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Pandemic response in Denmark



Foreword

Since the beginning of the COVID-19 pandemic, all nations have faced unforeseen and complex challenges. Limited knowledge about the characteristics of the virus, its severity and consequences made it challenging to manage the response.

In Denmark, our digital infrastructure combined with a comprehensive test strategy made it possible to collect reliable day-to-day data on the virus. The data formed a reliable foundation for decision-making, enabling us to limit the spread of the virus and respond swiftly to new developments.

Digital solutions were equally central to our effort to limit the spread of COVID-19. New COVID-19 apps and digital platforms were developed and proved vital for controlling the pandemic.

Building public trust through transparent, timely and clear communication with citizens has been a cornerstone of our pandemic response. The high level of trust is reflected in the support of the Danish people for public guidelines and measures, as well as in the level of compliance with our comprehensive testing strategy and vaccine programme.



Compliance with the vaccine programme has been vital in building immunity in the Danish population.

The Danish approach can be summarised as a combination of advanced data infrastructure, digital solutions, rapid response from authorities and a high level of trust among Danish citizens, which all contributed to the effective management of COVID-19.

Sophie Løhde
Minister for Interior and Health

Perspectives from OECD

The COVID-19 pandemic demonstrated the vulnerabilities of our interconnected world and exacerbated socio-economic disparities. In two years, the COVID-19 virus infected over half a billion people, and tragically caused the death of at least 6 million people. Across the OECD, Gross Domestic Product fell by 4.6% in 2020, and countries with greater success in containing the virus had better economic outcomes. Denmark demonstrated this with one of the faster economic recoveries.

The pandemic was not only a health crisis. Drastic government financial support was required for businesses and communities to respond to the challenges. The Danish experience demonstrated the value of prompt decision-making, widespread social support, extensive use of digital tools to support healthcare, comprehensive testing, and rapid vaccination. In addition, trust in institutions has been crucial. These elements align with OECD evidence that resilience improves with fast, comprehensive, whole-of-society approaches, investments in digitalisation and health systems, as well as integrated policy approaches to tackle inequalities.



The pandemic also highlighted the importance of international cooperation to mount effective responses on a global scale. Going forward, the international community needs to examine what worked, where we can improve, and what lessons to draw. We need greater pandemic resilience, but we cannot stop there. The international community requires resilience to the many threats we face - climate change, growing antimicrobial resistance, non-communicable diseases, and economic crises, among many others. The learnings of the pandemic will aid Denmark and the international community to build back better, healthier and more inclusively.

Ulrik Vestergaard Knudsen
OECD, Deputy Secretary General

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Introduction

The Danish response to the COVID-19 pandemic in Denmark has attracted international attention. Denmark has done well, consistently ranking among the European countries with the lowest excess mortality rate throughout the pandemic¹. Furthermore, Denmark has been able to keep restrictions to a minimum and maintain a strong economy and a well-functioning society.

The Danish COVID-19 strategy had the objectives to:

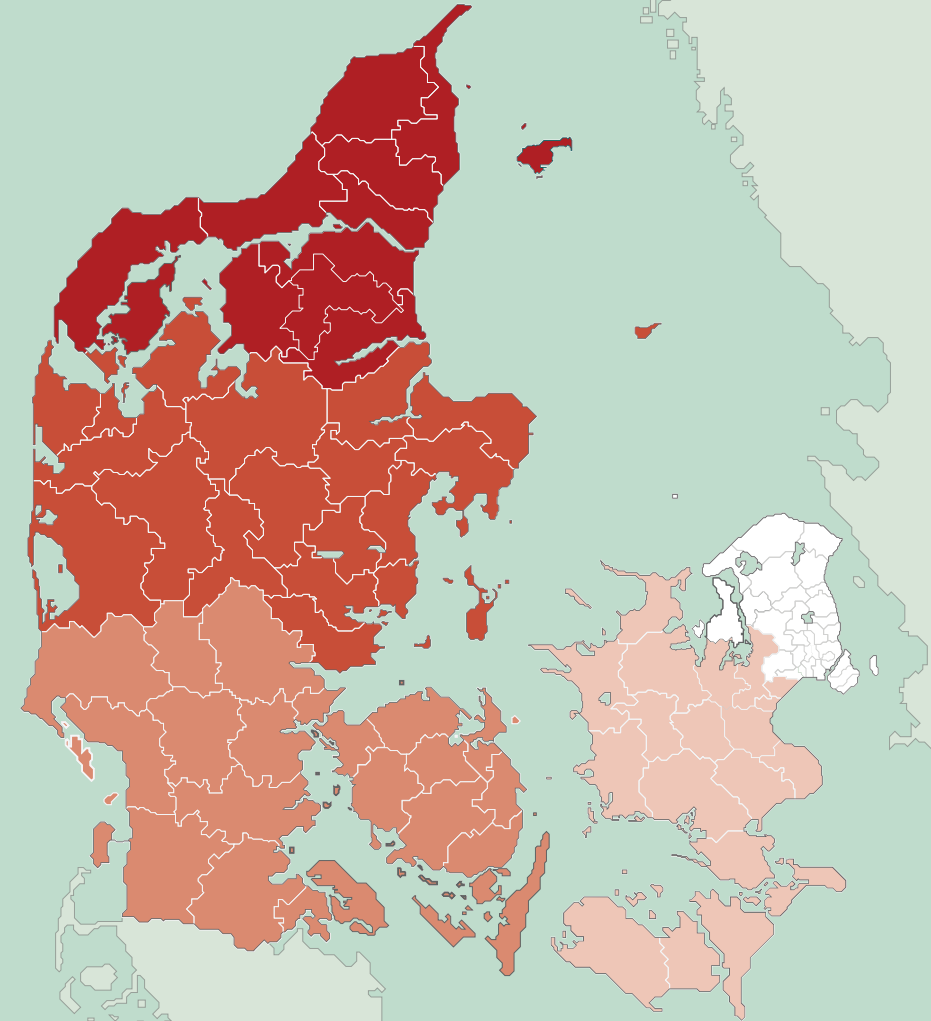
- Save human lives and protect elderly and vulnerable people
- Avoid overloading of hospitals and the healthcare system
- Maintain a healthy economy and keep people at work
- Avoid lockdowns and restrictions

