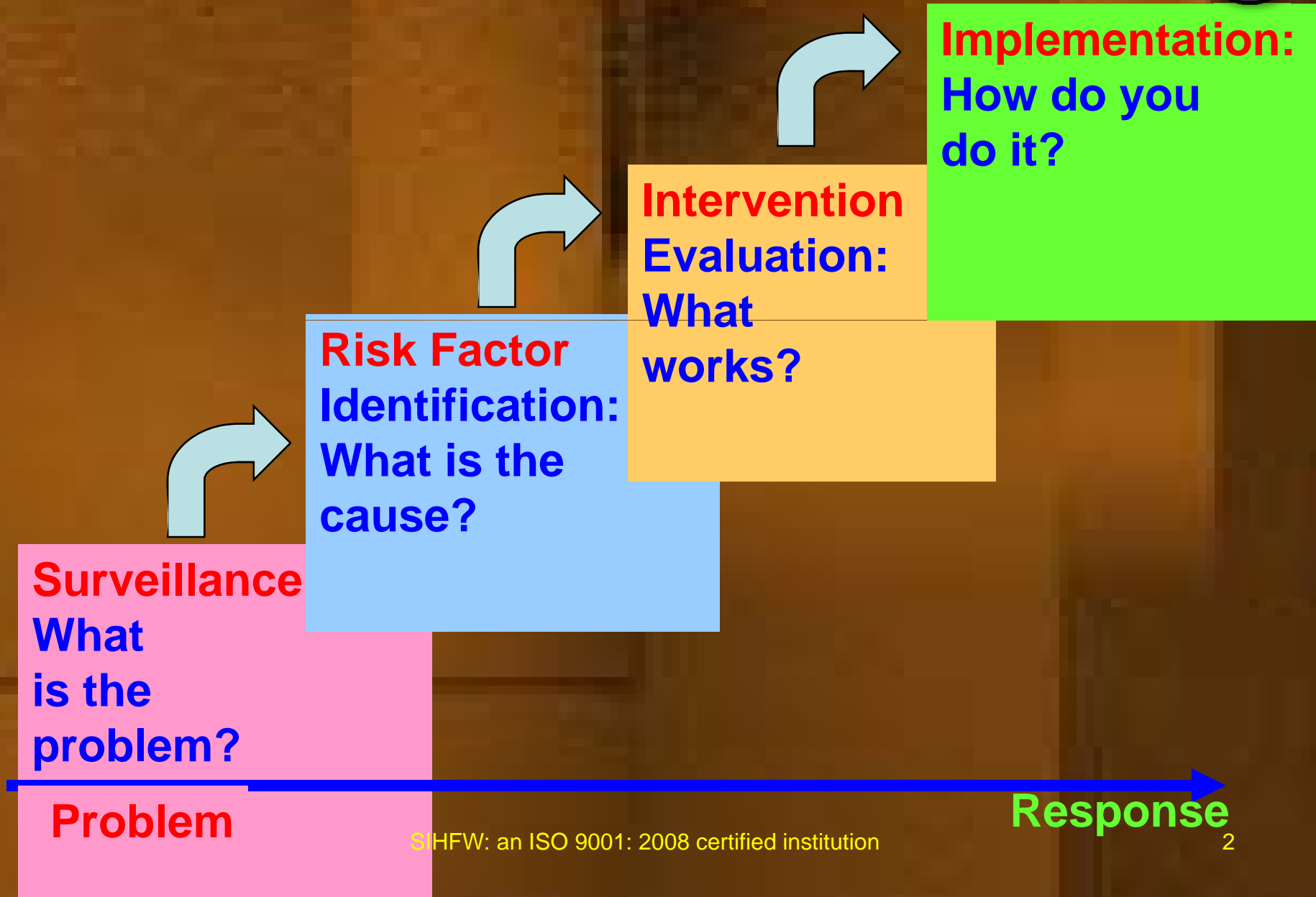




Surveillance

State Institute of Health & Family Welfare

Public Health Approach





Surveillance Information for Action

Surveillance is the bridge between what we think is happening and What actually is happening

Surveillance ?

“a system of close, continuous *observation* of all aspects of the *occurrence & distribution* of a disease through systematic Collection, Tabulation, Analysis and Dissemination (Timely) of all relevant data pertaining to that Disease/event”.

