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# Strengthening the Occupational Health Expertise and Scientific Performance of Public Health Institution of Turkey



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# Instruments for Health Assessments

B 3.1.1 ppt



# Learning Objectives

You will be able to further operationalize your surveillance program :

- Selecting the appropriate health measurements: instruments and tools
- Knowing methods and tools for diagnosing different types of occupational diseases
- Collecting data in a standardized way

# Summary of presentation



- Validated and reliable study instruments
- Validity, reliability
- Questionnaires, Lists
- Tests
- Registers
- Quality control

# Surveillance plan

Study design?

Population?

**Instruments for the health assessments**

**Errors?**

Statistical tests?

# Instruments

In your surveillance project you may use:

- Validated questionnaires
- Interviews (trained interviewers)
- Specific tests
- Data from biological monitoring
- Existing diagnostic data (protocol?) from occupational or other health care
- New diagnostic assessments (protocol)
- Use Instruments with high validity and reliability

# Validity

A valid indicator reflects the 'truth'



# Validity example

You are organizing your shopping and you ask your daughter how many apples are still in the living room.

She reports: 1

Her counting is not valid as it does not reflect the reality: one pear but many apples.



# Reliability

Reliability is the consistency in a series of measurements

# Reliability example

You ask your daughter to recount the apples.

She comes back and reports again:1

The reliability or internal (intra-observer) consistence is high (but her measurement is not valid)



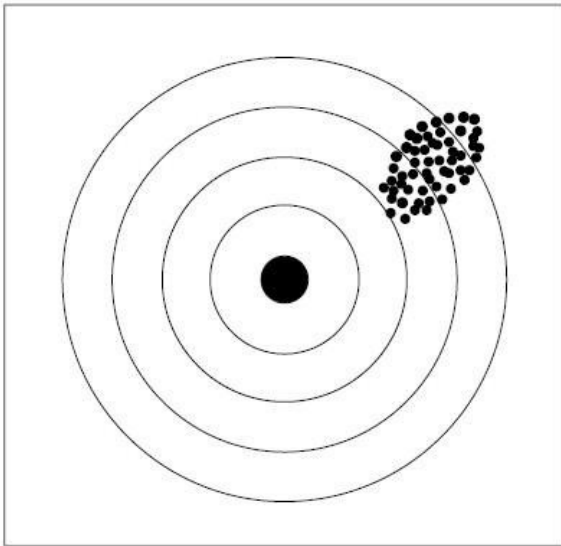
# Reliability example

You have doubts about the answer of your daughter and you ask your son to count the apples.

He returns and reports as well: 1

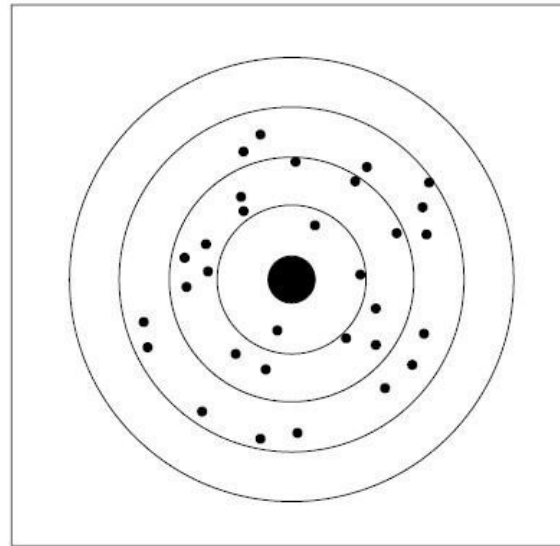
The inter-observer reliability of your children is high (but their measurement is still not valid)





The participant always reports that he has no COPD complaints but he has COPD complaints

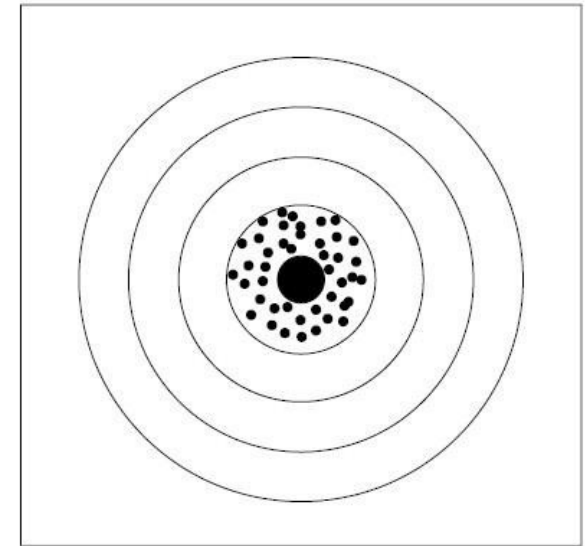
**Reliable, not valid**



One day the participant tells that he has no COPD complaints, the other day he reports COPD complaints (independent of exposure).

The mean is correct

**Not reliable, but valid**



The participant always reports some complaints and has COPD complaints

**Valid and reliable (intra observer)**

# Instruments

Use – when possible - existing instruments with a high validity and reliability

When you translate a questionnaire, verify the validity and reliability

The validity and reliability should be equal for

- the participants with and without exposure
- for formal and informal workers, when precariousness of work is the topic of study

# Horizontal and Vertical Surveillance

- **Horizontal Surveillance:**
  - Measuring a wide range of diseases in a specific company, occupation or a region
  - Instruments: questionnaires, interviews, exploration of existing health data, use of lists of OD's, use of GP's as surveillance officers
- **Vertical Surveillance:**
  - measuring one specific occupational or work-related disease in a region or specific occupation
  - Instruments: questionnaires, interviews, objective tests, exploring registers, in depth assessments, use of medical specialists as surveillance officers

# Your protocol

- For a 'vertical' surveillance focusing on one disease, we suggest to use a validated disease-specific questionnaire or module such as for respiratory diseases, musculoskeletal disorders, burnout, skin diseases, GHQ-12 for mental health, etc.
- For specific diseases, measurements can be part of the diagnose (e.g. audiometry, spirometry)
- For an integrated ('horizontal') health surveillance measuring a large number of health complaints or diseases, use a questionnaire including such a wide range of health complaints or diseases.