Several preconditions existed to succeed with this strategy; high levels of public trust, support and compliance, and a highly digitalised society, which made data-driven decision-making possible. Digitalisation was key for surveillance through contact tracing and genome sequencing and for the roll out of vaccines. The close collaboration between public and private contributors was central to the rapid development and implementation of innovative solutions throughout the Danish pandemic response.

This publication will cover different aspects of how Denmark managed the COVID-19 pandemic with the aim of creating dialogue and sharing experiences internationally.

On the 11th of March 2020, Denmark was one of the first countries to impose restrictions and, later, on the 1st of February 2022, the first EU country to remove all restrictions. Removing COVID-19 restrictions in February 2022 during rising number of positive cases, brought international attention to Denmark.

Denmark is divided into 5 regions which contain 98 municipalities. It has a population of 5.9 million (2022) and a size of 42,951 square kilometres.



The Danish healthcare system



A public healthcare system

Denmark's healthcare system is public with universal health coverage, meaning free and equal access to healthcare services for all Danes. Hospitalisation, including medication during hospitalisation, is free of charge. The healthcare system is financed primarily through taxation (84%) with smaller out-of-pocket payments (16%), for example for dental services and medicine co-pay.



Task responsibilities

The Danish healthcare system is largely decentralised. Legislation and national healthcare policy are agreed upon at a national government level. The five regions are responsible for running the hospitals and for managing contracts with private practices, including general practitioners. The 98 municipalities are responsible for home care, rehabilitation services, preventive health care and health promotion among other tasks. During COVID-19, collaboration across these levels was crucial to managing the complexity of the pandemic.



Personal identification system

All Danes have a civil registration (CPR) number, which facilitates linkage between all Danish national registers. This makes it possible to track diseases by e.g. age, sex, occupation, and geography. During COVID-19, this enabled the tracking of data for mathematical models predicting the spread of the virus and supporting the political decision-making process.



Freedom of choice

A fundamental pillar in the Danish healthcare system is the individual's right to autonomy. Testing, tracking, treatment, and vaccination have been done on a voluntary basis throughout the COVID-19 pandemic and required informed consent.

Digital infrastructure in Denmark

One of the cornerstones of the Danish COVID-19 response was the strong digital infrastructure. The advanced digital infrastructure and national registries made it possible to develop and implement a wide range of digital solutions within a short time frame to assist the control of the pandemic in Denmark.

In addition to the civil registration number, a core element of the Danish digital infrastructure is NemID (the Danish National eID, later replaced by the upgraded version, MitID), a secure digital ID that citizens use in situations

where it is essential to document one's identity electronically.

The digital infrastructure enabled efficient roll out of testing, contact tracing and vaccination, for example, by enabling an efficient online system for booking tests and obtaining test results. This was possible due to the integration of the Danish health databases. Furthermore, new digital solutions like the corona passport were successfully developed and implemented as tools to control the pandemic in Denmark.

Min Læge ("My Doctor")

The Danish app Min Læge ("My Doctor") was developed in 2019 by the Danish Association of General Practitioners and the Ministry of Health. The purpose of the app is to provide patients with digital access to their general practitioner, obtain test results, and keep track of and manage appointments. In the spring of 2020, video consultations with general practitioners were available via the app. The need for social distancing led to a huge increase in the number of app downloads and usage of video consultations between patients and general practitioners.

Sundhed.dk

Sundhed.dk is the Danish online portal that collects and distributes healthcare information to citizens and healthcare professionals. It is unique in providing an accessible space for citizens and healthcare professionals to meet and efficiently exchange information. Sundhed.dk has several functionalities, including a personal page with direct access to laboratory results, medical records, prescriptions, vaccinations and more.

COVID-19 test results were integrated and visible on sundhed.dk from the beginning of the pandemic. The corona passport (see also page 19) was integrated into sundhed.dk in the spring of 2021 and available to download from the sundhed.dk website and the corresponding app, which assisted in the reopening of Denmark. Quick data integration was possible due to the existing secure infrastructure.

