

Using data and analytics to underpin better healthcare



INTRODUCTION

The NHS is under immense pressure. From growing challenges of an aging population amid a shortage of key healthcare workers, to the impact of health crises, like Covid-19.

NHS Trusts are constantly looking for new ways to drive efficiencies that will help relieve the growing pressure on our health system. Most are exploring how technology and data can optimise operations and improve patient service delivery. Indeed, the Covid-19 crisis has demonstrated beyond question the value of using data to track patient welfare and manage critical medical resources amid rising demand. The Future NHS Collaboration Platform, an online platform that enables NHS Information and Data professionals, and industry leaders to exchange knowledge and information on transformation in health and social care, has arisen as a champion of best practice for information sharing.

However, it is not just in times of crisis that healthcare organisations should be looking at how they can use data effectively and efficiently to improve patient care delivery. Enabling employees to make more informed decisions - and faster - will prove critical to ensuring that the NHS can maintain its high standards of care as population health demands evolve.

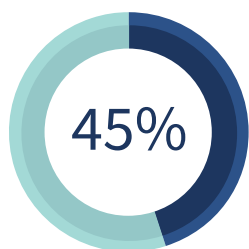
Data analytics is key to achieving this and new research from Qlik, which conducted Freedom of Information (FOI) requests, has shown that most NHS Trusts have embarked on their journey towards greater data use to improve their services. Analysis of the FOI responses, however, has identified three key areas where many NHS Trusts could increase their use of data to empower frontline care workers, data professionals, operations and management to improve the delivery of care.

This report provides practical guidance from data leaders in the NHS - including from University Hospitals of Morecambe Bay NHS Foundation Trust and Wrightington, Wigan and Leigh NHS Foundation Trust - alongside best practice expertise from Qlik to help Trusts as they take their next steps in using analytics to underpin better healthcare.

Sharing data to improve preventative care

Population Health is a key pillar of the NHS Long Term Plan, with a focus on supporting those who are frail or live with chronic conditions. Not only does this improve the patient experience, but limited hospital resources can be made available to those that are most in need.

Mark Singleton, Associate Director of IM&T at Wrightington, Wigan and Leigh NHS Foundation Trust, underlined its critical role in sustaining the NHS. “It’s not an overstatement to say that ensuring that the most in-need patients have access to medical support in A&E is a question of life and death. Better population health can help prevent the over-dependence on emergency departments by supporting earlier interventions that enable many patients to be treated at home.”

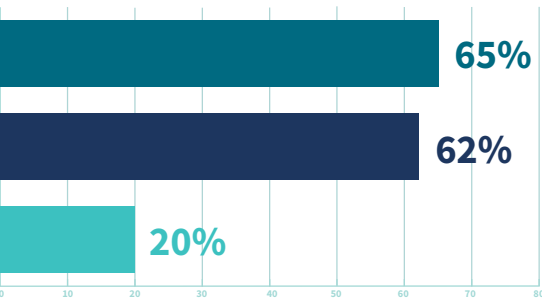


45% of NHS trusts are part of a multi-agency integrated network that shares data for analysis

However, many NHS Trusts are not sharing data for analysis with other organisations that would enable more effective preventative care in the community. Less than half of all NHS Trusts (45%) are part of a multi-agency integrated network that shares data for analysis, whether that be with other healthcare organisations, local police or social services organisations. An even smaller number of Trusts report having a relationship with primary care groups, for example General Practices, where they share data for analysis.

“It can often take up to two months before GPs receive data on which of their patients have been admitted to and discharged from hospital. By this point, it’s typically too late to make proactive interventions that will better support that patient’s recovery at home. Not only does this deprive the patient of sometimes much-needed support, but considerably increases the risk of re-hospitalisation,” Singleton continued.

Where NHS Trusts are part of multi-agency networks, most are already taking advantage of shared data analysis to help them better serve the community as a collective service.



