The value of data

The research and life sciences industry in the UK represents one of the most dominant sectors of our economy. It generates and manufactures a wide variety of products, drugs and medical technology, bringing significant jobs and growth to every region, and underpins a world-leading position in science and research. At the core of this industry sits data –data provides crucial opportunities to fundamentally change the way health services are delivered.Transformation in the NHS can only be achieved through understanding changing patterns of disease and demographics – all derived through data.

The life sciences Industrial Strategy – a significant input into the Government's Industrial Strategy – seeks to address a series of challenges under five key themes,

- **Science:** Continued support for the science base, maintaining strength and international competitiveness.
- **Growth:** An environment that encourages companies to start and grow, building on strengths across the UK, including expansion of manufacturing in the sector.
- **NHS:** NHS and industry collaboration, facilitating better care for patients through better adoption of innovative treatments and technologies.
- **Data:** Making the best use of data and digital tools to support research and better patient care.
- **Skills:** Ensuring that the sector has access to a pool of talented people to support its aims through a strong skills strategy.

Arguably for Britain to remain a respected, economically strong and prosperous country for our citizens, data and skills underpin the delivery of our life sciences industry, and the ability to meet all five challenges. In addition, data has huge potential to generate economic growth and advance knowledge for societal good.
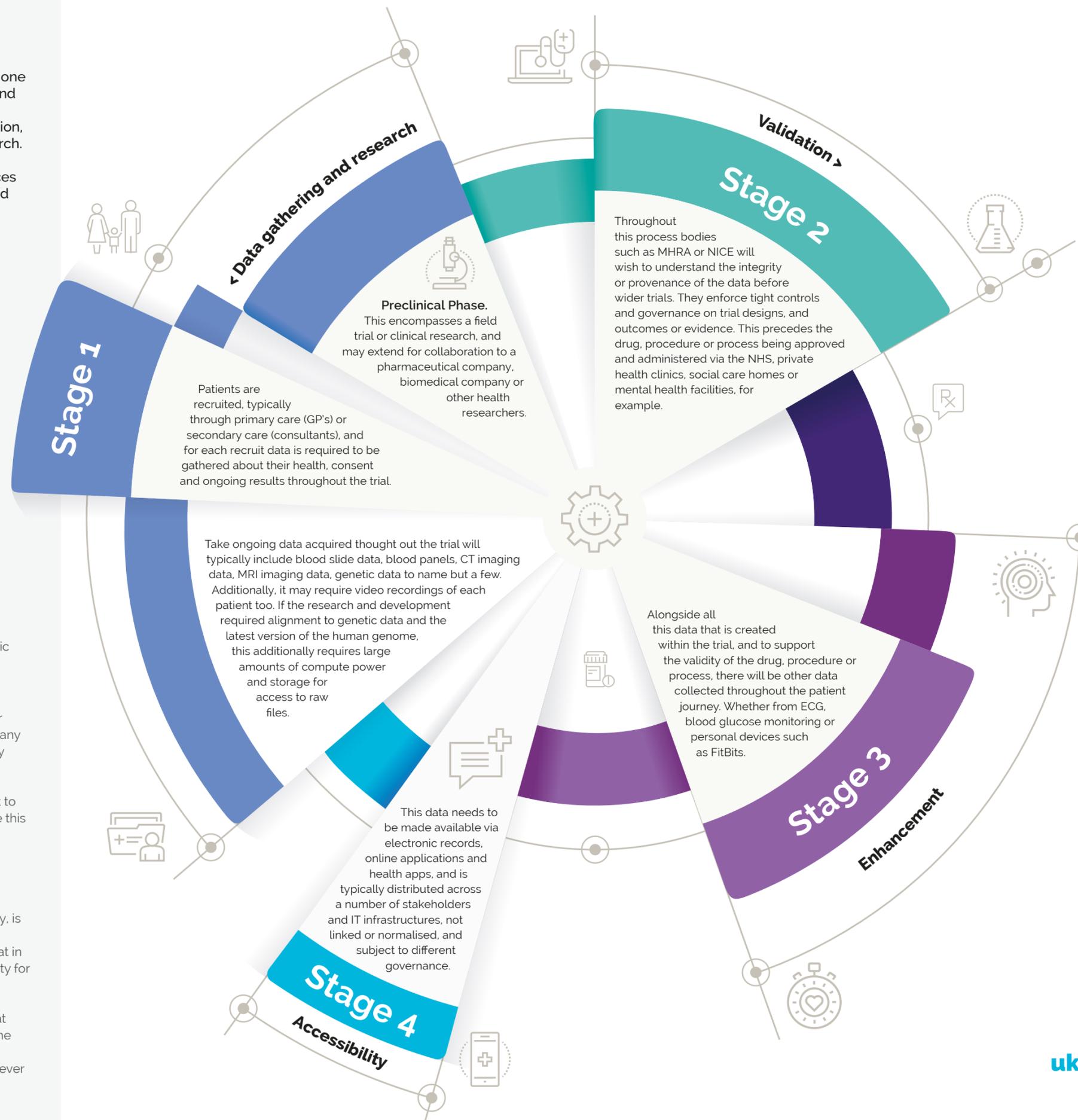
The data gravity explosion

