Summary
Week 2: Introduction to study design, surveys and questionnaire design

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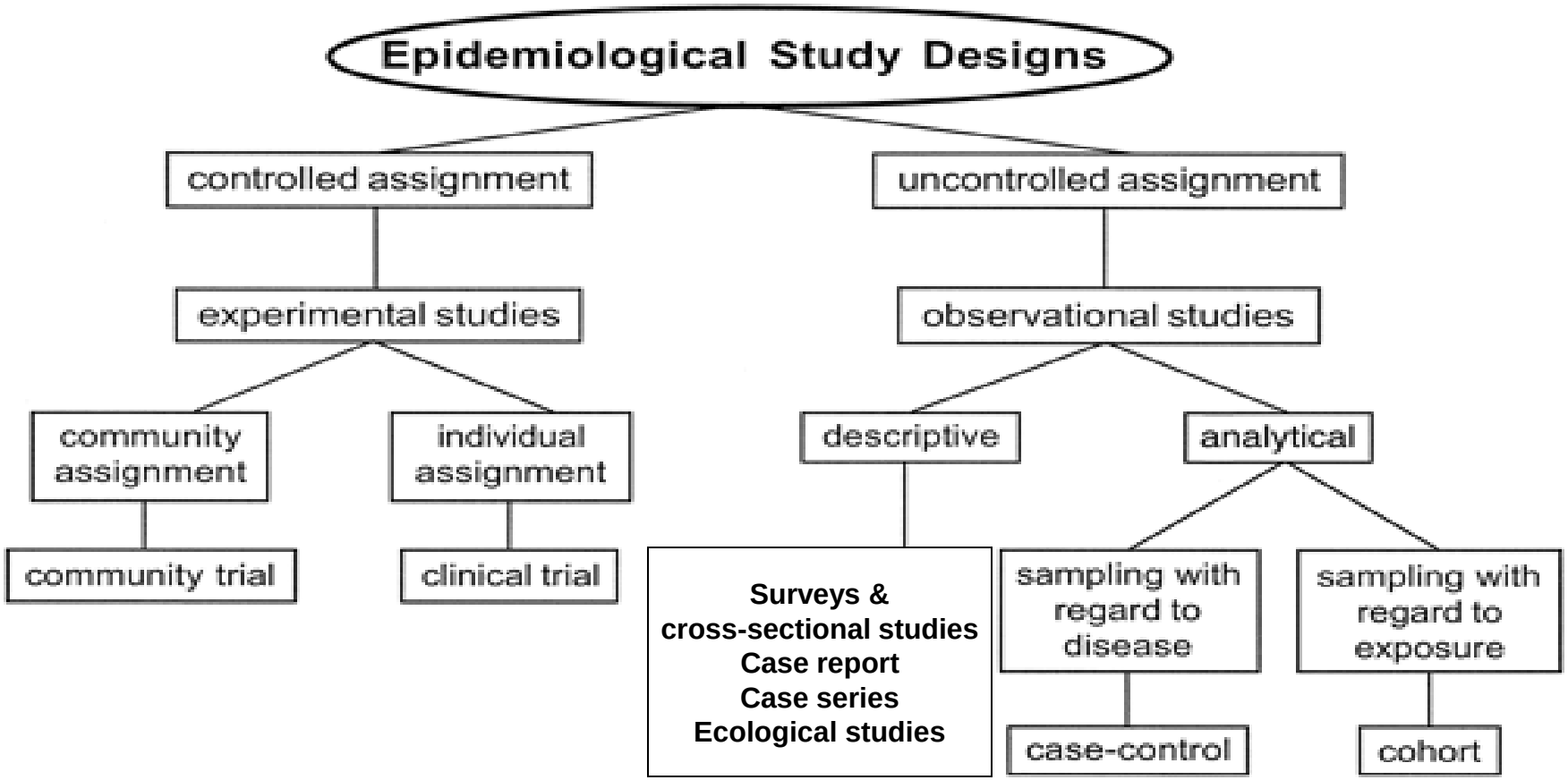
Objectives

- Understand the types of study design
- Compare prospective with retrospective studies
- Overview of surveys design
- Type of studies that can be conducted through survey design
- Questionnaires design and common problems in questionnaires wording
- How to deal with sensitive questions in questionnaires

Part 1: Introduction to study design

Study Design: Definition

A study Design is a specific plan or protocol for conducting the study, which allows the investigator to translate the conceptual hypothesis into an operational one.