How NHS Trusts in multi-agency networks use shared data:

- To understand key population health issues
- To identify and help vulnerable or high-risk people
- To allocate funding for preventative work

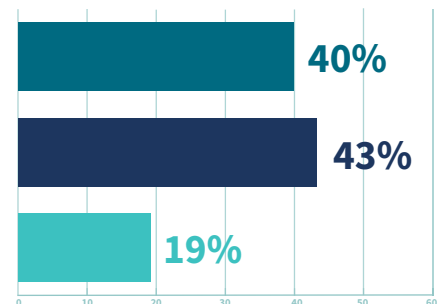
Indeed when asking those NHS Trusts that are already part of established multi-agency networks how they are using shared data for analysis, most report that they are using it to understand key population health issues (65%) and to identify vulnerable and high-risk people for support interventions (62%). Twenty percent of this group also share data analysis to understand where to allocate funding for preventative work in the community.

Greater sharing of data for analysis between different health and public services is key for identifying opportunities to improve care in the community and reduce the pressure on already-overburdened services.

Using insights to inform patient care

It is important that data analytics tools are used to inform the care being provided, as well as at an operational level. However, many of the solutions that NHS Trusts hold are not capable of providing that level of analysis. In fact, nearly two-thirds of data analytics tools currently deployed in the NHS do not have capabilities that support the identification of population health patterns and risk stratification (60%), nor can they inform the creation of clinical pathways (57%). An even smaller number of tools can help inform patient diagnosis (19%).

Speaking about the steps taken at University Hospitals of Morecambe Bay NHS Foundation Trust to use data to inform care pathways, the Head of Information, Rob O'Neill commented, "As part of our migration to Qlik Sense, we have been able to build a series of powerful apps for the integrated care communities that are focused on care pathways. We've moved from traditional healthcare analytics to looking at bespoke analytics for health issues, such as for strokes, type-2 diabetes, as well as for the frail and elderly."



NHS data analytics tools capable of informing patient care:

- Help identify population health patterns and risk strategy
- Inform clinical pathways
- Help inform patient diagnosis

Implementing this analysis to support population health is enabling clinical professionals who are based across the county to help patients better manage their health issues. “By looking at the longitudinal care pathway, we’re able to identify the different points at which patients interact with providers of health and care services. This helps us get a complete picture of their care: from what medication they’re taking, right through to whether they’re turning up to their primary care appointments,” O’Neill continued. “Understanding this not only helps us identify population health patterns and more successful care pathways at a community level, it also helps us determine where patients might benefit from more proactive reminders to engage with primary and community health services to help them better manage their health issue.”

Another way that Trusts can proactively use data analytics to inform patient care delivery is through delivering timely insights as notifications to mobile devices. This helps ensure that analytics are used at the point a decision needs to be made. Mark Singleton of the Wrightington, Wigan and Leigh NHS Foundation Trust commented, “One in nine clinician posts is currently vacant given the staffing shortages. I don’t want doctors and nurses sitting behind computer screens in their efforts to use data to inform their delivery of care, I’d much rather we adapt how we deliver these insights to help them spend more time with the patient. Notifications have played a key role in helping us to provide timely information to clinicians to support them in their care delivery. For example, a Parkinson’s patient may need medication every two hours. Understanding that patient’s requirements and the appropriate nurse to administer it, we are able to provide push-notifications to alert them when a new dose is required. This is just one way in which we are using notifications to make our data actionable for our frontline team.”

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Understanding patients’ health issues, requirements and behaviour through better data analysis is integral in helping healthcare professionals improve care delivery. With this deeper and more timely awareness of patient needs, clinical workers can be confident that they are delivering the right care programme to every patient and ensuring everyone receives the same high standard of care.

Real-time resource management

Especially during periods of peak activity, it's critical that NHS Trusts are effectively managing the resources they have to provide the best possible care to patients. Most Trusts' data analytics solutions (82%) already help them monitor for key operational issues, like Emergency Department demand, enabling them to prepare and react to surges in demand.

University Hospitals of Morecambe Bay NHS Foundation Trust recently won an award for 'Delivering for Front Line Staff'¹ for its Analytical Command Centre, a series of large analytics dashboards based at the Royal Lancaster Infirmary site. "Real time analytics really matters – especially in a fast-moving environment like the Emergency Department. We modelled the Command Centre on an airport Air Traffic Control system, displaying live and predictive information about patients throughout their hospital stay. Giving our frontline care workers instant access to key information, such as the status of ambulances, surges in demand, which patients are due for discharge, as well as the current bed state across the Trust, is critical for empowering them to make informed decisions relating to the patient experience and care," explained O'Neill.

