

Renaissance to the New World

4 April 2024

Late Middle Ages to the Renaissance

After centuries of decreasing scale and scope, Europe starts to reverse that trend:

- Nations
- Wars
- Trade
- Church
- Knowledge/Exploration



Changes in the Church

Restrictions on the practice of medicine by the clergy

- Focus should be on saving of souls not saving of lives
 - Physicians are again non-clergy practitioners
- Knowledge must be shared outside of the monasteries for this to happen
- Health and caring for the poor stay with the church
 - Almshouses
 - Beer?



Changes in Secular Society

Europe becomes larger scale

- Beginning of nations- one warlord subjugates others- centrally rules larger areas
- Rise of cities- population and administration
- *This rise brings more trash, more waste, more animals, more density = More disease*
- *This also requires more connection to a large area (travel), more food and more water*
 - *Solutions have to be on a larger scale than before*



People start moving around

Wars

- Crusades
- Muslims pushed out of Europe (Spain)
- Hundred Years War

Trade

- Silk Road
- Maritime trade and exploration

Diseases and Knowledge move with them:

- Muslim Medical knowledge and Leprosy come back from the crusades
 - Including Vaccination
- The Black Death comes from the east- wipes out 1/3 to 1/2 of the European Population
- Muslims and Jews are expelled from Spain
 - Migration to other parts of the world
 - Captured Medical knowledge
- Near constant War with large armies- networks needed to support it
- Larger Scale trade
 - Black death and other diseases
 - *Solutions needed are larger scale as well*

Public Health Returns

The Hospitallers, a religious order of knights, developed hospitals in Rhodes, Malta, and London to serve returning pilgrims and crusaders.

Leprosy became a widespread disease in Europe, particularly among the poor, and isolation in leprosaria was common in Europe.

- In France alone, there were 2000 leprosaria in the fourteenth century

Hygiene Practices improve and are restored

Universities are established under Royal (not Church/Papal) charter and medical education similar to the Arabic tradition becomes widespread across Europe with physicians coming from the secular middle class



Public Health Returns

Municipalities had their own administration under the king/lord and developed protected water sites (cisterns, wells, and springs) and public fountains across Europe with municipal regulation and supervision.

Piped community water supplies were developed in Dublin, Basel, and Bruges by the thirteenth century. Between the eleventh and fifteenth centuries, Novgorod in Russia used clay and wooden pipes for water supplies, and municipal bath houses were available.

Constant war displaced populations and disrupted areas, however armies had to develop networks for food, supplies and medical care

The Black Death

In Western Europe, public and religious ceremonies and burials were promoted by religious and civil authorities

Hygienic practices limited the spread of plague in Jewish areas

Seaport cities in the fourteenth century began to apply the biblical injunction to separate lepers by keeping ships coming from places with the plague waiting in remote parts of the harbor, initially for 30 days (*treutina*), then for 40 days (*quarantina*) (Ragusa in 1465, and Venice in 1485), establishing the public health act of quarantine as a government measure, which

- on a pragmatic basis was found to reduce the chance of entry of the plague.

This concept was later expanded to include the creation of a pesthouse or *lazaretto* to hold individuals suspected of harboring infections—ultimately used for a variety of infectious diseases

Towns along major overland trading routes in Russia took measures to restrict movement in homes, streets, and entire towns during epidemics. In sixteenth-century Russia, Novgorod banned public funerals during plague epidemics, and in the seventeenth century, Czar Boris Godunov banned trade, prohibited religious and other ceremonies,

- Despite local efforts to prevent disease by quarantine and isolation of the sick, the disease devastated whole communities, and public health measures are often overwhelmed

After the Plague

Guilds organized to protect economic interests of traders and skilled craftsmen developed mutual benefit funds to provide financial assistance and other benefits for illness, death, widows and orphans, and medical care, as well as burial benefits for members and their families.

Commerce, industry, trade, merchant fleets, and voyages of discovery to seek new markets led to the development of a moneyed middle class and wealthy cities. In this period, mines, foundries, and industrial plants flourished, creating new goods and wealth. Partly as a result of the trade generated and the increased movement of goods and people, vast epidemics of syphilis, typhus, smallpox, measles, and the plague continued to spread across Europe. Malaria was still widespread throughout Europe. Rickets, scarlet fever, and scurvy, particularly among sailors, were rampant.

