HFMA briefing
September 2020

Understanding resource consumption across a system

Joined Up Care Derbyshire - Derbyshire STP

Introduction

As the NHS moves to a more integrated approach to delivering care, understanding how resources are currently used is an essential first step in improving population health.

While individual organisations have information about the care they provide to individual patients, health and care systems are struggling to join up the data to have a full picture of provision across the local population. Each part of the health and care system has a different part of the jigsaw puzzle and the sharing of data to get a complete picture comes with a number of challenges.

As the Derbyshire health and care system developed its place-based approach, it identified the need to join up data to answer the question, 'which patients use most of our services and where do they live in the region?' It set out to develop a map that identified high resource consumption of NHS services across its communities.

This case study describes how the Derbyshire system set about linking up data from four providers, including establishing data sharing agreements, so that they had a better understanding of the use of resources across the system.

Developing a high resource consumption map

Background

The Derbyshire Sustainability and Transformation Partnership (STP) comprises of the five NHS providers in Derbyshire, the strategic commissioner (representing the four clinical commissioning groups (CCGs) and the two local authorities (Derby City Council and Derbyshire County Council). It serves a population of one million people.

The STP has established eight Derbyshire 'places' (**figure 1**) which will focus on providing integrated care for their populations.

Each place will provide a range of key services and interventions, including proactive care, access to primary care, reactive multifunction care support, medicines management and the management of elective activity. In addition they will be the co-ordinating units for more specialist services provided in networks across the county or more widely (**figure 2**).

Prevention, early intervention, diagnostics and care co-ordination will be integrated across pathways, from the individual patient level (including self-monitoring, management and care) to specialist provision. For those with the highest needs, this will be a crucial part of intensive case management and condition management.

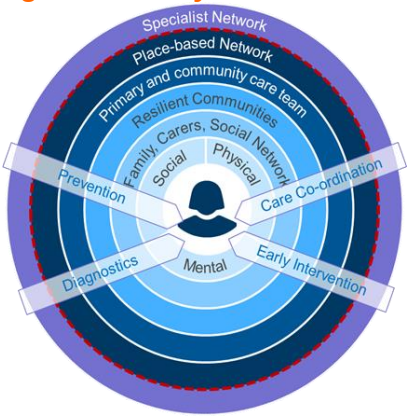
To deliver clinical and financial sustainability at place level, the STP needs information for:

- performance improvement (who are the high resource consuming patients?)
- performance monitoring (activity information at place level).

The place-based approach in Derbyshire recognises the need to adopt a population health focus, as well as changing the traditional understanding of healthcare value from relative costs of outputs to wider allocative and personal value, as summarised in Professor Sir Muir Gray's depiction of triple value (**figure 3**). Further information can be found in the HFMA briefing, *what finance data is required to drive value at a population level*?[1]

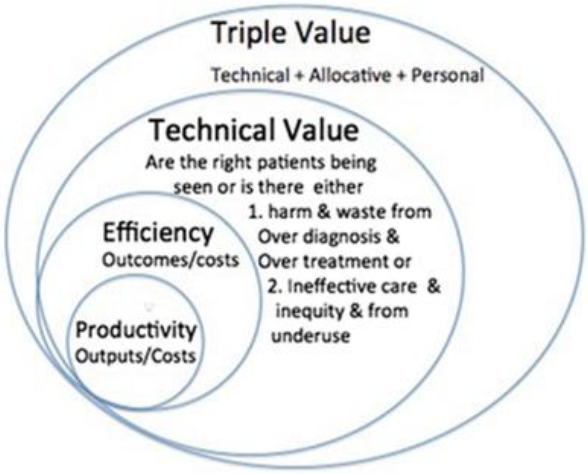
Figure 1: Derbyshire Places

Figure 2: Derbyshire networks



[1] HFMA, *What finance data is required to drive value at a population level?* June 2019

Figure 3: Muir Gray's triple value



Proposed approach

The STP recognised that the pseudonymised data commissioners held did not provide them with the information they needed to understand high resource consuming patients. What was required was the joining up of data from each of the providers to provide them with a full picture of how resources were consumed across the health system.