Descriptive (purposeful)

Action ↓ **(Public health policy)**

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Purpose:

General-

Reducing mortality/ morbidity through **timely** prevention & control



Specific-

- **Understanding problem**
NHD,
Magnitude,
Trend
- **Define priorities**
- **Decide objectives**
- **Determine strategies**
- **Evaluate control/ prevention**
- **Suggest further research**



Surveillance helps in:

- Understanding Natural History
- Deciding levels of existence of disease
- Explaining changes in pattern with time
- Identifying Changes in agent characteristics
- Measuring efficacy of control measure
- Forecasting trends



Uses of Public Health Surveillance

- Estimate magnitude of the problem
- Determine geographic distribution of illness
- Portray the natural history of a disease
- Detect epidemics/define a problem
- Generate hypotheses, stimulate research
- Evaluate control measures
- Monitor changes in infectious agents
- Detect changes in health practices
- Facilitate planning

Types:

➤ Routine

- **Active** (agency solicited)
- **Passive** (provider initiated)

➤ Sentinel

- Reporting by specified units from defined area
- Denominator absent

➤ Focused (Situation / Process / Area)

- Case/outbreak investigations
- Special surveys-Nutritional surveillance



Routine surveillance

- Through Out Patient Dept. of Health facilities (Passive) Wait & See who reports what
- Field surveys (Active) Go & Get Data/ Information

Issues-

Representative?

Home treatment?

Number of Health Facilities reporting

Completeness of reporting

Passive

- Simple
- Less burdensome
- Inexpensive
- May not be representative
- May fail to identify outbreaks



Active

- Assures complete reporting
- Can be used with specific investigations
- Can be done for brief periods
- Requires skilled personnel
- May be perceived as invasive
- Expensive



Sentinel Surveillance

Monitoring of key health events through sentinel:

- Sites
- Events
- Providers
- Vectors/animals

Sentinel surveillance

- Reporting of health events by selected Units/ Professionals representing a geographic area
- Could be active or Passive
- Only a small number of units selected
- Selected units report all cases for a specific time period
- Reports include additional information
- Easier to maintain Quality & Regularity
- Denominator absent
- Data collected are *Not representative & NO generalization*



Good Surveillance system:

- **Simplicity-**
 - ease of operation-** minimum paper work
 - simple definitions**
 - using existing system**

- **Flexibility**
- **Acceptability**
- **Sensitivity**
- **Predictive value**
- **Representative**
- **Timeliness**
- **Regularity**
- **Data quality-complete/reliable/accurate**
- **Cost-effectiveness**



Initiating a Surveillance system

Activities:

- Choose a disease that has proved control measures available
- Define how data collected shall be used
- Set a standard case definition
- Use existing system
- Visit those who supply Data
- Develop a data base
- Develop a regular reporting system for distribution (Feed back)

Disease selection for surveillance

Eligibility criteria:



- Public Health problem (Quantitative BOD)
- Impact
 - Clinical spectrum (Severity)
 - Mortality
- Communicability (Epidemic potential)
- Preventability (in terms of feasibility & cost)
- Risk perception
 - Global health organizations
 - National authority
 - NGO
 - People
- Political pressure



Prerequisites of an effective surveillance system

- Standard case definition
- Enumeration of Reporting units
- System For Disease Surveillance
 - Notifiable disease reporting System
 - Laboratory based surveillance
 - Hospital based surveillance
 - Population based surveillance

Standard Case Definition

- May not necessarily be the same as what clinician perceives
- Depends on-
 - Severity
 - Certainty of Diagnosis
 - Confirmed
 - Probable
 - Possible
 - Suspect
 - Non-case
 - Purpose
 - Sensitivity
 - Specificity

Systems of Disease surveillance



- Notifiable disease reporting System
 - Morbidity
 - Mortality
 - Case investigation
 - Epidemic reporting
 - Field investigation
 - Drug and Biological use
- Laboratory based surveillance
- Hospital based surveillance
- Population based surveillance
 - Surveys
 - Services

Sources of surveillance data

- Mortality
- Morbidity
- Case reports
- Epidemic reporting
- Epidemic field investigations
- Laboratory reporting
- Surveys
- Vector distribution studies
- Biologics & drug distribution
- Demographic & environmental data
- News media

Choice of Source depends on

- Disease
- Method used for identifying disease
- Program goals
- Resources-personnel/material
- Population involved
- Characteristics of disease occurrence



Surveillance processes:

- Routine surveillance
 - Reporting
 - Motivation
 - Procedural simplicity
 - Case definition
- Active reporting
- Sentinel physician reporting
- Lab. Surveillance
- Hospital surveillance
- Absenteeism surveillance
- Special surveillance
- Data analysis (time, place, person)
- Reports and evaluation

Diseases under NPSCD#

- Acute Flaccid Paralysis (AFP)
- HIV/AIDS
- Chickenpox
- Cholera like Diarrhea
- Diphtheria
- Dysentery
- Encephalitis
- Fever Syndrome (fever of more than 6 days duration)
- Fever with Bleeding
- Hepatitis
- Malaria
- Measles
- Meningitis
- Rabies
- Tetanus Neonatorum@
- Tetanus@
- Pulmonary Tuberculosis
- Whooping cough
- Any other disease of public health importance that might come up.

