



# Evidence-based Medicine: Challenges and Consensus for Clinicians & Epidemiologists

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## Abstract

Clinical epidemiology focuses on issues relevant to clinical medicine, representing a distinctive field that converts clinical practice into a quantitative science. Public health epidemiology is the basis of knowledge about how to prevent and treat disease in populations. Clinicians are concerned with diagnosing disease, making a prognosis, and prescribing specific treatment for each patient. Epidemiologists seek to identify a specific source of infection, mode of transmission, or causative factors in order to identify future trends and specifically recommend control measures. Evidence-based medicine (EBM) is both a challenge and a consensus for clinicians and epidemiologists. Through this article, we review the challenges and consensus of epidemiologists and clinicians on evidence-based medicine towards a future consensus development for the goal of medical ethics (Medical ethics ME) with the spirit of "All for One, One for All".

## Introduction

**Epidemiology:** The word is derived from the Greek words epi, which means above. Epidemiology is derived from the study of what happens to a population, about the distribution and determinants of health-related states or events in specific populations, and its application of this study to control health problems.

Clinical epidemiology is a field of epidemiology that specifically focuses on issues relevant to clinical medicine. The term was first coined by Jean Paul in his speech as president of the American Society for Clinical Investigation (ASCI) in 1938. [1,2] It is sometimes referred to as the "fundamental science of clinical medicine", which is "a combination of quantitative concepts used by epidemiologists to study disease in populations and make decisions in the individual case " [3,4]. Stephenson & Babiker (2000) showed "Clinical epidemiology investigated and controlled the distribution and confirmation of disease" [5]. Walter O. Spitzer has highlighted ways in which the field of clinical epidemiology is unclear. is determined. However, he feels that, despite criticisms of the term, it is a useful way to define a particular field of epidemiology [6]. In contrast, John M. Last felt that the term was

paradoxical and that its growing popularity in various medical schools was a serious problem [4].

## The value of epidemiological research for clinical practice

Epidemiology is the scientific analysis of the occurrence of disease in a general population in relation to the characteristics of individual subjects and their environment. Traditional epidemiology is concerned with basic facts about the frequency of diseases and their causes. Clinical epidemiology represents a distinctive field that converts clinical practice into a quantitative science. Public health epidemiology is the basis of knowledge about how to prevent and treat disease in populations. Epidemiology has important clinical implications because it can be used to understand pathogenesis, improve diagnostic accuracy, help patients reduce risk factors, and select treatment options precise treatment [7].

The challenges and consensus of epidemiologists and clinicians on evidence-based medicine are highlighted below. In the future for the goal of patients based on evidence-based medicine and medical ethics with the spirit of "All for One, One for All" will be continue to develop on this basis.

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## Challenges between epidemiology and clinical medicine

- In practice the clinician is concerned with diagnosing the disease, providing a prognosis, and prescribing specific treatment while the epidemiologist seeks to identify the specific source of infection, mode of transmission, or causative factor to determine future trends and specific recommendations for control measures. The patients visit their doctors to receive treatment, epidemiologists go out into the community to find people who have the disease or experience of the suspected causative factor in question. A clinician uses laboratory reports and autopsy reports to diagnose disease while in epidemiology the subject is conceptual and can only be symbolized in the form of tables, graphs and charts.
- In research, the unit of an epidemiological study is "population" or "population at risk" while in clinical medicine the unit of study is "case" or "multiple cases". Epidemiologists are interested in disease patterns in the entire population while in clinical medicine, clinicians are interested in disease patterns in individual patients. Epidemiology is concerned with both "sick" and "healthy" people (cases and controls respectively) while clinicians are concerned with cases.

It can be concluded that clinical medicine and epidemiology are not antagonistic. Both are closely related, co-exist and mutually beneficial [8].

## The concept of evidence-based medicine: a new challenge for epidemiology and preventive medicine

### Evidence-based medicine (EBM)

Over the past decade, evidence-based medicine has gained popularity among clinicians and epidemiologists as a tool to facilitate the transition scientific research into clinical practice. The concept applied to public health follows the same principles, but some additional aspects must be considered. For example, in preventive medicine, it is important to compare the relative effectiveness of different interventions in prolonging survival or preventing the occurrence or complications of disease both at the population and individually, as it is important to set fallback priorities. and health policymaking. Traditionally, systematic reviews and meta-analyses quantify the impact of treatments on selected endpoints (health outcomes). However, in setting prevention priorities, the opposite perspective is important. Furthermore, a judgment on preventive action cannot be made without adequate consideration of the social and ethical context. In view of the emerging evidence-based approach in preventive medicine, teaching evidence-based medicine to health professionals has become a new challenge [9].

