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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

Background: A primary goal for the development of EHRs and EHR-related technologies should be to facilitate greater knowledge management for improving individual and community health outcomes associated with HIV / AIDS. Most of the current developments of EHR have focused on providing data for research, patient care and prioritization of healthcare provider resources in other areas. More attention should be paid to using information from EHRs to assist local, state, national, and international entities engaged in HIV / AIDS care, research and prevention strategies. Unfortunately the technology and standards for HIV-specific reporting modules are still being developed. Methods: A literature search and review supplemented by the author's own experiences with electronic health records and HIV / AIDS prevention strategies will be used. This data was used to identify both opportunities and challenges for improving public health informatics primarily through the use of latest innovations in EHRs. Qualitative analysis and suggestions are offered for how EHRs can support knowledge management and prevention strategies associated with HIV infection. Results: EHR information, including demographics, medical history, medication and allergies, immunization status, and other vital statistics can help public health practitioners to more quickly identify at-risk populations or environments; allocate scarce resources in the most efficient way; share information about successful, evidenced-based prevention strategies; and increase longevity and quality of life. Conclusion: Local, state, and federal entities need to work more collaboratively with NGOs, community-based organizations, and the private sector to eliminate barriers to implementation including cost, interoperability, accessibility, and information security. Key Words: Usability of Health Information, Information Technology, Health Promotion / Disease Prevention MeSH Headings: HIV, Acquired Immunodeficiency Syndrome, Public Health Informatics, Electronic Health Records, Knowledge Management

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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 article provides a possible methodology to facilitate communication between open source and propriety systems using interoperability principles and a simple flexible text format.

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

Abstract

Welcome to the last issue of the 4th volume of the Online Journal of Public Health Informatics. I am sure you are all aware that the National Library of Medicine has approved our application for indexing and archiving in PubMed Central. The next step is to deliver all past issues of the journal to NLM in the required XML DTD format. The NLM will provide links to other related biomedical informatics journals. This process will be completed in February 2013. We can all proudly say that we now have a scholarly biomedical informatics journal dedicated to the exciting field of public health informatics. This issue contains nine original articles, two review articles, a technology review, and a commentary. The topics covered in this issue include the identification of some fundamental concepts and factors that must be understood if public heath informatics applications are to support high-level cognitive activities; the development of computerized decision support systems to capture structured clinical data from providers using office-based fax machines and the delivery of just-in-time alerts to PCPs statewide; identification of information requirements and barriers to information exchange by public health workers; development of a methodology to establish and maintain successful electronic health record exchanges between clinical practices and public health agencies; the use of data from the Behavioral Risk Factor Surveillance Systems surveys to study dental health disparities; the development of an develop an agent-based model to simulate the spread of sexually transmitted infections in a population; the use of institutional logics perspective to analyze the implementation of health information systems in a developing county; the development and use a modified Health Belief Model to improve the predictive power of factors that influence healthy eating behavior; an analysis of the history, issues, and potentials for successful implementation of electronic prescribing in the current health reform environment; improvement of HIV/AIDS knowledge management using electronic health records; the development of a methodology to facilitate communication between open source and propriety systems using interoperability principles; and a technology review on leveraging cloud computing to develop Smarter Public Health Prevention Systems (SPHS) to provide real-time reports of potential public health threats; and a commentary on identification of successes and challenges in the use of mobile phone applications in health and demographic surveillance systems in a developing country. It has long been noted by researchers that human and non-technical factors, rather than technological defects, contribute significantly to failures in implementation of public health informatics (PHI) applications. In order to improve the success rate of PHI tools it is important to pay more attention to human-centric design issues rather than completely focusing on technology issues. In the paper titled “Beyond information access: Support for Complex Cognitive Activities in Public Health Informatics Tools” the authors draw on research from the general area of human-information interaction in complex cognitive activities to identify some of the extant research needs of public health informatics tools. They also discuss a number of considerations for the design and evaluation of PHI tools, and demonstrate how an integration of such considerations facilitates the design and evaluation of successful PHI tools. In order to improve the successful adoption of electronic health records and health information exchanges by health departments in the current HITECH era it is important to encourage the participation of public health professionals in the design discourse. The secure sharing of protected health information is a fundamental determinant of the success of the HITECH Ac. An insignificant percentage of hospitals currently share structured data via the health information exchanges. The participation of majority of practices in the HIEs consists of using the office-based faxes to receive results or to log onto the HIE portal, where one exists, to receive health information. In the paper titled “Real Time Alert System: A Disease Management System Leveraging Health Information Exchange”, the authors developed a computerized decision support system (CDSS) using existing HIE infrastructure. The CDSS captures structured clinical data from providers using existing office-based fax machines and delivers real time alerts for recommended services to PCPs in the statewide Indiana Network for Patient Care when their patients visit. The technology was evaluated for emergency room visits anywhere in the state of Indiana. The results showed that the CDSS successfully delivered the just-in-time alerts to the PCPs across the state. Physicians who reported finding the information helpful also reported making a follow-up phone call or seeing the patient for a follow-up care. This study demonstrates that, even before the implementation of health information exchanges on a national level, most states can use such a CDSS to coordinate care, improve outcomes, and reduce costs of care. An understanding of the information requirements and barriers to information exchange by public health workers should precede information systems design efforts. In the paper titled “Public Health Practice within a Health Information Exchange: Information Needs and Barriers to Disease Surveillance”, Reeder, Revere, Hills, et.al, investigated information usage by public health professionals working on disease surveillance activities at a medium-sized health department. Their results indicated barriers in information systems usability; data timeliness, accuracy, and completeness; and social interaction with clients. In orders to improve the adoption of information systems and implementation of information exchanges by public health departments systems designers must address these barriers. In order for clinicians to make the best possible clinical and economically responsible vaccination decisions it is important to have access to information about the earliest possible intervals that are safe

