Public Health 101 Series

Introduction to Public Health Informatics

Instructor name
Title
Organization

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Course Topics

Introduction to Public Health Informatics

1. A Public Health Approach
2. Public Health Informatics Definition, Components, and Functions
3. Creating a Public Health Information System
4. At the Intersection of the Informatician, the Public Health Official, and the Information Technologist
Learning Objectives

After this course, 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
Topic 1
A Public Health Approach
A Public Health Approach

Surveillance

Risk Factor Identification

Intervention Evaluation

Implementation

Problem

What is the problem?

What is the cause?

What works?

How do you do it?

Response
Public Health Core Sciences

Prevention Effectiveness

Surveillance

Epidemiology

Public Health

Informatics

Laboratory
Topic 2
Public Health Informatics Definition, Components, and Functions
The Public Health Mission

CDC provides crucial scientific information that protects our nation against dangerous and costly health threats.
Public Health Informatics — Defined

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

Building Your Dream Home

- Developer/Architect
- Electrician
- Framer
- Brick Layer
- Plumber
- Painter
Building Your Public Health Information System

Programmer

Database Administrator

Informatician

Network Administrator

Web Designer

Security Specialist
A tuberculosis outbreak has occurred in 10 states across the country. To increase knowledge of the health threat, CDC uses computer science, technology, and applied information methods that will inform the nation’s population about important _________________.

A. research

B. health information

C. security measures
Informatics uses public health knowledge to

A. broaden the public health knowledge base through learning

B. improve population health in daily practice

C. further knowledge in public health research

D. all of the above
Topic 3
Creating a Public Health Information System
The Informatician

- Envisions innovative scenarios
- Understands ideas
- Understands capabilities, opportunities, and limitations

Security  Data Standards  Policy
## Creating a Public Health Information System

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<th>Step 1 — Vision and System Planning</th>
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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.
Step 1 — Vision and System Planning

- Hardware
- Software
- Communication Technology
Step 2 — Health Data Standards and Integration

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

Step 3 — Data Privacy and Security

Data privacy and security must be identified, prescribed, and implemented throughout the data lifecycle.
Step 4 — 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 and implementation of the required analysis, reporting, and meaningful use of the data collected and managed by the system.
Informatics in Action — CDC’s FluView

A clear-cut way to share national influenza data was needed by

- the public health community,
- clinicians,
- scientists, and
- the general public
Knowledge Check

On the basis of what you have learned about creating a public health information system, which of the following does an informatician consider first when identifying technologies to use for sharing national malaria data?

A. Health data standards and integration
B. Vision and systems planning
C. System design and implementation

B. Vision and systems planning
Informatics is used to create a program such as CDC’s FluView. Which of the following three disciplines must work together to visually represent the data in an effective method?

A. Computer science, epidemiology, and public health

B. Technology, computer science, and applied information methods

C. Technology, surveillance systems, and epidemiology

The correct answer is B.
Topic 4
At the Intersection of the Informatician, the Public Health Official, and the Information Technologist
# Common Knowledge and Skills

## Creating a Public Health Information System

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## Step 2 — Health Data Standards and Integration

| Define and design health data standards and transformation (e.g., HL7, ICD, SNOMED) and health domain integration (e.g., ELR, EHR, CMS, HIE, surveillance, demographics, social media) | Expertise in health data standards, database design, and data linking and integration across health systems |
| Design and implement databases, tables, columns, data formats, and keys for linking tables and data to support defined health data standards and integration | Expertise in relational/SQL databases and unstructured data design and management |

## Step 3 — Data Privacy and Security

| Define and implement health data privacy and HIPAA regulations | Knowledge of health data privacy |
| Implement and enforce data, systems, and communication security | Understanding information technology security functions |

## Step 4 — Systems Design and Implementation

| Define and design methods for public health functions, data elements, data flow, case definitions, and message mapping | Expertise in health systems and data interoperability |
| Implement information technology for defined functions, data elements, data flow, and case definitions | Expertise in managing information technology systems development |

## Step 5 — Visualization, Analysis, and Reporting of Health Data

| Expertise in public health practice, business intelligence, decision making, and use of analytic software |

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## Step 4 — Creating a Public Health Information System

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Combined Disciplines — The Informatician and the Information Technologist
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

The Role of the Information Technologist 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

One of the United Nations’ Millennium Development Goals is to substantially reduce infant mortality worldwide. A system has been developed that will display the data and track the progress of attaining this goal.

Which of the following professionals works with health data standards and sources and ensures the integrity and security of the standards?

A. The information technologist

B. The informatician

✓ B. The informatician
Knowledge Check

Which of the following is NOT a function of a public health informatician?

A. Uses data standards to support interoperability of data between systems

B. Ensures confidentiality, security, and integrity standards

C. Designs, implements, and administers database architecture, privacy, security, and backup procedures

D. Is knowledgeable about health data standards, sources, and meaningful use of health data
Learning Objectives

During this course, you learned 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
QUESTIONS?
Resources and Additional Reading


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