Pollution and crowding in industrial areas resulted in centuries-long epidemics of environmental disease, particularly among the urban working class.

Disease becomes increasingly associated with *miasmas* or bad air & while medical training includes anatomy and other sciences it is still symptom-focused. Medical and Pharmacies are often standardized. Military medical systems and court medical systems are established, but care for the general public is still very local

By 1601, the British Elizabethan Poor Laws defined the local parish government as being responsible for the health and social well-being of the poor, a system later brought to the New World by British colonists. Municipal control of sanitation was weak. Each citizen was in theory held responsible for cleaning his part of the street, but hygienic standards were low, with animal and human waste freely accumulating. Elsewhere in Europe there are local boards of health established to manage the same, and by 1630 they are being held accountable for the health of the community

The New World

As Europeans travel to the New World they bring with them these same diseases, especially smallpox and measles

- Native populations have not encountered these diseases and are devastated by them

Spread of disease also comes from the New World back to Europe.

- A virulent form of syphilis, allegedly brought back from America by the crews of Columbus, spread rapidly throughout Europe between 1495 and 1503, when it was first described by Girolamo Fracastoro (1478–1553).
- Control measures tried in various cities included examination and registration of prostitutes, closure of communal bath houses, isolation in special hospitals, reporting of disease, and expulsion of sick prostitutes or strangers. The disease gradually decreased in virulence, but it lingers as a diminishing public health problem to the present time.
- Other New World diseases are unknown to Europeans so they are unsure how to prevent or treat them

Prior to 1607 most European settlements are outposts rather than cities with limited population, trade and exploitation of resources does occur, but there is not much growth so population density remains low, and as such the sanitation and hygiene problems of European cities do not become as big an issue.

Europeans recognize that the waters and “Aires” in the new world are clean and high-quality, but still retain their beliefs about drinking water and miasmas

1607-1630

Early Permanent settlers planned to stay in America long term but have different reasons for doing so

- Communities develop differently
- Knowledge and Supplies brought over differ

Small communities, limited infrastructure

- PH concepts are more along the Survival of the tribe context
- Malnutrition, Starvation and Exposure are primary Public Health concerns



New England vs. Virginia

In Virginia, the antagonistic relationship with Native Peoples led to colonists often living in forts, causing the return of diseased of filth and some policy measures to relive them

- In 1611 the governor issues the first sanitary regulations and there are a series hospitals in 1612 and 1620

In NE, crowding is less of a problem and the first measures are some restrictions on medical practice

- In 1629 the General Court of Massachusetts limited the number of passengers according to the size of the vessel partly because often immigrants arrived in poor physical condition because of crowding on the overseas voyage
- By 1634 Boston, one of the most rapidly growing towns, prohibits the depositing of fish or garbage near the common landing



A Healthy Place

By 1630 immigration rates begin to grow- many communities have death rates higher than birth rates but immigration allows them to increase in population

Environmental Diseases of Europe are less of a concern in the New World:

- “Here is sweet aire faire rivers and plenty of springes and the water better than in Eng(land)” –John Winthrop, 1630
- New England described as very agreeable to “English Bodies” with those who could never be rid of their head ach, tooth ach, cough and the like were much healthier and those that are weake are now well –Master Wells, 1633
- Dutch Settlers too report in 1649 that the climate and air were better and the country was healthier