Source: Waning B, Montagne M: *Pharmacoepidemiology: Principles and Practice*: http://www.accesspharmacy.com

Controlled versus uncontrolled assignment

- Aspirin for prevention of colorectal cancer
- It can be a cohort study: Uncontrolled assignment for patients who are taking Aspirin for different indications
- It can be a randomized controlled clinical trial where we allocated patients to take Aspirin or Placebo

Observational epidemiology

- Provides information about disease patterns or drug use problems by various characteristics of person, place, and time.

- It also is used by epidemiologists to generate hypotheses regarding the causes of disease or drug use problems.

Observational epidemiology

a. Descriptive
Case reports and case series
Descriptive analysis (Person place time)
Ecological (correlational)
Surveys and Cross-sectional studies

b. Analytical
Case Control
Cohort

Epidemiological studies

- Observational studies are descriptive or analytical in nature.

- Descriptive studies attempt to uncover and portray the occurrence of the condition or problem, whereas analytical studies determine the causes of the condition or problem.
- Investigators in observational studies may plan and identify variables to be measured, but human intervention is not a part of the process.
- Experimental studies, in contrast, involve intervention in ongoing processes to study any resulting change or difference.

Observational epidemiology

- Descriptive studies: provide insight, data, and information about the course or patterns of disease or drug use problems in a population or group.

- Analytical studies are used to test cause-effect relationships, and they usually rely on the generation of new data.

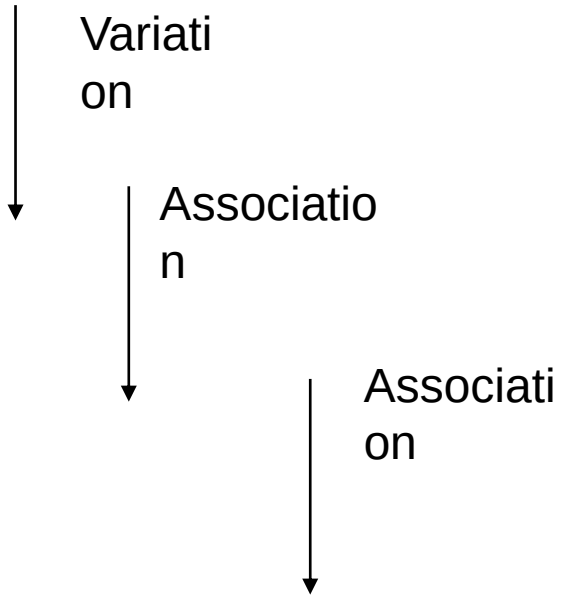
Epidemiological studies

Clinical observation

Descriptive studies

Analytical studies

Experimental studies



Does coffee causes pancreatic cancer

I am beginning to suspect that there is an association between coffee drinking and pancreatic cancer ……

I have seen a good number of cervical cancer patients positive for HPV…

Case series

Descriptive analysis

Ecological study

Cross-sectional analysis

How to investigate this further?

Prospective vs. retrospective studies

Prospective studies

- Watches for outcomes, such as the development of a disease, during the study period and relates this to other factors such as suspected risk or protection factor(s).
- The outcome of interest should be common; otherwise, the number of outcomes observed will be too small to be statistically meaningful (indistinguishable from those that may have arisen by chance).
- All efforts should be made to avoid sources of bias such as the loss of individuals to follow up during the study.
- Prospective studies usually have fewer potential sources of bias and confounding than retrospective studies.

