



Clinical Research Databases for Pharmaceutical Applications

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INTRODUCTION

Data generated by patients has been collecting since the first electronic health record (EHR) came out in the 1960s, but there has been no apparent way to organize it such that it can be useful. As time went on, more and more organizations started using databases to store and organize data in one central location. Clinical care components (such as nursing plans, drug administration records, and physician orders) and data from big auxiliary services (such as pharmacies, labs, and radiology studies) might be combined by hospitals. More and more data sources will probably become available in an open source setting as healthcare research that uses big datasets advances.

DATABASES

Open NHS

An executive non-departmental public body of the government's Department of Health, NHS England is known as the National Health Services. One of the world's biggest databases containing information on people's health is kept by the NHS. It also provides a comprehensive picture of population health across all areas of care and time, making it one of the few health systems that can say so. Among the many offshoots, Open NHS first appeared in October 2011. The National Health Service (NHS) in England is making strides towards making public the massive data warehouses that all of its many branches and divisions utilize. Transparency, tracking of results and efficiency in the British healthcare system, and other related goals were the primary motivations for moving to an open access dataset. It is believed that the health and social care sector would be better able to address

the needs of local communities with the use of high-quality data. By making the data available for patients, doctors, and commissioners to compare across regions, the NHS expects to more quickly and accurately pinpoint areas with subpar service performance¹.

The Medical Information Mart for Intensive Care (MIMIC) Database

With the support of Philips Medical Systems, Beth Israel Deaconess Medical Centre, and MIT's Bioengineering Research Partnership, the MIMIC database came into being in October 2003. Government funding for the study comes from the National Institute of Biomedical Imaging and Bioengineering. Patients hospitalised to any of the intensive care units (ICUs) at the academic, urban tertiary-care hospital Beth Israel Deaconess Medical Centre (BIDMC) for medical or surgical reasons formed the basis of this database. At now, MIMIC-III, the third major release of the database, has over 40,000 cases with thousands of variables. After de-identification and annotation, the database is made publicly available to researchers. Comprehensive physiological and clinical data is stored in the MIMIC-III database, in addition to patient information retrieved from the hospital. The project's overarching goal is to make critical care clinical decision-making more efficient, accurate, and timely by developing and evaluating sophisticated intensive care unit patient monitoring and decision support systems. Big data research in critical care is also a part of this project. Extensive epidemiological studies that connect patient data to clinical practice and results are made possible by data mining in such a database. Data with an exceptionally fine granularity enables in-depth investigation of intricate clinical issues².

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PCORnet

PCORI's National Patient-Centered Clinical Research Network, PCORnet, is one of its many endeavors. When it comes to running the network and choosing research topics, PCORI actively includes patients and their care-takers. The goal of launching this PCORnet effort in 2013 was to bring together information from several PPRNs and Clinical Data Research Networks (CDRNs) [3]. Academy Health, Johns Hopkins Berman Institute of Bioethics, Centre for Democracy & Technology, Group Health Research Institute, Brookings Institution, Academy Health, Duke Clinical Research Institute, Centre for Medical Technology Policy, America's Health Insurance Plans, and the other eight institutions that make up its coordinating centre are all vital to its mission. Access to massive volumes of clinical and healthcare data will be made possible via PCORnet, which is comprised of 29 separate networks. Facilitating more effective comparative effectiveness research is PCORnet's primary objective. At the heart of PCORnet—the National Patient Centred Clinical Research Network—is the Patient-Centered Outcomes Research Institute (PCORI) ³.

VistA

U.S. Department of Veterans Affairs (VA) medical facilities employ the Electronic Health Record (EHR), which is the foundation of the Veterans Health Information Systems and Technology Architecture (VistA), an enterprise-wide information system. There are more than 125 hospitals, 800 walk-in clinics, and 135 nursing homes that are part of the VA health care system. This whole network of medical centres has been using the same VistA interface since 1997. For more than 8 million veterans in the United States, the VistA system integrates inpatient, outpatient, pharmaceutical, and supplementary care. The health network's disproportionately

high number of male patients does introduce some bias into the studies it does, but the sheer number of high-fidelity data at its disposal more than makes up for it. Countless medical researchers have used the VA database over the last quarter of a century to carry out seminal studies in a wide range of fields. For many years, researchers affiliated with the VA system have used the VA database in their medical studies. Access to the dataset has historically been restricted to those with VA appointments. On the other hand, there are continuing talks to open up the database to additional scholars, following the current trend towards open access to big datasets. A diverse group of academics might use the database's massive amount of data to enhance health treatment in a variety of settings. One strength of the data is that it can follow patients from inpatient to outpatient settings and throughout the whole country. Large pharmacoepidemiological investigations are made very easy by connecting this data, as the VA system covers all prescribed medicines⁴.

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