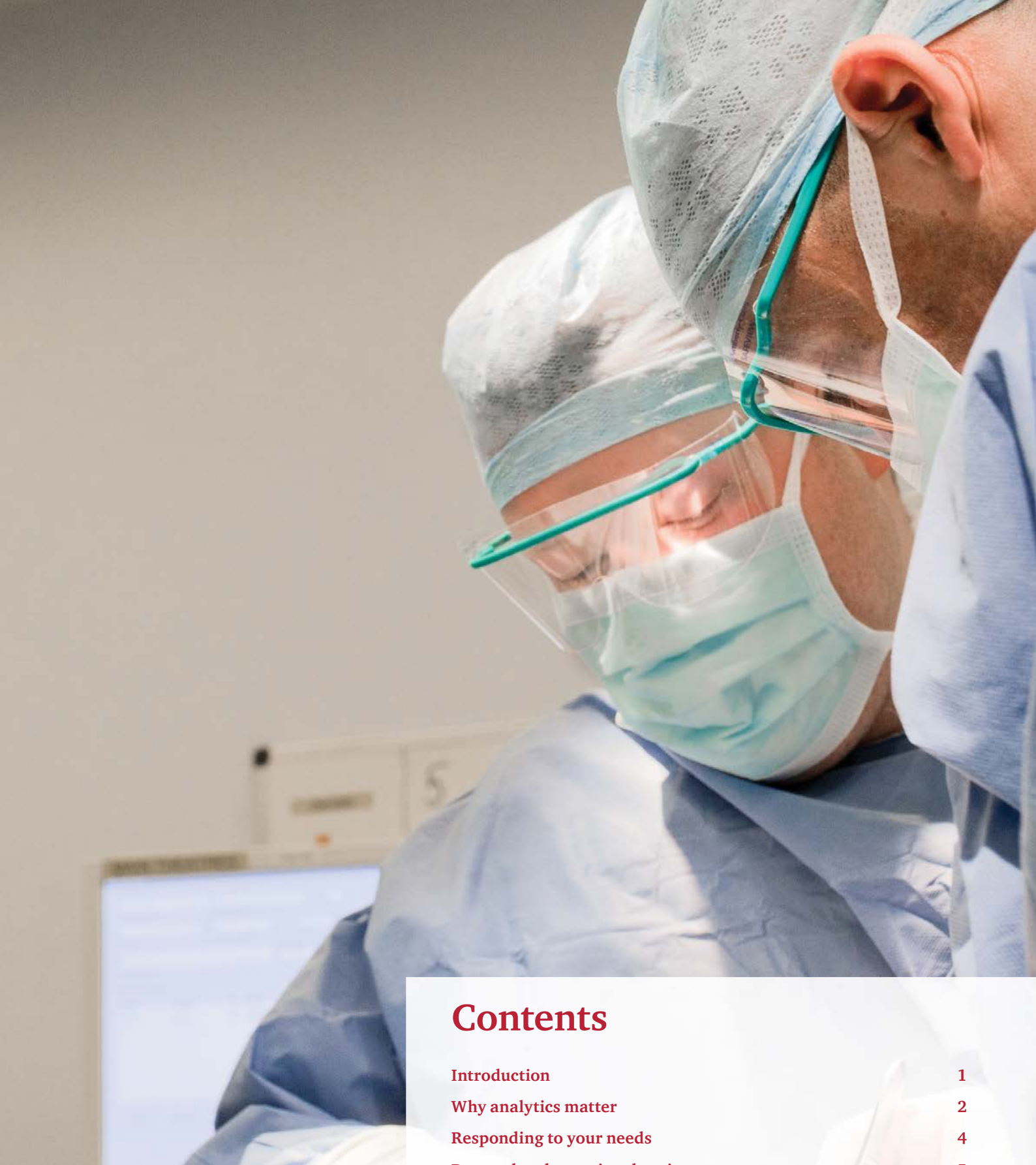




Better insights, better decisions, better outcomes

Using analytics in healthcare



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Introduction



The NHS is facing ever-rising costs through ageing populations and increased demand. At the same time budgets are constrained and systems are transforming. Across the healthcare sector organisations are looking for new and more effective ways to deliver services. Data analytics is key to this. Findings can be used to both design and implement transformation to improve patient outcomes and reduce overall costs.

