Using real-world patient data to improve healthcare outcomes

Dr Janet Valentine is a champion of collaboration – a quality much needed for her role as the director of Clinical Practice Research Datalink (CPRD) at the MHRA. She talks to Kate Stewart about how CPRD is contributing to improvements in drug safety and clinical practice through the use of real-world patient data in public health research.

Clinical Practice Research Datalink (CPRD) is a government research service, supported by the NHS National Institute for Health Research (NIHR) and the Medicines and Healthcare products Regulatory Agency (MHRA) that provides anonymised NHS healthcare records for public health research. CPRD has been collecting anonymised patient data from GP practices across the UK for over 30 years, and making it available for public health research, leading to improvements in drug safety, best practice and clinical guidelines.

Dr Janet Valentine, a molecular biologist who left the lab in 2001 to move into strategy and policy, explains: “CPRD supports public health and innovation by providing anonymised patient electronic health records (EHRs) for research.” She adds that CPRD plays an important part in pharmacovigilance. “Pharmacovigilance is the practice of monitoring the safety of licensed medicines and the potential impact of these products on public health. CPRD data is used extensively by medicines regulatory agencies and public health researchers worldwide to evaluate drug safety.

“Pharmaceutical companies are obliged to gather further information on a medicine’s safety profile once it has been authorised for use. CPRD data is widely used by industry for this purpose. Key MHRA pharmacovigilance studies using CPRD data include evaluating the safety of pertussis vaccination in pregnant women and demonstrating that there is no link between the HPV [human papillomavirus] vaccination and chronic fatigue in teenage girls [pending a government review].”
Supporting clinical trials

It is widely known that GPs steer clear of clinical trials because of the administrative burden that can be placed on practices, but Dr Valentine believes that CPRD can help this and she is encouraging GPs to get involved.

“CPRD services are designed to offer GPs the opportunity to take part in clinical research in a time-efficient, low-burden manner. Both GPs and patients can complete questionnaire studies electronically by logging into the CPRD research services platform.

“To save time and increase efficiency, CPRD supplies GPs with a pre-screened list of pseudonymised potential patients who meet the eligibility criteria for a clinical trial, instead of GPs or practice staff spending time searching their practice records for eligible patients. GPs are able to identify who these patients are from the pseudonymised pre-screened list. CPRD carries out real-time eligibility searches, so patient lists can be updated for the practice on a daily basis.

“GPs can also take part in pragmatic real-world clinical trials supported by CPRD. Because the trials are pragmatic, once the patient has consented there are no additional patient visits for the GP to manage and no paperwork for the GP to fill in, as the clinical data needed for the trial is captured directly by CPRD from the patient records into the eCRF [electronic case report form].”

Gathering real-world evidence

Dr Valentine has an extensive knowledge of health research and use of health data for an array of clinical and public health applications. She joined the CPRD in January 2015, having been head of population health and informatics at the Medical Research Council (MRC) since 2008. During her time at the MRC, she was responsible for strategy development and delivery of large multi-stakeholder initiatives in ageing, population health sciences and health informatics research.

Before that, Dr Valentine was the deputy chief executive at UK Clinical Research Collaboration (UKCRC), a body that brings together the key organisations that shape clinical research in the UK, including research funders, UK health departments, the NHS, industry, regulators and patients. Her scientific background is in cancer research and she has worked at the National Cancer Research Institute, Breakthrough Breast Cancer and the Imperial Cancer Research Fund.

This wealth of expertise and experience has enabled Dr Valentine to guide vast numbers of different professional groups and agencies to work together to make CPRD part of a shift in drug development testing to the use of real-world evidence, and helping it work alongside traditional clinical trials.

Dr Valentine says: “Randomised controlled trials are an essential part of drug development and are vital to determine the efficacy and safety of a new medicinal product before it can be licensed. However, these trials are carried out on highly selected populations. Understanding the clinical effectiveness of a licensed drug on real patients with co-morbidities, taking multiple medications, is where real-world studies, such as those supported by CPRD, become valuable.

Figure 1. Using Clinical Practice Research Datalink (CPRD) real-world patient data to support research
“Observational studies using real-world CPRD data have enabled researchers to compare different treatments in patient cohorts once products are on the market. But these studies are limited because it is not possible to remove confounding, so causation can only ever be inferred.

“CPRD combines observational knowledge gained from real-world evidence on real patients in routine settings with interventional approaches such as the ability to randomise treatments using a trial methodology, for example, assessing the study drug against other treatments offered in standard care. In this way, it is possible to evaluate the clinical effectiveness of a drug in a real-world trial.

“CPRD enables use of real-world evidence across the drug development pipeline. Firstly, by defining and understanding the treatment history and patient population for a potential study using observational studies on routine patient data, which can be supplemented by GP and patient questionnaires. Secondly, by locating potentially eligible patients for studies based on rapid and reproducible searches of the patient record database. Thirdly, by managing real-world pragmatic studies capturing data from the patient record, thereby reducing transcription errors and removing the need for manual data entry. And lastly, using observational methods for long-term patient independent follow-up after a study has finished, which reduces loss to follow-up and resulting bias.”

