Online Journal of Public Health Informatics

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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 social web has emerged as a dominant information architecture accelerating technology innovation on an unprecedented scale. The utility of these developments to public health use cases like disease surveillance, information dissemination, outbreak prediction and so forth has been widely investigated and variously demonstrated in work spanning several published experimental studies and deployed systems. In this paper we provide an overview of automated disease surveillance efforts based on the social web characterized by their different high level design choices regarding functional aspects like user participation and language parsing approaches. We briefly discuss the technical rationale and practical implications of these different choices in addition to the key limitations associated with these systems within the context of operable disease surveillance. We hope this can offer some technical guidance to multi-disciplinary teams on how best to implement, interpret and evaluate disease surveillance programs based on the social web.

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

Abstract

Introduction: Research examining the effective uses of social media (SM) in public health and medicine, especially in the form of systematic reviews (SRs), has grown considerably in the past decade. To our knowledge, no comprehensive synthesis of this literature has been conducted to date. Aims and methods: To conduct a systematic review of systematic reviews of the benefits and harms ("effects") of SM tools and platforms (such as Twitter and Facebook) in public health and medicine. To perform a synthesis of this literature and create a 'living systematic review'. Results: Forty-two (42) high-quality SRs were examined. Overall, evidence of SM's effectiveness in public health and medicine was judged to be minimal. However, qualitative benefits for patients are seen in improved psychosocial support and psychological functioning. Health professionals benefited from better peer-to-peer communication and lifelong learning. Harms on all groups include the impact of SM on mental health, privacy, confidentiality and information reliability. Conclusions: A range of negatives and positives of SM in public health and medicine are seen in the SR literature but definitive conclusions cannot be made at this time. Clearly better research designs are needed to measure the effectiveness of social technologies. For ongoing updates, see the wiki "Effective uses of social media in health: a living systematic review of systematic reviews". http://hlwiki.slais.ubc.ca/index.php/Effective_uses_of_social_media_in_healthcare:_a_living_systematic_review_of_reviews

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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: Anti-Retroviral Therapy (ART) care is a lifelong treatment, which needs accurate and reliable data collected for long period of time. Poor quality of medical records data remains a challenge and is directly related to the quality of care of patients. To improve this, there is an increasing trend to implement electronic medical record (EMR) in hospitals. However, there is little evidence on the impact of EMR on the quality of health data in low- resource setting hospitals like Ethiopia. This Comparative study aims to fill this evidence gap by assessing the completeness and reliability of paper-based and electronic medical records and explore the challenges of ensuring data quality at the Anti-Retroviral Therapy (ART) clinic at the University of Gondar Referral Hospital in Northwest Ethiopia. Methods: An institution-based comparative cross-sectional study, supplemented with a qualitative approach was conducted from February 1 to March 30, 2017 at the ART clinic of the University of Gondar Hospital. A total of 250 medical records having both electronic and paper-based versions were collected and assessed. A national ART registration form which consists of 40 ART data elements was used as a checklist to assess completeness and reliability dimensions of data quality on medical records of patients on HIV care. Kappa statistics were computed to describe the level of data agreement between paper-based and electronic records across patient characteristics. In-depth interviews were conducted using semi-structured questionnaires with ten key informants to explore the challenges related with the quality of medical records. Responses of the key informant interviews were analyzed using thematic analysis. Results: The overall completeness of medical records was 78% with 95% CI (70.8% - 85.1%) in paper-based and 76% with 95%CI (67.8% - 83.2%) EMR. The data reliability measured in Kappa statistics shows strong agreements on the socio-demographic data such as educational status 0.93 (0.891, 0.963), WHO staging 0.86 (0.808, 0.906); general appearance 0.83 (0.755, 0.892) and patient referral record 0.87 (0.795, 0.932).The major challenges hindering good data quality was the current side by side dual data documentation practice (the need to document both on the paper and the EMR for a single record), patient overload and low data documentation practice of health workers. Conclusion: The overall completeness of ART medical records was still slightly better in paper-based records than EMR. The main reason affecting the EMR data quality was the current dual documentation practice both on the paper and electronic for each patient in the hospital. The hospital management need to decide to use either the paper or the electronic system and build the capacity of health workers to improve data quality in the hospital.

