Role of Medical Laboratory in PHC

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Course Bame: Primary Health Care Grade 4

Code: 2023/1 MEDA MA 415

Fall Semester

Week No.5

Medical laboratory science is a complex field embracing a number of different disciplines such as :

- Microbiology,
- Hematology,
- Clinical Chemistry,
- Urinalysis,
- Immunology,
- Serology,
- Histopathology,
- Immunohematology
- Molecular biology and others.

Role of medical/Clinical laboratory science in Health Care:

- The medical laboratory services play a pivotal role in the promotion, curative and preventive aspects of a nation's health delivery system.
- The service gives a scientific foundation by providing accurate information to those with the responsibility for:
    1. Treating patients and monitoring their response to treatment,
    2. Monitoring the development and spread of infectious and dangerous pathogens (disease causing organisms),
    3. Deciding effective control measures against major prevalent disease,
    4. Deciding health priorities and allocating resources.

Why The Laboratory Is Needed In Health Care:

The clinical laboratory science has an important role in improving the:

1. Quality,
2. Efficiency,
3. Cost-effectiveness,
4. Planning and management of district health care.

5.Helping to control hospital acquired infections.

6. Participating in health education.

7. Examining designated community water supplies for indicators of faecal and chemical pollution.

8. Responding rapidly when an epidemic occurs, including appropriate on-site testing and the collection and despatch of specimens to the Regional or Central Laboratory for pathogen identification.

Structure of medical/Clinical laboratory services: A laboratory service network consists of:

1. Community based primary health care laboratory: Duties:

- To support primary health care in investigating, controlling and preventing major diseases in the country.
- Promoting health care by integrated health education

Structure of medical/Clinical laboratory services: A laboratory service network consists of:

2.District hospital laboratory:

In addition to the works stated above, these laboratories have an important role in supervising the work of the peripheral community based laboratories, testing referred specimens, and performing a range of tests compatible with the work of district hospital.

Structure of medical/Clinical laboratory services: A laboratory service network consists of:

3.Regional hospital laboratory:

In addition to the duties done at the two above lower levels, the regional laboratory assists and supervises the district laboratories. It analyses referred specimens and performs a range of specialized and other tests as required by the work of the regional hospital.

Structure of medical/Clinical laboratory services: A laboratory service network consists of:

4.Central and public health laboratory:

The central and public health laboratory is responsible for planning, advising and overall coordinating of medical laboratory services in the region.

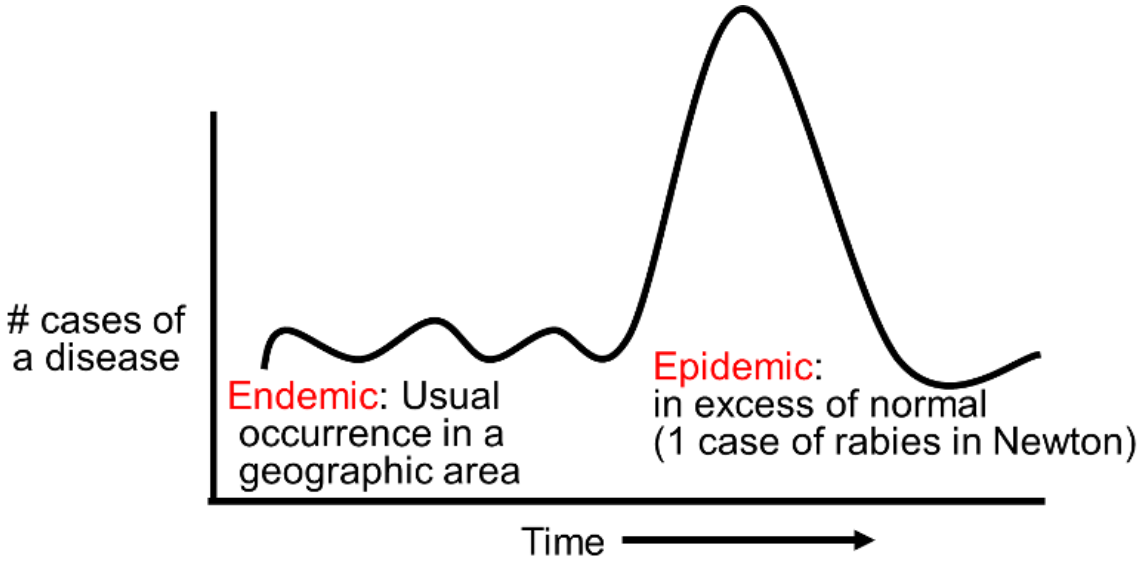
Main activities are to:

Formulate a professional code of conduct to medical laboratory personnel.

Perform a range of special tests not normally undertaken in the regional laboratories such as viral, histo-pathological, cytological, immunological, forensic and genetic investigations.

Disease Outbreak

A disease outbreak is the occurrence of cases of disease in **excess** of what would normally be expected in a defined **community**, **geographical area** or **season**.



Disease Outbreak

Laboratory role during outbreaks Laboratory role during outbreaks For new and emerging pathogens:

1. Identify the pathogen
2. Develop laboratory tests
3. provide direction for provide direction for proper and cost effective treatment

What's the difference?

Endemic, epidemic and pandemic explained.

Epidemic or Outbreak

Disease occurrence among a population that is more than what is expected in a given time and place, usually a sudden increase

Pandemic

An epidemic that spreads across regions

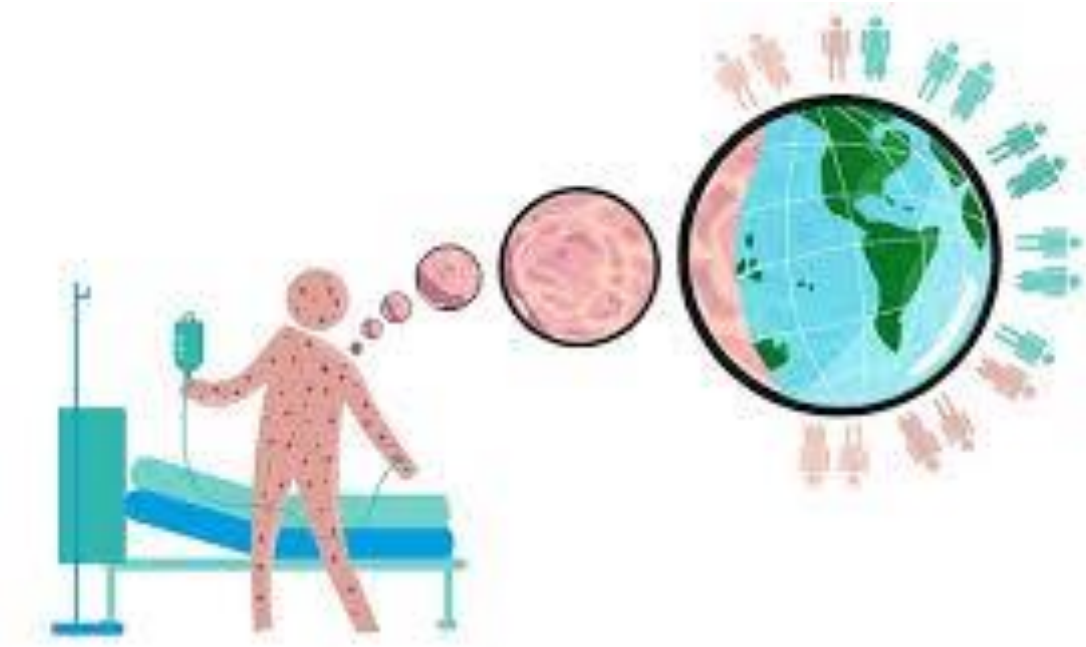
Endemic

A disease or condition present among a population at all times

Source: Centers for Disease Control and Prevention (CDC)

Disease Outbreak

An outbreak may occur in a **restricted geographical area**, or **may extend over several countries**. It may last for a few days or weeks, or for several years.



