

## 1: History of Public Health - Public Health - Oxford Bibliographies

*"As epidemic diseases were brought under control the Public Health Service began to shift its attention to other areas such as cancer, heart disease, health in the workplace, and the impact of environmental problems, such as toxic waste disposal, on health.*

Page 72 Share Cite Suggested Citation: A History of the Public Health System. The Future of Public Health. The National Academies Press. A History of the Public Health System In Chapter 1, the committee found that the current public health system must play a critical role in handling major threats to the public health, but that this system is currently in disarray. In this chapter the history of the existing public health system is briefly described. This history is intended to provide some perspective on how protection of citizens from health threats came to be a public responsibility and on how the public health system came to be in its current state. In earlier centuries, when little was known about the causes of disease, society tended to regard illness with a degree of resignation, and few public actions were taken. As understanding of sources of contagion and means of controlling disease became more refined, more effective interventions against health threats were developed. Public organizations and agencies were formed to employ newly discovered interventions against health threats. As scientific knowledge grew, public authorities expanded to take on new tasks, including sanitation, immunization, regulation, health education, and personal health care. The growth of a public system for protecting health depended both on scientific discovery and social action. Understanding of disease made public measures to alleviate pain and suffering possible, and social values about the worthiness of this goal made public measures feasible. The history of the public health system is a history of bringing knowledge and values together in the public arena to shape an approach to health problems. Although epidemic disease was often considered a sign of poor moral and spiritual condition, to be mediated through prayer and piety, some public effort was made to contain the epidemic spread of specific disease through isolation of the ill and quarantine of travelers. In the late seventeenth century, several European cities appointed public authorities to adopt and enforce isolation and quarantine measures and to report and record deaths from the plague. Several American port cities adopted rules for trade quarantine and isolation of the sick. In Massachusetts passed laws for isolation of smallpox patients and for ship quarantine as needed. After , inoculation with material from smallpox scabs was also accepted as an effective means of containing this disease once the threat of an epidemic was declared. By the end of the eighteenth century, several cities, including Boston, Philadelphia, New York, and Baltimore, had established permanent councils to enforce quarantine and isolation rules. Hanlon and Pickett, These eighteenth-century initiatives reflected new ideas about both the cause and meaning of disease. Diseases were seen less as natural effects of the human condition and more as potentially controllable through public action. Also in the eighteenth century, cities began to establish voluntary general hospitals for the physically ill and public institutions for the care of the mentally ill. Finally, physically and mentally ill dependents were cared for by their neighbors in local communities. Grob, ; Starr, By the eighteenth century, several communities had reached a size that demanded more formal arrangements for care of their ill than Poor Law practices. The first American voluntary hospitals were established in Philadelphia in and in New York in The first public mental hospital was established in Williamsburg, Virginia in Sanitation changed the way society thought about health. Illness came to be seen as an indicator of poor social and environmental conditions, as well as poor moral and spiritual conditions. Cleanliness was embraced as a path both to physical and moral health. Cleanliness, piety, and isolation were seen to be compatible and mutually reinforcing measures to help the public resist disease. At the same time, mental institutions became oriented toward "moral treatment" and cure. Protecting health became a social responsibility. Disease control continued to focus on epidemics, but the manner of controlling turned from quarantine and isolation of the individual to cleaning up and improving the common environment. And disease control shifted from reacting to intermittent outbreaks to continuing measures for prevention. With sanitation, public health became a societal goal and protecting health became a public activity. The Sanitary Problem With increasing urbanization of the population in the nineteenth century, filthy environmental conditions

became common in working class areas, and the spread of disease became rampant. In London, for example, smallpox, cholera, typhoid, and tuberculosis reached unprecedented levels. It was estimated that as many as 1 person in 10 died of smallpox. More than half the working class died before their fifth birthday. In New York, as late as 1847, "the filth and garbage accumulate in the streets to the depth sometimes of two or three feet. Hanlon and Pickett, Earlier measures of isolation and quarantine during specific disease outbreaks were clearly inadequate in an urban society. It was simply impossible to isolate crowded slum dwellers or quarantine citizens who could not afford to stop working. Wohl, It also became clear that diseases were not just imported from other shores, but were internally generated. Wohl, Urbanization, and the resulting concentration of filth, was considered in and of itself a cause of disease. In earlier centuries, disease was more readily identified as only the plight of the impoverished and immoral. The plague had been regarded as a disease of the poor; the wealthy could retreat to country estates and, in essence, quarantine themselves. In the urbanized nineteenth century, it became obvious that the wealthy could not escape contact with the poor. Almost all families lost children to diphtheria, smallpox, or other infectious diseases. Because of the the deplorable social and environmental conditions and the constant threat of disease spread, diseases came to be considered an indicator of a societal problem as well as a personal problem. Insanity came to be viewed at least in part as a societal failing, caused by physical, moral, and social tensions. The Development of Public Activities in Health Edwin Chadwick, a London lawyer and secretary of the Poor Law Commission in 1832, is one of the most recognized names in the sanitary reform movement. Hanlon and Pickett, To remedy the situation, Chadwick proposed what came to be known as the "sanitary idea. To remove disease, therefore, it was necessary to build a drainage network to remove sewage and waste. Further, Chadwick proposed that a national board of health, local boards in each district, and district medical officers be appointed to accomplish this goal. The report, which influenced later developments in public health in England and the United States, documented the extent of disease and suffering in the population, promoted sanitation and engineering as means of controlling disease, and laid the foundation for public infrastructure for combating and preventing contagious disease. In the United States, similar studies were taking place. Inspired in part by Chadwick, local sanitary surveys were conducted in several cities. The most famous of these was a survey conducted by Lemuel Shattuck, a Massachusetts bookseller and statistician. His Report of the Massachusetts Sanitary Commission was published in 1850. Shattuck collected vital statistics on the Massachusetts population, documenting differences in morbidity and mortality rates in different localities. He attributed these differences to urbanization, specifically the foulness of the air created by decay of waste in areas of dense population, and to immoral life-style. He showed that the poor living conditions in the city threatened the entire community. Further, Shattuck determined that those most likely to be affected by disease were also those who, either through ignorance or lack of concern, failed to take personal responsibility for cleanliness and sanitation of their area. Rosenkrantz, Consequently, he argued that the city or the state had to take responsibility for the environment. Massachusetts set up a state board of health in 1852. The creation of this board reflected more a trend of strengthened government than new knowledge about the causes and control of disease. Nevertheless, the type of data collected by Shattuck was used to justify the board. Many of the principles and activities he proposed later came to be considered fundamental to public health. And Shattuck established the fundamental usefulness of keeping records and vital statistics. This report eventually led to the establishment of the first public agency for health, the New York City Health Department, in 1862. During this same period, boards of health were established in Louisiana, California, the District of Columbia, Virginia, Minnesota, Maryland, and Alabama. Fee, ; Hanlon and Pickett, By the end of the nineteenth century, 40 states and several local areas had established health departments. Although the specific mechanisms of diseases were still poorly understood, collective action against contagious disease proved to be successful. For example, cholera was known to be a waterborne disease, but the precise agent of infection was not known at this time. The sanitary reform movement brought more water to cities in the mid-nineteenth century, through private contractors and eventually through reservoirs and municipal water supplies, but its usefulness did not depend primarily on its purity for consumption, but its availability for washing and fire protection. Blake, Nonetheless, sanitary efforts of the New York Board of Health in 1862, including inspections, immediate case reporting, complaint investigations, evacuations, and

