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Scientific

Method

inquiry

hypotheses

phenomena

knowledge

researchers

results

data

hypothesis

methodology

theory

explanations

procedures

principles

quantitative

qualitative

experimental

observational

descriptive

correlational

comparative

historical

ethnographic

phenomenological

grounded

critical

reflexive

participatory

action

transformative

emancipatory

liberatory

2

Why do we investigate outbreaks?

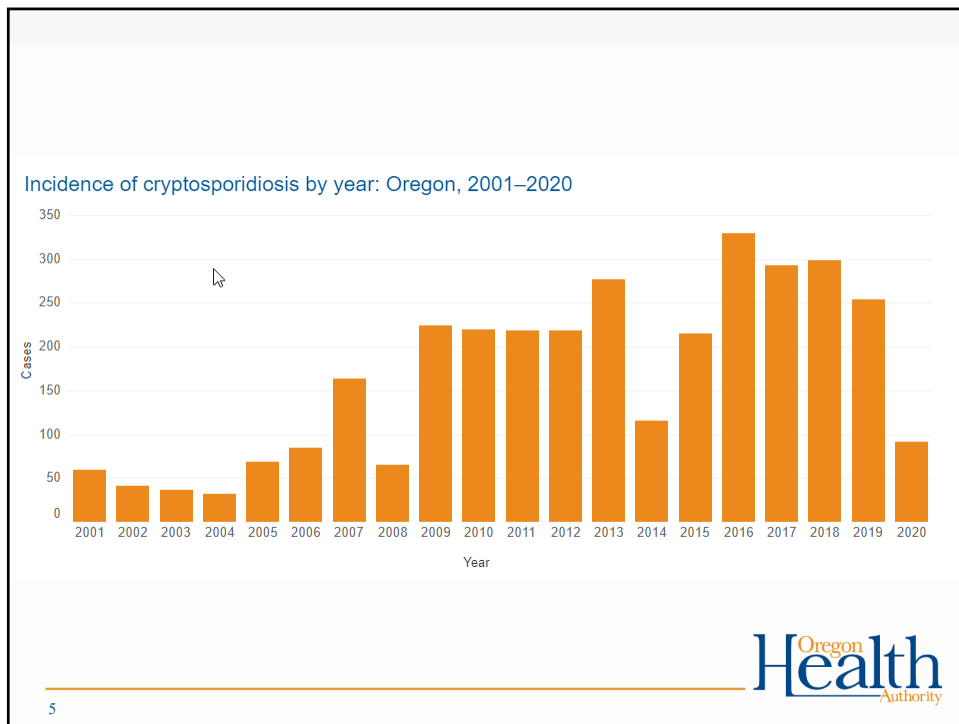
- Determine cause of disease
- Identify source of infection
- Determine mode of transmission
- Understand who is at risk
- Control/prevention of additional illnesses

1. Establish Existence of Outbreak

- Surveillance data
- Contact health care providers, neighboring counties, states, or national data

Don't be fooled by:

- New lab test (more sensitive)
- Increase in population size
- Increased reporting or change in how reported
- Increased awareness of disease in public



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2. Verify the Diagnosis

- Contact labs, providers and case patients
- Collect laboratory specimens
- Don't spread rumors!

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3. Define and Identify Cases

- Case definition: person, place, time and clinical information
- Make a line list

GASTROENTERITIS CASE LOG County _____ Facility _____ Outbreak # _____

Setting of exposure: ☐ Nursing home ☐ Day care ☐ School ☐ Hospital ☐ Other _____

IDENTIFIERS						ONSET		SIGNS & SYMPTOMS						OUTCOME							
List all hospital patients, preschoolers, students, residents, and staff with any gastrointestinal illness						First vomiting or diarrhea		check all that apply						Hospitalized (yes/no)							
name	age	sex	code	room	date	am	pm	nausea	vomiting	diarrhea	3+ loose stools in 24 hrs	fever (101°F or documented)	compa	bloody diarrhea	duration 48 hr or O	relapsed within 14 days	lab specimen collected	sent to PHO	sent to O&D	hospitalized (yes/no)	decd