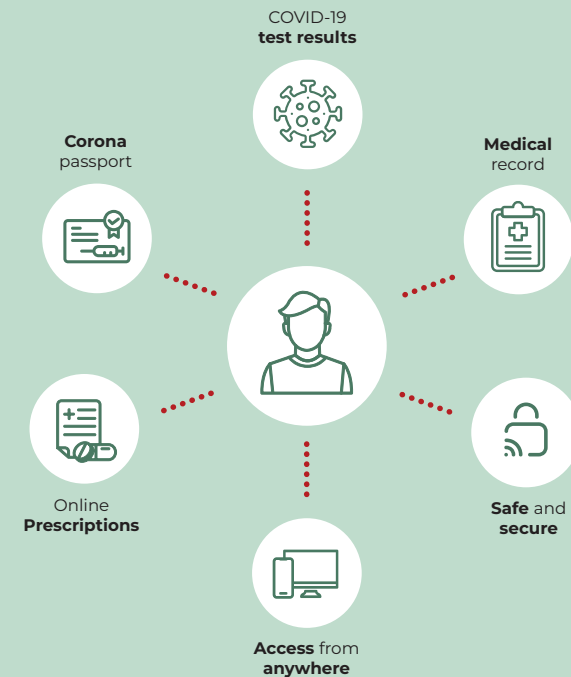
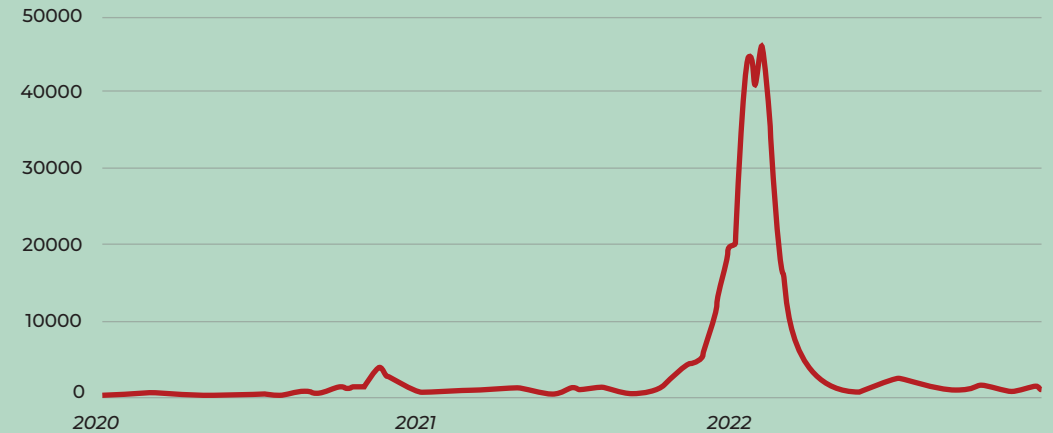
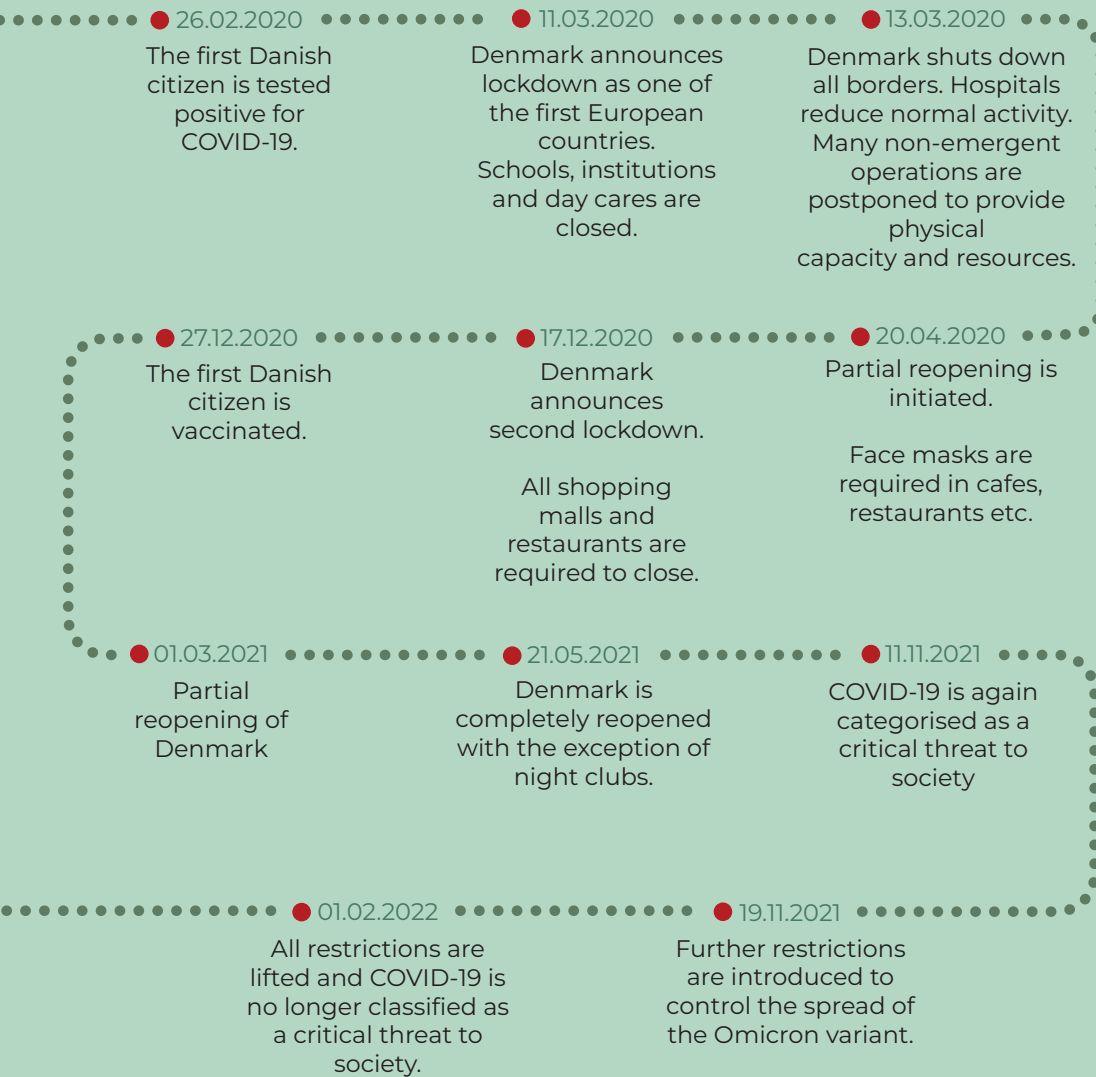


Figure 1 - The illustration shows features of the sundhed.dk platform.

