Questionnaire Design

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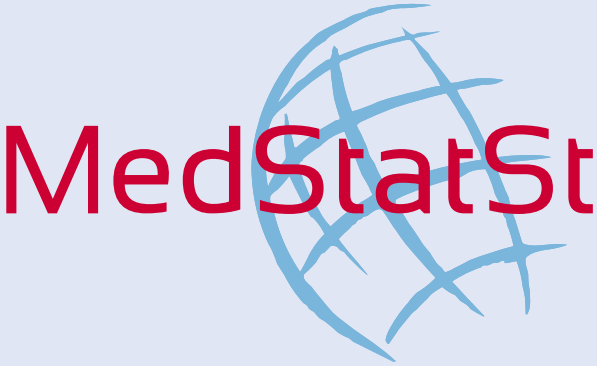

V2.0.3

Objectives

- Understand how to design a valid and reliable questionnaire
- Understand how to design a questionnaire to ensure seamless data collection and analysis

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- Understand how to design a valid and reliable questionnaire
- Understand how to design a questionnaire to ensure seamless data collection and analysis

We will discuss the actual data collection and data analysis in future sessions.

Quiz

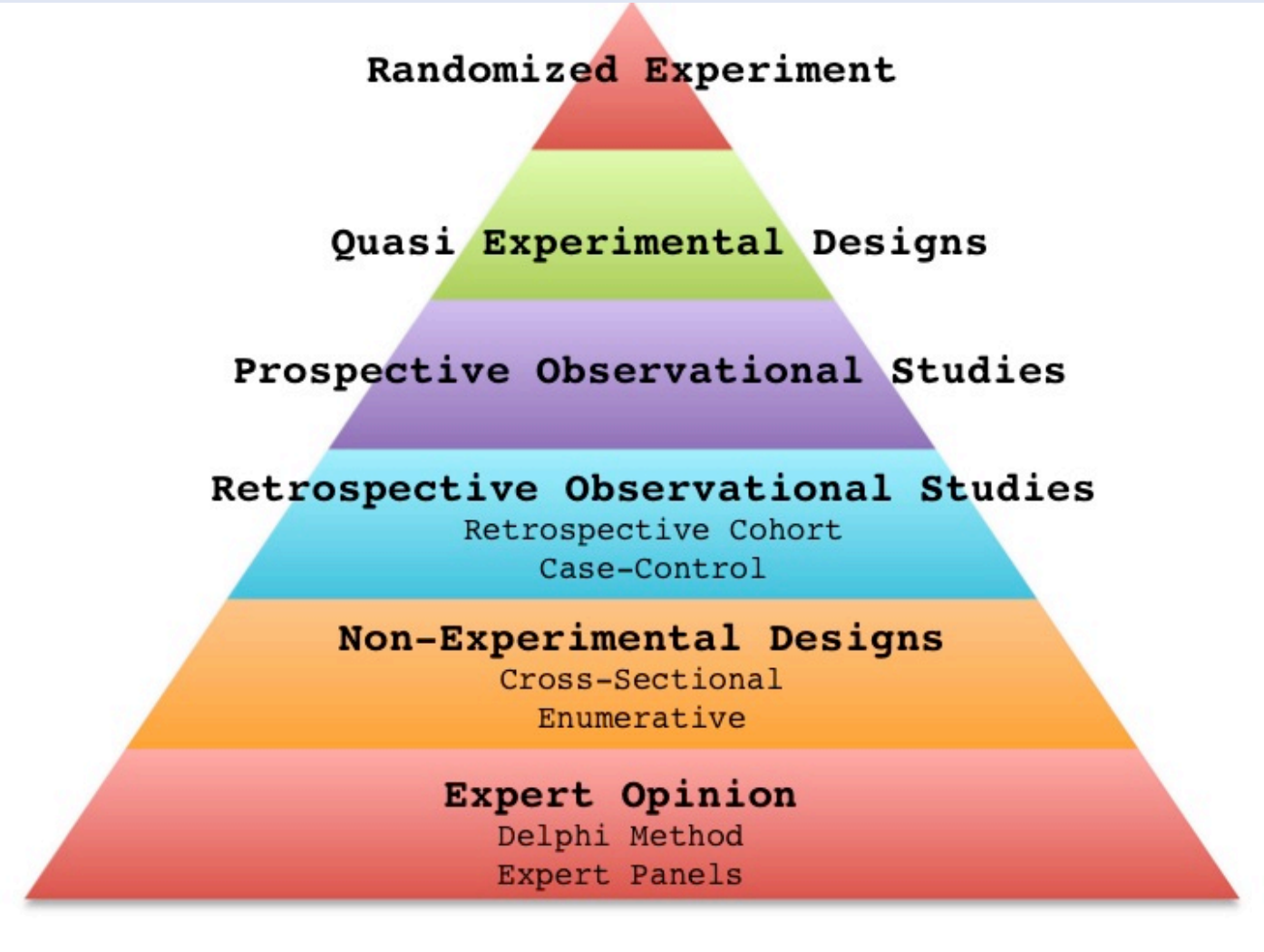
Find and circle at least 10 potential problems with the sample questionnaire

Working Construct

10:1 Rule

Emphasis is on one way to avoid getting in trouble. Not on presenting all ways of doing things

Where is Questionnaire?



