

Communicable Disease Control in NC

Laws and Principles

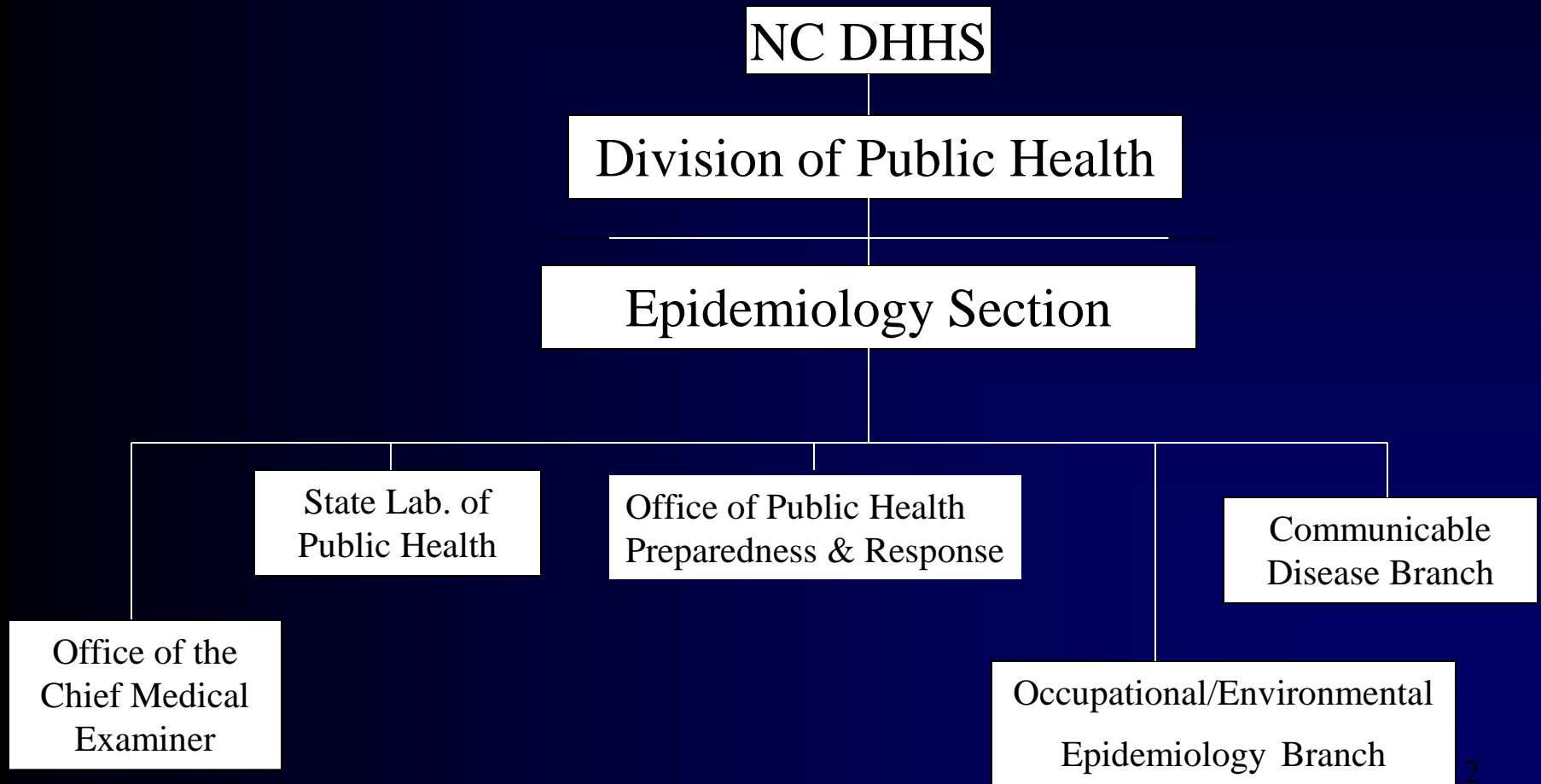
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NC DHHS - Division of Public Health

Epidemiology Section

Credits: J.N. MacCormack (Laws), Kristina Simeonsson (Principles)

Who We Are....



