Questionnaire Design

Learning Objectives

When you have completed this session you will be able to:

- Describe the steps in designing a questionnaire
- Describe how a questionnaire can be made more user-friendly for respondents and data-entry personnel
- Create a practical field questionnaire addressing a research question
- Explain the process to pilot-test a questionnaire

Questionnaires in Epidemiology

- Descriptive study
- Outbreak investigation/Analytic study
- Surveillance
- Evaluation

Questionnaires

- Loosely defined, a questionnaire is **a list of questions** (answered by a respondent) to generate an indirect measure of the variables under investigation

- The **design and administration** of a questionnaire is a **critical part** of the study

- Poorly designed and administered questionnaires can decrease the accuracy (validity) and the precision (reliability) of a measure.

Questionnaires

- A good questionnaire takes time and effort to design. Don't underestimate this !!
- The questionnaire should **only collect that information that you need** for the study
  - e.g. demographics/exposure/outcome
- Think about the **research questions and analysis plan**
  - e.g Are you only interested in exposure (Y/N) or are you also interested in dose ??

Steps in questionnaire design

- State the research question(s)/hypotheses
- Outline an analysis plan (dummy tables)
- List the variables to be measured
  - cross check with the study objectives
- Decide how the questionnaire will be administered,
- Formulate the questions
  - Decide on the questions
  - Phrase the questions

Steps in questionnaire design

- Determine the sequence of questions
- Plan the layout and design of the questionnaire
  - Data entry and coding
- Translate if necessary
  - back-translate for the accuracy
- Train interviewers
- Pilot test.

1. State the research question(s)/ hypotheses

- Smoking is associated with lung cancer
- Contact with a case is associated with illness
- Antibiotic is associated with recovery
- Vaccine is associated with protection from illness

- Milk is associated with illness
- Illness was associated with the amount of milk consumed

What exposures and outcomes do we specifically want to measure?

Steps in questionnaire design

- State the research question(s)/hypotheses
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2. Table Shells or "Dummy Tables"

- Titled and fully labeled but contain no data (e.g., frequency distribution tables, two-way tables)
- Show titles, headings and categories
- Serve as a guide for future analyses
- Should proceed in logical order from:
  - Simple: descriptive epidemiology
  - Complex: analytic epidemiology.

2. Table Shells or "Dummy Tables"

Tables that you would like to show in your report:

- **Table 1**: Clinical Features (e.g., signs, symptoms, % hospitalized, % died, etc.)

