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Welcome to the last issue of the 8th volume of the Online Journal of Public Health Informatics.

The current issue consists of interesting topics ranging from the design of visualizations for big health data; formulating an ontological framework for analyzing health policy; development of near real-time surveillance models using social media; asthma exacerbation risk predictions; deployment of analytics in community health centers; using Google reviews to assess the risk of elder abuse; the use of electronic health records in health care homes; to a review of data privacy and security requirements for public health research.

Policy makers and researchers require population health data in order to assess the health of communities, manage resources, educate the public, and develop policies. Public health data is often big data due to its high volume, low veracity, great variety, and high velocity. Such data presents analytic challenges to scholars and researchers. In order to perceive patterns and create hypotheses users need the capability to perform related tasks and see many facets and elements of the data simultaneously. Visualization techniques that encode multiple facets of data simultaneously can support complex health-related tasks such as predicting outbreaks of diseases, developing surveillance systems, development of health policies, and discovering populations at risk of disease or injury. The current off-the-shelf visualization tools can be used to represent only one or two facets of health data, thereby missing relevant but hidden patterns. In the era of big data, it is important to analyze the unknown relationships among the multiple data elements in order to discover patterns and develop relevant hypotheses for research and policy development. In the paper titled "Beyond simple charts: Design of Visualizations for Big Health Data" Ola and Sedig develop novel visualizations for global big health data. Their work demonstrates how designers of health visualization techniques can improve upon the existing simple chart-like visualizations to design new visualizations for analyzing the multiple data elements and facets of big health data in order to discover hidden patterns and extract value.

China has implemented waves of healthcare reforms since 1950. Between 1950 and 2009 the reforms emphasized the shifting of public finances to private sources by turning public hospitals and clinics into private for-profit enterprises. The health care system was also decentralized.

After 2009 different policies were introduced to provide public health services for all citizens and, among other objectives, to improve primary care delivery systems. Since the new set of policies did not completely eliminate the old (pre-2009) reforms the multiple layers of complexities made it difficult to analyze the performance of the policies. In a paper titled "China's National Health Policies: An Ontological Approach" Guobin D. et al. mined and mapped all the policies systematically and systemically in order to discover their emphases and biases. The framework, the method developed, and the results can be used by policy makers to assess the strengths and weaknesses of China's health policies and formulate better policies.

Access to medical information when and where needed enriches and facilitates the learning experience of medical students and residents. Clinicians with access to mobile health devices and applications can retrieve relevant treatment guidelines and other necessary information at the point of care in order to deliver quality care. These technologies also allow clinicians to monitor their patients after discharge. In order to optimize the value of mobile devices and applications it is important for medical students and residents to be very familiar with these technologies during training. A study was carried out by Fatima M. et al. at a large urban medical center in which residents were introduced to point-of-care institutional resources and authoritative public health applications using mobile devices. The results demonstrated significant improvements in residents' familiarity with medical information applications, appreciation of the use of electronic medical records, and familiarity with the relevant electronic technologies compared to baseline measures.

Influenza epidemics in the United States have been responsible for very high morbidity and mortality cases each year. The Centers for Disease Control and Prevention and other agencies develop surveillance systems in order to predict the severity of the impending influenza and prepare for vaccination efforts. Several factors such as the attributes of the circulating virus, the timing of the flu season, and the effectiveness of vaccine influence the severity of the disease. In recent years experts have used data from social media to develop near real-time surveillance models to provide healthcare workers with wider situational awareness. Since this data is based on conversations by regular social media participants it is necessary to verify the accuracy of the associated surveillance models. In a study titled 'Twitter Influenza Surveillance: Quantifying Seasonal Misdiagnosis Patterns' Jared Mowery demonstrated that approximately 40 percent of the flu tweets in the 2015-2016 season reflected misdiagnoses. The study also showed that, in addition to including data from other flu seasons it is important to understand the factors that affect Twitter users' misdiagnoses in order to develop more reliable flu surveillance models using data from social media.

It has been estimated that asthma affects approximately 24 million Americans and can have significant impact on the socio-economic well-being of those affected and their families. The direct medical of ED visits in 2011 alone was estimated at $50 billion. It is essential to develop strategies aimed at improving the timeliness and targeting of preventive and early intervention activities. Quite often the investigation capabilities of the professionals responsible for monitoring population health on a daily basis can be constrained by lack of access to near-term relevant information. In a paper titled Cross-Disciplinary Consultancy to Enhance Predictions of Asthma Exacerbation Risk' Margaret R. et al. focused on improving the response rate of public health officials to asthma exacerbations in Boston. This paper continues an initiative conducted

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by the International Society for Disease Surveillance with funding from the Defense Threat Reduction Agency to connect near-term analytical needs of public health practice with technical expertise from the global research community. The goal is to enhance investigation capabilities of day-to-day population health monitors (those who monitor population health and respond to significant public health issues on a daily basis). The unanimous consensus among the consultancy collaborators from the Boston Public Health Commission was that having access to near-term information from the technical experts was essential to improve the asthma monitoring capabilities of the field based professionals.

