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Contents

Roles of Health Literacy in Relation to Social Determinants of Health and Recommendations for Informatics-Based Interventions: Systematic Review

Abstract

Objective: Identify how novel datasets and digital health technology, including analytics- and artificial intelligence (AI)-based tools, can be used to assess non-clinical, social determinants of health (SDoH) for population health improvement. Methods: A targeted review with systematic methods was performed on three databases and the grey literature to identify recently published articles (2013-2018) for evidence-based qualitative synthesis. Following single review of titles and abstracts, two independent reviewers assessed eligibility of full-texts using predefined criteria and extracted data into predefined templates. Results: The search yielded 2,714 unique database records of which 65 met inclusion criteria. Most studies were conducted retrospectively in a United States community setting. Identity, behavioral, and economic factors were frequently identified social determinants, due to reliance on administrative data. Three main themes were identified: 1) improve access to data and technology with policy – advance the standardization and interoperability of data, and expand consumer access to digital health technologies; 2) leverage data aggregation – enrich SDoH insights using multiple data sources, and use analytics- and AI-based methods to aggregate data; and 3) use analytics and AI-based methods to assess and address SDoH – retrieve SDoH in unstructured and structured data, and provide contextual care management sights and community-level interventions. Conclusions: If multiple datasets and advanced analytical technologies can be effectively integrated, and consumers have access to and literacy of technology, more SDoH insights can be identified and targeted to improve public health.

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Roles of Health Literacy in Relation to Social Determinants of Health and Recommendations for Informatics-Based Interventions: Systematic Review

Abstract

Surveillance systems need to be evaluated to understand what the system can or cannot detect. The measures commonly used to quantify detection capabilities are sensitivity, positive predictive value and timeliness. However, the practical application of these measures to multi-purpose syndromic surveillance services is complex. Specifically, it is very difficult to link definitive lists of what the service is intended to detect and what was detected. First, we discuss issues arising from a multi-purpose system, which is designed to detect a wide range of health threats, and where individual indicators, e.g. ‘fever’, are also multi-purpose. Secondly, we discuss different methods of defining what can be detected, including historical events and simulations. Finally, we consider the additional complexity of evaluating a service which incorporates human decision-making alongside an automated detection algorithm. Understanding the complexities involved in evaluating multi-purpose systems helps design appropriate methods to describe their detection capabilities.

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Roles of Health Literacy in Relation to Social Determinants of Health and Recommendations for Informatics-Based Interventions: Systematic Review

Abstract

Research data may have substantial impact beyond the original study objectives. The Collaborating Consortium of Cohorts Producing NIDA Opportunities (C3PNO) facilitates the combination of data and access to specimens from nine NIDA-funded cohorts in a virtual data repository (VDR). Unique challenges were addressed to create the VDR. An initial set of common data elements was agreed upon, selected based on their importance for a wide range of research proposals. Data were mapped to a common set of values. Bioethics consultations resulted in the development of various controls and procedures to protect against inadvertent disclosure of personally identifiable information. Standard operating procedures govern the evaluation of proposed concepts, and specimen and data use agreements ensure proper data handling and storage. Data from eight cohorts have been loaded into a relational database with tables capturing substance use, available specimens, and other participant data. A total of 6,177 participants were seen at a study visit within the past six months and are considered under active follow-up for C3PNO cohort participation as of the third data transfer, which occurred in January 2020. A total of 70,391 biospecimens of various types are available for these participants to test approved scientific hypotheses. Sociodemographic and clinical data accompany these samples. The VDR is a web-based interactive, searchable database available in the public domain, accessed at www.c3pno.org. The VDR are available to inform both consortium and external investigators interested in submitting concept sheets to address novel scientific questions to address high priority research on HIV/AIDS in the context of substance use. Keywords: common data elements, data repository Abbreviations: National Institute on Drug Abuse (NIDA), Collaborating Consortium of Cohorts Producing NIDA Opportunities (C3PNO), human immunodeficiency virus (HIV), acquired immunodeficiency syndrome (AIDS), injecting drug users (IDU), virtual data repository (VDR) Correspondence: siminski@frontierscience.org*

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Roles of Health Literacy in Relation to Social Determinants of Health and Recommendations for Informatics-Based Interventions: Systematic Review

Abstract

The aim of universal health coverage (UHC) is to ensure that all individuals in a country have access to quality healthcare services and do not suffer financial hardship in using these services. However, progress toward attaining UHC has been slow, particularly in sub-Saharan Africa. The use of information and communication technologies for healthcare, known as eHealth, can facilitate access to quality healthcare at minimal cost. eHealth systems also provide the information needed to monitor progress toward UHC. However, in most countries, eHealth systems are sometimes non-functional and do not serve programmatic purposes. Therefore, it is crucial to implement strategies to strengthen eHealth systems to support UHC. This perspective piece proposes a conceptual framework for strengthening eHealth systems to attain UHC goals and to help guide UHC and eHealth strategy development.