Typical Reviewers Comment

- Has the Survey (or questionnaire or test) been validated?

What does this Mean?

1. Reliable
2. Valid

Definitions?

1. Reliable: How reproducible is the data?
2. Valid: How well does it measure what you WANT it to measure?

Validity and Reliability are properties of the survey instrument. You need to design a survey to be reliable and valid, and then later prove that it is.

Questionnaire Design

10 Rules for questionnaire design

Rule #0

Use a previously published and validated tool if you can find it!

Rule #1

Use an adequate introduction

Introduction

What are the important components of the introduction?

Introduction

What are the important components of the introduction?

- Purpose of the study
- Will results be anonymous?
- Is participation voluntary?
- How long will it take?
- Keep introduction short

Introduction

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Product Evaluation Survey
ICED: Incident Command for Emergency Departments

This survey pertains to the ICED (Incident Command for Emergency Departments) command-and-control package, including the printed disaster manual, organizational chart, job action sheets, and forms. You have been asked to provide your feedback so that the system can be improved for future versions. Your feedback is anonymous, and you do not need to put your name on the survey.

Rule #2

Divide the survey into manageable sections

Sections

- First question should be related to stated purpose
- Best if topics are in a meaningful order for participants
- Move from most familiar to least familiar
- Ask sensitive and difficult questions in the middle
- Organize by topic or scale type
- Objective before subjective questions
- Keep each section short

Sections

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Product Evaluation Survey
ICED: Incident Command for Emergency Departments

This survey pertains to the ICED (Incident Command for Emergency Departments) command-and-control package, including the printed disaster manual, organizational chart, job action sheets, and forms. You have been asked to provide your feedback so that the system can be improved for future versions. Your feedback is anonymous, and you do not need to put your name on the survey.

Part I

For each of the following statements, please pick a number from the scale to show how much you agree or disagree with each statement and write it in the space.

1	2	3	4	5
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

A) _____ An organized command-and-control structure is needed during a disaster

B) _____Training in command-and-control prior to a disaster is important

C) _____ICED improved the groups ability to manage the simulated disaster

D) _____I would encourage my department to adopt the ICED system

E) _____I would be comfortable using the ICED system in the event of a true disaster

Part II

For each of the following questions, rate your satisfaction on the following scale.

1 2 3 4 5 6 7

^ ^

Not at All Satisfied Very Satisfied

F) _____How satisfied were you overall with the ICED product?

G) _____How satisfied were you with the training session on command-and-control?

H) _____How satisfied were you with the ability to quickly learn ICED?

I) _____How satisfied were you with the ease of implementation of ICED during the simulation?

J) _____How satisfied were you with the ICED introductory text?

K) _____How satisfied were you with the ICED organization chart?

L) _____How satisfied were you with the ICED color coding?

M) _____How satisfied were you with the ICED job action sheets?

N) _____How satisfied were you with the ICED forms?

Rule #3

Limit branching

Branching

What type of residency training are you currently taking:

1. Emergency Medicine [go to section 2]
2. Anesthesia [go to section 3]

Branching

- Branching can be very confusing for the participants
- If subjects take wrong branch point it can result in missing data
- If you must use branching, make sure the instructions are simple and clear
- Consider electronic tools if you must use branching

Rule #4

Avoid bias in questions

Bias

How can we avoid bias in questions?

Bias

How can we avoid bias in questions?

- Don’t use leading questions
- Avoid inapplicable questions
- Avoid example containment
- Give criteria when needed
- Keep recall demands realistic
- Avoid over generalization
- Avoid overly specific questions
- Don’t assume too much about respondents
- Avoid cryptic abbreviations

Bias

To avoid misinterpretation bias:

- Keep sentences short
- Keep each sentence focused
- Keep wording clear
- Use simple sentence structure
- Watch for questions that are actually two questions

Rule #5

Leave demographics and sensitive questions for the end

Demographics

- Respondents will usually make a decision to complete or not complete the survey in the first several questions
- If survey can be anonymous, ensure participants know that completing demographics is optional

Rule #6

Precode the survey

Precodes

_____I would encourage my department to adopt the ICED system

_____I would be comfortable using the ICED system in the event of a true disaster

Part II

For the following questions, please rate your satisfaction on the following scale

1 2 3 4 5 6 7

^ ^

Not at All Satisfied Very Satisfied

_____How satisfied were you overall with the ICED product?

_____How satisfied were you with the training session on command-and-control?

_____How satisfied were you with the ability to quickly learn ICED?

Precodes

_____I would encourage my department to adopt the ICED system

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Part II

For the following questions, please rate your satisfaction on the following scale

1 2 3 4 5 6 7

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Not at All Satisfied Very Satisfied

_____How satisfied were you overall with the ICED product?

_____How satisfied were you with the training session on command-and-control?

_____How satisfied were you with the ability to quickly learn ICED?

Who has ever had to enter this type of data into a computer?

