OUTBREAK & INFECTIONS AT CAMP

PREVENTION AND MANAGEMENT

Presented at the OCA conference 2016

WHAT MAKES ME THINK I CAN TALK TO YOU ABOUT THIS TOPIC?

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OUTBREAK & INFECTIONS AT CAMP

OBJECTIVES:

- Preventing the spread of diseases at camp
- Identification of some common illnesses
- To isolate or not
- When to send a child home
- Notifying the authorities

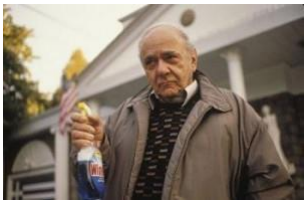
But first……..

EPIDEMIOLOGY 101

A look at how disease is spread

DEFINITION OF EPIDEMIOLOGY

The word “epidemiology” is derived from the Greek words: epi “upon”, demos “people” and logos “study”.



This broad definition of epidemiology can be elaborated upon further:

DEFINITIONS

Study includes: surveillance, observation, hypothesis testing, analytic research and experiments.

Distribution refers to analysis of: times, persons, places and classes of people affected.

Determinants include factors that influence health: biological, chemical, physical, social, cultural, economic, genetic and behavioural.

DEFINITIONS

Health-related states and events refer to: diseases, causes of death, behaviours such as use of tobacco, positive health states, reactions to preventive regimes and provision and use of health services.

Specified populations include those with identifiable characteristics, such as occupational groups.

APPLICATION OF EPIDEMIOLOGY

The application of epidemiological principles to prevention and control, is used to promote, protect, and restore health.

EXAMPLE: Epidemiological features of smallpox

Epidemiological methods were used to establish the following features of smallpox:
• there are no non-human hosts,
• there are no subclinical carriers,
• recovered pts are immune and cannot transmit the infection,
• naturally-occurring smallpox does not spread as rapidly as other infectious diseases such as measles or pertussis,
• transmission is generally via long-lasting human to-human contact, and
• most patients are bedridden when they become infectious, which limits transmission

CHAIN OF INFECTION

Communicable diseases occur as a result of the interaction between:

infectious agent x transmission process x host x environment

The control of such diseases may involve changing one or more of these components.

These diseases can have a wide range of effects, varying from silent infection – with no signs or symptoms – to severe illness and death

COMMUNICABLE DISEASE EPIDEMIOLOGY

The major thrust of communicable disease epidemiology is to clarify the processes of infection to develop, implement and evaluate appropriate control measures.

Knowledge of each factor in a chain of infection may be required before effective intervention can take place. However, this is not always necessary; it may be possible to control a disease with only a limited knowledge of its specific chain of infection.

1ST LINK: THE INFECTIOUS AGENT

A large number of microorganisms cause disease in humans.

Infection is the entry and development or multiplication of an infectious agent in the host.

Infection is not equivalent to disease, as some infections do not produce clinical disease.

2ND LINK: TRANSMISSION

Direct transmission is the immediate transfer of the infectious agent from an infected host or reservoir to an appropriate entry point through which human infection can take place. This may be by direct contact such as touching, kissing or sexual intercourse, or by the direct spread of droplets by sneezing or coughing.

2ND LINK: TRANSMISSION

Indirect transmission may be vehicle-borne, vector-borne or airborne.

Vehicle-borne transmission occurs through contaminated materials such as food, clothes, bedding and cooking utensils.

Vector-borne transmission occurs when the agent is carried by an insect or animal (the vector) to a susceptible host; the agent may or may not multiply in the vector.

2ND LINK: TRANSMISSION

Long-distance *airborne transmission* occurs when there is dissemination of very small droplets to a suitable point of entry, usually the respiratory tract. Dust particles also facilitate airborne transmission, for example, of fungal spores.

3RD LINK: THE HOST

The host is the person or animal that provides a suitable place for an infectious agent to grow and multiply under natural conditions.

The points of entry to the host vary with the agent and include the skin, mucous membranes, and the respiratory and gastrointestinal tracts.

3RD LINK: THE HOST

The reaction of the host to infection is extremely variable, being determined by the interaction between host, agent and mode of transmission.

The spectrum of this reaction ranges from no apparent signs or symptoms to severe clinical illness, with all possible variations between these two extremes.

3RD LINK: THE HOST

The incubation period—the time between entry of the infectious agent and the appearance of the first sign or symptom of the disease—varies from a few hours (staphylococcal food poisoning) to years (AIDS).

THE CONSEQUENCES OF INFECTION

Largely determined by the host's resistance.

Such resistance is usually acquired through previous exposure to or immunization against the agent in question.

Immunization (or vaccination) is the protection of susceptible individuals from communicable disease by the administration of a vaccine.