The opportunity to use analytics is enormous. Change is complex and involves a myriad of stakeholders and partners. Analytics can make sure the complexities of change can be unpacked and decisions can be made with trusted insights. From increasing patient safety, to ensuring greater financial stability through cost management, efficiency and improving the management and quality of care, the use of analytics is a vital component. Data analytics is ensuring health leaders can make the decisions that most benefit their patients and the populations they serve.

We have a nationwide team of experts who are at the forefront of delivering innovation and transformation through the use of the most up to date analytics tools and solutions.

Using the latest technology platforms and solutions we have the ability to develop strategy, design and implement processes and analyse results with a view to development of next steps. We operationalise end-to-end solutions that maximise the insights gained from data analytics. Every approach we take is bespoke to the people we work with. We are already working with key providers and commissioners and across health and social care systems to bring real and tangible benefits to organisations and to patients.

We'd be delighted to discuss your issues with you and work out how we can apply our learnings from across the sector to your institution.

Dr Oliver Bernath
Analytics leader

Why analytics matters

Analytics solutions can drive improvements in productivity, clinical effectiveness, patient experience and outcomes.

Using analytics effectively means:

- avoiding following misleading information
- taking the fastest route
- sharing the same information across a system
- effective monitoring and quick identification of issues
- empowered leaders

Using analytics means you can find out:

Who are your patients and why did they come?

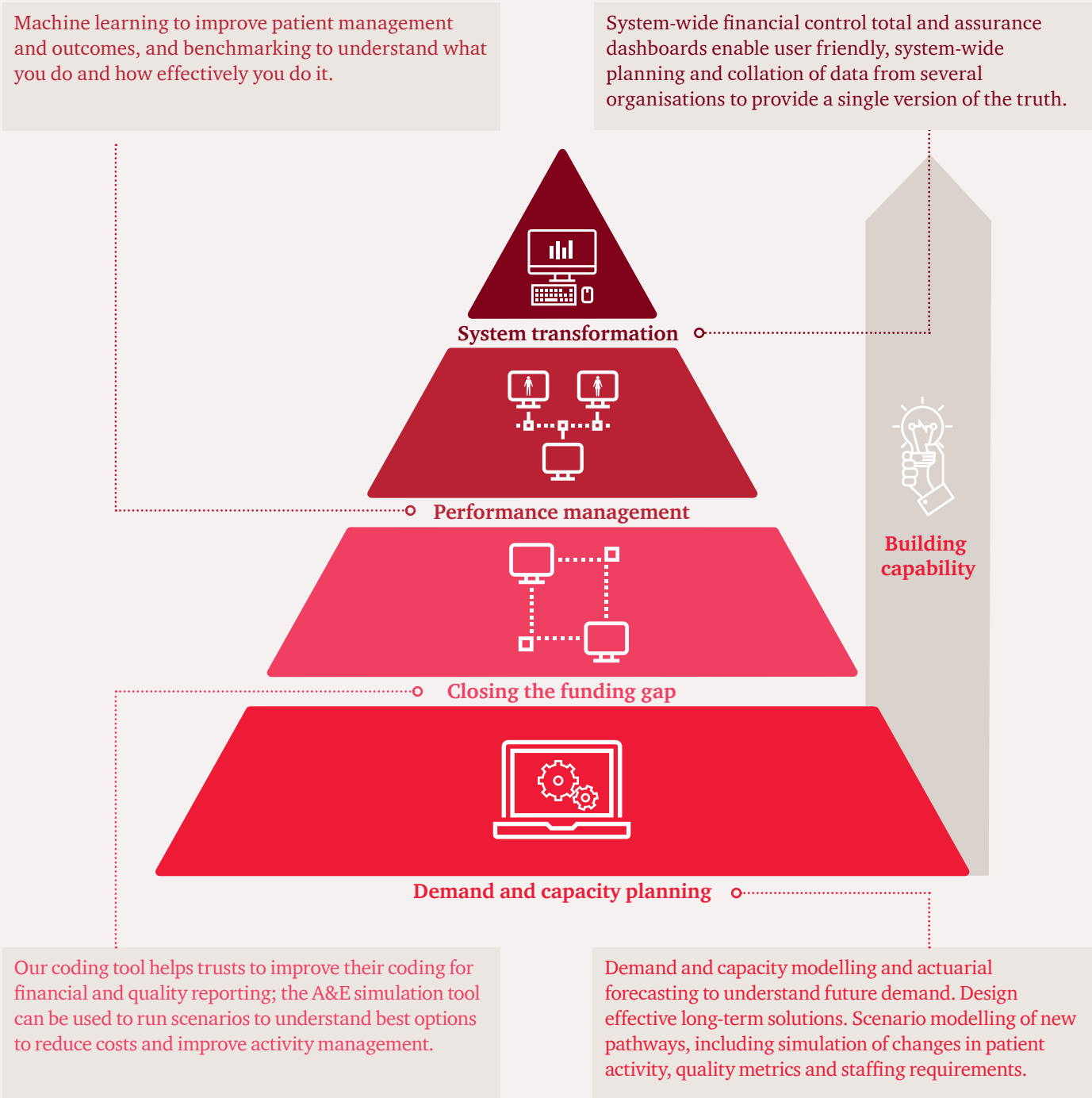
How many patients are likely to come this time next year?