Forms of Law

- Statutes - enacted by Legislature (General Assembly).
- Rules - adopted by agencies of Executive Branch of government.
- Ordinances - adopted by local county or municipal government.

General Aspects of NC Laws

- All forms of law are enforceable, although statutes are generally considered to carry more weight than rules and ordinances
- Rules and ordinances derive their authority from the General Statutes
- Statutes derive their authority from the NC Constitution
- Rules “flesh out” statutes
- Rules should not repeat what is already stated in a statute

Communicable Disease Laws

- Most, but not all, communicable disease statutes are in Article 6 of Chapter 130A of the NC General Statutes.

Reporting of Communicable Diseases

- Rule 10A NCAC 41A .0101
 - lists reportable diseases, conditions, and reportable positive laboratory tests
 - Note foodborne diseases
 - Reporting time frame: Within 7 days, within 24 hours, or immediately
 - CD report card –and Electronic Reporting

Disease Surveillance Systems - NC

- CASE REPORTS: NC-EDSS --North Carolina Electronic Disease Surveillance System-- since 2008
 - Prior to NCEDSS: 1987-2007: NETSS (National Electronic Transmission Surveillance System)
- Syndromic Surveillance: NC-DETECT, for early event detection and monitoring (Hospital Emergency Depts., Poison Center calls, Ambulance runs/EMS)
- Urgent secure communication: NC-HAN (Health Alert Network, www.nchan.org)

Who Reports?

- Physicians (GS 130A-135)
- School principals & DCC operators (GS 130A-136)
- Medical facilities *may report* (GS 130A-137)
- Operators of restaurants & other food or drink establishments (GS 130A-138):
 - Outbreak or suspected outbreak.
 - Infected food handler.
 - Must call LHD within 24 hours.
 - Not required to send CD report card.
- Laboratories (Report direct to DPH rather than LHD;
may report electronically)

Remember....

- A disease does NOT have to be reportable to be investigable!

Investigation: Role of Local HD

- The Local Health Department must:
 - Immediately investigate all reports of Com. Disease
 - Determine authenticity of the report
 - Determine identity of all persons for whom control measures are required
 - Collect and submit lab specimens
 - Determine which control measures have been given

Investigation

- Access to medical records and information
- Physician/medical facility/laboratory must permit local or state health director to examine and copy records pertaining to
 - diagnosis, treatment, or prevention of a CD
 - a known or suspected outbreak

Control Measures

- *Control of Communicable Diseases Manual*, (APHA publication), except for a few diseases & conditions covered in NCAC
- May be superceded by CDC publications
- When not specified, see the *guiding principles* in rule 10A NCAC 41A .0201(b).

Confidentiality

- In general, records that identify a patient specifically are not public records and are to be treated confidentially

Confidentiality (continued)

- Exceptions:
 - When necessary for control of a disease representing a significant **public health hazard** [GS 130A-143(4) and rule .0211]
 - When information is collected by a person other than a physician or nurse, it may not be protectable
 - Others as specified in GS 130A-143

Special Rules

- 10A NCAC 41A .0301-0302:
Turtles may not be sold as pets
- 10A NCAC 41A .0303: Records of bird sales by retail stores must be kept for 6 months

