May 14, 2024

RAID Informatics & Data Science

Washington County Public Health

Healthy People, Thriving Communities

About Me & Informatics

Ryan Ames
Informatics Supervisor
RAID

Background

- As a Researcher
- As a Data Scientist
- At Washington County

Public Health 101 Series

Introduction to Public Health Informatics

Session Topics

Public Health Informatics

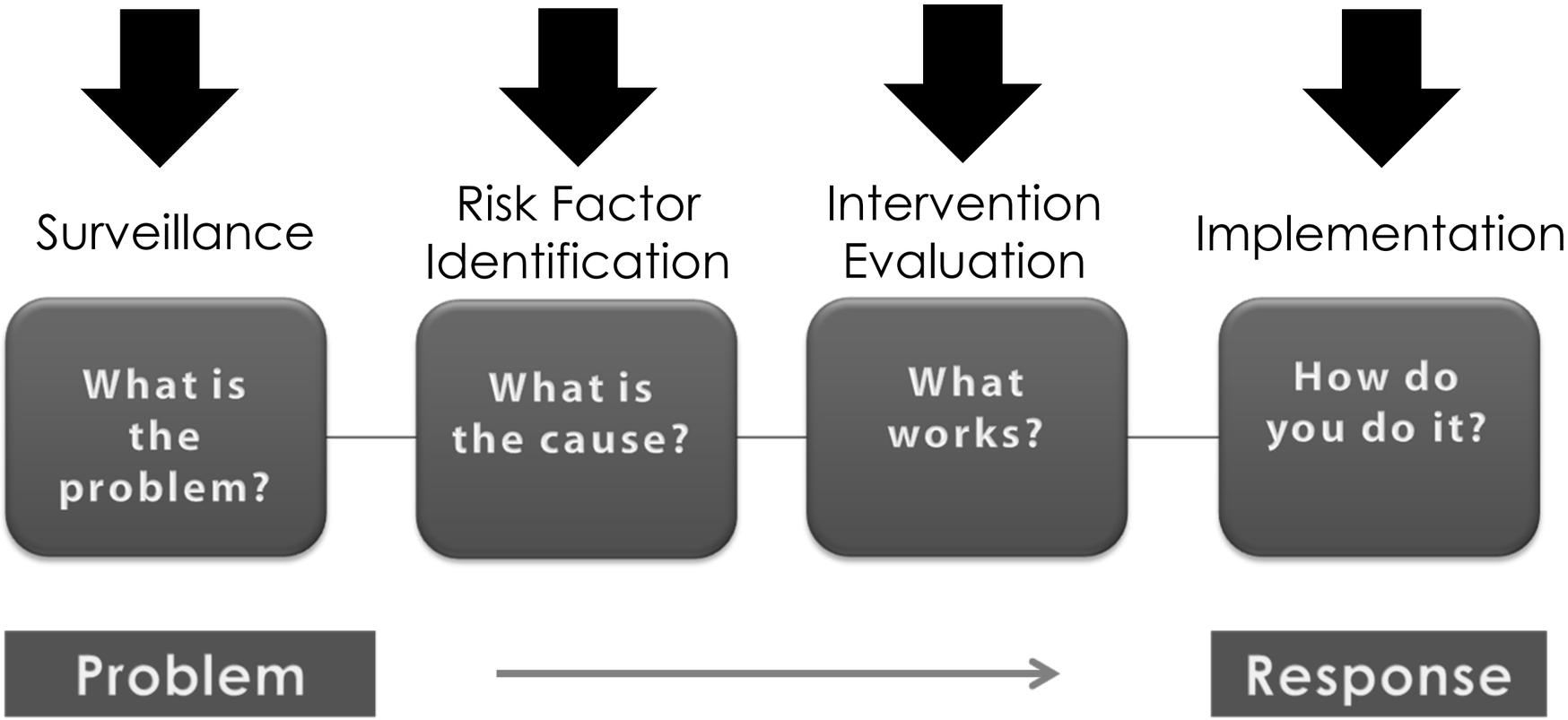
1. A Public Health Approach
2. Public Health Informatics Definition, Components, and Functions
3. Creating a Public Health Information System
4. Informatics and data science

