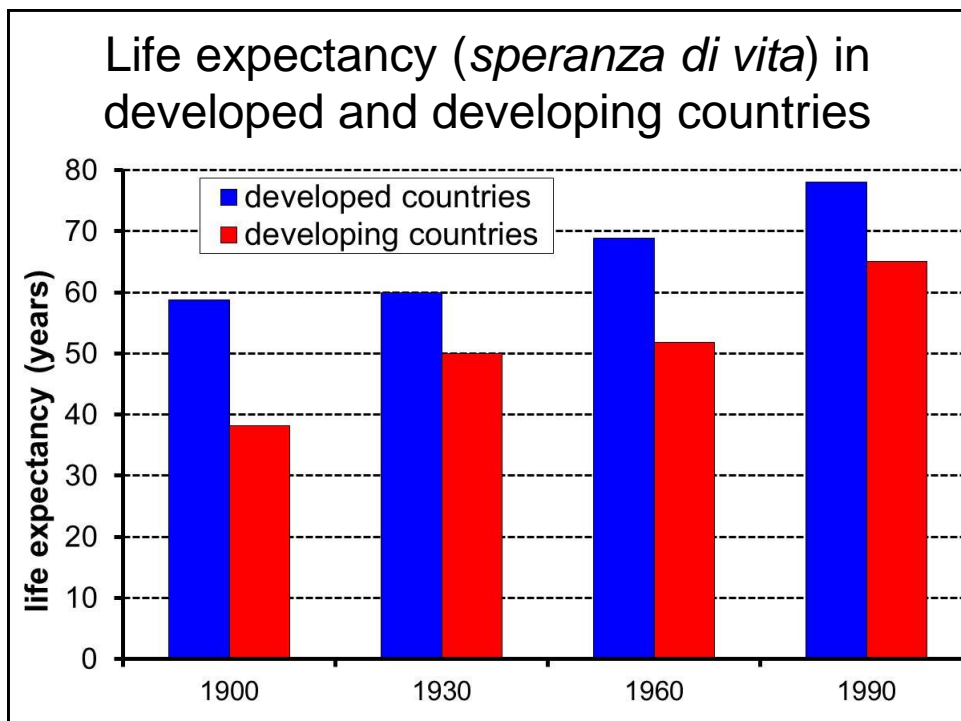


Introduction to Epidemiology

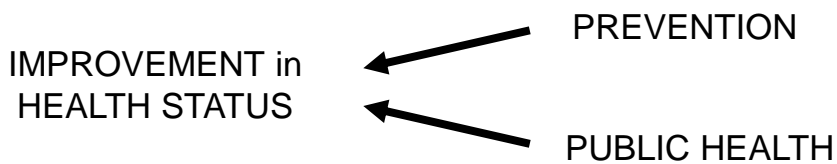
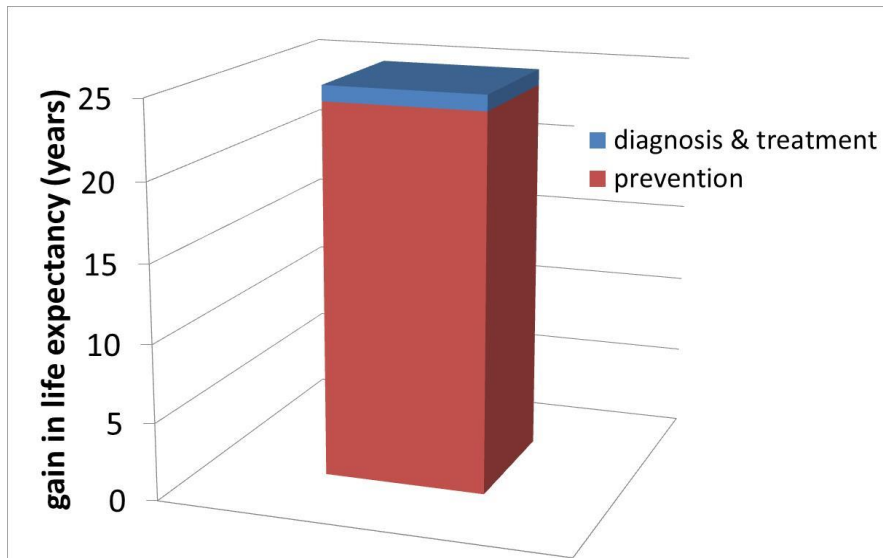
epidemiology = science of prevention
Epidemiologic Transition

