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



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3.1 Theory on Epidemiology

Learning Objectives

1. Recognise an epidemiological study
2. Explain differences between basic types of observational epidemiologic studies
3. Know the relation between epidemiology and surveillance
4. Understand why epidemiology is an important scientific area in Occupational Health
5. Be able to understand and interpret existing descriptive epidemiologic literature



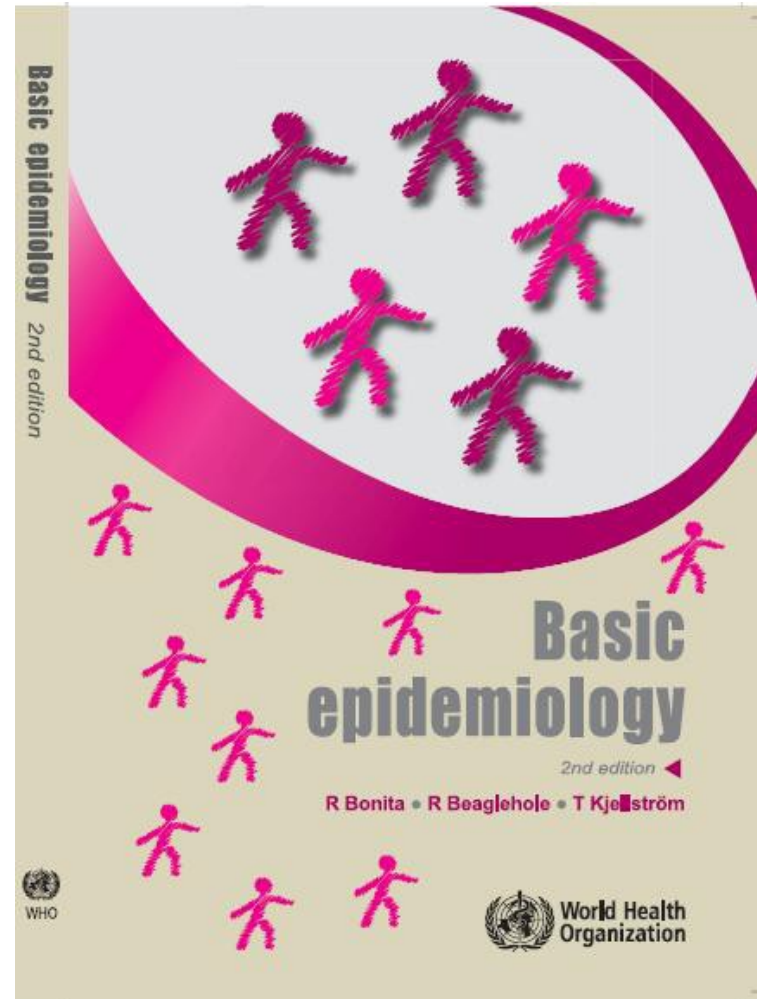
Definition of epidemiology

The study of the distribution and determinants of health-related states or events in specified populations, and the application of this study to the prevention and control of health.



Definition of epidemiology

Source:
Bonita 2006



Relation between surveillance and epidemiology

Surveillance is:

- an essential feature of epidemiologic research
- essentially observational and descriptive
- describes the occurrence of the disease and its determinants in the population.



Good surveillance uses epidemiologic knowledge

- often the starting point for epidemiological research aimed at testing a hypothesis by comparing and contrasting groups



Epidemiologic studies can use data from good surveillance systems



Definition of epidemiology

Box 1.2. Definition of epidemiology^a

The word “epidemiology” is derived from the Greek words: *epi* “upon”, *demos* “people” and *logos* “study”.

This broad definition of epidemiology can be further elaborated as follows:

Term	Explanation
Study	includes: surveillance, observation, hypothesis testing, analytic research and experiments.
Distribution	refers to analysis of: times, persons, places and classes of people affected.
Determinants	include factors that influence health: biological, chemical, physical, social, cultural, economic, genetic and behavioural.
Health-related states and events	refer to: diseases, causes of death, behaviours such as use of tobacco, positive health states, reactions to preventive regimes and provision and use of health services.
Specified populations	include those with identifiable characteristics, such as occupational groups.
Application to prevention and control	the aims of public health—to promote, protect, and restore health.