# Advantages of validated instruments

- ☺ The data are relatively more corresponding to reality than when using self-made questions (in general)
- ☺ The instruments have been used successfully in previous studies.
- ☺ A number of questionnaires are translated in other languages.
- ☺ You can compare your results with results from your colleagues in your country and in other countries; and with figures published in the scientific literature.
- ☺ It is not necessary to design and validate an instrument yourself.

# Validated instruments

- ☹ When you want to compare the results with others  
**Do not change the questions!**
- 😊 The only reason to change a question is when the question cannot be understood at all by your participants, or when preset answers such as for 'levels of education' or for 'income categories' are not valid in your country. All changes to the questions are to be recorded in the study protocol (!).

# Objective Measurements

## **Wide range of tests for specific diseases (examples):**

- Spirometry (lung diseases)
- Challenge test (occupational asthma)
- X-rays, CT-scan (silicosis, asbestosis, lung cancer)
- Audiometry ( occupational hearing loss)
- Skin: foto's (e-dermatology), patch test, skin prick test (allergic skin diseases)
- Blood tests: kidney/liver functions
- Biomonitoring / biological and early health effect surveillance (Lead in blood, cholinesterase level)
- Cytology in urine (bladder cancer screening)
- Neuropsychological tests (toxic encephalopathy)

# Major surveillance methods-I

Mandatory reports of certain diseases by clinicians or health-care providers or facilities

Traditional source of surveillance data  
The more severe the illness (such as meningitis) the more likely it is to be reported.

Reports are based on clinical diagnoses (not based on the most sophisticated diagnostic testing).



# Major surveillance methods-II

## Reports by laboratories

Usually more compliant in reporting disease than are health-care providers.

Due to high costs, the volume of laboratory testing in low-income countries is low and therefore the usefulness of lab-based systems is limited.



# Major surveillance methods-IV

## Sentinel surveillance

A sample of reporters (such as clinicians, hospitals, and local laboratories) are designated as the reporting sources.

It is effective where the goal is to estimate the magnitude and trends of a disease, rather than to detect the earliest or all cases



# Major surveillance methods-IV

## Periodic or ongoing prevalence surveys

A periodic survey of a representative sample of the population can provide useful information on prevalence of behavioral risk factors, utilization of preventive measures, occurrence of exposures, injuries, self-reported disease, and so on.

The benefit of sampling is that information from a relatively small group of respondents provides accurate estimates of the general population.



# Major surveillance methods-IV

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# Major surveillance methods-5

## Vital records

These records can be used to estimate the magnitude of certain diseases and injuries, describe distribution (such as by age or geography), track trends, set priorities, and fulfill many other useful public health needs. However, collection of information without analysis and dissemination for use in prevention does not qualify as public health surveillance.



# Major surveillance methods-6

## Secondary analysis of datasets collected for other purposes

Data are collected by nonpublic health agencies for a myriad of reasons. For example, local industries will collect data on absenteeism and even on the causes for absenteeism.

Departments of transportation may collect information on motor vehicle accidents and injuries. This information may then contribute to the overall surveillance system.



# Your protocol

- Describe in detail which method you will use for health assessment
- When you include objective measurements explain how you are measuring (instrument, protocol) and how you have collected the samples.
- This part of the protocol has to be presented on a maximum of one page, but in case you use objective measurements, it could be larger.
- Appropriate selection and use of instruments depends
  - on the precise research question
  - on the specific exposure or disease
  - is often context sensitive
  - So, ask expert advice.

# Quality control

- Everyone makes errors. It does not matter how careful you are, no one is perfect.
- However, you want the results of the project the best it can (and that makes it something outstanding!).
- In the protocol you must describe what you consider to do with possible errors. Consider at least the next measures.

# Quality control

- Write a good study protocol that everyone has to follow.
- Do you have persons who do the interviews or measurements for you? You are lucky!
- However,
  - How do you know that they did the interviews or measurements really and that they did not invent the data? Check a random number of interviews or measurements.
  - How do you know if they do the interviews or measurements well, affecting or not the response or measurement result? Therefore, train the co-workers carefully.

# Quality control

When you need to enter the data:

- Organize that another person (your husband or daughter/son) enters the data as well (double entry).
- Do not forget to put a unique number on the written questionnaire or measurement result form and enter the same number in both versions!!
- Afterwards, compare both versions to find errors (this can be done automatically)
- The data have to be entered in a database such as EpiInfo. Another option is that PHIT selects specific software and databases.

# Quality control

- A random number of questionnaires or measurements have to be revised by experienced colleagues.
- Back-up your archives daily on a pen-drive (USB stick) or external hard disk.
- Keep paper questionnaires and measurement result forms in a safe place.

# Ethical aspects

- In your protocol you have to show that the study will be performed according to good epidemiological practice.
- More details are to find in the Manual and in a special lecture (A/B 4.2 on “Issues”)



## **Group Work 4**

Complete the instruments and quality management in the Methods of the study protocol.