

# Epidemiology

*Epidemiology (epi - above, demos - people, logos - science; the term can be loosely translated as "the study of what is above people" or "the study of what affects the people") is a scientific field dealing with the study of the distribution of health and disease in the population and the factors that influence the health and morbidity of the population. It is considered the basis of research methodology in health care and is closely related to evidence-based medicine (evidence based medicine, EBM) - it helps to recognize Risk factor and misleading factor for the development of diseases and determines the optimal course of their treatment (guidelines).<sup>[1]</sup>*

## History of Epidemiology

We can trace the roots of epidemiology back to **Hippocrates of Kos**, who investigated the relationship between the occurrence of diseases and the influence of the environment. He introduced the terms endemic and epidemic.<sup>[1]</sup>

Medicine in the Islamic world in the Middle Ages was at a high level, and already at that time some methods of transmission of infectious diseases were known. The Persian physician **Avicenna** in his work '**Canon of Medicine**' described the transmission of tuberculosis and venereal diseases, the spread of diseases through water and soil. He also introduced quarantine measures, a method of risk factor analysis and diagnostic procedures.<sup>[1]</sup>

In the 14th century, during an epidemic of the plague in the Iberian Peninsula, **Ibn Khatima** suggested that infectious diseases are caused by tiny organisms that, upon contact with human body cause an outbreak of the disease.<sup>[1]</sup>

The amateur scientist **John Graunt** (1620–1674) compiled one of the first mortality statistics and provided an overview of the development of known and newly emerging diseases. Today we consider him the founder of "demography" and co-founder of "statistics".<sup>[1]</sup>

The British physician **John Snow** (1813–1858), also called the father of epidemiology, became famous for stopping the progressing cholera epidemic in London in 1854. He determined the water in the municipal pump as the source of the infection and removed it in time his handles prevented further spread of the disease. He compiled a map of the area with the occurrence of cholera cases and noted where Londoners got their drinking water from (cartogram). This event is considered to be the origin of epidemiology as a separate scientific discipline.<sup>[1]</sup>

No less important was the contribution of the Hungarian doctor *Ignác Filip Semmelweis*, who investigated the causes of teen fever epidemics in hospitals. He theorized that the disease was transmitted by doctors themselves while treating patients, and established hygienic principles to suppress epidemic.

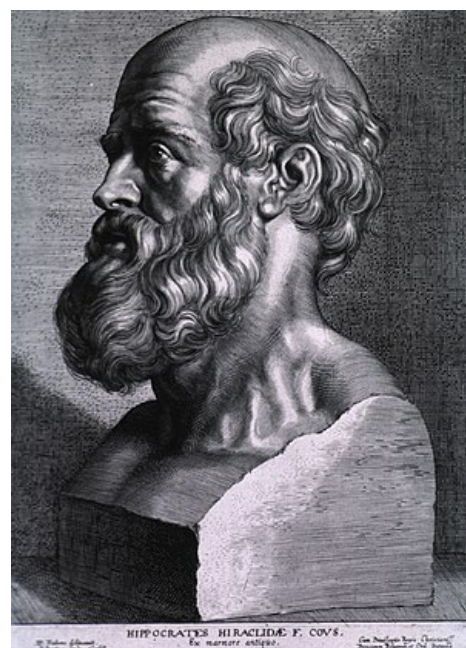
Another breakthrough moment was the publication in 1954 of the results of a statistical study led by doctors **Richard Doll** and Austin Bradford Hill, which confirmed the suspicion that tobacco has a direct effect on lung cancer.<sup>[1]</sup>

## History of epidemiology in our country

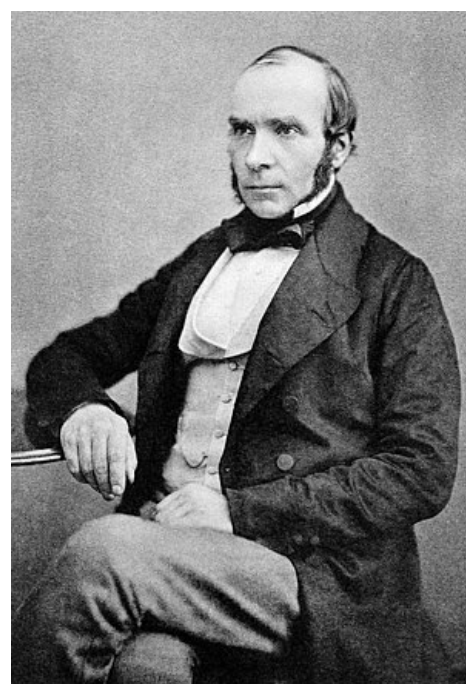
The founder of the modern Czechoslovak epidemiological school is *Karel Raška* (1909–1987). He was the author of the method of epidemiological vigilance (surveillance), which was adopted by the WHO General Assembly in 1968 as the basis of modern epidemiology on a global scale. During his work at the SZÚ, he promoted the introduction of diagnostics Rh factor and blood transfusions in fetal erythroblastosis.<sup>[2]</sup>