IMMUNIZATIONS

A vaccine can be:

- a living modified infectious agent (as for measles)
- inactivated organisms (as for pertussis)
- an inactive toxin (as for tetanus)
- bacterial polysaccharides.

IMMUNIZATIONS

Antibodies – which are formed as part of the natural immune response to pathogens – can be pooled from blood donations and given as post-exposure prophylaxis for a few diseases (such as rabies, diphtheria, varicella-zoster and hepatitis B) to people that have not been adequately immunized.

IMMUNIZATIONS

This is called passive immunization, and is done on a much smaller scale than active immunization due to its risks, indications and cost.

Passive transmission of maternal antibodies through the placenta can also confer resistance to infection in the fetus.

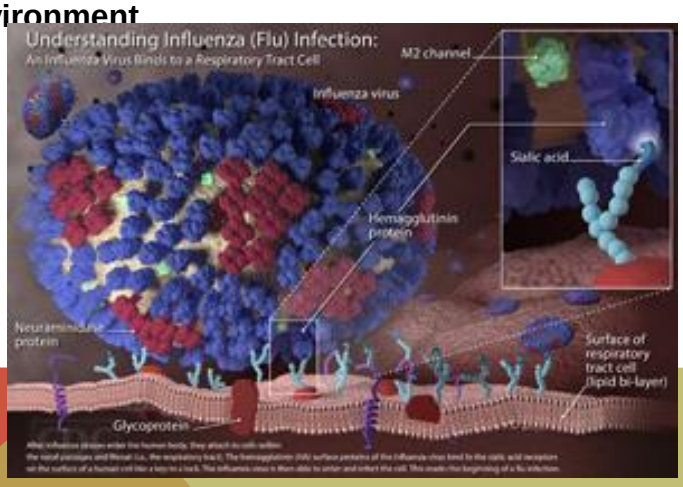
4TH LINK: THE ENVIRONMENT

The environment plays a critical role in the development of communicable diseases. General sanitation, temperature, air pollution and water quality are among the factors that influence all stages in the chain of infection.

In addition, socioeconomic factors – such as population density, overcrowding and poverty – are of great importance

RE-CAP CHAIN OF INFECTION

infectious agent x transmission process x host x environment



INVESTIGATING AND CONTROL OF EPIDEMICS

The purpose of investigating a communicable disease epidemic is to identify its cause and the best means to control it. This requires detailed and systematic epidemiological work, in the following steps:

- undertaking preliminary investigation
- identifying and notifying cases
- collecting and analyzing data
- managing and controlling
- disseminating findings and follow-up

INVESTIGATION

The initial stage of investigation should verify the diagnoses of suspected cases and confirm that an epidemic exists. The preliminary investigation also leads to the formulation of hypotheses about the source and spread of the disease, and this in turn may lead to immediate control measures.

INVESTIGATION

Early reports of a possible epidemic may be based on observations made by a small number of health workers or may reflect figures gathered by the formal communicable disease notification system that operates in most countries.

Sometimes reports from several health districts are needed; the number of cases in a single area may be too small to draw attention to an epidemic.

IDENTIFYING CASES

The investigation of a suspected epidemic requires that new cases be systematically identified, and this means that what constitutes a case must be clearly defined. Often, detailed information on at least a sample of the cases needs to be collected. The cases reported early in an epidemic are often only a small proportion of the total; a thorough count of all cases is necessary to permit a full description of the extent of the epidemic.

IDENTIFYING CASES

As soon as an epidemic is confirmed, the first priority is to control it. In severe contagious epidemics, it is often necessary to follow up contacts of reported cases to ensure the identification of all cases and limit the spread of the disease.

MANAGEMENT AND CONTROL

The management of an epidemic involves treating the cases, preventing further spread of the disease and monitoring the effects of control measures. Treatment is straightforward except in large-scale epidemics – especially when these occur as a result of social or environmental disruption – for which external resources may be needed. Control measures can be directed against the source and spread of infection and towards protecting people exposed to it.

MANAGEMENT AND CONTROL

Usually all of these approaches are required. In some cases, however, removing the source of infection may be all that is necessary, as when a contaminated food is withdrawn from sale. An essential component of control measures is to inform health professionals and the public of the likely causes, the risk of contracting the disease and the essential control steps.

This is particularly important if exposed people need to be protected through immunization, for example in containing an outbreak of measles.

MANAGEMENT AND CONTROL

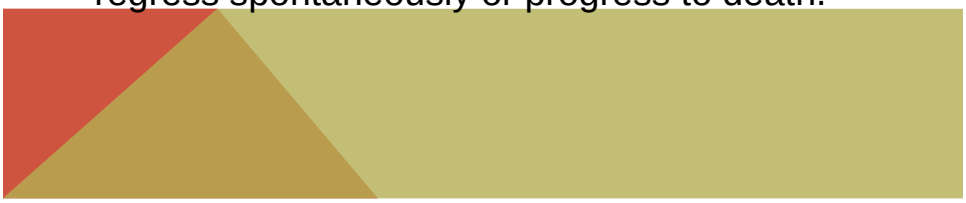
Once control measures have been implemented, surveillance must continue to ensure their acceptability and effectiveness.