Due to the unpredictability of the occurrence of bio-terrorism attacks it is normal for policy makers to be concerned about the capacity of local public health to protect the public from attacks. While it is relevant to have a preparedness plan before the events it is particularly relevant to prepare for persons with special needs. In a paper titled "Medical Allocations to Persons with Special Needs During a Bioterrorism Event" Donald B. et al. compared the time it takes to dispense medications to two different cohorts comprising the general population and special needs people. The results showed that the service times at the dispensing stations were not statistically different between the general population cohort and those with any special needs. However, the time in between stations was increased resulting in longer total service time for the special needs individuals. Modeling of service times per station and cohort type found significant delays at the medical station among persons in the general population who are pregnant. The authors recommend that in order to expedite the dispensing process it is important to ensure the existence of memorandums of understanding for select agencies involved in providing services to those with special needs.

A recent study by the National Institute of Justice found that the elder population in USA is expected to double from the 2010 level of 35 million to approximately 70 million in 2030. Most family members are ill-equipped to take care of the elderly at home resulting in an increase in the number of the elderly institutionalized in nursing homes and elder care facilities. The Centers for Medicare and Medicaid Services (CMS) inspects these facilities in order to determine the quality of care and the presence of elder abuse. The CMS inspections are time consuming and labor intensive. In recent years social media and other organizations have developed online applications for reviewing physicians and healthcare facilities. In a paper titled "Assessing Quality of Care and Elder Abuse in Nursing Homes via Google Reviews" Jared M. et al. correlate Google reviews of nursing homes with the CMS inspection results. The study showed that as the number of online reviews increases the correlation coefficient between the CMS results and the Google ratings converge (0.65). This demonstrates that, in future, as the online reviews increase they will become a valuable source of information for judging the quality of care and the prevalence of elder abuse in nursing homes.

The movement from fee-for-service to value-based payment requires a deep understanding of data as a source of value creation. Providers have to treat data as a strategic asset than can be leveraged to support their operations and clinical practices. As data volumes and varieties keep increasing there is the need to employ analytic tools capable of quickly processing large quantities of data of various complexity, scope and scale in order to uncover patterns and value. Community health centers constitute the nation's largest source of primary care for the medically underserved populations and frequently have budget constraints. To generate additional revenue under the new payer models community health centers need to improve their capabilities to

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understand and leverage an important strategic asset, data. In a paper titled "Deployment of Analytics into the Healthcare Safety Net: Lessons Learned" Hartzband and Jacobs carried out a study to assist community health centers plan for strategic use of data using Hadoop and electronic health records applications. Numerous challenges and inconsistences were uncovered and more work is required to assist community health centers improve their awareness of data quality, integrate analytic results into practice, and optimize the value of data.

The movement towards patient-centered medical care is aimed at providing a comprehensive, team-based, coordinated, accessible, quality care to patients compared to the previous care models where, quite often, care stops at the point of discharge. The incentive payments for the meaningful use of certified electronic health records, and the implementation and use of health information technologies have facilitated the transition to patient-centered medical care and the adoption of the advanced features of electronic health records. Minnesota is one of the leaders in the technological and organizational transformation of the health care industry. In a paper titled "Health Reform in Minnesota" Soderberg et al. studied the association between health care home (HCH) certification and the adoption and use of the advanced functionalities of electronic health records in primary care clinics. The results showed that certified health care homes used the advanced features of electronic health records to support care management, care coordination, and quality improvement at higher rates than non-HCH clinics.

Secure exchange of health information among authorized stakeholders facilitates care coordination and improve efficiency, quality of care, and ultimately reduce costs. The electronic health record is a core component of the health information exchange system. Personal health record (PHR), the electronic application that provides individuals with the capability to access, manage, and share their health information in a private secure environment, still plays a minor role in the patient engagement process. While there is ample evidence that the use of PHRs enables individuals to be engaged in the treatment process its adoption has been constrained by socio-technical factors. The adoption of PHRs in developing countries has been investigated by only a few researchers. In a paper titled "Perceived Challenges for Adopting the Personal Health Record in the Ministry of National Guard Health Affairs" Al-Sahan and Saddick showed that education was the main barrier to adopting PHRs in Saudi Arabia. Patients with higher levels of education showed higher interest in using PHRs compared to those with minimal education. Educated individuals also expressed more concern for privacy and confidentiality compared to less educated individuals. The overwhelming majority (78%) were not aware of the existence of PHRs and other electronic health services on the website of the Ministry of National Guard Health Affairs.

In order to manage healthcare resources, assess the effectiveness of interventions, improve outcomes, or minimize disparities in health status between various populations one needs high quality and reliable data. Among indigenous populations demographic variable such as names (first, middle, last names) may not be consistently reported. Depending upon the circumstances the first name could become the last name resulting in an individual assuming multiple identities. It is important to create key identifiers in order to provide quality information on native or aboriginal populations. In a paper titled "Managing Aboriginal and Torres Strait Islander Data for Public Health Research" Gaans D. et al examined the structure of key identifying variables of Aboriginal and Torres Strait Islander Australians. The study demonstrated the necessity to improve the collection and management of key variables such as name, address and date of birth

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which usually assume multiple values, in order to improve the quality of health data needed for research and population health management.

Most hospitals and clinics have implemented electronic health record systems and health information exchanges to facilitate the documentation and sharing of health data in order to, among other benefits, improve the coordination of care and efficiency of the delivery system. Data retrieved from electronic health record systems have become valuable assets for the public health research community. In order to maintain faith in the data it is important to safeguard the privacy of the research participants and the security of the sensitive health information. In the commentary section Goldstein and Sarwate draw a clear distinction between privacy and security and introduce technologies for protecting the individual research participants.

I am sure you will enjoy reading the materials contained in this issue. Many thanks to the editors, the journal manager, the publishers, and all the reviewers and readers who have contributed to the success of this project.

Happy New Year!

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