What can you do to change the pattern?

For example, analytics can give you a better understanding of who and why people are visiting A&E, how many will come in future years and what you can do to support some of these patients in the community instead.



Analytics can address financial, operational, clinical and performance management challenges.



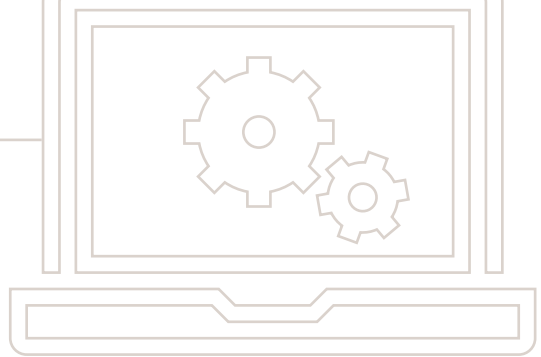
Responding to your needs

We bring together activity and cost datasets, including the Healthcare Evaluation Data tool, population data such as ONS data, and geospatial data, to build enriched datasets that can yield unique insights into a local healthcare system.

We use the latest technologies and analytical techniques, such as artificial intelligence, machine learning, predictive analytics, financial forecasting, statistical analysis, visualisation, simulation and scenario modelling, to provide organisations with the most meaningful understanding of data.

And we accelerate insights via our data and analytics tools and apps, which can be customised for each individual organisation. We always propose the solution that is most beneficial, never prescribing a 'one size fits all' approach.





Demand and capacity planning

How we can help

We can give you insights into the flow in key aspects of your system enabling you to model different strategies and assess which will have the most impact in delivering improvements in patient care, performance and resourcing.

How we do it

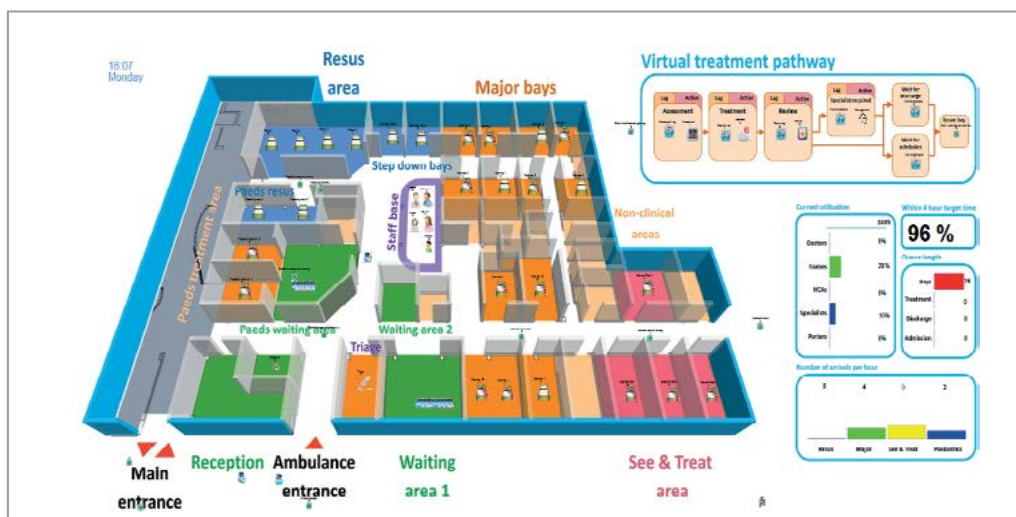
- a hospital simulator tool which analyses historical data trends and applies dynamic simulation modelling to help you understand patient flow and capacity and visualise performance against key metrics – this can be used in A&E, for bed management or across a whole health economy;
- patient flow analytics to help understand the potential impact of possible changes to urgent and emergency care;
- stochastic modelling to test strategies for improving performance and prioritising staffing and resources;
- acute reconfiguration scenario modelling, including patient travel time analysis;
- workforce and facilities planning tool.