disinfection of possessions and living quarters, kept an outbreak of cholera to a small number of cases. During this period, states also established more public institutions for care of the mentally ill. Dorothea Dix, a retired school teacher from Maine, is the most familiar name in the reform movement for care of the mentally ill. In the early nineteenth century, under Poor Law practices, communities that could not place their poor mentally ill citizens in more appropriate institutions put them in municipal jails and almshouses. Beginning in the middle of the century, Dix led a crusade to publicize the inhumane treatment mentally ill citizens were receiving in jails and campaigned for the establishment of more public institutions for care of the insane. In the nineteenth century, mental illness was considered a combination of inherited characteristics, medical problems, and social, intellectual, moral, and economic failures. It was believed, despite the prejudice that the poor and foreign-born were more likely to be mentally ill, that moral treatment in a humane social setting could cure mental illness. Dix and others argued that in the long run institutional care was cheaper for the community. The mentally ill could be treated and cured in an institution, making continuing public support unnecessary. Although the practice of moral treatment proved to be less successful than hoped, the nineteenth-century social reform movement established the principle of state responsibility for the indigent mentally ill. Grob, ; Foley and Sharfstein, New ideas about causes of disease and about social responsibility stimulated the development of public health agencies and institutions. As environmental and social causes of diseases were identified, social action appeared to be an effective way to control diseases. When health was no longer simply an individual responsibility, it became necessary to form public boards, agencies, and institutions to protect the health of citizens. Sanitary and social reform provided the basis for the formation of public health organizations. Public health agencies and institutions started at the local and state levels in the United States. Federal activities in health were limited to the Marine Hospital Service, a system of public hospitals for the care of merchant seamen. Because merchant seamen had no local citizenship, the federal government took on the responsibility of providing their health care. A national board of health, which was intended to take over the responsibilities of the Marine Hospital Service, was adopted in 1890, but, opposed by the Marine Hospital Service and many southern states, the board lasted only until 1893. Meanwhile, several state boards of health, state health departments, and local health departments had been established by the latter part of the nineteenth century. Rapid advances in scientific knowledge about causes and prevention of numerous diseases brought about tremendous changes in public health. Many major contagious diseases were brought under control through science applied to public health. Louis Pasteur, a French chemist, proved in 1856 that anthrax is caused by bacteria. By 1881, he had developed artificial immunization against the disease. During the following few years, discoveries of bacteriologic agents of disease were made in European and American laboratories for such contagious diseases as tuberculosis, diphtheria, typhoid, and yellow fever.

## 2: History Of Public Health | [www.enganchecubano.com](http://www.enganchecubano.com)

*In the History of Public Health we will examine the historical experience of health and illness from a population perspective. This material seeks to reveal how the organization of societies facilitates or mitigates the production and transmission of disease.*

A hand pump was located right on Broad Street, and Snow was immediately suspicious. Water samples did not reveal gross contamination, but Snow persisted and began to collect detailed information on where the victims had gotten their drinking water. He obtained the names and the addresses of the first 83 victims who had died by the end of the first week. He went to their homes and learned from relatives that the vast majority of them had obtained their water from the Broad St. He argued that the pump handle should be removed in order to prevent further contamination. The board was not convinced, but agreed to remove the pump handle as a precaution. The epidemic quickly subsided. Ultimately, Snow was able to track down victims, the vast majority of whom lived within walking distance of the pump. It was also noted that there was an extremely low incidence of cholera at a nearby work house and also at the Lion Brewery, and both of these businesses had their own water supply. The workers at another large business used water from the Broad St. The map below shows the location of the pump, and the home or business location of the victims is shown by stacks of small dark marks that are clearly clustered around the pump. This type of map, which marks the location of disease cases, is now referred to as a "spot map. The timing of her death indicated that she had been the first cholera case. The cesspool and the pump well were then excavated, revealing that the cesspool, which was within three feet of the well, was leaking, and the wall of the well was decayed, allowing the contamination from the cesspool to seep in. In retrospect, it appeared that once the child died, there was no further contamination of the well, and the epidemic ended. This graph shows the number of cholera deaths over time. There is an abrupt increase in cholera deaths at the very end of August. Deaths peak on September 2, when there were about 500 deaths, and the cholera death rate gradually declines to near zero over the next three weeks. With knowledge of the incubation period for the disease, the shape of an epidemic curve can sometimes provide clues regarding the source of the epidemic. Cholera has an incubation period of only days, and this graph indicates that new cases occurred over a period of about 10 days. This suggests a "continuous source" epidemic, because new cases continue to occur for more than one incubation period, suggesting an ongoing source of contamination.. In retrospect, Snow made several important contributions to the development of epidemiologic thinking: He proposed a new hypothesis for how cholera was transmitted. He tested this hypothesis systematically by making comparisons between groups of people. He provided evidence for an association between drinking from the Broad St. He argued for an intervention which prevented additional cases removal of the pump handle. The Sanitary Idea In many respects, public health as we think of it today i. However, the circumstances that propelled the development of public health as a discipline are more complex with many contributing factors. First, there was the notion of the importance of the monarchy and the power of the state. The influence and power of the state could be assessed in many ways including commerce and trade, but also by the size of the population and the health and fitness of the working population. This crude notion made the work of John Graunt quite compelling, and the importance attached to "numbering the people" grew. A second factor was the emergence of the Enlightenment in the 18th century, which embraced democracy, citizenship, reason, rationality, and the social value of intelligence the value of information gathering. These ideas provided important underpinnings for public health. In the early s, Jeremy Bentham and his disciples the theoretical radicals developed the philosophy of utilitarianism which provided a theoretic underpinning for health policy and wider social policies. One theme was that the reduction of mortality and improvements in health had an economic value to society. Healthy workers were more able to contribute to the economy of the state. To Bentham the welfare of both the wealthy and the poor could be achieved most efficiently with good government. Yet another factor was the recognition that poor health was a burden that fell disproportionately on the poor. Villerme, a physician in Paris had noticed that mortality rates varied widely among the districts arrondissement of Paris. None of these things correlated. However, when he used tax rates as an indicator of