### Clinical epidemiology and evidence-based health care

Provides a brief overview of the history of clinical epidemiology and describes its relationship to evidence-based medicine. Clinical epidemiology differs from classical epidemiology in that clinical epidemiology supports other basic medical sciences such as biochemistry, anatomy, and physiology because it facilitates the use of them in research through the development of appropriate clinical research methods and the inclusion of these disciplines in the clinical context. Therefore, clinical epidemiology extends beyond clinical trials. Introduction to the key concepts of developing clinical

questions, using diagnostic tests, evaluating therapy, validating systematic reviews, developing guidelines, and making clinical decisions facilitate favorable conditions for development. By describing clinical epidemiology in this way, the relationship to evidence-based health care encompassing all relevant areas of medicine and clinical science becomes clear.[10]

## Clinical medicine meets modern epidemiology - and benefits both

### Clinical medicine and epidemiology

The practice of clinical can best be understood through the work of clinical epidemiologists. It is closely related to both clinical medicine and epidemiology but is distinct from them. It bridges the gap between the two fields and helps each to recognize and utilize the strengths of the other. Epidemiology has provided physicians with powerful methods for answering clinical questions, a population perspective on individual patient care, and a scientific basis for preventive health care. Clinicians brought to epidemiology a deep understanding of the biology of disease, direct experience with epidemiological variables, and a keen interest in how research results will be used. The success of clinical epidemiology is evident through research, courses, textbooks, and contributions to clinical and public policy. Clinical medicine and epidemiology began together, then separated. Both have suffered from separation and both can now profit from becoming combined.[11]

### Clinical Trials Where Both Epidemiological and Clinical Consensus

Human clinical trials can only begin after the preclinical phase, involving in vitro and animal testing, for found that the reagents were considered safe and effective. However, none of the animals were similar enough to humans to perform the test. For this reason, experimental drugs must also be tested on humans. Before being approved for use in a new treatment, a drug or vaccine must go through a rigorous process and systematic testing on volunteers. This process is designed to assess whether a new product can be approved for general use. Each clinical trial is designed to address the issues raised in the study. It is a strict adherence to predefined research procedures to ensure accurate and safe results. Each phase of the trial has different goals for drug or vaccine development.[12]

Treatment research often includes an intervention such as medication, psychotherapy, a new device, or a new approach to surgery or radiation. Prevention research looks for better ways to prevent disorders develop or returning. Different types of prevention studies may study medications, vitamins, vaccines, minerals, or lifestyle changes. Epidemiological studies seek to identify patterns, causes, and control disorders in groups of people.[13]

In addition, both epidemiologists and clinicians have the same goal because the patient is based on the 4 basic principles of Medical ethics ME that Tom Beauchamp and James Childress in their textbook Principles of Biomedical Ethics: • Respect for autonomy: Patients have the right to refuse or choose their treatment. • Non-maleficence to the patient: not a cause of harm. • Patient's beneficence: The physician should act in the best interests of the patient and the "Benefit" is to promote the good over the harm. • Patient's justice: Involves the distribution of scarce medical resources and deciding who gets treatment in the spirit of "All for One, One for All". [14].

## Conclusion

Clinicians work in hospitals to treat patients. Epidemiologists work for the community, not in a certain place like a hospital or clinic. Although there are many challenges in the practice of clinicians and epidemiologists, their goals are the same, which is to help people care for their health in the most effectively way. On the basis of evidence-based medicine /medical ethics (EBM / ME) with the goal for patients in the spirit of "All for One, One for All", the harmonious relationship between the clinician and the epidemiologist will develop more and more in the future.

**Declaration of Interests:** The author states that he has no conflicts of interest to declare.

## References

1. Paul JR. President's Address Clinical Epidemiology. *J Clin Invest.* 1938;17(5):539-541..
2. Sackett DL. Clinical epidemiology. what, who, and whither. *J Clin Epidemiol.* 2002;55(12):1161-1166.
3. Dieckmann KP, Pichlmeier U. Clinical epidemiology of testicular germ cell tumors. *World J Urol.* 2004;22(1):2-14.
4. Last JM. What Is "Clinical Epidemiology?". *Journal of Public Health Policy.* 1988;9(2):159-163.
5. Stephenson JM, Babiker A. Overview of study design in clinical epidemiology. *Sex Transm Infect.* 2000;76(4):244-247.
6. Spitzer WO. "Clinical epidemiology". *Journal of Chronic Diseases.* 198;39(6):411-415.
7. Cimmino MA, Hazes JM. Introduction: Value of epidemiological research for clinical practice. *Best Pract Res Clin Rheumatol.* 2002;16(5):vii-xii.
8. <https://www.medicotips.com/2011/11/epidemiology-and-clinical-medicine.html>
9. Jedrychowski W. Concept of evidence-based medicine: a new challenge to epidemiology and preventive medicine. *Przegl Epidemiol.* 2001;55(1-2):1-8.
10. Schünemann HJ, Guyatt GH. Clinical Epidemiology and Evidence-Based Health Care. In: Ahrens, W., Pigeot, I. (eds) *Handbook of Epidemiology.* Springer, New York, NY.
11. Fletcher RH. Clinical medicine meets modern epidemiology--and both profit. *Ann Epidemiol.* 1992;2(3):325-333.
12. Dieu D. Evidence-based medicine and evidence-based pharmacy in medical practice. *IJSER.* 2019;10(2):1253-1255.
13. <https://www.fda.gov/patients/clinical-trials-what-patients-need-know/what-are-different-types-clinical-research>
14. Lakhan SE, Hamlat E, McNamee T, Laird C. Time for a unified approach to medical ethics. *Philos Ethics Humanit Med.* 2009;4:13.