Protecting patient data
There are so many examples of where CPRD has had a significant impact on current UK clinical practice, Dr Valentine says. And she cites establishing the safety and effectiveness of several national vaccination programmes including pertussis for pregnant women, rotavirus for infants, and the influenza vaccine for patients with diabetes, to name but a few.

“Multiple CPRD-enabled studies contributed evidence to the 2015 NICE guideline for suspected cancer recognition and referral in primary care [NG12]. They helped in establishing a new risk prediction tool for postpartum venous thromboembolism and they confirmed the safety of incretin-based drugs for diabetes.”

However, there are some critics who raise legitimate concerns about the sharing of patient data for research as well as researchers struggling to access data. There were also significant privacy concerns raised about care.data, a controversial programme set up in 2014, in which information on GP records was to be shared with the Health and Social Care Information Centre (HSCIC) but which was later scrapped.

Dr Valentine says: “It is very important that the public understand how their data is being used and why it is so valuable for evidence-based medicine and public health.

“CPRD is a partner of the Understanding Patient Data initiative, which is seeking to support better conversations with the public about the benefits and safety of data sharing. CPRD only collects de-identified data from GP practices, with all patient identifiers removed at source. The data is further encrypted before being provided to researchers. All data requests must be reviewed and approved by an independent scientific advisory committee and data is only provided for public health research.

Table 1. Five good reasons for GP practices to join Clinical Practice Research Datalink (CPRD)

1. To ensure your patient population is represented in research evidence informing clinical guidance and best practice
2. To earn extra income for the practice by taking part in questionnaires and clinical studies
3. To receive regular practice-level prescribing and patient safety quality improvement reports, including patient case finding and national practice benchmarking
4. Case reviews from quality improvement reports, questionnaires and research contribute towards annual appraisals and revalidation
5. Joining is an easy, one-off process, following which data automatically flows to CPRD

Encouraging GP involvement
Dr Valentine predicts that over the next five years clinicians and researchers will see a “significant increase” in the volume of data available for observational and interventional research, and an increase in the research services CPRD offers to support these studies.

“As part of this growth, we will build strong relationships with research-active clinicians by offering a variety of clinical studies to match their research interests and available time,” she adds.

Dr Valentine says the CPRD is working hard to recruit as many GPs as possible to work with them and she explains why. “We’d like to have more GP practices involved, so we are proactively trying to get GPs signed up. We have the most practices signing up from the West Midlands at the moment; they are very well engaged and research active and we would like that to be reflected across the UK.”

“It’s very important that the public understands how we make our medicines safe. When you are doing population analysis you need to have representative populations, which is why we don’t want people opting out so we know what we are looking at is the full picture. Take for example the controversy surrounding HRT [hormone replacement therapy] – that was a live issue and still is to a certain extent – and yet during the care data collection period a lot of people opting out were middle-aged women, who were the demographic group we really needed to look at.”

“CPRD relies on GPs opting in and offers a number of incentives to those who sign up [see Table 1]. Working with CPRD will ensure their anonymised patient population data is represented

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within the national government research database used to support evidence-based medicine.

“GPs will receive regular bespoke quality improvement drug prescribing and patient safety reports, which enable individual patient case finding and practice benchmarking to improve quality of care and health outcomes. The quality improvement reports enable patient case review and this can be used as evidence in their annual appraisals, for revalidation and for practice clinical audit.

“GPs can earn extra income for the practice by taking part in further research activities, including simple questionnaires and clinical studies. Joining CPRD is a simple, one-off process through a web-based consent form, following which data automatically flows, meaning no burden on the practice staff. Sharing data with CPRD is endorsed by the Department of Health and Social Care, NHS England and the Royal College of GPs.

“In terms of clinical benefits: more practices = more representative data = greater ‘generalisability’ and validity in research results = safer and more effective medicines and patient care. It’s a virtuous circle.”

Dr Valentine’s passion for CPRD is palpable. As a result, she rarely has time for her running or listening to favourite bands Fleetwood Mac and Clean Bandit, but that does not diminish her enthusiasm for this huge job.

“I like running because it’s quite meditative, and can be very therapeutic and good for the mind as well as the body. I used to run to the MRC, which is six miles from where I live, three times a week but those days are gone as this job is so time-consuming – now I just run at the weekends.

“Working for CPRD is fantastic. There are hundreds of examples where using research based on CPRD data has influenced clinical guidance – it is really gratifying to be part of an organisation where you get to see direct patient benefit.

“I love working in collaboration and partnership and I’d like to be remembered as someone who strived to promote collaboration – a bridge builder.”

More information
CPRD never collects patient identifiable information from GP practices or any other source. They obtain annual regulatory permission to supply anonymised data to researchers for approved public health studies. To find out more about CPRD, visit www.cprd.com, email gpnetwork@cprd.com or call 020 3080 7206.

References
1. Understanding Patient Data has been set up to support conversations with the public, patients and healthcare professionals about how health and care data is used, providing resources for people to find out more. For further information, visit: understandingpatientdata.org.uk/

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