

Public Health and Outbreak Management



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Summary of Presentation

- **Background** of outbreaks and public health
- What is **surveillance** of infectious disease?
- Why is it necessary?
- What is the legislation in this area?

- The **notification** process
- How surveillance provides **evidence** for public health action

● ● ● 19th Century London



- *Poor sanitary conditions*
- *Cesspools in basements*
- *Waste dumped in to River Thames*

Cholera

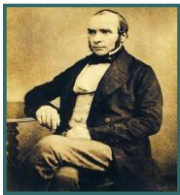


- o Severe Diarrhoea
- o Dehydration – Shock - Death



1831	6,000 RIP
1849	14,000 RIP
1853	10,000 RIP





1854 Broad Street Cholera Outbreak



Talked with locals

Histories / exposures

Studied pattern of disease - mapping

Public water Broad St Pump



o *'The result of the inquiry, then, is, that there has been no particular outbreak or prevalence of cholera in this part of London except among the persons who were in the habit of drinking the water of the above-mentioned pump well.'*

- o Control measure:
 - Remove Handle



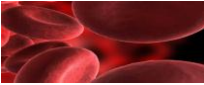
- CDC task force formed to monitor the outbreak
- "the 4H disease"
- heroin users, homosexuals, haemophiliacs and Haitians
- "GRID"
- gay-related immune deficiency
- 1982: Acquired Immunodeficiency Syndrome

Transmission

- Sexual



- Blood



- Mum to baby

- Control Measures

- Safe Sex



- Clean needles



Surveillance – why?

- To allow planning for ID prevention and control
 - particular diseases of public health importance e.g. TB, meningococcal disease, malaria ...
 - particular disease problem e.g. antimicrobial resistance
- National Infectious Disease Legislation
- International requirements



**What happens following a notification?
Role of Public Health Doctor**

S.I. No. 390/1981 – Infectious Diseases Regulations 1981

On becoming aware of a case or a suspected case of an infectious disease shall:

- make enquiries to investigate the nature and source of infection
- for preventing the spread of infection
- and removing conditions favourable to such infections

What happens following a notification?

- Most notifications are sporadic i.e. individual case of salmonella associated with a BBQ
- Generic questionnaire is completed
 - Broad exposure data collection – demography, onset of symptoms, symptoms, outcome of illness



What happens following a notification?

- Specific questionnaire
 - Risk factors especially in high risk groups
 - Focused exposure data collection – food histories, foreign travel, exposure to animals, water
- Food or water source suspected
 - Environmental Health Officer
 - Food or water samples taken



Surveillance data - how used?

For the prevention, management and control of ID

- Control spread of disease
- Identify outbreaks early
 - An episode in which two or more people, thought to have a common exposure, experience a similar illness or proven infection

Who is involved? Depends on organism

- Public health doctors
- Environmental health officers
- Microbiologists and lab staff / Infection Control Staff
- Veterinary officers
- Department of Agriculture staff
- Food Safety Authority of Ireland
- Health Protection Surveillance Centre
- Others as required



Surveillance data - how used?

For the prevention, management and control of ID

- Monitor disease trends
 - changing?
- Provide evidence for public health interventions
 - immunisation programmes
 - information campaigns



Evidence for Intervention

First Example:
Meningococcal Disease

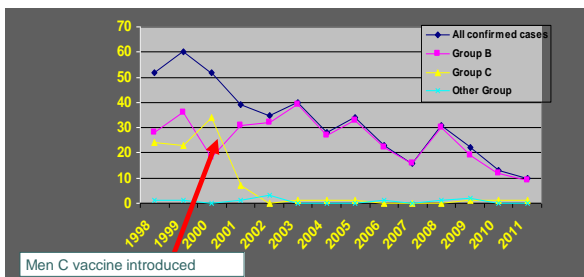
- Ireland had highest levels of meningococcal disease in Europe
- Group B (2/3) and Group C (1/3)
- 11 Group C deaths between July 1999-June 2000
- Highest risk in the under 5's and 15-18 years



*Evidence for public health intervention
Men C vaccine introduced Oct 2000*

Meningococcal Disease

Cork & Kerry 1998-2011



Evidence for Intervention

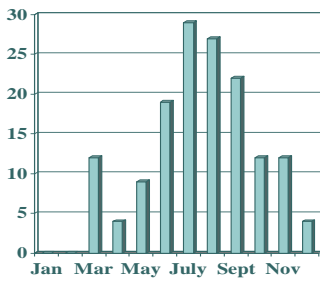
Second Example: VTEC Infection



- o Verocytotoxigenic E.coli (VTEC)
- o Potentially very serious ID pathogen
- o Caused by no. different strains [best known E.coli O157]
- o 5-10% complication HUS
Haemolytic Uraemic Syndrome



VTEC Notifications HSE-South 2012



Marked increase in VTEC notifications

- rural areas in particular
- doubling of rate of HUS notifications



VTEC Outbreak

Contaminated private well water supplies

↑ average rainfall



Need for public health intervention

National multi-agency expert group established

(HSE, EPA, Local Authorities, FSAI)



● ● ● | Spread

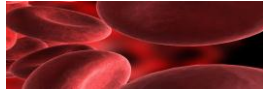


- Natural Reservoir unknown
- First person gets infected through contact with an infected animal



● ● ● | Modes of Transmission

- Direct exposure to the blood, bodily fluids, of a dead or living infected person or animal



- Injury from needles and other sharp implements contaminated by the blood of a dead or living infected person or animal



● ● ● | Modes of Transmission

- Items that have become contaminated with an Ebola patient's infectious fluids such as soiled clothing, bed linen, or used needles



- Contact with bodily fluids includes unprotected sexual contact with patients up to 12 weeks post recovery



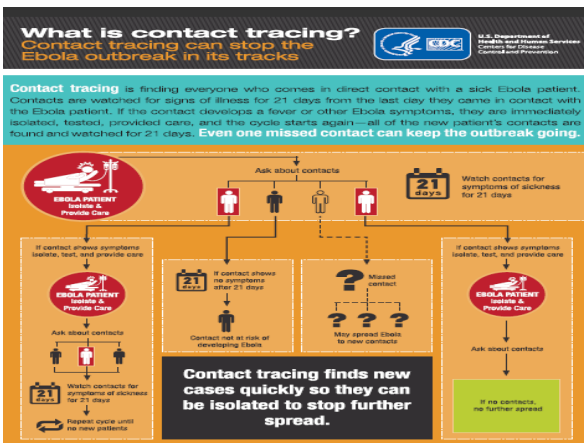
● ● ● Incubation Period

- Interval between being in contact with an infected person and developing symptoms of disease varies between 2-21 days



● ● ● Treatment





Further information

- o Health Protection Surveillance Centre www.hpsc.ie
- o National Immunisation Office www.immunisation.ie
- o European Centre for Disease Control www.ecdc.eu
- o Centers for Disease Control and Prevention www.cdc.gov
- o World Health Organisation www.who.ie