As the population grows Infectious Diseases Return

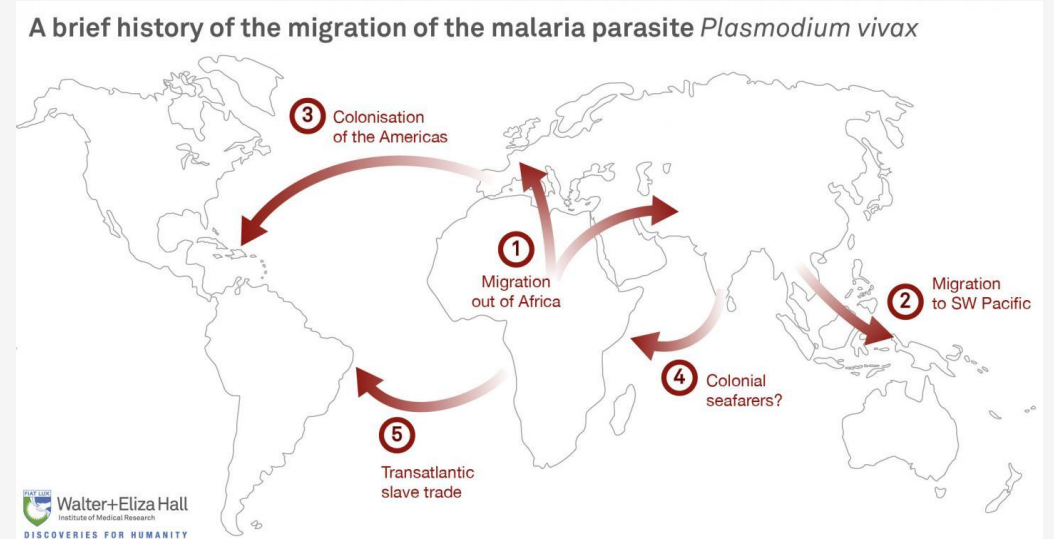
Mostly diseases of Europe that the colonists bring with them:

- Diarrhea & dysenteries are common and
- Measles, mumps, scarlet fever and diphtheria ubiquitous
- Malaria becomes a problem across the colonies

Community living creates sanitary problems, especially in summer

Colonial people accepted common infectious diseases as part of life, and so don't really think about PH interventions to stop them

Communities are however, more concerned about diseases that come in epidemics like Smallpox and later Yellow Fever- these are generally managed by days of fasting and prayer across the colonies, but not quarantine at this point



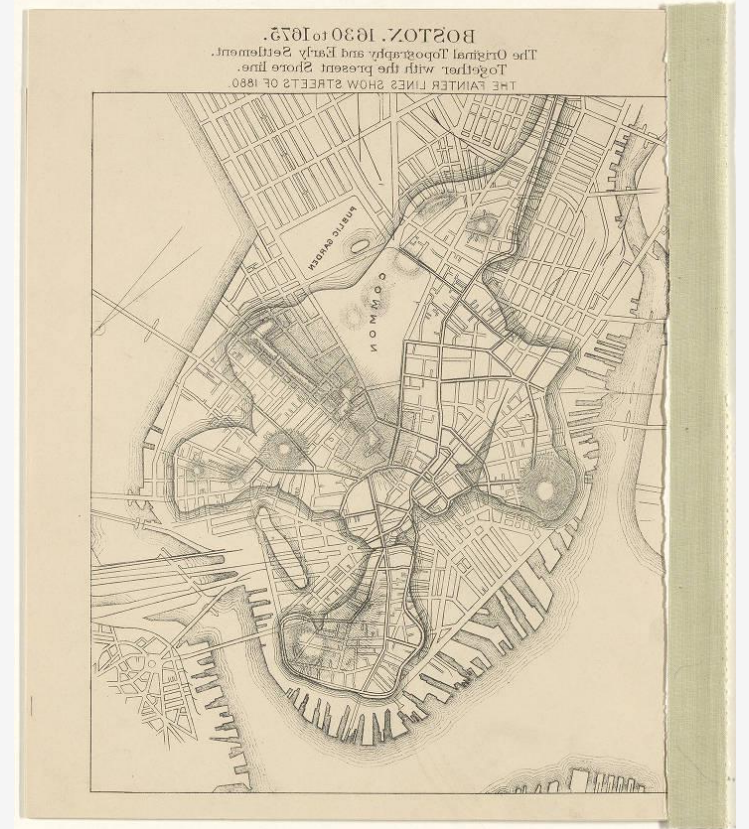
Boston has to deal with the problems of cities

1652- a series of health codes are enacted, especially about privies, and other follow

1666-7 Boston appoints a scavenger to remove stray and dead animals

- Soon most towns have such

In 1684 the Massachusetts General Court orders butchers and slaughterer to keep their premises clean und threat of a fine



New Amsterdam/New York

Founded in 1625 and grows more slowly than Boston and by 1644 Issues similar rules to Jamestown

1648 The city issues animal control order- resistance to related orders for sometime- somewhat abandoned in 1658

First colonial town to regulate food staples- not just for consumption but also for export

1649 regulations related to Bread and by 1656 all bakers had to be licensed. In 1661 inspectors with seizure authority are appointed

1653 a public weighhouse and storage house established and by 1656 a public slaughterer and three public butchers are appointed

By 1668 there are inspectors for meat as well and all barrels of meat and flour are inspected. And by the 1680s there are fines for a variety of unwholesome foods

Houses and care for the sick poor are not enacted until the 1680s



Medical and Health Knowledge

Most sick people turned to local healers, and used folk remedies. Others relied upon the minister-physicians, barber-surgeons, apothecaries, midwives, and ministers; a few used colonial physicians trained either in Britain, or an apprenticeship in the colonies.

