



Introduction to Public Health Informatics and their Applications

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We Protect Lives.

Learning Objectives

By the end of this presentation, participants will be able to

- Describe the importance of informatics to the PH mission
- Relate how PH informatics could help with chronic disease prevention and management
- Describe some applications of PH Informatics

Origins of 'Informatics'

- In 1957, the German computer scientist Karl Steinbuch coined the word *Informatik* by publishing a paper called *Informatik: Automatische Informationsverarbeitung* ("Informatics: Automatic Information Processing")
- 1962 France, Phillipe Dreyfus, a French information system/software pioneer — combination of “information” and “automatic”

Health Informatics



Is the linkage of information technology, communications and healthcare to improve the quality and safety of patient care.

Public Health Informatics

The application of informatics in areas of public health, including

- Surveillance
- Prevention
- Preparedness
- Health promotion

Public Health Core Sciences



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Basic Ingredients to the PH Informatics

- Vision and system planning
- Health data standards and integration
- Data Privacy
- Systems design and implementation



Data, Information, Knowledge, Wisdom (DIKW)

- **Data:** unorganized and unprocessed facts; static; a set of discrete facts about events
 - No meaning attached to it as a result of which it may have multiple meanings
 - Example: what does “Alex” mean?
 - **Information:** aggregation of data that makes decision making easier
 - Meaning is attached and contextualized
 - Answers questions: what, who, when, where)
- (Zins, 2007)

DIKW (continued)

- **Knowledge:** includes facts about real world entities and the relationship between them

It is an understanding gained through experience

Answers the 'how' question

(Zins, 2007)

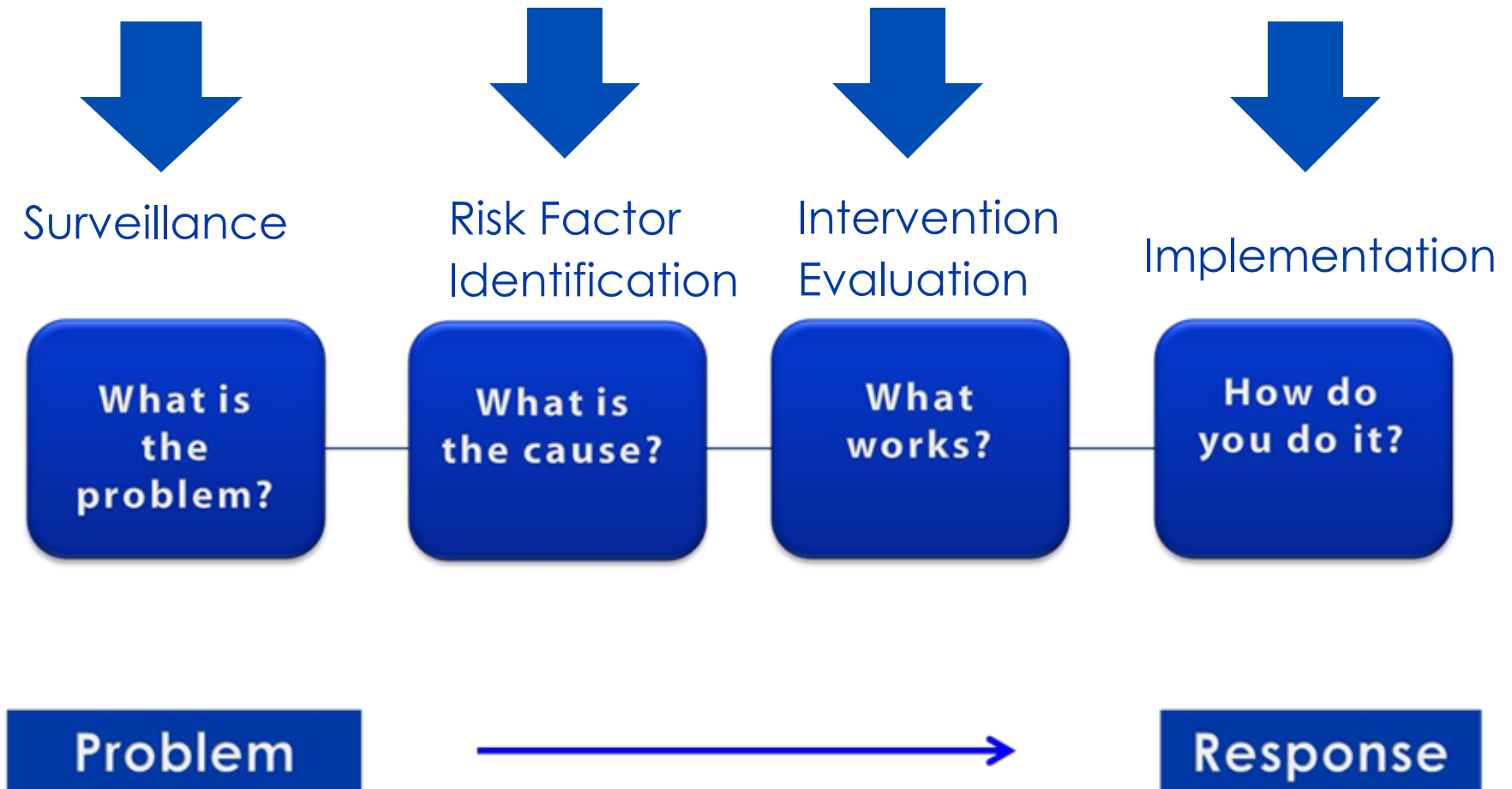
- **Wisdom:** are embodies principles, insight and moral by integrating knowledge. Knowledge Answers 'why' questions.