Prof. Giuseppe Verlato
Unit of Epidemiology & Medical Statistics,
Department of Diagnostics & Public Health,
University of Verona

E-mail: giuseppe.verlato@univr.it



Worldwide increase in life expectancy during the 20^o century



- 1) Infant mortality or life expectancy are poorly related to the number of physicians per 1000 inhabitants.
- 2) Most of the increase in life expectancy, i.e. 24 years out of 25, have been attributed to epidemiologic interventions, prevention and public health.

DEFINITION of EPIDEMIOLOGY

Epidemiology is the science of prevention.


Epidemiology is the study of the distribution (incidence, prevalence) and determinants (risk factors) of health-related states or events in specified populations, and the application of this study to the control of health problems [Last, 2001].

Clinical medicine → individuals (single patients)
Epidemiology → populations

EPIDEMIOLOGY

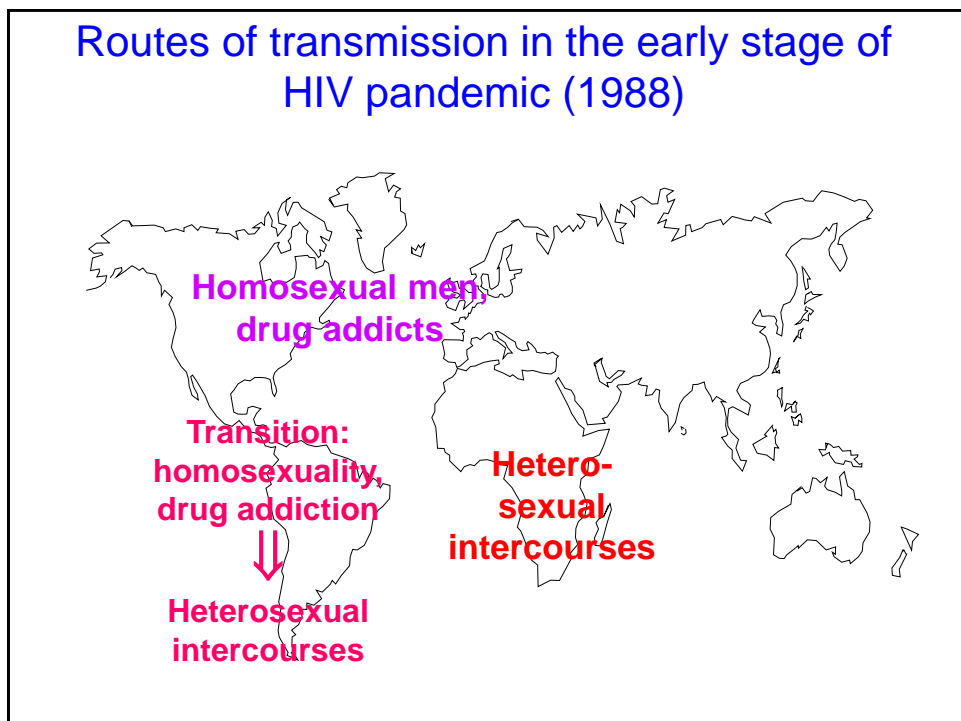
The word epidemiology comes from the Greek words **epi**, meaning on or upon, **demos**, meaning people, and **logos**, meaning the study of.

pronunciation translation		
επι	epi	on/upon
δημος	demos	people
λογος	logos	study of