Types of studies

Table 3.1. Types of epidemiological study

Type of study	Alternative name	Unit of study
<i>Observational studies</i>		
Descriptive studies		
Analytical studies		
Ecological	Correlational	Populations
Cross-sectional	Prevalence	Individuals
Case-control	Case-reference	Individuals
Cohort	Follow-up	Individuals
<i>Experimental studies</i>		
<i>Intervention studies</i>		
Randomized controlled trials	Clinical trials	Individuals
Cluster randomized controlled trials		Groups
Field trials		
Community trials	Community intervention studies	Healthy people Communities

Why do we need epidemiology?

- Target of Turkish Ministry Of Health is to increase the frequency of Occupational Disease Diagnosis

WHY ???

- What is the current situation in Turkey (and in most other countries)?



Current situation in a lot of countries and a lot of sectors

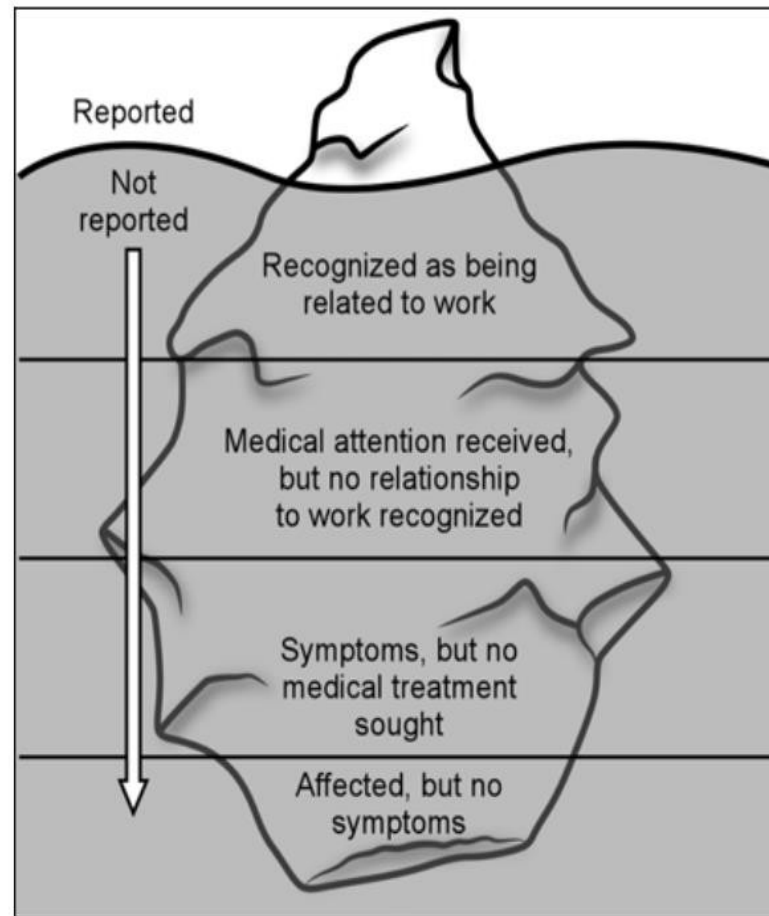
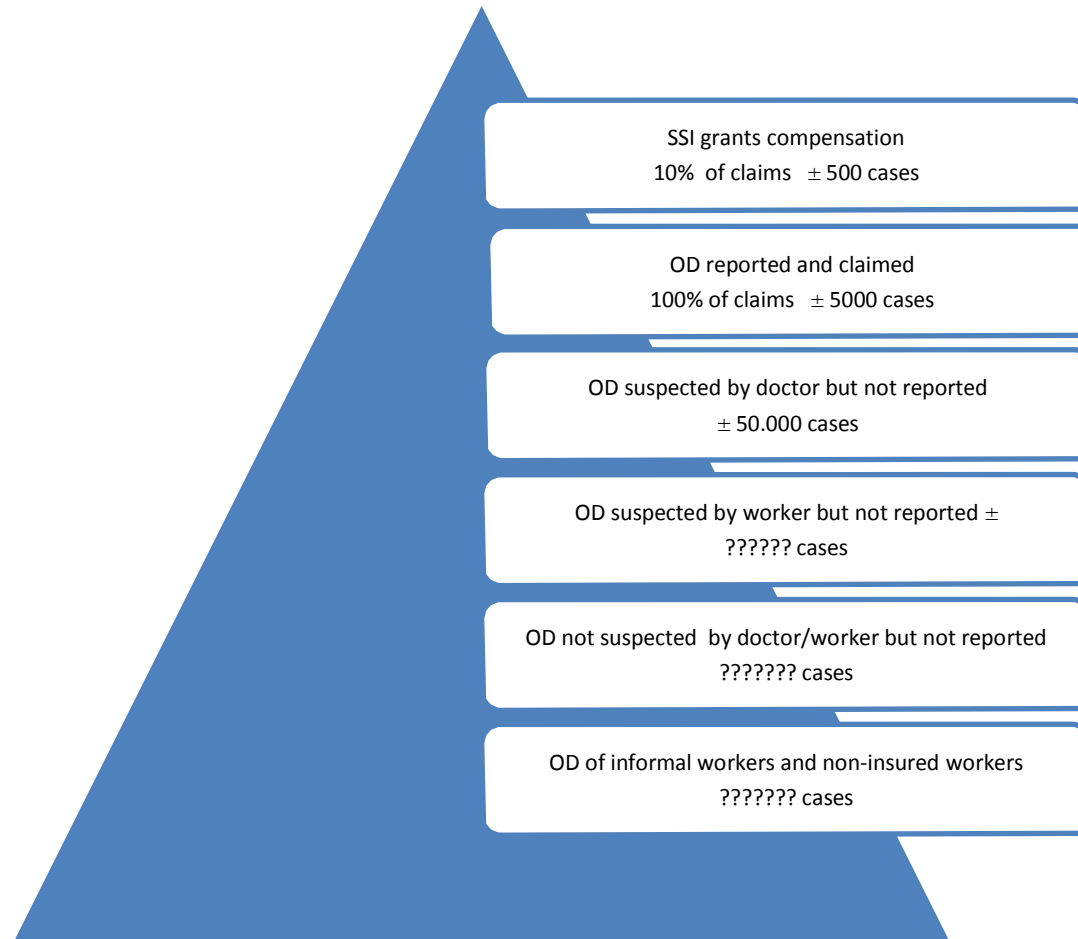


