May / June 2024 Workforce

Navonil Mustafee, Professor of Analytics and Operations Management at the University of Exeter

HOW OPERATIONAL RESEARCH IMPROVED NHS URGENT CARE DECISIONS IN THE SOUTH WEST

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In 2016/17, after several years of stability, performance against NHS Accident and Emergency (A&E) waiting times were declining. A team of researchers from the University of Exeter Business School collaborated with a team from South Devon and Torbay NHS Foundation Trust to model the A&E department at Torbay Hospital. The modelling also considered Minor Injury Units (MIU) and Urgent Care Centres (UCC) in South Devon. They found that whilst all MIU/UCC centres met the four-hour standard, A&E underperformed by 20%.

The Keogh Review[1] of Urgent and Emergency Care stated that patients with urgent but non-life-threatening needs should be treated outside of hospitals, with care delivered in or as close to people's homes as possible. It was important to spread patient demand amongst regional facilities to reduce waiting times.

The University team investigated how existing data, already captured by the NHS, could be used to relieve pressure on A&E departments. They brought together a group of experts – clinicians, businesses, and operational researchers – and founded the Health and Care IMPACT Network to work on a solution.

The Network included people from multiple NHS Trusts in the South West of England. Together they agreed on a format for waiting time data from A&E departments, MIUs/UCCs and other centres for urgent care. A common data standard was necessary as the objective was to develop a digital platform at a regional level, rather than a Trust-specific solution, ensuring that the platform could receive data feeds from multiple systems.

The research team used Operational Research (OR) to develop a digital solution to reduce pressure on busy A&E departments by giving patients the ability to make real-time informed choices on the best place to go for urgent care. Using system integration techniques, the team developed a digital platform and the NHSquicker[2] app to provide live waiting times for A&E departments and other centres of urgent care.

By transforming real-time data into actionable insights and nudges, NHSquicker is designed to encourage patients to choose the appropriate treatment facility for their condition, so only the most serious present at A&E. This reduces demand and waiting times at A&E, and shapes demand across urgent-care facilities by encouraging patients to choose a destination with a lower waiting time. The app, which has been in continuous operation since 2017, empowers patients to make more informed decisions about available healthcare options, not only reducing the wait experienced by patients but also helping the NHS meet the four-hour standard.

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In 2022, the team was awarded the Lyn Thomas Impact Medal[3] by the Operational Research Society, an annual award for research that demonstrates novelty and real-world impact. The project highlights how OR can be used for solving complex issues today. Often termed 'the art and science of decision making' OR combines advanced mathematics, data analytics and human insights to tackle complex business challenges.

This case study, based on an article in our membership magazine by Nav Mustafee, Professor of Analytics and Operations Management, and John Powell, Professor Emeritus, from the University of Exeter Business School, looks at how the University team, that included Alison Harper, Surajeet Chakravarty, and Todd Kaplan, developed the innovative solution for the NHS that is benefiting both patients and staff.

Recent challenges

At the national level, A&E waiting times have continued to increase steeply over recent years, particularly in the wake of Covid. In January 2024, NHS figures show the number of people who waited more than 12-hours in A&E departments in England increased by nearly 25% compared with the month before[4]. This is a long way off the NHS "four-hour standard" set in 2010 whereby at least 95% of attendances are admitted, transferred, or discharged within four hours of their arrival at any type of A&E department. This standard also applies to MIUs and UCCs, which together with A&E departments, are part of the NHS Urgent Care Network. By the end of 2023/24, only 55% of A&E patients met the 4-hour standard; not far off the worst A&E performance in over a decade[5]. Despite declining A&E performance, the figures show that MIUs typically continue to meet the standard.

Response to recent challenges

Version three of NHSquicker was launched in March 2024 in collaboration with Rachael Shine, Head of Urgent Care Transformation Programmes NHS Devon ICB, and Tom Monks from the University of Exeter Medical School. In addition to wait time information, this version uses the NHS Directory of Services (DoS) Urgent and Emergency Care API to report non-routine closure of urgent care facilities. The integration also provides users with on-demand information on dentists, opticians, pharmacies, and sexual health clinics. As of April 2024, NHSquicker receives real-time data from 37 centres of urgent care, including seven A&E departments. The app is available to 1.7 million patients across the South West.

The benefits of NHSquicker

The benefits have been three-fold. Firstly, NHS Trusts in the South West have interfaced their IT systems with NHSquicker. This app is a way for Trusts to use existing data in a new way to improve the patient experience of their urgent care services.

Secondly, patients are finding the app useful. An in-app survey in 2020 found that 78% of users agreed that NHSquicker helped them decide where to go. The new version has advanced analytics features that will further help with evidence.

Finally, data analysis from early adopting Trusts found a significant shift in the pattern of attendance, with a reduction in A&E attendance and an increase in MIU/UCC visits. The Trusts had a well-planned publicity campaign that increased awareness of the solution.

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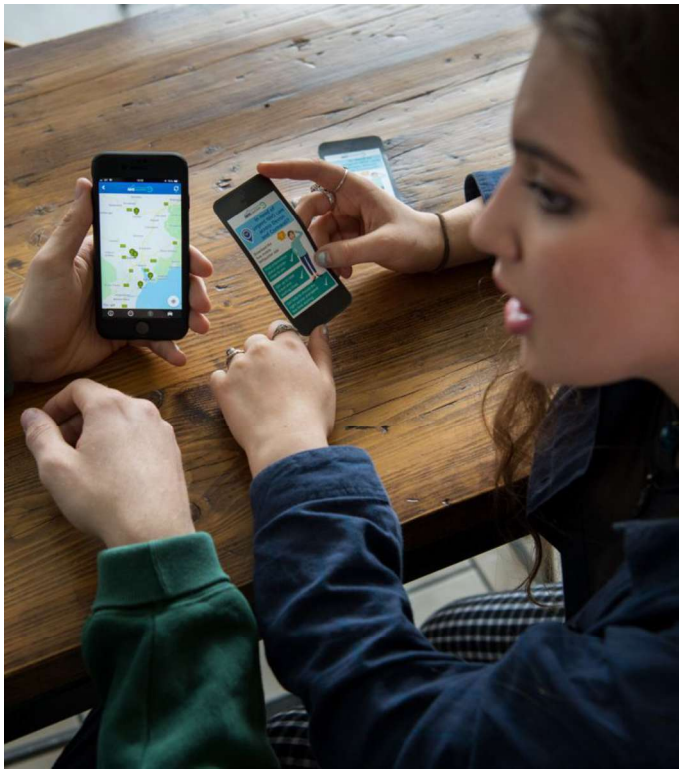

To conclude

The University researchers behind NHSquicker have shown that local-level digital initiatives using OR can be scaled up regionally. The next stage will be to scale up further from regional to national settings. By unlocking data from multiple sources and joining wait time and travel data, NHSquicker empowers patient decision-making and transforms their experience of urgent care services. Simultaneously, it is helping NHS frontline staff in their day-to-day operations and smoothing demand in overstretched facilities, particularly those offering emergency treatment.