Precodes

Please check any other command-and-control systems you have used in an exercise or disaster

V1) __ MIMMS (Major Incident Medical Management and Support)

V2) __ ICS (Incident Command System)

V3) __ HEICS (Hospital Emergency Incident Command System)

V4) __ HICS (Hospital Incident Command System)

V5) __ Other (please specify) _____

Pre-codes should be:

- Subtle
- Usually in a lighter color
- One code for each possible response
- Should match your data collection form or spreadsheet

Rule #7

When using scales, consider how you will analyze before constructing

Scales

- Scales are usually the best way to get valuable information ***
- In general scales are a very good way to get very specific information
- Tend to provide much more information than yes/no questions

Scales

What types of scales are commonly used in surveys?

Scales: Types

Categorical response scales

- Discrete Choice
- Checklist
- Ranking
- Fixed Sum
- Paired Comparison

- Ordered response scales
  - Ordinal Scale
  - Likert Scale
  - Verbal Frequency Scale
  - Sematic Differential Scale
  - Rating Scale
  - Comparative Scale

Scales: Discrete Choice

Which of the following is your preferred method for respiratory protections during patient care during pandemic influenza:

A. Surgical Mask

B. N95-Mask

C. Powered Air Purifying Respirator

D. Self Contained Breathing Apparatus

Ranking

Please rank the following in priority of which you would PREFER to see in a disaster medicine teaching module. (Use 1 as the most preferred, 2 as the next, etc)

___Complex Humanitarian Emergencies

___Bioterrorism

___Pandemic

___Explosions

___Natural Disasters

Ranking

Please rank the following in priority of which you would PREFER to see in a disaster medicine teaching module. (Use 1 as the most preferred, 2 as the next, etc)

___Complex Humanitarian Emergencies

___Bioterrorism

___Pandemic

___Explosions

___Natural Disasters

Often Mistakes are Made on Ranking Questions

Scales: Likert

How much do you agree with the statement below:

1. Strongly Agree
2. Agree
3. Neither Agree nor Disagree
4. Disagree
5. Strongly Disagree

Scales: Sematic Differential

Contain pairs of opposite words

Linear numeric scales are generally preferred (easy to analyze).

Often best to anchor only ends to preserve interval nature

Rate your satisfaction:

1 2 3 4 5 6 7 8 9 10

Unsatisfied Satisfied

Likhert vs Semantic Differential

Likhert

Advantages:

- Familiar
- Used often in literature

Disadvantages:

- Cannot use the “mean”
- Use of t-test or ANOVA is controversial

Semantic Differential

Advantages:

- Can be analyzed as ratio(continuous data)
- Easy to use the mean
- Easy to apply t-tests or ANOVA

Disadvantages:

- Unfamiliar
- Some respondents may not understand the scale

Likhert vs Semantic Differential

Likhert

"When asked about overall satisfaction with the product, 15 people stated that they were completely satisfied, 12 stated mostly satisfied, 11 were satisified, 22 were slightly unsatisified, and 10 were completely unsatisfied."

Semantic Differential

"When rated on a scale of 1 to 9, mean satisfaction was 7.8, with a range of 4 to 9."

Scales

- First time scale is used, provide detailed instructions
- Subsequent use can be brief instructions
- Consider the audience!
- Watch vocabulary: Small changes in wording can drastically change response
- Changing direction of scales between sections? (Controversial)
- For discrete scales, often better to use too many categories as they can be amalgamated later

Rule #8

Use open ended questions sparingly

Open Ended Questions

What are potential issues with open-ended questions?

Open Ended Questions

What are potential issues with open-ended questions?

- Don't show any dimensions
- Data may not be comparable from one respondent to the next
- Difficult for the respondent
- Difficult to record and analyze

Open Ended Questions

When might open ended questions be necessary?

Open Ended Questions

When might open ended questions be necessary?

