Public health and the way forward

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Public health is one of the efforts organized by society to protect, promote, and restore people’s health. It is the combination of science, skills, and beliefs directed towards the maintenance and improvement of the health of the whole population through collective and social actions [1]. The programs, services, and institutions involved emphasize the prevention of disease and the health needs of the population as a whole. Public health activities change with developing technology and social values, but the goals remain the same: to reduce the amount of disease, premature death, and disease-produced discomfort, sickness and disability in the population. Public health is thus a social institution, a discipline, and a practice. The Acheson Report [2] focusing on the future development of public health function in the United Kingdom gave this definition of public health in 1988: “The science and art of preventing disease, prolonging life, and promoting health through organized efforts of society”.

Epidemiology and public health in the past

The general concept that the environment influences disease occurrence had its origin in antiquity, and so did a more specific idea that many diseases are contagious [3]. The Hippocratic (app. 460–370 BC) work On Airs, Waters, and Places already stressed the importance of considering the variety of environmental influences on diseases in humans.

The question of population health moved from a narrow concern of patrician comfort to political actions to control epidemic disease among the masses [4]. While the rationale for epidemic disease control prevented social disorder, it also stimulated new social concerns about the health and welfare of the poor. From early modern times, disease prevention became increasingly bound to broader issues of social welfare, especially as concerns with health, rather than disease prevention, began to dominate discourses from the nineteenth century. The idea that disease is caused by contagium vivum, i.e. a living contagion, necessarily depended upon the development of two other concepts: the specificity of both diseases and their causes, and the existence of harmful organisms [3]. The germ theory competed with the widely accepted ancient miasma theory, which had infective vapours as the central principle. Some practices commonly associated with the germ theory are truly ancient in their origin; for example, the custom of isolating people with contagious diseases is recorded in the Bible and was continued by the Catholic Church during the Middle Ages. And in the mid 1800s, almost 25 years before Pasteur (1822–1895), the contagium vivum doctrine was espoused by many European scientists. Indeed, there is evidence that it was the scientific basis for the initiation of the filtration of part of the London water supply in 1829. During this time the contagium vivum theory and the evolving study of epidemiology merged; thus began the current era of epidemiology. The essence of epidemiologic study is the comparison of groups of people with regard to characteristic of in-
terest, i.e. pathological factors more than salutogenic factors as described by Aaron Antonovsky (1923–1994) in his book “Unraveling the mystery of health” from 1987 [5].

However, the earliest recorded account of “an epidemiological comparison study”, interestingly enough, is found in the Old Testament in the first chapter of the Book of Daniel. Daniel asked for vegetarian food to eat and water to drink, and after 10 days his health was compared to all the youths who had partaken of the food and wine of king Nebuchadnezzar. The underlying logic for the modern form of epidemiologic study evolved from the Scientific Revolution of the 1600s. Francis Bacon at this time (1561–1626) developed the basis of inductive logic and, with it, the concept of “inductive laws”. Many seventeenth century scientists reasoned that if mathematical relationships could be found to describe, analyze, and understand the physical universe, then similar relationships, known as “laws of mortality”, must exist in the biological world. In 1747, James Lind (1716–1794) published his hypothesis from epidemiological observations regarding the etiology and treatment of scurvy. From his results, Lind inferred that fruits containing citric acid cured the scurvy and that this would also provide a means of prevention.

Another epidemiological paper some years later, written by Daniel Bernoulli (1700–1782) in 1760, had great importance for public health in the years to come [3]. Having evaluated the available evidence, Bernoulli, a member of the noted European family of mathematicians, concluded that inoculation protected against smallpox and conferred lifelong immunity. Using a life table, not unlike those of today, he determined that inoculation at birth would increase life expectancy.

The French Revolution at the end of the eighteenth century stimulated an interest in public health and preventive medicine, thereby facilitating the development of the epidemiologic approach to disease and public health practice. Furthermore, it permitted several individuals from the lower classes to assume positions of leadership in medicine. One such person was Pierre Charles-Alexandre Louis (1787–1872), one of the first modern epidemiologists. His approach is illustrated by a comment made in 1836: “To determine the question of tuberculosis (phthisis) satisfactorily, tables of mortality, i.e. life tables, would be necessary, comparing an equal number of persons born of parents infected by tuberculosis with those in an opposite condition”.

In a personal reference to the old epidemic pattern throughout a two-week period in 1849 my great, great grand mother lost her husband, father, and three children in a cholera epidemic on the west coast of Norway. This disaster changed her and the rest of her family's social life dramatically [6]. One year later, the London Epidemiological Society, organized in 1850, with the initial purpose of determining the etiology of cholera, quickly expanded its activities. Its report on smallpox vaccination in 1853 was, for example, in England the main reason for the adoption of the Vaccination Act of the same year, mandating vaccination on a nationwide basis. One of the Society's founding members, John Snow (1813–1858), conducted a series of classical studies of cholera [7]. His studies comparing two of London's water companies, and his investigation into the Broad Street Pump cholera outbreak are well known. John Snow's achievement was based on his logical organization of observations, his recognition of a natural experiment, and his quantitative approach in analysing the occurrence of a disease in a human population. The influence of his report on Public Health Policy and Practice was more widespread than has been realized. It led for example to legislation mandating that all of the water companies in London filter their water by 1857, only two years after the report's publication. This example illustrates that the situation is similar in our time, i.e. that there is a fine line between epidemiological science and public health policy and practice [8].

Snow's close friend, Sir Benjamin Ward Richardson (1828–1896) was among the first to attempt to develop a disease-reporting system and to propose the teaching of preventive medicine in medical schools. In this context you should notice that it was not until 1883