



Chapter 6

EPIDEMIOLOGIC SURVEILLANCE

Learning Objectives

- At the end of the unit, students should be able to:
 - ▢ Define surveillance
 - ▢ Mention purposes of surveillance
 - ▢ Describe the three types of surveillance
 - ▢ Discuss factors/criteria for selecting a disease for surveillance
 - ▢ Describe deviancies of surveillance system
 - ▢ Discuss IDSR in Ethiopia

Surveillance

- It is derived from a French word **‘SURVEILLER’** meaning **‘to watch over’** which encompasses **careful observation and timely intervention**
- Surveillance is the **Systematic, Collection, Analysis, Interpretation and Dissemination** of health related data in an ongoing basis

Surveillance---

- Surveillance provides **information for action** which can be used to investigate, prevent and control disease in a community.
- Surveillance can be conducted **globally, regionally, nationally or locally.**
- Though surveillance is totally different from survey there is slight confusion in interpreting their meanings

Characteristics of Surveillance

- Dynamic/continuous
- Current/timely
- Purposeful/Orientation to action

Surveillance Vs Survey

Surveillance

- It is relatively cheap (for health department)
- can often use existing systems and health personnel
- Ongoing collection allows to use enough cases for study

Survey

- It is costly, needs to use by hiring a trained once
- More in-depth data could be collected

Surveillance Vs Survey

Surveillance

- Allows monitoring of trends of disease over time
- Quality control may be the major problem
- May not provide representative data

Survey

- Represents only single point in time and informs little if anything about change in time
- More accurate assessment of true incidence or prevalence
- representative data may be achieved)

Purposes & Uses of Surveillance

- ☞ To detect active changes of disease occurrence as in epidemic
- ☞ to identify trends & patterns of disease
- ☞ to study the natural history & epidemiology of diseases.
- ☞ to plan prevention & control measures

Purposes & Uses---

- ☞ To detect change in health care practices
- ☞ To assess the effectiveness of a preventive intervention in a population
- ☞ Testing a hypothesis (test a hypothesis regarding impact of exposure on disease occurrence).

Activities in surveillance

- * Data collection and recording
- * Reporting and notification
- * Compilation, analysis & interpretation
- * Dissemination of findings/ information
- * Linking to public health actions

Types of surveillance

1. Passive surveillance

- 👉 it is a condition in which health care providers send reports based on a known set of regulations.
- 👉 during normal operation of health services(a routine surveillance)
- 👉 through self reporting of patients
- 👉 based on passive case detection
- 👉 Uses routine recording & reporting system

Types of Surveillance----

○ **Advantages of passive surveillance:**

- covers wide range
- no need of special arrangement
- cheaper

○ **Disadvantages**

- unreliable to a large extent
- incomplete
- lack of representativeness
- lack compliance
- lack timeliness
- no feed back

Types of Surveillance----

2. Active surveillance

- A condition in which the health providers collect reports of a disease by moving to the community with a morbidity of interest.
- Surveillance activity outside the routine surveillance
- Information can be from health institutions & other sources

Types of Surveillance----

➤ Can be based on:

- **active case detection**-
systematic and intentional search for cases of disease in a population
e.g door-to-door survey and
- **passive case detection**-*relies on people presenting themselves to health care facilities,*
- Both uses special recording & reporting measures*

Types of Surveillance----

- **Advantages**

- data is complete & accurate
- timely

- **Disadvantage**

- expensive
- limited to specific diseases
- limited period of time

Types of Surveillance----

Active surveillance is appropriate for:

A. Periodic evaluation of ongoing programs

B. Occurrence of unusual situation:

- 👉 discovery of a new disease
- 👉 a new mode of transmission
- 👉 recognition of high risk period
- 👉 disease in new geographic area or affects a new subgroup

types of Surveillance----

- 👉 eradicated(zero level) diseases reappear
- 👉 increased in incidence of a given disease

types of Surveillance----

3. Sentinel Surveillance

Sentinel-the selected populations

- **Done to identify epidemics**
- Uses a pre-arranged **sample of reporting sources** to report all cases of one or more conditions
- Usually the sample sources are selected to be those most likely to see cases
- it is an alternative to population based surveillance in developing countries