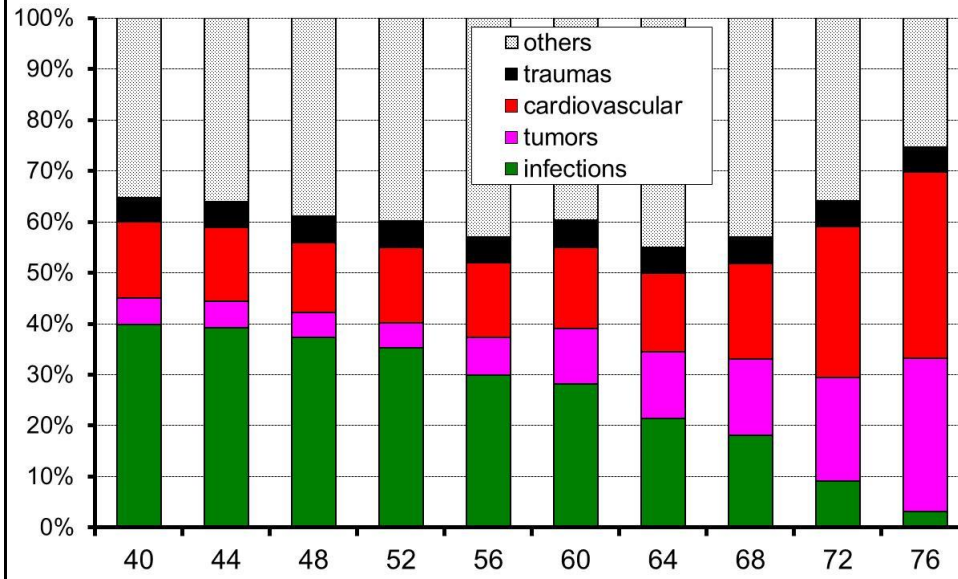
 **Study on the population**

AIDS is a typical example of a disease with strong epidemiological features:

- 1) American statisticians gave an essential contribution to its discovery, as they detected an abnormal increase in *Pneumocisti Carinii* infections among homosexual men.
- 2) While it is not possible to cure AIDS, effective treatments are available. However these antiretroviral therapies have been very expensive till recently, thus limiting their possible use in Developing Countries. Hence, prevention remains the main defense against the disease.
- 3) To implement effective preventive strategies, it is essential to know how the disease is transmitted.



Temporal trend of the main causes of death in industrialized countries



EPIDEMIOLOGIC TRANSITION

Infectious diseases

At the beginning of the 20th century, around 1.5 million people died from smallpox (Italian: vaiolo) every year.

On the 22nd of October 1977 a 23-year old cook from Merca, Somalia, developed high fever and skin eruption. He was the last case of smallpox recorded worldwide [World Development Report, 1993].

Smallpox eradication was achieved by prevention (vaccination) rather than by disease treatment.

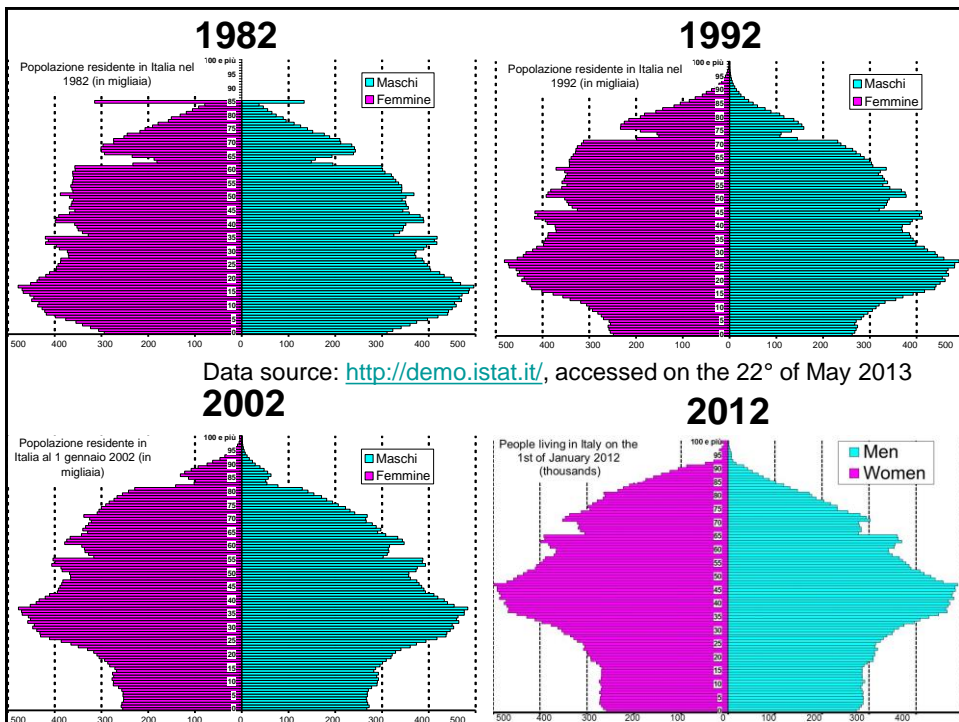
Chronic degenerative diseases

If most chronic degenerative diseases can be treated, but not cured (Italian: guarite), emphasis should be posed on prevention of early onset [WHO World Health Report, 1997].

