

MEC(OR)

# Developing and using Questionnaires



LSTM



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Featuring Datadyne

# What is a questionnaire?

**A tool for collecting information to describe, compare and explain:**

- **Knowledge**
- **Attitudes**
- **Behaviors**
- **Sociodemographic characteristics**

**.....on a particular target group**

# General Format

- **Self-administered (mailed or personal contact)**
- **Interviewer administered (face to face interview)**
- **Telephone interviews**

# The Questions

- **Are the focus on any survey or questionnaire**
- **It is crucial to know how to ask the questions in written and spoken form**
- **The way you ask the questions determines the quality of answers**

# Questions Context

- **Know the questionnaire's purpose(s)**
- **Be sure to know the specific objectives of the questionnaire**
- **Know the respondents**

# Questions Context

- **Standardize the interviewer**
- **Standardize the response format**
- **Ask questions in a social, cultural and economic context**
- **Keep confidentiality and voluntary participation**

# Questions Format

## Open ended questions

- more information but difficult to code, enter and analyze

## Closed ended questions

- less information but easy to code, enter and analyze

# How to obtain valid information

- **Ask concrete questions**
- **Use time periods based on the importance of the questions**
- **Use conventional language**
- **Use complete sentences**
- **Avoid abbreviations**

# How to obtain valid information

- Review questions with experts and potential respondents
- Use short questions
- Avoid double-barreled or two edged questions
- Avoid negative questions

# Bias in Data Collection

- **Information Bias = systematic differences in the measurement of a response**
  - Recall bias – e.g. cases being more likely to remember than controls
  - Observer bias – e.g. interviewer probes or prompts cases to recall events more than controls “Are you absolutely sure your parents didn’t smoke when you were a baby? Think back” – a questionnaire is an important way to reduce this
- **Non-response Bias = Those who respond are different from those who do not (e.g. more motivated, worried, or non-responders too sick to respond)**

# Bias in Data Collection

- **Observer bias** = differences between different observers. To minimize this, it is important that all observers use a standardized method of measuring or collecting data.
  - People (even doctors) can be calibrated!
- **Selection bias** = the sample group you have chosen is not representative of the population you want to generalize your results to

# Minimizing Survey Bias

Define Sampling Framework

To avoid selection bias

ASK:

Is the population I'm surveying representative of the population of interest?

Consider response rate and representativeness

Avoid response bias

ASK:

Are my survey respondents representative of the population of interest?

Determine appropriateness, validity and reliability of responses

Avoid information bias

ASK:

Do my survey items accurately, consistently and appropriately assess the variable of interest?

Plan for data completeness, management and analysis

Avoid a complete data mess

ASK:

Are my data complete for all questions? Did all data get entered accurately? Did I analyze the data appropriately?

# Why and when we use surveys/questionnaires

- No objective measures exist to assess the variable of interest (e.g. diet, exercise, smoking history)
- Not feasible to use objective measures (time frame of study, cost of data collection, completeness of objective data)

# Advantages of Questionnaires

- Can reach a **large number** of people relatively easily and economically (especially mail questionnaires)
- Provide **quantifiable** answers
- Relatively **easy** to analyse
- May be **less expensive**

# Disadvantages of Questionnaires

- May provide only **limited insight** into the problem:
  - Limited response allowed by questions
  - You may not have asked the right questions
- May have **varying response**
  - they may not understand your question and may interpret it differently
- Questions **may not be a valid** measure of the variable
- Mailed questionnaires → **low response rate?**
- Hard to chase after **missing data** – need to get it right first time

# Before Starting

- Questionnaire design should be an integral part of the study, not an “add-on”
- Therefore:
  - Decide on the **goals** of the study (for yourself and for others)
  - Know the **subject** – literature, experts
  - Know the **respondents** – (SES, occupation, special sensitivities, educational, ethnic)
  - Know **how much** – cost, time, sample size, response rate
  - Determine if you will **use an existing measure** or **create your own measure**

# Considering Content

- Keep a clear focus on your research question
- Literature search; what do we need to know in order to ask the most relevant and probing questions? (e.g. how is smoking best measured? How is asthma best measured? Are there any existing measures? Will you need to create your own measure?)

# Example questionnaire using Datadyne technology

- Hypothesis: Parental smoking increases the risk of asthma in children
- Study Design: Cross-Sectional Survey
- Participants: Parents of children

# Creating Your Own Questionnaire: Examples of Content Pitfalls

- “Have you ever had an EKG?”
  - **Technical jargon, abbreviation**
- “Do you think smoking should be banned in restaurants?”
  - **“banned” is a strong negative; choose something more neutral**
- “How many times have you quit smoking or considered quitting smoking?”
  - **contains multiple concepts**

# More Problems and Pitfalls

- Avoid questions that ask **two things at once** - you won't know which 'bit' people are answering:  
*Have you ever smoked cigarettes or had a cat ?*
- Match the questionnaire to **the reading level and literacy** of your target population
- **Ambiguity.....**  
e.g. *Does your child have frequent sleep disturbances?*

# More problems and pitfalls

- Avoid **jargon**
  - *Have you ever had PFTs done?*
  - *Do you use your albuterol every day or PRN?*
- Avoid options that are **not mutually exclusive** when they need to be

