# Application of computer in public health fields

# A **computer**

- A **computer** is an electronic device that can store, retrieve, and process data, perform calculation; and present results based on a program given to it by a programmer.

(Tiamson, 2006)

# Advantages of Computers

- Storage of information
- Quick data processing
- Audio-visual aids
- Better presentation of information
- Access to the Internet
- Quick communication between students, teachers and parents

# *Use of computer in different fields*

- Business.
- Medical.
- Banking sector.
- Education.
- Service sector.
- Defense.
- Engineering and Robotics.
- Entertainment.

# *MEDICAL*

- Research :-Used in different pharmaceutical companies.
- Hospitals :- Mainly computer is used for keeping the record of patients.

  Inventory of medicines.

  Surgeries.
- Diagnosis :-

  CT scan.

  Ultra-sound.

  Blood test.

  Electro-cardio gram.

# *EDUCATION*

- Higher education :- All the universities and colleges are furnished with computer labs.
- Online education :- This can done with the help of computer and internet.
- Self-Learning.
- Faculty usage.
- School library.
- Used to generate letters and documents.

# What is Information?

- “Information is data that has been processed into a form that is meaningful to the recipient”

  (Davis & Olson, 1985)

- What is the DIKW hierarchy?

# 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.

# What is Health Informatics?

- "The intersection of information science, computer science, and health care"

  (Wikipedia)

- Deals with the resources, devices, and methods required to optimize the acquisition, storage, retrieval, and use of information in health and biomedicine

- The tools include computers, clinical guidelines, formal medical terminologies, and information and communication systems

# Public Health Informatics

- "the systematic application of information and computer science and technology to public health practice, research and learning"
- **Activities may include:**
  - Collection and storage of vital statistics
  - Collection and reporting of communicable diseases
  - Disease surveillance
  - Display disease statistics and trends
  - Immunization
  - Hospital statistics (O'Carroll et al., 2002*J*