The criteria for identifying an outbreak

1. The occurrence of a greater number of cases or events than normally occurs in the same place and during the same period as in past years.
2. A cluster of cases of the same disease occurs that can be linked to the same exposure.
3. A single case of disease that has never occurred before or might have a significant implication for public health policy and practice can be judged as an outbreak that merits investigation.

Purposes of outbreak investigation

1. Controlling the current outbreak.
2. Prevention of future outbreaks.
3. Research to provide knowledge of the disease.
4. Evaluation of the effectiveness of prevention programmes.
5. Evaluation of the effectiveness of the existing surveillance system.
6. Training of health professionals.
7. Responding to public, political, and legal concerns.

Components of an investigation team

1. Field epidemiologist
2. Disease control specialists.
3. **Laboratory technicians.**
4. Specialists in particular areas (e.g. veterinary medicine).
5. Public health administrators.
6. In charge of public relations and press releases.
7. Local health professionals at the district or provincial level

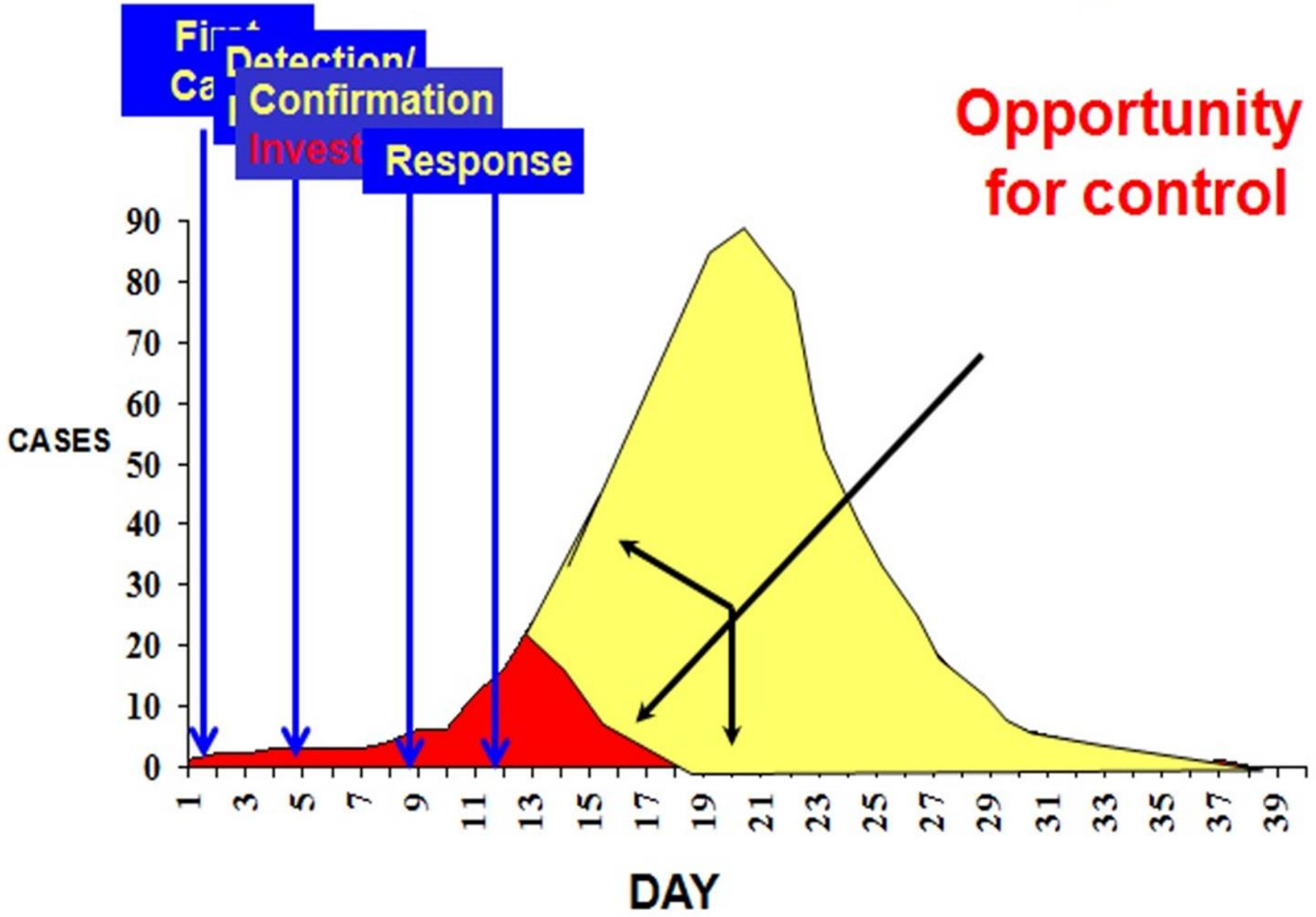
Steps of Outbreak Investigation

Step 1: Confirm the existence of an outbreak

'Is this a true outbreak?'

Investigators should review the number of cases with the local health officers or hospital staff and compare it with the number found during the same period recorded in past years.

Outbreak Detection and Response



If it is confirmed as outbreak thennext related question are-

Step 2: Verify the diagnosis and etiology of the disease

A. What is the correct diagnosis and a etiology of the disease?

B. What can be done immediately toprevent new cases from occurring?

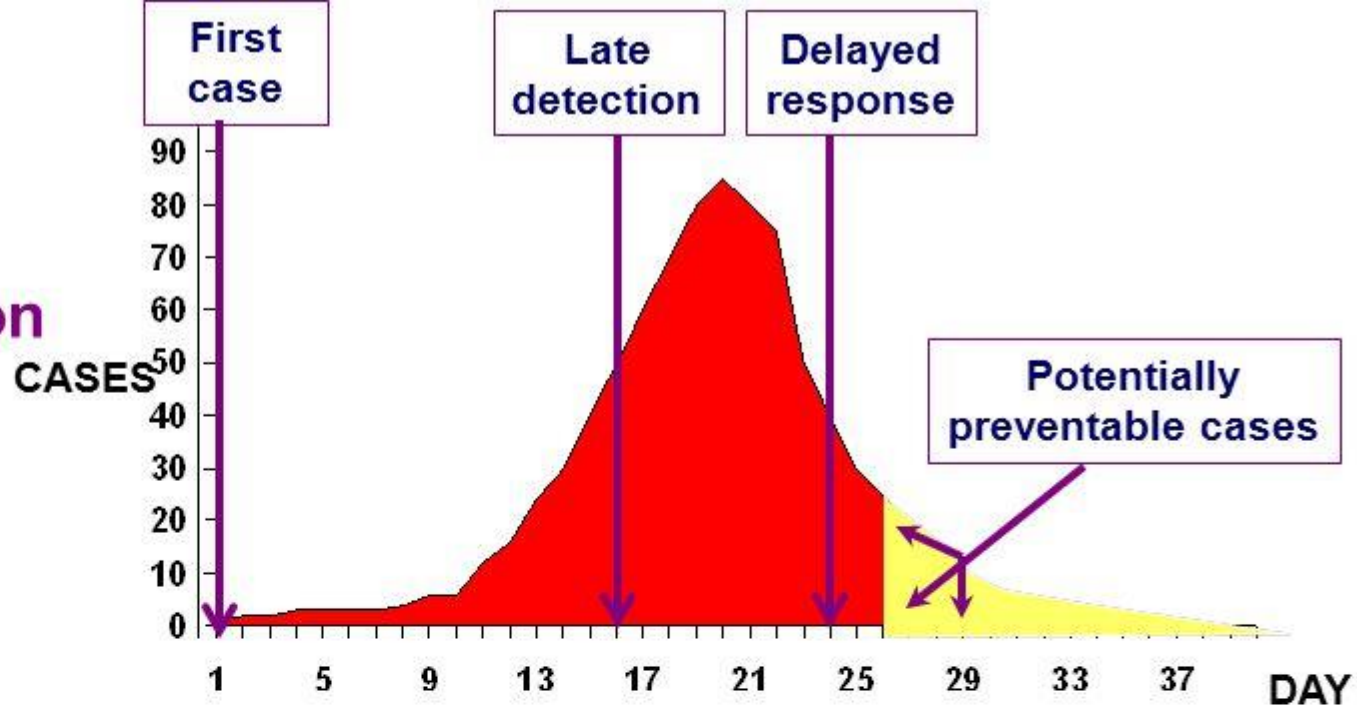
Step 3:

Develop an appropriate case definition, start case finding, and collect information on cases

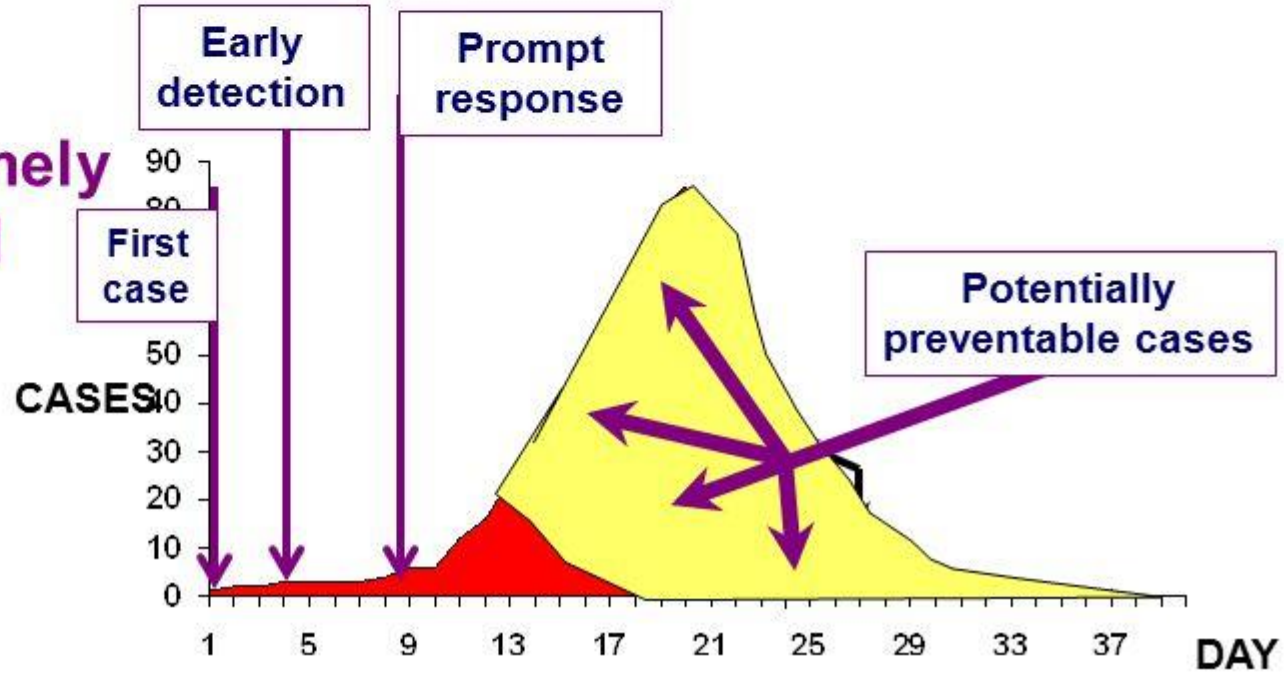
At this stage, the investigator needs to answer at least three questions:

1. Who should be counted as a case?
2. Are there more undetected cases in the hospitals and in the community?
3. What are the characteristics of cases?