Main chronic-degenerative diseases:

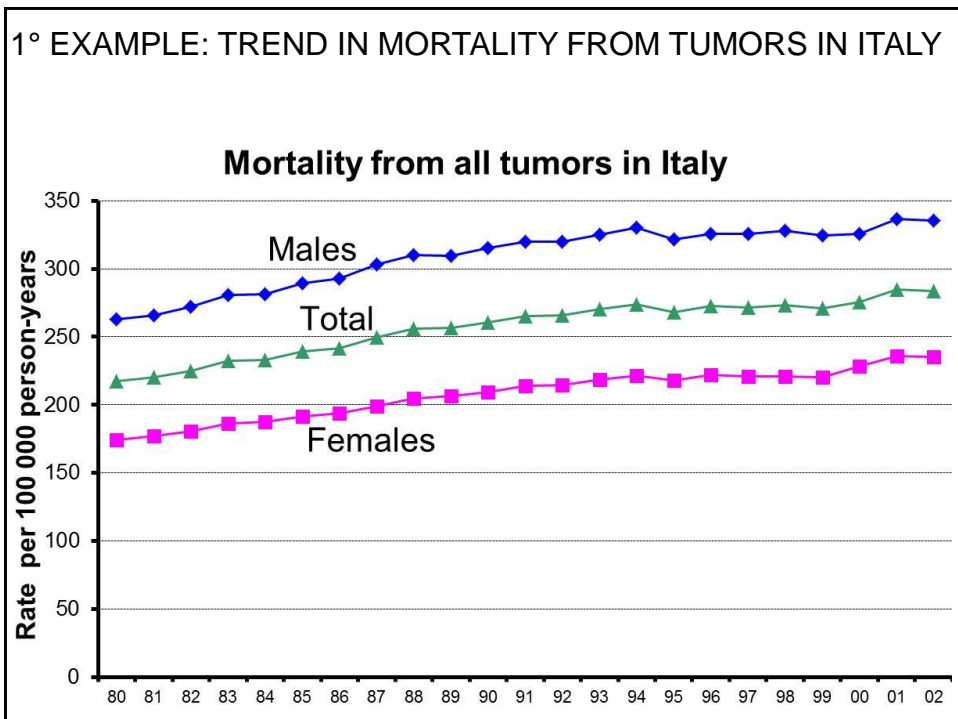
Ischemic heart diseases, cerebrovascular diseases, diabetes, Chronic Obstructive Pulmonary Diseases, osteoarthritis.

In Western Countries, particularly in Italy, the burden of Chronic-Degenerative Diseases and Tumors is increasing further and further increasing, due to **population ageing**.



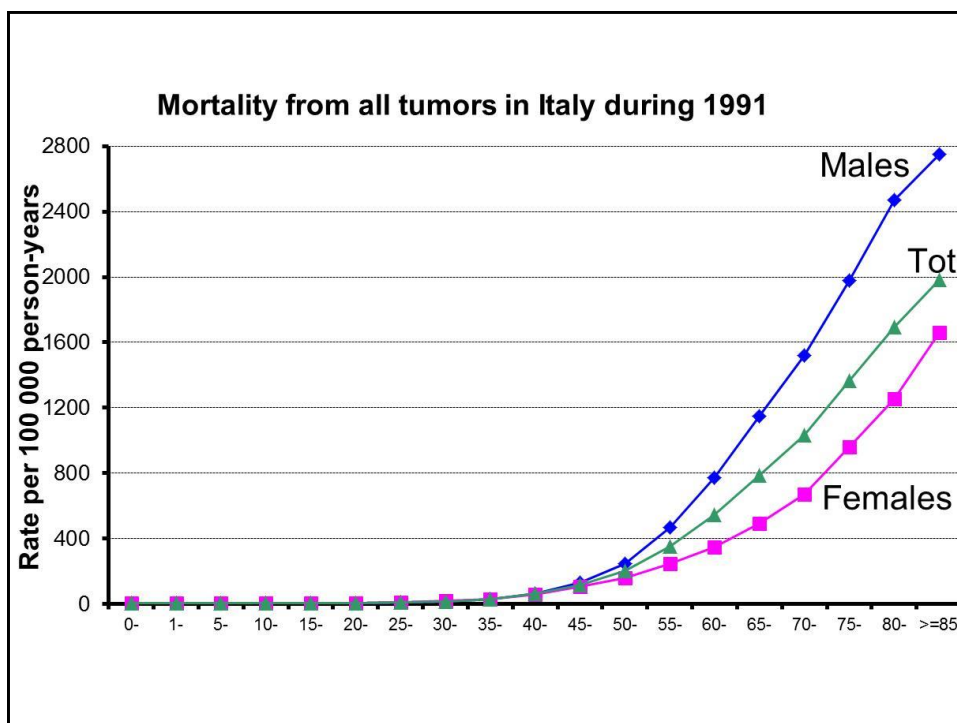
**Epidemiology seems simple
and easy to most clinicians.**