Retrospective studies

- A looks backwards and examines exposures to suspected risk or protection factors in relation to an outcome that is established at the start of the study.
- Many valuable case-control studies, such as Lane and Claypon's 1926 investigation of risk factors for breast cancer, were retrospective investigations.
- Confounding factors and bias are more common in retrospective studies than in prospective studies.

Comparison of Retrospective and Prospective Approaches	
Retrospective	**Prospective**
Inexpensive to conduct	Expensive to conduct
Completed in a shorter time period	Completed over a longer time period
Easier to access a larger number of subjects	More difficult to access subjects and usually requires a larger number of subjects
Allows results to be obtained more quickly	Exposure status and diagnostic methods for disease may change
Useful for studying exposures that no longer occur	Loss of subjects from the study over time may be substantial
Information and data may be less complete and inaccurate	Information and data may be more complete and accurate
Subjects may not remember past information	Direct access to study subjects enhances reliability of data

Observational Epidemiology

- Provides information about disease patterns or drug use problems by various characteristics of person, place, and time.
- It also is used by epidemiologists to generate hypotheses regarding the causes of disease or drug use problems.

Surveys

A survey may be defined as a collection of information from all individuals or a sample of individuals chosen to be representative of the population from which the are drawn

Definition of Survey

- Non-experimental research design used primarily to measure characteristics of a population

- A research method based on self reported information from participants rather than on observations or measurements taken by researchers

Survey ≠ Questionnaire

Types of information collected by survey

- Morbidity prevalence
- Mortality
- Detailed risk factors or behavioral information
- Knowledge, attitudes, and practices
- Physical signs (paralysis, splenomegaly, malnutrition)
- Serological or laboratory tests

Data Collection Methods

- **Primary**: where the investigator is the first to collect the data.

Sources include: medical examinations, interviews, observations, etc.

Advantage: less measurement error, suits objectives of the study better.

Disadvantage: costly, may not be feasible.

- **Secondary**: where the data is collected by OTHERS, for other purposes that those of the current study.
- Sources include: individual records (medical / employment); group records (census data, vital statistics)

Characteristics of survey

- representative if sample chosen correctly
- Single point in time –snapshot
- Provide more in depth information than surveillance or chart reviews
- Usually performed by a limited number of personnel specially trained to perform surveys
- Can sometimes be expensive, time consuming to perform
- Cannot be used to monitor change unless repeated

When to do a survey

- When accurate population-based data are needed to determine the magnitude of the problem
- When more detailed or recent information is needed than is available from record review or surveillance (demography, examination, laboratory)
- When information is needed on health problems that may not routinely be seen by health providers
- When information is needed on health behaviors or health knowledge and attitudes not routinely available through existing mechanisms

Survey

Key Concepts of survey design:

1. Primary data
2. Communication
3. Sample
4. Representative

TYPE OF MEASUREMENT

- *Attitudes*: What people feel
- *Knowledge*: What people know
- *Beliefs*: What people think is true: their beliefs
- *Behaviours*: What people do or have done
- *Evaluation*: People's perception of thing are/were

Classifying Survey Research Methods

1. By method of communication.
    a) Personal Interviews
    b) Telephone interviews
    c) Self-administered interviews
2. By degree of structure and disguise.
    a) Structured disguised
    b) Structured undisguised
    c) Unstructured disguised
    d) Unstructured undisguised
3. By time frame (Temporal classification).
    a) Cross-sectional surveys
    b) Longitudinal surveys

By degree of structure and disguise

Disguised (indirect): **When the purpose of the data collection is not told to the respondents and asked in** indirect manner

Undisguised (direct): purpose of data collection is known to respondents

Do you have a family history of cancer?

What cancers run in your family?