- Table 2: Descriptive Epidemiology

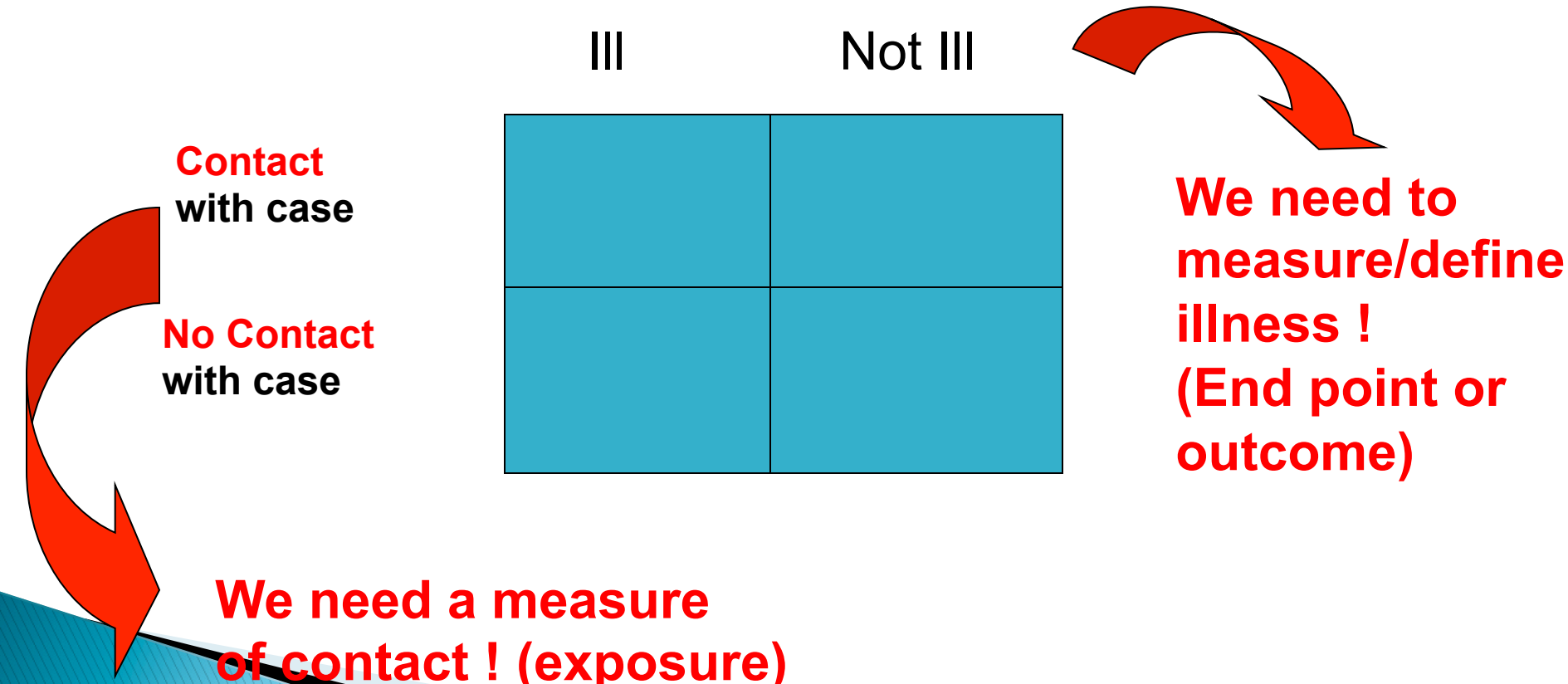
  Time: usually graphed as line graph (for secular trends) or epidemic curve.

  Place: district/VDC of residence or occurrence, spot or shaded map)

  Person: "Who is in the study" (age, race, gender, etc.)

2. Outline an analysis plan (dummy tables)

- What measure of association will be used
- Which associations am I interested in ?



Steps in questionnaire design

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3. Variables to be collected *(observed or measured)*

- The participants' characteristics
  - Participant (Name, soundex etc...)
  - Address, age, sex, occupation etc.
- The exposure
  - Where/when/how much/how long.
- The outcome
  - Symptoms/signs/tests.

Define variables

Make and use a variable definition:

- Tobacco Smoking
  - ✓ Make a variable definition

    Tobacco smoking=Lifetime consumption of > 100 cigarettes

    Have you ever smoker at least 100 cigarettes or 5 packs of cigarettes?