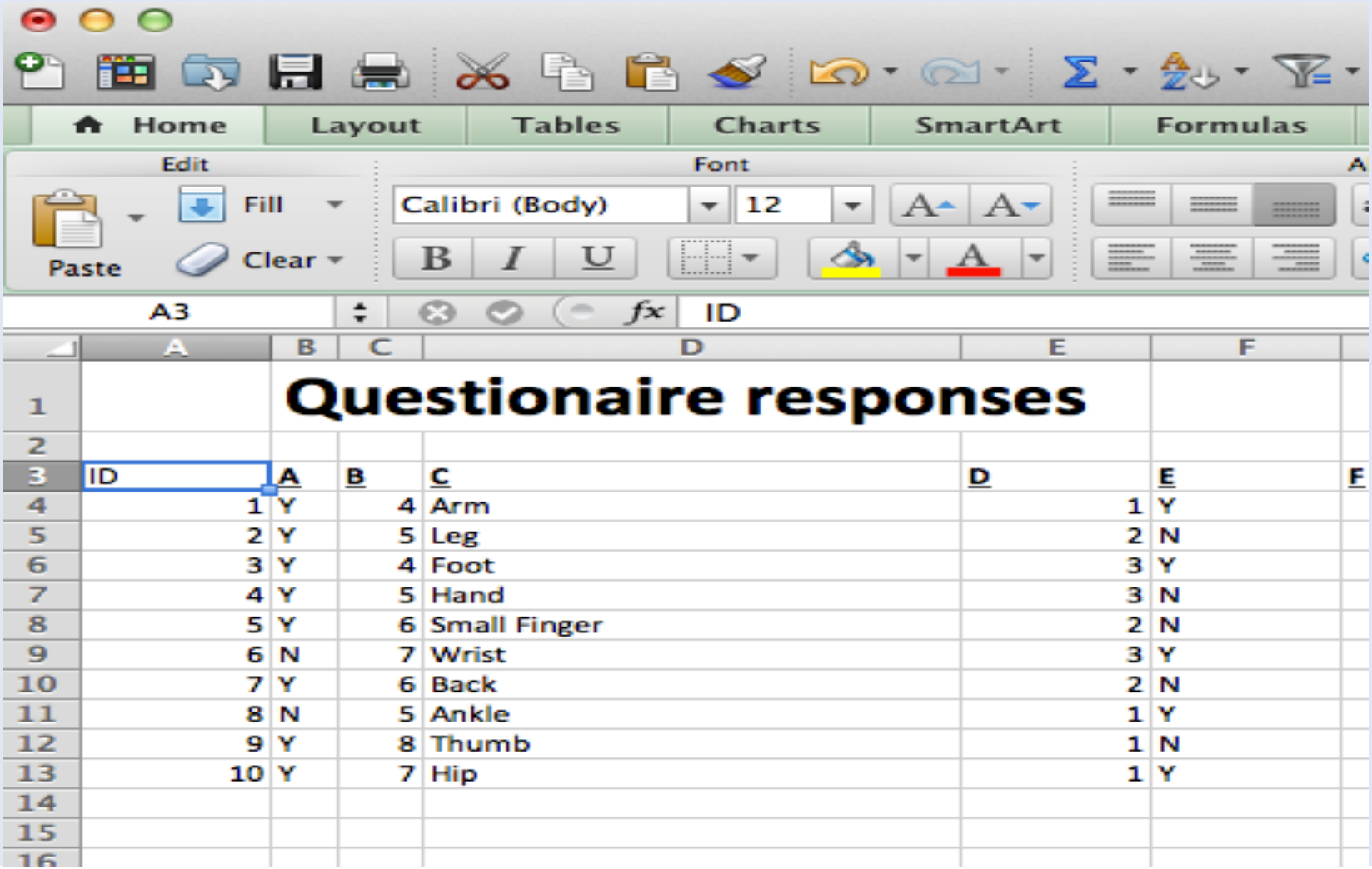
- List of potential responses is very long
- Listing potential responses can bias respondent
- Person composing survey is lazy (these are very easy to compose)

Rule #9

Use a Code Book

Codebook

Who has done this before?



Questionaire responses

ID	A	B	C	D	E	F
1	Y	4	Arm	1	Y	
2	Y	5	Leg	2	N	
3	Y	4	Foot	3	Y	
4	Y	5	Hand	3	N	
5	Y	6	Small Finger	2	N	
6	N	7	Wrist	3	Y	
7	Y	6	Back	2	N	
8	N	5	Ankle	1	Y	
9	Y	8	Thumb	1	N	
10	Y	7	Hip	1	Y	

Codebook

- Simply recording verbatim all open-ended responses can make analysis difficult
- Best to make some decisions about grouping early.
- When in doubt, make too many groups, and they can be amalgamated later

Code Book

Using a codebook

- Code is entered on the questionnaire
- Actual response in codebook
- All persons entering data use the same codebook

Code Book

Q) Which part of your body is most likely to get injured in your sport:

Fifth metatarsal

A) Other comments or recommendations:

Part IV

Please tell us a little about yourself

Code Book

Q) Which part of your body is most likely to get injured in your sport:

Fifth metatarsal

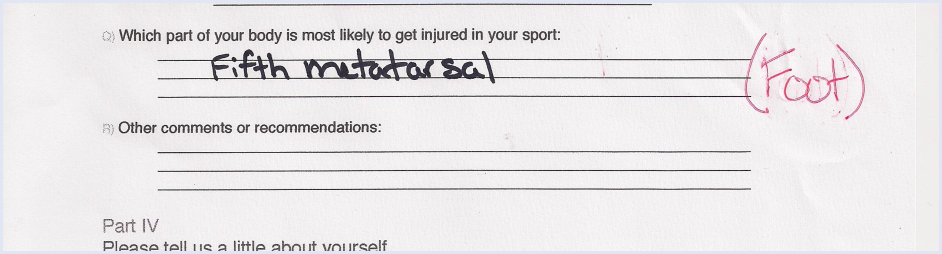
A) Other comments or recommendations:

Part IV

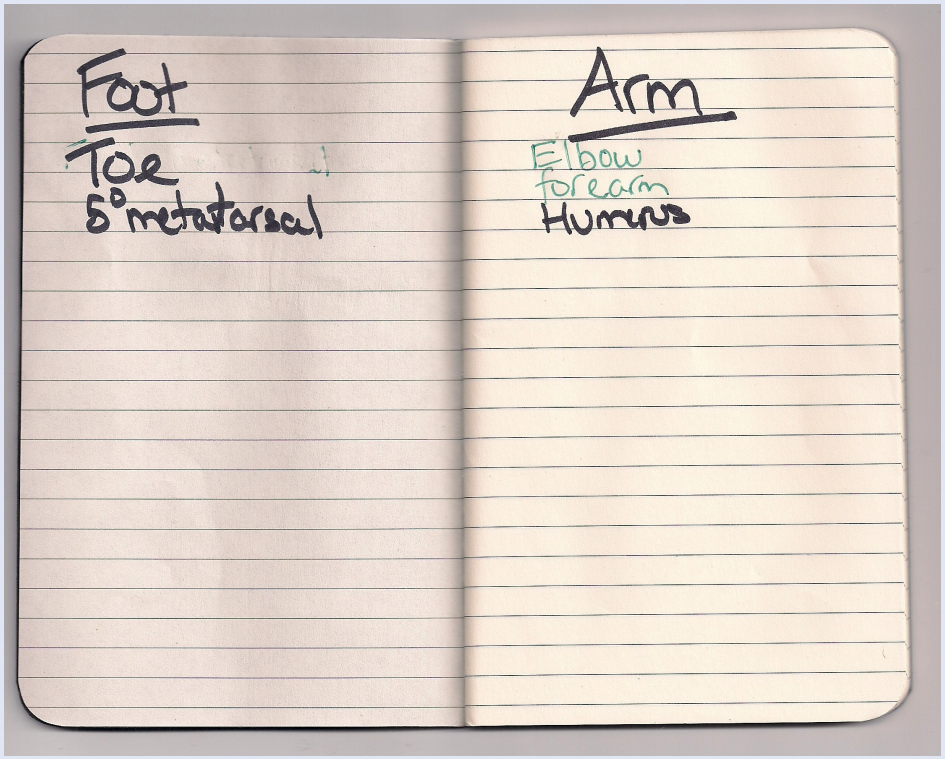
Please tell us a little about yourself

Using A Codebook

Code on Questionnaire



Response in Codebook