Outbreak with delayed detection and response



Outbreak with timely detection and response



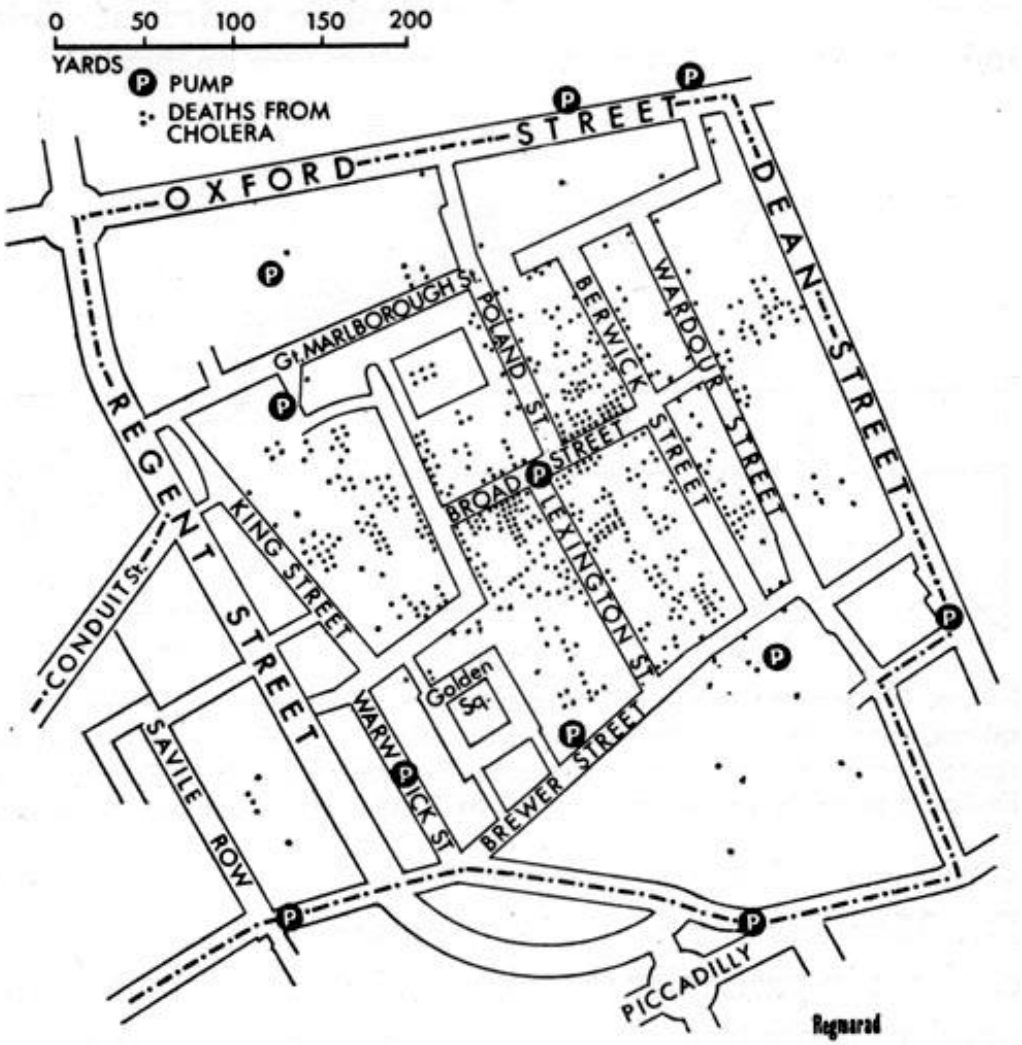
Develop an appropriate case definition

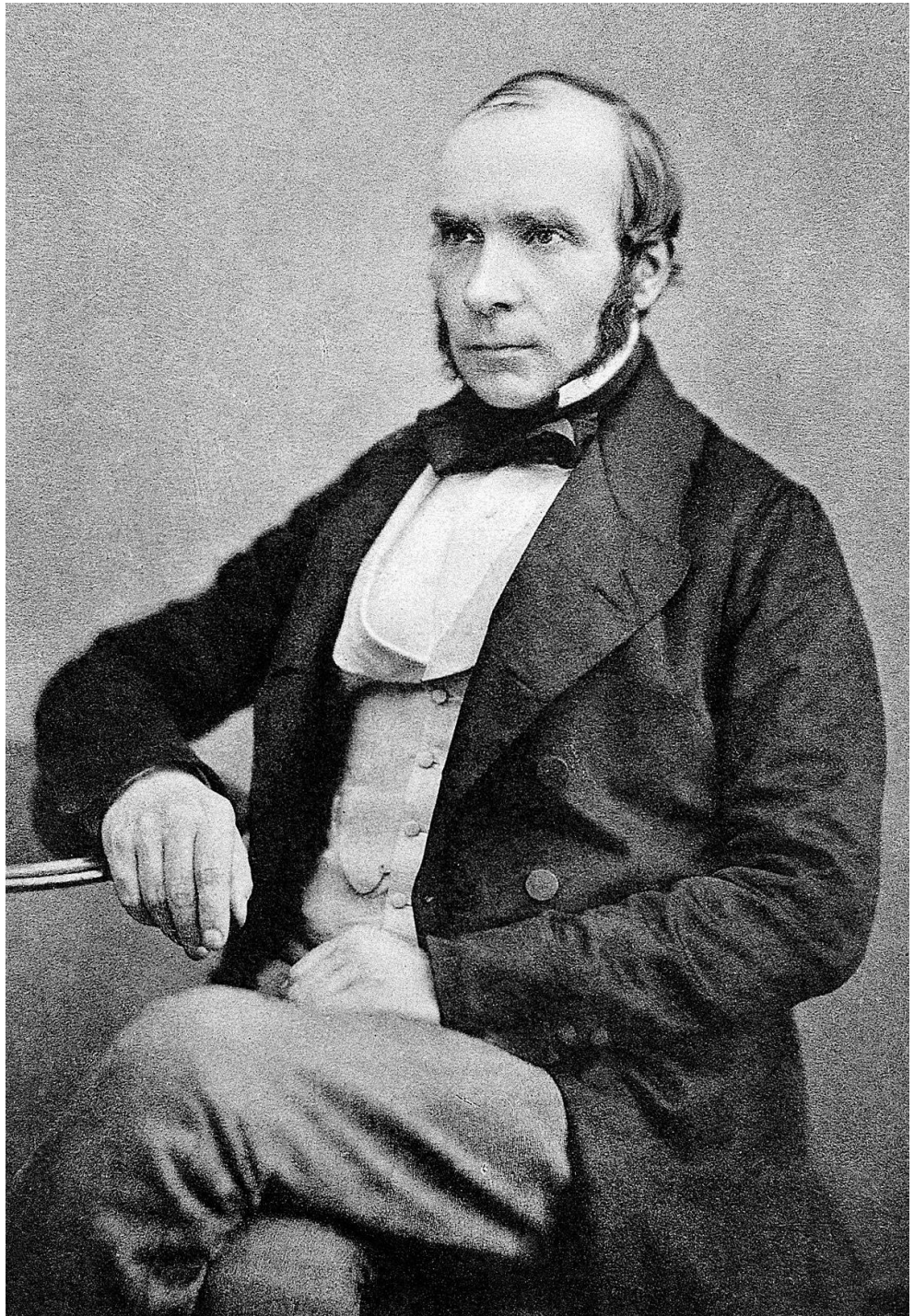
1. It is important that the investigator develop a case definition, which will be applied consistently during the investigation.
2. The definition should be sensitive or adequate at the beginning, in order to capture actual cases.
3. A good case definition for investigative purposes should be specific to time and location.

Active case finding

- The investigator must start a process called active case finding.
- The objective of active case finding is to have enough cases to analyse. At the same time, this case finding will give a better picture of the magnitude of the outbreak.
- This active case finding in the community also provides two more benefits