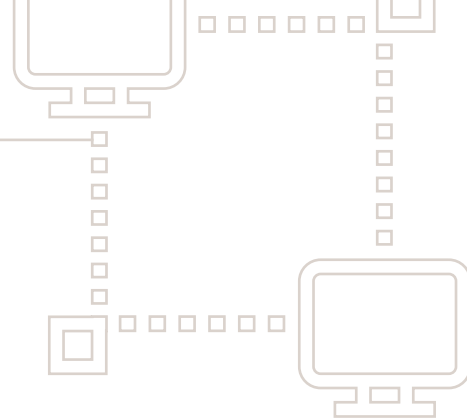
Where we've done it

We have worked with a number of trusts to understand their baseline bed usage and benchmark them against comparable other trusts through using bed capacity and demand models.

Our robust quantitative analysis on existing patient flows, cancelled treatment and bed occupancy provides new insights to senior management and clinical teams.

The simulation model we developed meant they could identify and address instances of suboptimal care, manage day-case patients efficiently, and plan for high demand. We trained internal teams to run the tool so that they can continue to use it to make better bed capacity decisions.





Closing the funding gap

How we can help

We can work with you to understand how to drive down costs and achieve financial efficiencies, whilst also identifying opportunities to increase your revenue. We benchmark you against the national average and peer trusts so that you can see how you are comparing.

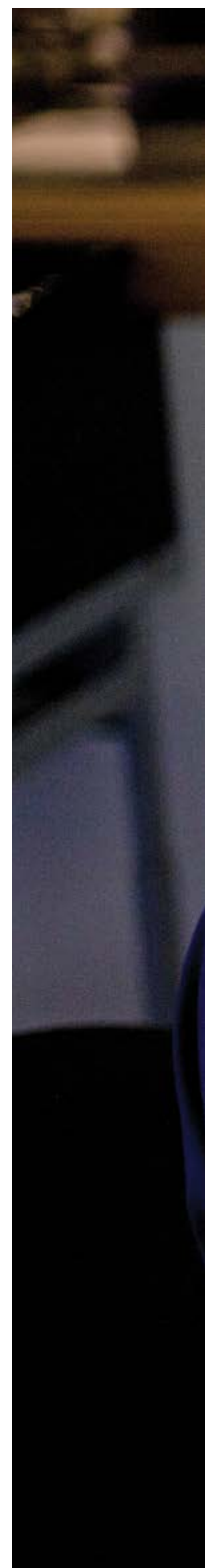
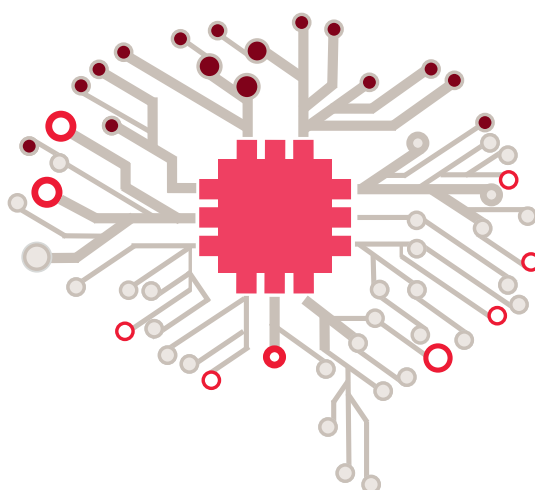
How we do it