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

Abstract

Objective To explore the most important public health information system database integration project success factors, whether technological, organizational, project-specific, or external in nature. Methods This study involved a cross-case design. Cases were identified through literal replication logic and screened through a survey and literature review. Study participants were interviewed through hour-long sessions with a semi-structured guide. Survey responses, interview transcripts and available documents were coded and analyzed deductively, with matrices developed to illustrate relationships. Results Leadership among the project's participants is the most important integration project success factor. Executive sponsors champion the initiative. Informaticians facilitate communication and system requirement collection. Program directors contribute substantive energy to the project and remove obstacles. Other factors substantially contribute to project success. Strong Financial Management and Support promotes project initiation. Technological aspects impact the functionality of the final product. Utilizing formal project management techniques, particularly the Agile software development methodology, contributes to successful project resolution by ensuring daily operational effectiveness. Discussion The principal finding illustrates project leadership transcending the role of the executive sponsor. Other participants, notably informaticians and program directors, substantially contribute to the project's success. Additionally, the Agile software development methodology is emerging as a successful approach to project management for these and related projects. Conclusion Investing in the leadership and project management skills of database integration project participants could improve the success of future projects. State health department staff considering these projects should carefully select project participants and train them accordingly.

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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: There have been few studies conducted on Electronic Medical Records (EMR) among medical doctors who practice in resource limited settings. This study aimed to assess the attitude to and willingness of medical doctors at the Lagos University Teaching Hospital to use EMR and to identify the factors that are associated with the willingness to use EMR. Methods: A stratified sampling method was used to select medical doctors to participate in the study according to their experience and professional cadre. A pretested self-administered questionnaire was used to collect data which were entered and analyzed using the Epi-info version 7 software. Statistically significant associations were tested using the chi-square and fishers exact tests. Results: There were 202 participants in the study. All (100%) had good attitude towards EMR. Nearly all of them (96.54%) were willing to use EMR. There was no significant association between age, gender and willingness to use EMR. However, there was a statistically significant association with work duration and IT skills (p< 0.05). Conclusion: Work duration and IT skills are significant factors in determining the willingness to use EMR. There is therefore a need to include IT skills acquisition in medical training so as to increase the chance of use of EMR.

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Abstract

Introduction The 2014 Ebola virus outbreak in parts of West Africa marked the 25th occurrence of the disease since its discovery in 1976. While earlier outbreaks in Central and Eastern Africa had limited geographical extension and little media coverage, news media interest in the 2014 epidemic was remarkably high. In countries like Ghana, where the risk of imported infection was estimated to be among the highest, news coverage for the epidemic proliferated. This study aimed to describe and analyze the central themes which characterized media representations of the risk of Ebola outbreak in Ghana. Method A quantitative content analysis (CA) was employed to study news media reportage of the risk of Ebola outbreak in Ghana. Two daily newspapers, the Daily Graphic and Today were sampled. An online search for Ebola news stories in the selected newspapers was conducted, and all hits with Ebola downloaded and screened. A total of 332 articles were retrieved and 156 articles met the inclusion criteria. Three independent coders carried out the coding using identical story analysis form. Results In the course of the 2014 Ebola epidemic in parts of West Africa, the Daily Graphic and Today newspapers in Ghana published 332 stories about the epidemic. Of this number, the study analyzed 156 news articles which met the inclusion criteria. The analysis found that, media coverage for the risk of Ebola outbreak in Ghana reflected nine salient themes: concerns about the Ghana's preparedness, support for Ghana's preparation, public education on Ebola virus, assurances on Ghana's readiness, suspected cases of Ebola, effects of Ebola, critique of Ebola risk handling, Misinformation and other. Conclusion Analysis of news media coverage for the threat of Ebola outbreak in Ghana revealed nine important themes. These themes, contributed to an understanding of the broad impact of the recent Ebola outbreak on various sectors of the population. Key words: media coverage, Ebola threat in Ghana, epidemic preparedness, West Africa Ebola outbreak

