

## Special article

## Epidemics and epidemiology: back to the future

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## ABSTRACT

The word “epidemiology” was written for the first time in a report on the plague in Alghero in 1583. Although its etymology has its intricacy. For centuries it has been concerned with understanding and trying to control and prevent epidemics. During the cholera epidemic in London in 1848 the London Society of Epidemiology was formed, main instrument of public health since then. The increase in chronic diseases –supposedly no communicable– gave way to the epidemiology of black boxes and the predominance of risk factors. And later to an enormous methodological progress increasingly complex and intricate but professionally very appealing. So few epidemiologists have experience in field control of epidemics. Thus, perhaps it is convenient to return, although partially, to the origins. Looking at the future.

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## Epidemias y epidemiología: regreso al futuro

## RESUMEN

La palabra «epidemiología» se escribió por primera vez en un informe sobre la peste en Alghero, en 1583. Aunque su etimología tiene su intrínquilis. Durante siglos se ha ocupado en comprender y tratar de controlar y prevenir las epidemias. Durante la epidemia de cólera en Londres en 1848 se creó la Sociedad de Epidemiología de Londres, principal instrumento de salud pública desde entonces. El aumento de las enfermedades crónicas –supuestamente no transmisibles– dio paso a la epidemiología de las cajas negras y al predominio de los factores de riesgo. Y más tarde a un enorme desarrollo metodológico cada vez más complejo e intrincado, pero profesionalmente muy atractivo. Muy pocos epidemiólogos tienen experiencia en el control de epidemias en el campo. Así, quizás convenga volver, aunque sea parcialmente, a los orígenes. Mirando al futuro.

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## Palabras clave:

Epidemiología

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“Epidemiology” was, at one time, a neologism. As far as we know, the first time it was used, at least in one preserved document, was in 1583. Quinto Tiberio Angelerio, a physician from Alghero, a town on the island of Sardinia that belonged then to the kingdom of Philip II of Spain, faced an epidemic wave of bubonic plague, whose index case, seems to have been a sailor from Barcelona.

One of the reports written by Angelerio giving an account of the evolution of the epidemic was entitled, in Latin, *Epidemiologia sive Tractatus de peste* and in Spanish also *Tratado de Epidemiología de la Peste*.<sup>1</sup> Another, addressed to the municipal authorities, contained a series of recommendations to prevent contagion and limit propagation, written in Catalan, which was the language of the neighborhood population. Although most of the inhabitants could not read, it is to be assumed that the recommendations could be understood better when they were read to the people.

It was clear that the meaning of epidemiology for Angelerio was the study of the epidemic, as understood since Galen had defined the concept as a disease that suddenly affects many people for a short period, so as to distinguish it from endemic diseases.

This meaning was deduced from the translation of the series of Hippocratic treatises entitled *Epidemics*, which were called *De morbis populoaribus* in Latin. However, the epidemics of the hippocratics have nothing to do with plagues or what they called *loimia*. Epidemic in classic Greek means near or on the population because the prefix *epi* can mean both on and near. The review of those books confirms that the author –or authors– were referring to the visits they made to the sick. According to experts, the content is a list of the patients’ diseases.<sup>2</sup>

In any case, Angelerio’s initiative was very successful, though a few centuries passed before Joaquin Villalba published his Spanish *Epidemiology*<sup>1</sup> in 1802, which consolidated the use of the word with that particular sense of treatise, study or list of epidemic diseases.

At that time numerous discussions were held about the etiology of diseases. Some supported the miasma theory while others were contagionists. These finally achieved interpretive hegemony thanks to Henle, Koch, Pasteur and the authors of the germ theory at the end of the XIX century.

In the intervening period, the Broad Street pump fountain episode was transcendental. Actually, more than the legendary episode itself, the epidemic wave of cholera that ravaged London among other European cities in 1848, prompted the constitution

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of the London Society of Epidemiology, a very select association of eminent personalities, including Edwin Chadwick, William Farr, still a *miasmalist*, and John Snow, of course.

That same year and thanks to Chadwick's efforts, the first Public Health law in the world, The Public Health Act, was approved, thus consolidating public health as a government institution of public administration. It came to be an instrument of the executive power of sovereign states to protect both the physical and moral health of the population, particularly of the industrial proletariat whose deplorable living conditions were unfavorable to the capital accumulation needs of the ruling bourgeoisie. A public health that Michael Foucault mentioned to illustrate his interpretation of biopolitics.<sup>3</sup>

It was a public health in which, precisely, epidemiology was one of the key disciplines and whose main objective for almost a century was communicable diseases. The increase in chronic diseases suggested that epidemics has ceased to be a threat to the population. This belief was perhaps favored by a certain naivety or even arrogance, of some famous doctors, among others, for example, Frank MacFarlane Burnett, Nobel Prize winner in Physiology and Medicine in 1960 and author of the first version of the concept of natural history of disease.

The time had come for risk factors, which we owe to Kenel<sup>4</sup> and the Framingham study: from the epidemiology of black boxes as defined by Mervy Susser, although he himself advocated its conversion into the epidemiology of Chinese boxes, claiming a more ecological approach. However, the evolution of the discipline has focused on a methodological development, the sophistication of the designs and the refinement of the indicators with the help of Greenland, Kleimbaum, and Miettinen, among many others.

Without forgetting the clinical applications that were at the origin of the discipline, the numerical method by Louys has been incorporated as well as the uses that personalities such as Alvar Feinstein, David Sackett or the Fletchers have effectively developed. In fact, epidemiology has traditionally been very close to the field of medicine much more so than public health, which was born at the same time as cities and separated from clinical practice with which it has been maintaining some discrepancies that people like Cochrane, Terris, Rose or Marmott have tried to overcome.

However, much of the dedication of epidemiologists today has to do with the definition, measurement, analysis and manipulation of data, as Harvard professor Miguel Hernán said at the annual conference on epidemiology in León dedicated to COVID-19,<sup>5</sup> so the primitive *raison d'être* of epidemiology remains in the background digital epidemiology.<sup>6</sup>

The field epidemiology<sup>7</sup> is not a particularly attractive area from an academic point of view, but it is still very necessary to fully understand epidemics and consequently to control them in the most pertinent and proportionate way possible, interfering as little as possible in the daily life of people, especially those who suffer most of the consequences of pandemics such as COVID-19<sup>8</sup> and above all the adverse effects of preventive measures.

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