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Introduction to epidemiology1 : historical
development of thinking, Hippocrates, Graunt,
Farr, Snow = 初歩の疫学 1

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Introduction to epidemiology 1

初歩の疫学 1



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Intro to Epidemiology 1

historical development of thinking, Hippocrates, Graunt, Farr, Snow.

This time, I will talk about the historical development of epidemiological thinking.

Epidemiology is the study of the distribution and determinants of health-related states or events (including disease), and the application of this study to the control of diseases and other health problems. It is the basics of public health.

The term "epidemiology" firstly used to describe the study of epidemics. It is now widely applied to cover the study of not only epidemic disease, but of disease, in general, and even many non-disease health-related conditions, such as high blood pressure and obesity.

Here, I will describe the historical development of epidemiological thinking.

1. Miasma theory

In the ancient time, the prevailing view was that disease was the result of demonic possession or divine displeasure, and/or bad air, such as miasma.

The miasma theory held that diseases such as cholera were caused by a miasma (Μίασμα, ancient Greek: "pollution"), a noxious form of "bad air", also known as "night air".

The miasma theory was accepted even after the appearance of scientific thinking. The theory was continuously supported by some scientists and physicians even after 1880 until people finally accepted the germ theory of disease: not miasma, but specific germs caused specific disease.

2. Hippocrates and importance of observation

Hippocrates was a Greek physician who has a profound influence on the practice of medicine as well as on public health. The prevailing view in the time of Hippocrates was that disease was the result of demonic possession or divine displeasure. However, Hippocrates sought a logic to sickness. Hippocrates valued the observation of phenomena in daily life and the environment. He tried to formulate hypotheses concerning the phenomena. For example, in *Airs, Waters, and Places*, the influence of the environment on disease occurrence was stressed for the first time in history. If you want to read the text in Greek, the following text edited by Evan Hayes and Stephen Nimis is available. Here, I will read a chapter

in English translation.

Whoever wishes to investigate medicine properly, should proceed thus:
in the first place to consider the seasons of the year, and what effects each of them produces for they are not at all alike but differ much from themselves in regard to the changes.

Then the winds, the hot and the cold, especially such as are common to all countries, and then such as are peculiar to each locality. We might also consider the quantities of the waters, for as they differ from one another in taste and weight, so also do they differ much in their qualities. In the same manner, when one comes into a city to which he's a stranger, he ought to consider its situation, how it lies as to the winds and the rising of the Sun; for its influences is not the same whether it lies to the North or the South, to the rising or to the setting sun.

Later in the 17th century and afterward, the logic of epidemiology was developed by several pioneers.

3. John Graunt and data compilation, one of the first demographers

A London haberdasher, John Graunt (24 April 1620 – 18 April 1674) is known as the world's first epidemiologist and demographer. He focused on an available data resource, the weekly bills of mortality, which summarized data collected in the parishes of London and later throughout England, originally to monitor deaths from the plague. The list included baptisms and deaths by cause in each parish. Graunt realized that much could be learned from a compilation of the data, thus setting a tradition for epidemiologists who still seek to use already collected data for epidemiologic research. He published a small book, titled "Natural and Political observations Mentioned in a Following Index, and Made Upon the Bills of Mortality", which contained an impressive number of original findings.

4. William Farr (1807-1883) regarded as one of the founders of medical statistics.

Farr was the first Compiler of Abstracts at the General Register Office in England. The General Register Office was created to record the civil registration of births, deaths, and marriages in England and Wales. Around that time, information on the cause of death was collected along with age and occupation for all deaths. Farr started to work for the General Register Office since in 1839, and he remained in the Office for 40 years. Farr kept the tradition that started by John Graunt for using routinely collected vital statistics to study disease occurrence. He studied demographic issues of population size, sex ratio at birth, fecundity, and time trends.

5. John Snow 1813-1858

John Snow is considered the founding father of both epidemiology and anesthesiology. He developed the apparatus to administer ether to the patients and also designed a mask to administer chloroform. He administered chloroform to Queen Victoria during delivery.

His renown as an epidemiologist stems from his investigation of the London cholera epidemics in the mid-19th century. By talking to local residents, Snow identified the source of the outbreak of cholera as the public water pump on Broad Street. He contributed to remove the pump handle from the pump, so as to contain the epidemic of cholera in the summer of 1854.

Snow did critical contribution to epidemiology through his work on the statistical relationship between water supply and Cholera cases observed in certain districts of London. The key finding was that water pipes from two competing companies, one carrying clean water and the other carrying contaminated water with London sewage, supplied the same neighborhood. This situation, described by Snow as being better than any experiment that could have been devised, became known as a natural experiment.

By referring to some historical works, I have just described the characteristics of epidemiological thinking, such as careful observation of disease, examination of the environment, focusing not only on a case but on cases, mapping and counting, and applying statistics. In these references, most of the observations were done for epidemics, infectious disease. Later especially in the last century and this century, epidemiology advanced to include not only the disease but also other health problems such as obesity.

(Masaki Moriyama)