Once the Derbyshire STP Board and Place Board had agreed on the need for this information, the next step was to work out what this should include and how it would be created. The key stages in the approach taken are set out in **figure 4**.

Figure 4: Key planning stages for Derbyshire's high resource consumption map

Agree purpose and need for joining data

⇩

Agree as a group of providers to find a way to share data

⇩

Ensure buy-in from all partners including Caldicott Guardian, data protection officer and senior information risk owner

⇩

Discussions with Information Commissioner's Office

⇩

Agree what data will be shared and who can see what

⇩

Each provider to provide two years episodic data

⇩

Engage with external data analyst to map the data to show where the resources are used

The four Derbyshire providers agreed that the purpose for joining the data was to better understand the fragmentation of care across the system, which was both costly and not meeting the needs of patients. This joined up data would help them to improve the care and treatment of patients.

The system agreed that they would like a resource consumption map which would give some insight into this, in particular:

- differential resource consumption by GP practice
- differential resource consumption by care home
- examples of patients who have received seemingly less than perfectly integrated care, with numerous hospital admissions
- data on out-of-county flows to ensure the results took account of the areas of the county that more routinely don't use the four in-county providers.

Each of the four providers agreed to provide 24 months of episodic data to 31 February 2018 to support this project. The legal basis for sharing the data was initially for planning and commissioning purposes. It required the use of NHS numbers and postcodes in the dataset as identifiers. The data processing agreement made it clear that the Derbyshire system did not seek to identify the individual patient when building the resource consumption map.

Derbyshire engaged with a third party organisation, IQVIA, to collate and analyse the data into a map, using a variety of privacy-enhancing technologies and safeguards to protect individual privacy. The resulting 'data cube' was to provide information at two levels:

- de-identified data available to all users, showing where the resources were consumed, such as by GP practice or provider, and where the highest resource consumption was
- additional data available to individual organisations, allowing them to drill down to their own individual patients to see where they had been treated elsewhere in the system, what the resource consumption was.

The data sharing challenges and the Derbyshire approach to overcoming these are set out in more detail in the next sections.

Sharing data between organisations

Primary versus secondary use

The ability to legally share data between NHS organisations hinges on whether it is for primary or secondary use. Organisations can only share data if it is for primary use. Secondary use data is data for purposes other than direct clinical care such as healthcare planning, commissioning, public health, clinical audit and governance, benchmarking, performance improvement, medical research and national policy development.

It was therefore essential to clearly understand and document the proposed use of the data that was being shared. In Derbyshire the primary purpose for sharing the data was to reduce the fragmentation of care for patients. This clarity of use was important for reassuring data protection officers and Caldicott Guardians across the four providers, as well as the Information Commissioner's Office. The need for data originating from the providers made it easier to evidence that this was part of delivering care in a different way and that action would be taken as a consequence of this shared data. The STP was able to demonstrate that the sharing of data was for primary use, as it would provide individual organisations with information about what other parts of the system their patients touched, thus allowing them to better deliver clinical care.

It was made clear that data would not be shared above and beyond those people who could influence treatment and care. Each NHS organisation would only be able to see their own patients but across all care contexts. Data partitions had to be put in place to demonstrate data would only be able to be used for this primary use.

Data protection impact assessment

It is a legal requirement to complete a data protection impact assessment (DPIA) for processing information that is likely to be high risk. (**Figure 5** sets out the DPIA policy for Chesterfield Royal Hospital NHS Trust). It is helpful to set out what assurances are in place to make sure data can only be seen as agreed. It does not have to eradicate risks altogether but should help to minimise risks and assess whether or not remaining risks are justified.

Figure 5: Example of Data Protection Impact Assessment Policy

Chesterfield Royal Hospital NHS
NHS Foundation Trust

Data Protection Impact Assessment (DPIA)
The General Data Protection Regulations (GDPR) require that the Trust performs a DPIA before carrying out types of processing likely to result in high risk to individuals' interests. If your DPIA identifies a high risk that you cannot mitigate, the DPO will consult with the Information Commissioner's Office. A DPIA does not have to eradicate the risks altogether, but should help to minimise risks and assess whether or not remaining risks are justified. DPIAs are a legal requirement for processing that is likely to be high risk. An effective DPIA can also bring broader compliance, financial and reputational benefits, helping you demonstrate accountability and building trust and engagement with individuals.