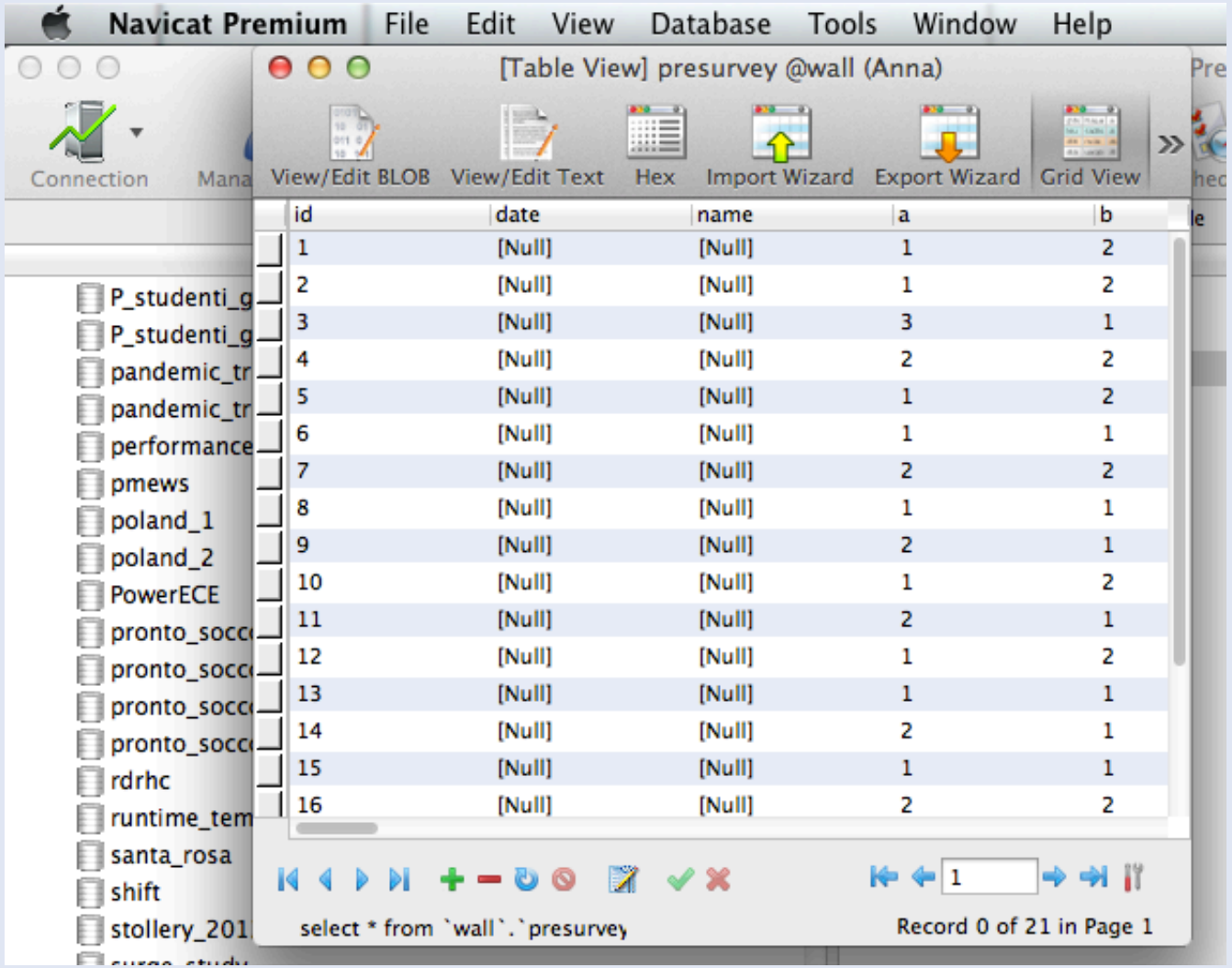


Rule #10

Trial the survey first:

1. Give Survey to a few volunteers
2. Trial the DATA COLLECTION:
   - Including data collection form
   - Including software (spreadsheet)
3. Be prepared to revamp the form