# Public Health informatics

Introduction to Public Health Informatics

# 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

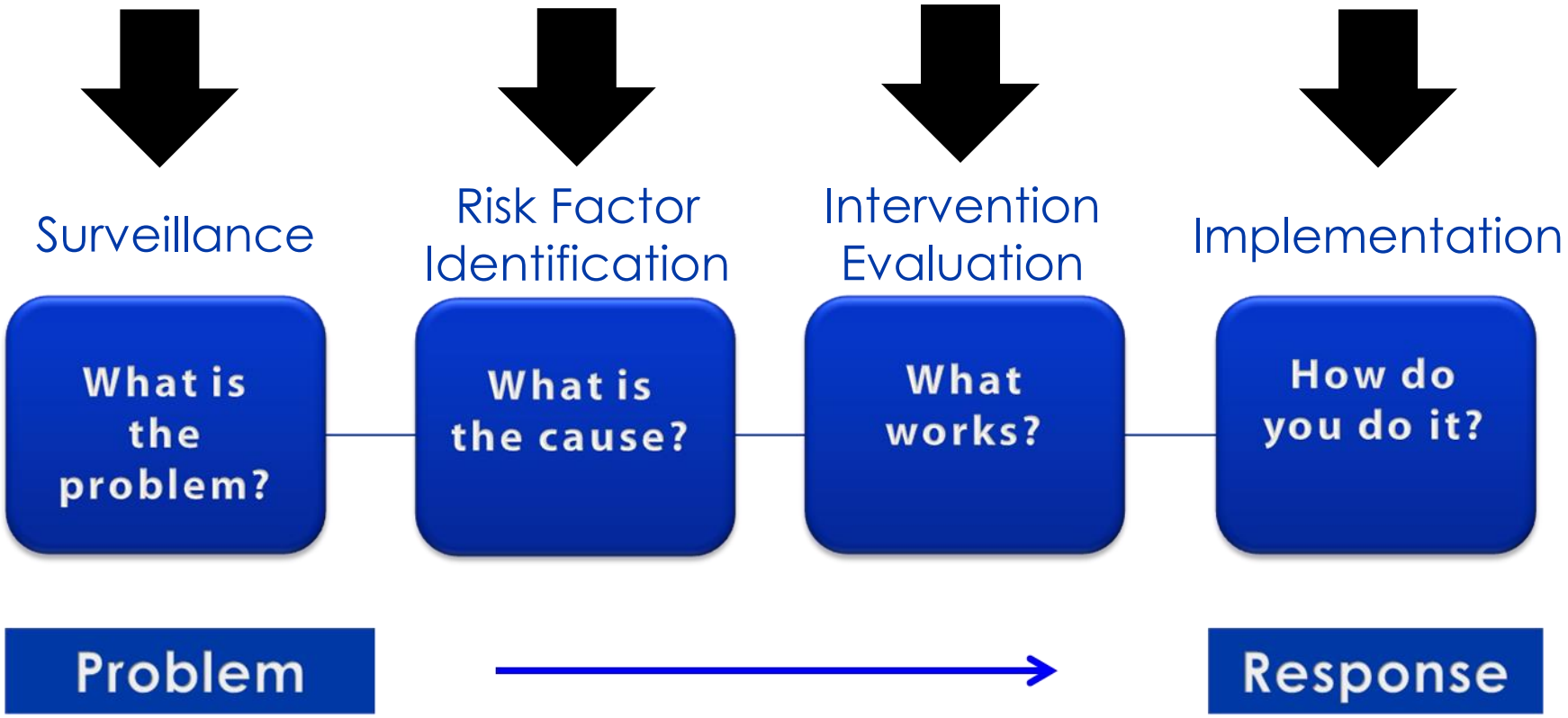
# Learning Objectives

After this lectures, students 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



# Public Health Core Sciences

# Topic 2

# Public Health Informatics Definition, Components, and Functions

# The Public Health Mission

**Public Health Mission** 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

Electrician


Brick Layer

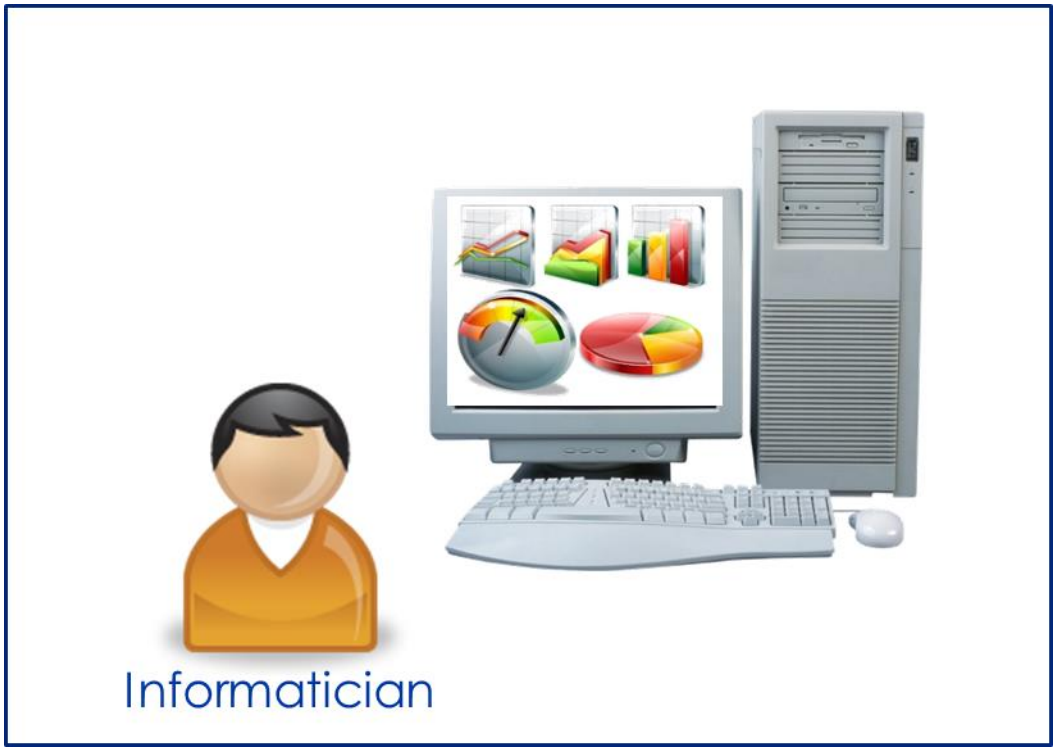
Framer

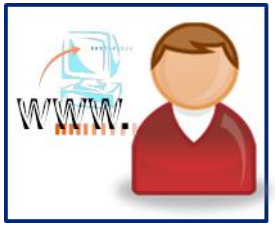
Plumber

Painter

# Building Your Public Health Information System

Programmer




Web Designer

Database Administrator

Network Administrator

Security Specialist

# Knowledge Check

A tuberculosis outbreak has occurred in 3 localities across the country. To increase knowledge of the health threat, uses computer science, technology, and applied information methods that will inform the nation's population about important _____.