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

Abstract

Objectives: To review user signal rating activity within the Canadian Network for Public Health Intelligence's (CNPHI's) Knowledge Integration using Web-based Intelligence (KIWI) technology by answering the following questions: (1) who is rating, (2) how are users rating, and (3) how well are users rating? Methods: KIWI rating data was extracted from the CNPHI platform. Zoonotic & Emerging program signals with first rating occurring between January 1, 2016 and December 31, 2017 were included. Krippendorff's alpha was used to estimate inter-rater reliability between users. A z-test was used to identify whether users tended to rate within 95% confidence interval (versus outside) the average community rating. Results: The 37 users who rated signals represented 20 organizations. 27.0% (n = 10) of users rated ≥10% of all rated signals, and their inter-rater reliability estimate was 72.4% (95% CI: 66.5-77.9%). Five users tended to rate significantly outside of the average community rating. An average user rated 58.4% of the time within the signal's 95% CI. All users who significantly rated within the average community rating rated outside the 95% CI at least once. Discussion: A diverse community of raters participated in rating the signals. Krippendorff's Alpha estimate revealed moderate reliability for users who rated ≥10% of signals. It was observed that inter-rater reliability increased for users with more experience rating signals. Conclusions: Diversity was observed between user ratings. It is hypothesized that rating diversity is influenced by differences in user expertise and experience, and that the number of times a user rates within and outside of a signal's 95% CI can be used as a proxy for user expertise. The introduction of a weighted rating algorithm within KIWI that takes this into consideration could be beneficial.

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

Abstract

Objectives: Consumers routinely seek health and nutrition-related information from online sources, including social media platforms. This study identified popular online nutrition content to examine the advice and assess alignment with the Australian Guideline to Healthy Eating (AGHE). Methods: We used Facebook page likes as an indicator of popularity to identify online nutrition and diet content. Websites and blogs associated with pages that had more than 100,000 Australian likes on 7th September 2017 were included. The dietary advice promoted was collected and compared with the AGHE. Results: Nine Facebook pages met the inclusion criteria. The four most-liked pages were hosted by celebrities. Only two pages and their associated websites had advice consistent with AGHE recommendations. The concept of "real food" was a popular theme online. While most sources advocated increasing vegetable consumption and reducing processed food, other advice was not evidence-based and frequently conflicted with the AGHE. Discussion: Health information seekers are exposed to a variety of online dietary information and lifestyle advice. While few public health goals are promoted, there are many conflicts with AGHE. Public health organisations promoting AGHE on Facebook are few and not as popular. Conclusion: Public health organisations need to be more engaged on popular internet platforms such as Facebook. The prevailing popular nutrition advice online may increase consumer confusion, scepticism and even avoidance of dietary advice. Proactive efforts are needed by public health organisations, in partnership social marketing experts, to create and share engaging and accurate nutrition content. Partnership with celebrities should be explored to improve reach and impact of evidence-based diet recommendations online.

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

Abstract

This paper describes a continuing initiative of the International Society for Disease Surveillance designed to bring together public health practitioners and analytics solution developers from both academia and industry. Funded by the Defense Threat Reduction Agency, a series of consultancies have been conducted on a range of topics of pressing concern to public health (e.g. developing methods to enhance prediction of asthma exacerbation, developing tools for asyndromic surveillance from chief complaints). The topic of this final consultancy, conducted at the University of Utah in January 2017, is focused on defining a roadmap for the development of algorithms, tools, and datasets for improving the capabilities of text processing algorithms to identify negated terms (i.e. negation detection) in free-text chief complaints and triage reports.

