

HDR UK Multimorbidity Briefing Paper 1

What is health data research?

Health data research is a term used to describe a subject that combines maths, statistics and technology. It identifies different types of health problems by using statistical and machine learning techniques to explore large medical data sets. Modern healthcare generates large amounts of rich data as most contacts we have with healthcare is recorded.

Why is health data science important?

Making sense of the large amounts of data we produce can provide earlier insights to diseases and health conditions. Using tools and methods, data can be turned into useful information that can be analysed to detect patterns which help clinicians offer patients the best care. For example, data on individual patients can be combined and analysed in order to learn more about how conditions develop in populations, and who is more likely to develop these. Analysing data can help us learn more about causes and symptoms so that we can learn to spot diseases and conditions earlier and plan how best to manage the care of patients.

Where does the health data come from?

The data used by health data scientists comes from many sources and can also come in a variety of formats, such as text, code and images. Sources include:

- **Health care records** on primary care and hospital attendance, such as doctors' records — both notes and codes — prescriptions and social care provision, records of hospital admissions and A & E visits
- **Mobile phone applications, smart watches and other tracker devices** that collect information on heart rate, physical activity, sleep, age and menstrual cycle.

Who has access to health data?

The ethical and legal responsibility of using data is closely controlled in the UK, each project is assessed by the relevant governing body and data is provided in an anonymous format in order to protect patient confidentiality. Health Data Research UK suggested best practice is that access to data is given for a specific use and provided through a data safe haven. A data safe haven is a platform that holds electronic records in a secure environment, providing restricted access in a de-identifiable format for analysis to enable research.

Who are the data scientists?

Data scientist come from a broad range of disciplines such as: Computer Science, Mathematics, Statistics, Biomedical Science, Physical Science and Social Science. A multidisciplinary team works particularly well in health data research, as each expert, brings a different perspective and approach to how they interpret the research. Through sharing their thoughts, opinions and expertise, better results can be achieved.

What are some of our current research interests?

Health Data Research UK enhance our research through their funding, support and endeavours to combine health data from across the UK through their national implementation projects. Multimorbidity resource — defined as two or more long-term conditions — identifying which conditions are commonly found together, how these develop with age and what challenges are faced by these people and the health services that are supporting them.