to administer vaccinations, especially to children at highest risk of vaccine preventable diseases. The required data are contained in state Immunization Information Systems (IIS) and registries. The Meaningful Use Stage 1 standards require providers and hospital EHRs to demonstrate the ability to send immunization data to an IIS while the Meaningful Use Stage 2 standards include the requirement to send clinically correct and complete immunization records from the provider's EHR to an IIS. In a paper titled "A Three-Step Approach for Creating Successful Electronic Immunization Record Exchanges between Clinical Practice and Public Health", Janet Balog presents a methodology to establish and maintain electronic health record exchanges; demonstrates the value of clinical and technical testing before implementation of data exchanges; and discusses how the Meaningful Use requirement to advance data exchange with public health agencies achieves mutual health outcomes for providers and public health programs. Monitoring health disparities is a major activity of the Healthy People 2020 initiative. Research shows that the most important determinants of oral health are poverty, race and ethnicity. In the paper titled "Overcoming Data Challenges Examining Oral Health Disparities in Appalachia", the authors use the Behavioral Risk Factor Surveillance Systems survey data to study dental health disparities. Using Beale codes to define metropolitan and non-metropolitan statistical areas and GIS maps the authors provide informative sub-state results to assist health planners in targeting oral health intervention strategies. While public health professionals devote significant amount of time and money to screen and treat STISs annually this cluster of diseases remain a major public health challenge. Estimates from CDC show that approximately 19 million new cases of STIs occur in the U.S. each year, costing the healthcare system $12 billion to $20 billion annually. In recent decades researchers are increasingly employing agent-based models to simulate the spread of sexually transmitted infectious diseases as a complementary approach to the traditional statistical or differential equation-based models. In the paper titled "An Agent-Based Model for Simulating the Spread of Sexually Transmitted Infections", Rutherford, Friesen, et.al, develop an agent-based model to simulate the spread of sexually transmitted infections in a population of 1000 agents over a 10-year period. The model allows the effects of various mitigating and control policies and behaviors to be analyzed. The results show that changes in individual behaviors can reduce the risk of exposure. However, population-wide behavior modifications through public health activities have can have more dramatic impacts on the transmission of STIs. The healthcare sector is one of the most information-intensive enterprises and health information systems (HIS) are important components of health reform. Well-developed and implemented health information systems can improve the coordination of care, reduce duplications and errors, improve access, quality, and reduce costs. However, even in the U.S., less than 50 percent of health information systems are outright successes, delivering the expected functionalities on time and within budget. This significant failure has been attributed to the complexities of the technologies and the difficulty in satisfying the multiple conflicting objectives of the many stakeholders involved. The situation is even worse in developing countries. In a paper titled "Understanding HMIS Implementation in a Developing Country Health Country" Ime Asangansi employs the institutional logics perspective to analyze HMIS implementation in a state government ministry in Northern Nigeria. The author recognizes that certain institutional logics may be conflicting and lead to increase in the risk of failure. The following institutional logics were identified: a) the logic that sustainability can only be achieved through local ownership or the local control logic, b) the logic of universal coverage, and c) the logic of network-centric organizations where network technologies disrupt institutional power structures. It is proposed that the resolution of the conflicting logics must be addressed within the context of deinstitutionalization, changeover management, and by balancing the competing interests. A major recommendation from the study is that, in order to improve the implementation of HMIS in developing countries, policy makers must understand and resolve the conflicting logics. The increase in lifestyle-related health problems and Meaningful Use requirements provide incentives to providers to shift their practices from the current treatment-and-prescription centric models to patient-and population centric prevention and health promotion models. When Meaningful Use Stage 2 and Stage 3 requirements are enforced in future healthcare providers will be expected to provide patients with information that will help them make lifestyle changes. Health application and game designers are already developing behavior modification programs to assist patients in making healthy choices. Behavior modification models based on intuition are less successful or sustainable than those informed by evidence-based research. One of the most widely used theories for behavior modification is the Health Belief Model (HBM) which was developed to investigate why people fail to undertake preventive health measures. The main limitation of this model is that it has very low predictive power. In a paper titled "Towards an Effective Health Intervention Design: An Extension of the Health Belief Model", the authors extended the HBM to include new lifestyle changing factors and tested the validity of the extended HBM and the original model on healthy eating behavior. The results showed a significant increase in the predictive power of the extended model over the original model. As the health information exchanges mature and generate individual and population level databases researchers will use these data to create new evidence for lifestyle modifications in order to achieve the objectives of the Accountable Care Act. This is the final issue of the Online Journal of Public Health Informatics in 2012.Many thanks to the editors, the journal manager, and all the volunteers who have contributed to the success of this project. Through your hard work the field of public health informatics can now boast of a scholarly journal dedicated to the dissemination of evidence-based information to our stakeholders. I look forward to your continued support in 2013 and beyond. Happy New Year! Edward Mensah, PhD Editor-in-Chief Online Journal of Public Health Informatics 1603 West Taylor Street, Room 759 Chicago, Illinois, 60612 Email:dehasnem@uic.edu Office: (312) 996-3001