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Abstract

The article highlights the Telehealth Ecosystem™ model, a holistic cross sector approach for socioeconomic revitalization, connectivity, interoperability and technology infrastructure development to address health equity for rural underserved communities. Two guiding frameworks, Community & Economic Development (CED) and Collective Impact, provided the foundation for the Telehealth Ecosystem™ model. Public and private organizational capacities are addressed by comprehensive healthcare and social service delivery through stakeholder engagement and collaborative decision-making processes. A focus is maintained on economic recovery and policy reforms that enhance population health outcomes for individuals and families who have economic challenges. The Telehealth EcoSystem™ utilizes an Intranet mechanism that enables a range of technologies and electronic devices for health informatics and telemedicine initiatives. The relevance of the Intranet to the advancement of health informatics is highlighted. Best practices in digital connectivity, HIPPA requirements, EHRs, and eHealth applications, such as patient portals and mobile devices are emphasized. Collateral considerations include technology applications that expand public health services. The ongoing collaboration between a social science research corporation, a regional community foundation and an open access telecommunications carrier is a pivotal element in the sequential development and implementation of the Telehealth EcoSystem™ model in the rural southeastern region community.

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Abstract

Objective Duplication of effort across development projects is often the resultant effect of poor donor coordination in low and middle income countries which receive development assistance. This paper examines the persistence of duplication through a case study of health facility listing exercises in Nigeria. Methods Document reviews, key informant interviews and a stakeholder's meeting were undertaken to identify similar health facility listing exercises between 2010 and 2016. Results As an outcome of this process, ten different health facility listing efforts were identified. Discussions Proper coordination and collaboration could have resulted in a single list grown over time, ensuring return on investments. This study provides evidence of the persistence of duplication, years after global commitment to harmonization, better coordination and efficient use of development assistance were agreed to. Conclusions The paper concludes by making a proposal for strategic leadership in the health sector and the need to leverage information and communications technology through the development of an electronic Health Facility Registry that can archive the data on health facilities, create opportunity for continuous updates of the list and provide for easy sharing of the data across different country stakeholders thereby eliminating duplication.

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

Abstract

Objectives: The Canadian Network for Public Health Intelligence (CNPHI) is a secure, web-based scientific informatics and biosurveillance platform that leverages disparate public health information resources and expertise for the direct benefit of local, regional and national decision makers. CNPHI fosters collaboration and consultation through innovation in disease surveillance, intelligence exchange, research and response to protect, promote and support public health. The objective of this article is to present the CNPHI 'on the go' mobile application, and to discuss preliminary evaluation of the technology. The mobile application is intended to enable rapid mobile data collection using both online and offline modes supporting various stages of surveillance and response through the extension of data collection and analysis to the mobile environment. Methods: Two needs assessment meetings were held with stakeholders representing individuals from government, academia and research institutions, to inform the development of the CNPHI "on the go" mobile application. An initial version of the mobile technology (an "app") was developed and piloted by end-users with expertise in the field. Two focused pilots were conducted to test the technology: Pilot 1: 17-7-2017 to 21-11-2017 (6 participants); Pilot 2: 25-7-2017 to 15-9-2017 (2 participants). An initial consultation was held with the project leads to identify data elements for mobile data collection. A custom data collection form was designed using CNPHI's Web Data technology for each pilot, which was then made available through the mobile app. The technology was assessed using feedback received during each pilot as well as through a survey that was conducted at the conclusion of pilots. Results: Pilot participants reported that the mobile technology allowed seamless data collection, data management and rapid information sharing. Participants also reported that the entire process was seamless, simple, efficient, and that fewer steps were required for data collection and management. Further, significant efficiencies were gained by directly entering information using the mobile app without having to transfer handwritten information into an electronic database. An overall positive experience was reported by participants from both pilots. Discussion: Literature suggests that traditional methods of surveillance and data collection using a paper based methodology pose many challenges such as data loss and duplication, difficulty in managing the database, and lack of timely access to the data. Accurate and rapid access is critical for public health professionals in order to effectively make decisions and respond to public health emergencies. Results show that the CNPHI "on the go" app is well poised to address some of the suggested challenges. A limitation of this study was that sample size for pilot participation was small for capturing overall feedback on the readiness of the technology for integration into regular surveillance activities and response procedures. Conclusions: CNPHI "on the go" is a customizable technology developed within an already thriving collaborative CNPHI platform used by public health professionals, and performs well as a tool for rapid data collection and secure information sharing.