Adding cancer margin positivity in the chart review form in a study for quality of life assessment for breast cancer survivors

Structured disguised: close

Unstructured: open ended questions

Temporal Classification of Survey Research

1. ***Cross-sectional studies:*** studies in which various segments of a population are sampled and data collected at a single point in time. (also to measure prevalence of certain factors or diseases)
2. ***Longitudinal studies:*** studies in which data are collected at different points in time

Survey

- Focus on personal and demographic characteristics, illness and health related habits
- These surveys may also examine frequencies of disease and other characteristics may be examined in relation to age, sex, location, education, etc

Range of uses of survey

Target groups:

1. Patients

Examples of topics of interest:

Need for services

Satisfaction with care given

Side effects of care

Compliance with therapy

Quality of life

Health behaviour and beliefs

Range of uses of survey

Target groups:
2. Health professionals
Examples of topics of interest:
Knowledge and experience
Activities undertaken
Attitudes to the provision of care
Sources of stress and dissatisfaction
Educational needs

Range of uses of survey

Target groups:

3. Relatives and carers

Examples of topics of interest:

Understanding of illness and its treatment

Satisfaction with information given

Knowledge of available support services

Attitudes to and stresses of caring

Range of uses of survey

Target groups:
4. General public and selected subgroups
Examples of topics of interest:
Morbidity
Quality of life
Unmet need for services
Access to services
Use of preventive services
Health behaviour and beliefs

Range of uses of survey

Target groups:
5. Health care facilities
Examples of topics of interest:
Availability of equipment
Staffing levels
Training and experience of staff
Extent of provision of services
Nature of service organisation

Align your measure with your theoretical orientation

- Good survey measures must be grounded on sound theory and conceptual definitions

Examples:

- Health Belief Model
- Illness behaviour model

ADVANTAGES OF SURVEYS

- Can complete structured questions with many stakeholders within a relatively short time frame.
- Can be completed by telephone, mail, fax, or in-person.
- It is quantifiable and generalizable to an entire population if the population is sampled appropriately.
- Standardized, structured questionnaire minimizes interviewer bias.

ADVANTAGES OF SURVEYS

- Tremendous volume of information can be collected in short period of time.
- Speed: faster data collection than other methods
- Cost: relatively inexpensive data collection
- Accuracy
- Efficiency: measured as a ration of accuracy to cost, surveys are generally very efficient data collection methods

DISADVANTAGES OF SURVEYS

- More difficult to collect a comprehensive understanding of respondents' perspective (in-depth information) compared to in-depth interviews or focus groups.
- Survey error: Potentially large sources of error in surveys
- Communication Problems - Each of the different communication survey methods has its own unique problems.

WHY DO YOU WANT TO DO THIS SURVEY?

1.Why have you chosen to conduct a survey?
What did you want to learn from the results and/or what decisions need to be made from the results?

Clearly write down your survey research questions.

2. When considering why you want to do this survey?
Be very specific

3. Focus on the 'need' to knows, not the 'nice' to know
Does your reasoning fit the uses of surveys?

If not, perhaps you should consider a different method.

Survey design

4. WHO ARE THE STAKEHOLDERS?

- Stakeholders are all those individuals who would have an interest in the questions you are asking and the results obtained (i.e. Stakeholders of the screening program/service/medication)

Involving them will assist in results dissemination and utilization

Survey design

5. WHO IS THE POPULATION OF INTEREST?

- Describe the population you are interested in surveying:

- What is their demographics (age, gender, ethnicity)?
- Where do they live?
- Are they all very similar or are there unique differences?
- Are you interested in any sub-groups of this population?

Survey design
Study population

Determining the characteristics of your population of interest gives you some indication of:

I. How you can get a sample of respondents
II. Whether you need to stratify your sample (subgroups)
III. How many people you would need to survey.

Survey design
Study population

What is the best way to reach them?

What is the best way to communicate with them?

Face to face

Medium (phone, fax, mail, e-mail)

Time of day

Time of week

Definition of Questionnaire

A series of questions designed to gather information on a certain subject from a respondent

- A tool for data collection
- A series of written questions in a fixed, rational order

Chart review form/Case report form

A Case Report Form is a document recording all the patient clinical information (past medical history, diagnosis, investigations, treatment, complications, finance data) based form their medical records/files, as required by the study protocol.

Why do we need develop a questionnaire?

