SAFOSO

Animal Health Matters.
For Safe Food Solutions.

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Confederation

Federal Department of Economic Affairs,
Education and Research EAER
State Secretariat for Economic Affairs SECO

Data collection

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Objectives

- Why questionnaires are used.
- The steps in questionnaire design.
- Formats in which a questionnaire can be delivered.
- How the quality of the questionnaire can be assured.

Methods of data collection

Data are collected in three main ways, by:

1**. observation** (e.g., clinical examination, diagnostic imaging and post-mortem examination);

2. **completing questionnaires** (either directly or by interview);

3. use of **documentary sources** (e.g., clinical records, and records of diagnostic laboratory results), with an increasing use of data sets generated by other workers.

- Why questionnaires are used

How do questionnaires fit in an outbreak investigation?

- Verify the diagnosis and confirm the diagnosis
- Define a case and conduct case finding
- Tabulate and orient data: time, place, person
- Take immediate control measures
- Formulate and test hypotheses
- Plan and execute additional studies
- Implement and evaluate control measures
- Communicate findings

What is a questionnaire?

- A series of written questions
- Used to gather data from individuals
- Used to improve understanding of ongoing/past disease outbreaks
- Different types of questionnaires are used at different stages of an outbreak
- The person who answers the questionnaire is termed the **respondent**.

Different types of questionnaires

	Surveillance questionnaire	Trawling questionnaire (hypothesis generating)	Analytical study questionnaire (hypothesis testing)
WHEN	Normally used in routine surveillance and for creating line list	Detailed interview on some selected cases to identify common exposures	There is a specific hypothesis about the source
WHY	To get an overview of the situation in terms of time, place, person	To generate hypothesis about the source	To quantify risk associated with suspected sources
NEXT STEPS	Decide if it is an outbreak and describe the outbreak	Design analytical study based on hypotheses and sample suspected sources	If source is confirmed, implement intervention

- Describe the steps in questionnaire design

General principles of questionnaire design

- Sufficient & necessary questions to cover the objectives of research
- Ease of use for interviewer & respondent
- Ease of use for data processing

Why not have a longer questionnaire?

- Risk of non-completion
- Quality of data might be reduced
- Response rate might be lower
- Co-operation in future studies might be affected

Formulating questions

Questions should

- Contain only one concept
- Clearly define concepts
- Avoid double-negatives
- Avoid leading questions

Ten steps to design a questionnaire

1. State the research question / hypothesis (formulate objective)
2. Define your target audience
3. List the variables to be measured
4. Determine order of variables to be measured
5. Formulate the questions
   a) Decide on the questions
   b) Phrase the questions
6. Determine the sequence of questions
7. Plan the layout and design of the questionnaire
8. Translate if necessary
9. Train interviewers
10. Test questionnaire

Ten steps to design a questionnaire

Step 1. State the research question / hypothesis (formulate objective)

- Questionnaires have different objectives depending on when in the outbreak they are used
  - Early stages: to generate hypothesis about the source of the outbreak
  - Later stages: to quantify risk associated with suspected sources

Ten steps to design a questionnaire

Step 2. Define your target audience

- Your target audience depends on your objective
- Hypothesis **generation**: cases
- Hypothesis **testing**: cases and controls

Ten steps to design a questionnaire

Step 3. List the variables to be measured

- All questionnaires include some general information about the respondent, adequate to the objective
  - General characteristics of the respondent that may be relevant for the objective, e.g. age, gender, occupation
  - Anonymous questionnaires do not include information that identifies the respondent, e.g. name or address
- Inclusion of other variables depends on the objective of the questionnaire
  - Hypothesis generation: all possible risk factors to be included as variables
  - Hypothesis testing: only suspected risk factors to be included as variables

Example: variables for hypothesis generation

- Outbreaks of E. coli EHEC reported via Promed from July 2015-July 2016

(http://www.promedmail.org/)

- Implicated sources in the outbreaks:

Unpasteurized milk	Commercial chicken salad	Pizza dough
Unpasteurized cheese	Sprouts	Unpasteurized apple juice
Cottage cheese	Ground beef	Petting zoo
Soft cheese	Precooked meat products	Livestock faeces (cattle, goats, ...)
Salad	Flour	Water

- At the start of an outbreak, the source is not clear
- The variables in the questionnaire need to cover all possible sources/risk factors