Whether someone has an idea for a new drug, medical procedure or process, from this the "germ" of an idea eventually develops, over many years, to become a patient outcome supported by research that may come from Academia or the Pharma industry.

But the key to developing this idea is data. A researcher will first look to existing data, perhaps from a similar project, and for instances where this idea is a potential drug they will "match make" to find potential candidates/patients for a trial.

During the development of this idea there are two key things that happen, the first being that a lot of different people get involved and collaborate to make the idea a reality. The second, and most critically, is that the amount of data collected, stored and analysed becomes exponential. This data explosion or journey of data gravity means that in order for it to drive real business outcomes you need storage capacity for the data and you need collaboration.

Organisations need to work in partnership and collaboratively so that data access is gile, constantly available and accessible by not only the initial researcher, but by the National Institute for Health Research, universities, hospitals, charities or other research institutions – whichever are required to bring the idea to reality.

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Data gathering and research

Stage 1

Patients are recruited, typically through primary care (GP's) or secondary care (consultants), and for each recruit data is required to be gathered about their health, consent and ongoing results throughout the trial.

Preclinical Phase.
This encompasses a field trial or clinical research, and may extend for collaboration to a pharmaceutical company, biomedical company or other health researchers.

Take ongoing data acquired thought out the trial will typically include blood slide data, blood panels, CT imaging data, MRI imaging data, genetic data to name but a few. Additionally, it may require video recordings of each patient too. If the research and development required alignment to genetic data and the latest version of the human genome, this additionally requires large amounts of compute power and storage for access to raw files.

Validation
Stage 2

Throughout this process bodies such as MHRA or NICE will wish to understand the integrity or provenance of the data before wider trials. They enforce tight controls and governance on trial designs, and outcomes or evidence. This precedes the drug, procedure or process being approved and administered via the NHS, private health clinics, social care homes or mental health facilities, for example.

Enhancement
Stage 3

Alongside all this data that is created within the trial, and to support the validity of the drug, procedure or process, there will be other data collected throughout the patient journey. Whether from ECG, blood glucose monitoring or personal devices such as FitBits.

Accessibility
Stage 4

This data needs to be made available via electronic records, online applications and health apps, and is typically distributed across a number of stakeholders and IT infrastructures, not linked or normalised, and subject to different governance.

Making data transformation happen

UKCloud Health is at the forefront of making data transformation happen. Our unique capabilities and laser like focus enable us to bring the compute to the data, utilising exponential storage capacity via our multi-cloud platforms.

We have been working with pioneering organisations such as Genomics England for many years. It has set the global standard for healthcare genomic data in rare disease, and now increasingly in cancer.

Genomics England took a pragmatic and serious approach to its ICT needs – by deciding early on NOT to burden the NHS with long-term investments in hardware and data-centres, and by embracing the positives that the cloud could offer whilst taking a safe approach of private-cloud and Genomics England-owned storage assets.

Data gravity and the aggregation of data that comes from the work that Genomics England is undertaking and enabling organisations to come together and gain new insights into data, has the potential to ensure that the UK stays at the forefront of the transformation in digital health.

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