4. Steps in questionnaire design

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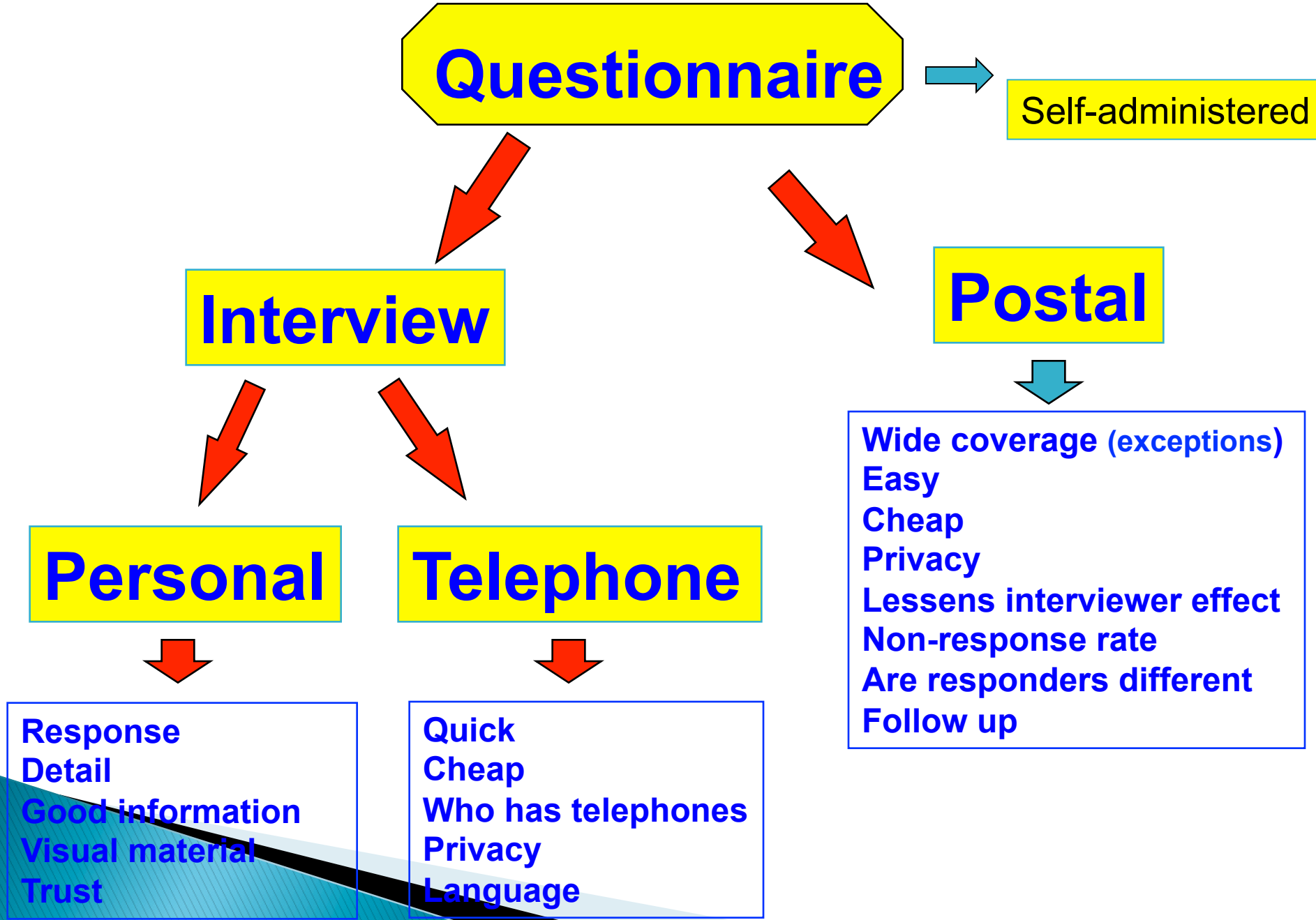
Questionnaire
Self-administered
Interview
Postal
Personal
Telephone
Wide coverage (exceptions)
Easy
Cheap
Privacy
Lessens interviewer effect
Non-response rate
Are responders different
Follow up
Response
Detail
Good information
Visual material
Trust
Quick
Cheap
Who has telephones
Privacy
Language

Questionnaire administration

- **Postal Questionnaires**
  - Inexpensive/Rapid/Large numbers or area
  - Non-response/complexity
- Telephone interviews
  - Inexpensive/rapid/large numbers or area
  - Non-response/no visual cues/rushed/observer
- In-person interviewing
  - Most frequently used
  - High response rates/flexibility
  - Time consuming/observer
  - Self-Administered

Administration of Questionnaires Advantages of Self-Administered

- Greater standardization
- Eliminates interviewer bias
- Easier to administer to large numbers of persons
- More comfortable.

Administration of Questionnaires Disadvantages of Self-Administered

- Limited to simple, closed, and restricted choice questions
- Requires high degree of literacy
- Inability to probe for subtleties or qualification of response
- Inability to clarify questions.

Steps in questionnaire design

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5. Questions formulation

- Simple language
- Closed questions
- Staged questions
- Scaling
- Visual cues
- Coding of responses
- Pilot tests

Open vs Closed questions

What symptoms did you have?

_____

e.g. Felt "off"
Hot
Pain in stomach

Yes and No

Did you have any of the following symptoms ?

	Yes	No	Unsure
Diarrhoea	☐ 1	☐ 2	☐ 3
Fever	☐	☐	☐
Abdominal pain	☐	☐	☐
Vomiting	☐	☐	☐
Other	☐	☐	☐

Choices

What milk products have you eaten?

_____

Choices

Which of the following milk products have you eaten?