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

Abstract

Maternal and child health indicators are generally poor in Nigeria with the northern part of the country having the worst indicators than the southern part. Efforts to address maternal and health challenges in Nigeria include, among others, improvement in health and management information systems. We report on the experience of mobile phone technology in supporting the activities of a health and demographic surveillance system in northern Nigeria. Our experience calls for the need for the Nigerian Government, the mobile network companies, and the international community at large to consolidate their efforts in addressing the mobile network coverage and power supply challenges in order to create an enabling environment for socio-economic development particularly in rural and disadvantaged areas. Unless power and mobile network challenges are addressed, health interventions that rely on mobile phone technology will not have a significant impact in improving maternal and child health.

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Abstract

Globally, health management information systems (HMIS) have been hailed as important tools for health reform (1). However, their implementation has become a major challenge for researchers and practitioners because of the significant proportion of failure of implementation efforts (2; 3). Researchers have attributed this significant failure of HMIS implementation, in part, to the complexity of meeting with and satisfying multiple (poorly understood) logics in the implementation process. This paper focuses on exploring the multiple logics, including how they may conflict and affect the HMIS implementation process. Particularly, I draw on an institutional logics perspective to analyze empirical findings from an action research project, which involved HMIS implementation in a state government Ministry of Health in (Northern) Nigeria. The analysis highlights the important HMIS institutional logics, where they conflict and how they are resolved. I argue for an expanded understanding of HMIS implementation that recognizes various institutional logics that participants bring to the implementation process, and how these are inscribed in the decision making process in ways that may be conflicting, and increasing the risk of failure. Furthermore, I propose that the resolution of conflicting logics can be conceptualized as involving deinstitutionalization, changeover resolution or dialectical resolution mechanisms. I conclude by suggesting that HMIS implementation can be improved by implementation strategies that are made based on an understanding of these conflicting logics. Keywords: Legal and Social issues in Public Health Informatics; developing countries; health management information systems; institutional logics; institutional aspects of information systems; action research; Nigeria; Ministry of Health; change management