wealth, Villerme found a striking correlation with mortality rates. The graph below shows the correlation between poverty and mortality rates among different districts arrondissements in Paris found by Villerme. This relationship has persisted for centuries, and it is a powerful predictor of health. He concluded that what was really needed was not more physicians, but civil engineers to provide drainage of streets and to devise more efficient ways of delivering clean water and removing sewage and other noxious substances. It is interesting to note that many of the proponents of the "Sanitary Idea," including Edwin Chadwick shown on the right, were "miasmatists" who clung to the belief that disease was caused by breathing foul vapors. Since sewage and garbage smelled bad, they were associated with disease, so the miasmatists pushed to clean up the environment. And despite the fact that their belief in miasmas would prove to be incorrect, the end result was that many of the sources of infectious disease were removed. Chadwick was instrumental in creating a central public health administration that paved the way for drainage, sewers, garbage disposal, regulation of housing, and regulations regarding nuisances and offensive trades. This "sanitary idea" resulted in remarkable improvements in health and well-being, as illustrated in the graph below, which shows a remarkable decline in mortality from tuberculosis from the mid 18th century until the mid 19th century. Among others, these included: Through their efforts landmark legislation was passed including: In the 1840s The Epidemiologic Society of London was formed, consisting of local physicians, ex-military commanders, and civil servants who presented papers related to public health issues. John Snow presented "The comparative mortality of large towns and rural districts and the causes by which it is influenced". This intersection of statistics, philosophy, and economy sparked a new agenda for social reform. These efforts had an enormous impact. The graph below shows the remarkable decline in mortality from tuberculosis in the United Kingdom from 1800 to 1850. The remarkable decline in mortality from TB and other infectious diseases is believed to have been the result of the many environmental improvements that occurred as a result of the implementation of the "Sanitary Idea. Louis Pasteur late Louis Pasteur was a French biologist and chemist who made enormous contributions to germ theory, to prevention of food spoilage, and to the control of disease. In 1854 Pasteur began studying fermentation in wine and beer and rapidly concluded that microorganisms were responsible. He discovered that some microorganisms require oxygen aerobic organisms, while others reproduce in the absence of oxygen anaerobic. Pasteur pioneered the idea of artificially generating weakened microorganisms as vaccines. Pasteur was able to artificially weaken strains of anthrax and cholera in order to generate vaccines. Pasteur developed vaccines against anthrax in sheep and cholera in chickens. In 1885 he developed a vaccine for rabies by growing it in rabbits and then drying the nerve tissue that had been infected with the virus. This vaccine was successfully used to save the life of a boy who had been bitten by a rabid dog. The US also underwent a rapid transition from a rural, agricultural society to one that was intensely urban and industrial. Inventions such as the cotton gin that promoted agricultural production, but also decreased the need for farm workers, driving many to the cities for work. Economic growth and inventions spawned factories and textile mills in US cities. Seamen often became ill while at sea and often were unable to find adequate health care in port cities. Their health was viewed as essential to the developing country, and a network of marine hospitals, mainly in port cities, was established by Congress in 1794 to care for sick and disabled seamen. Seamen were taxed 20 cents a month in order to raise funds to pay physicians and support the network of hospitals. This tax was abolished in 1800. From 1800 to 1850 funds were raised by a levy on merchant ships, and after funds were allocated by the US Congress. Thomas Welsh, a Harvard College graduate and participant in the Revolutionary War battles at Lexington and Bunker Hill, was appointed as the physician in charge. Paul Revere is named as the first health officer. Benjamin Waterhouse was appointed the physician in charge from 1794. Benjamin Waterhouse introduced smallpox vaccination to the United States. Lemuel Shattuck, a Massachusetts legislator, established the first US system for recording births, deaths and marriages. Largely through his efforts Massachusetts legislation became the model for all the other states in the Union. The report was enthusiastically received by the New England Journal of Medicine, but the 50 recommendations in the report were otherwise ignored. It became national in scope and military in outlook and organization. Medical officers, called surgeons, were required to pass entrance examinations and wear uniforms. In 1800, when the Commissioned Corps was formally recognized by legislative action, the medical officers were given titles and pay corresponding to Army and Navy grades. Physicians

who passed the examinations were appointed to the general service, rather than to a particular hospital, and were assigned wherever needed. The goal was to create a professional, mobile, health corps, free as possible from political favoritism and patronage, and able to deal with the new health needs of a rapidly growing and industrializing nation. They killed many people, spread panic and fear, disrupted government, and caused Congress to enact laws to stop their importation and spread. As a result of these new laws, the functions of the MHS were expanded greatly beyond the medical relief of the sick seamen to include the supervision of national quarantine ship inspection and disinfection, the medical inspection of immigrants, the prevention of interstate spread of disease, and general investigations in the field of public health, such as that of yellow fever epidemics. The laboratory later moved to Washington, D. The video below is a segment from a PBS documentary on public health. This particular segment focuses on events at the dawn of the 20th century when bubonic plague threatened San Francisco. Note the futile and inappropriate use of quarantine to deal with the threat of plague. The last section of the clip describes a broad array of public health interventions that eventually emerged. [Link to transcript of the video](#) The Immigration Act of 1892 required that all immigrants entering the US be given a health examination by PHS physicians. The law stipulated the exclusion of "all idiots, insane persons, paupers or persons likely to become public charges, persons suffering from a loathsome or dangerous contagious disease," and criminals. Some estimates indicate that HIV was transmitted from monkeys to humans as early as 1900, but was either unrecognized or failed to initiate human to human transmission until later. The legislation required the Surgeon General to organize conferences of local and national health officials in order to coordinate state and national public health activities. They also passed the Food and Drugs Act. The law forbade adulteration and misbranding of foods, drinks, and drugs in interstate commerce, but contained few specific requirements to insure compliance. Investigations in the garment making industry, as illustrated by these women making flowers, revealed unsanitary conditions and an excessive rate of tuberculosis. Other studies were done of silicosis among miners, sanitation and working conditions in the steel industry, lead poisoning in the pottery industry, and radiation hazards in the radium dial painting industry.

## 3: A brief history of public health | Health Careers

*Schneider and Lilienfeld is a comprehensive but brief history of public health, whereas Ravenel is a history of public health in the United States that has been republished. The latter was complete through the original date of publication in*

See Article History Public health, the art and science of preventing disease , prolonging life, and promoting physical and mental health , sanitation, personal hygiene, control of infectious diseases , and organization of health services. From the normal human interactions involved in dealing with the many problems of social life, there has emerged a recognition of the importance of community action in the promotion of health and the prevention and treatment of disease, and this is expressed in the concept of public health. Comparable terms for public health medicine are social medicine and community medicine; the latter has been widely adopted in the United Kingdom , and the practitioners are called community physicians. The practice of public health draws heavily on medical science and philosophy and concentrates especially on manipulating and controlling the environment for the benefit of the public. It is concerned therefore with housing, water supplies, and food. Noxious agents can be introduced into these through farming, fertilizers , inadequate sewage disposal and drainage, construction, defective heating and ventilating systems, machinery, and toxic chemicals. Public health medicine is part of the greater enterprise of preserving and improving the public health. Community physicians cooperate with diverse groups, from architects, builders, sanitary and heating and ventilating engineers, and factory and food inspectors to psychologists and sociologists, chemists, physicists, and toxicologists. Occupational medicine is concerned with the health, safety, and welfare of persons in the workplace. It may be viewed as a specialized part of public health medicine since its aim is to reduce the risks in the environment in which persons work. The venture of preserving, maintaining, and actively promoting public health requires special methods of information-gathering epidemiology and corporate arrangements to act upon significant findings and put them into practice. Statistics collected by epidemiologists attempt to describe and explain the occurrence of disease in a population by correlating factors such as diet, environment, radiation exposure, or cigarette smoking with the incidence and prevalence of disease. The government, through laws and regulations, creates agencies to oversee and formally inspect and monitor water supplies, food processing , sewage treatment , drains, and pollution. Governments also are concerned with the control of epidemic diseases, establishing guidelines for appropriate medical responses and isolation procedures, and issuing travel warnings to prevent the spread of disease from affected areas. Ministry of Public Health worker administering water-purifying tablets in Kabul, WHO is especially important in providing assistance for the implementation of organizational and administrative methods of handling problems associated with health and disease in less-developed countries worldwide. Within these countries, health problems, limitations of resources, education of health personnel, and other factors must be taken into account in designing health service systems. Advances in science and medicine in developed countries, including the generation of vaccines and antibiotics , have been fundamental in bringing vital aid to countries afflicted by a high burden of disease. Yet, despite the expansion of resources and improvements in the mobilization of these resources to the most severely afflicted areas, the incidence of preventable disease and of neglected tropical disease remains exceptionally high worldwide. Reducing the impact and prevalence of these diseases is a major goal of international public health. The persistence of such diseases in the world, however, serves as an important indication of the difficulties that health organizations and societies continue to confront.

