to provide its platform to patients, which has helped to improve patient choice and access to care.[27]

- **Alcove:** Alcove is a UK-based digital platform for elderly care providers. The platform includes a range of features, such as remote monitoring, medication reminders, and social engagement tools. Alcove has collaborated with several elderly care providers in the UK to implement its platform, which has helped to improve patient outcomes and reduce social isolation.[28]

[24] https://digitalhealth.london/how-birdie-is-supporting-the-care-sector-during-covid-19
[25] https://digitalhealth.london/innovation-directory/profile/oxehealth
[26] https://businesscloud.co.uk/company/carelinelive/
[27] https://supercarers.com
[28] https://www.londoncouncils.gov.uk/our-key-themes/london-ventures/current-ventures/make-independent-living-possible-more-people

Challenges with digital healthcare transformation in the UK

The UK is also facing some challenges in digital healthcare transformation. One of the challenges is integrating disparate digital systems across different healthcare providers and systems. This could result in fragmented patient data, which can impact the quality of care and patient outcome.

Digital transformation in healthcare in Denmark

Denmark is known for having one of the most advanced healthcare systems in the world, with a strong emphasis on digital transformation. With strong emphasis on collaboration between healthcare providers, government, and private sector, Denmark is probably well-positioned to continue leading the way in digital health. Here are some examples of digital transformation in healthcare in Denmark:

- **Sundhed.dk:** Sundhed.dk is Denmark's national health portal, which provides patients with access to their medical records, online booking for doctor's appointments, and access to health information. The platform has been instrumental in improving patient engagement and self-management, as well as reducing administrative burden for healthcare providers.[29]

- **Telemedicine:** Telemedicine is a growing area in Denmark, with many healthcare providers offering virtual consultations and remote monitoring services. For example, the Region of Southern Denmark has implemented a telemedicine program that allows patients with chronic conditions to monitor their health at home and communicate with their care team remotely. This has helped to reduce the need for hospital visits and improve patient outcomes.[30]

- **Electronic Health Records (EHRs):** EHRs are widely used in Denmark, with all healthcare providers required to use a standardized system. This has helped to improve communication and coordination between providers, as well as reduce errors and improve patient safety. One example is the "openEHR" platform, which is used by several hospitals in Denmark and allows for the exchange of patient data between healthcare providers. It is used by both public and private health care providers

- **Health data analytics:** Denmark has a wealth of health data, which is being used to develop insights and improve patient care. For example, the Danish Health Data Authority has developed a platform called "Sundhedsdatastyrelsens Analyseplatform" that allows researchers and healthcare providers to access and analyze health data. This has helped to improve the understanding of disease patterns and develop more targeted interventions.

- **Collaboration between public and private sectors:** There is a strong collaboration between public and private sectors in Denmark when it comes to digital health innovation. For example, the Danish government has launched several initiatives to support startups and digital health companies, such as the "Digital Hub Denmark" program. This has helped to drive innovation and create new opportunities for healthcare providers and patients.

[29] https://apps.who.int/iris/bitstream/handle/10665/332595/Eurohealth-25-2-20-23-eng.pdf?sequence=1&isAllowed=y
[30] https://www.healthcaredenmark.dk/media/r2rptq5a/telehealth-v1.pdf

Status of digital transformation in Denmark's healthcare today

Denmark has a well-established infrastructure for digital health, including electronic health records, telemedicine, and health data analytics. Denmark has a well-established infrastructure for digital transformation in healthcare, with several companies and collaborations driving innovation in the field. As the demand for digital health solutions continues to grow, we can expect to see more collaboration between healthcare providers, government, and private sector to develop innovative solutions and improve patient outcomes. Here are some examples of specific digital transformation in healthcare in Denmark:

- **PatientsLikeMe:** PatientsLikeMe is an online platform that allows patients with chronic conditions to connect with each other, share information, and participate in research studies. The platform has been used in Denmark in collaboration with healthcare providers to improve patient engagement and self-management. PatientsLikeMe has about 850,000 members.[31]

- **Novo Nordisk:** Novo Nordisk is a Danish multinational pharmaceutical company that has developed several digital health solutions, such as the NovoPen 6 insulin pen, which includes a digital display that tracks insulin doses and sends reminders to patients. Novo Nordisk has also partnered with several digital health startups to develop innovative solutions for diabetes management.

