

Principles of Epidemiology for Public Health EPID 160

UNC School of Public Health
Department of Epidemiology
Summer 2002

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1/6/2002

Introduction to EPID 160

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INTRODUCE VIC - Faculty since 1980, taught 168 20 yrs, now taking over 160. Very special - I took EPID 160 from John Cassel

Introduce LORRAINE ALEXANDER, MARTHA HUNSKOR, AILEEN MCGINN, MICHELE TUROK, JENNIFER WESSON

Thank CARL SHY, LORRAINE ALEXANDER, past TAs

29 years ago - fall 1972 - HEED, led discussions on human sexuality, but gave people no opportunity to meet others

3 minutes to make an acquaintance

“Epidemiology is fundamentally engaged
in the broader quest for social justice
and equality.”

- John C. Cassel, MD

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Actual instructions on products

- Marks and Spencer bread pudding: “Product will be hot after heating”
- Rowenta iron: “Do not iron clothes on body”
- Nytol (a sleep aid): “Warning: may cause drowsiness”
- Kitchen knife: “Warning: keep out of children”

More actual instructions on products

- Christmas lights: “For indoor or outdoor use only.”
- Sainsbury's peanuts: “Warning: contains nuts.”
- American Airlines nuts packet: “Instructions: open packet, eat nuts.”
- Chainsaw: “Do not attempt to stop chain with your hands.”

“I’m studying epidemiology”: 3 responses

- You're studying what?"
- "Does that have something to do with skin?"
- "Uh-huh. And what else are you studying?"

What is Epidemiology?

“The study of the distribution and determinants of health related states and events in populations, and the application of this study to control health problems”

John M. Last, *Dictionary of Epidemiology*

What is Epidemiology, really?

- The study of the health and disease of the “body politic” – the population.
- The basic science of public health
 - What causes disease?
 - How does disease spread?
 - What prevents disease?
 - What works in controlling disease?

What for?

1. Provide the scientific basis to prevent disease & injury and promote health.
2. Determine relative importance to establish priorities for research & action.
3. Identify sections of the population at greatest risk to target interventions.
4. Evaluate effectiveness of programs in improving the health of the population.

– Milton Terris, The Society for Epidemiologic Research (SER) and the future of epidemiology. *Am J Epid* 1992; 136(8):909-915, p 912

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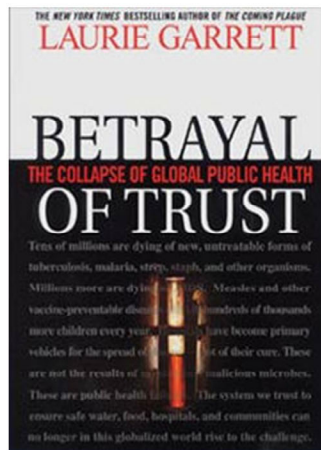
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What for? – more

5. Study natural history of disease from precursor states through clinical course
6. Conduct surveillance of disease and injury occurrence in populations
7. Investigate disease outbreaks

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www.lauriegarrett.com

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Plague!

- September 30, 1993: Earthquake levels over one million homes in Maharashtra State, in India, with powerful aftershocks.
 - Peasants harvest and store their crops, then decamp.
 - August 26, 1994: farmer return to stored grains, rats, fleas & *Yersinia pestis*.

Plague!

- September 14, 1994: Four cases of bubonic plague in Mamala, Beed District, Maharashtra State
- Health care infrastructure still disrupted from earthquake.
- September 18: Festival of Ganesh in Surat, hundreds of miles to northwest, rapidly growing and crowded city.

Plague!

- September 21: cases of pneumonic plague in Surat.
- Public hospital doctors alert private doctors, but 80% flee Surat, closing all private clinics and hospitals
- September 22: Media barrage in India and outside
 - “Surat Fever”. 500,000 Suratis depart in one week.

Plague!

- Suratis take trains all over India, disappearing into densely-packed cities.
- Five Indian states go on emergency health alert status.
- Actions by Indian federal government are slow in coming and ineffectual; Minister of Health is not even a physician; WHO also ineffectual.

Plague!

- Remaining medical personnel in Surat work round the clock, suffer exhaustion.
- Sales of tetracycline soar and become depleted.
- Plague expertise in short supply throughout the world (CDC has one half-time scientist).

Plague!

- Indian and multinational drug companies promote antibiotics, cleansers, pesticides, rat poison.
- 20% of tourism packages canceled;
Gulf State Nations, Pakistan, Sri Lanka ban all flights, citizens, goods, postal communications (!) with India.
- Bombay stock market crashes.