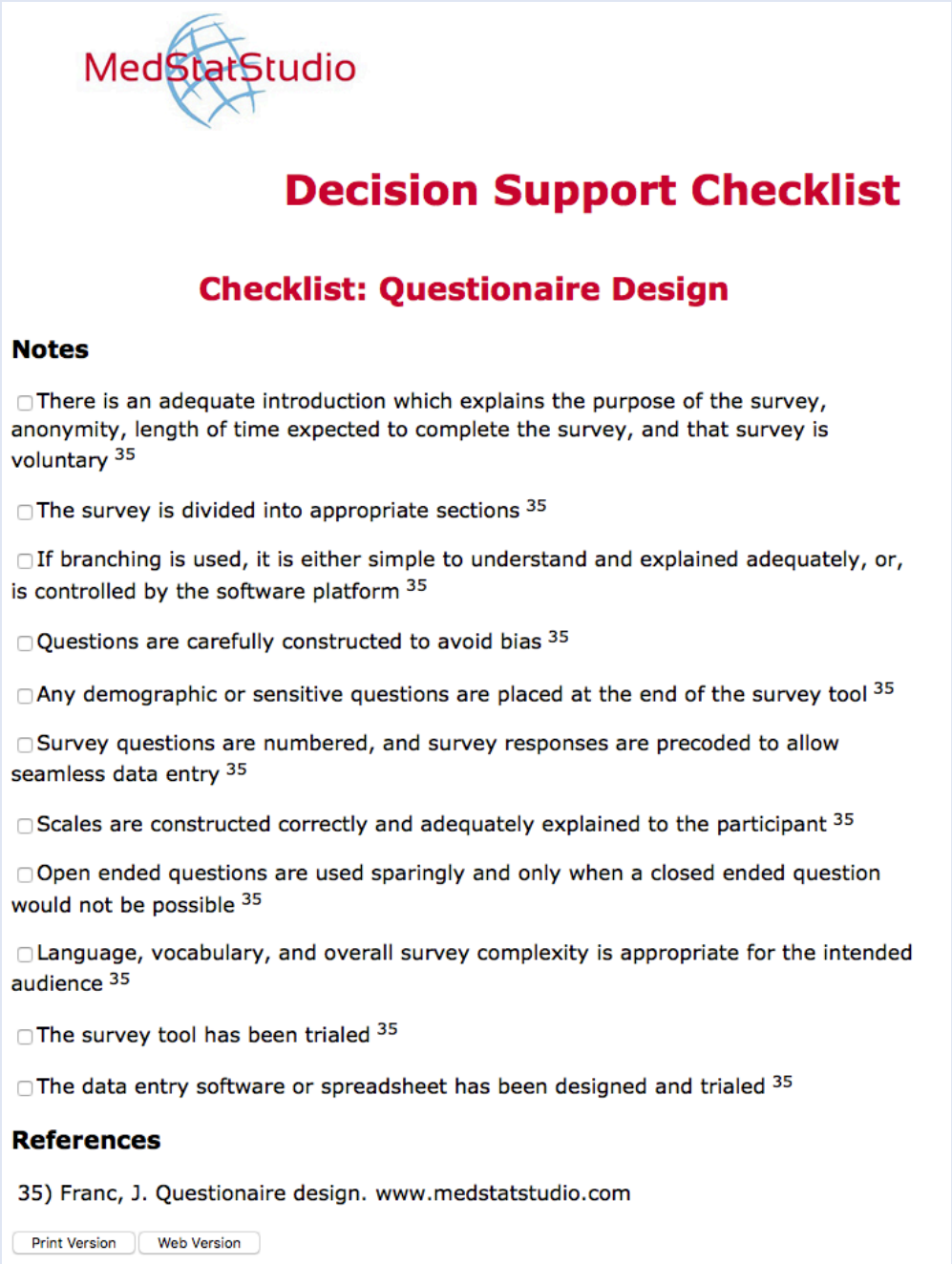
Hard Learned Lesson



Checklists

Checklist available

www.medstatstudio.com/
checklists



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Decision Support Checklist

Checklist: Questionaire Design

Notes

- ☐ There is an adequate introduction which explains the purpose of the survey, anonymity, length of time expected to complete the survey, and that survey is voluntary [35]
- ☐ The survey is divided into appropriate sections [35]
- ☐ If branching is used, it is either simple to understand and explained adequately, or, is controlled by the software platform [35]
- ☐ Questions are carefully constructed to avoid bias [35]
- ☐ Any demographic or sensitive questions are placed at the end of the survey tool [35]
- ☐ Survey questions are numbered, and survey responses are precoded to allow seamless data entry [35]
- ☐ Scales are constructed correctly and adequately explained to the participant [35]
- ☐ Open ended questions are used sparingly and only when a closed ended question would not be possible [35]
- ☐ Language, vocabulary, and overall survey complexity is appropriate for the intended audience [35]
- ☐ The survey tool has been trialed [35]
- ☐ The data entry software or spreadsheet has been designed and trialed [35]

References

35) Franc, J. Questionaire design. www.medstatstudio.com

Print Version | Web Version

Quiz Answers

What were the problems with the sample questionnaire?

No introduction
↳ what is this survey about?
what is it for?

NO page number

Demographics should be last

My current occupation is....
__ Student
__ Resident
__ Staff

This is not inclusive

No numbering of questions

__My current salary is: _____ offensive and irrelevant

__ I am involved in Emergency Department Administration

__ I have a non-clinical portfolio in Emergency medicine in addition to my clinical duties

Please check any other command-and-control systems you have used in an exercise or disaster
__ MIMMS (Major Incident Medical Management and Support)
__ ICS (Incident Command System)
__ HEICS (Hospital Emergency Incident Command System)
__ HICS (Hospital Incident Command System)
__ Other (please specify) _____

Please check any other disaster planning exercises you have attended
__ Teaching sessions / Lectures
_ Online Tutorials
__ Table-top exercises
__Simulations
__Computer Simulations
__ Live Simulation Exercises
__ Other (please specify)

Not mutually exclusive

needs space for response

If you have never completed the ICED lesson, please skip ahead to the next question

where is the branch point?

1	2	3	4	5
Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree

_____ An organized command-and-control structure is always needed during a disaster (Bias)
_____Training in command-and-control prior to a disaster is important
_____ICED improved the groups ability to manage the simulated disaster
_____I would encourage my department to adopt the ICED system
_____I would be comfortable using the ICED system in the event of a true disaster
_____I prefer the quick and concise ICED system to the long and complicated ICS system

Leading question

For the following questions, please rate your satisfaction on the following scale
1 2 3 4 5 6 7

no anchors on scale

_____How satisfied were you overall with the ICED product?
_____How satisfied were you with the training session on command-and-control?
_____How satisfied were you with the ability to quickly learn ICED?