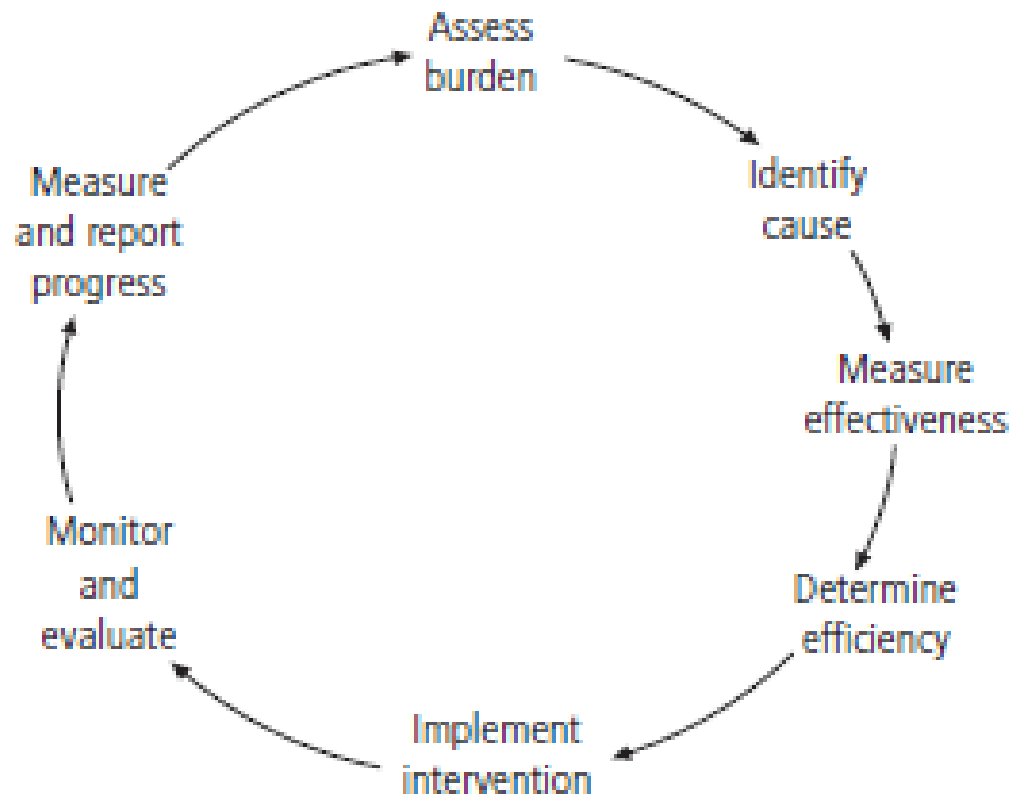
Figure 1. □ Disease and illness in the mining industry (after Metz 2002).