In most places, there were families in which the folk practice of medicine and knowledge of curative drugs was passed down through the generations, although there were some early practitioners:

Thomas Thacher- an outstanding Puritan preacher and physician of his time. After coming to America at fifteen, Thacher received his early education under pastor Charles Chauncy. Thacher's education was liberal; he learned elements of medicine. Thacher committed much of his time to the practice of medicine and was a prominent physician in Boston. Shortly before Thomas Thatcher's death in 1677, he wrote a short article on smallpox and measles. It was the first medical paper written that was published in America.

Giles Firmin was a deacon in Boston, who came to America from England in 1632. While practicing medicine in Ipswich, Massachusetts, Firmin became the first anatomical lecturer in America and gave detailed lectures about dried bones stimulating an interest of the General Court in 1647, which recommended that his anatomical lectures be given at least once every four years. Nevertheless, it was not followed and anatomy went untaught.

John Winthrop Jr. was a physician who was in constant communication with England asking for advice on various medical topics and diseases. Winthrop realized the Colony needed trained doctors and received from a physician in England eight pages of notes on herbs and their uses in curing diseases in 1643. Through these notes, Winthrop used the knowledge to advise the people in the Colony. He was untrained in medicine and had little experience in making a diagnosis relying a great deal on the notes from England. Winthrop's recommendations were for various ointments, nauseous remedies, cupping, bandages and baths.

Smallpox

Before smallpox was eradicated, it was a serious infectious disease caused by the **variola virus**. It was contagious—meaning, it spread from one person to another. People who had smallpox had a fever and a distinctive, progressive skin rash.

Most people with smallpox recovered, but about 3 out of every 10 people with the disease died. Many smallpox survivors have permanent scars over large areas of their body, especially their faces. Some are left blind.

Thanks to the success of vaccination, smallpox was eradicated, and no cases of naturally occurring smallpox have happened since 1977. The last natural outbreak of smallpox in the United States occurred in 1949.



Origins of Smallpox

The geographical origin of the disease remains a matter of debate; hypotheses suggest the Indus Valley or Egypt and the Near East, regions that had high population densities 3,000 to 4,000 years ago

The earliest evidence for the disease comes from the Egyptian Pharaoh Ramses V, who died in 1157 B.C. His mummified remains show telltale pockmarks on his skin.

Some more recent theories the initial spread of the virus in humans could have occurred in the Horn of Africa (Kingdom of the Queen of Sheba). In this region, active trade expeditions overlapped with the distribution areas of several animal poxvirus hosts (including the naked-soled gerbil) and the introduction of the domesticated camel as a new potential host.



Spread of Smallpox

6th Century—Increased trade with China and Korea brings smallpox to Japan.

7th Century—Arab expansion spreads smallpox into northern Africa, Spain, and Portugal.

11th Century—Crusades further spread smallpox in Europe.

15th Century—Portugal occupies part of western Africa, bringing smallpox.

16th Century—European settlers and the African slave trade import smallpox into the Caribbean & then Central and South America

17th Century—European settlers bring smallpox to North America.

18th Century—Explorers from Great Britain bring smallpox to Australia.

THE SPREAD AND ERADICATION OF SMALLPOX

3rd CENTURY BCE
Smallpox is present in the Egyptian Empire.

4th CENTURY BCE
Increased trade with China and Korea introduces smallpox into Japan.

6th CENTURY
Smallpox goddess Shitala Mata, worshipped in northern India, was considered both the cause and cure of smallpox disease.

7th CENTURY
Smallpox spreads to Asia Minor, the area of present-day Turkey.

10th CENTURY
Population expansion and more frequent travel renders smallpox endemic in previously unaffected Central and North Europe, with severe epidemics occurring as far as Iceland.