This may be relatively easy in short-term epidemics but difficult when dealing with longer-term epidemics. For example, epidemic meningococcal meningitis requires large-scale immunization programs. Follow-up epidemiological and laboratory studies are often indicated, particularly to establish long-term cost-effectiveness.

NATURAL HISTORY OF A DISEASE

The term natural history refers to the stages of a disease, which include:

- pathological onset;
- the pre-symptomatic stage, from onset of pathological changes to the first appearance of symptoms or signs; and
- the stage when the disease is clinically obvious and may be subject to remissions and relapses, regress spontaneously or progress to death.



NATURAL HISTORY OF A DISEASE

Detection and treatment at any stage can alter the natural history of a disease, but the effects of treatment can only be determined if the natural history of the disease in the absence of treatment is known.

ENVIRONMENTAL FACTORS THAT CAN AFFECT HEALTH

Psychological Stress: unemployment, shiftwork, human relationships

Biological: Bacteria, viruses, parasites

Physical: Climate, noise, radiation, ergonomics

Accidental: Hazardous situations, speed, influence of alcohol, drugs

Chemical: Tobacco, chemicals, dust, skin irritants, food additives

THE PLANNING CYCLE:

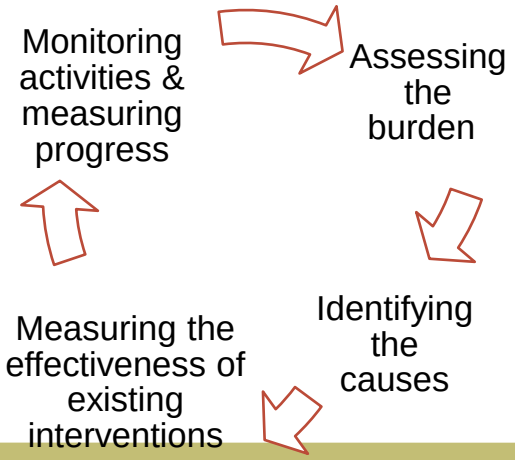


Table 11.1. Basic epidemiological information about a disease

Natural history in the individual:

- development with age (cohort basis)
- early indicators (for screening)
- impact of different treatments
- possibility of cure
- need for care
- social impact

Etiology:

- specific causal factors
- other risk factors

Development in the community:

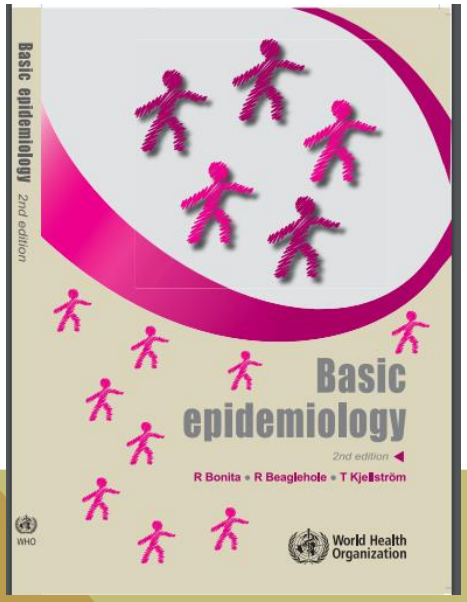
- time trends
- variations with age (cross-sectional basis)

Differences in occurrence:

- sex
- ethnic group
- social class
- occupation
- geographical area

Possibilities for prevention:

- specific actions to address causal factors and underlying determinants
- general actions to address other risk factors
- impact of medical services including screening and early detection
- impact of health policy



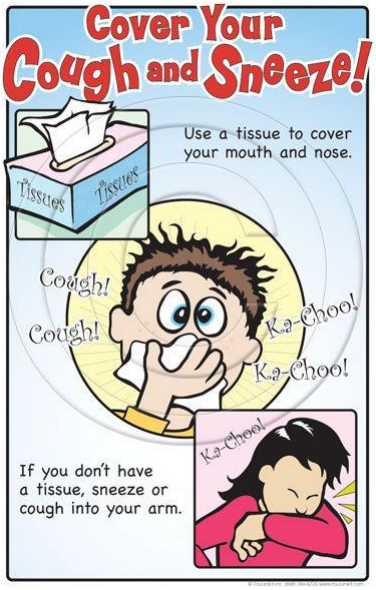
http://www.nwcphp.org/training/opportunities/online-courses/basic-infectious-disease-concepts-in-epidemiology