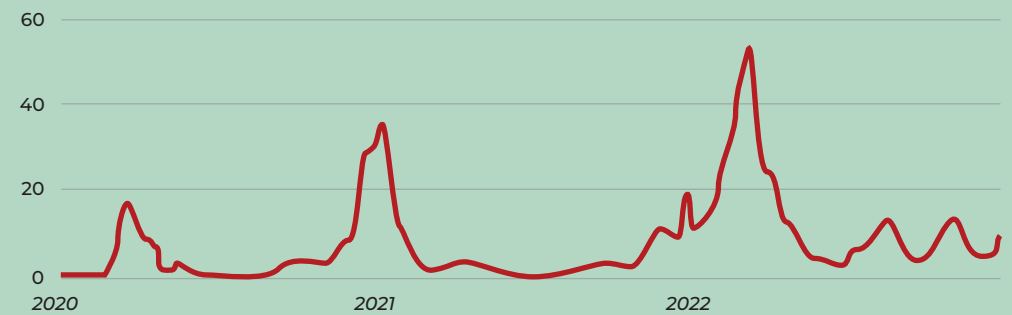
COVID-19 Timeline

Key events in Denmark



Source: <https://covid19.ssi.dk/>

Figure 2 - Daily confirmed new cases in Denmark (7-day moving average)



Source: <https://covid19.ssi.dk/>

Figure 3 - Daily COVID-19 related deaths (30 day mortality)

Building trust

One of the reasons for Denmark's relatively successful management of COVID-19 is that the Danish government and health authorities enjoy a significant level of trust from the population.

To earn and maintain the society's trust, government and health authorities were transparent about unknown factors, and new information was communicated once it was obtained. Statens Serum Institut (equivalent to a centre for disease control) analysed and, in some cases, sequenced the virus throughout the pandemic, which provided vital information for data-driven decision making.

Furthermore, the authorities regularly published key data on the pandemic. Some updates were issued daily, and others were issued weekly, enabling individuals to assess the situation in their local area and take necessary precautions.

The high level of public trust and a sense of "community spirit" eased the implementation of the COVID-19 policy and recommendations. Imposing curfews were avoided, and recommendations provided by health authorities were widely accepted and complied with. Once vaccines were approved, Denmark quickly gained very high vaccination rates, especially among the elderly and vulnerable.

The HOPE Project

The HOPE Project (How Democracies Cope with Covid19: A Data-Driven Approach) is a Danish research study focusing on changes in social behaviour during the COVID-19 pandemic. The study concludes that transparency positively impacted the level of public compliance with restrictions and guidelines issued by authorities.

"Having the public comply with restrictions and guidelines from the authorities is probably one of the most important factors when it comes to achieving pandemic resilience."

- Michael Bang Petersen

Professor at Aarhus University, co-author of the HOPE Project Report

"One of the major strengths of the Danish pandemic response is the significant confidence and trust in our society, both horizontally and vertically. As health authorities, we have relied on our population's high level of trust in science and in authorities. However, as authorities, we have also been acutely aware of our significant responsibility in living up to this trust by always providing the rationale and evidence for our decisions, being transparent about processes, and disagreements, admitting errors and adapting strategies as new knowledge emerged."

- Søren Brostrøm

Director General, Danish Health Authority

Between March 2020 and January 2022 a total of 25 press conferences from the Prime Minister's Office have been broadcasted on Danish television. 18 of these press conferences had between 1.5 - 2.9 million viewers (25-50% of the Danish population).



Preventing the spread of infection

Preventing the spread of infection was crucial to keep the pandemic under control, and the Danish Health Authority launched campaigns and published a guideline with six easy-to-remember recommendations. The guidelines were posted in public spaces nationwide and online, targeting specific population groups. The recommendations were updated regularly as new knowledge was gained and were in accordance with international recommendations.

The corona passport was introduced in March 2021 on the Sundhed.dk website and documented whether you had been vaccinated, previously infected, or tested negative for COVID-19 within a given time frame. The passport was used to reduce the risk of infection where many people gathered and was mandatory at e.g. entry points to cinemas, cultural events, and restaurants. The app automatically updated to display the most recent test results, and both PCR and quick test results were recorded, whether obtained from a public or a private test centre.

From March 2022, the corona passport was no longer used within Denmark. However, it was still in use for travel within the European Union.