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Abstract

Background: Past and present national initiatives advocate for electronic exchange of health data and emphasize interoperability. The critical role of public health in the context of disease surveillance was recognized with recommendations for electronic laboratory reporting (ELR). Many public health agencies have seen a trend towards centralization of information technology services which adds another layer of complexity to interoperability efforts. Objectives: To understand the process of data exchange and its impact on the quality of data being transmitted in the context of electronic laboratory reporting to public health. The study was conducted in context of Minnesota Electronic Disease Surveillance System (MEDSS), the public health information system for supporting infectious disease surveillance in Minnesota. Data Quality (DQ) dimensions by Strong et al., was chosen as the guiding framework for evaluation. Methods: The process of assessing data exchange for electronic lab reporting and its impact was a mixed methods approach with qualitative data obtained through expert discussions and quantitative data obtained from queries of the MEDSS system. Interviews were conducted in an open-ended format from November 2017 through February 2018. Based on these discussions, two high level categories of data exchange process which could impact data quality were identified: onboarding for electronic lab reporting and internal data exchange routing. This in turn comprised of eight critical steps and its impact on quality of data was identified through expert input. This was followed by analysis of data in MEDSS by various criteria identified by the informatics team. Results: All DQ metrics (Intrinsic DQ, Contextual DQ, Representational DQ, and Accessibility DQ) were impacted in the data exchange process with varying influence on DQ dimensions. Some errors such as improper mapping in electronic health records (EHRs) and laboratory information systems had a cascading effect and can pass through technical filters and go undetected till use of data by epidemiologists. Some DQ dimensions such as accuracy, relevancy, value-added data and interpretability are more dependent on users at either end of the data exchange spectrum, the relevant clinical groups and the public health program professionals. The study revealed that data quality is dynamic and on-going oversight is a combined effort by MEDSS Operations Team and Review by Technical and Public Health Program Professionals. Conclusion: With increasing electronic reporting to public health, there is a need to understand the current processes for electronic exchange and their impact on quality of data. This study focused on electronic laboratory reporting to public health and analyzed both on-boarding and internal data exchange processes. Insights gathered from this research can be applied to other public health reporting currently (e.g. immunizations) and will be valuable in planning for electronic case reporting in near future.

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Abstract

The Village Health Registry (VHR) was a community health data collection tool introduced in 1998. It was first introduced in Mwanza district of Malawi with the objectives of collecting community-based data, analysing and taking action in a local setting. The tool was collecting and updating data such as demography, immunization status for children under one year, growth monitoring for children under five, monitoring of all pregnant women, incidence of malaria, acute respiratory infections, diarrhoea cases, water and sanitation and deaths, by visiting households in every village every month. The tool was able to collect all targeted information as required. The data collected by the tool appeared to be more reliable than that obtained through a national information system used by the Ministry of Health (MoH) for the same district and the same year. It was easy for health centres to accurately order supplies based on actual requirements, to follow-up cases during disease outbreaks and to identify deficiencies in immunisation coverage rates. Despite promising results, the VHR registry fell into disuse following the establishment of a national register. The MoH's Health Information System (HIS) data used projections which normally did not represent the actual situation on the ground while the VHR registry gave real physical data which was representative and verifiable. The potential of the VHR outweighed that of the HIS. Although the HIS had been rolled out nationally, there were shortfalls which MoH could consider rectifying to reach its full potential. In conclusion, the VHR was worth adopting as it would give MoH realistic statistics to be effectively used at all levels. Keywords: Village Health Register, Mwanza district, Ministry of Health, Community Health Workers, Health Information System.

