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Underpinning a city's response to COVID-19
Glasgow City Council

As soon as the first COVID-19 cases emerged in Scotland, Glasgow City Council turned to GIS to help it gain answers to questions that had never been asked before. Using Esri's ArcGIS Dashboards and analysis, the council was able to gain a deeper insight into the challenges of the pandemic and share this understanding to improve the delivery of services for citizens.

The Challenge

The first case of COVID-19 was detected in Scotland on 1st March 2020. Within just short three weeks, this deadly coronavirus had begun to spread through community transmission within Scotland; the first patient with COVID-19 had died in a Scottish hospital; and the First Minister had announced unprecedented lockdown measures. Glasgow City Council, like other local authorities throughout the UK, needed to react quickly to this rapidly escalating public health crisis and provide effective support for Glasgow's 600,000 citizens.

It soon became clear that the council could maximise the use of its data assets to inform the introduction of new services that were being set up in response to the pandemic. "The council had invested heavily in data analytics and data science over the preceding ten years and so was in a good place to respond quickly to the challenge," says Stephen Sprott, Open Data and Innovation Project Manager at Glasgow City Council. "The data team was asked what solutions it could provide that would help the council to meet the needs of local people, especially vulnerable groups and vulnerable individuals in the community."

The Solution

Experienced in the use of Esri's ArcGIS solutions, the council's data team began by using ArcGIS on the desktop to perform advanced geospatial analysis and geocoding. While the official number of people who needed to shield in the city was 24,000, this ArcGIS analysis revealed that there are nearly 100,000 potentially vulnerable citizens, who are registered as disabled, in receipt of benefits or receiving support from social workers, for example. The council used ArcGIS to produce density maps to identify where large numbers of these vulnerable people live and where support services should be focused.

The council then used ArcGIS Online to create a series of highly visual, interactive dashboards to display COVID-19 information internally in a format that is easy for anyone to understand. Critically, the dashboards combine the council's own data with the latest data from NHS National Services Scotland and Public Health Scotland about current levels of COVID-19 cases and vaccinations across the city, broken down into local areas. This vital epidemiological and health information is streamed into ArcGIS Online every night, with no manual intervention, providing the council's planning and strategic teams with rapid access to accurate, up-to-date intelligence.

Glasgow City Council realised that other local authorities and public sector bodies also needed access to up-to-date information about the pandemic and stepped forwards to share its expertise. Its ArcGIS Online solution subsequently evolved into a template for use across the whole of Scotland and was shared with other members of local and national resilience groups including councils, police and NHS services.
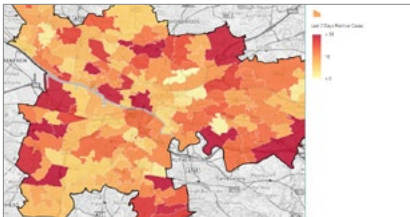
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Piero Matassoni, GIS Officer, Glasgow City Council

ArcGIS analysis showing the last seven days of COVID-19 positive cases by local area

One of Glasgow City Council's ArcGIS Dashboards, showing incidence of COVID cases in Glasgow, as well as vulnerability indicators

ArcGIS analysis showing the percentage of the local population over the age of 16 that has received the first dose of a COVID-19 vaccine, by local area

The Benefits

Real-time insight to inform the delivery of services for citizens

The use of ArcGIS enables Glasgow City Council to visualise, in near real-time, at neighbourhood level, how COVID-19 is impacting citizens. With this improved understanding of fast-changing situations, the council can ensure that the right support services are delivered in the right locations. "ArcGIS gives us the ability to visualise a wealth of detailed information and use this insight to make the best decisions to support communities and vulnerable people in Glasgow," says Piero Matassoni, GIS Officer at Glasgow City Council.

*Targeted testing to reduce COVID-19 transmission*

Using the ArcGIS Dashboards, senior managers within the council can monitor areas of the city with rising levels of COVID-19 cases, identify outbreaks of concern and then target these specific areas with interventions to help reduce community transmission. For example, when a spike in cases occurred in one particular area of the city, the council used ArcGIS Dashboards to decide where to locate intensive community testing sites (before home testing was widely available) to help it identify asymptomatic cases and stem the increase in the spread of the disease.

Effective, comprehensive roll-out of COVID-19 vaccines

The intelligence provided by ArcGIS analysis is also helping to ensure the success of the vaccination programme in Glasgow. For example, the council can use ArcGIS to track take-up of the vaccine by area, age groups and ethnicity. "ArcGIS gives us a real-time view of where the gaps are and where the vaccine programme might be lagging behind," Sprott says. "The council can then use this information to influence where to set up additional drop-in, mobile and pop-up vaccination facilities and where to increase publicity to encourage more people to get vaccinated."
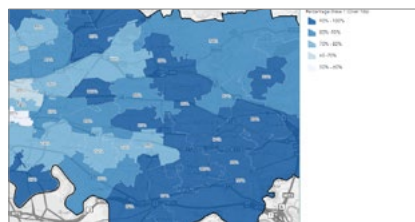
Improved management of ongoing COVID-19 risks

The council now uses ArcGIS to analyse anonymised 'track and trace' data on the leisure facilities, schools, hospitality businesses, places of worship and retail sites visited by people who have contracted COVID-19. The council's environmental and public health teams can then focus their efforts on visiting these high risk premises to check that COVID-19 secure measures are being followed. Summing up, Sprott says, "COVID-19 is not going away anytime soon so we need to continue to use ArcGIS and data analysis to deliver practical solutions to managing this ongoing public health crisis."

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