Example: variables for hypothesis generation

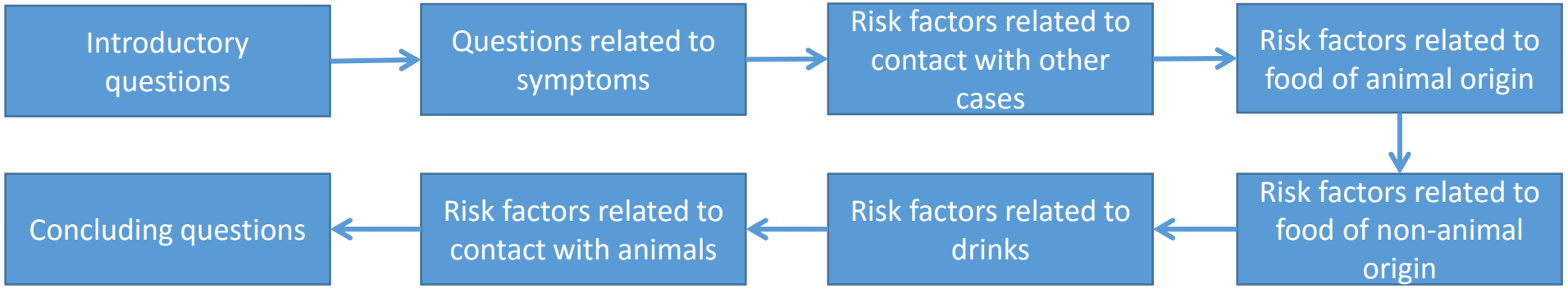
- Unpasteurized cheese is implicated as a risk factor for an EHEC outbreak

- Indepth variables in the questionnaire may include:
  - Different types of unpasteurized cheese
  - Eaten at home or eaten at a restaurant/canteen
  - Place of purchase of the unpasteurized cheese
  - Date of purchase of the unpasteurized cheese
  - ....

Ten steps to design a questionnaire

Step 4. Determine order of variables to be measured

- Presented as a flowchart
- It helps to define the «flow» of the questionnaire before phrasing individual questions
  - Brings a better structure and logic
  - Helps to verify that no relevant field of variables has been forgotten



Ten steps to design a questionnaire

Step 5a. Formulate the questions: decide on questions

- What is the specific information that needs to be asked
- In which form should the answer be given
  - Qualitative, quantitative, scales, ...
- Information asked should be specific and adequate to the objective of the questionnaire
- Do not overload the questionnaire with questions that are merely «interesting»

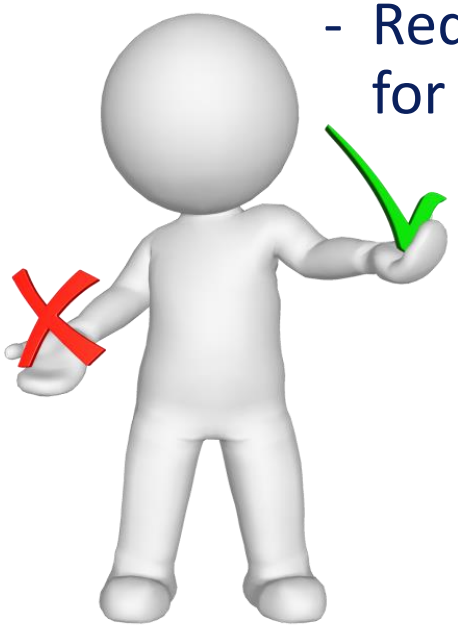
Types of questions

Closed questions

- Limited selection of answers for respondents
- Different types of closed questions
- Easier to analyse

Open questions

- Free text
- Provides freedom to respondent
- Requires special techniques for data analysis



Closed questions

Qualitative data

Nominal data

What is your sex?

□ Male

□ Female

Ordinal level data

How would you characterize your symptoms?

□ Very mild

□ Mild

□ Medium

□ Severe

□ Very severe

Quantitative data

Discrete data

What is your age group?

□ 0-9

□ 10-19

□ 20-29

□ 30-39

□ 40-49

□ 50-59

□ 60 or older

Continuous data

What is your age?

.....

Ten steps to design a questionnaire

Step 5b. Formulate the questions: phrase the questions

- A poorly phrased question will get poor answers!