Principles of Communicable Disease

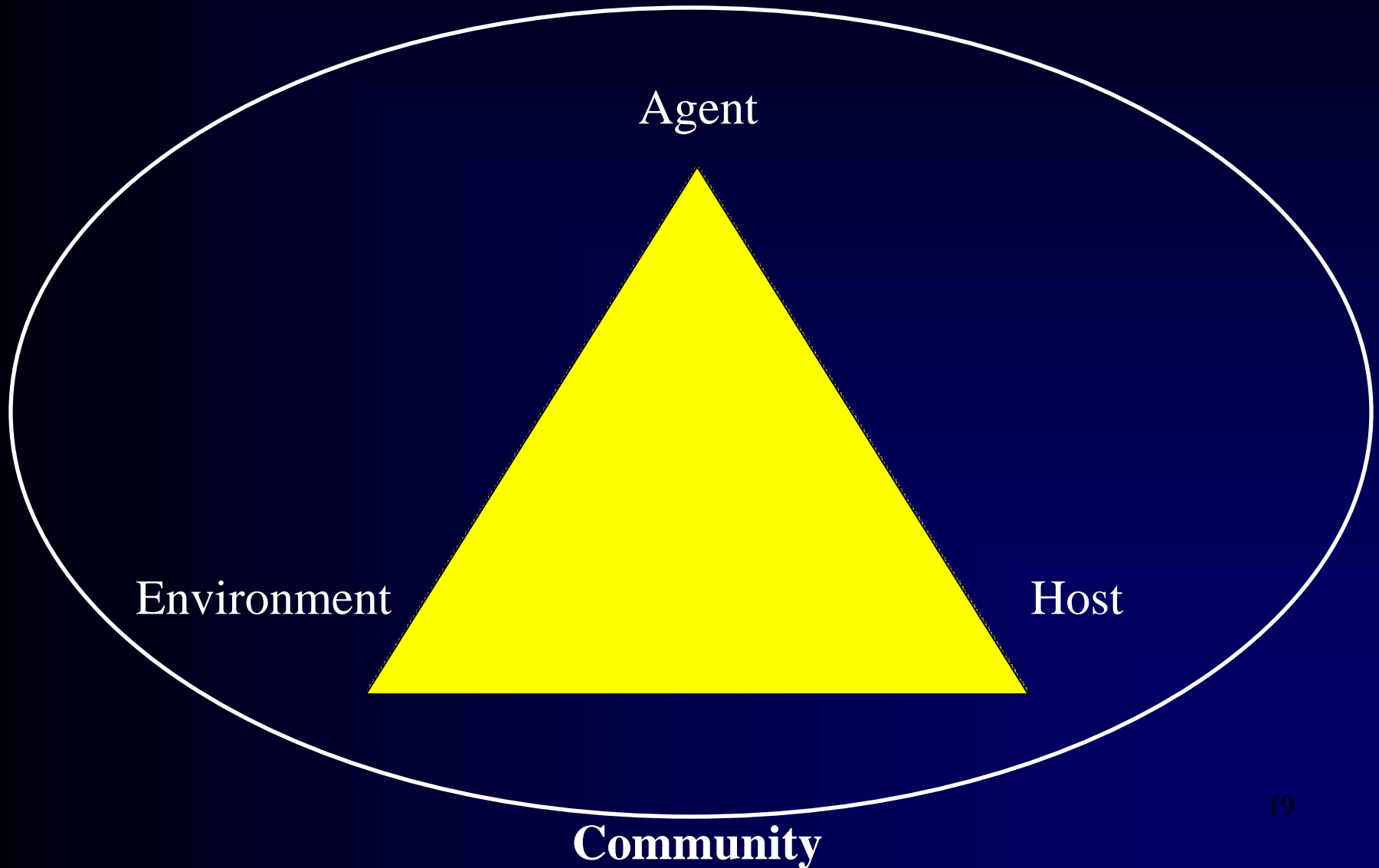
Credits: K. Simeonsson, MD, MSPH

“Communicable Disease”

An illness due to a specific infectious agent that arises through transmission of that agent or its products from an infected person, animal or inanimate source, to a susceptible host, through an intermediate plant or animal host, vector, or the inanimate environment.

(Adapted fr. Dictionary of Epidemiology, Last, 2001)

Epidemiologic Triad



Types of Agents

Biologic

Bacteria

Virus

Parasite

Protozoa

Fungi

Prion (?)