Plague!

- Russia, China, Egypt, Malaysia, Bangladesh close all connections to India; others inspect all Indian travelers (10 suspected cases in NYC had malaria, typhoid, viruses, liver disease). KLM sprays pesticides in plane cabins.
- Delhi closes all public schools.
- October 2: Indian federal officials announce over 4,000 cases.

Plague!

- India's National Institute of Communicable Diseases and All India Institute of Medical Sciences engage in stand-off over specimens and decline outside laboratory assistance despite limited equipment and no air-conditioning. Most of original specimens deteriorate through lack of proper handling.

Plague!

- Lack of definitive laboratory diagnosis undercuts governmental public health authority.
Alternative theories abound – hantavirus, melioidosis, *Burkholderia pseudomallei*, leptospirosis, tularemia, *Pseudomonas pseudomallei*, conspiracy theories (rebels, U.S.).
- Ministry of Defense takes over all remaining blood and sputum samples.

Plague!

- Thousands of worried well fill hospitals.
- Widespread inappropriate use of antibiotics, DDT
- \$1.3 billion lost trade and tourism.

Lesson learned: Public health matters.

About EPID160

- Cooperative learning model - structured learning tasks where students
 - apply concepts and methods
 - exercise critical judgment
 - confront complexities of real life
- Lab group with TA consultant
- Resources

Each week

- Lecture – preview/supplement topic
- At home
 - Textbook chapter
 - Case study, based on published article
 - Course web site
- Meet for 2 hours with lab group
 - Review by TA and question opportunity
 - Complete case study as a group

Learning resources

- Course pack
- Textbook – Leon Gordis, *Epidemiology*
- Class web site: blackboard.unc.edu – announcements, schedule, glossary, ...
- Bulletin board (opposite 2101 MG)
- Instructors – your TA, Vic, Lorraine
- Each other

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Textbook

Class web site:

Final Paper Materials – criteria, sample paper, outlines, writing handbook

Practice questions and exams

Supplemental Readings

Optional reading materials

Glossaries and Formulas

Medical and technical glossary, epidemiologic terminology and commonly used formulas.

Bulletin board in hallway opposite 2101G

Instructors - your TA, Vic, Lorraine

Each other

www.epidemiolog.net

- *Understanding the fundamentals of epidemiology – an evolving text* (includes problems and answers)
- Old EPID 168 exercises, examinations, spreadsheets, more ...
- Extensive lists of resources, web sites

Challenges in an introductory course

 The picture can't be displayed.

- Diversity of **backgrounds** – biology, physiology, math/statistics, public health, epidemiology
- Diversity of **interest** –
from: “I ❤️ Epidemiology”
to: “Let me out of here!”
- Basic epidemiologic concepts are still evolving

Course objectives

- Understand measures of disease occurrence and correlates in populations
- Explain basic approach to investigating disease outbreaks
- Explain relative strengths and limitations of different epidemiologic study designs
- Identify and control major sources of error in community health studies

Course objectives - continued

- Weigh the evidence from different epidemiologic studies
- Understand strategies to evaluate public health interventions
- Appreciate complexities in applying scientific evidence in making policy

Evaluation and Grading

Grades are assigned based on:

30% – two examinations

25% – final paper

20% – class participation (TA evaluation)

20% – class participation (peer evaluation)

5% – self evaluation (all based on specified criteria)

UNC-CH Honor Code

- Integrity of academic work is vital to scholarly activity
- Integrity of academic work is an individual and collective responsibility
- Your participation in EPID 160 implies full observance of the Honor Code

What is prohibited?

- Academic cheating includes unauthorized copying, collaboration or use of notes or books on examinations, and plagiarism.
- Plagiarism is the intentional representation of another person's words, thoughts, or ideas as one's own.
- If you are uncertain in a specific instance, ask an instructor.

What is encouraged?

- Read, discuss, ask questions, attend seminars, explore web sites
- Design studies, collect and analyze data, find answers
- Apply epidemiology to your profession – many of your colleagues practice epidemiology even if they don't say so

Some final instructions (on products)

- Bag of Fritos: “You could be a winner! No purchase necessary. Details inside.”
- Bar of Dial soap: “Directions: Use like regular soap.”
- Frozen dinner: “Serving suggestion: Defrost.”
- Hotel-provided shower cap in box: “Fits one head.”