research .A

✓ health information .B

security measures .C

# Knowledge Check

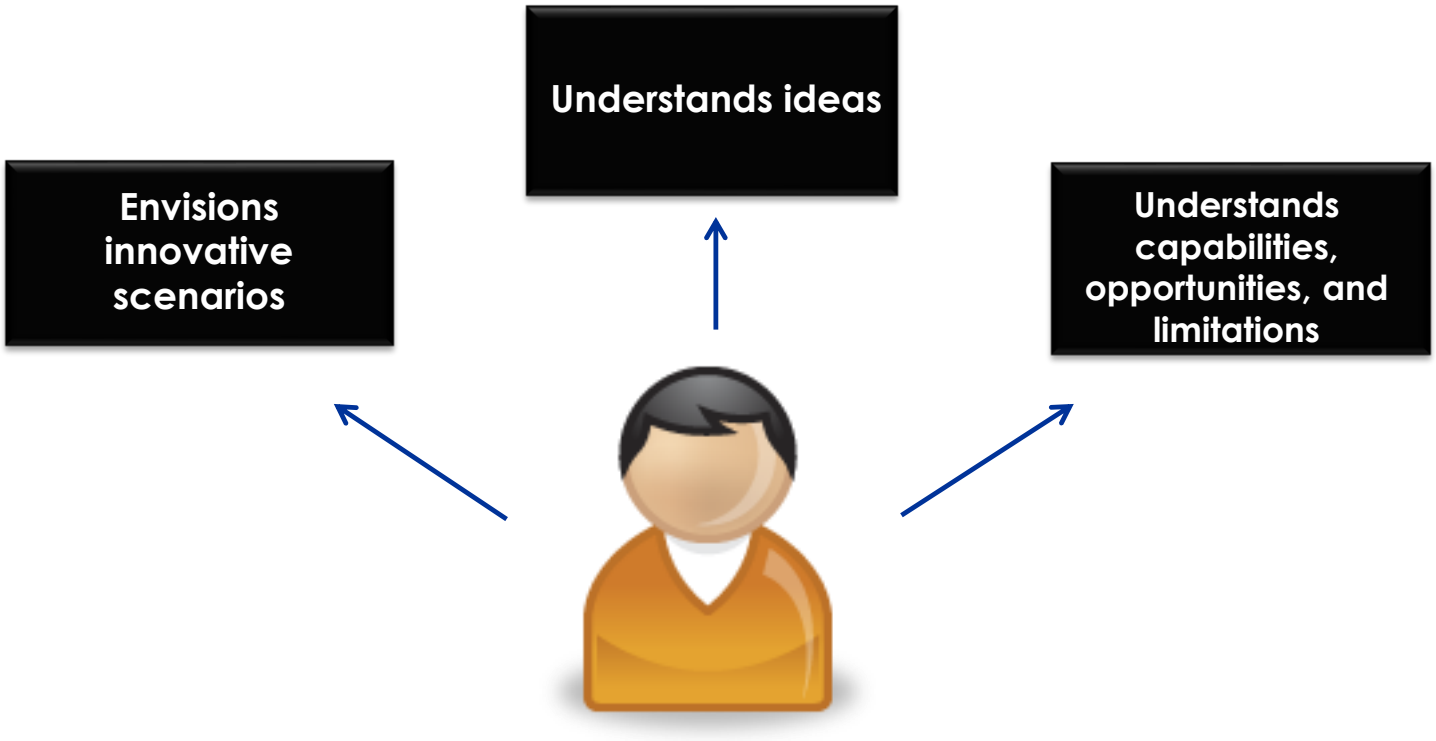
Informatics uses public health knowledge to

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




Security

Data Standards

Policy

# 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

# Step 5 — 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 in Action

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

# Knowledge Check

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?