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Roles of Health Literacy in Relation to Social Determinants of Health and Recommendations for Informatics-Based Interventions: Systematic Review

Abstract

Background: The initial limited supply of COVID-19 vaccine in the U.S. presented significant allocation, distribution, and delivery challenges. Information that can assist health officials, hospital administrators and other decision makers with readily identifying who and where to target vaccine resources and efforts can improve public health response. Objective: The objective of this project was to develop a publicly available geographical information system (GIS) web mapping tool that would assist North Carolina health officials readily identify high-risk, high priority population groups and facilities in the immunization decision making process. Methods: Publicly available data were used to identify 14 key health and socio-demographic variables and 5 differing themes (social and economic status; minority status and language; housing situation; at risk population; and health status). Vaccine priority population index (VPI) scores were created by calculating a percentile rank for each variable over each N.C. Census tract. All Census tracts (N = 2,195) values were ranked from lowest to highest (0.0 to 1.0) with a non-zero population and mapped using ArcGIS. Results: The VPI tool was made publicly available (https://enchealth.org/) during the pandemic to readily assist with identifying high risk population priority areas in N.C. for the planning, distribution, and delivery of COVID-19 vaccine. Discussion: While health officials may have benefitted by using the VPI tool during the pandemic, a more formal evaluation process is needed to fully assess its usefulness, functionality, and limitations. Conclusion: When considering COVID-19 immunization efforts, the VPI tool can serve as an added component in the decision-making process.

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Roles of Health Literacy in Relation to Social Determinants of Health and Recommendations for Informatics-Based Interventions: Systematic Review

Abstract

Even when older adults monitor hypertension at home, it is difficult to understand trends and share them with their providers. MyHealthNetwork is a dashboard designed for patients and providers to monitor blood pressure readings to detect hypertension and ultimately warning signs of changes in brain health. A multidisciplinary group in a Digital Health course at Tufts University School of Medicine used Design Thinking to formulate a digital solution to promote brain health among older adults in the United States (US). Older adults (aged 65 and over) are a growing population in the US, with many having one or more chronic health conditions including hypertension. Nearly half of all American adults ages 50-64 worry about memory loss as they age and almost all (90%) wish to maintain independence and age in their homes. Given the well-studied association between hypertension and dementia, we designed a solution that would ultimately promote brain health among older adults by allowing them to measure and record their blood pressure readings at home on a regular basis. Going through each step in the Design Thinking process, we devised MyHealthNetwork, an application which connects to a smart blood pressure cuff and stores users' blood pressure readings in a digital dashboard which will alert users if readings are outside of the normal range. The dashboard also has a physician view where users' data can be reviewed by the physician and allow for shared treatment decisions. The authors developed a novel algorithm to visually display the blood pressure categories in the dashboard in a way straightforward enough that users with low health literacy could track and understand their blood pressure over time. Additional features of the dashboard include educational content about brain health and hypertension, a digital navigator to support users with application use and technical questions. Phase 1 in the development of our application includes a pilot study involving recruitment of Primary Care Providers with patients who are at risk of dementia to collect and monitor BP data with our prototype. Subsequent phases of development involve partnerships to provide primary users with a rewards program to promote continued use, additional connections to secondary users such as family members and expansion to capture other health metrics.

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Roles of Health Literacy in Relation to Social Determinants of Health and Recommendations for Informatics-Based Interventions: Systematic Review

Abstract

Background: Fall injuries (FI) are a priority for public health planning. Syndromic surveillance (SS) is used to detect outbreaks, environmental exposures, and bioterrorism in real time. Since information is gathered on patients, the utility of using this system for FI should be evaluated. Methods: Strategies to integrate FI medical and SS data were compared using a cohort versus case control (CC) study design. Results: The CC study was accurate 77.7% (57.7-91.3) of the time versus 100% for a cohort design. The CC study design found FI increased for older age groups, female gender, November, and December months. Dates with any freezing temperature had a higher case fatality rate. Repeat acute care visits increased the risk of FI diagnosis by over 6% and trended upward with each visit (R=.333, p<.001). Conclusions: The CC diagnostic quality of FI were better for age and gender than for area. The CC study found the indicators of increased risk of FI including: Freezing temperature, repeat acute care visits, older age groups, female gender, November, and December months. A gradient of increasing odds of FI with the number of acute care visits provides proof that community fall prevention programs should focus on those most likely to fall. A CC design of SS data can quickly identify indicators of FI with a lower accuracy but with less cost than a full cohort study, thus providing a method to focus local public health interventions.

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Toronto, ON, M5A 3Y5
Phone: (+1) 416-583-2040
Email: support@jmir.org