- Use simple language
- Keep questions short and simple
- Only ask one question at a time
- Avoid ambiguity in wording
- Be specific
- Closed questions must be mutually exclusive and completely exhaustive

Use simple language:

- Do not use technical words in a questionnaire addressing lay people
  - *Swelling* instead of *oedema*
  - *Muscle aches* instead of *myalgia*

- If you need to use a technical word, then explain what it means in simple words

Keep questions short and simple

- Longer sentences are more difficult to understand and therefore increase the probability of getting poor responses
- Questions with negations are difficult to understand and answer correctly

1. Did you not visit the restaurant?

Yes

No

1. Did you visit the restaurant?

Yes

No

Only ask one question at a time

- With multiple questions built into a single question, it is not clear to which question the answer refers to
- Better to phrase follow-up questions with the possibility to skip a question if not applicable

1. When did calves and cows receive the last vaccination for pasteurellosis? .....

→ it is possible that the last vaccination was not given at the same time for calves and cows

1. When did calves receive the last vaccination for pasteurellosis? .....
2. When did cows receive the last vaccination for pasteurellosis? .....

Only ask one question at a time

1. How do you judge the rate of animal movements in your village (e.g. due to proximity of main road, proximity to slaughterhouse, proximity to market)?
   Very high High Medium Low
   Very low

→ epidemiologically, there are differences in risk factors between the presence of a main road, a slaughterhouse or a market

→ we cannot know which factor determines the rate of animal movements

1. How do you judge the rate of animal movements in your village?

Movements in relation to proximity of ...	Very high	High	Medium	Low	Very low	Not applicable
Main road						
Slaughterhouse						
Market						

Avoid ambiguity in wording

- Make sure to use words that can only be interpreted in a single way
- Use of ambigious words means that different people will interpret the question in a different way

1. Do you know about LSD?

→ Have I ever heard the word LSD?
→ Have I ever read or heard something about LSD?
→ Have I ever received training on LSD?
→ Am I an expert on LSD?

1. Have you ever received information about LSD from a government official, medical or veterinary professional?

Be specific

- Make sure that you make explicit references to time/date/ geographical regions

1. Have you travelled to province xx?

→ what is your period of interest? Entire lifespan of a person or only a certain time period that is associated with the outbreak under investigation?

1. Have you travelled to province xx in the period March-June 2016?

Closed questions must be mutually exclusive and completely exhaustive

- If you use closed questions (multiple choice), make sure that the given answers
  - Do not overlap
  - Cover all possible options

1. What is your age category?
   0-20
   20 and older

→ which one to choose if I am exactly 20?

1. What is your age category?
   0-19
   20 and older

Mutually exclusive

Closed questions must be mutually exclusive and completely exhaustive

1. Which livestock species do you have on your farm?
   - cattle
   - sheep
   - goats
   - horses

→ what if I have chicken and water buffaloes?

1. Which livestock species do you have on your farm?
   - cattle
   - sheep
   - goats
   - horses
   - other

Completely exhaustive

Ten steps to design a questionnaire

Step 6. Determine the sequence of questions

- Questions should be grouped logically (see also Step 3)
- Order of the questions is important
  - General to particular
  - Easy to difficult
  - Factual to abstract
  - If possible, start with closed format questions
  - Start with non-threatening questions relevant to the objective
  - Do not put the most important topic at the end

Ten steps to design a questionnaire

Step 6. Determine the sequence of questions

- Use of staged questions/skip patterns
- 1 complex question can be separate into 2 simple questions
- Respondents only need to answer questions that are relevant to them

Step 6. Determine the sequence of questions

1. Did you eat any soft cheese last week?
   - yes (go to question 2)
   - no (go to question 3)
   - I do not know (go to question 3)

2. How much soft cheese did you eat last week?
   - less than 100 gram
   - 100-500 gram
   - more than 500 gram
   - I do not know

3. Did you eat any beef last week?
   - ....

Ten steps to design a questionnaire

Step 7. Plan the layout and design of the questionnaire

- Clear language
- Clear instructions
- Easy to follow
- Well-illustrated skip patterns
- The layout and design must be adapted to the method of delivery of the questionnaire
  - Interviewer
  - Phone
  - Mail/email/internet

An example with poor question phrasing

FMD OUTBREAK INQUIRY FORM

Province :
District :
Village : Phone number of head of the village:
Date of Start of Event :
Date of last occurence :

POSSIBLE SOURCE OF DISEASE

1. Presence of wild boar in the same area:
   Yes ☐ No ☐
2. Rate of Animal Movement (Movement of the migratory animals, Trade of animal, Location to main road Presence of Slaughterhouse, Presence of animal marked.)
   Much intense: ☐ intense: ☐ mild: ☐ none: ☐ variable: ☐
3. Presence of FMD outbreak a neighbouring village or farmer
   Yes ☐ No ☐
4. Presence of Animal which enters in herd during the last month
   Yes ☐ No ☐ if yes, indicate orgin ……
5. Presence of Animal which exits from herd in a month
   Yes ☐ No ☐ if yes, indicate the destination ……