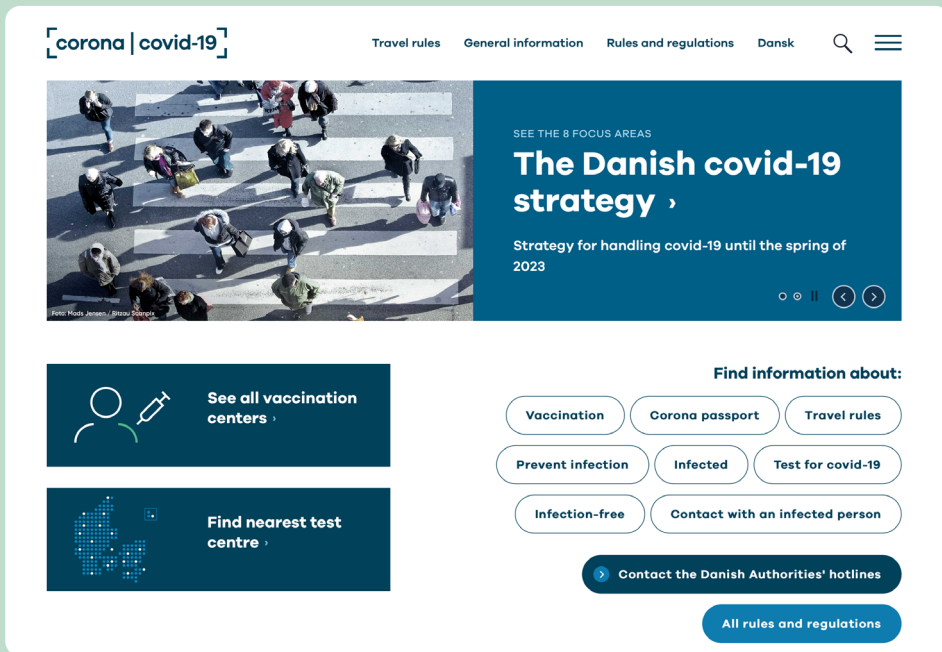
The guidelines published by the Danish Health Authority were posted in public spaces nationwide.

Digital solutions

In Denmark, a wide range of digital solutions have been developed to support the handling of the pandemic. In this chapter, some of the most widely used solutions are presented.

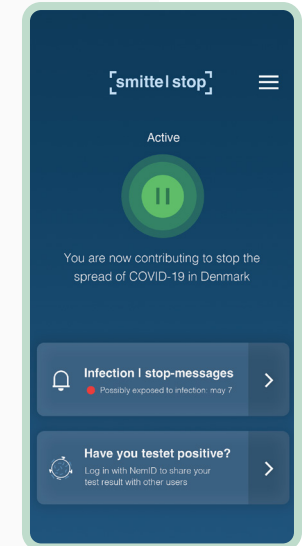
Coronasmitte.dk (“Corona transmission.dk”)

The homepage Coronasmitte.dk was introduced by the Danish authorities as a shared platform where citizens can access updated COVID-19 information, such as guidelines, an overview of test centres, vaccinations, travel information, phone hotline numbers, and COVID-19-related news.



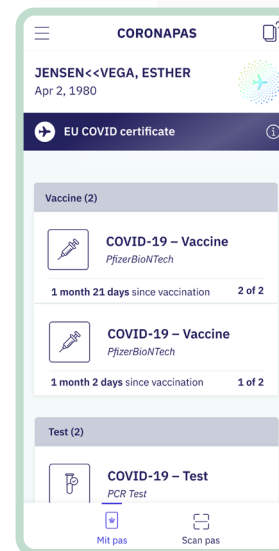
SmitteStop (“InfectionStop”)

The Danish authorities collaborated with the Danish IT company Netcompany to develop the Danish Smittestop app, which was launched in June 2020. The app was designed to help break the chain of COVID-19 infections in society. Users could voluntarily enter positive test results using the app to alert other app users if they had been in close contact, for instance, on public transport or in restaurants. The app preserves anonymity and does not disclose when and where close contact occurred. The app has been downloaded 2.5 million times with more than 500,000 results entered. The app was closed in March 2022 due to the decline in number of COVID-19 cases in Denmark.



The corona passport app

During the spring of 2021, it was decided to supplement sundhed.dk with a separate app for the digital corona passport. The corona passport app was developed by the Danish Health Data Authority, Statens Serum Institut, The Danish Agency for Digital Government, and the Ministry of Health in collaboration with the Danish IT companies Netcompany and Trifork as well as with business organisations and cultural institutions. The app played a key role in the reopening of the Danish society.



Contact tracing

Since the beginning of the pandemic, the Danish Patient Safety Authority (DPSA) has been responsible for and managed contact tracing in Denmark. One of their responsibilities was to phone citizens that tested positive for COVID-19 and provide advice on the Danish Health Authority guidelines on isolation, testing etc. The same guidance was offered to close contacts of the infected citizen. A special effort was made to trace citizens who might be infected with new virus variants to slow the spread of new variants and detect new outbreaks.

During the peak of the pandemic in winter 2021/2022, the individual phone calls made by the DPSA were supplemented and later replaced by a self-service solution where citizens could register details about their infection on sundhed.dk. The DPSA continued to send information and guidelines to infected citizens by digital post, and the citizens could then, via the self-service solution, request a phone call for guidance if needed.

Platform to assist the national contact tracing efforts

The Danish health authorities worked closely with the company Systematic to develop an IT solution for planning, managing, and following up on all contact tracing efforts. The “Columna Flow Pandemic Control” solution provides an easy-to-use interface for contact tracing, guiding callers through the contact tracing process. It includes a self-service solution enabling collated contact tracing data to be displayed on visual dashboards, showing the current progress and emerging trends. Furthermore, the solution includes a machine learning

algorithm for automatically matching and clustering data entered by citizens.

The solution enabled the authorities to closely monitor the efforts to contain the spread of the virus nationally. It provided updated information on new mutations, local outbreaks, or travel-related incidents requiring special attention. By June 2022, approximately 1 million infected citizens had been in contact with the Danish Patient Safety Authority contact tracing unit.



“With our Pandemic Control solution, we have a better overview of the national contact tracing efforts. The visual interface helps us prioritise our resources and to take action earlier than without the solution.”

- Birgitte Drewes
Deputy Director General, Danish Patient Safety Authority

Critical supply of personal protective equipment

Like many other countries at the beginning of the pandemic, Denmark had challenges securing supplies of the much-needed personal protective equipment (PPE) for frontline healthcare workers. Therefore, in March 2020, the Danish Medicines Agency launched the “Denmark helps Denmark” campaign, where Danish companies and manufacturers could contribute to providing PPE to the public sector. During the first week after the campaign launched, more than a thousand companies made contributions, such as; facemasks, gloves, hand sanitisers, and shields for frontline staff.

