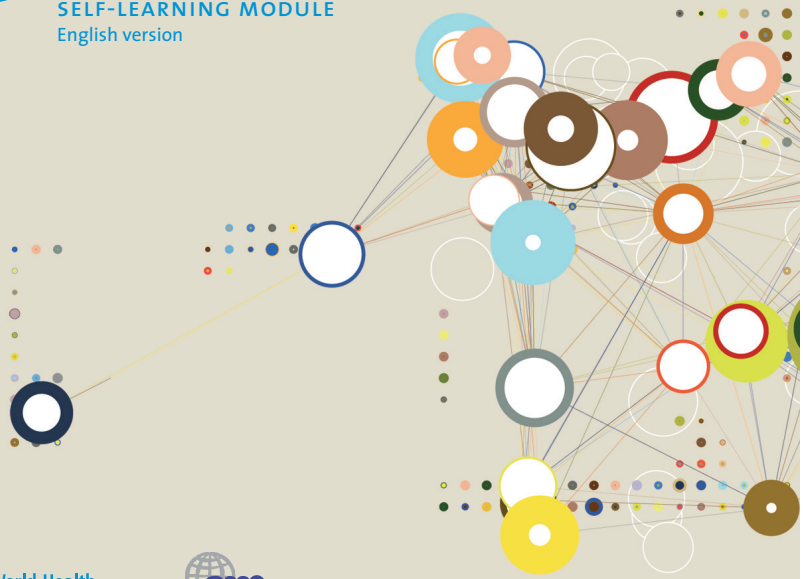
Biostatistics

SELF-LEARNING MODULE

English version



World Health Organization

Agence de Médecine Préventive

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Foreword

Biostatistics is the appli to the analysis of biologi

About this self-learning CD-ROM

The first version of this self-learning CD-ROM on biostatistics was developed through a partnership between the World Health Organization (WHO) and the Institut de Veille Sanitaire (InVS; France) in 2004. The book "Statistique Epidemiologie", by Thierry Ancelle (Paris: Maloine 2002) was used as a reference.

This second version of the CD-ROM has been co-produced by the Agence de Médecine Préventive (AMP) and WHO. It has been designed and developed in such a way that trainees can work independently using only the CD-ROM when no book or tutor is available. Trainees can solve the six problems with the resources provided in the CD-ROM (142 knowledge sheets).

cation of statistics
cal and medical data

What is the main objective of this self-learning CD-ROM?

The main objective is to understand the purpose of biostatistics through realistic cases and to acquire basic biostatistics skills that can be applied to your work.

Who are the target audiences?

The target audiences of this self-learning course in biostatistics are medical and biomedical students, laboratory specialists and other professionals who need to use or understand basic biostatistics. However, it may also be a helpful reminder to epidemiologists.

How is the content organized?

The learning method uses a problem-based approach, with 6 problems to resolve.

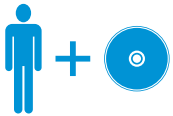
Each problem is divided into steps and each step has its own question.

To help you answer a question, each step is linked to specific knowledge sheets. The 142 knowledge sheets are also available from the knowledge database which can be directly accessed from the problems list by clicking on “view knowledge sheets” or from a problem by clicking on the tab “knowledge sheets”.

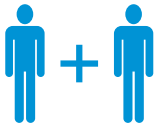
From some of the knowledge sheets, you can test your understanding through short exercises by clicking on the button “Practice”.

Choose an option to use this CD-ROM

A On your own



B Accompanied by a tutor



When you choose this option, enter your tutor's email address on the form proposed by the CD-ROM. Each time you finish a problem, you can send your submitted answers to your tutor by clicking on "send answers" button.

C Subscribing to a forum

For this option, you need to know the forum's address and register this when you start your session. A "forum" tab will be activated, allowing you to participate in forum discussions at any stage.

Learning objectives by problem

1 **Problem 1: Description and presentation of data**
At the end of this problem, you will be able to:

- identify the different types of variables
- organize data
- choose the most appropriate way of presenting data (tables, graphs)

2 **Problem 2: Statistical measurements**
At the end of this problem, you will be able to:

- define, calculate and use the different measurements of central tendency (or position) for a distribution
- define, calculate and use the different statistical parameters of dispersion for a distribution

3 **Problem 3: Parameter estimation**
At the end of this problem, you will be able to:

- differentiate statistical measurements in a sample from those in the population
- estimate the mean in the population
- estimate a percentage in the population
- choose an alpha (α) risk
- calculate the required study sample size

4 **Problem 4: Comparison tests**
At the end of this problem, you will be able to:

- formulate hypotheses to be tested
- choose a suitable statistical test
- calculate the value of a statistical test for a given alpha risk
- interpret the results of a test
- use mean and relative frequency comparison tests

5 **Problem 5: Rate, ratio, proportion & indexes in epidemiology**
At the end of this problem, you will be able to:

- define and calculate rate, ratio, and proportion
- define and calculate the different health indicators (incidence, prevalence, specific mortality, case-fatality ratio, etc.)

6 **Problem 6: Performance of diagnostic tests**
At the end of this problem, you will be able to:

1. Use in your professional practice the notions of:
- false positives, false negatives, true positives, and true negatives
- sensitivity, specificity
- ROC curves
- predictive values

2. Interpret a test's predictive values with regard to disease prevalence, sensitivity and specificity

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Content experts:
Pierre Nabeth, WHO
Maïna L'Azou, WHO

Content development and instructional design:
Anouk Berger, WHO
Sylvio Menna, WHO
Cécile Duperray, AMP

Graphic design and development:
Alphonse Guyot, AMP

Packaging: design and layout
Dankastudio
www.dankastudio.fr

Contact
For further information, please contact:

World Health Organization (WHO)
Health Security and Environment (HSE)
International Health Regulations Coordination Department (IHR)

Avenue Appia 20
1211 Geneva 27 - Switzerland
www.who.int/ihr

WHO Lyon Office for National Epidemic Preparedness and Response

58, avenue Debourg
69007 Lyon - France
Tel: +33 (0)4 72 71 64 70
Fax: +33 (0)4 72 71 64 71
E-mail: ihrinfo@who.int
Web: www.who.int/ihr/lyon

Agence de Médecine Préventive (AMP) à l'Institut Pasteur

25-28 rue du Dr Roux
75724 Paris cedex 15 - France
Tel: +33 (0)1 53 86 89 20
Fax: +33 (0)1 53 86 89 39
E-mail: amp@aamp.org
Web: www.aamp.org