"This system has undoubtedly improved how we run our wards. The numbers of patients triaged within 15 minutes of arrival has improved from around 65% to a position where the Trust consistently triages 95% of patients within 15 minutes of arrival at one of the Emergency Departments. We've also seen a significant fall in medical outliers since the Command Centre went live, which is known to support high quality care and improved patient outcomes."

Resource management is most effective when those on the ground have access to information in near real-time. For example, enabling the patient flow manager to easily capture data on the number of patients awaiting discharge across different wards into an iPad helped Wrightington, Wigan and Leigh NHS Foundation Trust identify bottlenecks to effective patient care. "Previously we didn't know how long it was taking for patients to have an MRI scan," Singleton added. "But through more agile reporting and analysis, we've reduced that from 10 days down to two days."

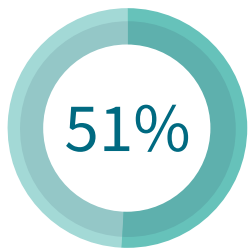
Yet while most NHS Trusts using data analytics do give access to all roles across the organisation, less than half of NHS workers report having access to these insights on mobile devices.

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**Rob O'Neill, Head of Information,
University Hospitals of Morecambe Bay
NHS Foundation Trust**

¹ <https://www.freshthinking.uhmb.nhs.uk/trust-wins-prestigious-award-for-analytical-command-centre/>

Mark Singleton of the Wrightington, Wigan and Leigh NHS Foundation believes that this may in part be due to security concerns. “Healthcare organisations across the country are naturally very cautious of Bring your Own Device because of fears over security, particularly in the wake of the WannaCry ransomware attack,” he commented. “We’ve overcome that challenge by hosting our applications on Qlik Sense Enterprise SaaS, so that they can be accessed on any device without requiring the user to connect to a secure hospital network.”



51% of NHS data analytics tools have open APIs, allowing them to be integrated with existing applications in use

Similarly, he holds WannaCry largely responsible for the reticence amongst healthcare IT teams to use Application Programming Interfaces (APIs). Just half (51%) of data analytics tools currently deployed in the NHS have the capability to use open APIs, which would allow teams to embed data analytics dashboards into existing applications that teams are using. This makes it more cumbersome for employees to integrate data-informed decision making into their existing working practices.

Once again, Singleton has overcome the security concern by hosting the Trust’s applications on Qlik Sense Enterprise SaaS, removing any risk of opening a hole in the hospital firewall. However, O’Neill highlights another significant challenge that must be overcome in the pursuit of using open APIs - legacy healthcare IT solutions. Speaking about a current data science project Morecambe Bay NHS Trust is planning, he said “We would like to build data analytics into our Electronic Medical Records (EMRs), so clinicians have all the information in one place when making important decisions about patient condition and possible treatment routes. However, some EMRs are quite difficult to integrate.”

Actionable improvements for data analytics in healthcare

There are success stories across the NHS of Trusts that are effectively and innovatively using data to improve the experience and care of their patients – whether in hospital, primary care or in the community.

Through our research, we have identified three key areas where NHS Trusts can accelerate the value that they drive from their data:



Share data analysis to make the biggest impact

To manage the growing demand on NHS Services, we must relieve the immediate pressure on hospitals through better preventative care and connected services. Analysing data across different NHS and public health services will help identify many high-risk individuals where early interventions in the community could help prevent more serious issues requiring hospitalisation.

This is largely a management issue rather than a technical challenge. While NHS Trusts typically have a plethora of different data sources – indeed two-thirds of NHS Trusts have over 100 different systems holding data – data integration technology can bring together information from diverse sources in near real-time to support comprehensive and actionable data analysis. This combined view can then be made available to users in different organisations by hosting the analytics on a secure, governed platform.



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To improve the use of data to support preventative health programmes, the government needs to introduce incentives for senior leaders to unlock massive data sharing and the insights that come with it. Part of this, Singleton from the Wrightington, Wigan and Leigh NHS Foundation Trust believes, will come when the government changes how it funds organisations. “Traditionally hospitals are paid per patient treated. As data sharing with community organisations aims to reduce the number of patients requiring hospitalisation, it will be important to reflect on an appropriate funding model that is fit for the population health goals the government aspires to.”

For more information on using data analysis to support greater healthcare outcomes, please visit [Qlik Healthcare Analytics](https://www.qlik.com/us/solutions/industries/healthcare-analytics)².