W5: Role Medical laboratory in PHC



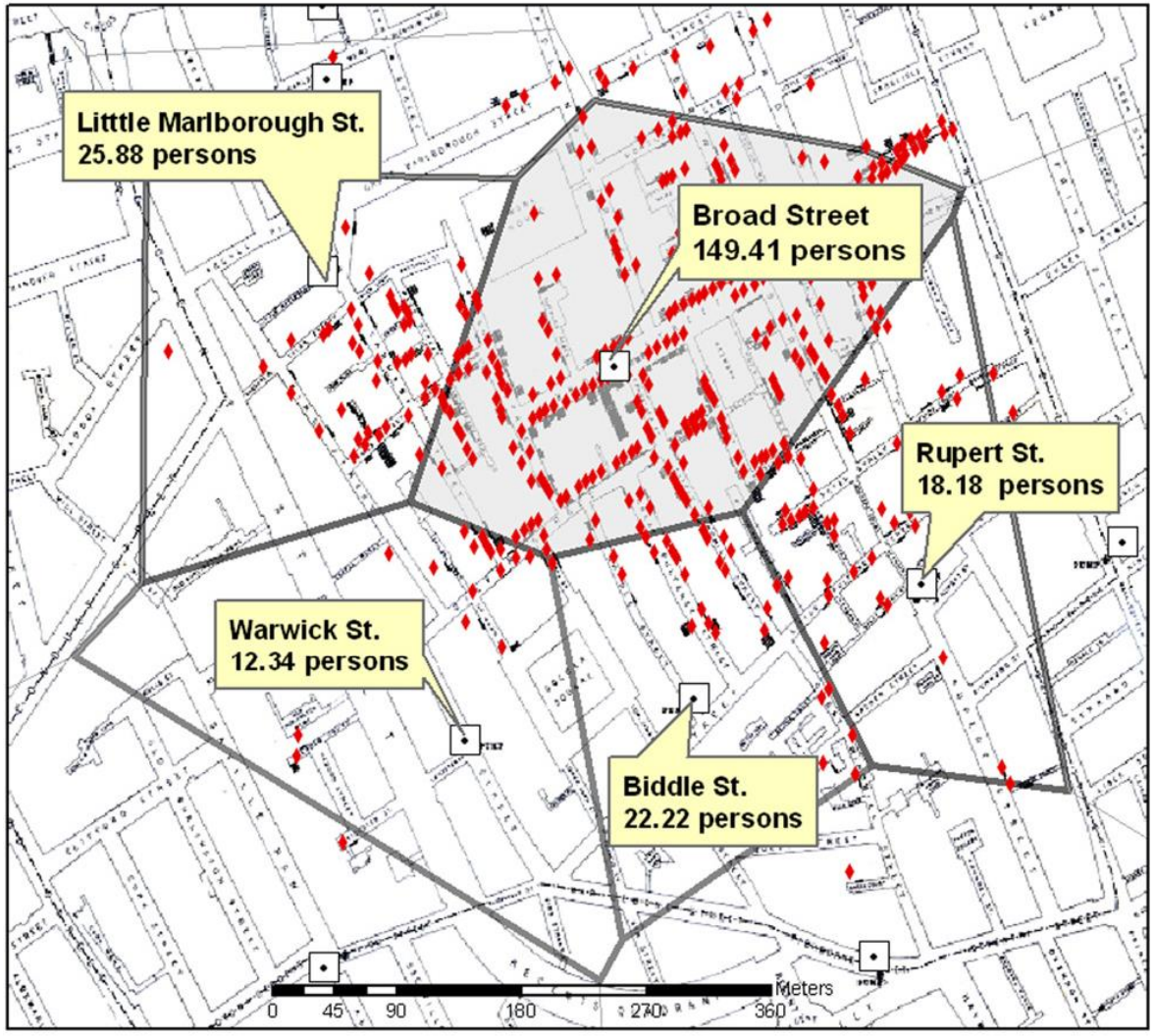


John Snow (1813 –1858) was an English physician and a leader in the development of **anaesthesia** and **medical hygiene.**

He is considered one of the founders of modern **epidemiology**, in part because of his work in tracing the source of a cholera outbreak in Soho, London, in **1854**, which he curtailed by removing the handle of a water pump.

Remaking Snow's 1855 Map

Cholera Mortality per 1,000 persons



Cholera Mortaliy per 1,00 persons for central pump catchments.

Home work

The role of the Medical laboratory professional in disease surveillance in Primary Health Care


QUESTIONS?
COMMENTS?
CONCERNS?