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

Abstract

Public health professionals work with a variety of information sources to carry out their everyday activities. In recent years, interactive computational tools have become deeply embedded in such activities. Unlike the early days of computational tool use, the potential of tools nowadays is not limited to simply providing access to information; rather, they can act as powerful mediators of human-information discourse, enabling rich interaction with public health information. If public health informatics tools are designed and used properly, they can facilitate, enhance, and support the performance of complex cognitive activities that are essential to public health informatics, such as problem solving, forecasting, sense-making, and planning. However, the effective design and evaluation of public health informatics tools requires an understanding of the cognitive and perceptual issues pertaining to how humans work and think with information to perform such activities. This paper draws on research that has examined some of the relevant issues, including interaction design, complex cognition, and visual representations, to offer some human-centered design and evaluation considerations for public health informatics tools.

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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: Rates of preventive and disease management services can be improved by providing automated alerts and reminders to primary care providers (PCPs) using of health information technology (HIT) tools. Methods: Using Adaptive Turnaround Documents (ATAD), an existing Health Information Exchange (HIE) infrastructure and office fax machines, we developed a Real Time Alert (RTA) system. RTA is a computerized decision support system (CDSS)that is able to deliver alerts to PCPs for recommended services around the time of the patient visit. RTA is also able to capture structured clinical data from providers using existing fax technology. In this study, we evaluate RTA's performance for alerting PCPs when their patients with asthma have an emergency room visit anywhere in the state. Results: Our results show that RTA was successfully able to deliver "just in time" patient-relevant alerts to PCPs across the state. Furthermore, of those ATADs faxed back and automatically interpreted by the RTA system, 35% reported finding the provided information helpful. Of those who reported finding information helpful also reported making a phone call, sending a letter or seeing the patient for follow up care. Conclusions: We have successfully demonstrated the feasibility of electronically exchanging important patient related information with the PCP despite lack of a link with their electronic health record (EHR). We have shown that using our ATAD technology, a PCP can be notified quickly of an important event such as a patient's asthma related emergency room (ER) admission so further follow up can happen in real or almost real time.

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

Abstract

Electronic-Prescribing, Computerized Prescribing, or E-RX has increased dramatically of late in the American health care system, a long overdue alternative to the written form for the almost five billion drug treatments annually. Pharmacies were early adopters of computerization for a variety of factors. The profession in its new corporate forms of chain drug stores and pharmacy benefits firms has sought efficiencies, profit enhancements, and clinical improvements through managed care strategies that rely upon data automation. E-RX seems to be a leading factor in overall physician acceptance of Electronic Medical Records (EMRs), although the Centers for Medicare and Medicaid (CMS) incentives seem to be the propelling force in acceptance. More research should be done by public health professionals focusing on resolutions to pharmaceutical use, safety, and cost escalation, which persist and remain dire following health reform.

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

Abstract

Introduction: Public health professionals engage in frequent exchange of health information while pursuing the objectives of protecting and improving population health. Yet, there has been little study of the information work of public health workers with regard to information exchange. Our objective was to gain a better understanding of information work at a local health jurisdiction before and during the early stages of participation in a regional Health Information Exchange. Methods: We investigated the information work of public health workers engaged in disease surveillance activities at a medium-sized local health jurisdiction by conducting semi-structured interviews and thematically analyzing interview transcripts. Results: Analysis of the information work of public health workers revealed barriers in the following areas: information system usability; data timeliness, accuracy and completeness; and social interaction with clients. We illustrate these barriers by focusing on the work of epidemiologists. Conclusion: Characterizing information work and barriers to information exchange for public health workers should be part of early system design efforts. A comprehensive understanding of the information practice of public health workers will inform the design of systems that better support public health work.