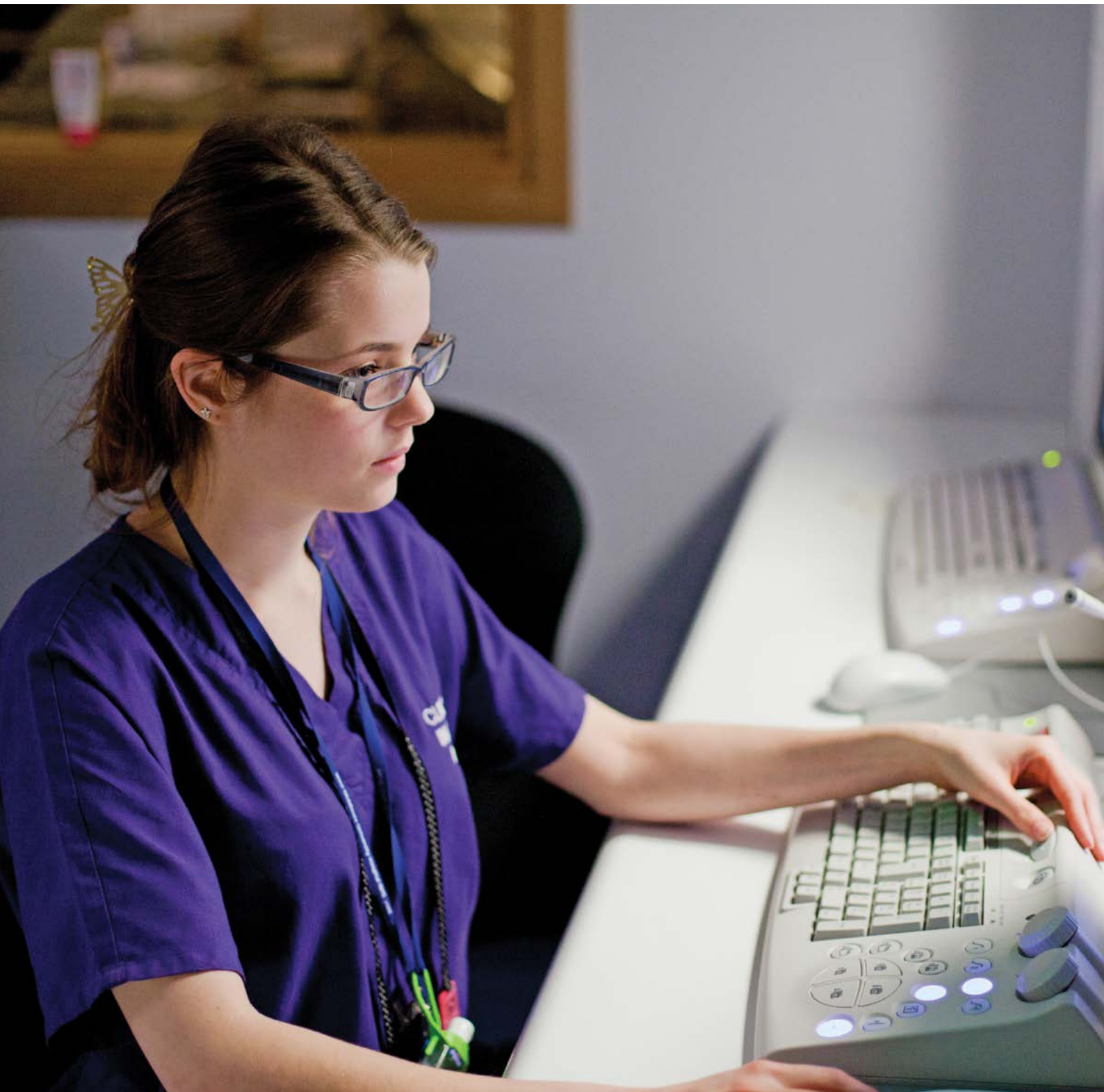
- identify the specific areas where you can improve your clinical coding to provide an accurate basis for future planning, drive performance outcomes and increase revenue;
- use an automated clinical coding model to classify patient diagnoses and procedures from free-text input and other recorded hospital metrics;
- calculate the funding gap now and in the future, through baselining and forecasting costs in the system across multiple organisations;
- highlight which specialties cost more than those of their peers and indicate where costs can be reduced;
- connect the analysis to targeted recommendations for implementation.

