Responding 10x Faster with COVID-19 Contact Tracing

As COVID-19 surged through Belgium, a team charged with contact tracing needed a better solution than a spreadsheet. To gain visibility into the spread of the virus, the team built an application for detecting and responding to clusters of infection.

BY THE NUMBERS

90% reduction in triage time
>5K clusters identified
618K nodes
587K relationships
6M properties

PLATFORM
Neo4j Enterprise Edition

INDUSTRY
Government

USE CASE
Track and Trace

OBJECTIVE
Quickly identify clusters of infection to prevent the spread of COVID in the Brussels-Capital region

CHALLENGE
An overwhelming amount of data flowing in rapidly was untenable to manage in spreadsheets

SOLUTION
Used Neo4j to track cases of COVID-19 and visualize clusters that needed attention from public health officials

RESULTS
- Analyst triage time reduced from 10 minutes to 1 minute
- More visibility into health data for more effective contact tracing and cluster identification

The Organization
GGC Belgium COCOM acts as a central liaison for matters regarding public health of the French and Flemish communities. COCOM is ultimately responsible for health prevention matters in the Brussels-Capital region, for all citizens and collectivities in the territory. Potential disease data for all Brussels citizens is sent to the COCOM team for analysis.

The Challenge
There was a critical need to understand where clusters of COVID-19 infections were occurring in the Brussels-Capital region, but CoCom had so much data coming in from so many places that it was increasingly difficult to see how it all connected while it was all being managed as tabular data in Excel.

Excel macros gave the data team insight into individual COVID-19 cases, but to get virus outbreaks under control they needed a way to detect whole clusters of infection and track the spread of the disease. With just a spreadsheet, the connections between cases were buried and hard to uncover.

The analysts needed a fast, scalable way to track infections, identify clusters, and stop the spread of the virus. They needed to visualize the connections and trace positive cases to identify whether, for example, a person who was on a flight might have brought the virus into work or school.

The Solution
COCOM recognized the nature of its problem and started to look for a different way of understanding its data. The solution was a graph.

The COCOM team rapidly created a COVID-19 contact tracing system using Neo4j. By identifying positive COVID-19 cases in overlapping time frames and locations, and then connecting exposure points, the team could plot out a visualization of virus activity in a given area.

neo4j.com

CASE STUDY

The COCOM team created an effective COVID-19 contact tracing system using Neo4j.

For a team of data analysts who need to work closely with the medical community, ease of use was important – the solution could not be overly technical. Neo4j's Cypher query language made it easy to share information with the medical teams. COCOM could query the database in Cypher, but get the results delivered as a list, ready to share with medical teams.

"Neo4j reduces the work of data analysts significantly. Before I would have to spend 10 minutes or so per cluster, and now it's about one minute."

Ilona Hendrix
Data Analyst, COCOM

The Results

Having so much data in one place and being able to analyze it quickly to identify clusters of infection and respond by investigating or dispatching medical personnel compressed overall triage time for COVID response – reducing it by 10x, said COCOM analyst Ilona Hendrix.

"Because all the information is linked already and we have it readily available, it reduces the work of data analysts significantly," she said. "Before I would have to spend 10 minutes or so per cluster, and now it's about one minute."

With COVID-19 creating a real-life crisis-response situation for detecting clusters of the coronavirus, the data team had a very good proof of concept exercise with Neo4j. In the future, COCOM will look at ways to track other diseases with Neo4j.

"The graph made it much easier to understand the links between different people, and how it becomes a cluster in the end," Hendrix said.

Questions about Neo4j?
Contact us around the globe:
info@neo4j.com
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