*What age are you?*

16-20

20-25

25-30

35-40

# More problems and pitfalls

- Avoid **leading questions**

*Do you think that the bad air pollution in the city caused your asthma?*

*Do you think George Bush is a dangerous idiot?*

- Avoid making the questionnaire **too long**
- **Check and double-check any skip patterns**

# Basic Rules

- **KISS** → **K**eep **I**t **S**hort and **S**imple
- **Appearance** is crucial and affects:
  - Response rate
  - Ease of data summarisation and analysis
- **Length** of questionnaire: shorter → ↑ response
- **Question order** is important:
  - Easy → difficult
  - General → particular
  - Start with questions relevant to the main subject.
  - Try to avoid starting with sensitive or personal questions

# More Basic Rules

- **Group questions** by topic or response options
- **Don't put the most important item last**
- **Open** with relevant **non-threatening** questions
- It is most likely to be completed if **easy on the eye, relevant, logical** and as **short as possible**

# Using Existing Questionnaires

➤ **Don't reinvent the wheel !!!!!!!**

# Why you should try and use an existing questionnaire

- Using a previously validated and published questionnaire will save you time and money
- You will be able to compare your own findings with those from other studies
- You need only give outline details of the instrument when you write up your work
- You may find it easier to get published

# General Considerations when Selecting Existing Measures

- Do a comprehensive literature search
- Contact researchers working in your area of interest to ask for information about measures (current or suggested)
- Evaluate measures from the standpoint of use with your population & with your selected data collection method
- When using existing measures be careful about translation and adaptation

# What should you look for in an existing measure?

- Reliability
- Responsiveness
- Validity
- Feasibility

# What to look for in existing instruments

- Does the instrument meet your specific study goals and practical limitations?
  - Does the instrument measure the variable you want to assess?
  - Are you qualified to administer this instrument?
  - What age group is targeted by the instrument?
  - Are there instructions available for how to administer the instrument?
  - How difficult is it to obtain a copy of it?
  - How expensive is it?
- Have the validity and reliability of the instrument been demonstrated and published?

# Is your Questionnaire Reliable?

- Reliable questionnaires yield consistent results from repeated samples and different researchers over time
- Differences in results come from differences between participants, not from inconsistencies in how the items are understood or how different observers interpret the responses
- A standardized questionnaire is one that is written and administered so all participants are asked precisely the same questions in an identical format and responses recorded in a uniform manner. Standardizing a measure increases its reliability

# Reliability

- Types of reliability
  - Test-retest reliability (the degree to which participants get similar results when re-tested in a short time)
  - Internal consistency (the degree to which similar items on the questionnaire or scale measure responses consistently)
  - Inter-rater reliability (the degree to which two or more raters agree on ratings or classification)

# Is the Measure Responsive?

- Can the instrument detect change if it occurs?
- What is the smallest clinically-important change in score?

# Is the Questionnaire Valid?

- A valid questionnaire measures what it claims to measure.
- In reality, many fail to do this. For example, a self report questionnaire that seeks to measure people's food intake may be invalid because it measures what they say they have eaten, not what they have actually eaten. Similarly, responses on questionnaires that ask general practitioners how they manage particular clinical conditions differ significantly from actual clinical practice.
- An instrument developed in a different time, country, or cultural context may not be a valid measure in the group you are studying.

# Validity

- Types of validity
  - **Content validity**: *Does the instrument measure what it is supposed to measure?*
  - **Construct validity**: *Does the instrument give results that are consistent with the underlying hypothesis? [e.g to what extent does the ACQ measure asthma control]*
  - **Criterion validity**: *Does the instrument give results that are consistent with observable predictions (e.g. “gold standard”) [e.g correlation between ACQ score and asthma exacerbations]*

# Is the Measure Feasible?

- Is it the right length?
- Does it require special training to administer?
- Can you afford it?

# Piloting is essential to all studies!!!!

- Pilot with a similar group of people to your intended subjects
- Piloting questionnaires will allow you to:
  - Identify problems with content
  - Identify problems with administration
  - Identify problems with coding
  - Turn back before its too late!
- Always analyze pilot data-you may want to revise your study questions or hypotheses

# Keep in Mind ....

- Are you asking only the necessary & relevant questions?
  - Will you really use all those questions?
- Constraints in overall length by survey mode:
  - In person: 1-2 hours
  - Telephone: 40 minutes-1 hour
  - Self-administered: up to 12 pages

# Essential ingredients for a high response rate are.....

- Make the questionnaire **relevant**
- Ensure respondents see its **potential and usefulness** (e.g. “we are trying to find out why children develop asthma”)

# And don't forget to...

- **Include a brief covering letter or verbal introduction stating:**
  - Who you are
  - Who you work for
  - Why you are investigating/researching
  - Where you obtained the respondent's name
  - How and where you can be contacted
  - Absolute guarantee of confidentiality
  - Self-addressed envelope for mailed surveys!!

# Practical Ways to increase response rates.....

- Be positive and respectful when contacting participants
- Explain why the study is important and how participation can contribute
- Give a tangible reward (\$, small gift)
- Make the questionnaire interesting
- Do not inconvenience the participant
- Make questions appear short and easy
- Avoid asking highly personal information (if it must be asked, use 'soft' wording and inform about confidentiality)
- Say thank you!!