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

Abstract

Introduction: The recent years have witnessed a continuous increase in lifestyle related health challenges around the world. As a result, researchers and health practitioners have focused on promoting healthy behavior using various behavior change interventions. The designs of most of these interventions are informed by health behavior models and theories adapted from various disciplines. Several health behavior theories have been used to inform health intervention designs, such as the Theory of Planned Behavior, the Transtheoretical Mode, and the Health Belief Model (HBM). However, the Health Belief Model (HBM), developed in the 1950s to investigate why people fail to undertake preventive health measures, remains one of the most widely employed theories of health behavior. However, the effectiveness of this model is limited. The first limitation is the low predictive capacity (R2 < 0.21 on average) of existing HBM's variables coupled with the small effect size of individual variables. The second is lack of clear rules of combination and relationship between the individual variables. In this paper, we propose a solution that aims at addressing these limitations as follows: (1) we extended the Health Belief Model by introducing four new variables: Self-identity, Perceived Importance, Consideration of Future Consequences, and Concern for Appearance as possible determinants of healthy behavior. (2) We exhaustively explored the relationships/interactions between the HBM variables and their effect size. (3) We tested the validity of both our proposed extended model and the original HBM on healthy eating behavior. Finally, we compared the predictive capacity of the original HBM model and our extended model. Methods: To achieve the objective of this paper, we conducted a quantitative study of 576 participants' eating behavior. Data for this study were collected over a period of one year (from August 2011 to August 2012). The questionnaire consisted of validated scales assessing the HBM determinants – perceived benefit, barrier, susceptibility, severity, cue to action, and self-efficacy – using 7-point Likert scale. We also assessed other health determinants such as consideration of future consequences, self-identity, Concern for appearance and perceived importance. To analyses our data, we employed factor analysis and Partial Least Square Structural Equation Model (PLS-SEM) to exhaustively explore the interaction/relationship between the determinants and healthy eating behavior. We tested for the validity of both our proposed extended model and the original HBM on healthy eating behavior. Finally, we compared the predictive capacity of the original HBM model and our extended model and investigated possible mediating effects. Results: The results show that the three newly added determinants are better predictors of healthy behavior. Our extended HBM model lead to approximately 78% increase (from 40 to 71%) in predictive capacity compared to the old model. This shows the suitability of our extended HBM for use in predicting healthy behavior and in informing health intervention design. The results from examining possible relationships between the determinants in our model lead to an interesting discovery of some mediating relationships between the HBM's determinants, therefore, shedding light on some possible combinations of determinants that could be employed by intervention designers to increase the effectiveness of their design. Conclusion: Consideration of future consequences, self-identity, concern for appearance, perceived importance, self-efficacy, perceived susceptibility are significant determinants of healthy eating behavior that can be manipulated by healthy eating intervention design. Most importantly, the result from our model established the existence of some mediating relationships among the determinants. The knowledge of both the direct and indirect relationships sheds some light on the possible combination rules

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

Abstract

Objectives. The objective of our study of oral health disparities in Appalachia was to use existing data sources to geographically analyze suspected disparities in oral health status in the 420 counties of Appalachia, and to make sub-state comparisons within Appalachia and to the rest of the nation. The purpose of this manuscript is to describe the methods used to overcome challenges associated with using limited oral health data to make inferences about oral health status. Methods. Oral health data were obtained from the Behavioral Risk Factor Surveillance System (BRFSS). Because the BRFSS was designed for state-level analysis, there were inadequate number of responses to study Appalachia by county. We set out to determine the smallest possible unit we could use, aggregating data to satisfy CDC minimum requirements for spatially identified responses. For sub-state comparisons, data were first aggregated to Appalachian and non-Appalachian regions within Appalachian states. Next, rural versus urban areas within Appalachian and non-Appalachian regions were examined. Beale codes were used to define metropolitan and non-metropolitan statistical regions for the United States. Results. Aggregating the data as described proved useful for smoothing the data used to analyze oral health disparities, while still revealing important sub-state differences. Using geographic information systems to map data throughout the process was very useful for determining an effective approach for our analysis. Discussion. Studying oral health disparities on a regional or national level is difficult given a lack of appropriate data. The BRFSS can be adapted for this purpose; however, there is a limited number of oral health questions and because they are also optional, they are not routinely asked by all states. Expanding the BRFSS to include a larger sampling frame would be very helpful for studying oral health disparities. Conclusions. Novel techniques were introduced to use BRFSS data to study oral health disparities in Appalachia, which provided informative sub-state results, useful to health planners for targeting intervention strategies.