## 4: Public Health in the United States

*Public health is "the science and art of preventing disease, prolonging life and promoting human health through organized efforts and informed choices of society, organizations, public and private, communities and individuals".*

Interestingly, though, advances in public health knowledge and practice occur typically as reactions to public health problems. A century and a half ago, for example, cholera epidemics in London stimulated the public health movement and the development of the London Epidemiological Society. Wars are also a very important factor in public health, devastating to public health and public health programs in populations that suffer attack and engines of advances in public health knowledge in countries whose homeland remains undamaged. Improved treatment of wounds Britain and the purification, testing, and manufacture of penicillin Britain and the U. The rise of the National Institutes of Health was in response to research needed to assist our military efforts in WWII where soldiers and sailors faced a variety of environments, diseases, injuries, etc. The medical industrial complex in many ways has come to resemble the military industrial complex, with the same benefits and drawbacks - RCB Apart from military motives, the growth of government is responsible for public health advances for other reasons when there are supportive attitudes about what government should do. For example, the French Revolution and the growth of populist thinking in Europe were strong stimuli to interest in public health. Scientific progress is fundamental to public health advances, of course, since regardless of what people think that government should do, what it can do is constrained by available knowledge and technology. What government can do is also constrained by attitudes and beliefs about what is proper. Progress in preventing HIV and sexually transmitted diseases has had to contend with legal and extra-legal restrictions on open discussion about sex and particularly about anal sex. These are only a few of the myriad influences on the evolution of public health and epidemiology. Further examples of these influences, most of which affect each other as well as public health, are: Introduction of Pap smear in s led to knowledge of natural history of cervical cancer. Development of coronary angiography enabled visualizing of atherosclerosis during life as well as coronary artery spasm. Consider the impact of the development of microscopy, the stethoscope, electrocardiograms, culture techniques, biochemistry, cytology, computers, angiography, radioimmunoassay, DNA probes, Increased demand for and on epidemiology and public health e. Many of the problems faced by past investigators seem so manageable compared to the ones we face today. But how did those problems look without the benefit of the knowledge and concepts that we take for granted. Induction and latency Consider the example of the incubation period. In infectious diseases, there is commonly an incubation period, typically on the order of days. Until this phenomenon became known and accepted, it must have been difficult to make the connection between the onset of an illness and an exposure some two weeks earlier. Panum helped to document this phenomenon, and his studies of measles onset and previous exposure to cases are a classic of careful description and inference. With chronic diseases, the "incubation period" is much longer. Pellagra develops over a period of several months. Atherosclerotic heart disease and cancer can take 5, 10, 20, or even 30 years. Lengthy separation of cause and effect is certainly much more formidable than the 2 weeks involved in measles, but is it more formidable in terms of the level of knowledge then and now? Rarity of disease Rarity of a disease is in some respects an advantage for studying it and in some respects an obstacle. Epidemics are easy to study in the sense that each occurrence represents a form of natural experiment. They provide contrasts between the before and the after e. With an endemic disease, on the other hand, there is no obvious contrast to stimulate perception of new events or new modes of living that could have introduced the disease. On the other hand, very rare diseases are difficult to study because of the difficulty of assembling enough cases. We now take it for granted, and grant proposal reviews enforce, that an investigator will conduct a systematic review of existing evidence, make use of vital statistics data, formulate precise definitions of disease and other variables, collect data in an even-handed manner, employ checks of reliability and validity of the data, and analyze the data with due attention to alternative explanations of the findings. But each of these and other desirable methodologic practices had to be introduced at a time when it was not common practice. Not all of the practice of epidemiology is as glorious as the

celebrated insights. It is also interesting to contrast these diseases and the interventions they recommended with those for contemporary epidemics CHD, lung cancer, motor vehicle injuries, handgun fatalities. Do you suppose the public reacts differently to being told to eat less meat than it did to being told to eat more meat? Insight based on but not constrained by knowledge Enduring recognition over time comes from distinctive accomplishment, from achievement beyond the expected. One mark of distinction is the attainment of insight that builds on existing knowledge but is not unduly constrained by it. Scientific advances generally build on knowledge that has been successively accumulated by many people over many years. But such knowledge is understood in terms of existing paradigms see Thomas Kuhn, *The structure of scientific revolutions*. If the existing paradigm or theoretical structure that governs the interpretation of observations is inadequate to the problem at hand, then progress demands a new or modified paradigm. Almost by definition, a great step forward in thinking occurs in advance of general understanding. X-rays were originally regarded as an elaborate hoax Kuhn, In a number of the epidemiologic classics, the prevailing theories were misleading. A key contribution was the discarding of certain beliefs of the time, and the investigator had to contend with active opposition to his investigations. This study took him three months. It then took him several years, including some outlandish heroic? William Farr fought the idea that cholera was spread by germs because in his data high altitude was associated with cholera, consistent with theories about atmospheric pressure and miasmas. The classic papers on lung cancer and tobacco smoke, published in the *Journal of the American Medical Association* by Wynder and Graham and Doll and Hill, were almost rejected by the editor because of the lack of existing knowledge supporting the association. Despite numerous studies yielding similar findings, eminent statisticians R. Fisher, Berkson remained highly skeptical for many years. For example, if an epidemiologist were to suggest that psychiatric disorders are spread by transmission of thoughts, this suggestion would be ridiculed. Was the suggestion that water was a vehicle of transmission of cholera and typhoid similarly regarded in the last century? What about the transmission of measles virus through air? Can we achieve the acuity of hindsight without the wait? Despite decades of advances in cancer identification and treatment, the first time the overall cancer mortality dropped was and this was because of a decrease in male smokers some 20 years before. The EPID web site <http://www.epidemiology.com>; The history of public health. Hobson ed, *Theory and practice of public health*. NY, Oxford, , Committee for the Study of the Future of Public Health. *The future of public health*. *Am J Epidemiol*; Chapters provide an interesting and easy-to-read introduction to this landmark investigation, requiring no prior background in epidemiology or cardiovascular disease. These chapters provide a good introduction to basic epidemiologic concepts. New Haven, CT, Yale, *The mirage of health*. NY, Anchor, *Epidemiology Monitor*. *The future of epidemiology*. A study of the diet of nonpellagrous and of pellagrous households. *Epidemiology in the 21st century*: *Am J Public Health*; *The origin of plagues: The structure of scientific revolutions*, 2nd ed, Chicago, University of Chicago, *Innovations in health care: Bulletin of the History of Medicine* Spring ; The Johns Hopkins University Press, *A treatise of the scurvy*. Edinburgh, Sands, Murray, and Cochran for A. *Chirurgical observations related to the cataract, the polypus of the nose, the cancer of the scrotum, the different kinds of ruptures and the mortification of the toes and feet*. London, England, Hawes, Clarke, and Collins, *National Cancer Institute Monograph No. A history of public health*. Baltimore, Johns Hopkins Univ, Chicago, University of Chicago. *American Journal of Epidemiology*: *Am J Epidemiol* Nov 15 ; *Retrolental Fibroplasia, A Modern Parable*. On the mode of communication of cholera. New York, The Commonwealth Fund, *Who made John Snow a hero?* *Am J Epidemiol* May 15 ; See also letters in *Am J Epidemiol* Feb 15 ; 4: *A history of preventive medicine*. Medical advance, public health and social evolution. NY, Pergamon, Winkelstein, Jr. *Interface of epidemiology and history*:

## 5: A Brief History of Public Health

*Public health, the art and science of preventing disease, prolonging life, and promoting physical and mental health, sanitation, personal hygiene, control of infectious diseases, and organization of health services.*

Background[ edit ] The focus of a public health intervention is to prevent and manage diseases, injuries and other health conditions through surveillance of cases and the promotion of healthy behaviors , communities and environments. Many diseases are preventable through simple, nonmedical methods. For example, research has shown that the simple act of handwashing with soap can prevent the spread of many contagious diseases. Public health communications programs , vaccination programs and distribution of condoms are examples of common preventive public health measures. Measures such as these have contributed greatly to the health of populations and increases in life expectancy. Public health plays an important role in disease prevention efforts in both the developing world and in developed countries through local health systems and non-governmental organizations. The World Health Organization WHO is the international agency that coordinates and acts on global public health issues. Most countries have their own government public health agencies, sometimes known as ministries of health, to respond to domestic health issues. For example, in the United States , the front line of public health initiatives are state and local health departments. In Canada, the Public Health Agency of Canada is the national agency responsible for public health, emergency preparedness and response, and infectious and chronic disease control and prevention. Current practice[ edit ] Public health programs[ edit ] This section needs additional citations for verification. Please help improve this article by adding citations to reliable sources. Unsourced material may be challenged and removed. Unfortunately, for example, take tobacco: However, public health generally receives significantly less government funding compared with medicine. Three former directors of the Global Smallpox Eradication Programme read the news that smallpox had been globally eradicated, The World Health Organization WHO identifies core functions of public health programs including: In particular, public health surveillance programs can: Antibiotic resistance, also known as drug resistance, was the theme of World Health Day Although the prioritization of pressing public health issues is important, Laurie Garrett argues that there are following consequences. This public health problem of stovepiping is thought to create a lack of funds to combat other existing diseases in a given country. For example, the WHO reports that at least million people worldwide suffer from diabetes. Its incidence is increasing rapidly, and it is projected that the number of diabetes deaths will double by the year Mexico follows behind with Once considered a problem in high-income countries, it is now on the rise in low-income countries, especially in urban settings. Many public health programs are increasingly dedicating attention and resources to the issue of obesity, with objectives to address the underlying causes including healthy diet and physical exercise. Some programs and policies associated with public health promotion and prevention can be controversial. One such example is programs focusing on the prevention of HIV transmission through safe sex campaigns and needle-exchange programmes. Another is the control of tobacco smoking. Changing smoking behavior requires long-term strategies, unlike the fight against communicable diseases , which usually takes a shorter period for effects to be observed. Many nations have implemented major initiatives to cut smoking, such as increased taxation and bans on smoking in some or all public places. Simultaneously, while communicable diseases have historically ranged uppermost as a global health priority, non-communicable diseases and the underlying behavior-related risk factors have been at the bottom. This is changing, however, as illustrated by the United Nations hosting its first General Assembly Special Summit on the issue of non-communicable diseases in September From an evolutionary psychology perspective, over consumption of novel substances that are harmful is due to the activation of an evolved reward system for substances such as drugs, tobacco, alcohol, refined salt, fat, and carbohydrates. New technologies such as modern transportation also cause reduced physical activity. Research has found that behavior is more effectively changed by taking evolutionary motivations into consideration instead of only presenting information about health effects. The marketing industry has long known the importance of associating products with high status and attractiveness to others. Films are increasingly being recognized as a

public health tool [15]. In fact, film festivals and competitions have been established to specifically promote films about health. Political concerns can lead government officials to hide the real numbers of people affected by disease in their regions, such as upcoming elections. Therefore, scientific neutrality in making public health policy is critical; it can ensure treatment needs are met regardless of political and economic conditions. As argued by Paul E. Farmer, structural interventions could possibly have a large impact, and yet there are numerous problems as to why this strategy has yet to be incorporated into the health system. One of the main reasons that he suggests could be the fact that physicians are not properly trained to carry out structural interventions, meaning that the ground level health care professionals cannot implement these improvements. While structural interventions can not be the only area for improvement, the lack of coordination between socioeconomic factors and health care for the poor could be counterproductive, and end up causing greater inequity between the health care services received by the rich and by the poor. Unless health care is no longer treated as a commodity, global public health will ultimately not be achieved. Only about one-third focused on seeking measurable changes in the populations they serve i. What this research showcases is that if agencies are only focused on accomplishing tasks i. The term is used in three senses. In the first sense, "Public Health 2. These private organizations recognize the need for free and easy to access health materials often building libraries of educational articles. In the developing world, public health infrastructures are still forming. There may not be enough trained health workers, monetary resources or, in some cases, sufficient knowledge to provide even a basic level of medical care and disease prevention. However, expenditures on health care should not be confused with spending on public health. Public health measures may not generally be considered "health care" in the strictest sense. For example, mandating the use of seat belts in cars can save countless lives and contribute to the health of a population, but typically money spent enforcing this rule would not count as money spent on health care. Large parts of the developing world remained plagued by largely preventable or treatable infectious diseases. In addition to this however, many developing countries are also experiencing an epidemiological shift and polarization in which populations are now experiencing more of the effects of chronic diseases as life expectancy increases with, the poorer communities being heavily affected by both chronic and infectious diseases. The WHO reports that a lack of exclusive breastfeeding during the first six months of life contributes to over a million avoidable child deaths each year. Each day brings new front-page headlines about public health: Since the s, the growing field of population health has broadened the focus of public health from individual behaviors and risk factors to population-level issues such as inequality , poverty, and education. Modern public health is often concerned with addressing determinants of health across a population. There is a recognition that our health is affected by many factors including where we live, genetics, our income, our educational status and our social relationships; these are known as " social determinants of health ". The upstream drivers such as environment, education, employment, income, food security, housing, social inclusion and many others effect the distribution of health between and within populations and are often shaped by policy. The poorest generally suffer the worst health, but even the middle classes will generally have worse health outcomes than those of a higher social stratum. Health aid in developing countries[ edit ] Main article: Aid Health aid to developing countries is an important source of public health funding for many developing countries. Proponents of aid claim that health aid from wealthy countries is necessary in order for developing countries to escape the poverty trap. The positive impacts of these initiatives can be seen in the eradication of smallpox and polio; however, critics claim that misuse or misplacement of funds may cause many of these efforts to never come into fruition. Sustainable Development Goals To address current and future challenges in addressing health issues in the world, the United Nations have developed the Sustainable Development Goals building off of the Millennium Development Goals of to be completed by These goals hope to lessen the burden of disease and inequality faced by developing countries and lead to a healthier future. The links between the various sustainable development goals and public health are numerous and well established: Living below the poverty line is attributed to poorer health outcomes and can be even worse for persons living in developing countries where extreme poverty is more common. The World Health Organization estimates that Public health efforts are impeded by this, as a lack of education can lead to poorer health outcomes. This is shown by children of mothers who have no education