11th CENTURY
Crusades further contribute to the spread of smallpox in Europe with the European Christians moving to and from the Middle East during the next two centuries.

13th CENTURY
Portuguese expeditions to African west coast and new trade routes with eastern parts of Africa introduce the disease into West Africa.

15th CENTURY
Variolation is introduced into England by Lady Mary Wortley Montagu, a wife of the British ambassador in Turkey.

16th CENTURY
European colonization and the African slave trade import smallpox into the Caribbean and Central and South America.

17th CENTURY
Variolation is a commonly used method for preventing smallpox in the Ottoman Empire (former Asia Minor, present-day Turkey) and North Africa.

18th CENTURY
Lady Mary Wortley Montagu, a survivor of smallpox herself, had both of her children variolated and was the foremost advocate of the technique in England.

20th CENTURY
Smallpox is widespread in Africa, Asia, and South America in the early 1900s, while Europe and North America have smallpox largely under control through the use of mass vaccination. After a global eradication campaign that lasted more than 20 years, the 53rd World Health Assembly officially declares the world free of smallpox in 1980.

Worldwide distribution of smallpox and the countries in which it was endemic in 1945.

Edward Jenner (1749-1823)

EDUCATIONAL RESOURCES

Signs and Symptoms

Incubation Period: The incubation period is the length of time the virus is in a person's body before they look or feel sick. During this period, a person usually has no symptoms and may feel fine. This stage can last anywhere from 7 to 19 days (although the average length is 10 to 14 days) and people are not contagious

Initial Symptoms: This stage lasts anywhere from 2 to 4 days an infected people have a high fever Head and body aches and sometimes vomiting. At this time, people are usually too sick to carry on their normal activities, but are only somewhat contagious

A **rash starts** as small red spots **on the tongue and in the mouth**. These spots change into sores that break open and spread large amounts of the virus into the mouth and throat. The person continues to have a fever. Once the sores in the mouth start breaking down, a rash appears on the skin, starting on the face and spreading to the arms and legs, and then to the hands and feet. Usually, it spreads to all parts of the body within 24 hours. As this rash appears, the fever begins to decline, and the person may start to feel better. By the fourth day, the skin sores fill with a thick, opaque fluid and often have a dent in the center. Once the skin sores fill with fluid, the fever may rise again and remain high until scabs form over the bumps. People are very contagious at this point



Disease Progression

As the disease progresses, the sores become **pustules** (sharply raised, usually round and firm to the touch, like peas under the skin). After about 5 days more, the pustules begin to form a crust and then **scab**.

By the end of the second week after the rash appears, most of the sores have scabbed over if the patient has survived

Three weeks after the rash appears, most scabs will have fallen off, leaving marks on the skin. The scab material is contagious but once the scabs fall off the patient is no longer contagious and recovers with lifelong immunity (and scars)



Smallpox and Public Health

The modern period in the history of smallpox began in the 17th century, with a more accurate appraisal of its incidence. Epidemics occurred regularly. Meticulous records in England and the Continent attributed one of every ten deaths to smallpox, and it replaced bubonic plague as Europe's most feared disease at that time.

The case fatality rate varied between 20 and 60%, left most survivors with disfiguring scars and caused subsequent blindness in 30% because of secondary corneal infection. Among children younger than age 5, the case fatality rate was 80 to 98%.

During this time therapy consisted of the sweating regimen, along with standard techniques, including blood-letting, purging, ointments, salves, herbs and witchcraft based on the ancient accounts of the disease.

North America

The first epidemics in North America occurred in 1617 to 1619 in Massachusetts as a result of colonization by European settlers and kills 90% of the Massachusetts Bay Indians

In 1633 in Plymouth, Massachusetts, the Native Americans were struck by the virus. As it had done elsewhere, the virus wiped out entire population groups of Native Americans. It reached Mohawks in 1634, the Lake Ontario area in 1636, and the lands of the Iroquois by 1679.

