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Saving Lives with *Secure* Data

Lancashire and South Cumbria Secure Data Environment



CASE STUDY

The Lancashire and South Cumbria Secure Data Environment (SDE) is a digital platform designed to securely store health and care data.

This platform enables the analysis of this information for research and planning purposes, which is crucial for the healthcare system's ultimate goal: preventing illness before it starts. By providing insights into population health, the SDE not only helps identify risks early but also supports the development of effective treatments, ensuring timely interventions that improve patient outcomes and overall public health.

The SDE program is being delivered on behalf of the Lancashire and South Cumbria Integrated Care System (ICS), which includes a number of Trusts, including Lancashire & South Cumbria, University Hospitals of Morecambe Bay, Lancashire Teaching Hospitals, East Lancashire Hospitals and Blackpool Teaching Hospitals.

CHALLENGE

During a time of economic uncertainty and growing pressures, the NHS faces significant challenges.

- Funding Constraint
- Workforce Shortages
- Long Waiting Times
- Difficulties Integrating with Social Care

This strain is clear when you consider the differences in life expectancy across regions of the UK, as reported by the Office for National Statistics.

These harsh realities require innovative solutions and collaboration. Therefore, digital transformation and data integration are seen not just as enablers but as critical components for improving patient outcomes and solving these deep-rooted problems. However, the fragmented nature of healthcare data, spread across multiple systems and locations, makes this challenging.

For Lancashire and South Cumbria ICS, the issue was particularly acute. The trusts within the integrated system operate multiple hospitals, managing vast amounts of patient data, from various clinical interactions such as diagnoses, treatments, and tests. However, this data was siloed across different systems, making it difficult to gain a comprehensive view of patient journeys or to extract meaningful insights – which is essential in informing better healthcare delivery and research.

NHS trusts across the UK faced further pressures from the findings of the Goldacre Review, commissioned by the UK Government in 2021, which highlighted deficiencies in data integration, security, and accessibility across the NHS. The review's recommendations placed additional pressure on the NHS to enhance its data infrastructure to meet national standards.





SOLUTION

Recognising the urgent need for a robust and unified data platform, Lancashire and South Cumbria ICS set out to consolidate its data systems across the region. The solution centred around the implementation of a Secure Data Environment (SDE) programme, designed to integrate different data sets into a single, coherent system that could support both clinical operations and research.

At the heart of this transformation was the adoption of the OMOP (Observational Medical Outcomes Partnership) data model, a globally recognised framework that standardises healthcare data to enable comprehensive analysis and research. This model has already been successfully implemented by Lancashire Teaching Hospitals, and plans were in place to extend it to University Hospitals of Morecambe Bay and other providers in the region over the next two to three years.

To support this ambitious project, Lancashire and South Cumbria's SDE team worked in partnership with Telefónica Tech, leveraging cutting-edge technologies including Microsoft Azure, Azure Data Factory, and Databricks, to build a secure, scalable data platform that could accommodate the complex needs of the healthcare sector. Telefónica Tech's wealth of experience in supporting other NHS Trusts, including NHS Blood & Transplant, highlights the deep understanding of the unique challenges faced by NHS trusts.

Together, we recognise the pressing need for a robust and unified data platform; our focus has therefore been on consolidating systems to better serve both clinical operations and research. It isn't easy and requires system-wide openness and reciprocity to foster the human connections that power the digital ones. I've always believed that the strength of our work lies in bringing together diverse perspectives and ensuring our solutions are inclusive, addressing inequalities and making healthcare accessible for everyone. From here, we can transform fragmented data into a coherent and usable resource for all that can drive real-world improvements in patient care and the staff experience. This work and the success had so far are crucial in building momentum to scale within the region and UK wide.

Dr Stephen Dobson
CIO, Lancashire Teaching Hospitals
Director of Digital, OneLSC

The project was structured into multiple phases to ensure smooth and rapid delivery. This phased approach allowed Lancashire and South Cumbria to handle the vast amounts of data from different sources, including electronic patient records, imaging data, and clinical procedure codes. Telefónica Tech played a crucial role in this process, and within three months from initial engagement, a data platform was set-up that was already ingesting OMOP data.