having a lower survival rate compared to children born to mothers with primary or greater levels of education. Combating these inequalities has shown to also lead to better public health outcome. In studies done by the World Bank on populations in developing countries, it was found that when women had more control over household resources, the children benefit through better access to food, healthcare, and education. Global Health Initiatives The U. Global Health Initiative was created in by President Obama in an attempt to have a more holistic, comprehensive approach to improving global health as opposed to previous, disease-specific interventions. Women, girls, and gender equality Strategic coordination and integration Strengthen and leverage key multilaterals and other partners Country-ownership Improve metrics, monitoring, and evaluation Promote research and innovation [48] The aid effectiveness agenda is a useful tool for measuring the impact of these large scale programs such as The Global Fund to Fight AIDS, Tuberculosis and Malaria and the Global Alliance for Vaccines and Immunization GAVI which have been successful in achieving rapid and visible results. The training typically requires a university degree with a focus on core disciplines of biostatistics , epidemiology , health services administration , health policy , health education , behavioral science , gender issues, sexual and reproductive health, public health nutrition and environmental and occupational health. Operational structures are formulated by strategic principles, with educational and career pathways guided by competency frameworks, all requiring modulation according to local, national and global realities. It is critically important for the health of populations that nations assess their public health human resource needs and develop their ability to deliver this capacity, and not depend on other countries to supply it. The report focused more on research than practical education. By , schools of public health were established at Columbia , Harvard and Yale on the Hopkins model. By there were twenty nine schools of public health in the US, enrolling around fifteen thousand students. In the beginning, students who enrolled in public health schools typically had already obtained a medical degree; public health school training was largely a second degree for medical professionals. Professional degrees of public health Schools of public health offer a variety of degrees which generally fall into two categories: DrPH is regarded as a professional degree and PhD as more of an academic degree. Professional degrees are oriented towards practice in public health settings. The Master of Public Health , Doctor of Public Health , Doctor of Health Science DHSc and the Master of Health Care Administration are examples of degrees which are geared towards people who want careers as practitioners of public health in health departments, managed care and community-based organizations, hospitals and consulting firms, among others. Master of Public Health degrees broadly fall into two categories, those that put more emphasis on an understanding of epidemiology and statistics as the scientific basis of public health practice and those that include a more eclectic range of methodologies. A Master of Science of Public Health is similar to an MPH but is considered an academic degree as opposed to a professional degree and places more emphasis on scientific methods and research. The doctoral programs are distinct from the MPH and other professional programs by the addition of advanced coursework and the nature and scope of a dissertation research project. Currently, there are approximately 68 chapters throughout the United States and Puerto Rico. Public health has early roots in antiquity. From the beginnings of human civilization , it was recognized that polluted water and lack of proper waste disposal spread communicable diseases theory of miasma. Early religions attempted to regulate behavior that specifically related to health, from types of food eaten, to regulating certain indulgent behaviors, such as drinking alcohol or sexual relations. Leaders were responsible for the health of their subjects to ensure social stability, prosperity , and maintain order.

## 6: Public Health timeline | World History Project

*The history of public health is a story of the search for effective means of securing health and preventing disease in the population. Epidemic and endemic infectious disease stimulated thought and innovation in disease prevention on a pragmatic basis, often before the causation was established scientifically.*

The US also underwent a rapid transition from a rural, agricultural society to one that was intensely urban and industrial. Inventions such as the cotton gin that promoted agricultural production, but also decreased the need for farm workers, driving many to the cities for work. Economic growth and inventions spawned factories and textile mills in US cities. Seamen often became ill while at sea and often were unable to find adequate health care in port cities. Their health was viewed as essential to the developing country, and a network of marine hospitals, mainly in port cities, was established by Congress in to care for sick and disabled seamen. Seamen were taxed 20 cents a month in order to raise funds to pay physicians and support the network of hospitals. This tax was abolished in 1800. Funds were raised by a levy on merchant ships, and after funds were allocated by the US Congress. Thomas Welsh, a Harvard College graduate and participant in the Revolutionary War battles at Lexington and Bunker Hill, was appointed as the physician in charge. Paul Revere is named as the first health officer. Benjamin Waterhouse was appointed the physician in charge from 1799. Benjamin Waterhouse introduced smallpox vaccination to the United States - Lemuel Shattuck, a Massachusetts legislator, established the first US system for recording births, deaths and marriages. Largely through his efforts Massachusetts legislation became the model for all the other states in the Union. The report was enthusiastically received by the New England Journal of Medicine, but the 50 recommendations in the report were otherwise ignored. It became national in scope and military in outlook and organization. Medical officers, called surgeons, were required to pass entrance examinations and wear uniforms. In 1800, when the Commissioned Corps was formally recognized by legislative action, the medical officers were given titles and pay corresponding to Army and Navy grades. Physicians who passed the examinations were appointed to the general service, rather than to a particular hospital, and were assigned wherever needed. The goal was to create a professional, mobile, health corps, free as possible from political favoritism and patronage, and able to deal with the new health needs of a rapidly growing and industrializing nation. They killed many people, spread panic and fear, disrupted government, and caused Congress to enact laws to stop their importation and spread. As a result of these new laws, the functions of the MHS were expanded greatly beyond the medical relief of the sick seamen to include the supervision of national quarantine ship inspection and disinfection, the medical inspection of immigrants, the prevention of interstate spread of disease, and general investigations in the field of public health, such as that of yellow fever epidemics. The laboratory later moved to Washington, D. The video below is a segment from a PBS documentary on public health. This particular segment focuses on events at the dawn of the 20th century when bubonic plague threatened San Francisco. Note the futile and inappropriate use of quarantine to deal with the threat of plague. The last section of the clip describes a broad array of public health interventions that eventually emerged. The law stipulated the exclusion of "all idiots, insane persons, paupers or persons likely to become public charges, persons suffering from a loathsome or dangerous contagious disease," and criminals. The 1906 Pure Food and Drug Act - Some estimates indicate that HIV was transmitted from monkeys to humans as early as 1906, but was either unrecognized or failed to initiate human to human transmission until later. The legislation required the Surgeon General to organize conferences of local and national health officials in order to coordinate state and national public health activities. They also passed the Food and Drugs Act. The law forbade adulteration and misbranding of foods, drinks, and drugs in interstate commerce, but contained few specific requirements to insure compliance. Investigations in the garment making industry, as illustrated by these women making flowers, revealed unsanitary conditions and an excessive rate of tuberculosis. Other studies were done of silicosis among miners, sanitation and working conditions in the steel industry, lead poisoning in the pottery industry, and radiation hazards in the radium dial painting industry. The Rockefeller Foundation later supported schools of public health at Harvard and the University of Michigan. It is believed to have caused at least million deaths worldwide. The law also makes dangerous or falsely labeled