- Survey questionnaires
- In case of ready to use questionnaires, to collect relevant additional data such as demographics and predictors of response such as socioeconomic status and medical history
- Questionnaire to assess outcomes in clinical trials and other research methodology
- To collect data on variables relevant to research methodology such as predictors of response to treatment

Structured versus unstructured

- In a structure interview each question is clearly defined and given a rigid sequence
- An unstructured interview resembles a discussion with the interviewer leading it

Questionnaires are best used when:

- *There is a large sample*
- *You want fairly straightforward information*
- *You want standardized data from identical questions and preferably in the presence of* ***a reference manual***
- *You are more interested in what occurs rather than why or how*

Advantages of using a questionnaire?

- Target large amount of people
- Use to describe, compare or explain
- Can cover activities and behaviour, knowledge, attitudes, preferences
- Specific objectives, standardised and highly structured questions
- Used to collect quantitative data – information that can be counted or measured

Strengths

- Reach respondents in widely dispersed locations
- Can be relatively low cost in time and money
- Relatively easy to get information from people quickly
- Standardised questions
- Analysis can be straight-forward and responses pre-coded
- Low pressure for respondents
- Lack of interviewer bias in case of self-administered questionnaires

Types of Questionnaires

1. Face to face (personal) interview
   e.g., door-to-door interviews

   - Interviewer administers the questionnaire
   - Ensure consistent and complete responses
   - Allows for clarification and probing
   - High response rate
   - Expensive
   - Confidentiality and privacy concerns
   - Interviewer bias

Interviewer-administered questionnaire

- Advantages
  - participation of illiterate people
  - clarification of ambiguities
  - quick answers
- Disadvantages
  - interviewer bias
  - needs more staff resources
  - difficult for sensitive issues
  - Time needed

Types of Questionnaires

2. Self-completed questionnaire
   e.g., mailed questionnaires

- Completed by respondent
- Requires literate respondent
- Variable completeness of answers
- Low-cost
- Low response rate
- No instructions or check on incomplete responses: Instructions cancer be provided but incomplete response is still a limitation

Self-administered Vs interviewer administered

- Self-administered questionnaire (as opposed to interviewer administered) requires:
  - More instruction for respondent
  - Clear-cut, unequivocal wording
  - More pre-coded questions
  - A separate coding sheet for analysis

Self-administered questionnnaire

- Advantages
  - cheap and easy to administer
  - preserves confidentiality
  - completed at respondent's convenience
  - not influenced by interviewer
- Disadvantages
  - low response
  - questions can be misunderstood
  - no control by interviewer
  - only literate persons
  - time delay (post)

Types of Questionnaires

3. Telephone interviews
   - Wide coverage rate
   - Standardization depends on interviewer
   - Medium cost: lower cost than personal interviews
   - Can be conducted quickly
   - Miss those without a telephone or at work
   - Interviews have to be kept short
   - Medium response: better response rate than mailed questionnaires

Survey Study Design: Summary

- Clear definition of the research question
- What method is the most appropriate?
- Who will be surveyed?
- How will the survey be carried out?
- cross-sectional survey
- longitudinal survey
- What analysis will be carried out?
- THEN, develop the survey instrument!

Sampling techniques

A Word About Sampling…

- The **population is all the members of** the group you are researching (e.g., all youth in our city)
- The **sample is the selection of the** population who will be asked questions
- To **generalize is to state that what you** say about your sample can be applied to the rest of the population

General limitations of questionnaires

- Can be superficial – difficult to capture the richness of meaning
- Information is not causal – cannot attribute cause-effect relationships
- Information is self-report – which does not necessarily reflect actual behavior
- Cannot deal with context – information is collected in isolation of environment

Other limitations

- Low response rate and consequent bias and confidence in results
- Unsuitable for some people
  - e.g. poor literacy, visually impaired, young children
- Question wording can have major effect on answers
- Misunderstandings cannot be corrected

Type of questions

Types of Questions

A. Open-end questions
B. Close ended questions
   - Two-choice
   - Multiple choice
   - Checklist
   - Numerical
   - Ranking
   - Rating

Questions selection

- Choice of question type depends on:
  A. Information required
  B. Question itself
  C. Study design:

Examples:

- What are the causes of ischaemic heart disease?
- From the following list, select factors that you think could cause heart disease
- But avoid:
  Is smoking a risk factor for heart disease?