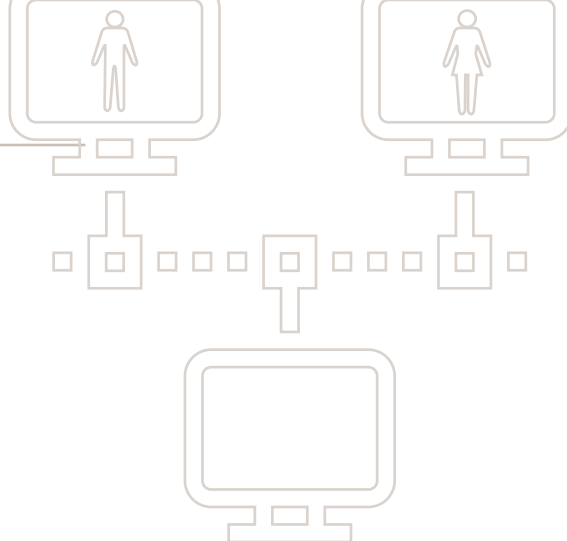
Where we've done it

We have worked with a number of trusts around the country to bring analytical insight into acute coding outcomes for the organisations within a local health economy. Coupled with targeted and actionable recommendations to help trusts increase coding accuracy this has improved the activity and financial data informing the baseline. We also maintain a consistent focus on engaging with clinicians to ensure the coded data truly reflects the complexity of the care they are delivering.

Our outputs have enabled local health economies to deliver real in-year improvements in the accuracy of acute activity coding and the associated tariff values, as well as sustained improvements for future years.







Performance Management

How we can help

We can help you maintain a grip on service delivery, and drive quality and productivity. We have worked with a number of providers to offer insights into operational changes that achieve safe, effective, compassionate, high-quality care and that meet national performance indicators.

How we do it

- data analytics and visualisation dashboards, including theatres and outpatients for example, to quickly identify which quality indicators are performing well and which require further investigation, thus enabling you to act before issues escalate;
- benchmarking analysis against suitable comparators/peers;
- clinical variation analysis and dashboards;
- patient length of stay and Estimated Discharge Dates (EDD) analysis;
- Emergency Department (ED) breach analysis tool;
- risk-based and proportionate approach which ensures that safety and quality is upheld.

Where we've done it

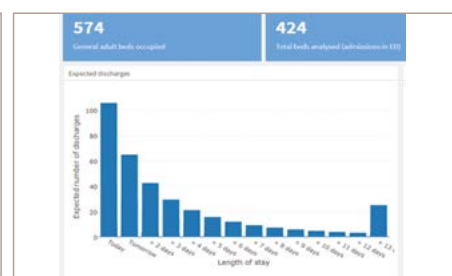
Working with various clients we have developed a 'Machine Learning' mechanism to predict EDDs for individual patients based on large but routinely recorded data sets.

Through the tool we are able to predict, with a good level of accuracy, whether a patient will be admitted, whether they will stay overnight, and how long they will stay in hospital for.

This has meant that at moments of high bed pressure, the tool helps focus escalation procedures, for example patient-by-patient reviews on those areas and those patients where it matters most.



Patient ID	Surname	First name	Age	Current ward	Current ward group	Bed number	Discharge probability today	Discharge probability today or tomorrow	Overstay index
x	B	A	5	CDU	GO	x	94.3%	99.6%	0
x	B	A	5	CDU	GO	x	87.3%	94.3%	5.7
x	B	A	5	CDU	GO	x	87.2%	88.1%	65.1
x	B	A	5	CDU	GO	x	86.6%	87.3%	72
x	B	A	5	CDU	GO	x	86.6%	95.3%	0
x	B	A	5	CDU	GO	x	86.4%	87.8%	27.1
x	B	A	5	CDU	GO	x	85.7%	95.4%	0
x	B	A	5	CDU	GO	x	82.0%	96.0%	95.5





System transformation

How we can help

We have extensive expertise in developing system transformation towards population-based, outcomes focused, integrated organisations which empower patients. We have worked with providers, commissioners and national bodies across the country to be at the forefront of the development of innovative contracting and payment approaches within the NHS and Social Care.