Furthermore, the Danish Medicines Agency collaborated with the Medico Industry, the Confederation of Danish Industry, and the Danish Chamber of Commerce to change Danish companies’ production lines to focus on producing PPE. For example, the Danish toy company LEGO went from producing plastic bricks to producing visors and manufactured 13,000 visors a day for frontline healthcare workers. Further examples include Novo Nordisk and a public hospital collaborating on COVID-19 test analysis; several private companies entered a consortium and collaborated on producing hand sanitisers; and the Danish shipping company Maersk enabled air transport of PPE and ventilators from China.

“Our strategy was to have our employees on the ground in Asia, securing supplies, negotiating deals, and carrying out quality control. This was fortunate when the pandemic occurred. Consistent and intensive cooperation with our partners and, subsequently, the public sector made it possible to deliver sufficient personal protective equipment (PPE) and hygiene supplies. We were happy to succeed in supporting and protecting healthcare workers in a difficult time and situation.”

- Preben Terp
CEO, Abena

Hygiene control

The need for high hygiene standards increased dramatically during the pandemic. Clean working environments became particularly important in hospitals where trolleys moved between departments contribute to the risk of infection.

Autonomous mobile robots were - and are - used in Danish hospitals to mitigate viral and bacterial spread. The robots transport a wide range of goods ranging from waste bins, trolleys and linen to sterile supplies, pharmaceuticals, and hand sanitiser for visitors. The robots also help facilitate social distancing because they take care of the intralogistics,

thus ensuring productivity and hygienic transportation.

During COVID-19, the need for bacterial disinfection modules in hospitals and other parts of the healthcare sector increased. Disinfection modules were developed and added to the mobile robots, providing efficient solutions for disinfection of large areas. Moreover, talking mobile robots were used at hospitals to greet patients and visitors, encouraging them to use hand sanitiser carried by the robot; a feature that was very well received.



“With Covid-19, we experienced another benefit of the flexibility of our robots. Our integrators and other partners quickly started developing disinfection modules and shortly after the pandemic broke out, we were able to provide solutions to accommodate the new needs.”

- Rasmus Smet Jensen
Vice President Marketing and Strategy, Mobile Industrial Robot

Test strategy and execution

Extensive testing was one of the key elements in the Danish management of the COVID-19 pandemic, and the Danish testing capacity was among the highest in Europe. The Danish regions established nationwide test locations across the country to ensure that all citizens could be tested easily and quickly anywhere in the country. Moreover, the regions and municipalities were responsible for testing in schools and educational institutions, contributing to the safe reopening of these institutions.

COVID-19 testing in Denmark has been free of charge throughout the pandemic. Since May 2020, it has been possible for all adults to book a COVID-19 test without a referral, in accordance with the national testing strategy.

During spring 2021, PCR testing was supplemented with antigen testing (quick tests) as a screening tool to reduce the spread of infection in conjunction with the gradual reopening of activities in the Danish society.

Up to 700,000 tests (PCR and antigen) were performed per day during the peak of the pandemic – a capacity corresponding to the entire population being tested in 8 days. During the first two years of the pandemic, public and private operators performed 64 million PCR tests and 61 million antigen tests on a 5.9 million population. The close collaboration between the public and private sectors enabled a fast and agile COVID-19 test response.

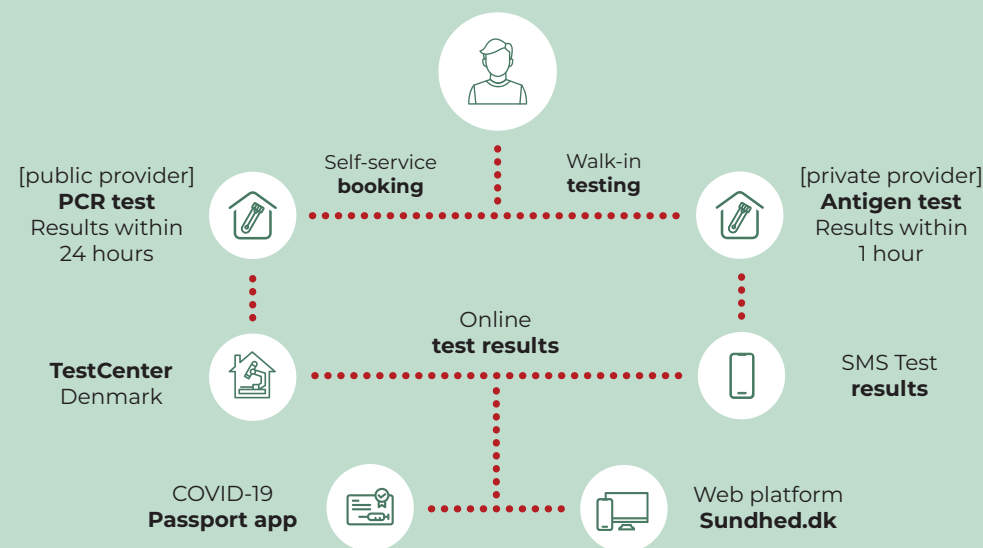


Figure 4 - The flowchart illustrates the organisation of the Danish testing program, which includes both PCR and antigen testing with test results available online.

The Danish testing programme was organised in two tracks: a health track and a societal track.

The health track was conducted under the auspices of the regional health service. The societal track, called TestCenter Denmark, was created in April 2020 as an important testing capacity supplement.