When do I need to complete a DPIA?
You must do a DPIA before you begin any type of processing which is "likely to result in a high risk". This means that although you have not yet assessed the actual level of risk you need to screen for factors that point to the potential for a widespread or serious impact on individuals.

In particular, a DPIA must be completed if you plan to:
- process special category (including health) or criminal offence data on a large scale; or
- use new technologies;
- use profiling or special category data to decide on access to services;
- match data or combine datasets from different sources;
- collect personal data from a source other than the individual without providing them with a privacy notice ('invisible processing');
- track individuals' location or behaviour;
- profile children or target marketing or online services at them; or
- process data that might endanger the individual's physical health or safety in the event of a security breach.

Example activities, which could require a DPIA are:
- a new IT system for storing and accessing personal data
- a data sharing initiative where two or more organisations seek to pool or link sets of personal data.
- using existing data for a new and unexpected or more intrusive purpose.
- a new surveillance system (especially one which monitors members of the public)
- transfers of services in or out of the Trust

If you are unsure whether to complete a DPIA please ask the IG Team to advise.

Who completes the DPIA?
The project or service lead should complete the template. Advice can be sought from the IG Team.

The DPIA should include a number of standard items such as the following:

- **briefly describe the aim, purpose and desired outcome of the project**
- **describe the nature of the processing:** how will you collect, use, store and delete data; what is the source of the data; and will you be sharing data with anyone?
- **describe the scope of the processing:** what is the nature of the data, and does it include special category (e.g. health) or criminal offence data; how much data will you be collecting and using; how often; how long will you keep it; how many individuals are affected; and what geographical area does it cover?

- **describe the context of the processing:** what is the nature of your relationship with the individuals; how much control will they have; would they expect you to use their data in this way; and do they include children or other vulnerable groups?
- **describe compliance and proportionality measures:** what is your lawful basis for processing; does the processing actually achieve your purpose; is there another way to achieve the same outcome; how will you prevent function creep; how will you ensure data quality and data minimisation; what information will you give individuals; how will you help to support their rights; what measures do you take to ensure processors comply; and how do you safeguard any international transfers? (See example at **Figure 6**).
- **identify and assess risks:** consider level of risk and actions to mitigate risk
- **sign off and outcomes:** including risk approval, data protection officer advice and Caldicott Guardian review

Figure 6: Extract from Chesterfield Royal NHS Trust DPIA on high resource consumption map

The intent of the STP Board and Place Board is to use the following lawful basis for processing personal and sensitive information under the General Data Protection Regulation:

6(1)(c)processing is necessary for compliance with a legal obligation to which the controller is subject – to ensure we deliver best value joined up care

6(1)(e)processing is necessary for the performance of a task carried out in the public interest or in the exercise of official authority vested in the controller – to ensure we can have appropriate information to help shape more person centric care and to ensure we have the right case-holding model to address the right approach to care co-ordination in each of the eight Derbyshire places.

9(2)(h) '…medical diagnosis, the provision of health or social care or treatment or the management of health or social care systems

"9(2)(j) ' …necessary for reasons of public interest in the area of public health…or ensuring high standards of quality and safety of health care and of medicinal products or medical devices…"