Chemical

Poison

Alcohol

Smoke

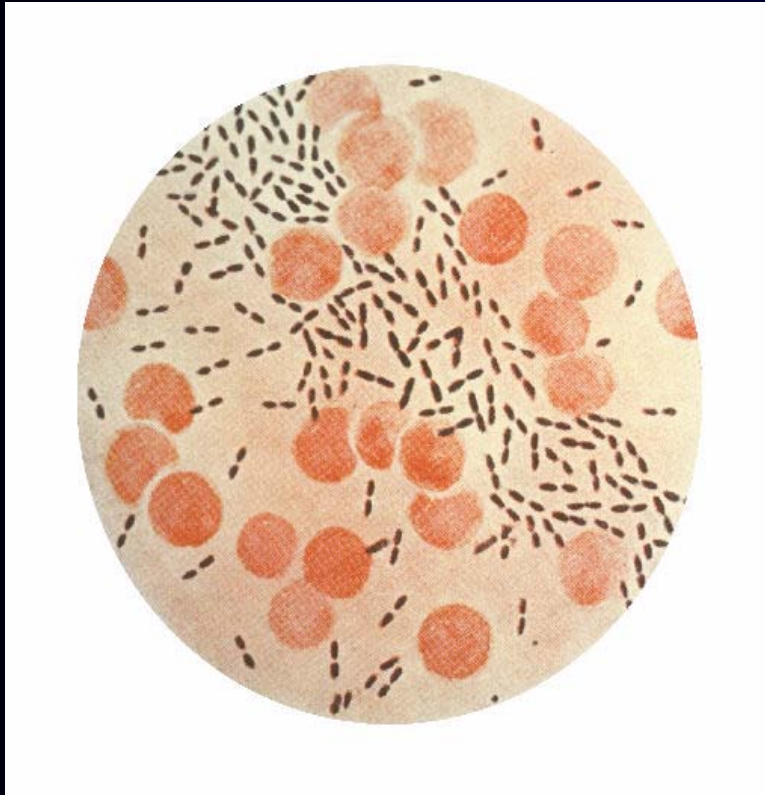
Physical

Trauma

Radiation

Fire

Agent Factors



- Infectivity
 - Ability of a pathogen to establish infection
- Pathogenicity
 - Ability to cause disease
- Virulence
 - Severity of illness in those infected