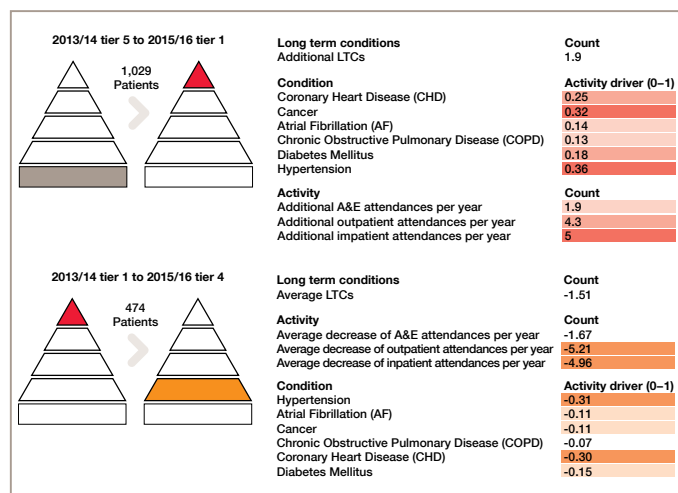
How we do it

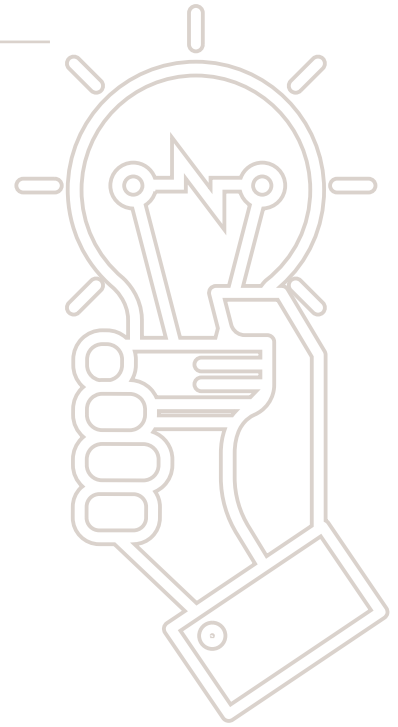
- predictive analytics and risk stratification to model future activity, demand and funding across the local health economy for the short, medium or long term;
- redesigning models of care or interventions and modelling their local operational and financial impacts;
- testing the feasibility of a capitation-based funding mechanism to align incentives and promote integration, including identifying and quantifying system-wide risks;
- developing sophisticated payment mechanisms and gain/loss share mechanisms to manage risks across the lifespan of a multi-year contract;
- model multiple scenarios.

Where we've done it

We were engaged to develop a five year Strategic Plan for the Greater Manchester Devolution Deal. We conducted analysis to understand the local health and care system in the area. Our modelling focused on the financials of all related organisations in the locality and population health analytics giving insight into the system cost drivers, the patient structure and activity anomalies.

We were able to identify what influenced a move between being a high cost/need or low cost/need patient and the specific trigger points. The team also used the analysis to uncover patterns within the data and define cohorts of patients with similar characteristics.





Building capability

How we can help

The task of avoiding financial deficit while maintaining and improving quality standards is an increasing challenge for many local health economies. We can collaborate with you to find solutions to the challenge of delivering high quality services whilst planning for a sustainable future. As well as conducting data analysis for you, we can help you embed data analytics platforms, skills and capabilities within your organisation.

How we do it

- examine the potential benefits of building in-house data analytics capabilities;
- develop a roadmap and operating model for a new data and analytics strategy and understand the infrastructure and staffing investments required for implementation;
- create a linked health and social care database that allows analysis along entire care pathways across acute, community, mental health, primary care, prescribing, continuing care and social care sectors;
- support every aspect of your information management strategy including data definition, pseudonymisation, Caldicott approval, data collection, data linking and database assembly;
- establish a governance framework to manage the development and delivery and mitigate information governance risks.

“The Programme which PwC delivered this Trust has delivered excellent value. Full year savings equal £93m or 9.5% of turnover. The documentation and processes that the PwC team developed are innovative and unique. These processes have added significantly to the value proposition as well as delivering real, tangible savings.”

Director of Transformation and Turnaround, NHS Foundation Trust

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Health Industries

Tomorrow's healthcare today

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