Data sharing agreement

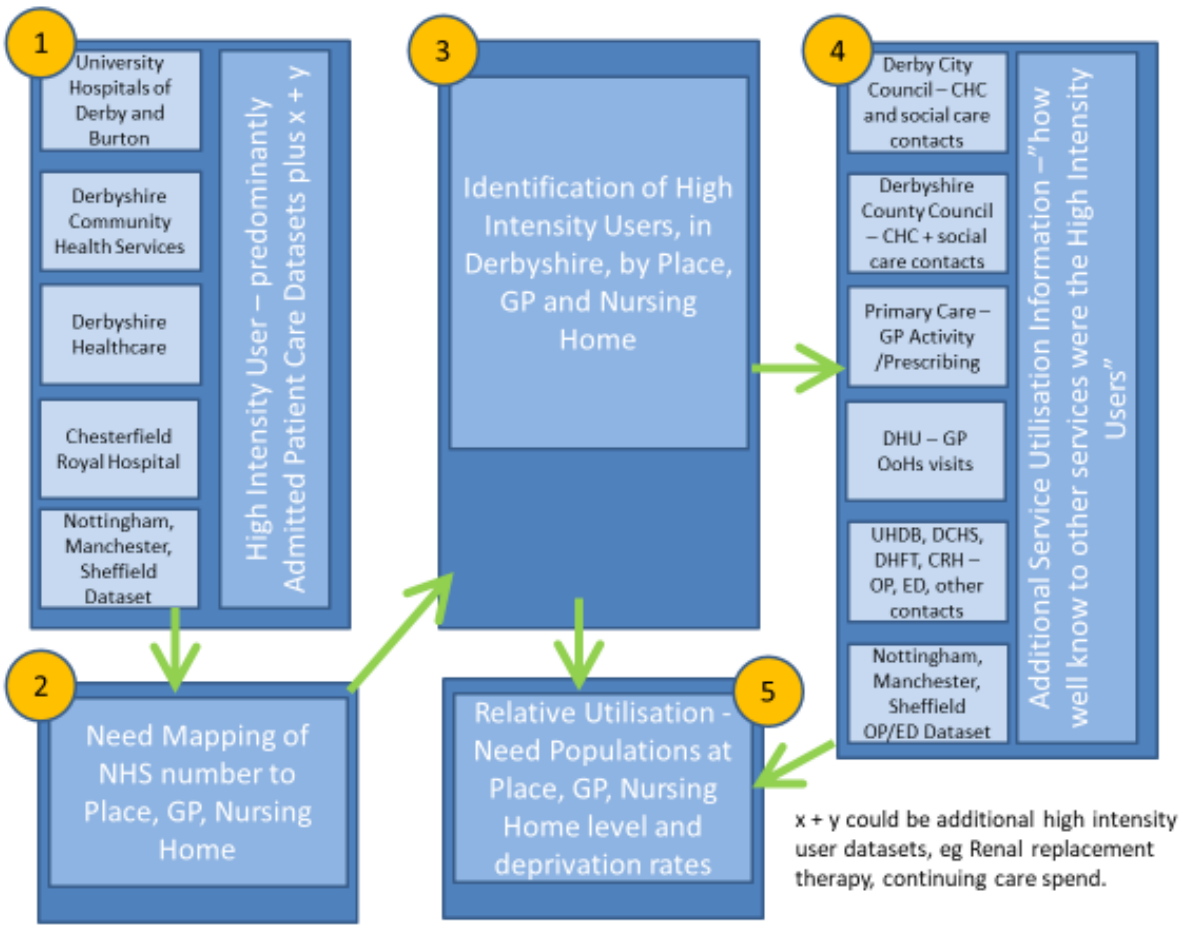
It took considerable time and many conversations to work out the legalities of data sharing. If other systems want to share data in a similar way to Derbyshire, they will have to each seek permission from the Information Commissioner's Office, rather than being able to rely on the response Derbyshire received.

In Derbyshire the shared data was a number of standard hospital episode statistics (HES) datasets on admitted patient care, outpatient and community contact datasets. The data included postcode and NHS number to act as the primary keys for the required analysis (see **figure 7**).

Once the data sharing arrangements had been agreed, these needed to be set out in a data sharing agreement. There was a lot of sensitive data being shared including mental health patients, and therefore clarity was needed on who could see what data. In Derbyshire the data sharing agreement was split into two, with the initial agreement concerning outbound data to be shared, and then a second agreement on who could see it and for what purpose. It was easier to be clearer on the latter once the collated data had been seen.