Host Factors



- Age
- Behavior
- Immunologic status
- Genetic susceptibility
- Nutritional status

Environmental Factors



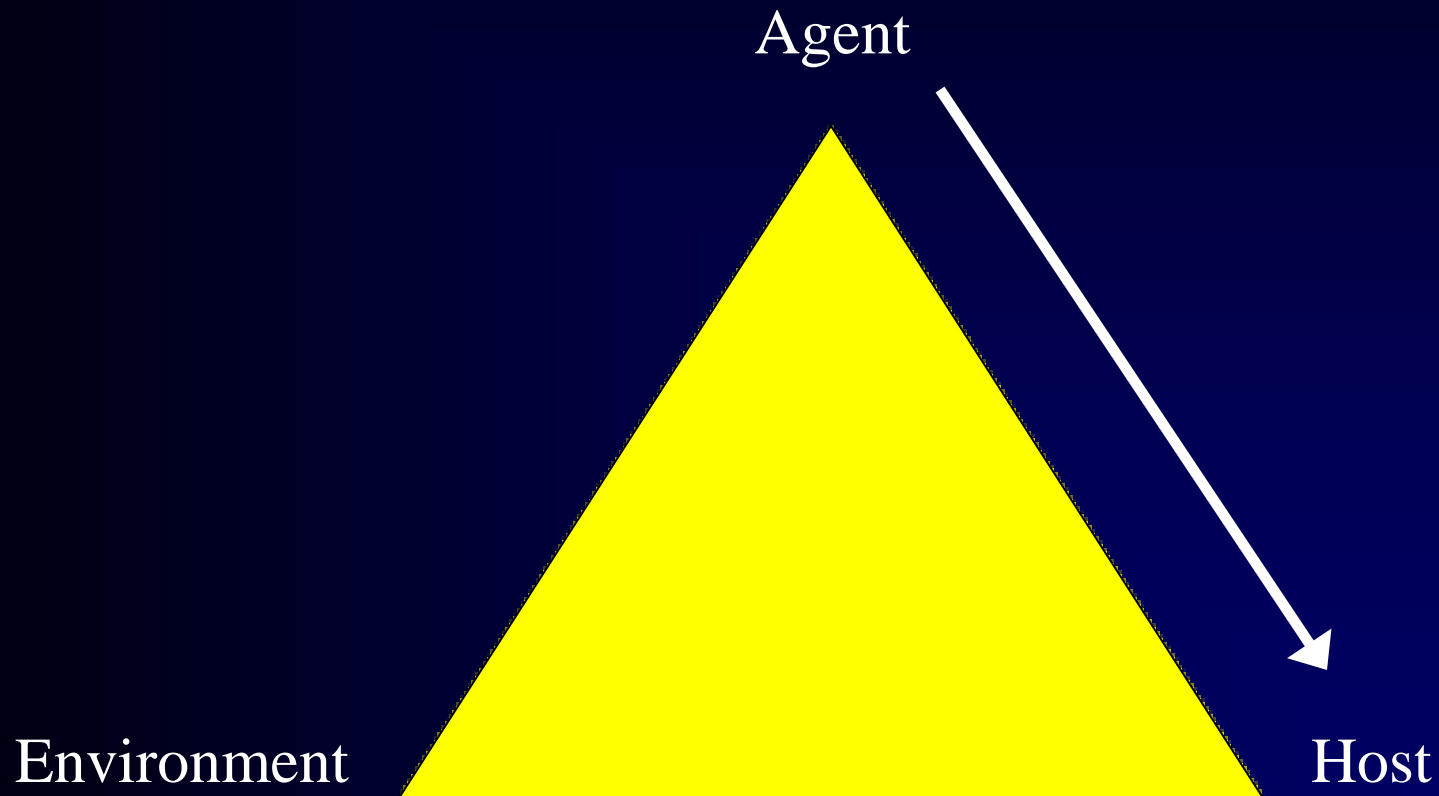
- Physical
 - climate, season, geology
- Biologic
 - insect vectors
- Socioeconomic
 - crowding
 - sanitation