- **Netcompany:** Netcompany is a Danish IT company that has developed several digital health solutions for healthcare providers. One example is the "Laboratory System 3.0," which is used by several hospitals in Denmark and includes features such as automated test results and real-time data analysis. Netcompany has also collaborated with healthcare providers to develop solutions for telemedicine and electronic health records.

- **The Capital Region of Denmark:** The Capital Region of Denmark has implemented several digital health solutions to improve patient care and reduce costs. One example is the "Emergency Telemedicine" program, which allows patients to receive virtual consultations from emergency physicians. The region has also developed a mobile app for patient self-management and remote monitoring.

Status of digital transformation in Denmark's elderly care today

Denmark is one of the countries that has been at the forefront of digital transformation in elderly care, with several companies and collaborations developing innovative solutions to improve the quality of life for older adults. Here are some examples of digital transformation in elderly care in Denmark:

- **Dementia-friendly homes:** Denmark has developed several dementia-friendly homes that use technology to improve the safety and well-being of people with dementia. For example, the "Gentofte Dementia Village" uses smart sensors and monitoring systems to provide residents with a safe and secure environment while also allowing them to maintain their independence.

[31] https://www.patientslikeme.com/about

- **Hjælpemiddelbasen:** Hjælpemiddelbasen is an online platform that provides information about assistive technology for people with disabilities, including older adults. The platform includes information about products and services, as well as advice and guidance for caregivers and healthcare providers.
- **Acesion Pharma:** Acesion Pharma is a Danish pharmaceutical company that has developed a digital health solution for atrial fibrillation, a common heart condition in older adults. The company has developed a mobile app that allows patients to monitor their heart rate and receive alerts when there are irregularities. The app also provides personalized insights and recommendations for managing the condition.
- **The Digital Hub Denmark:** The Digital Hub Denmark is a government-supported initiative that aims to promote digital innovation in healthcare, including elderly care. The initiative has provided funding and support to several startups and digital health companies that are developing innovative solutions for elderly care, such as the "Gerionet" platform, which uses virtual reality and gamification to promote physical activity and social interaction.

Challenges with digital healthcare transformation in Denmark

One of the main challenges in Denmark is ensuring interoperability between different digital systems across the healthcare sector.

The future of digital transformation in healthcare and elderly care

The future of digital transformation in healthcare and elderly care is very likely to involve continued investment in digital solutions, with a focus on *AI, body scans,* and collaborations with tech companies. These technologies have the potential to improve patient access to care, promote patient engagement and self-management, enable remote patient monitoring and reduce costs. Considering the demographic development with people living longer with chronic diseases, the potential in digital transformation can be one important solution to respond to an increased demand of health services.

Google Health has partnered with Ascension, a US-based healthcare system, to develop and implement a digital health platform that can securely store patient data and make it accessible to healthcare providers. This platform can help improve patient outcomes by enabling more coordinated and personalized care. Google health is also developing AI tools that can help healthcare providers more accurately diagnose diseases and develop personalized treatment plans. For example, Google's DeepMind has developed an AI system that can detect acute kidney injury earlier than current methods, improving patient outcomes.

In Japan, AI-powered chatbots have been used to screen potential COVID-19 patients, reducing the workload on healthcare professionals and minimizing the risk of exposure. AI algorithms are also being used to analyze medical images and detect early signs of diseases such as Alzheimer's and Parkinson's, enabling earlier interventions and better patient outcomes. AI tools also being developed to help healthcare providers make more informed decisions about medication dosages, reducing the risk of adverse drug reactions and improving patient safety.

In the UK, body scans are being used to identify patients at high risk of developing lung cancer, enabling earlier interventions and improving survival rates. In Sweden Neko Health[32] also uses body scans as a means of early intervention in individuals' health. Advanced imaging techniques such as MRI and CT scans are being used to detect early signs of cancer, heart disease, and other conditions, enabling more targeted treatment and improved outcomes. Wearable technology is also being developed to continuously monitor patients' health and alert healthcare providers to any changes or abnormalities, enabling more timely interventions and reducing hospital readmissions.

Microsoft's cloud-based platform, Azure, is being used by healthcare providers to store and analyze patient data, enabling more effective data sharing and analysis. Microsoft's AI tools, such as its Healthcare Bot service, are being used to screen patients for COVID-19 and other illnesses, reducing the workload on healthcare professionals and minimizing the risk ofexposure. Microsoft is also developing tools to help healthcare providers improve patient engagement and care coordination, such as its HealthVault patient portal.