Data sharing agreements do not need to be lengthy, but they do need to be clear on key points. In Derbyshire the key elements included names and signatures of all parties involved; date of agreement; the agreement that each organisation would only be able to view the individual patient profiles relating to their patients; and that the individual patient profiles would be identified by their NHS number.

Figure 7: Derbyshire STP summary of information flows on high resource consumption



Creating the map

Collecting the data

Once the data sharing agreement and DPIA were in place, the next practical step was the collation and analysis of the data from the provider organisations, which was undertaken by IQVIA on behalf of the STP. The task was to collect and present the data so that the STP could understand which patients used the services the most, and where they lived, so that they could consider how to better organise their services.

Data from each of the four providers was shared in excel spreadsheets via encrypted e-mail. The data was then held on a secure server environment provided by IQVIA. The quality of data provided was important with one of the key pieces of data being the clinical coding. For example, in order to ensure the right analysis was provided for cancer patients, the clinical coding needed to be correct for the data search to provide an accurate picture.

Figure 8: Derbyshire STP high resource consumption map processing

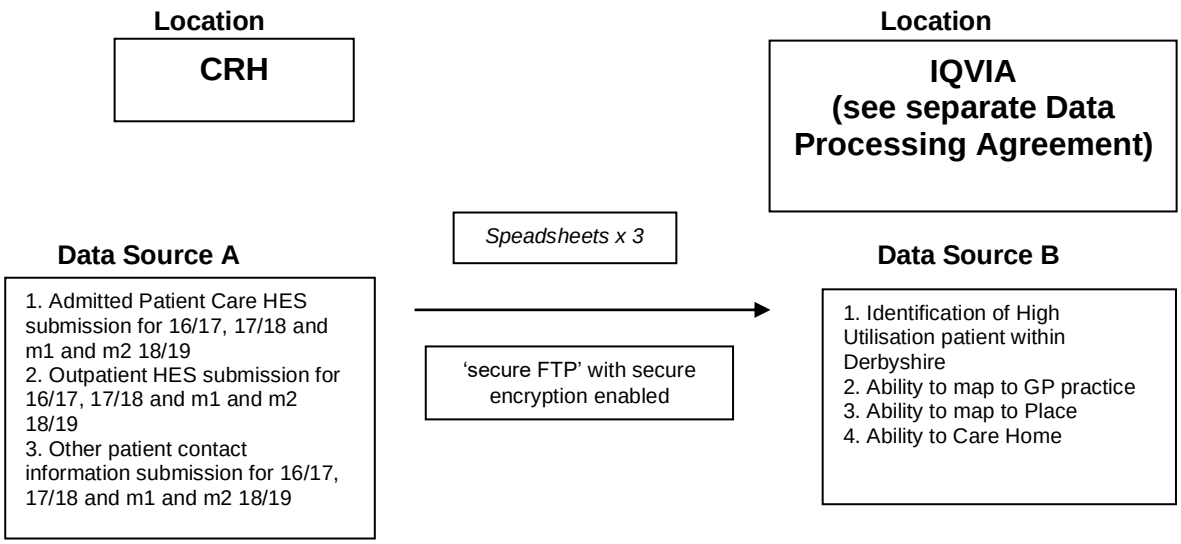


Fig 1. The CRH data will be collated in spreadsheet form (excel) and will be securely transferred via encrypted e-mail to IQVIA Technology Services Ltd.

It was felt that using an external provider to do the data processing provided a neutral place to collate and analyse the data before it was returned. It removed the potential challenges over whether individual organisations would be willing to give their data to another organisation within the system; which server this would sit on; and which organisation had the best security arrangements. The STP is now working with its commission support unit (CSU) in phase two of the project, looking at what the STP should do next with the map.

Analysing the data

While it took considerable time at the planning stage to get full buy-in of the vision and to agree data sharing arrangements, the analysis of the data was relatively quick with the map being created within a month for Derbyshire STP.

IQVIA analysed the data provided from the two acute providers, community provider and mental health provider. The data mapping linked episodes of care delivered by all four providers at the patient level to start to understand patient pathways. In future the plan is to add data from the ambulance trust and social care.