cosmetics and therapeutic devices illegal. Enforcement of these laws is the mission of the Food and Drug Administration FDA , which is tasked with ensuring that foods are safe and wholesome. It also ensures that drugs and medical devices are safe and effective, and that cosmetics are harmless. Provisions are also made to ensure accurately labeling and that radiofrequency emissions from electronic devices is not hazardous to consumers. They identified lung cancer patients in 20 London hospitals and enrolled a comparison group of non-cancer patients and conducted a case-control study. Somewhat to the surprise of Doll and Hill, the study found that the one consistent difference between lung cancer patients and the non-cancer controls was that the cancer patients were more frequently smokers, and they were heavier smokers. In retrospect, the study was quite carefully done and quite convincing. Nevertheless, it initially stirred much controversy, even among the medical community. Smoking was extremely prevalent, even in physicians, and many refused to believe that it could be a cause of cancer. Other studies were conducted which corroborated these findings, and eventually the importance of the study was recognized, not only for establishing the link between smoking and lung cancer, but for establishing the role of case-control studies. At the time, case-control studies were infrequently done, and careful standards for their conduct had not been established. In the video below Sir Richard Doll briefly describes the study that he and Bradford Hill conducted in The video is a segment of a PBS video on public health. The researchers recruited 5, men and women between the ages of 30 and 62 from the town of Framingham, Massachusetts, and began the first round of extensive physical examinations and lifestyle interviews that they would later analyze for common patterns related to cardiovascular disease. Since , the subjects have continued to return to the study every two years for a detailed medical history, physical examination, and laboratory tests. As a result of these successes nearly 20 years were added to the average life expectancy at birth between and from 47 to 67 years. Much of the work of the early plague fighters and sanitarians is now carried out by the scientists at the Centers for Disease Control and Prevention CDC in Atlanta, Georgia. Early testing of the vaccine developed by Jonas Salk is encouraging. He also pointed out that Western health was not optimal and that life expectation at age 45 had improved little. Moreover, one out of four Americans spent at least some time in mental hospitals. Increasing levels of drug dependency all kinds of drugs also indicated that health was not optimal. He said that disease is complex and tends to be rooted in social, physical, and cultural environment in which people lived. The eradication of smallpox, one of the deadliest and most dreaded diseases, was the result of a massive global effort utilizing case finding and vaccination. The last known case occurred in in Somalia. This historic new statute gave EPA the authority to clean up uncontrolled hazardous waste sites and spills. Michael Gottlieb and his associates r eport on four previously healthy young men who had developed *Pneumocystis carinii* pneumonia. They hypothesized that this was a new syndrome of acquired immunodeficiency cause by a sexually transmitted infectious agent. Such an ecological model, the committee believes, is key to effectively addressing the challenges of the 21st century.

## 7: History of Public Health

*History. During the past years, two factors have shaped the modern public health system: first, the growth of scientific knowledge about sources and means of controlling disease; second, the growth of public acceptance of disease control as both a possibility and a public responsibility.*

The Middle Ages In terms of disease , the Middle Ages can be regarded as beginning with the plague of and ending with the Black Death bubonic plague of Diseases in epidemic proportions included leprosy, bubonic plague , smallpox , tuberculosis , scabies, erysipelas, anthrax, trachoma, sweating sickness , and dancing mania see infection. The isolation of persons with communicable diseases first arose in response to the spread of leprosy. This disease became a serious problem in the Middle Ages and particularly in the 13th and 14th centuries. The Black Death , an outbreak of plague , reached the Mediterranean ports of southern Europe in and in three years swept throughout Europe. The chief method of combating plague was to isolate known or suspected cases as well as persons who had been in contact with them. The period of isolation at first was about 14 days and gradually was increased to 40 days. Stirred by the Black Death, public officials created a system of sanitary control to combat contagious diseases, using observation stations, isolation hospitals, and disinfection procedures. Major efforts to improve sanitation included the development of pure water supplies, garbage and sewage disposal, and food inspection. These efforts were especially important in the cities, where people lived in crowded conditions in a rural manner with many animals around their homes. Flagellants in the Netherlands scourging themselves in atonement, believing that the Black Death is a punishment from God for their sins, The Renaissance Centuries of technological advance culminated in the 16th and 17th centuries in a number of scientific accomplishments. Educated leaders of the time recognized that the political and economic strength of the state required that the population maintain good health. No national health policies were developed in England or on the Continent, however, because the government lacked the knowledge and administrative machinery to carry out such policies. As a result, public health problems continued to be handled on a local community basis, as they had been in medieval times. Scientific advances of the 16th and 17th centuries laid the foundations of anatomy and physiology. Observation and classification made possible the more precise recognition of diseases. The idea that microscopic organisms might cause communicable diseases had begun to take shape. Among the early pioneers in public health medicine was English statistician John Graunt , who in published a book of statistics , which had been compiled by parish and municipal councils, that gave numbers for deaths and sometimes suggested their causes. Inevitably the numbers were inaccurate but a start was made in epidemiology.

*THE FUTURE OF PUBLIC HEALTH "With the relish of a good storyteller, Sedgwick would unravel a plot in which the villain was a bacterial organism; the victim, the unwitting public; the hero, sanitary hygiene brought to life through the application of scientific methods."*

University of West of England, Bristol The history of public health has been a flourishing field in the last three decades. Yet despite a spate of excellent monographs about various epidemic diseases and many good collections about health and disease in Africa, Asia, the Middle East, Latin America, as well as Europe and North America, the most recent textbook on the history of public health is four decades old. Public Health in Ancient Rome Public health was developed by the Romans as they believed that cleanliness would lead to good health. The Romans made links between causes of disease and methods of prevention. The Romans believed that Prevention of illness was more important than cure of illness. Roman Philosophy was based along the lines of searching for a reason then establishing a preventative measure to minimise the risk attached. As a practical people they used observations of the environment to determine what was causing ill health. This form of empirical observation led the Romans to realise that death rates were higher in and around marshes and swamps. The cure would then be based upon logic. As the Romans believed that Gods held the key to longevity of life they initially built Temples to the gods near large swamps to pacify them and reduce the deaths. Alternatives to this were the drainage of swamps and they also ensured that the army and important people lived away from these areas. Such empirical observations led the Romans to believe that ill health could be associated with, amongst other things, bad air, bad water, swamps, sewage, debris and lack of personal cleanliness. In some places, Rome included, it is impossible to avoid all of these unless something is physically done to alter the environment. Personal hygiene was encouraged through the building of large public baths The City of Bath being an obvious British example of these. Public Health in Ancient Greek The Ancient Greek would not have been too unfamiliar with some of the health and fitness regimes that are used by people today. These ideas were very thorough: Such is the quality of the remaining evidence that we can even see that doctors advice differed for those who were rich: Origins of Public Health In some ways, public health is a modern concept, although it has roots in antiquity. From the beginnings of human civilization, it was recognized that polluted water and lack of proper waste disposal spread vector-borne diseases. Early religions attempted to regulate behavior that specifically related to health, from types of food eaten, to regulating certain indulgent behaviors, such as drinking alcohol or sexual relations. The establishment of governments placed responsibility on leaders to develop public health policies and programs in order to gain some understanding of the causes of disease and thus ensure social stability prosperity, and maintain order. Early public health interventions By Roman times, it was well understood that proper diversion of human waste was a necessary tenet of public health in urban areas. The Chinese developed the practice of variolation following a smallpox epidemic around BC. An individual without the disease could gain some measure of immunity against it by inhaling the dried crusts that formed around lesions of infected individuals. Also, children were protected by inoculating a scratch on their forearms with the pus from a lesion. This practice was not documented in the West until the early 18th century, and was used on a very limited basis. The practice of vaccination did not become prevalent until the 1770s, following the work of Edward Jenner to treat smallpox. During the 14th century Black Death in Europe, it was believed that removing bodies of the dead would further prevent the spread of the bacterial infection. This did little to stem the plague, however, which was most likely spread by rodent-borne fleas. Burning parts of cities resulted in much greater benefit, since it destroyed the rodent infestations. The development of quarantine in the medieval period helped mitigate the effects of other infectious diseases. However, according to Michel Foucault, the plague model of governmentality was later controverted by the cholera model. A Cholera pandemic devastated Europe between 1817 and 1824, and was first fought by the use of what Foucault called "social medicine", which focused on flux, circulation of air, location of cemeteries, etc. All those concerns, born of the miasma theory of disease, were mixed with urbanistic concerns for the management of populations, which Foucault designated as the concept