	Yes	No	Unsure
Cheese	☐ 1	☐ 2	☐ 3
Butter	☐	☐	☐
Yoghurt	☐	☐	☐
Other	☐	☐	☐

If “other” then specify _____

Staged Questions

Did you drink the apple juice at the party and how much did you drink ?

OR

Did you drink any apple juice ? Y ☐ ☐ N

↓

If "yes" then how much did you drink ?

1 cup ☐ 2 cups ☐ 3 cups ☐ 4 cups + ☐

Using Scales

How would you characterise the pain that you had ?

Light ☐ Moderate ☐ Severe ☐

Using Scales

How would you characterise the pain that you had on the following scale ?

No pain

Very severe pain

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6. Sequence of Questions

- Logical
- Depends on study type
  - E.g. Case-control
    - Participant details
    - Outcome (Case or Control)
    - Exposures of interest
- Sensitive issues.

Steps in questionnaire design

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7.a. Layout: general

- Particularly important with postal questionnaires
- Attractive
- Clear language and instructions
- Easy to follow
- Well illustrated jumps

Layout: general

NUTRITION SURVEY 2001 -- Data collection form (page 3)

CHILD 6-59 MONTHS OF AGE

Cluster number: _____ Household number: _____ Child's household member number: _____

Child's date of birth: ..... Day _____ Month _____ Year _____

Sex: (circle one) ..... Male, Female

Relationship of respondent to child: (circle one) ..... Mother Father Grandparent Other

Is this child breast feeding? ..... Yes, No

If no, was this child ever breast fed? ..... Yes, No

If no, at what age did child stop breast feeding? ..... ____ mos.

Now I would like to ask you about foods that your child ate in the last 7 days. In the past 7 days:

How many days did this child eat meat? ..... _____ days

How many days did this child eat flour or flour products? ..... _____ days

How many days did this child eat milk, butter or dairy products? ..... _____ days

How many days did this child eat rice? ..... _____ days

How many days did this child eat potatoes? ..... days

7.b.Outline of Questionnaires

- Identifying information
- Demographics
- Exposures
- Other data that may be relevant

Identifying Information

- Name
  - ID code linking to name
  - follow-up information (ie phone, email)
- Encryption (coding) may be necessary for sensitive information.

Demographic Information

- Gender,
- Marital status,
- Education,
- Occupation,
- Income,
- Group memberships,
- Affiliations, religion,
- Principal wage earner,
- Number of rooms per household …

Other Information that may be relevant

Varies by study:

- **Ecologic**
  - rainfall, vegetation, ...
- **Laboratory**
  - antimicrobial resistance, molecular markers, ..
- **Residence**
  - Exposures, GIS, …

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8. Translation

- The best way to interview people is to address them in their own language
- Translation into local language
- Back-translation (check)
- Interviewers should be fluent in the language of the interview.

Steps in questionnaire design

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9. Training Interviewers

- Need to understand the questionnaire
  - Study objectives
  - Terminology
  - Skips
  - Definitions
- Only read the questions, not interpret them for the respondent
- Master the consent process

Steps in questionnaire design

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10. Testing the questionnaire

- **Conduct internal questionnaire piloting**
  - Administer questionnaires to other survey staff and correct questionnaires
  - Go over each question:
    - Ensure questions are easily readable
    - Be sure skip patterns clear

Testing the questionnaire

- Final preparation of data collection form
- Piloting
  - Always pretest on a comparable population BUT not the sampled study population
  - Supervisors should observe pretest
  - Pretest entire data collection procedures
  - Ask respondents about interview questions
  - Ask survey workers about
    - Individual questions
    - Entire process of data collection.

Piloting

Pretesting answers these questions:

- Are people willing to answer questions?
- Are people willing to allow specimen collection?
- Are any questions difficult to answer?
- Are any questions sensitive?
- Do people understand every question?
- Can interviewers follow instructions on data collection form?
- Are there other difficulties with the data collection form?
- Are there any answers that should be included on data collection form?
- How long does data collection take?
- What is best organization of data collection steps within household?

Recap

Now that you have completed this session you should be able to:

- Describe the steps in designing a questionnaire
- Describe how a questionnaire can be made more user-friendly for respondents and data-entry personnel
- Create a practical field questionnaire addressing a research question
- Explain the process to pilot-test a questionnaire.

THANK YOU.