Current situation in Turkey



Why do we need epidemiology?

Figure 10.1. The health planning cycle



What interventions do we talk about?

- Treatment of the disease
 - Rehabilitation (back to work)
 - Prevention of the development of the disease
-
- ❖ Interventions are preferably evidence based
 - ❖ Interventions are preferably monitored and evaluated



Difference between observational and experimental studies

- Observational studies do not intervene they only 'observe'
 - Descriptive – describes the occurrence of a disease in the population
 - Analytical – analyses relationships between disease occurrence and other variables
- Experimental studies study the effect of an intervention by comparing a group with intervention with a group without intervention



ethical considerations are important here



Uses of epidemiology

1. Agenda setting
2. Identify priority diseases
3. Identify risk groups (sectors, occupations, regions)
4. Identify risk factors and determinants
5. Identify effective and (cost-)efficient interventions
6. Monitor and evaluate interventions



Ecological or correlational studies

- useful for generating hypotheses
- the units of analysis are groups of people rather than individuals.
- can also compare populations in different places at the same time or, in a time series, by comparing the same population in one place at different times.



Cross sectional studies

- measure the prevalence of disease.
- the measurements of exposure and effect are made at the same time.
- helpful in assessing the health care needs of populations.
- repeated cross-sectional surveys provide useful indications of trends



Case control studies

- provide a relatively simple way to investigate potential causes of diseases
- include people with a disease (cases) and a suitable control (comparison or reference) group of people unaffected by the disease.
- compares the occurrence of the possible cause in cases and in controls.
- collection of data on disease occurrence at one point in time and exposures at a previous point in time.



Cohort studies

- begin with a group of people who are free of disease, and who are classified into subgroups according to exposure to a potential cause of disease or outcome
- variables of interest are measured
- the whole cohort is followed up to see how the development of new cases of the disease differs between the groups with and without exposure.



Role of epidemiological studies in determining causation

- Descriptive research can give evidence for associations between potential risk factors and the occurrence of a disease, or between an intervention and the occurrence of a disease
- Only experimental research can give evidence for causation
- Experiments are hardly ever used in public and occupational health because of ethical issues



Summary

- Epidemiology studies determinants and distribution of occupational diseases
- Epidemiology is essential to (occupational) health policy and planning
- Surveillance is essential starting point for epidemiological studies
- Several types of epidemiological studies exist
- Current situation in Turkey (and other countries) can be improved



Individual assignment

Read again the articles of the homework assignment and answer for each article the following questions:

- Is it an observational or an experimental study?
- Is it an descriptive or an analytical study?
- Classify the type of study.

Read Bonita Chapter 1 and 3 if necessary and fill in the form.

You have 45 minutes for this assignment



Types of Epidemiological studies

Study main author	Observational		Experimental	Type
	Descriptive	Analytical		
1.Ceylan				
2. Karadeniz				
3. Percin				
4. Erdogan				
5. Dogac				
6. Alphan				
7. Bilir				
8. Akgün				