The data mapping resulted in a data cube which meets the requirements set out above. All organisations in the STP can view the data on a de-identified basis so that they can see the relative resource consumption between GP practices, Derbyshire places and fledgling integrated care partnerships (ICPs). Organisations can view the data at an individually identifiable level for their own patients.

Figure 9 sets out the main data which can be viewed in the map on a de-identified basis.

Figure 9: Examples of map data available on a de-identified basis

- all organisations by total cost
- all organisations by total bed days
- prevalence of conditions such as COPD
- view multiple related conditions
- drill down to GP practice
- complex patients who are known to 1 organisation
- complex patients known to more than 2+ 0rganisations
- system resource consumption by care home
- number of NHS bed days used by care home
- patients in a care home where they have had a urinary tract infection (UTI) and have had to attend acute setting
- care home name and the number of patients with a UTI
- patients in a care home where they have had a fall and attended an acute setting
- care home name and the number of patients who have had a fall
- GP practices by number of patients
- system resource consumption by GP practice
- Number of bed days by GP practice
- number of patients known to 2 or 3 organisations
- patients known to 2 or 3 organisations that have only had an A&E attendance

Figure 10 provides a screenshot of the map, showing all organisations by total bed days with COPD and related, and depression, by place and GP practice. Another example is provided in **figure 11** which shows the number of patients by GP practice.

Figure 10: Screenshot of map showing all organisations by total bed days with set conditions