Overall, the future of digital transformation in healthcare and elderly care is likely to involve continued investment in AI, body scans, and collaborations. These technologies have the potential to revolutionize patient care, enabling more accurate diagnoses, personalized treatment plans, improve patient outcomes and reduce costs.

[32] https://www.nekohealth.com/se/om

Conclusion

Digital transformation in healthcare and elderly care is a global phenomenon, with many countries adopting new technologies and digital solutions to improve patient outcomes and quality of care. Sweden, the UK, and Denmark are all leading countries when it comes to digital transformation in healthcare and elderly care.[33] Sweden, UK and Denmark have well-established digital health infrastructures, including electronic health records and telemedicine even if there are main challenges still especially when it comes to share data. These countries are investing in digital solutions for elderly care, such as assistive technology and remote monitoring systems. Furthermore, these countries are exploring the use of artificial intelligence and machine learning in healthcare, with several collaborations and partnerships between healthcare providers and tech companies.

On the other hand, the industries in Sweden are investing heavily in digital health startups, while the UK and Denmark on the other hand are investing more in collaborations and partnerships between healthcare providers and tech companies. The UK is exploring the use of artificial intelligence and machine learning in healthcare in more detail than the other two countries.[34] Denmark has a strong focus on patient engagement and self-management, while the UK is focusing on improving patient access to care.

Also, the future of digital transformation in healthcare and elderly care is expected to be characterized by the increased use of AI, body scans, and collaborations with companies such as Google Health and Microsoft. These advancements have the potential to revolutionize patient care, enabling more accurate diagnoses, personalized treatment plans, and improved patient outcomes. AI is expected to play a significant role in developing more precise diagnoses and personalized treatment plans. Body scans are likely to become more widely used in the future, allowing for earlier detection and prevention of diseases. Collaborations with tech companies like Google Health and Microsoft are expected to drive innovation and accelerate the adoption of digital solutions in healthcare and elderly care. Overall, the future of digital transformation in healthcare and elderly care is promising and has the potential to revolutionize the way healthcare is delivered and received.

Digital transformation could have a profound impact on the organization and financing of healthcare systems. One of the major benefits of digital transformation in healthcare is the ability to streamline processes and make healthcare more efficient. This can lead to cost savings for healthcare providers and patients alike. On the organizational side, digital transformation enables healthcare providers to better manage patient data, improve communication between providers, and enhance patient engagement. For example, electronic health records (EHRs) can provide a more complete picture of a patient's medical history, which can improve diagnostic accuracy and treatment outcomes. Telehealth and remote monitoring technologies can also help healthcare providers deliver care to patients who may not have easy access to in-person visits. In terms of financing, digital transformation helps reduce costs by enabling more accurate billing and payment processes, reducing administrative costs, and improving supply chain management. Additionally, the use of digital health technologies can potentially improve patient outcomes, leading to lower healthcare costs in the long run.

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[33] https://www.oecd.org/health/digital-health.htm

[34] https://www.mckinsey.com/~/media/McKinsey/Featured%20Insights/Artificial%20Intelligence/Artificial%20intelligence%20in%20the%20United%20Kingdom%20Prospects%20and%20challenges/Artificial-intelligence-in-the-United-Kingdom-VF2.ashx

Policy recommendations

Promoting digitalization necessitates a consistent policy framework both within ministries and agencies, and across levels of government. Here are some policy recommendations:

- The governments need to pay close attention to platform compatibility, data portability, and the scope of gatekeeping. Such standards are required to preserve present levels of safety, to assure confidence based on improved levels of digital security and privacy, to increase energy and resource efficiency, and to handle emergent social and organizational difficulties brought about by digital transformation in healthcare.[35]

- The government could promote digital inclusion by focusing on those that use digital technology less often. In addition, a clear concept of digital security risk management should be promoted. The government should also create proper policy coordination structures for digital security.[36]

[35] https://read.oecd-ilibrary.org/science-and-technology/oecd-reviews-of-digital-transformation-going-digital-in-sweden/sweden-in-the-digital-transformation-opportunities-and-challenges_9789264302259-3-en#page16
[36] https://www.oecd-ilibrary.org/docserver/9789264302259-8-en.pdf?expires=1680721722&id=id&accname=guest&checksum=F98C37565B57FC2535CDC6ADFAFF787D

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