DISEASE SURVEILLANCE

Introduction

- The significant increase of communicable diseases, especially emerging and re-emerging infections is attracting greater attention
- About 65% of the world's first news about infectious disease events now comes from informal sources, including press reports and the internet which are now easily accessed by everyone.
- There is a need to improve surveillance systems in order to recognize emerging threats, both in the community and in hospitals & health facilities, and to respond to them in a timely manner.

What is SURVEILLANCE?

- Ongoing, systematic collection, verification, analysis, and interpretation of data, and the dissemination of information regarding diseases and health events
- To those who need to know, for use in public health action to reduce morbidity and mortality and to improve health.

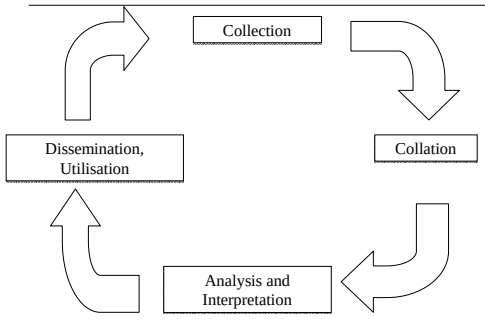
What is Surveillance? (cont...)

- Systematic collection of information on a specific disease or other health-related event
- Must occur on an ongoing basis with sufficient accuracy and completeness for data analysis
- Utilisation of information for disease prevention and control

Information Loops

- A surveillance system is an information loop or cycle that involves:
  - healthcare providers
  - public health agencies
  - the public

Flow of Surveillance Data



Surveillance Terms

- ***Universal case reporting*** – a surveillance system in which all cases of a disease are supposed to be reported
- ***Sentinel surveillance*** – a surveillance system in which reports are obtained from certain facilities or populations
- ***Laboratory-based reporting*** – a surveillance system in which the reports of cases come from clinical laboratories instead of healthcare practitioners or hospitals

Terms Related to Surveillance (Cont...)

- ***Case definition*** – the clinical and laboratory characteristics that a patient must have to be counted as a case for surveillance purposes
- ***Prevalence*** – the proportion of persons in a population who have a disease or condition at a given point in time
- ***Incidence*** – the number of persons who newly develop a disease or condition within a specified period of time

Terms Related to Surveillance (Cont...)

- ***Passive surveillance*** – a system in which data generated without solicitation, intervention or contact by the health agency carrying out the surveillance. Other agencies initiate reporting.
- ***Active surveillance*** – the organization conducting surveillance initiates procedures to obtain reports

Past Approaches in Surveillance System

- Duplication of efforts and resources
- Delays in reporting and identification of outbreaks
- Lack of dissemination and feedback to the local level
- Lack of integration of training and surveillance activities

Common Problems with Past Surveillance Systems

- Limited evaluation of programmes
- Inadequate involvement of laboratories
- Incomplete reporting and lack of supervisory support

Disease Surveillance

- Surveillance data
  - analysed and interpreted
  - can provide public health officials and policy-makers with evidence-based information for decision making
  - enable public health professionals to detect early signals of outbreaks and to take quick remedial measures to control them

Disease Surveillance (cont...)

- The impact of communicable diseases has grave implications for the social and economic well being of the peoples in every nation.
- Therefore, the Disease Control Division has planned and implemented a wide range of programmes and activities, nation-wide, to reduce the incidences of communicable diseases.

Disease Surveillance (cont...)

- Strengthening the surveillance of communicable diseases is one of more important strategies to keep them at bay.
- New surveillance systems were introduced to detect early communicable disease outbreaks, especially newly emerging & reemerging ones, & to respond rapidly to them.
- This will also help in monitoring them.
- The establishment of Communicable Disease Surveillance Section under the Disease Control Division is another step to strengthen coordination of communicable disease surveillance in our country.

Integrated Disease Surveillance (IDS)

- **Integrates** priority communicable disease surveillance activities at the district level
- Provides support for training and supervision
- Full-time district-level staff dedicated to
  - monitoring health events in the community
  - mobilising community action
  - encouraging national assistance
  - accessing regional resources
- Resources combined to collect information at each level

IDS Goals

- Strengthen the capacity of countries to conduct effective surveillance activities
- **Integrate multiple surveillance systems** so that forms, personnel and resources can be used more efficiently and effectively
- Improve the use of information for making decisions
- Improve the flow of surveillance information between and within levels of the health system

IDS Goals (Cont...)