Why PH Informatics?

- Provides **information** to make decisions that leads to better

health outcomes of the population

Public Health Approach



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National Background

A number of health IT legislations have passed to

- Protect patients privacy and security
- Improve health outcomes
- Drive down the cost of health care

National Background

- 1996 - Health Insurance Portability and Accountability Act
- 2004 – President Bush signed an executive order calling for the implementation of interoperable electronic health records in 10 years „
- 2006-2007 – The U.S. DHHS advocates that value-driven health care encompasses health information technology, health care price and quality transparency, and quality and efficiency improvement „
- 2009 –Health Information Technology for Economic and Clinical Health Act (HITECH)
- 2010-Affordable Care Act

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The HITCH Act - Purpose

Encourage the adoption and use of certified electronic health record (EHR) technology by the States to: ...

- Improve health care outcomes ...
- Improve care ...
- Ensure quality ...
- Permit greater access to care ...
- Reduce costs „

Electronic Medical Records (EMR)

- The 2003 IOM Patient Safety Report describes an EMR as encompassing:
 - “A longitudinal collection of electronic health information for and about persons
 - Electronic access to person- and population-level information by authorized users
 - Provision of knowledge and decision-support systems [that enhance the quality, safety, and efficiency of patient care] and
 - Support for efficient processes for health care delivery”

(IOM, 2003)

Two pieces to the HITECH-Act

- Office of the National Coordinator (ONC)- Provides certification to ensure that health IT conforms to the standards and certification criteria adopted by the Secretary of Health and Human Services
- Under ONC advisement, CMS created '**Meaningful Use**' (MU) to provide financial incentives program to eligible health care providers

Meaningful Use

Meaningful use is using certified electronic health record (EHR) technology to:

- Improve quality, safety, efficiency, and reduce health disparities
- Engage patients and family
- Improve care coordination
- Maintain privacy and security of patient health information

MU – Ultimate Outcomes

- Better clinical outcomes
- Improved population health outcomes
- Increased transparency and efficiency
- Empowered individuals
- More robust research data on health systems

3 Stages of MU

- Stage 1 – Data capture and sharing (2011-2012)
- Stage 2 – Advanced clinical processes (2014)
- Stage 3 – Improved outcome (2016)

MU in PH

Public Health Objective @ Stage 2	Eligible Professionals	Eligible Hospitals/ Critical Access Hospitals
Immunization	Core	Core
Reportable laboratory results	-	Core
Syndromic surveillance	Menu	Core
Cancer Registry	Menu	-
Specialized registry	Menu	-

PH Informatics is Critical to PH Mission

Improve PH Reporting & Surveillance

- Syndromic surveillance data submission
- Immunization registries
- Electronic laboratory reporting
- Ambulatory care cancer reporting

Advancing Health Equity

- EHR have the potential to capture social determinants of health to bring in-depth understanding of the factors affecting health and well-being
- IOM, WHO, DHHS studies have recommended the inclusion of 11 determinants of health in EHR

Advancing Health Equity

- Race/Ethnicity
- Education
- Financial constraint
- Stress
- Depression
- Physical activity
- Tobacco use and exposure
- Alcohol use
- Social connections and isolation
- Exposure to violence: intimate partner violence
- Neighborhood and community composition

Population Health Management

- **Population Health Management** is the aggregation of patient data across multiple **health** information technology resources, the analysis of that data into a single, actionable patient record, and the actions through which care providers can improve both clinical and financial outcomes

Population Health Management

3 Elements of Population health management

- The **primary care physician** in a patient's treatment.
- **Care coordination**, and in some cases intensive care management by specially trained nurses for complex patients.
- Increased involvement by **patients themselves**

Population Health Management

- Generally uses BI tool to aggregate data to provide comprehensive clinical picture of patients
- Helps providers and administrators to improve efficiency and patient care
- Better health outcomes
- Preventing diseases
- Closing care gaps
- Cost savings for providers

Questions?