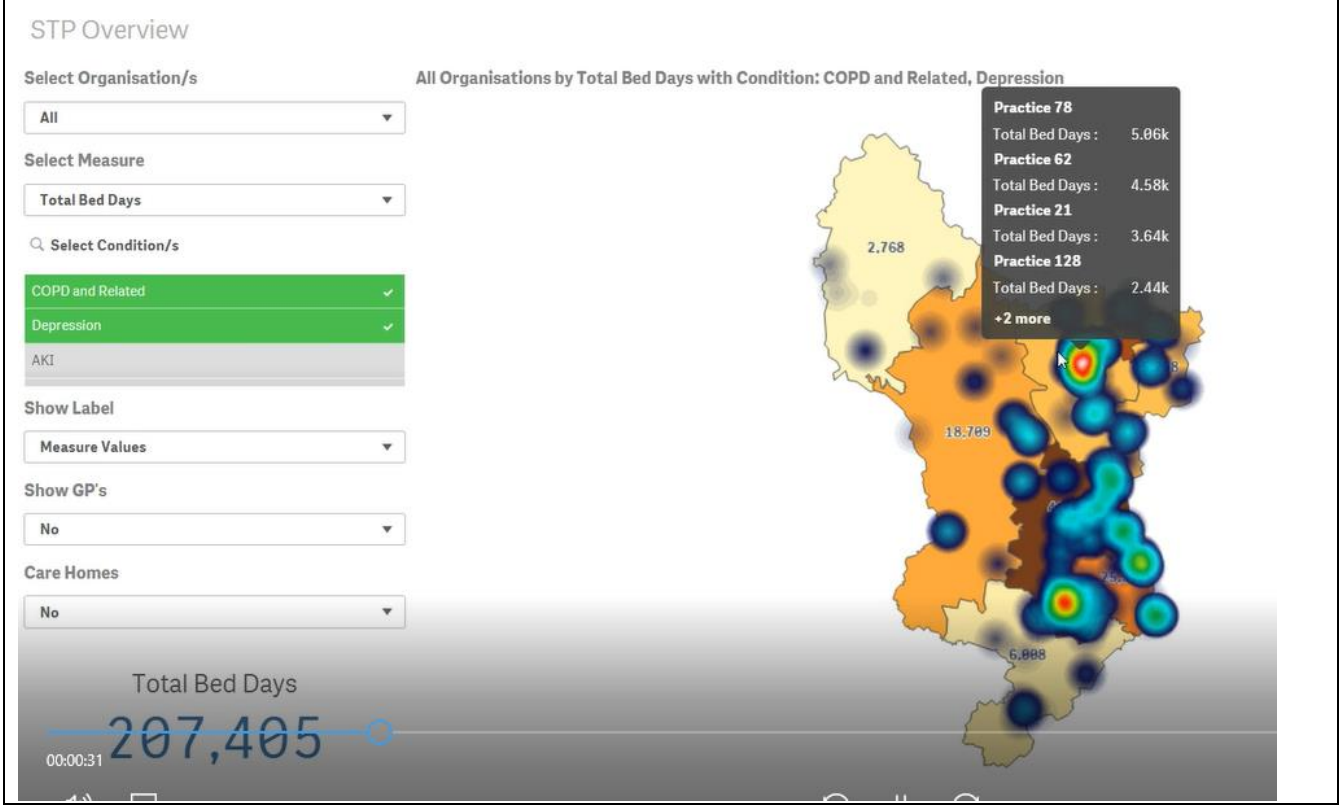
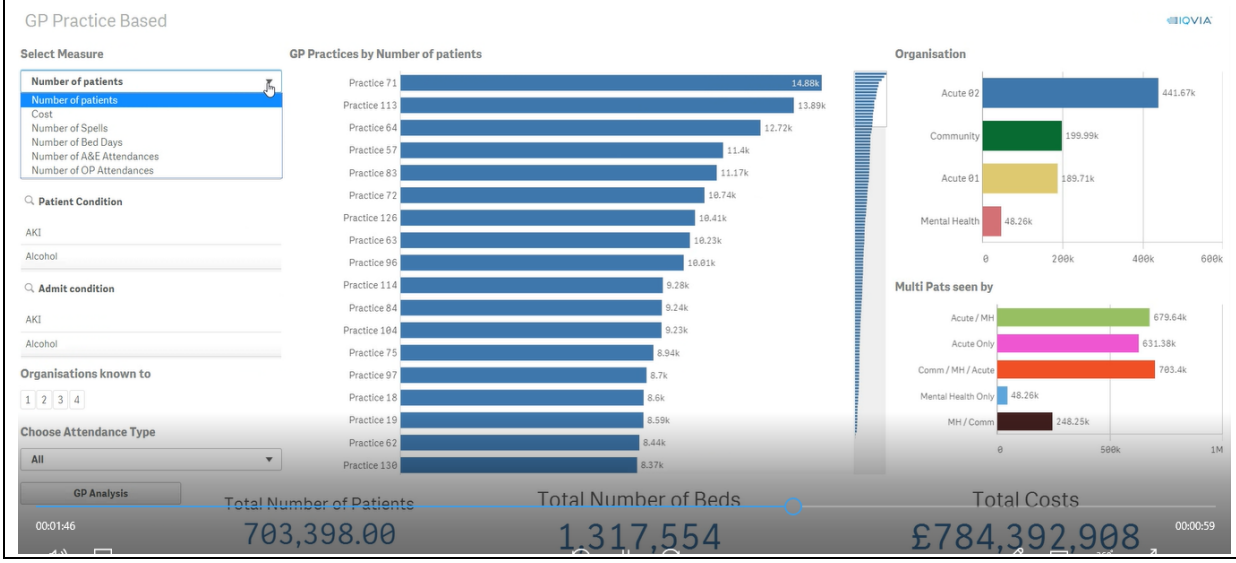


Figure 11: Screenshot of map showing number of patients by GP practice



Using the data

What does the data tell us?

In Derbyshire STP's population of one million, the map shows that 650,000 people have been seen once in two years and 75,000 people have been seen by more than one NHS organisation in that time. The majority of the resources are consumed by less than 20% of the population.

The map enables the STP to see the different touch points of a patient across organisations and can be actively used to support changes to the way care is delivered.

The system is now starting to look at giving each GP practice access to the list of their top 10 patients who use the most resources, to identify whether there could be a change in approach to their treatment and care. They will then able to look at the next 10 and so on. The work underway, addressing which care homes are giving rise to higher rates of general and acute access, is starting to lead to conclusions on changing their primary and community support offer. GP practices with similar deprivation and population types are looking at which other practices are seemingly giving rise to less general and acute care, to see if that can be explained.