But for two all are communicable disease



Notifiable / Under Surveillance diseases

- ✿ Under WHO surveillance-

Louse borne Typhus
Relapsing fever
Paralytic Polio
Malaria
Viral Influenza

- ✿ Notifiable

- ✿ Cholera/
- ✿ Plague/
- ✿ Yellow fever

- ✿ Notifiable as part of routine HIS

Cholera
Malaria
Plague
Polio
Relapsing fever
Influenza
Rabies
Salmonellosis



How to Notify

Notification-

1. Report of Cases- Individually
Collectively

2. Report of Epidemics-

- ✓ Case report universally required under International Health Regulations or as disease under WHO surveillance
- ✓ Case reports regularly required whenever a disease occurs Report to local health authority by fastest means
- ✓ Selectively reportable in endemic areas

3. Obligatory reporting of Epidemics



What steps do I take for Notification

- Collect basic data-(Health facility)
- Compile at
 - ✿ District,
 - ✿ State and
 - ✿ National level
- Report: District – State - National Health authority to WHO

How do I Disseminate surveillance data:



- Morbidity and mortality weekly report
- Surveillance summaries
- Surveillance reports
- Annual summary
- Medical literature

General framework of Surveillance system



- Engagement of stakeholders
- Evaluation objective
- System description
- System performance
- Conclusions and recommendations
- Communication

A. Engagement of stakeholders

Stakeholders ?

- Owners and the customers
- Users of surveillance system information
 - Public health workers
 - Government
 - Data providers
 - Clinicians
- Steering group?
- A condition for change

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B. Evaluation objective

- Objective and methods
- Specific purpose
- Scope of evaluation
- Methods
 - Document studies
 - Interviews
 - Direct observations
 - Special studies

C. System description

- Public health rationale(why?)
- Objectives (what?)
- Operations (how?)
- Resources (how much?)

1. Rationale for surveillance

The disease

- Severity
- Frequency
- Communicability
- International obligations
- Costs
- Preventability

Society

- Public and mass media interest
- Will to prevent
- Availability of data

2. Objectives of system

- Documented?
- SMART?
 - Specific
 - Measurable
 - Action oriented (information for action)
 - Realistic
 - Time frame specified

3. Operations of system

- Health events under surveillance
 - Type of event:
exposure -> infection -> disease /
outbreaks -> outcome
 - Case definitions
- Legal framework
- Organisational framework
- Components
 - Flow chart
 - Description

Components of system

- Population under surveillance
- Period of data collection
- Type of information collected
- Data source *Confidentiality,*
- Data transfer *security*
- Data management and storage
- Data analysis: how often, by whom, how
- Dissemination: how often, to whom, how



4. Resources for system operation

- Funding sources
- Personnel time
- Other costs
 - Training
 - Mail
 - Forms
 - Computers

Importance of evaluation

➤ **Quality**

- Often neglected
- Basis for improvements

➤ **Obligation**

- Does the system deliver?
- Credibility of public health service

➤ **Learning process**

- "Do not create one until you have evaluated one"

Goals of Surveillance Evaluation:



- Prioritizes health events under surveillance
- Surveillance systems meet objectives
- Surveillance systems operate efficiently

System performance

Does it work? → *Is it useful?*

System attributes

- Simplicity
- Flexibility
- **Data quality**
- Acceptability
- **Sensitivity**
- Positive predictive value
- Representativeness
- **Timeliness**
- **Stability**

Use of information

- Users
- Actions taken

Link to objectives

Data quality

Completeness

- Proportion of blank / unknown responses
- Simple counting

Validity

- True data?
- Comparison
 - Records inspection
 - Patient interviews

Evaluation of Surveillance system

3 basic

- Does the system address an important public health problem?
- Does it accomplish the Objectives (purpose) of the system?
- Does the system have the right combination of attributes to achieve its purpose?

Does the system address an important public health problem?



Can it measure-

- **Disease burden**
 - Incidence/prevalence
 - Severity
 - Lost productivity
 - Premature mortality
 - Medical care costs
- **Potential burden**
 - Emerging problems
 - Problems under control
- **Preventability**



Does it meets the Goal

Reduction in-

- **Morbidity**
- **Mortality**



Does it accomplish the Objectives

- Projects NHD and trends ?
- Quantifies morbidity / mortality ?
- Detects changes in epidemiologic pattern of disease ?
- Evaluates hypotheses ?
- Identifies and evaluates control/ prevention measures ?
- Detects epidemics ?
- Leads to public health action ?
- Stimulates research ?

Meeting objectives?

- **Has information produced?**
 - Trends
 - Outbreaks
 - Future impact
 - Cases for further studies
- **Was information used, and by whom?**
 - Actions: list
 - Consequences: list

Does it have right combination of Attributes



- Sensitivity (ability to detect all cases)
- Specificity (non-cases not reported)
- Predictive value (Reported are real)
- Representative
- Timeliness

Limitations

- Severe events need treatment (Treatment sought alters the course of disease)
- Laboratory facilities- availability
- Reporting-Timeliness and accuracy
- Sources for identifying mild or sub clinical cases
- Support of Public Health system



A good Surveillance System does not necessarily ensure making of right decisions; but it reduces the chances of wrong ones



Thank You

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