- Improve **laboratory capacity** in identification of pathogens and monitoring of drug sensitivity
- Increase the **involvement of clinicians** in the surveillance system
- Emphasise **community participation** in detection of and response to public health problems
- Strengthen the involvement of laboratory personnel in epidemiologic surveillance

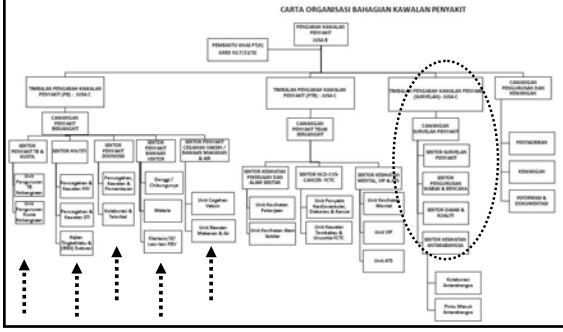
Examples of Priority Communicable Diseases for IDS

- Epidemic-prone diseases
  - Cholera
  - Yellow fever
- Diseases targeted for eradication and elimination
  - Polio
  - Neonatal tetanus
- Other diseases of public health importance
  - Malaria
  - STIs (Sexually Transmitted Infections)

Surveillance of Infectious Disease in Malaysia

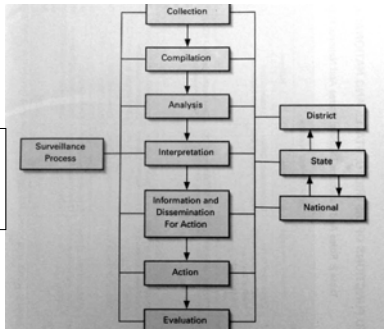
- Notification system: 36 disease→ 26 diseases need to notified
- Prevention and Control of Infectious Disease Act 1988

Surveillance of Infectious Disease in Malaysia



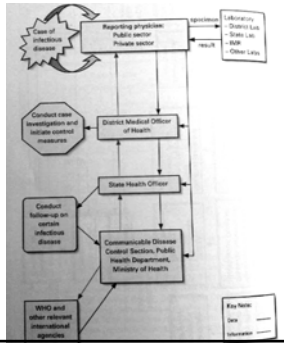
Surveillance of Infectious Disease in Malaysia

SURVEILLANCE ACTIVITIES AT VARIOUS LEVEL



Surveillance of Infectious Disease in Malaysia

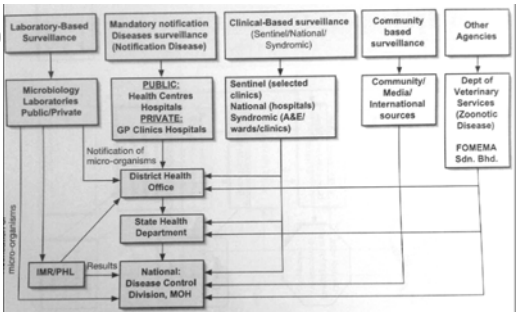
FLOW OF SURVEILLANCE DATA AND INFORMATION DISSEMINATION



Surveillance System

- The notification data were collected and compiled on a weekly basis by the District Health Office.
- A summary report was sent to the State Health Department and Statistic Unit, Disease Control Division, Ministry of Health Malaysia .

Surveillance of Infectious Disease in Malaysia



1) Mandatory notification surveillance system

Started 1967
With Malaria Eradication Program
1970s – surveillance of 36 notifiable disease

- **Mandatory notification** - under Section 10(2) Act 342:
  Prevention & Control of Infectious Disease Act 1988.
  - for surveillance and disease control and prevention activities

➢27 infectious diseases – within 24 hrs/1 week.
➢Every medical practitioners (notifying facilities) to nearest District Health Office
➢Compounded offenses if fail to notify
➢Notification – phone & form – fax/post/by hand – Manual System

1) Mandatory notification surveillance system

List of Notifiable Infectious Disease First Schedule (Section 2)

- **Part I:**
- **1. Chancroid**
- **2. Cholera**
- **3. DF & DHF**
- **4. Diphteria**
- **5. Dysenteries (All forms)**
- **6. Ebola**
- **7. Food Poisoning**
- **8. Gonoccocal Infection. (All)**
- **9. Leprosy**
- **10. Malaria**
- **11. Measles**
- **12. Myocarditis**
- **13. Plague**
- **14. Poliomyelitis (Acute)**
- **Rabies**
- **16. Relapsing Fever**
- **17. Syphilis (All forms)**
- **18. Tetanus (All forms)**
- **19. Tuberculosis (All forms)**
- **20. Typhus & Other Rickettsioses**
- **21. Typhoid & Paratyphoid Fevers**
- **22. Viral Encephalitis**
- **23. Viral Hepatitis**
- **24. Whooping Cough**
- **25. Yellow Fever**
- **26. Any other life threatening microbial infection**
- **Part II:**
- **HIV Infection (All forms)**