Next steps

Derbyshire STP is now working with their CSU to consider what the next stage could be. The initial analysis not only helps inform where resources could be directed from a place setting perspective but generates further questions. Possible ideas that could form part of the next phase for Derbyshire STP include:

- focused conversations on cohorts of patients, for example developing care plans for complex patients
- the addition of primary care data
- the addition of non-NHS data, such as deprivation index
- mapping the community resource alongside the resource consumption
- creating a predictive model of the next wave of complex patients i.e. 'rising risk' patients
- providing wider access to the map, for example GPs, practice managers, provider clinicians and managers
- refreshing the model with more recent data

Key lessons

Key messages from the development of Derbyshire STP's high resource consumption map include:

- there needs to be clear Board commitment from across all organisations that it is important to join up this data and they must have an agreed vision on how it will be used
- a champion leader to keep the programme on track is vital
- the programme must be able to clearly demonstrate whether the data is for primary or secondary use
- you need to break down the question to take people on the journey in step by step manageable chunks i.e. how do we gather the data in one place; what does the data tell us; and what else do we want to know?
- the data privacy impact assessment must be clear on why it is the right thing to do and how the programme will are ensure that patient data is dealt with appropriately through data sharing protocols
- it is important to have enough capacity to do something with the data outputs
- it is worth considering other sources of data, including broader measures from other parts of the public sector that may indicate social isolation or vulnerability'
- and finally: persevere and remember the end goal when it can feel like it is too challenging!

Across the country systems are looking at how they can better use joined up data to improve services. One such example, from Gloucestershire ICS, is shared below.

The Gloucestershire ICS experience

The Gloucestershire system consists of one acute foundation trust, one care trust providing community and mental health services, one CCG, one local authority and one ambulance trust. It serves a population of 0.6 million people.

The ICS has also been looking at how it can use data to inform where resources can best be directed to improve population health. Initial data analysis has been undertaken within individual organisations.

Gloucestershire Health and Care Foundation Trust used patient-level costing data (PLICS) to review diabetes patients, as part of the Engagement Value Outcome (EVO) pilots, using the framework developed by HFMA's Costing for Value Institute and Future-Focused Finance. [2] The use of community services by patients with and without diabetes were compared. Patients with diabetes cost almost six times as much as those without. The data also showed that patients who attended a diabetes education programme had a significantly lower need for community healthcare services than those who had not. If this analysis could be expanded to link with primary, acute and ambulance data, the ICS would have a better understanding of the impact of certain interventions which may then determine which ones are more effective and thus, improve patient outcomes alongside resource utilisation.

Gloucestershire ICS are keen to join up data across the system to support their focus on population health management.

This type of programme holds improving patient care at its centre, and clearly for the programme to be successful there need to be ways in which ICS organisations can work together, sharing data, without infringing any information governance regulations. After achieving agreement for the ICS to work together (within Gloucestershire, that is Gloucestershire CCG as well as Gloucestershire Hospitals NHS Foundation Trust and Gloucestershire Health and Care Foundation Trust), data sharing is by far the biggest challenge to be overcome. Covid priorities have slowed progress in this area, but the ICS will soon return to the programme of work to overcome this first significant hurdle.

[2] HFMA and FFF, *Engagement Value Outcome – Gloucestershire Health and Care Foundation Trust*, February 2020

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About the HFMA

The Healthcare Financial Management Association (HFMA) is the professional body for finance staff in healthcare. For nearly 70 years, it has provided independent and objective advice to its members and the wider healthcare community. It is a charitable organisation that promotes best practice and innovation in financial management and governance across the UK health economy through its local and national networks.

The association also analyses and responds to national policy and aims to exert influence in shaping the wider healthcare agenda. It has particular interest in promoting the highest professional standards in financial management and governance and is keen to work with other organisations to promote approaches that really are 'fit for purpose' and effective.

The HFMA offers a range of qualifications in healthcare business and finance at undergraduate and postgraduate level and can provide a route to an MBA in healthcare finance. The qualifications are delivered through HFMA's Academy which was launched in 2017 and has already established strong learner and alumni networks.

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