

Delivering Healthcare Using Informatics

Informatics and Population Health

Introduction to Informatics and Population Health

Stop and think about the technologies you use regarding your health. Have you ever accessed your electronic medical record through a client portal? Have you taken an online survey about your health? Have you had an online consult with a healthcare provider? Have you used social media to gain information about a health concern or natural disaster? All of these are examples of how informatics plays a role in population health.

- Public Health Surveillance monitors the impact of control measures like vaccinations.
 - Public Health Informatics collects, compiles, and communicates vaccination information.
 - Epidemiology determines where diseases originate, the spread through populations, and possible preventive measures, but do not monitor vaccine use.
 - Public Health Laboratories perform tests to confirm disease diagnoses and conducts research and training. They do not monitor vaccine usage.
 - Prevention Effectiveness provides economic information for decision makers to assist them in selecting the best solutions when there is a disease outbreak.
 - The first step is identifying the problem. Informatics are used by surveillance systems to collect data about a health event.
 - The second step is identifying the cause. Informatics investigate factors, environmental or personal behaviors, that might make certain populations more susceptible to a health event.
 - The third step is looking at possible interventions. Data from the past help guide proposed interventions.
 - The fourth step is implementing the intervention. This takes a lot of collaboration between different agencies and informatics is key in communication.
 - Electronic health (eHealth) technologies can communicate through phones, mobile devices, and computers help clients receive timely consultations, appointments, and resources especially in remote areas and within vulnerable populations. eHealth technologies do not provide remote self-testing, data collection yearly, and prevent all outbreaks.
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Public and Population Health Informatics

Public health informatics is defined as “systematic application and science of the effective use of data, information, and knowledge to improve the health of individuals and communities”

(Association of State And Territorial Health Officials, n.d.). Informatics includes information technology but also includes the communication, governance, and legal policy issues involved in public health information. Public health leaders are responsible for good decision making provided they have the right information. Data collection, analysis, and dissemination of information drive quality decision-making in public health systems across states and territories. Regardless of their job title, public health professionals use informatics daily to improve population health and expand public health knowledge.

Informatics is also used in population health. Population health focuses on groups within the public that have certain characteristics such as conditions, economic status, or location.

- Data collection, analysis, and dissemination of information drive quality decision-making in public health systems across states and territories. However, analyzing how they would like to be educated would help the public health system's decision. Data about current food safety practices, surveying current knowledge, and just distributing pamphlets will not help decide how to educate the public.
 - Intervention evaluation includes examining data from the past help guide proposed interventions.
 - Surveillance systems to collect data about a current health event.
 - Risk factor identification is where informatics investigate factors, environmental or personal behaviors, that might make certain populations more susceptible to a health event.
 - Implementation is putting the solution into action.
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Public Health Core Sciences

Prevention Effectiveness

Provides economic information for decision makers to assist them in selecting the best solutions

Epidemiology

Determines where diseases originate, the spread through populations, and possible preventive measures

Public Health Laboratories

Performs tests to confirm disease diagnoses and conducts research and training

Public Health Informatics

Collects, compiles, and communicates health information

Public Health Surveillance

Monitors a public health situation

- Public Health **Surveillance** monitors a public health situation like influenza.
 - Public Health **Informatics** collects, compiles, and communicates that health information.
 - **Epidemiology** determines where diseases originate, the spread through populations, and possible preventive measures.
 - Public Health **Laboratories** perform tests to confirm disease diagnoses and conducts research and training.
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Public Health Surveillance

In 2014, the Centers for Disease Control and Prevention (CDC) developed strategies to improve public health data surveillance. Data is collected in four categories:

- Infectious disease
- Non-infectious health conditions
- All infectious and non-infectious diseases and health conditions
- Risk factors and exposures

The data is used to “inform policy changes, guide new program interventions, sharpen public communications, and help agencies assess research investments” (Centers for Disease Control and Prevention, 2018, para.1).

The electronic exchange of information between national, state, and local agencies is critical. Over 85% of all health data is electronic. However, the initiative is ever-changing. There is a greater need to connect globally and find solutions that promote efficiency.

Informatics, Health Disparities, and Health Equity

One of the primary goals of public health is to reduce health disparities. Health disparities are differences in health outcomes among groups of people. Health equity occurs when conditions are present where everyone has the chance to be as healthy as possible (Centers for Disease Control and Prevention [CDC], 2016). Differences in social factors such as education, housing, income, transportation and access to healthy foods can create health inequities. These inequities can be improved through community partnerships and changes to public health policy. Health informatics can be used to assess and understand disparities faced by some groups as well as provide more equitable healthcare.

Disaster Planning

Public health informatics is also used in disaster preparedness. It is considered one of the most useful systems during a natural disaster or a terrorist attack. It assists in population-level monitoring. Prior to 2004, surveillance was done by paper, e-mail, or fax. In 2004, the Centers for Disease Control and Prevention, along with the Department of Health and Human Services, received funding for the Public Health Information Network (Aziz, 2017). This was the beginning of a worldwide digital database. This database includes real time outbreak detection systems as well as a geographic information system called HealthMap. These improve identifying, monitoring, and responding to emerging disasters at a global level.

Social media can also play a large role in disaster data collection and communication. In recent years, Twitter and Facebook have been used to disseminate relief information, disaster warnings, and weather alerts (Hassan, 2017). Citizens can use social media to mark that they are safe and facilitate the search for the missing. Authorities can use social media to track potential terror threats. Social media can also provide a communication platform between citizens and authorities. Overall, there is a positive attitude towards the use of social media in disaster events and an increase in social media use by organizations. However, there is an issue with validating accuracy of information. As social media use continues to grow, work needs to be done on usage guidelines.

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- Social media can improve response to mass disasters by helping responders locate people who need help, provide information pre-or post-disaster, and promote community resources post-disaster. The accuracy of social media information and education is an issue since it is difficult to validate.
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Patient Centered Care and Informatics

Informatics used to meet the needs of patient centered care are called electronic health (eHealth) technologies. These can include electronic records that health care providers use to communicate between themselves and with clients. Most electronic records have a provider and client portal. Client portals allow clients to monitor and retrieve their health information. There are also many self-monitoring mobile apps and devices that help clients manage current conditions.

Communication through phones, mobile devices, and computers help clients receive timely consultations, appointments, and resources. eHealth technologies help clients track preventive measures such as activities and medications. Overall, the advances in eHealth technologies have helped improve access and quality of healthcare especially in remote areas and within vulnerable populations.

Electronic health (eHealth) technologies includes four aspects.

- Mobile and wired communication, advice, and education
 - Health care provider-client consultation via telehealth
 - Clinic appointments