Community Factors



- Population
- Infrastructure
- Culture
- Medical facilities
- Public health infrastructure
- Political will

How Does Infection Occur?



Chain of Infection

- Agent
- Reservoir
- Portal of exit
- Transmission
- Portal of entry
- Establishment of infection (disease?)
in new host

Chain of Infection



Reservoir

The Habitat in which an infectious agent normally lives, grows, and multiplies

Human Reservoir

- Respiratory infections
e.g., tuberculosis, pertussis
- Sexually-transmitted infections
e.g., gonorrhea, Chlamydia infection

Animal Reservoirs: Zoonotic infections

Example: Rabies



Other reservoirs

- Water
 - *Legionella*
- Soil
 - *Clostridium* species
(botulism, tetanus)
 - *Histoplasma capsulatum*



Portals

Portals of Exit

- Body fluids
- Skin
- Shower head



Portals of Entry

- GI tract
- Respiratory tract
- Skin
- Mucous membrane
- Percutaneous (blood)

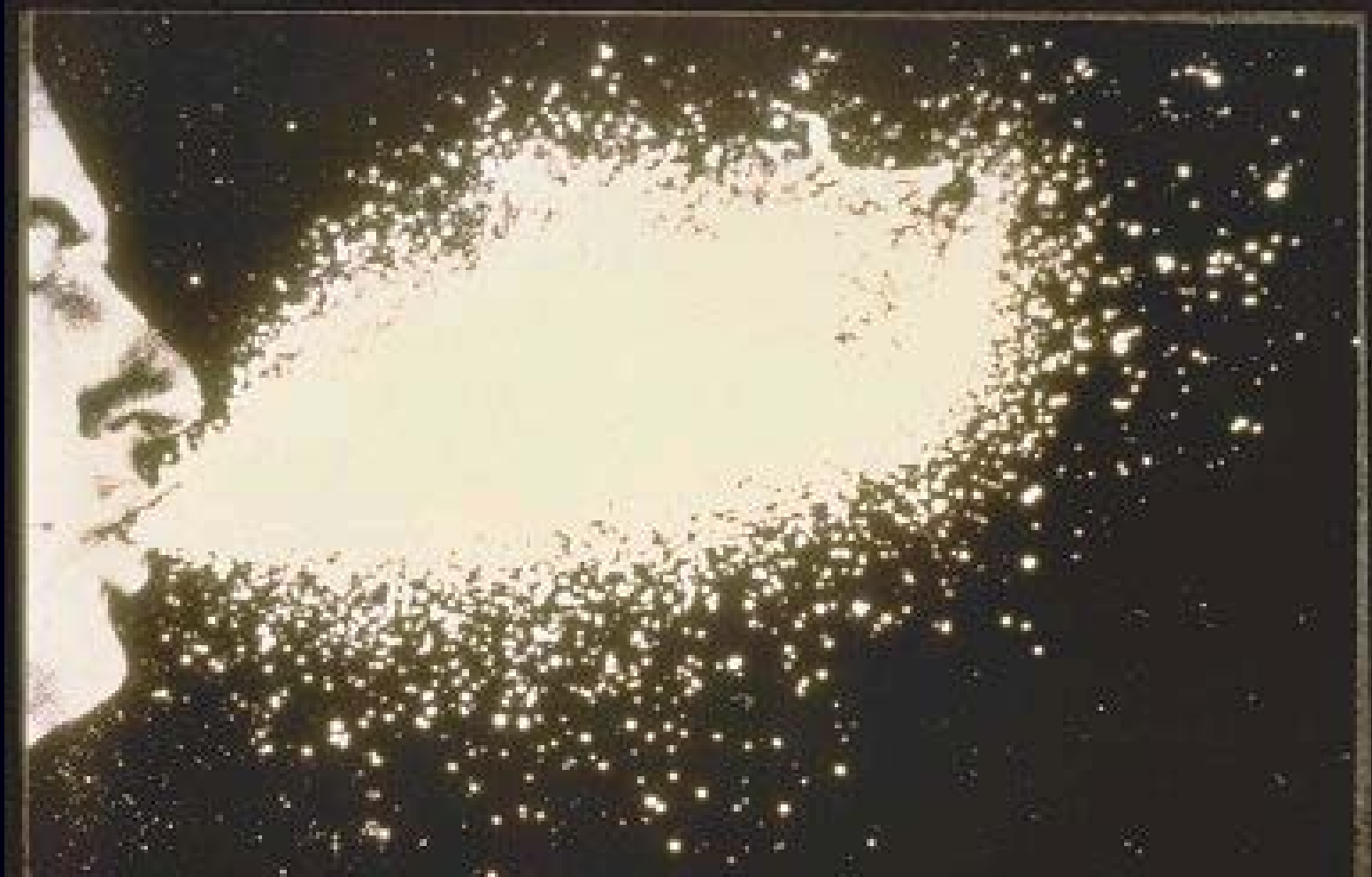
Modes of Transmission

- Direct
 - direct contact
 - droplet spread
- Indirect
 - Vector
 - common vehicle
 - airborne

Direct Transmission: Direct Contact



Direct Transmission: Droplet



Indirect Exposure: Common vehicle?



Indirect Exposure: Common Vehicle

- Inanimate object that facilitates transmission of an infectious agent
 - Food
 - Water
 - Medical equipment
 - Toys
 - *Kitchen equipment*



Indirect Exposure: Common Vehicle



Indirect Exposure: Vector

A living animal (arthropod)
capable of transmitting
infectious agent from one
host to another

- biological transmission
- mechanical transmission



Natural History of Disease

- Susceptible stage
- Exposure
- Incubation period
- Onset of symptoms
- Clinical disease
- Recovery or death
- Immunity
 - temporary versus permanent

Incubation Period

- Minutes Heavy metals
- Hours Staphylococcal toxin
- Days Shigella, Salmonella
- Weeks Hepatitis
- Months Rabies, tuberculosis
- Years Leprosy

