Session 2: Healthcare Associated Infections (HAIs) Surveillance

Objectives

By the end of this module, participants should be able to:

- Define and describe surveillance as a method to determine the prevalence and incidence of a disease
- Discuss the role of surveillance in IPC
- List the characteristics of successful HAI surveillance programs
- Describe Key HAIs frequency measures

Introduction

- HAI are infections people get during the process of receiving care in a hospital or other health care facility which are not present or incubating at the time of a patient's admission to a health care setting

HI Surveillance

- surveillance is the ongoing, systematic collection, analysis, interpretation and dissemination of health data (e.g., HAI) to help guide clinical and public health decision-making and action (i.e., information for action).

Purpose of HAI surveillance

- To provide data on HAI occurrence for decision-making, policy and research.
- It helps describe microbiological profiles of pathogens causing HAI, and, depending on most frequent infections,
- It provides critical information to plan and tailor IPC interventions.

Definition of Surveillance

- The ongoing, systematic collection, analysis, and interpretation of health data essential to the planning, implementation, and evaluation of public health practice, closely integrated with the timely dissemination of these data to those who need to know.” CDC
- **If you don’t measure it, you cannot improve it” ~ Lord Kelvin**

Components of a Strong Surveillance Program (Cont.)

- **Ongoing**
  - continuous collection, analysis and interpretation of data
- **Systematic**
  - Done according to an agreed set of methods or organized plan.
- **Collection**
  - Process of gathering information/data. Information on both numerator and denominator data should be collected for the calculation of rates.
- **Analysis**
  - Process of considering something carefully or using statistical methods in order to understand or explain it
- **Interpretation**
  - Explanation of the meaning of the surveillance data collected
- **Dissemination**
  - Spread information, knowledge, opinions widely through a structured manner
- **Action**
  - Activities that you need to make to successfully intervene to curb & control the spread of HAIs

Types of HAI Surveillance

- **Passive**

Passive Surveillance Passive surveillance occurs when local and state health departments rely on health care providers or laboratories to re-port cases of disease. The primary advantage of passive surveillance is its efficiency: it is simple and requires relatively few resources.

The majority of public health surveillance systems are passive because it is cost effective.

Cont.

- **Active Surveillance**

Active surveillance occurs when the health department contacts or visit health care providers or laboratories searching or requesting information about conditions or diseases to identify possible cases.

This method requires more resources than passive surveillance, but is especially useful when it is important to identify all cases.

HAI surveillance Priority Areas

- Ventilator-associated pneumonia (VAP)
  - High mortality rate
- Surgical site infections (SSIs)
  - Extra-hospital days and cost
- Central (intravascular line) bloodstream infections (CLABSIs)
  - High mortality rate
- Catheter associated urinary tract infections (CAUTIs)
  - Most common
- Multiple drug-resistant organisms (MDROs e.g., MRSA)

Considerations for HAIs surveillance systems

- All types of surveillance are expensive and time-consuming thus Identification of resources and focus on high-risk units or infections is critical. Personnel involved in surveillance must be trained.

Definitions and Objectives:

- Essential that definitions and objectives of surveillance must be agreed with the clinical team. Some surveillance activity should occur for the rest of the hospital on a rotating basis (laboratory-based or repeated prevalence studies.

Considerations for HAIs surveillance systems

- **Cost & Time**: All types of surveillance are expensive and time-consuming
  - Identify resources and focus on high-risk units or infections
- **Definitions and Objectives**: Essential that definitions and objectives of surveillance must be agreed with the clinical team
  - Some surveillance activity should occur for the rest of the hospital on a rotating basis (laboratory-based or repeated prevalence studies
- **Training**: Personnel involved in surveillance must be trained

Characteristics of a Successful Surveillance Program

- Targeted
  - Infection prevention
  - Performance improvement
  - Patient safety
  - Public health activities
- Engages in mandatory and public reporting

Characteristics of a Successful Surveillance Program

- Able to identify risk factors for infection
  - Adverse events
  - Outbreaks
  - Emerging infectious diseases
  - Antibiotic-resistant organisms
  - Bioterrorist events
- Implements control or risk-reduction measures
- Monitors the effectiveness of intervention

HAI Surveillance Challenges

- Complex and time consuming of case definitions
- Limited laboratory capacity
- Lack of data source and shortage of competent surveillance staff.

HAI frequency measures:

Rate

Is an expression of the frequency with which an event occurs in a defined population.

- **Numerator**
  - Number of HAIs identified
- **Denominator**
  - **P**opulation at risk within a defined timeline

HAI frequency measures…cont

- **Example Rate**

$$\text{rate of infection} = K \times \frac{\text{the number of infections}}{\text{the number of those in a population that are at risk of infection}}$$

Example:
10/100 `male patients in surgical ward developed SSI ***in January***.

(The 10 male patients in surgical ward are part of the 100 patients that were operated)

HAI frequency measures…cont

Incidence

The number of new cases of disease or health event that occur in a specified period of time.