After 1945, he was one of the leading organizers of the Czechoslovak healthcare system, he was a professor at the Faculty of Medicine of the Charles University in Hygiene and in 1963–70 the director of the Prague Institute of Epidemiology and Microbiology.<sup>[2]</sup>

He was instrumental in developing the strategy of *eradication variola in the world*.<sup>[2]</sup>



Hippocrates



John Snow

# Characteristics of epidemiological work

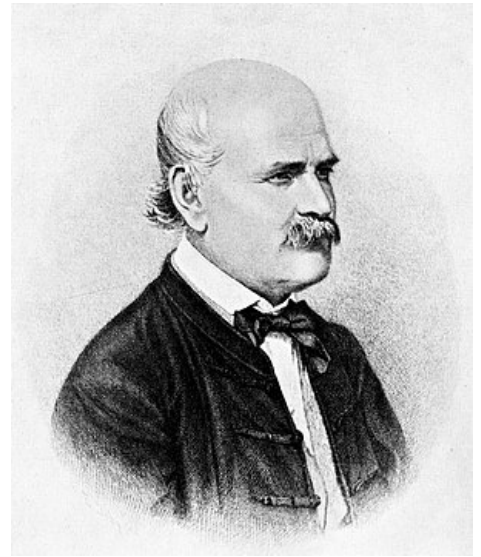
The work of epidemiologists includes:

- investigation of the origin of the disease,
- choosing a suitable study,
- data collection and analysis with regard to the development of statistical models,
- drawing up a hypothesis and writing conclusions in an article published in a professional journal. The complexity of epidemiology makes it require multidisciplinary collaboration.<sup>[1]</sup>

Epidemiology is deterministic influenced both by its own "subject of research" and by its own "work method". The basic goal of epidemiology is to influence the occurrence of diseases in the population as much as possible. For this purpose, mainly preventive measures are introduced in the population.

## Division of the field of epidemiology

1. **General epidemiology** - provides theoretical foundations, e.g. for the epidemiological method of work.
2. **Special epidemiology** - studies the issue of specific diseases and proposes specific preventive or punitive measures.
3. **Environmental epidemiology** - deals with ensuring the prevention of health risks for the population in relation to the quality of the environment.
4. **Clinical epidemiology** - deals with the clinical application of epidemiological findings and the assessment of clinical test results.



Ignaz Semmelweis

## Importance of epidemiological methods

Epidemiology and its methods allow us to:

- determine the ***extent of occurrence of diseases'*** and the factors that influence this occurrence;
- determine the groups of persons exposed to ***increased risk of the disease;***
- to reveal the ***causes of the emergence and persistence of the disease'*** in the population and its disappearance;
- ensure epidemiological ***surveillance;***
- to carry out relevant ***measures'***, the task of which is to influence the occurrence of the disease in the population;
- ***set priorities*** of health programs and evaluate their effectiveness;
- contribute to the selection of optimal ***diagnostic methods;***
- establish the criteria of "normality" of various ***health status indicators'***.

## Links

### Related Articles

- Hygiene

### External links

- Epidemiology (Czech Wikipedia)
- Epidemiology (English Wikipedia)

### Source

ws:Epidemiologie

1. Wikipedia: The Open Encyclopedia. *Epidemiology* [online]. ©2005. The last revision 2010-03-20, [cit. 2010-04-01]. <<https://cs.wikipedia.org/w/index.php?title=Epidemiologie&oldid=5111579>>.
2. CHURAN, M, et al. *WHO WAS WHO in our history in the 20th century* [online]. ©1994. The last revision 2001, [cit. 2010-04-01]. <<http://www.libri.cz/databaze/kdo20/list.php?od=r&start=1&count=20>>.

### References

- WIKIPEDIA. *Epidemiology* [online]. ©2005. Last revision 2010-03-20, [cit. 2010-04-01]. <<https://cs.wikipedia.org/wiki/Epidemiologie> >.

- BENCKO, Vladimír, et al. *Epidemiology, teaching texts for students 1. LFUK, Prague*. 2nd edition. Prague: Charles University in Prague – Karolinum Publishing House, 2002. ISBN 80-246-0383-7 .
- CHURAŇ, M, et al. *WHO WAS WHO in our history in the 20th century* [online]. ©1994. Last revision 2001, [cit. 2010-04-01]. < <http://www.libri.cz/databaze/kdo20/list.php?od=r&start=1&count=20> >.