◆ The **current impact & magnitude** of the health event:

- Having high Incidence/ prevalence
- Mortality (overall and age specific rates)
- Morbidity (Hospitalization, disability, 'top morbidity')
- Severity (case fatality rate)
- Health care costs

Eg HIV/AIDS, STIs, TB,

Factors for selection---

- ◇ Having epidemic potential (high R_0)
(eg. Meningitis, Cholera)
- ◇ Surveillance internationally required
(eg Plague, yellow fever, cholera)
- ◇ Having available and effective
control and preventive interventions
(eg Polio, Measels)



Deficiencies of surveillance system

- Are never perfect
- Understanding limitations ensures correct interpretation

Deficiencies of surveillance---

❖ ***Common limitations are:***

1. Under reporting due to ($<K$ & $-A$)
 - K and $-A$ are parameters used in disease surveillance
 - K are Growth parameters or Multiplication factors (average number of new infections)
 - $-A$ is the ascertainment rate or detection rate (represents the proportion of cases)
2. Lack of representativeness
 - Bias to reporting severe cases
 - Reporting after publicity (delay)
3. Lack of timelines
4. Inconsistency of case definitions



Measures to strengthen the surveillance system

- ❑ Improving awareness of practitioners
- ❑ Simplification of the process of reporting
- ❑ Frequent feed back to those reporting

Measures to strengthen the surveillance system---

- ❑ Widening the “nets”
 - obtain information from different sources
- ❑ Use active surveillance
- ❑ “share the data share the responsibility and share the credit”

Conclusion

- ❑ Surveillance provides quick information for action
- ❑ Good surveillance system has the following features:
 - Use of combined system
 - Active + passive
 - Timely reporting

Conclusion---

- Timely & comprehensive action
 - Action must be targeted towards both case detection & treatment as well as to the control of the disease
- Strong laboratory services for accurate diagnosis

Surveillance in Ethiopia

- Passive, based on:
 - Monthly activity reports
 - Weekly notification (notifiable + out breaks)
- Disease control programs have their own systems:
 - Passive
 - Active
 - E.g. - Malaria
 - CDD
 - TB & leprosy etc



The common deficiencies in the national surveillance system are:

○ ***Deficiency in data collection***

- Lack of diagnostic accuracy
- Lack of completeness and
- Lack of representativeness

○ ***Deficiency in reporting/notification***

- Multiplicity of case reporting forms
- Lack of compliance
- Lack of timeliness

The common deficiencies in the national surveillance system are--

○ ***Deficiencies in data analysis***

- Carried out at the central rather than local level
- Results in national indicators of health status rather than local indicators

○ ***Deficiencies in dissemination***

- ▢ Aggregate information which is not useful at the local level
- ▢ No feed back system
- Lack of follow- up for action

The integrated disease surveillance & Response (IDSR)

- It is a new strategy to improve the above deficiencies

Definition: It is an approach adapted to strengthen national disease surveillance system by *coordinating and streaming all surveillance activities and ensuring timely supervision of surveillance data to all diseases prevention and control programs*

IDSR---

- The activities are combined taking advantage of similar surveillance functions, skills, resources and target population.
- It recommends coordination and integration of surveillance activities for diseases of public health importance

The disease that are targeted by IDSR Are

- **Epidemic prone diseases**

- Cholera
- Diarrhea with blood
- Measles
- Meningitis
- Plague
- Viral hemorrhagic fever
- Yellow fever
- Typhoid fever
- Relapsing fever
- Epidemic typhus

disease that are targeted by IDSR Are:

- **Diseases targeted for eradication & elimination**
 - Acute flaccid paralysis (AFP/Polio)
 - Dracunculiasis (Guinea worm)
 - Leprosy
 - Neonatal tetanus

The integrated disease surveillance system IDSR---

- **Other diseases of public health importance:**

- Pneumonia in under 5 children
- Diarrhea in under 5 children
- HIV/AIDS cases
- Onchocerciasis
- STIs
- Tuberculosis