VACCINATION

- Willingness of Farmers to vaccination:
  Willing ☐ Unwilling: ☐ Variable: ☐
- Are Animals vaccinated regularly twice a year?
  Yes ☐ No ☐ variable: ☐
- Last FMD Vaccination:
  Date: Batch Number: Expiry Date: Trademark:
- Who did vaccinate the animals the last vaccination campaign:
  Official Veterinarian: ☐ Private Veterinarian: ☐ Other: ☐

An example with cleare structure

C. PREMISES DESCRIPTION *(Cont.)*

14. What other types of animals are present on the farm?

a.	Beef cattle	☐ Yes ☐ No
b.	Dairy cattle	☐ Yes ☐ No
c.	Horses	☐ Yes ☐ No
d.	Sheep	☐ Yes ☐ No
e.	Goats	☐ Yes ☐ No
f.	Pigs	☐ Yes ☐ No
g.	Dogs	☐ Yes ☐ No
h.	Cats	☐ Yes ☐ No
i.	Poultry or domesticated waterfowl	☐ Yes ☐ No
j.	Other (*specify*: _____)	

15. Is water treated prior to delivery to poultry? ☐ Yes ☐ No

If Yes, how is it treated and with what? _____

D. FARM BIOSECURITY

1. Is there a house with a family living in it on the property?
☐ Yes ☐ No

2. Is there a common drive entrance to farm and residence?
☐ Yes ☐ No

3. Do you have signage of "no admittance" or "biosecure area" on this property?
☐ Yes ☐ No

4. Is there a gate to this farm entrance?
☐ Yes ☐ No

5. Is the gate secured/locked? ☐ Yes ☐ No
If Yes, what hours is it secured? _____

6. Is the farm area fenced in?
☐ Yes ☐ No

7. How frequently is vegetation mowed/bush hogged on the premises?
_____ times/month

8. Is the facility free of debris/clutter/trash piles?
☐ Yes ☐ No

9. Is there a wash station/spray area available for vehicles? ☐ Yes ☐ No
If Yes, what disinfectant is used? _____

10. Is there a designated parking area for workers and visitors away from the barns/pens?
☐ Yes ☐ No

11. Is there a changing area for workers? ☐ Yes ☐ No
Do they shower? ☐ Yes ☐ No

12. Do workers don dedicated laundered coveralls before entering each house on the premises?
☐ Yes ☐ No

Ten steps to design a questionnaire

Step 8. Translate if necessary

- Sometimes the questionnaire needs to be made available in the local language
- Work with professional translators to ensure that the intent of each question is well understood and properly translated
  - Possibly work together with the translator

Ten steps to design a questionnaire

Step 9. Train interviewers

- If you make use of interviewers to deliver the questionnaire, training them is essential
- They need to understand the questionnaire
  - Terminology and definitions used
  - Logic of the questionnaire, e.g. skip patterns
- They need to know how to deliver the questionnaire
  - Master the consent process proceeding the actual questionnaire
  - Only read the questions, but not interpret them for the respondent
  - Avoid interviewer bias by asking the questions in a calm and neutral manner

Ten steps to design a questionnaire

Step 10. Test questionnaire

- Testing of a questionnaire is essential to identify and remove unclarities and errors
- Helps to increase the quality of the data collected during the actual delivery period of the questionnaire
- Two stage testing process:
  - Internal testing
  - External testing

Ten steps to design a questionnaire

Step 10. Test questionnaire

- Does everybody understand the questions?
- Are certain questions difficult to answer?
- Are people willing to answer all questions?
  - Culturally sensitive issues
- Are there any unnecessary questions?
- Are there any questions missing?
- Are response categories adequate?
- Are collected data suitable for analysis?
- Are instructions for interviewers clear and practical?
- How long does data collection take?
- Are there any other difficulties with the questionnaire/form?

