348

Real-time data synchronization: Assessing the implementation of REDCap CDIS (Clinical Data Interoperability Service) for EHR systems

Waqas Amin, Saravanan Kanakasabai, Randall Grout, Joe Butler, Scott Michael and Titus Schleyer
Indiana University School of Medicine

OBJECTIVES/GOALS: This study tests the REDCap Clinical Data Interoperability Service (CDIS) for streamlined data extraction from electronic health records (EHRs) for research. Managed by Clinical and Translational Science Institute, IU Health, and Eskenazi Health, CDIS offers real-time data syncing, automated workflows, and HIPAA-compliant data security. METHODS/STUDY POPULATION: The REDCap CDIS uses the Fast Health Interoperability Resource (FHIR) Application Programming Interface (API) to extract data from EHRs. It includes the Clinical Data Pull (CDP), which automatically pulls EHR data into user-defined REDCap fields, and the Clinical Data Mart (CDM), which collects longitudinal patient data. Three use cases were selected to assess the CDIS's effectiveness in extracting data from the IUH Cerner and Eskenazi Epic EHR systems. The technical team set up clinical data mapping and adjudication processes, simplifying complex manual data extraction. RESULTS/ANTICIPATED RESULTS: The CDIS successfully achieved real-time data synchronization during pilot testing with each EHR system. We extracted demographics, drugs, procedures, labs, and conditions. The mapping interface supports many-to-one data point mapping for the study data dictionary, and the adjudication process ensures data quality before integration into the REDCap database. The CDIS also improved data security and HIPAA compliance. An implementation intake process was developed for Indiana University investigators, allowing them to use the service for affordable clinical data extraction from EHR systems. DISCUSSION/SIGNIFICANCE OF IMPACT: The implementation and testing of the REDCap CDIS demonstratesits effectiveness in streamlining EHR data extraction for research. The CDIS facilitates real-time data synchronization, automated workflows, and enhanced data security, offering a cost-effective solution through collaborative oversight with research teams.

349

Rare Disease Alert System (RDAS) to promote rare disease research

Timothy Sheils, Devon Leadman, Jaber Valinejad, Minghui Ao, Shixue Sun, Sungrim Moon, Yanji Xu and Qian Zhu
NCATS

OBJECTIVES/GOALS: Rare disease patients often face lengthy delays in receiving accurate diagnoses or experience misdiagnoses due to a lack of available information. The NCATS Rare Disease Alert System (RDAS) is a public, comprehensive rare disease resource to collect and share accurate, up-to-date, and standardized data on rare diseases. METHODS/STUDY POPULATION: RDAS is composed of a frontend UI, Application Programming Interfaces, and backend Neo4j graph database. Each component of data collection, data annotation, data standardization, and data representation as steps were implemented during the process of each graph database creation. The UI allows users to search, browse, and subscribe to RDAS to receive the latest information and findings about their rare disease(s) of interest. The back-end data include four knowledge graphs built by integrating information from the NCATS Genetic and Rare Disease program, PubMed articles, clinical trials, and NIH grant funding. Ultimately, the integrative information pertinent to rare diseases from RDAS would advance rare diseases research. RESULTS/ANTICIPATED RESULTS: Of 5001 rare diseases belonging to 32 distinct disease categories, we identified 1294 diseases that are mapped to 45,647 distinct, NIH-funded projects obtained from the NIH ExPORTER by implementing semantic annotation of project titles. To capture semantic relationships presenting among mapped research funding data, we defined a data model comprised of seven primary classes and corresponding object and data properties. A Neo4j knowledge graph based on this predefined data model has been developed, and we performed multiple case studies over this knowledge graph to demonstrate its use in directing and promoting rare disease research. DISCUSSION/SIGNIFICANCE OF IMPACT: We developed an integrative knowledge graph with rare disease data and demonstrated its use as a source to identify and generate scientific evidence to support rare disease research. With the success of this study, we plan to implement advanced computation to analyze more funding related data and link to other types of data to perform further research.

350

A half century of rural health research in the United States: the who, where, and what by bibliometrics

Jungwei Fan and Christi Patten
Mayo Clinic

OBJECTIVES/GOALS: As a priority area in translational science, rural health research can benefit from informatics methods for conducting thematic and environment scans. This study demonstrates an efficient approach to gaining insights about the rural health research literature by automated bibliometrics analysis. METHODS/STUDY POPULATION: We developed an automated pipeline to retrieve the 1972–2023 PubMed publications indexed with the MeSH terms "Rural Health" and "United States". The article metadata in XML format were downloaded and parsed, including title, year, journal, author institutions, and MeSH terms. Each institution address was augmented by Google Maps API to obtain the county and latitude/longitude coordinates. Summary statistics were computed for the publication years, journals, author departments, and locations. A topic network was generated from the frequent co-occurring MeSH terms. The institutions were linked to Rural-Urban Continuum Codes and labeled on a map to visualize their geographic distribution. RESULTS/ANTICIPATED RESULTS: A total of 4564 articles on rural health were analyzed. Two salient peaks of publications were revealed, one around 1978 and the other around 1993. The top author departments include Family Medicine, Nursing, Pediatrics, and Epidemiology. The five leading institutions reside in Chapel Hill, Minneapolis, Iowa City, Seattle, and Atlanta. The geographic distribution shows few institutions that reside in deep rural areas are well published on rural health, although the most scholarly productive institutions do seem adjacent to some moderately rural pockets. The frequently identified topics pertain to age group, study design, and specific concepts such as health services accessibility. DISCUSSION/SIGNIFICANCE OF IMPACT: The two publication peaks in history were likely linked to certain policy milestone or seminal publication. Primary care and epidemiology departments have been most active in rural health research. Of

https://doi.org/10.1017/cts.2024.975 Published online by Cambridge University Press