The SDE programme also adopted a single Lakehouse architecture for the entire region, connecting various healthcare providers through a unified semantic data layer. This approach not only streamlined data management but also accelerated the development of intelligence that could be translated into tangible benefits for the public.

The inclusion of AI-powered tools within Azure Databricks further enhanced the platform's capability to rapidly deliver value, addressing the significant intelligence needs of the system.

For Lancashire and South Cumbria's SDE team, data privacy and security are critical. The team implemented the Five Safes Framework to ensure that patient data was protected at all times. This framework provided multiple layers of security, covering everything from how data is used to the technologies that protect it. The partnership with Telefónica Tech also extends beyond the technical aspects of the project, involving close collaboration with public engagement leads to ensure that ethical considerations and public trust remained central to the initiative.

KEY RESULTS

The implementation of the Secure Data Environment has generated significant benefits for Lancashire and South Cumbria ICS, the wider healthcare community in the region, and the general public. One of the most notable achievements is the rapid establishment of a regional data platform, which has accelerated strategic decision-making and planning. This platform has already harmonised 2.3 million electronic patient records, covering the entire care journey of many patients over the past 15 years. This vast dataset has become an invaluable resource for researchers, enabling them to conduct high-quality studies that have the potential to improve healthcare outcomes not just locally, but nationally and internationally.

The success of the SDE program has also positioned Lancashire and South Cumbria SDE team as leaders in data harmonisation within the NHS. The Trust's work has been recognised with the Health Data Research UK (HDR UK) Team of the Year Award, highlighting the significant impact that the project has had on health data science. This accolade underscores the value of the project in advancing health research and improving patient care, aligning with HDR UK's broader goal of leveraging routinely collected data to drive better health outcomes.

The collaboration with Telefónica Tech has provided Lancashire and South Cumbria with a repeatable model and a set of best practices that can be rolled out across other regions of the NHS. This model not only addresses technical challenges but also considers legal, governance, and ethical aspects, ensuring a comprehensive approach to data management. As a result, Lancashire and South Cumbria ICS is now better equipped to share knowledge with other NHS trusts and regions, further enhancing the overall efficiency and effectiveness of healthcare delivery across the country.



2.3 million records



350,000 residents



15-years of patient care journeys



5 clinical systems



One Single Common Data Model

Our work through the Lancashire and South Cumbria Secure Data Environment is transforming the use of health data for public benefit. This is a large-scale digital research infrastructure programme underpinned by technology and processes that enhance data security and patient privacy while making data more accessible to researchers. This helps us to generate valuable insights that improve patient outcomes, reduce waste and drive efficiencies across the system. This digital research infrastructure is also crucial in training a new generation of research software engineers and healthcare data analysts who play an important critical role in delivering the government's "data saves lives" strategy. As an example, our work with microbiologists will help improve the timely provision of the most effective antibiotics to treat people's infections, as well as reducing the emergence of drug-resistant superbugs. This saves lives, reduces time to recovery, and minimizes waste. This work also fuels research that brings long-term improvements to healthcare and the economy, attracting funding and producing jobs.

Prof. Vishnu V Chandrabalan
Consultant Surgeon, Lancashire Teaching Hospitals
Director of Lancashire and South Cumbria Secure Data Environment

In addition to these achievements, the project has opened up new improvement opportunities. The trust is now supporting Morecambe Bay Hospitals in their OMOP conversion journey, with plans to extend this work across Lancashire, South Cumbria, and the broader North-West region. The ongoing partnership with Telefónica Tech continues to evolve, with a focus on further enhancing the platform and upskilling the SDE team to ensure long-term success.

Looking ahead, Lancashire and South Cumbria Secure Data Environment remains committed to maintaining the highest standards of data safety and privacy. The trust is reinforcing public trust by adhering to OMOP opt-out rights and maintaining transparent communication about data handling practices. This commitment to data security and ethical use is critical for ensuring continued public support and participation in health research, ultimately leading to better healthcare outcomes for all.

The Lancashire and South Cumbria Secure Data Environment project stands as a powerful example of how innovative technology, strategic partnerships, and a commitment to ethical data management can drive transformative change in healthcare. Through this initiative, the team has not only addressed immediate challenges but has also laid the foundation for a more integrated, efficient, and patient-centred healthcare system.

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T: 0333 188 7868 | info@telefonicatech.co.uk | telefonicatech.uk