Fill in the blank

My choice for the residency program would be . . . . . .

. . . . . .

What do you think of the care you receive at the clinic?

_____

_____

Rating scales

Are you satisfied with the care you receive at the clinic?

Extremely Dissatisfied 0 _____ 10 Extremely satisfied

OPEN END QUESTIONS

- Are asked without specific response options or when we want to hide the answer.

- Respondents need to create their own answer.
- The questions are great for depth and unbiased opinions

- Best used when having multiple response and the options may be too leading and result in biased answers

  e.g.

1. type of medical services they would like us to provide
2. what are the risk factors of ischaemic heart disease.

Sometimes you can pre-code an open ended question if you know the type of responses you will get

Types of questions

Open-ended questions
What? Why? How?

- No predetermined responses given
- Able to answer in own words
- Useful exploratory research and to generate ideas
- Flexible
- Requires skill in asking questions and interpreting results
- Answers can lack uniformity and be difficult to analyze

Open-Ended Questions

- Answered in the respondent's own words
- Allows the respondents to interpret the question and answer any way they want
- Blank spaces left after question for written responses
- More demanding and time-consuming for respondents
- More difficult to analyze and interpret

  Example: "Please describe your ideal boss."

Open ended questions

- Advantages
  - Allows a much greater range of responses
  - Allows for creativity
  - May find unanticipated results
- Disadvantages
  - Statistical analysis is very difficult
  - Large variety of responses
  - Takes much longer
  - Interpretation of results is more difficult

Close-ended questions

- Designed to obtain predetermined responses
- (Yes/No; True/False; strongly agree-strongly disagree, etc..)
- Easy to count and analyze
- Easy to interpret
- May not have catered for all possible answers
- Questions may not be relevant or important

Close-ended questions

- Respondent selects a response from those provided on the questionnaire
- Less time consuming and easier for respondent
- Requires more effort to develop questions
- May oversimplify an issue
- Response categories must be inclusive and non-overlapping (i.e., mutually exclusive)

Types of Close-ended Questions

- **Two-choice** – Have you heard of the Alberta Community Council on HIV? (yes or no)
- **Multiple choice** – How often will you use the information from this workshop? (never, sometimes, all the time)
- **Checklist** – Please select all the services that you have used in the last year: (list)
- **Numerical** – How old are you? ___
- **Ranking** – Please put these postcards in order from the one you like the most to the one you like least.
- **Rating** – "This workshop is boring me" To what extent do you agree with this statement?
  (on a scale from 1=strongly agree to 5=strongly disagree)

Closed-ended questions

- The discharge summaries from hospital X allow me to provide adequate care to my patients:
  - Strongly agree
  - Agree
  - Neutral
  - Disagree
  - Strongly disagree

Closed ended questions

- **Advantages**:
  1. Easier for participants to respond
  2. Standardization
  3. Easy to count and analyse
  4. Easy to interpret

- **Disadvantages**:
  1. May not have catered for all possible answers
  2. Questions may not be relevant or important
  3. Answer options can influence responses

Screening or Filter Questions:

are used to ensure respondents included in the study are those that meet the pre-determined criteria of the target population.

“Today we are conducting a study on attitudes of smokers, do you currently smoke tobacco (cigarettes, narjeela, pipe)?” __ Yes __ No

SENSITIVE QUESTIONS

- Researchers sometimes ask sensitive questions in surveys.
- Respondents are often hesitant to answer sensitive items, so item non-response on these questions is normally higher than for other questions in a survey.
- Some respondents may even stop taking the survey because a sensitive question turns them off from the process.

How to deal with sensitive questions?