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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: Information technology has become an inevitable, constitutive element of the healthcare institution as well as health education. This study investigates the effects of mobile phone use in clinical practice at the Cape Coast Teaching Hospital. The use of mobile phones to access health information by health professionals has the potential to improve the provision of health service to the population. In addition, primary care physicians can use mobile phones to communicate with their patients before and after they are discharged, thereby improving the health of individual patients and the population at large. Method: The study adopted the cross-section survey design and obtained data using questionnaire from 100 medical students (medical, nursing and midwifery students) through purposive sampling procedure. Descriptive statistics and Pearson Chi-square were used for the analysis. Results: The results show that 98% of the respondents owned smartphones, thus, they are receptive to and can confidently use their phones to access medical information (65%). It also emerged that, respondents can render effective and continuous service to clients (90%) with assistance from mobile medical apps. Respondents dispelled fears that it was unethical to always depend on mobile apps for medical information. However, there was no significant relationship between using mobile apps to access medical information and ensuring effective and continuous service to clients ($p \leq 0.937$). Conclusion: In spite of high patronage of mobile phone, respondents maintained that accessing mobile phones during medical practice does not interfere with the service delivery, rather it facilitates effective and continuous service, speed up access to healthcare information and helps to increase knowledge as well as improve care giving skills. Mobile phone use can ensure quick communication between health facilities and health professionals which can help control diseases of public health concern thereby improving the health of the population. Keywords: apps, smartphones, medical information, health professionals, medical practice Abbreviations: Applications (Apps), Deloitte Global Center for Health Solutions (DGCFHS), Cape Coast Teaching Hospital (CCTH), University of Cape Coast (UCC), Clinical Teaching Centre (CTC), College of Health and Allied Sciences (CoHAS) Correspondence: gabriel.keney@ucc.edu.gh*

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Abstract

Public Health immunization registries and the immunization ecosystem have evolved over the past two decades to become significant population health data assets. Clinical providers and pharmacists are reporting to public health registries in 49 states and all territories the immunizations given to their patients, creating consolidated immunization event patient records. Most of these immunization events are reported through the provider's Electronic Health Record system (EHR), Pharmacy Management System (PMS), online, or through data uploads. Meaningful Use and health data standards (HL7) became the drivers that accelerated reporting to immunization registries and significantly improved the quality of the data. The infrastructure supporting the Immunization Ecosystem (IE) has enabled real-time compliance reporting and, more importantly, real-time patient queries. The provider community now has online access to a patient's immunization history in over three quarters of the states, and growing. This access includes a forecast of the patient's immunization gaps provided by public health decision support tools based upon the most recent ACIP recommendations. This is creating an opportunity for the provider and the patient to work together to reduce their risk of suffering a vaccine-preventable disease. This IE and the data in an Immunization Information System (IIS) are especially useful as pharmacies expand their immunization practices and create opportunities to reduce the adolescent and adult immunization gaps. In a few states, this provider-public health ecosystem has begun to extend to individuals by allowing them to access the IIS online. This provides them with the electronic version of their immunization \"yellow cards,\" recommendations for immunizations due, and the ability to print official certificates. This emerging consumer engagement creates opportunities to empower individuals to be more proactive in their family's health care. This paper builds upon early experiments to empower individuals in this ecosystem by leveraging the value of these public health data assets and trusted communications, illustrating the possibilities for engaging consumers to support reducing the impact of emerging diseases, outbreaks and the next pandemic. This paper will suggest the value of the IE and the role individuals can play within their own social networks to advance public health's efforts to manage disease events. In turn, this social mission would encourage consumers to be more proactive in managing their own healthcare.

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Abstract

We describe a computational population model with two risk factors and one outcome variable in which the prevalence (%) of all three variables, the association between each risk factor and the disease, as well as the association between the two risk factors is the input. We briefly describe three examples: retinopathy of prematurity, diabetes in Panama, and smoking and obesity as risk factors for diabetes. We describe and discuss the simulation results in these three scenarios including how the published information is used as input and how changes in risk factor prevalence changes outcome prevalence.

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