4. Descriptive Epidemiology

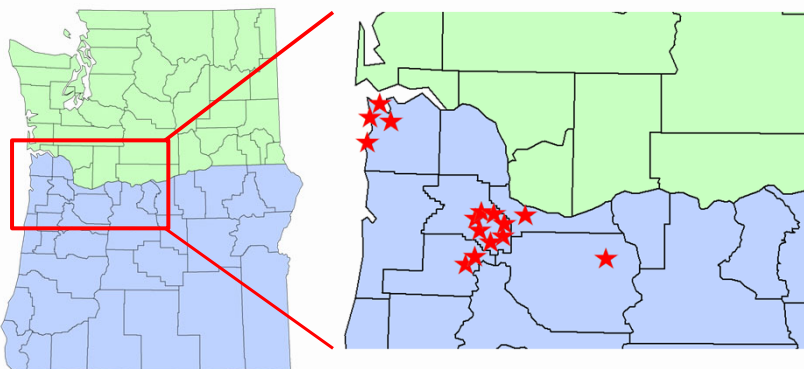
- Characterize the outbreak in terms of person place and time
- Make epidemic curve
- Use maps to visualize in space and time

“Person” Characteristics

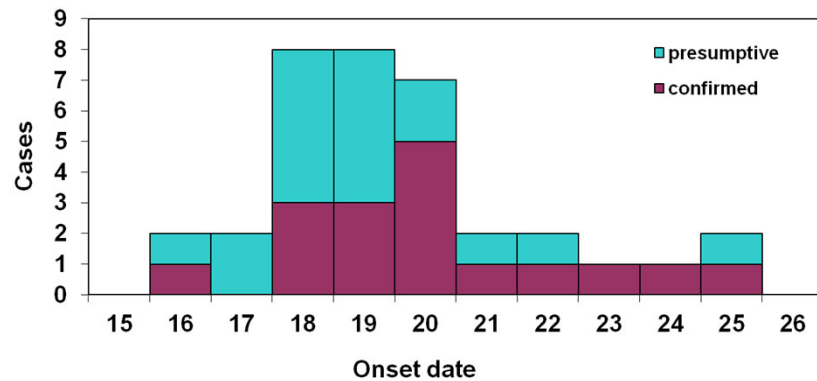
- Age
- Sex
- Race
- Ethnicity
- Medical status
- Exposures
- Occupation



Residences of Cases

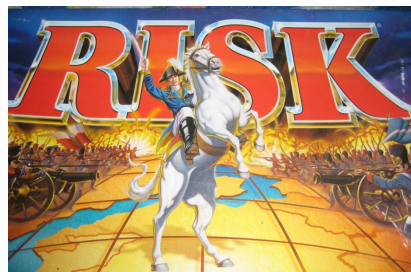


Epidemic Curve



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5. Determine who is at risk



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6. Develop Hypotheses

- Use descriptive epi
- Use historical information
- Source of agent – usual reservoir
- Mode of transmission
- Pertinent exposure
- Talk to patients

7. Evaluate Hypotheses

- Design a study and questionnaire
- Use analytic epidemiology

Cohort
Case-control
Case-Case

Cohort Study

- How are subjects selected?
 - Not based on illness
 - Based on other commonality
- When would you use this type of study?
 - Small, well-defined population
- Can calculate risks and relative risks

Case-Control Study

- How are subjects selected?
 - Based on illness
- When would you use this type of study?
 - No small, well-defined population
- Cannot calculate risks and relative risks
 - Must use odds and odds ratios as surrogates

8. Reconsider Hypotheses

- Do data make sense?
- If not, may need to do another study or involve further lab or environmental tests



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9. Implement Control Measures

- Control this outbreak
- Prevent future outbreaks



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Control Measures

- Recall product
- Administer prophylaxis/vaccine
- Make environmental changes

CHOLERA. **PREVENTION.**

1. Let every person be washed perfectly clean, morning and evening.
2. Let every room be cleaned and swept every day, and well washed at least once a week.
3. Let no rubbish nor dirt lie about the door, nor near the house.
4. Let off all stagnant water.
5. Let the house be whitewashed with hot lime.
6. Beware of Drunkenness—nothing is so likely to bring on Disease.

If any one is seized with sickness, slight vomiting, and purging, a burning heat at the stomach, with cramp in various parts of the body, and a feeling of cold all over, it probably is the Cholera.

10. Communicate Findings

- Share locally, state, national and international
- Write up findings
- Present findings
- Use media

Steps of an Outbreak Investigation

1. Establish the existence of an outbreak
2. Verify the diagnosis
3. Define and identify cases
4. Perform descriptive epidemiology
5. Determine who is at risk
6. Develop hypotheses
7. Evaluate hypotheses
8. Perform additional studies
9. Implement control and prevention measures
10. Communicate findings