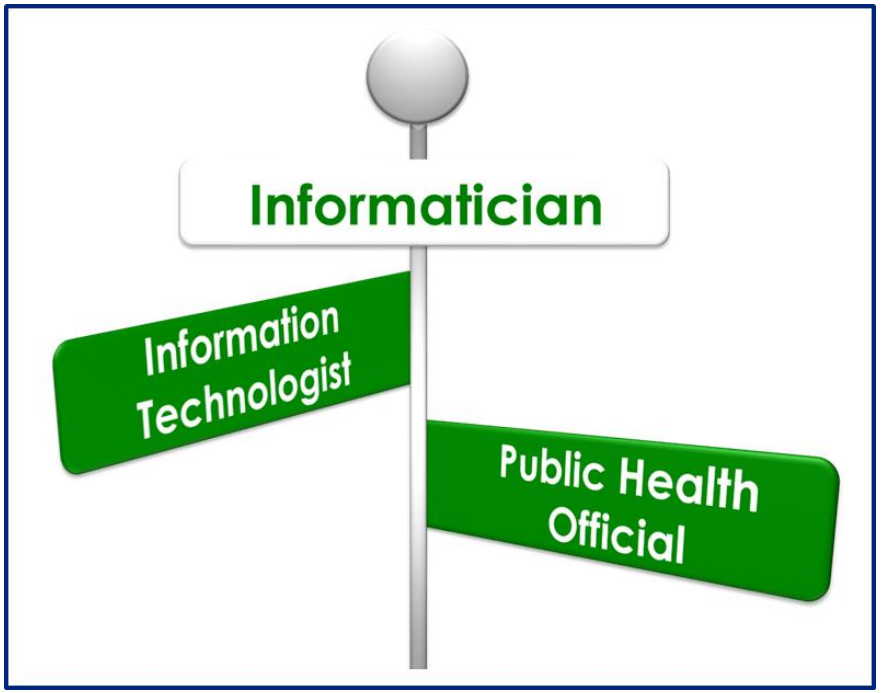
A. Computer science, epidemiology, and public health

✓ B. Technology, computer science, and applied information methods

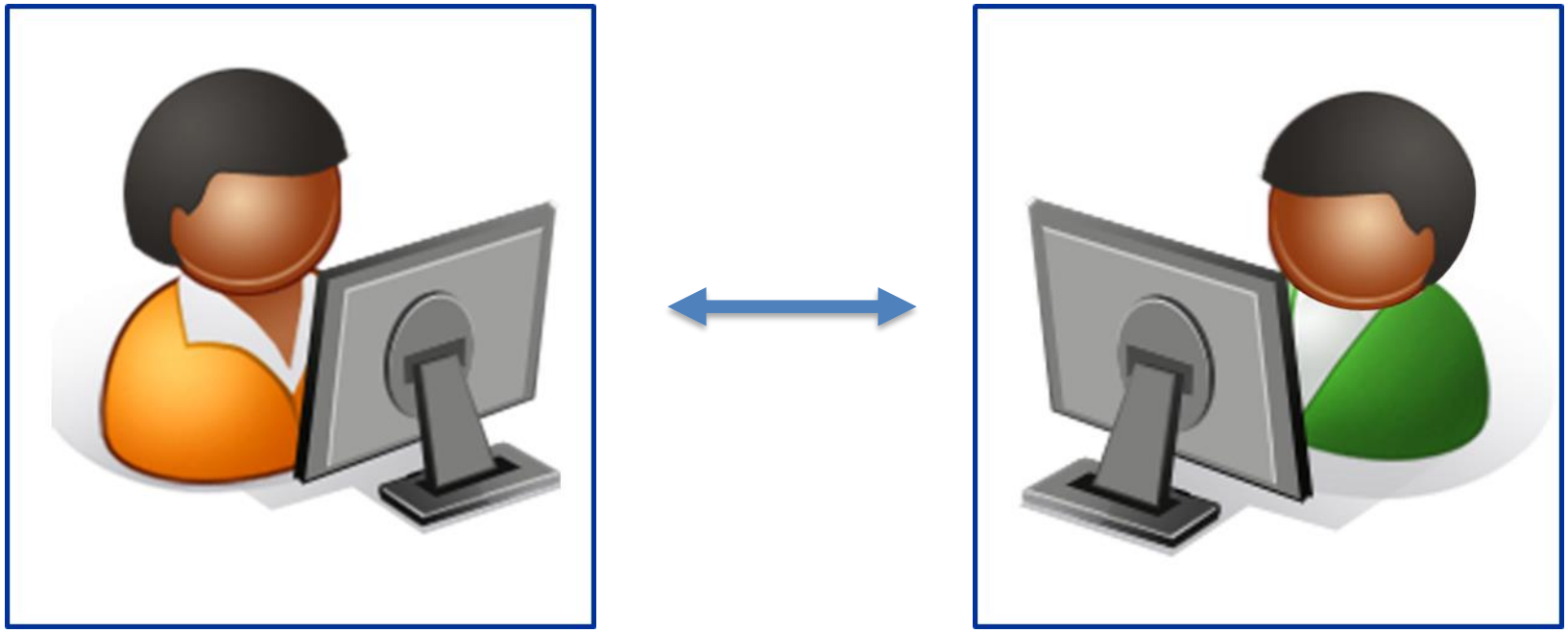
C. Technology, surveillance systems, and epidemiology

# Topic 4

## At the Intersection of the Informatician, the Public Health Official, and the Information Technologist



# 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

# Knowledge Check

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?

# 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