Learning Objectives

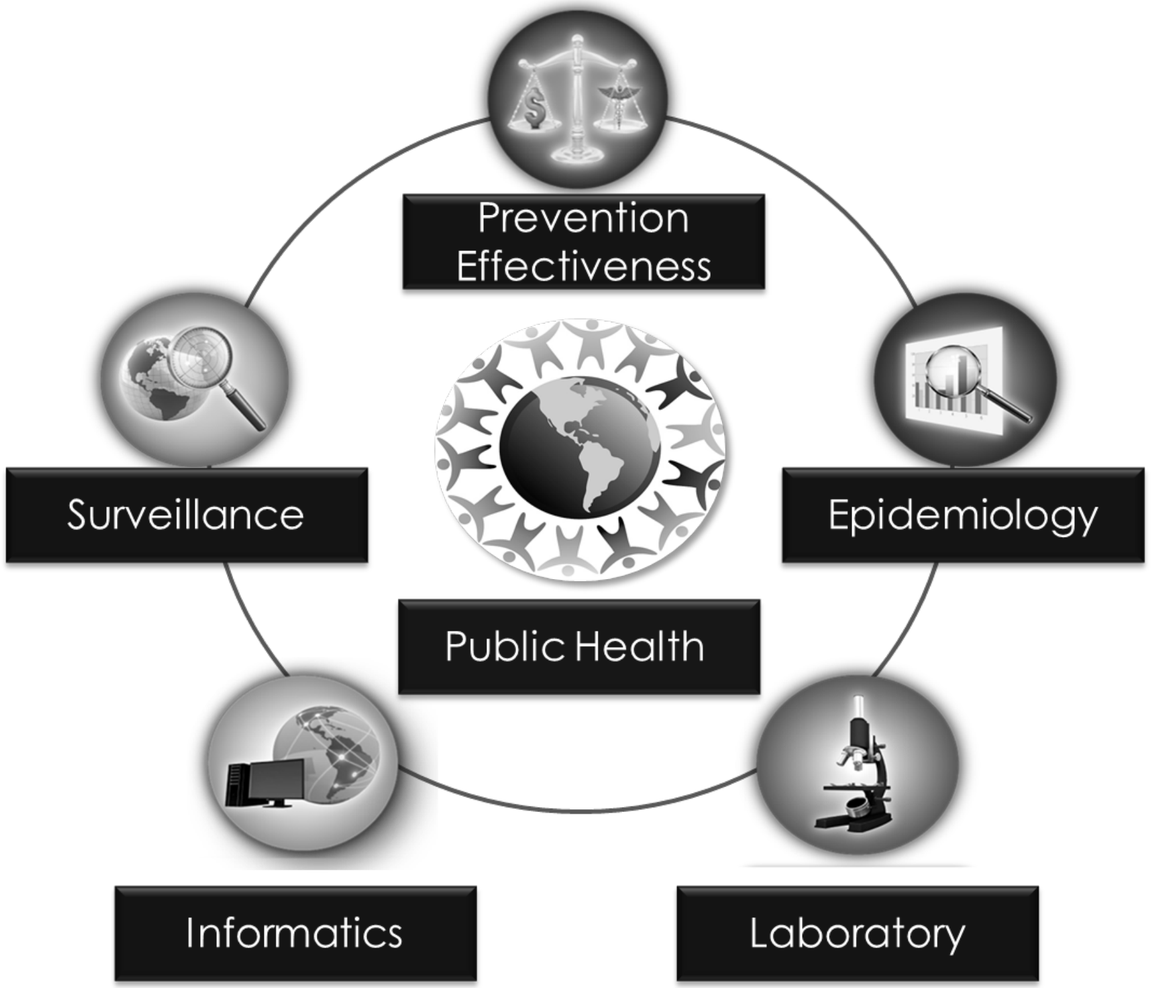
After this, you will be able to

- Explain the importance of informatics to the public health mission
- Describe the role of the informatician in public health practice
- Differentiate between public health informatics and information technology

A Public Health Approach



Public Health Core Sciences



Public Health Informatics — Defined

Public health informatics is the systematic application of information, computer science, and technology to public health practice, research, and learning.

Yasnoff WA, O'Carroll PW, Koo D, Linkins RW, Kilbourne EM. Public health informatics: improving and transforming public health in the information age. J Public Health Manag Pract 2000;6:67–75.
Riegelman R, ed. Public health 101: healthy people—healthy populations. Sudbury, MA: Jones & Bartlett Learning; 2010: 40.