of "biopower". The German conceptualized this in the Polizeiwissenschaft "Science of police". In the 18th Century due to the migration of people from farms and villages in the country to towns during the industrial revolution for work in the newly formed factories and industries, the population in British towns rose dramatically. Eventually public hysteria grew due to the cholera epidemic and the high mortality rates from other communicable diseases like dysentery and TB. Ashton, cites an annual death rate in Liverpool about that time as 36 in 1, the highest in the country. Only one report had enough significance to force concern about these conditions into action to improve them. Because of his work on this report his thinking about the reasons for the plight of the poor began to change and like many health professionals trying to tackle inequalities in health today, he became convinced that their suffering was due to the dreadful conditions in which many of them lived. The act also instigated the setting up of a General Board of Health to oversee these reforms. Snow believed in the germ theory of disease as opposed to the prevailing miasma theory. Although miasma theory correctly teaches that disease is a result of poor sanitation, it was based upon the prevailing theory of spontaneous generation. Germ theory developed slowly: As the prevalence of infectious diseases in the developed world decreased through the 20th century, public health began to put more focus on chronic diseases such as cancer and heart disease. Public health, though often insufficiently appreciated by the other specialties of medicine, has since the nineteenth century helped to bridge the traditional gulf that exists between individual medicine and the greater society in which it functions. Thus it is Public Health, with its emphasis on populations rather than individual patients, that has provided medicine its ultimate rationale. And throughout the history of public health since the Renaissance, there has been a tension between the restriction of individual liberties and the greater interests of the community or the state. The plague has always fascinated historians, but leprosy during the centuries of its great prevalence, from about 1000 to 1500, also deserves more attention, if for no other reason than it was the model for disease as stigma well into our own time. In the early modern world, after about 1500, the West grew in wealth and world dominance, but it did not grow healthier. Infections that took a terrible toll on previously isolated societies, so-called virgin populations, became domesticated as world travel increased and urbanization progressed. Diseases that had been epidemic became endemic in urban centres. The strength of the state was assessed by the size of its population; one way of assessing that strength was to count numbers of people. Basic terms in public Health

**Addiction** Contested term used to describe compulsive drug taking. First in use to denote a disease requiring psychiatric treatment in the early 20th century, replacing older language of "habit", "inebriety", "morphinomania". Primarily focused on alcohol and drugs initially. Recent discussion of nicotine addiction symbolises ownership by public health as well as by psychiatry. Conceptual and practical confusion between PHC and public health, as in the UK, with tensions between general practitioners GPs and public health personnel.

**Community Medicine** Concept developed by social medicine academics in the UK to provide training in health administration and epidemiology for the effective administration of health services. Critics argued that, when implemented in the 1960s, the loss of the medical officer of health meant that the relationship with the local community was lost. Distinct from community health see above.

**Epidemiology** The science of disease in populations. In the 19th century, the epidemiology of infectious disease and vital statistics were central parts of the public health curriculum. After the Second World War, epidemiology expanded its remit within public health to include chronic disease and the concept of "relative risk" was born.

**Disease** The health of the public was undermined by epidemic infectious diseases like cholera, which ravaged industrialising countries in the 19th century. After the Second World War, the greater prevalence of chronic, degenerative disease began to characterise high and middle income populations. New and re-emerging infectious disease became a global health problem at the close of the 20th century.

**Eugenics** The science of improving the quality of the human race, especially by selective breeding. Prominent in the early 20th century. Contrasted the declining fertility of the middle class with the high fertility of the "residuum" in large towns. Positive and negative versions, which attracted a wide range of political and social reform opinion. Pasteur demonstrated the existence of bacteria that communicated disease and Koch identified the causative agent of tuberculosis. Germ theory identified the underlying cause of disease as the entry of micro-organisms in the body. For public health this meant a change of focus from environmental to individual solutions.

**Health Education** The individual focus in turn of the century public

health led to increased reliance on educating individuals, often mothers. The revival of individual arguments for prevention and lifestyle in the s saw further emphasis on health education, often carried out through mass media "single issue" campaigns. Their efficacy in changing behaviour was questioned. Implies intersectoral cooperation, marketing techniques for health, broader environmental emphasis. Often confused with health education. Hygiene Originally meant practices and principles for maintaining health—that is, moderation, cleanliness. Now interchangeable with "sanitary", its meaning is restricted to prevention of infection. In previous centuries the term was more expansive, encompassing ideas of moral and racial contamination. Social or racial hygiene described interventions like forced sterilisation of the "unfit". Jenner published the account of his first experiment with vaccination in Important, but controversial public health procedure, with history of working class opposition because of inequities and safety issues. Maternity and Child Welfare Maternal and child welfare was central to the individualised public health of the turn of the 19th century. Many countries established child welfare clinics. In the UK the role of the health visitor was important, advising mothers and monitoring infant health, an intrusion that was often resented. A state administered system of health inspectors with powers to quarantine, disinfect, and cleanse. Aimed to support aims of absolutist rulers to boost population numbers, ensuring fit labour force and military conscripts. Policing model remained important in 19th century, as with British medical officer of health. New Public Health Term subject to confusion, used to denote different versions of recent public health. Lifestyle public health of s, with reference to Lalonde Report, emphasised individual responsibility for prevention of ill health. Limitations of this approach led to new public health of the s focusing on environmental concerns and health inequality. More recent changes stress role of clinical prevention and genetics. Occupational Health Occupational diseases more prevalent because of the industrial revolution. European states introduced legislation to regulate the health and safety of factory work in the 19th century. Systems of factory inspection developed in Britain and Prussia. Occupational health an important driving force behind social insurance systems, but tended to remain separate from mainstream public health.

*Images From the History of the Public Health Service. Ramunas Kondratas, Ph.D.*

These discoveries laid the foundation for the public health profession and for the infrastructure to support our work. Our headquarters, located in Washington, D. We actively work to enhance collaboration with other professional organizations and develop public-private partnerships to help solve public health problems. NPHW is celebrated in every state and we create organizing and outreach materials that can be used during and after the week to advance public health issues. The campaign includes a blog, fact sheets, podcasts and more. The Association conducted scheduled discussions regarding the pandemic in December APHA sets qualification standards for health educators. National Library of Medicine established. APHA celebrates its th anniversary with 25, members. Water pollution, milk sanitation, hygiene education, bacteriology, infectious diseases s: Infectious diseases, municipal health, water, standardization of health data s: Local health departments, water, milk, training standards, personal hygiene, infectious disease, close-quartered living s: Communicable diseases, sanitation, laboratories, statistics, food safety, housing, education, poverty, medical care, war s: Professional standards, evaluations of schools of public health, infectious diseases, functions of local health departments s: Push for federal agency solely focused on health and federal health funds for states, health legislation and advocacy, accreditation of public health schools, polio, pasteurization and food safety s: Equality within public health work force, integration, the War on Poverty, birth control, public health training, environmental issues, consumer protection, human rights s: War, global health, drug abuse, new technology, upgraded health facilities s: AIDS, teen pregnancy, nuclear safety s: Emergency preparedness, obesity, climate change, built environment s: Food safety, child nutrition, EPA regulations.

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