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

Abstract

Population health and individual health are strengthened through proactive immunization programs. The clinical community references immunization records at the point of care to make decisions about the immunizations individuals and families need to minimize their risk of contracting (and spreading) vaccine preventable disease (VPD). Understanding the earliest possible intervals that are safe to administer vaccinations provides the youngest children with as much immunity as possible as early as possible. This is especially useful for children at highest risk as their visits to a medical provider may be sporadic. This, coupled with the continuous development of new and combined vaccines and complex vaccine schedules, challenges the provider to easily know the appropriate vaccinations to order for their patients. Under-vaccinating increases patient's VPD risk; over-vaccinating increases provider and consumer health care costs. Clinicians want to make the best clinical and economically responsible decisions — this is the challenge. The solution lies in providing to a clinician timely and accurate vaccination data with decision support tools at the point of care. The use of Electronic Health Records (EHRs) alone cannot achieve this goal. It will take an accountable team made up of the clinician organization, their EHR vendor, and a public health agency to effectively manage immunization coverage for a patient population. This paper provides a three-step approach to establish and maintain EHR data exchanges, demonstrates the value of both clinical and technical testing prior to data exchange implementation, and discusses lessons learned. It illustrates the value of federal Meaningful Use criteria and considers how its objective to advance data exchange with public health systems increases providers' access to timely, accurate immunization histories and achieves desired mutual health outcomes for providers and public health programs.

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Abstract

Objectives: This study examined determinants of using an immunization registry, explaining the variance in use. The technology acceptance model (TAM) was extended with contextual factors (contextualized TAM) to test hypotheses about immunization registry usage. Commitment to change, perceived usefulness, perceived ease of use, job-task changes, subjective norm, computer self-efficacy and system interface characteristics were hypothesized to affect usage. Method: The quantitative study was a prospective design of immunization registry end-users in a state in the United States. Questionnaires were administered 100 end-users after training and system usage. Results: The results showed that perceived usefulness, perceived ease of use, subjective norm and job-tasks change influenced usage of the immunization registry directly, while computer self-efficacy and system interface characteristics influenced usage indirectly through perceived ease of use. Perceived ease of use also influenced usage indirectly through perceived usefulness. The effect of commitment to change on immunization registry usage was insignificant. Conclusion: Understanding the variables that impact information system use in the context of public health can increase the likelihood that a system will be successfully implemented and used, consequently, positively impacting the health of the public. Variables studied should be adequate to provide sufficient information about the acceptance of a specified technology by end users. Keywords: Public health informatics; Technology acceptance model; TAM, Immunization registry; Public health; Health information technology

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Abstract

This work uses agent-based modelling (ABM) to simulate sexually transmitted infection (STIs) spread within a population of 1000 agents over a 10-year period. The work contrasts compartmentalized mathematical models that fail to account for individual agents, and ABMs commonly applied to simulate the spread of respiratory infections. The model was developed in C++ using the Boost 1.47.0 libraries for the normal distribution and OpenGL for visualization. Sixteen agent parameters interact individually and in combination to govern agent profiles and behaviours relative to infection probabilities. The simulation results provide qualitative comparisons of STI mitigation strategies, including the impact of condom use, promiscuity, the form of the friend network, and mandatory STI testing. Individual and population-wide impacts were explored, with individual risk being impacted much more dramatically by population-level behaviour changes as compared to individual behaviour changes.

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

Abstract

As the use of certified electronic health record technology (CEHRT) has continued to gain prominence in hospitals and physician practices, public health agencies and health professionals have the ability to access health data through Health Information Exchanges (HIE). With such knowledge health providers are well positioned to positively affect population health, and enhance health status or quality-of-life outcomes in at-risk populations. Through big data analytics, predictive analytics and cloud computing, public health agencies have the opportunity to observe emerging public health threats in real-time and provide more effective interventions addressing health disparities in our communities. The Smarter Public Health Prevention System (SPHPS) provides real-time reporting of potential public health threats to public health leaders through the use of a simple and efficient dashboard and links people with needed personal health services through mobile platform for smartphones and tablets to promote and encourage healthy behaviors in our communities. The purpose of this paper is to evaluate how a secure virtual private cloud (VPC) solution could facilitate the implementation of the SPHPS in order to address public health disparities.

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