2) Laboratory based surveillance system

- Monitoring of disease agent : introduced on August 2002
- Complement the mandatory surveillance system
- Reporting of micro-organisms isolated in all private/public lab in Malaysia
- Facilitate outbreak identification and investigation through strain identification
- Example:
  - V.cholerae, H. influenzae B, Salmonella spp., S.typhi/paratyhpi, N. meningitides, Leptospira , H1N1 virus

3) Clinical based surveillance system

- Can help to assess situation fast to determine epidemiological link and potential source
- Act as 'smoke detector'
- A clinical approach before lab confirmation is available
- 2 recent example:
  - SARS
  - Anthrax

3) Clinical based surveillance system

- Include surveillance of:
  - National (Acute flaccid paralysis, conjunctivitis, acute gastroenteritis)
  - Sentinel (Hand Foot and Mouth Disease)
  - Syndromic surveillance (6 syndromes)
    - Acute dermatological syndrome
    - Acute haemorrhagic syndrome
    - Acute Jaundice syndrome
    - Acute respiratory syndrome
    - Acute neurological syndrome
    - Acute diarrhoeal syndrome

3) Clinical based surveillance system

Table 4: Proxy indicators of existing surveillance system

Proxy	Disease/problem
Acute Gastroenteritis	Food and water borne disease
Acute Flaccid Paralysis	Poliomyelitis
HFMD	Enteroviruses
Acute Respiratory Infection	Pneumonia, Influenza virus
The defined syndromes under the syndromic notification system	Emerging or unknown infections
Unexplained/ill defined death of infectious origin	Emerging or unknown infections

4) Communicable disease surveillance system by others agency

- Veterinary: zoonotic disease (rabies, JE, avian influenza)
- FOMEMA: Communicable disease among foreigners

NO	DISEASE
1	Rabies
2	Nipah Virus Infection
3	Avian Influenza
4	Japanese Encephalitis
5	Vancomycin Resistant Enterococcus
6	Bovine Tuberculosis
7	Bovine Spongiform Encephalopathy
8	Brucellosis
9	Anthrax Infection
10	Toxoplasmosis
11	Leptospirosis
12	Salmonella Enteritidis/Typhimurium
13	Rift Valley Fever
14	Q Fever
15	Hanta Virus
16	Filariasis
17	Yellow Fever

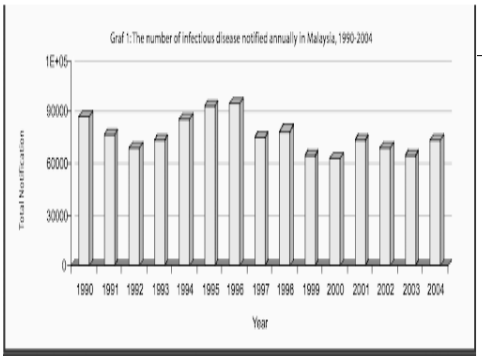
5) Community based surveillannce system

Community Based Surveillance
- *Media/Rumour Surveillance*

Media reporting
- Obtain reports on possible infectious diseases occurring locally and in other countries
- Monitor global and local situation
- Provide alert if necessary
- Initiate data gathering for surveillance
- Collaborate with other agencies in surveillance and preparedness

5) Community based surveillannce system

- **Methodology**
  - Passive: News
    - News
    - Printed
    - Internet
    - Telecast
    - Others
      - Word-of-mouth
      - Calls
      - E-mail
  - Active: Mobilising communities
    - Police stations
    - Private clinics / hospitals
    - Pharmacies



Case report internationally to WHO under International Health Regulation

Q: What are the International Health Regulations?

A: The International Health Regulations (IHR) are an international legal instrument that is binding on 194 countries across the globe, including all the Member States of WHO. Their aim is to help the international community prevent and respond to acute public health risks that have the potential to cross borders and threaten people worldwide.

IHR 1969 ⇨ IHR 2005

Case report internationally to WHO under International Health Regulation

IHR 1969

The 1969 IHR were primarily intended to monitor and control six serious infectious diseases: cholera, plague, yellow fever, smallpox, relapsing fever and typhus.

With its focus on just three diseases (cholera, plague and yellow fever), the IHR (1969) were not equipped to address the growing and varied public health risks that resulted from increased travel and trade in the last quarter of the 20th century.

Case report internationally to WHO under International Health Regulation

The IHR (2005) aim to prevent, protect against, control and respond to the international spread of disease while avoiding unnecessary interference with international traffic and trade. The IHR (2005) are also designed to reduce the risk of disease spread at international airports, ports and ground crossings.

The IHR (2005), which are firmly grounded in practical experience, broaden the scope of the 1969 Regulations to cover existing, new and re-emerging diseases, including emergencies caused by non-infectious disease agents.

Under the IHR (2005), all cases of these four diseases must be automatically notified to WHO: smallpox, poliomyelitis due to wild-type poliovirus, SARS and cases of human influenza caused by a new subtype.