Building Your Public Health Information System

Programmer

Database Administrator

Network Administrator

Web Designer

Security Specialist

The Role of the **Informatician** in Public Health

- Plans, designs, and defines functional requirements for public health information systems
- Evaluates the application and impact of information systems in support of health goals
- Serves as a liaison between multidisciplinary teams
- Uses data standards to support interoperability of data between systems
- Ensures confidentiality, security, and integrity standards
- Is knowledgeable about health data standards, sources, and meaningful use of health data

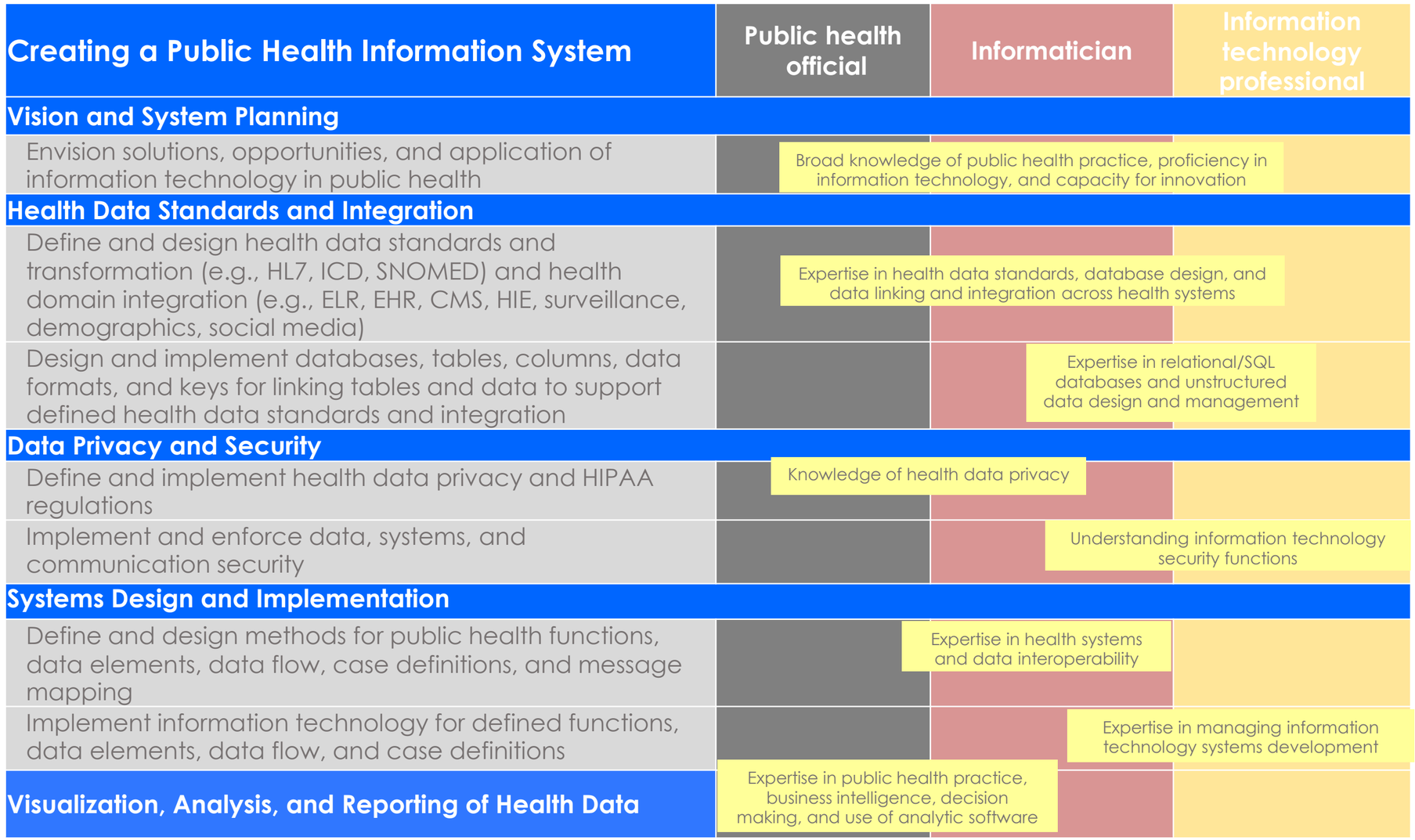
Centers for Disease Control and Prevention (CDC). Public health informatics competencies. Atlanta, GA: US Department of Health and Human Services, CDC; 2009. http://www.cdc.gov/informaticscompetencies/.

The Role of the **Information Technologist (IT)** in Public Health

- Plans technology projects and milestones, develops software, and maintains and operates systems
- Evaluates the performance and availability of information systems
- Designs, implements, and administers database architecture, privacy, security, and backup procedures

Centers for Disease Control and Prevention (CDC). Public health informatics competencies. Atlanta, GA: US Department of Health and Human Services, CDC; 2009. http://www.cdc.gov/informaticscompetencies/.

Creating a Public Health Information System



CMS = Centers for Medicare and Medicaid Services; EHR = electronic health record; ELR = electronic laboratory record; HIE = health information exchange; HIPAA = Health Insurance Portability and Accountability Act; HL7 = Health Level 7; ICD = *International Classification of Diseases*; SNOMED = Systematized Nomenclature of Human Medicine; SQL = structured query language.