HAZARD CONTROL

HAZARD CONTROL

At the source, along the path and at the worker/camper

CONTROL AT THE HAZARD:



CONTROL ALONG THE PATH:

CONTROL AT THE WORKER/CAMPER:

CONTROL AT THE WORKER/CAMPER:

PREVENTING DISEASES AT CAMP

SOME COMMON CAMP DISEASES

- Influenza
- Pink eye (bacterial/viral)
- Gastroenteritis/Norovirus
- Salmonella
- Giardia
- Impetigo
- Hand, foot and mouth disease

GOVERNMENT OF CANADA SITE

IDENTIFICATION OF COMMON ILLNESSES

EXAMPLE #1:

Common Symptoms: Fever or feeling feverish/chills, Cough, Sore throat, Runny or stuffy nose, Muscle or body aches, Headaches, Fatigue (tiredness), Vomiting and diarrhea.

What disease might this be?

common cold, influenza, meningitis, West Nile?

How it's spread:

Isolate or Not:

Report?

Home?:

CLEANING

Use a bleach based product or diluted bleach to disinfect all hard surfaces, door knobs, etc.

Wash bedding

Empty and clean garbage pail if used for tissues

Wash/replace water bottle, toothbrush etc.

EXAMPLE #2:

Common Symptoms: Diarrhea, Gas, Greasy stools that tend to float, Stomach or abdominal cramps, Upset stomach or nausea/vomiting
Dehydration (loss of fluids)
What disease might this be?: gastroenteritis, norovirus, giardia, crohns
How it's spread:
Isolate or Not:
Report?
Home?:

CLEANING

Clean with soap and paper towels or cloths. Wear gloves.

Disinfect after area has been cleaned.

Bleach solution (1 part bleach to 9 parts cool water) has to remain wet on the area for 20 minutes!

(FYI: kill time for e-coli is only 2 minutes)

EXAMPLE #3:

Common Symptoms: starts with a fever, reduced appetite, sore throat, and a feeling of being unwell (malaise). One or two days after the fever starts, painful sores can develop in the mouth (herpangina). Sometimes there is a rash

What disease might this be?: Hand foot and mouth disease, chicken pox, measles, rubella

How it's spread:

Isolate or Not:

Report?

Home?:

CLEANING

Same as everything else: disinfect hard surfaces with bleach.

EXAMPLE #4:

Common Symptoms: Redness or swelling of the white of the eye or inside the eyelids, Increased amount of tears, White, yellow or green eye discharge, Itchy, irritated, and/or burning eyes, Increased sensitivity to light, Gritty feeling in the eye, Crusting of the eyelids or lashes

What disease might this be?: Viral pink eye, bacterial pink eye, allergy-related conjunctivitis

How it's spread:
Isolate or Not:
Report?
Home?:

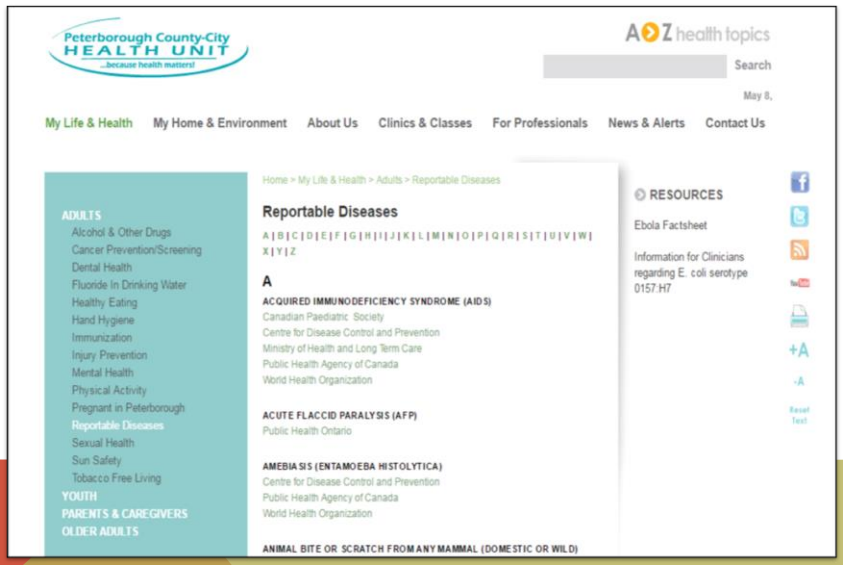
CLEANING

Next verse, same as the first….

FOR ANY ILLNESS, COMMUNICABLE OR OTHERWISE:

RESOURCES

https://www.peelregion.ca/health/infectioncontrol/pdf/ENV-0141.pdf



THANK YOU!