

Study tracks the spread of COVID-19 in Sweden

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During the pandemic, the free COVID Symptom Study app has helped researchers understand the complexity and spread of the corona virus better.

"The study has exceeded our expectations since its launch in Sweden in April 2020. Participants from all over Sweden got involved and many of them have spent one minute every day answering questions about their health," says Maria Gomez, Professor of physiology at Lund University.

Since April 2020, volunteer participants 18 years and older who reside in Sweden have been eligible to report daily their health status. Analyses of these data have been used to predict which parts of the country currently have a high rate of infection, what the trends look like, and which factors increase the risk of serious illness. Already in the first week the app was available, 100 000 participants registered in the study. Today, COVID Symptom Study Sweden has around 208 000 participants, making it the largest epidemiological study ever conducted in Sweden.

In addition to information on, among other things, age, sex, weight, smoking habits, diabetes, cancer, and blood group, participants are invited to report how they are feeling physically.

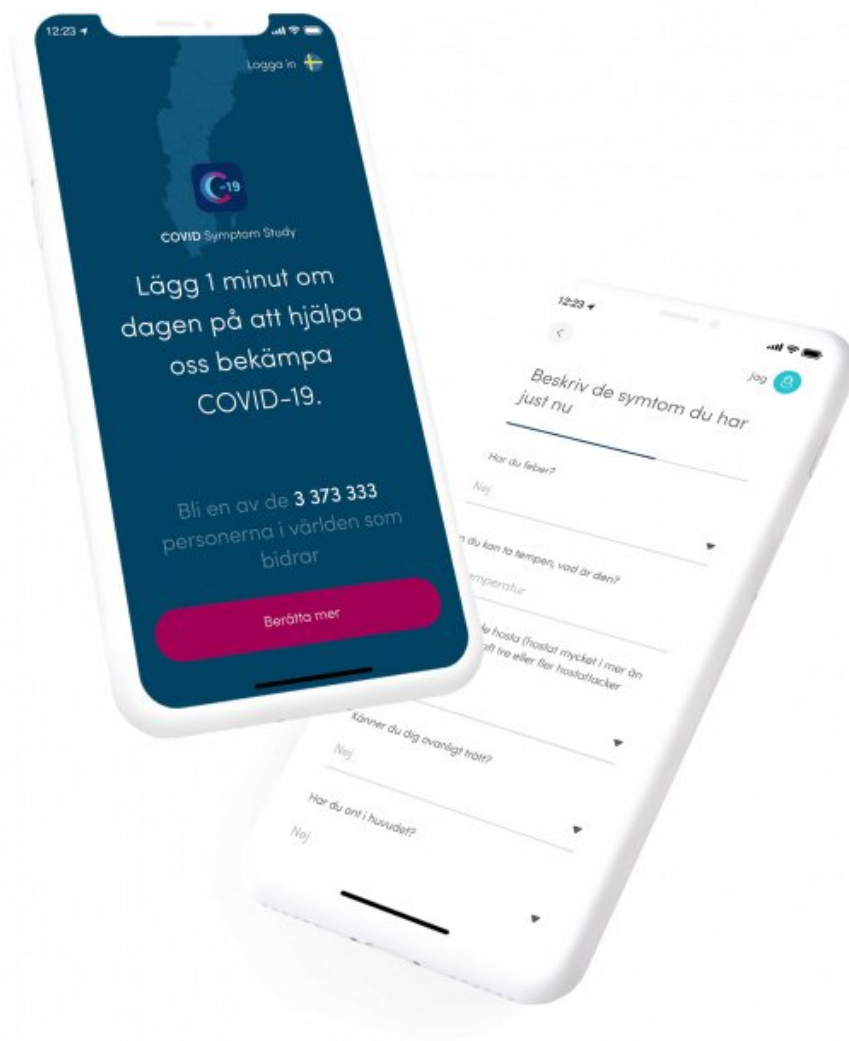
"In addition to a list of symptoms, there is a free text field in the app where participants can describe other symptoms. This has enabled us to pick up new COVID-19-related symptoms. At the start of the pandemic, when there was not so much information available on COVID-19, researchers in the UK identified loss of smell and taste, for example," explains Maria Gomez.

It was in the UK that everything began. The app was developed a few years ago by British healthcare company ZOE Global Ltd in collaboration with researchers at King's College London, to study lifestyle behaviors. In spring 2020, researchers at Lund University were, together with researchers at Uppsala University, given the green light and ethical approval to use the app free of charge to collect data in Sweden as well.

Discovering trends

As testing capacity increased in Sweden and more active COVID-19 prevention strategies were introduced, data accumulated by the app became valuable as a tool to discover trends. Since last spring, COVID Symptom Study Sweden has published a weekly report that is available to the public online and is sent to Swedish infection prevention control units and the Public Health Agency of Sweden.

"In the weekly report, we publish general maps of Sweden's 21 counties and more detailed maps for postcode areas using the first two digits. We also include tables where we identify the ten areas that have seen the greatest increase and decrease of estimated prevalence of symptomatic COVID-19 in the past week. We monitor the situation continuously and have been able to identify areas that are experiencing a particularly negative trend," explains Maria Gomez.



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Helsingborg City has actively used data from the study in its preventive

work. During the winter months, Helsingborg saw a high rate of infection which put enormous pressure on the local healthcare system.

"The City's analysts combined our results with Google mobility data at municipal level. Thanks to this, they were able to rapidly make decisions and follow developments in the municipality," says Maria Gomez.

Expanding possibilities

In the past, other apps have been able to manage large amounts of data, but the COVID Symptom Study app has clearly shown how researchers can quickly, efficiently, and at a low cost gather data and generate information.

"The richness of the data is fantastic. These data will form the basis for many additional studies, for example when we follow the vaccination process, and observe the effect of vaccination levels on the spread of COVID-19. We are also studying long-term COVID-19 symptoms and the correlation between underlying conditions and COVID-19," says Maria Gomez.

Researchers also realized early on that there is a link between diabetes and/or obesity and the risk of suffering severe COVID-19 complications. Therefore, they are now focusing on data from people with type 1 and type 2 diabetes. Is there a link between how long someone has had diabetes and the type of treatment they are receiving and COVID-19 severity? The research team is also trying to understand whether diabetes is linked to specific symptoms of COVID-19 and whether there is an increased risk of being affected by what is known as long COVID. And does the combination of diabetes diagnosis and a person's BMI play a role in how ill he or she becomes with COVID-19?

"Thanks to our positive collaboration with the app developer and help

from our participants, we have been able to expand on the questions relating to diabetes in the app. We were also able to reach people with diabetes for example via the Swedish Diabetes Organization, which makes our data set even stronger."

Small team—major commitment

For as long as ZOE makes the app available, Maria Gomez and her colleagues will continue to use it to collect relevant data and the team will continue to study COVID-19. The small Swedish team currently consists of 11 researchers—at one point there were 20—who are all driven by the same conviction of wanting to make a difference and help during the pandemic. The great take away here is how efficiently a project can be set up. The usual planning process over three or four years could be cut to 1.5 months thanks to hard work and dedication.

"What we have realized is that with the right incentives, we can be more efficient and work in a more focused way. We can bring these navigation skills with us to new research projects. We have also learnt the value of working in a more interdisciplinary manner. The team is still completely committed."

Provided by Lund University

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