1. **Build Rapport with Respondent:**
   - Quite often, it is best to start a survey with neutral questions, and let the respondent work his or her way through the survey, letting each question lead up to the information you need to ask about.

   - Placing controversial questions late in the questionnaire has two benefits:

   If the respondent chooses to stop the survey once he or she reaches the sensitive questions, you still have the respondent's answers to all questions beforehand, upon their consent, which you can use for other analyses.

How to deal with sensitive questions?

2. Questions order

- It is generally not a good idea to start the survey with any question that touches on something private.

- When respondents start a survey, they are generally not drawn into the process yet or committed to finishing it.
- Sometimes respondents start a survey to see if the first few questions are interesting, then decide whether it is worth finishing it.
- Putting a sensitive question up front immediately raises a red flag with respondents who have privacy concerns and increases the likelihood that they will break off the survey.

How to deal with sensitive questions?

2. Questions order (cont'd)

- It is better to lead the questionnaire with simple items that draw respondents into the survey process and engage their interest.

- If there are no other viable alternatives, it is acceptable to start the survey with simple demographics, but this approach is not ideal.
- **Never put a sensitive question with concerns first.**

How to deal with sensitive questions?

2. Questions order (cont'd)

- Placing controversial questions late in the questionnaire has two benefits:

1. If the respondent chooses to stop the survey once he or she reaches the sensitive questions, you still have the respondent's answers to all questions beforehand, which you can use for other analyses.

2. The respondent works through the easy, unthreatening questions, he or she may feel as though trust is being established, and will be more likely to answer the question asking the sensitive information.

How to deal with sensitive questions?

3. Be Casual About it!

- Let's assume you are trying to assess poor compliance with medications.

- Getting truthful responses can be very difficult. You, therefore, need to try reducing the perceived importance of the topic by asking the question in a nonchalant manner:
- "Did you happen not to take your medications while remembering that you need to take them?"
- Worded this way, the question leads the respondent to believe the survey's authors do not think that not taking the medications is a big deal, so the respondent may be coaxed to answer truthfully.

How to deal with sensitive questions?

4. Make it Sound Like "Everybody's Doing It!"

- Instead of directly asking a respondent if he or she is not taking his/her medications, ask if they know of anyone who does. "Do you know that some patients are not taking their medications regularly?"
- Then the next question could be "How about you?"
- When he or she feels he/she isn't alone, the respondent may be more inclined to be honest. \

- Another way is to combine the casual approach with this one:

  "As you know, many people are not taking their medications regularly, although they remember that they need to take them. Do you happen to have not taken your medications, while remembering that you have to do so?"

How to deal with sensitive questions?

5. Choose Longer Questions Instead of Shorter Ones

We follow this only in sensitive questions:

- Longer questions can “soften the blow” with the excess verbiage, and reduce the threat.
- Consider these examples:

“Even some of the health care professionals do not take their medications regularly. Have you, yourself, not taken your medications while remembering that you need to do so?”

“ The Ministry of Health reported recently widespread practice of missing taking medications regularly amongst patients with chronic diseases that have lead to high rates of uncontrolled diseases. Have you happened not to take your medications while remembering you need to do so?”

“Did things come up that kept you from taking your medications regularly while remembering you need to do so?”

How to deal with sensitive questions?

6. Anonymity and Confidentiality

- Always reassure respondents about their anonymity or confidentiality in the introduction to the survey.
- Remind them of these assurances later in the survey when introducing sensitive questions.
- Researchers may even want to state explicitly that no one (outside of the research team) will ever be able to match respondents' identities to their answers.
- For demographic questions, it sometimes helps to say that these questions are asked for analysis purposes only. Respondents may be put at ease the more researchers can reassure them of their privacy, so repeat these reassurances as often as needed.

How to deal with sensitive questions?

7. Try self-completion approach

- Respondents are more hesitant both to answer sensitive questions in the first place and to answer them truthfully in modes where a human interviewer is present. Thus, social desirability bias and privacy concerns are bigger issues in face-to-face and phone surveys.
- Respondents feel less anonymous in these formats and prefer to project a positive image to the interviewer, so they are less willing to disclose sensitive information.
- However, surveys administered without a human interviewer reduce sensitivity effects substantially.