²<https://www.qlik.com/us/solutions/industries/healthcare-analytics>



Embed data decision making into existing processes

Health professionals are incredibly time poor and are already having to balance their administrative work with patient-facing time. Data-informed decision making cannot become an additional layer of work; insights must be made available on the devices and in the software they already use to help frontline workers naturally make data part of their decision making process.

To best support this seamless integration of data into employees' existing working practices, Data and Information leaders must ensure that mobile capabilities are made available and that, where possible, insights are integrated into the existing applications using open-APIs.

However, for Trusts embarking on this shift towards more agile analytics, it is important that the design of these new applications isn't siloed to the Data and Information team. "Involving operational and clinical stakeholders in the design process of the applications they'll be using is key to ensure that the analytics strategy is developed to best support their work," advocated O'Neill at Morecambe Bay NHS Trust.

Involving stakeholders from across the organisation in the design and roll-out of more agile analytics applications will also be key in helping overcome the important cultural change that is required within hospitals for such strategies to be successful. "Historically, if a nurse was seen getting their phone out on a ward, they'd be reprimanded by the matron," Singleton commented. "We need to shift the perception of mobiles in hospitals away from "checking Facebook" to "a powerful pocket computer that helps me make better decisions".

For more information on integrating data analytics into existing work processes, please visit Qlik Embedded Analytics³.

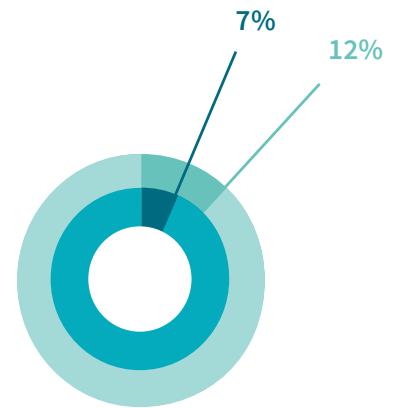
³<https://www.qlik.com/us/bi/embedded-analytics>



Investing in people to improve processes

“Data is the golden thread that runs right through the hospital – from patients up to the board level – and we can enable people to make data-driven decisions in all care settings” commented O’Neill on the power for analytics in Morecambe Bay NHS Trust.

However, while our research has shown that Trusts are giving more of their employees access to data analytics, there remains a significant barrier that many organisations face in translating this information into actionable insights. Amid a global data literacy skills deficit – of which the the UK is no exception, with just 17% of the UK working population able to confidently read, understand, analyse and argue with data⁴ – many NHS workers are not experienced or confident in using data to make decisions. Yet, most NHS Trusts are not currently investing in closing that skills gap, with just 12% reporting running a data literacy training programme. An even smaller number of Trusts (7%) provide this training to all employees – whether they’re in management or a frontline worker – which significantly impacts their ability to use data as part of their decision making process.



- Trusts that are running a data literacy programme
- Trusts that offer it to all employees

NHS Trusts must ensure that data literacy training becomes a key pillar of their data strategy so that their employees can understand and use data confidently in their decision making process. There are a number of free resources available that can help Data and Information teams create programmes that will help NHS employees better understand data and the ways in which it can help them improve operational processes and patient care.

For more guidance on building data literacy into your data strategy and for access to free resources, please visit the Qlik Data Literacy Program⁵.

⁴<https://thedataliteracyproject.org/humanimpact>

⁵<https://www.qlik.com/us/services/data-literacy-program>



About the research

In February 2020, Qlik conducted research into the use of data analytics within NHS Trusts through a series of Freedom of Information (FOI) requests. As part of the research, 141 NHS Trusts were approached, of which 92 replied. In some instances, the NHS Trusts did not respond to all questions asked. In such instances, the percentages cited within this report are representative of those NHS Trusts that responded to the given question.

About Qlik

Qlik’s vision is a data-literate world, one where everyone can use data to improve decision-making and solve their most challenging problems. Only Qlik offers end-to-end, real-time data integration and analytics solutions that help organizations access and transform all their data into value. Qlik helps companies lead with data to see more deeply into customer behaviour, reinvent business processes, discover new revenue streams, and balance risk and reward. Qlik does business in more than 100 countries and serves over 50,000 customers around the world.

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