Testing in the health track took place in for example hospital departments, while testing in the societal track was done in permanent testing stations, flexible mobile units, and other testing facilities. The societal track also used antigen tests, which were performed by private suppliers.



TestCenter Denmark

Testing capacity increased through public-private collaboration

In April 2020, the government decided to increase the Danish testing capacity significantly by establishing TestCenter Denmark. TestCenter Denmark was created in close collaboration between the government, the Danish regions, hospitals, the Novo Nordisk Foundation, and Novo Nordisk A/S.

TestCenter Denmark was established in less than a month through this unique collaboration between public and private stakeholders. The centre remains a part of Statens Serum Institut (SSI) under the auspices of the Danish Ministry of Health and has close collaborations with the five regions in Denmark. TestCenter Denmark currently has the capacity to analyse 10,000 PCR tests per day (October 2022), while capacity can quickly be escalated if necessary. If needed, TestCenter Denmark can analyse 200,000 PCR tests per day.

“It has been a very positive collaboration between our Foundation, Novo Nordisk, and all the public stakeholders. It is a state-of-the-art example of an efficient public-private partnership finding the right solutions to address these acute problems created by the pandemic.”

- Martin Ridderstråle

Senior Vice President, Medical Science, The Novo Nordisk Foundation



“TestCenter Denmark was a key component of Denmark’s COVID-19 strategy. Combining the regions’ logistics with Statens Serum Institut’s high-capacity laboratories allowed us to test hundreds of thousands of people every week. This slowed down the virus, helped protect the most vulnerable in our society, and gave decision-makers a detailed, real-time view of the pandemic. Ultimately, it saved lives.”

- Anne Marie Vangsted

Executive Vice President, Biobank, Digital Infrastructure, TestCenter Denmark

Booking a COVID-19 test

Log in to
Coronaprøver.dk
with a digital ID



Fast track
requisition number

Optional **questionnaire**
to acquire **data** for
contact tracing



Choose **test location**
based on **current**
location



Choose **time** and
date of test



Fast track
Additional time-slots
available

Figure 5 - The illustration shows the process for the self-service booking system for COVID-19 test ("Coronatest.dk")

Coronaprøver.dk ("Coronatest.dk")

The digital self-service solution Coronaprøver.dk was introduced in the spring of 2020 as a collaboration between the Danish Ministry of Health, Statens Serum Institut, the Danish regions, and SYNLAB Medical Digital Services. The nationwide homepage, coronaprøver.dk, provides a quick and easy test booking system for PCR-tests, where citizens select the time, date, and location for testing. People in close contact with COVID-19 infected individuals are provided with fast-track testing in accordance with the Danish Health Authority's guidelines. The pre-booking tests feature contributed to efficient capacity utilisation.

"When the pandemic hit, we quickly realised we could reuse our existing infrastructure for a test setup in Denmark. With our infrastructure setup and extensive experience in the field, we had the first version of Coronaprøver.dk ready in a very short time"

- **Lars Holdt**

CEO, SYNLAB Medical Digital Services

"The fight against the COVID-19 pandemic has shown us how significant an impact a close public-private collaboration can have in a relatively short period of time, and how essential it is to think of public-private collaboration with a longer-term perspective to ensure sustainable healthcare."

- **Pernille Schmidt**

Chapter Lead, Healthcare Development, Roche Diagnostics

Award-winning antigen test

Falck, Carelink, and the Danish Regions entered a unique collaboration to develop a COVID-19 antigen test (quick test) set-up which, as a screening tool, was an important element in the reopening of Denmark twice (spring 2021 and early 2022). The collaboration won the Danish Chamber of Commerce award 2021, acknowledging the efforts to deliver concrete results for the citizens during a crisis.

Genome sequencing

Internationally, Denmark has become a frontrunner in monitoring the development and evolution of COVID-19 variants through extensive whole genome sequencing of positive COVID-19 tests. Statens Serum Institut monitors the tracking and sequencing of the virus, and many countries rely on Denmark, the UK, and a few other countries to keep track of new COVID-19 variants. As of September 2022, Denmark has performed more than 830,000 whole genome sequences.

“We have collated a lot of valuable data due to our intensive test strategy, and we have learnt a lot from analysing data and making it available to others. This means we can make the right decisions on time and respond in line with the risks. By combining our extensive test and sequence data with our rich health data registers, we have also contributed significantly to scientific knowledge about new variants, their clinical features and vaccine effectiveness.”

- **Henrik Ullum**
Director General, Statens Serum Institut

University supports genome sequencing of tests

At the beginning of the pandemic, a group of researchers from Aalborg University were working on a project related to sequencing of bacteria. They realised that the equipment and setup already established could also be used for genome sequencing of COVID-19 tests. Their existing project was halted due to the COVID-19 restrictions. Instead, they started to help analyse tests to support the battle against the pandemic in Denmark.

“The methods for identifying bacteria and genome sequencing are similar, and we only had to add a single step to the process, which we had established. When we realised that we were able to help, it was self-evident for us to offer to do so. It was a great experience to see how the Danish research system came together to address the challenge.”

- **Mads Albertsen**
Professor MSO, Aalborg University



Hospitalisation during COVID-19

Throughout the COVID-19 pandemic, a big concern was the risk of overburdening hospitals, and infection numbers were therefore closely monitored in relation to hospital capacity.

Wards for COVID-19 patients were established at existing hospitals, and clinical personnel was re-assigned and underwent training to ensure sufficient resources. Furthermore, non-acute appointments were postponed, and the regions were asked to plan for an extraordinary high-intensive care capacity and increased number of beds and isolation units at existing medical wards.