Example:

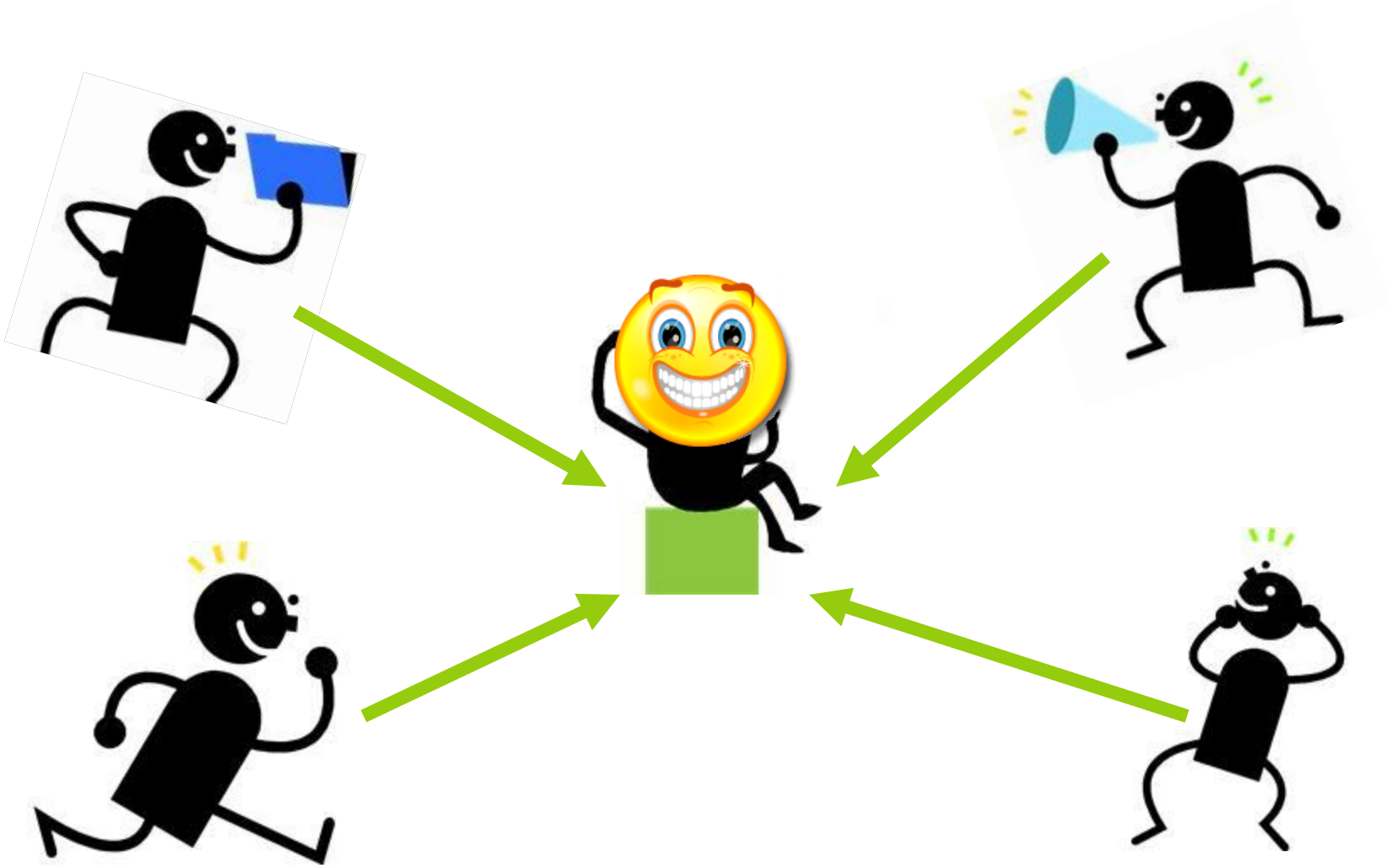
$$\text{Incidence Rate} = \frac{2\ (\text{Residents with CAUTI})}{188\ (\#\ \text{Indwelling catheter}} \times 1000 = \mathbf{10.63}$$

Prevalence

The number of existing cases of a disease or health event at a particular point in time

$$\text{Prevalence} = \frac{\#\ \text{of people in sample with characteristic}}{\text{Total \# of people in sample}}$$

Use Your Local Resources



Surveillance System Evaluation

- Identifies elements of surveillance that should be enhanced to improve its attributes,
- Assesses how surveillance findings affect control efforts
- Improves the quality of data and interpretations provided by surveillance.

Characteristics of Well-Conducted Surveillance

- To ensure a well functional surveillance system, the following surveillance attributes should be evaluated:

- **Acceptability**
- **Flexibility**
- **Predictive Value Positive**
- **Representativeness**
- **Sensitivity**
- **Simplicity**
- **Stability**
- **Timeliness**
- **Validity**

ANY QUESTION ??