Practical 3: Ecologic and Cross-sectional studies

Objectives

To enhance understanding of:

- ecologic and cross-sectional study designs and their uses
- their strengths and limitations
- sources of data for ecologic studies
- the type of measures of disease frequency and measures of effect (if appropriate) that can be obtained from these designs
- the issue of non-response in a cross-sectional study and how this may introduce bias

Question 1: Circumcision and HIV

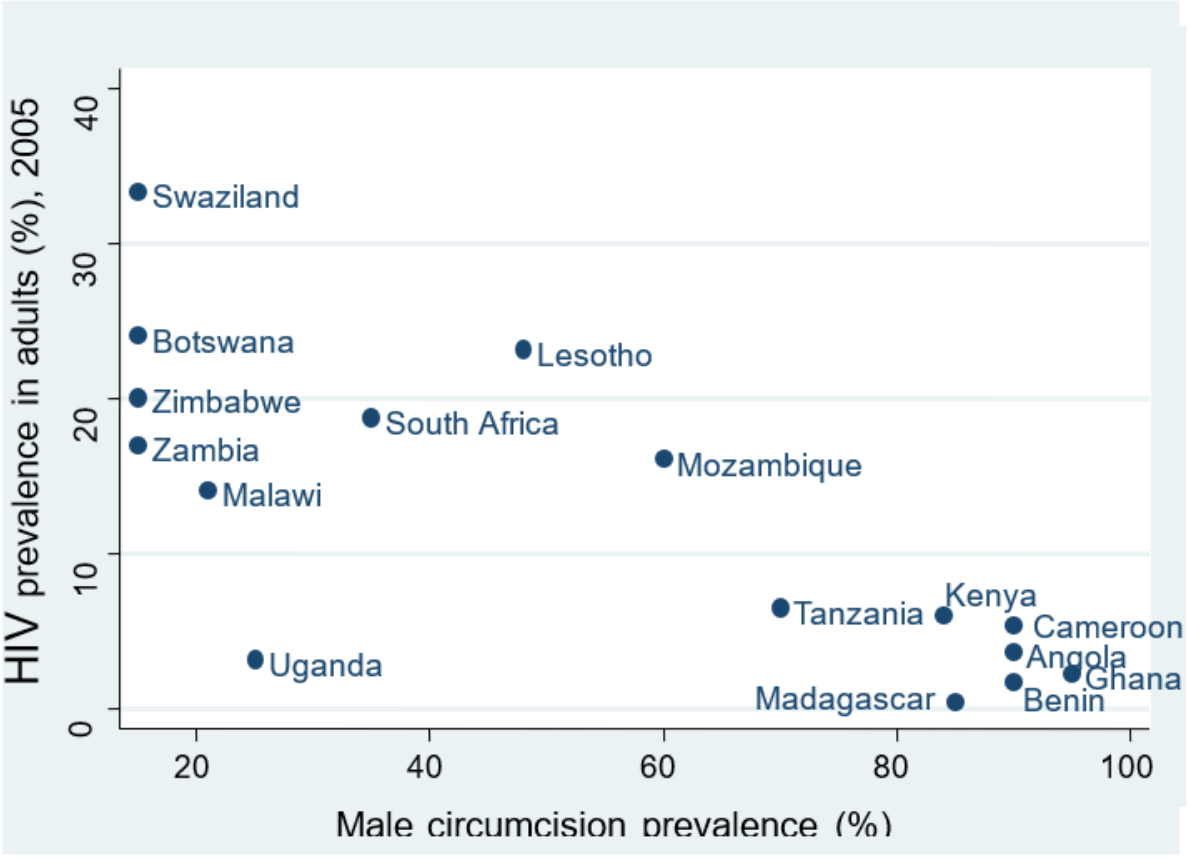

Figure 1. Source: Weiss. WHO Consultation, Montreux. Unpublished. 2007.

Question 1a:

I. What is the exposure? What epidemiologic measure is used to measure the exposure?
II. What is the outcome? What epidemiologic measure is used to measure the outcome?
III. What are the study populations?

Question 1b: What do these data show?

Question 1c:

I. Specify the study design and the potential data sources. Which of the data sources are likely to be routine?
II. How valid are the measures of exposure and outcome likely to be?

Question 1d: What are the strengths and limitations of the design?

Question 1e: Can you be sure the exposure preceded the outcome (i.e. what is the likely direction of temporality of this association)?

Question 2: The British National Survey of Sexual Attitudes and Lifestyles (NATSAL)

The first NATSAL (http://www.natsal.ac.uk/) was conducted in 1990, focussing on patterns of HIV risk behaviour, partnership formation, and sexual practices. A second survey was conducted in 1999-2001, and a third in 2010-2012.

For NATSAL-3, a random sample of 56,000 addresses was selected from the residential postcode address file for Britain (details of the sampling method can be found in the references). Interviewers visited all the sample addresses and listed all residents aged 16-74 living there. One adult (aged 16-74) from each address was randomly selected from each list and invited to take part in the survey. If they agreed, information was obtained using both face-to-face personal interviews and computer-assisted self-interview (interviewer present but did not participate except to advise where necessary).

Question 2a: What is the study design?

Question 2b: Describe the source population.(Note: the source population is the collection of individuals that the study participants are selected from)

Question 2c: In NATSAL-3 authors reported the response rate was 58%, compared to 65% in NATSAL-2. Why do we need to worry about response rates?

Question 2d:

- What kind of sexual attitudes and lifestyle measures are likely to be part of the NATSAL?
- What labels from the 'epidemiologic measures' lecture would you use for each of these? (e.g. point prevalence, period prevalence)

Question 3: Deciding what was done

Two studies are described below. For each of the examples given, fill in the accompanying table.

Question 3a: A study was set up to investigate whether there was an association between air pollution and infant mortality, using data collection from 15 countries. National infant mortality rates in 1990 were plotted against estimated levels of air pollution in the same year for each country:

STUDY DESIGN?	
SOURCE POPULATION	
PRIMARY OUTCOME?	
PRIMARY EXPOSURE?	
MEASURE OF DISEASE (OUTCOME) OCCURRENCE?	
POSSIBLE APPROACHES/MEASURES TO ASSESS THE EXPOSURE-OUTCOME RELATIONSHIP?	

Question 3b: A study looked for an association between trachoma (a chronic eye infection caused by *Chlamydia* bacteria) and overcrowding. A random sample of individuals in one community were examined for the presence of trachoma. Immediately following examination, the participants filled in a questionnaire about the size of their homes and the number of people living in it:

STUDY DESIGN?	
SOURCE POPULATION	
PRIMARY OUTCOME?	
PRIMARY EXPOSURE?	
MEASURE OF DISEASE (OUTCOME) OCCURRENCE?	
POSSIBLE APPROACHES/MEASURES TO ASSESS THE EXPOSURE-OUTCOME RELATIONSHIP (consider only for a binary measure of exposure)?	

Question 4

To do in your own time: Visit the Gapminder website and explore the various datasets to create graphs - instant ecological studies! Consider the quality of data for the chosen variables and what the relationship may (or may not) show.