When new and milder COVID-19 variants developed, the need

for hospitalisation decreased. However, COVID-19 patients with chronic diseases often have a more complicated disease trajectory than individuals without comorbidities and, therefore, require significant intensive care at hospitals.

A Danish study showed that for patients with type-2 diabetes, the risk of dying from COVID-19 was increased by 30%². Of all admitted COVID-19 patients in Denmark, 45% have diabetes³, and almost one fourth of all health related COVID-19 expenses are related to people with diabetes⁴. Therefore, it is important that underlying chronic conditions are managed to reduce the risk of developing a complicated COVID-19 trajectory.

“Research has unfortunately confirmed what we feared at the very beginning of the pandemic; that people with chronic disease including type 2-diabetes have an elevated risk of dying from a COVID-19 infection. This underlines the importance of good chronic disease management and prevention measures.”

- Claus Richter
CEO, the Danish Diabetes Association



Vaccination procedures

Denmark rapidly obtained very high vaccination rates once the vaccines were approved, and by the summer of 2022, 82% of the population were fully vaccinated. Vaccination in Denmark is voluntary.

The Danish Health Authority planned the vaccination program, and the first vaccine was administered in December 2020. Within the first quarter of 2021, vaccines were administered to citizens at care homes or receiving home care, health sector frontline personnel, all citizens above the age of 85 years, and citizens with increased risk of developing severe illness or death. From March to June 2021, citizens between 50 and 85 years of age were vaccinated according to age, starting with the most senior citizens. After that, citizens between 16 and 49 years were vaccinated, prioritising the eldest and the youngest due to the importance of vaccinating seniors at risk and younger groups, including high school students, to limit outbreaks. In July 2021, vaccines were offered to children aged 12-15. In November 2021, vaccines were also provided to children aged 5-12. This is, however, no longer recommended practice.

“The regional vaccination centres offered Danish citizens high vaccine availability, for instance, by providing available vaccination times on both weekdays and weekends. Our collaboration with municipalities, general practitioners and other private healthcare providers played an important role in creating a successful vaccination programme in Denmark.”

- Anders Kühnau

President, Danish Regions

To enable large-scale vaccination of the population during a short timeframe, people within the healthcare system, including students and retired healthcare professionals like doctors, nurses, and dentists were recruited and trained to administer vaccinations.

The advanced digital healthcare system enabled a smooth rollout of the vaccines. Invitations were sent by digital post to all citizens in accordance with the Danish Health Authority's vaccination rollout plan. Subsequently, vaccination time slots could be booked online.



Vacciner.dk (“Vaccines.dk”)

The digital platform Vacciner.dk was developed by the Ministry of Health, the Danish Regions and SYNLAB Medical Digital Services, and launched in December 2020. The platform enables easy online vaccination appointment booking, and the system automatically shows available time slots at the locations in the closest proximity. Citizens can book vaccination appointments after receiving an invitation from the Danish health authorities via digital post (or postal service in some cases). Vaccination status is updated within a few hours in the individual citizen's profile on the health platform Sundhed.dk and in the corona passport.

Next-generation COVID-19 vaccine

The Danish company Bavarian Nordic is developing a next-generation COVID-19 vaccine candidate, based on the capsid virus like particle (cVLP) technology. The vaccine is being developed as a universal booster vaccine intended for use as a booster to any other type of COVID-19 vaccine. The goal is to create a longer-lasting vaccine protection with broader efficacy that obviates the need for continuously adapting to new variants of the virus. The vaccine is in the final development stage with expected completion in 2023.

Future perspectives

“Trust, innovation, and communication carried Denmark well through this pandemic, with strong and effective collaboration across various levels and sectors of government, public-private domains, and civil society. I believe this is the key to future pandemic resilience.”

- Søren Brostrøm

Director General, Danish Health Authority

Denmark, with support from the World Bank, initiated the International Centre for Antimicrobial Resistance Solutions (ICARS) in 2019 with the aim of fighting AMR globally. Denmark takes a One Health approach, including human, animal, and environmental perspectives.

The Danish strategy for managing COVID-19 enabled Denmark to lift all restrictions (except travel restrictions) in February 2022, despite the rising number of positive cases. The strategy proved to be sound, and Denmark did not see any concerning increases in excess mortality.

We know that more pandemics and global health challenges are on the horizon. Antimicrobial resistance (AMR) is already contributing to 4.95 million deaths, is directly responsible for 1.27 million deaths globally (2019)⁵

and has been exacerbated by the COVID-19 pandemic. AMR is expected to rise to 10 million deaths annually in 2050 and could have far more deadly consequences than COVID-19, including the loss of foundations underpinning modern medicine.

Denmark has learned valuable lessons throughout COVID-19 which can bring value to handling of future challenges. Through close public-private collaboration, we have built scalable systems that make us more resilient than before the COVID-19

pandemic. The strategy is to ensure that no matter what kind of infection is encountered next, Denmark will be prepared to act quickly and efficiently to avoid lockdowns and restrictions, maintain a healthy economy by keeping people at work and in schools, as well as avoiding hospital overload, saving human lives and protecting the elderly and vulnerable.

As part of the preparation for future pandemics, Statens Serum Institut is looking into possible ways to optimise the self-testing infrastructure. Statens Serum Institut has, for example, developed a mobile phone app which may be possible to use on barcoded test tubes. The citizens should be able to take the test themselves and drop off the sample for analysis. This infrastructure could potentially be used not only for COVID-19 but also for various looming infectious diseases in the future.

References & Credits

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Pandemic response in Denmark - February 2023

A publication in the Triple-I paper series: Denmark Informs - Inspires - Invites

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