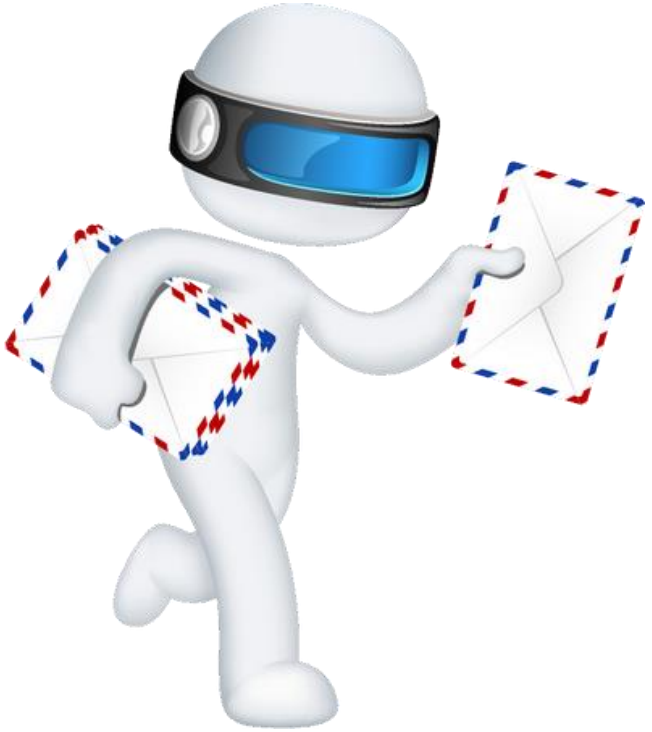
Internal or informal testing

- Use colleagues as respondents
- Check every question
  - Are they comprehensible
  - Are there any typing mistakes
  - Are the skip patterns logical and correct
  - Are the answer options adequate
- Following the feedback, revise the questionnaire as needed

External or formal testing

- Pilot testing
- Always done on the actual target population
- Conducted as if in a real questionnaire setting
- Afterwards, ask for feedback from the respondents and the interviewers
  - Individual questions
  - Process of delivery of the questionnaire
- Afterwards, revise the questionnaire as needed
- People who participated in the pilot test must not take part in the actual questionnaire

- Describe formats in which a questionnaire can be delivered



Delivery of the questionnaire

- There are 2 main formats for delivery of a questionnaire
  - Delivered by an interviewer
  - Administered by respondent independently

- You need to decide on the format of delivery at the beginning of the questionnaire design
  - Has an impact on how questions are phrased
  - Has an impact on how the instructions on how to complete the questionnaire are phrased

Delivery by an interviewer

- Delivery by interviewer
  - Face-to-face
  - By telephone
- Interviewer can influence the responses given by respondent and recorded on the form, therefore:
  - Training of interviewers essential
  - Neutral voice
  - No interpretation of questions and responses done by interviewer
  - Standarization in recording

Administered by respondent

- Administered by respondent
  - By email
  - Online portal

- Format of questionnaire needs to be adapted to self-administration
  - Very clear instructions, because no clarifications can be asked
  - Attractive design to keep people motivated

- Describe how the quality of the questionnaire can be assured

Ensuring quality of the questionnaire

- Designing and delivering a questionnaire requires a lot of resources
- Therefore it is essential to ensure that the quality of the data derived from it is good
  - To get as close to the truth as possible
  - Else: waste of money and time
- Two key characteristics of quality of questionnaire
  - Reliability
  - Validity
- Response rate

Reliability

- Does the questionnaire produce consistent results?
  - If so, you will receive similar answers to similar questions ??????

- **Internal consistency**
  - The response to one question is not in conflict with the response to another question
  - Avoid asking a question more than once

- **Interviewer consistency**
  - Each interviewer asks questions and records responses in the same manner
  - Train the interviewers

Validity

- Do the responses reflect the truth?

- **Construct validity**
  - To ensure that the responses relate correctly to the question that was asked

- **Content validity**
  - To ensure that possible responses cover all relevant aspects of the questions that was asked

Quality control

Supervision of the team is needed at all levels

- Monitoring of interviewers, vets, data staff, lab staff
- Checking questionnaires in field
- Checking questionnaire at data entry stage
- Checking lab results
- Explicit procedures needed to correct errors at different stages

Response rate

- Response rate has an important influence on the quality of the data that are derived from the questionnaire

- Low response rate can lead to significant bias – response bias
  - The group of people who answered the questionnaire may be very different from the group of people who did not answer the questionnaire

Influencing the response rate

- Method of delivery (face-to-face, phone, mail, email, internet)
- Response rate may increase if the questionnaire is supported by well-recognized and well-respected organizations
- Questionnaires that are long and/or have poor appearance tend to get lower response rates
- Questionnaires that are not confidential may get lower response rates
- If the topic is directly relevant/of interest to the respondent, response rates may increase

Web based tool to develop questionnaire and web survey

- Epidata http://www.epidata.dk/
- SurveyMonkey https://ru.surveymonkey.com/
- Microsoft Access https://products.office.com/uk-ua/access

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Thanks