Spectrum of Disease

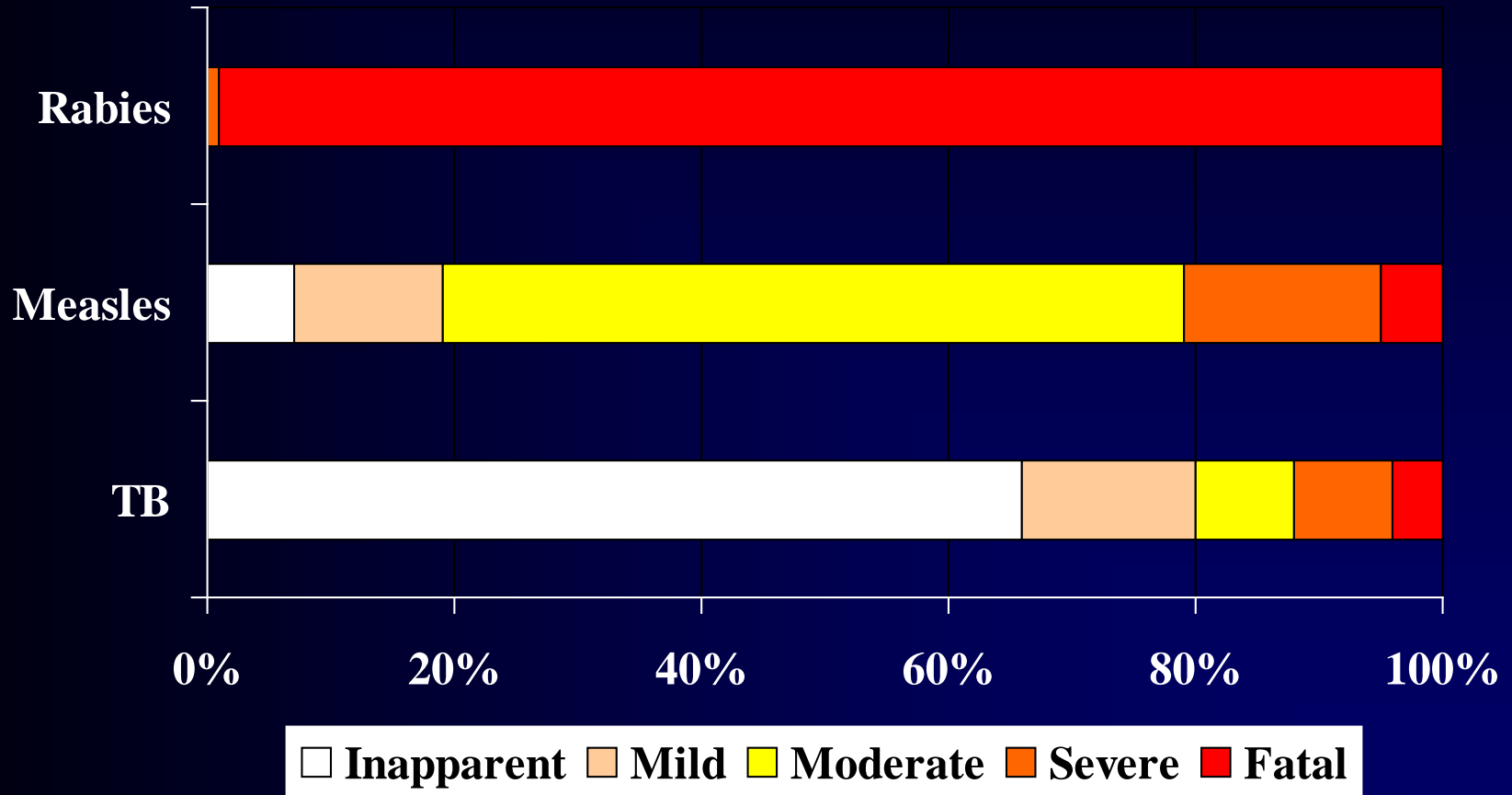
Clinical features

- Subclinical
- Mild
- Moderate
- Severe / Fatal

Epidemiological features

- Asymptomatic Carrier
- Chronic Carrier

Varying Degrees of Clinical Severity



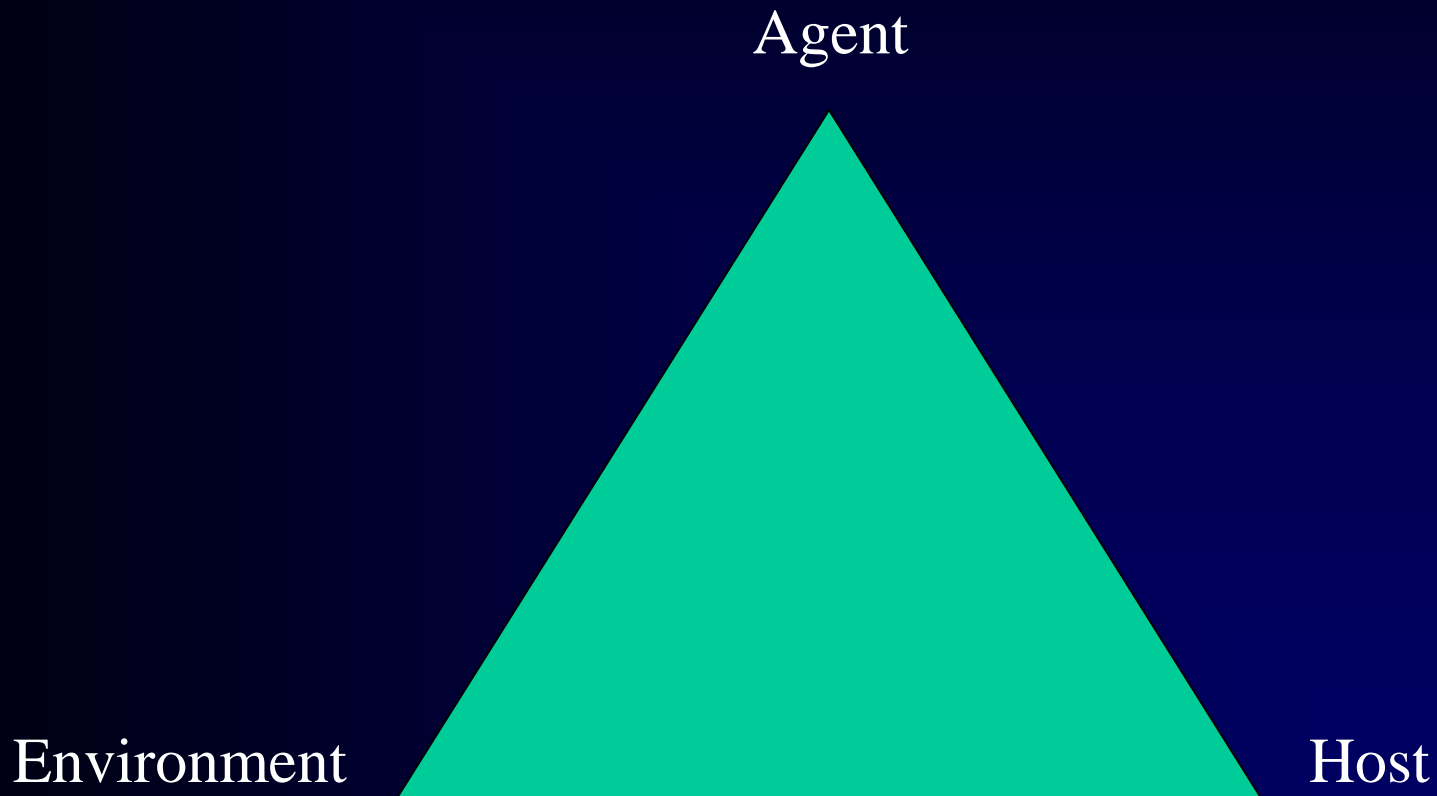
Levels of Disease Incidence

- Individual infection
- Endemic levels
- Epidemic levels
- Pandemic levels

Causes of Epidemics

- Change in virulence of agent
- Change in environment
- Change in host susceptibility
- Change in modes of transmission

Approaches to Prevention



Prevention: Agent

- Control measures aimed at destroying the agent in its reservoir
- Examples:
 - chlorination
 - surgical scrubbing

Prevention: Host

- Modify hosts to make them less vulnerable to disease / infection
- Examples:
 - vaccination
 - prophylaxis
 - improving nutritional status

Prevention: Environment

- Control measures are adapted to the type of transmission involved
- Examples:
 - spraying of insecticide to eliminate mosquito vectors
 - draining cooling towers when not in use

Prevention: Community

- Support your local public health department!
- Examples:
 - Collaborative investigations: restaurant inspection and co-worker interviews when a *Salmonella* case who works there is identified

Conclusion

- Infectious disease results from interactions between agent, host, and the environment
- Epidemiologic triad provides the conceptual framework
 - disease in individuals
 - disease in communities
 - prevention and control measures

If only investigations were this
easy...



How to reach us

Communicable Disease
Branch (24/7):

(919) 733-3419