Vision and System Planning

Hardware

Software

Communication
Technology

Health Data Standards and Integration

Health data standards and integration are required when defining the data.

Centers for Disease Control and Prevention (CDC). Meaningful use—introduction. Atlanta, GA: US Department of Health and Human Services, CDC; 2012. http://www.cdc.gov/ehrmeaningfuluse/introduction.html.

Data Privacy and Security

Data privacy and security must be identified, prescribed, and implemented throughout the data lifecycle.

Systems Design and Implementation

- Define or design methods for public health functions, data elements, data flow, case definitions, and message mapping
- Implement information technology for defined public health functions, data elements, data flow, case definition, and similar needs

Visualization, Analysis, and Reporting of Health Data

Visualization and implementation of the required analysis, reporting, and meaningful use of the data collected and managed by the system.

Informatics & Data Science

- **Informatics** is sometimes called the science of information.
- **Data science** is the field of math, statistics, AI, and machine learning that specializes in analyzing and uncovering insights hidden in data.
- Data science analyzes the data, and informatics applies the information gathered from that analysis.
- The two ought to be essential parts of the larger Public Health Information System

Research Analytics Informatics and Data (RAID)

The Epidemiologists

Paneen Petersen, CD Epi

Catherine Desmarais, CD Epi

Jonathan Geertsen, CD Epi

Alyssa Mooney, EMS Epi

Molly Mew, MCH Epi

Chandra Greenberg, Community Epi

Lauralee Fernandez, EH/PHEP Epi

The Analysts

Blanca Perez, Data Analyst

Lily Ramsay, Data Analyst

Evelyn Quarshie, Data Analyst

Allina Cannady, Data Analyst

Kevin Jian, Informatics Specialist

The Supervisors

Kathleen Rees, Epi Supervisor

Carrie Shuler, Epi Supervisor

Ryan Ames, Informatics Supervisor

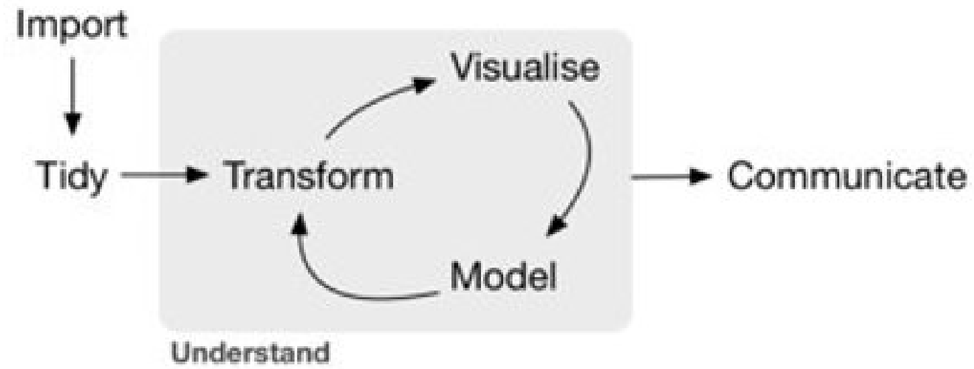
Kimberly Repp, Epi Supervisor

Building a Data Science Team

- Hire diverse analytic skills and experiences
  - Public health, statistics, programming, visualization
- Develop standards of practice
  - Versioning (github)
  - Code style guide (tidyverse)
  - Code reviews (Pull requests)
  - Project and report templates (RAID Template)

Data Science Practices

- Project lifecycles
  - From ingestion to end product(s)
  - Data architecture, confidentiality, transformation, and utilization
- Analytic data pipelines
- Automation
- Repeatability
- Scale



Informatics at WashCo

- Public Health Modernization
  - Coordination with CHIP/CHNA updates
  - Internal and external data indicators and visualizations

- Regional datamart
  - Communicable disease analytic data curation and data quality assurance
  - System improvements and maintenance

- EPIC
  - Expanded use of our data supporting harm reduction, infectious disease, and maternal child health
  - Building analytic data pipelines and reporting infrastructure

In Development

- Supporting programmatic data needs from design to delivery of data products
- Metopio
  - Public Health data for external facing audiences
- Posit (Connect, Workbench)
  - Centralized automation of data products
  - Processing power for data resource-intensive actions and model deployment
  - Interactive application and database development
- R Package development
- Additional technical trainings with Epidemiologists and Analysts
- ePublic Health & Informatics Workgroup (NACCHO)

Public Health Division
www.washingtoncountyor.gov