Is this impression true ?



In Italy mortality from tumors increased from 217.6 deaths per 100,000 person-years in 1980 to 283.8 deaths in 2002 (from 263.1 to 335.7 deaths among males, from 174.35 to 235.1 deaths among females).

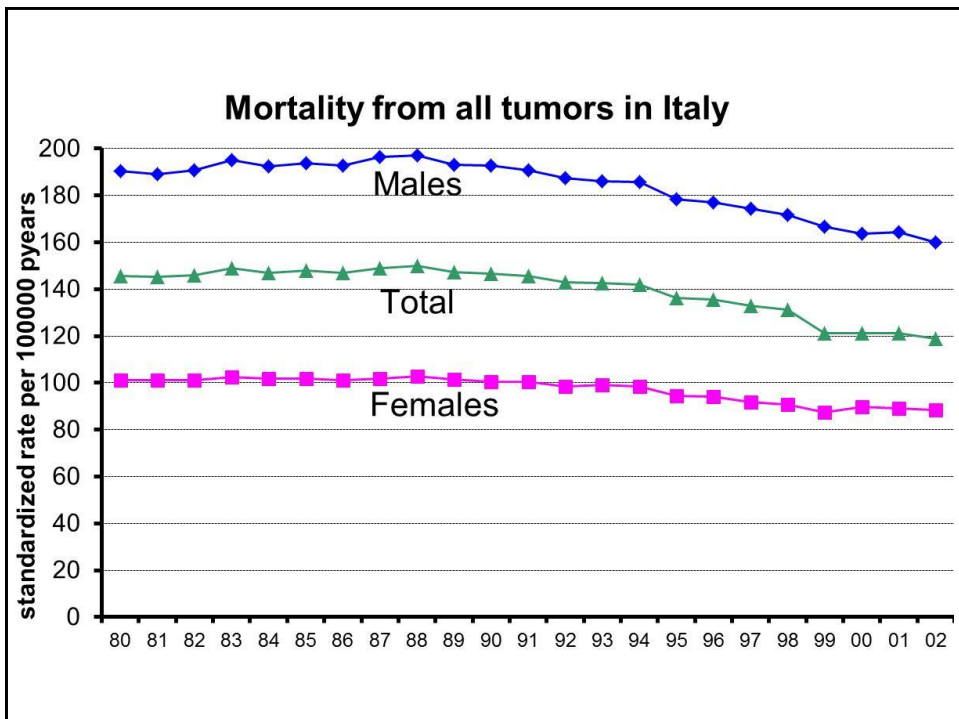
This corresponds to a percent increase of 30.4% (27.6% in males and 34.8% in females).



However:

1) A large population ageing occurred in Italy from 1980 to 2002.

1) Mortality from tumors exponentially increases with increasing age.



If we adjust for population ageing by using the statistical method «direct standardization», it is apparent that mortality from tumors has decreased in Italy by 18.4% during the study period (1980-2002).

This decrease is equal to 16.0% among males and 12.6% among females.

2° EXAMPLE: SELECTION BIAS
(DISTORSIONE DA SELEZIONE)