Is this the first or second page?

Page is split and scale is on previous page

_____How satisfied were you with the ease of implementation of ICED during the simulation?

_____How satisfied were you with the ICED introductory text?

_____How satisfied were you with the ICED organization chart?

_____How satisfied were you with the ICED color coding?

_____How satisfied were you with the ICED job action sheets?

_____How satisfied were you with the ICED forms and the binder that contained them?

Two part question

(can I choose any number of these? just one?)

The following should be added to the ICED program

__ A longer training session of 4 hours and 23 minutes prior to the simulation — Overly specific

__ Home(online) training prior to the simulation

__ More detailed written introductory text

__ More positions on the organizational chart

__ Inclusion of positions outside the emergency department on the org chart

__ More detailed job action sheets

__ Job action sheets for additional positions

__ A larger selection of forms

__ Electronic (tablet) based version of the ICED Program

__ Additional color codes for positions within the ICED program

__ Other

No request to specify what "other" is

What are the main advantages: Main advantage of what? [unstated criteria]

_____

_____

_____

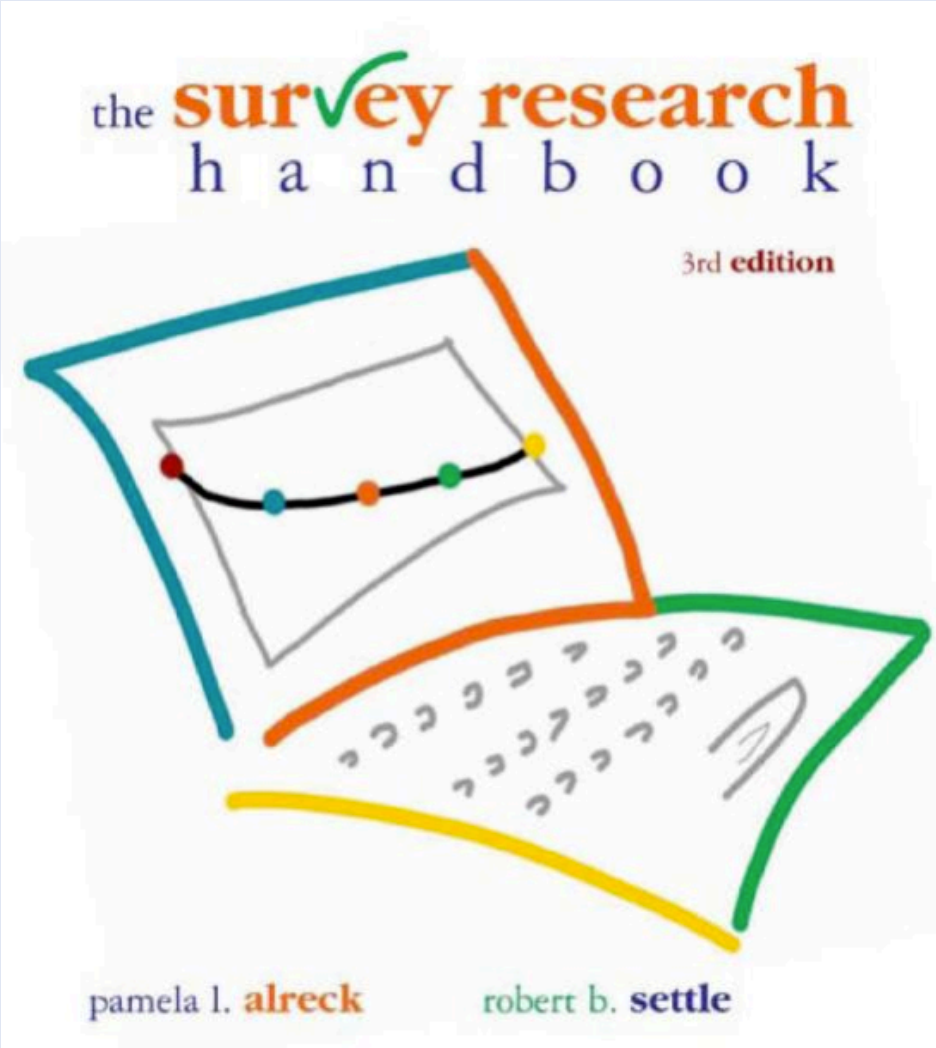
Other: — overly general

_____

_____

_____

Reference



- Excellent resource for questionnaire based research
- Includes:
  - Sample selection
  - Survey design
  - Processing the data
  - Basic statistics
  - Writing the report

Objectives

- Understand how to design a valid and reliable questionnaire
- Understand how to design a questionnaire to ensure seamless data collection and analysis

Questionnaire Design

Questions

Questionnaire Design

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Math Lesson

What is the relationship between relative risk and odds ratio?