How to deal with sensitive questions?

7. Try self-completion approach (cont'd)

- Respondents are more willing to disclose private and socially undesirable information about themselves in web and mail surveys where there is not the pressure of maintaining a positive image in front of an actual human being.

- Self-administered surveys overall tend to yield lower data quality and lower response rates, but this approach may be worth greater disclosure on sensitive items.

Summary

- Make sure everyone will interpret the question the

same way

- Specify the frame of reference
- Avoid leading questions
- Avoid double-barreled questions
- Avoid questions that contain double negatives
- Be aware of the impact of “socially desirable” phrases
- Make sure questions are applicable to all respondents
- Make sure response categories are mutually exclusive

Week 2
Part 4:
Questions: wording

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Questionnaire design: What do you need to avoid?

Avoid language that suggests a response

- *Does smoking increase the risk of cancer by 30%?*

Common problems with wording

Leading questions:

- Do you prefer being examined by a doctor of your own sex?
- Would you rather be examined by a:

1. Male doctor
2. Female doctor
3. Either/doesn't matter

Common problems with wording

- **Threatening questions**

– Do you know enough about treating patients with stroke?

How would you rate your knowledge of treating patients with stroke?

(I know very little, I need to learn a little more, I need to learn a lot more etc..)

Do you have any knowledge of the condition “subclinical hypothyroidism”

- How do you rate your knowledge of the condition “subclinical hypothyroidism”
- Thyroid function tests results for patients with sublclinical hypothyroidism include:
- 1. High TSH & Low Free Thyroxine 2. Low TSH & Low Free Thyroxine
- 3. High TSH & Normal Free Thyroxine 4. High TSH & High FT4

Questionnaire design: What do you need to avoid? Threatening questions

- Do you know how to manage ischemic colitis
- An alternative question

How do you rate your knowledge of ischaemic colitis management:

0 1 2 3 4 5 6 7 8 910

Or

How do you rate your knowledge of ischaemic colitis management:

1. I am satisfied with my knowledge 2. I need to know little more

3. I need to know much more 4. I know very little

Questionnaire design: What do you need to avoid? Double-barrelled questions

Two concepts in one question

- Have you had a shoulder pain or back pain since your last visit?
- The right approach:

Since your last visit have you experienced any of the followings:

	Yes	No
Shoulder pain		
Back pain		
Knee pain		
Neck pain		

Ask one thing at a time

7 - Do you smoke cigarettes and do you exercise regularly?

□ *Yes*

□ *No*

Targeting our Respondents

- Asking lay person about risk factors of multiple myeloma?
- Asking school children about contraceptive pills?

Common problems with wording

Complex questions:

- On a scale of 1 to 10, please rate for each of the 8 categories listed below, your level of knowledge, confidence and experience:

  Laparoscopic cholecystectomy, saphenofemoral ligation, splenectomy ,liver transplantation, bowel resection&anastomisis, hernia repair, internal fixation of fracture, chest tube insertion

On a scale of 1 to 10, please rate for each of the eight procedures listed below, your level of knowledge, confidence and experience.

	Knowledge	Experience	Confidence
1. Laparoscopic cholecystectomy			
2. Saphenofemoral ligation			
3. Splenectomy			
4. Liver transplantation			
5. Bowel resection&anastomisis			
6. Hernia repair,			
7. Internal fixation of fracture			
8. Chest tube insertion			

Common problems with wording

- Avoid pitfalls
  :jargon/abbreviations/slang

Should those travelling to malaria endemic areas receive PTBT?

(prophylactic treatment before travelling)

Summary

- Make sure everyone will interpret the question the same way
- Specify the frame of reference
- Avoid leading questions
- Avoid double-barreled questions
- Avoid questions that contain double negatives
- Be aware of the impact of “socially desirable” phrases
- Make sure questions are applicable to all respondents
- Make sure response categories are mutually exclusive