A particularly virulent sequence of smallpox outbreaks took place in Boston, Massachusetts. From 1636 to 1698 where six epidemics ravaged the city, with an especially bad outbreak in 1692

In 1701-2 The disease moved up the St. Lawrence river valley

A British sailor disembarking HMS *Seahorse* brought smallpox to Boston again in 1721. Ultimately 5759 people were infected and 844 died, and nearly the entire population of Boston fled spreading the virus across the 13 colonies

Thomas Sydenham

Sydenham, called by his contemporaries "The English Hippocrates," was born in 1624 in Dorsetshire and studied at Oxford, Montpellier and Cambridge. He regarded disease as an entity independent of the individual invaded and maintained that the body tried to rid itself of all morbid material through the blood. Although relying on diet and purgatives, he was among the first to recognize the curative powers of cinchona bark, which had just been brought to Europe from Peru, and of opium, in the form of Sydenham's drops, which he regarded as an excellent remedy for the heart. Generally he relied on the healing powers of nature. Most importantly he stressed careful bedside observation of clinical phenomena as the basis of medical knowledge, and he conceived of the physician as a clinical observer untrammelled by theory. Finally he expounded the revolutionary idea that the chief aim of the physician should be to make himself useful to the patient. Rather than sweating the smallpox victim, Sydenham advocated a "cooling regimen," which he believed helped nature to do "her own work at her own rate; both excreting and expelling the morbid matter in due course and time."

Sydenham also believed that the pattern of epidemics was determined by what he called "epidemic constitution," and this in turn depended on certain mysterious atmospheric conditions. Aided by contemporary meteorologic studies by his friends Robert Hooke and John Locke, he attempted to demonstrate a correlation between annual weather patterns and the occurrence of epidemics. Such reasoning reflected the prevailing scientific view that disease could be traced to an omnipresent "seed" within each individual, which was then activated by adverse external circumstances or injudicious dietary measures.



Variolation

Sydenham's writings on smallpox had been prompted by extensive and increasingly severe epidemics in England and Europe during the 1660s and 1670s. Scarcely 20% of the population escaped it entirely. Like plague it would assume epidemic proportions every 5 to 10 years. At this time are found the first accounts of what has been seen as the source of the practice of variolation.

The Chinese inhaled a powder made from the crusts shed by a recovering patient. In Africa fresh pustular material was rubbed into a cut or scratch in the skin of the person being immunized.

In Europe there was the traditional method of "buying the smallpox," in which children were sent out to buy crusts from mild cases of smallpox for a few pennies. The child would then be exposed to the infected material and, if lucky, would emerge unscarred and immune to the disease. Educated people came to call this practice of folk medicine "inoculation," after the Latin *inoculare*, to graft. There were numerous techniques of inoculation. To explain the general success of such practices, the theory of "Transplantation of Disease" was developed, in which it was thought that ailments of one individual could be transferred to a brute animal, to another person or to some inanimate thing.

Inoculation was known and practiced frequently in the Ottoman Empire, where it had been introduced by Circassian traders around 1670. Women from the Caucasus, who were in great demand in the Turkish Sultan's harem in Istanbul because of their legendary beauty, were inoculated in childhood on parts of the body where scars would not be seen. Travelers from Istanbul brought variolation to Europe at the beginning of the 18th century. However, the conservative physicians of the day refused to adopt such oriental techniques.

Lady Montagu

Mary Pierrepont was a well-born English beauty, who against her father's wishes eloped in 1712 with Edward Wortley Montagu, a grandson of the first Earl of Sandwich. The couple lived quietly in the country until Edward became a member of Parliament in 1715, and his wife suddenly blossomed into one of the most popular hostesses in London. That same year Lady Mary contracted smallpox, which led to what she considered to be a lasting disfigurement, the loss of her very fine eyelashes. In 1717 Edward Montagu became Ambassador to Constantinople

On March 18, 1718, Lady Mary, without her husband's knowledge, had her 6-year-old son Edward Jr. inoculated, against the bitter opposition of the Embassy Chaplain, who called the practice an unchristian operation that could succeed only in the infidel. So as to take no chances, the procedure was performed jointly by Dr. Charles Maitland, the Scottish Embassy surgeon, and the old Greek woman who was a local fixture on the smallpox scene. There were no untoward complications. When the Montagus returned to England in 1719, Lady Mary reported her experience to her friend Caroline of Anspach, the Princess of Wales, later to be the Queen of King George II.

There was initial resistance to the practice, but after a careful review of the data, the Royal Society concluded in 1727 that variolation, as it came to be called, did reduce the risk of acquiring smallpox by 90%. Soon thereafter all of the members of Europe's royal families requested inoculation, and in 1745 the London Smallpox and Inoculation Hospital was founded.

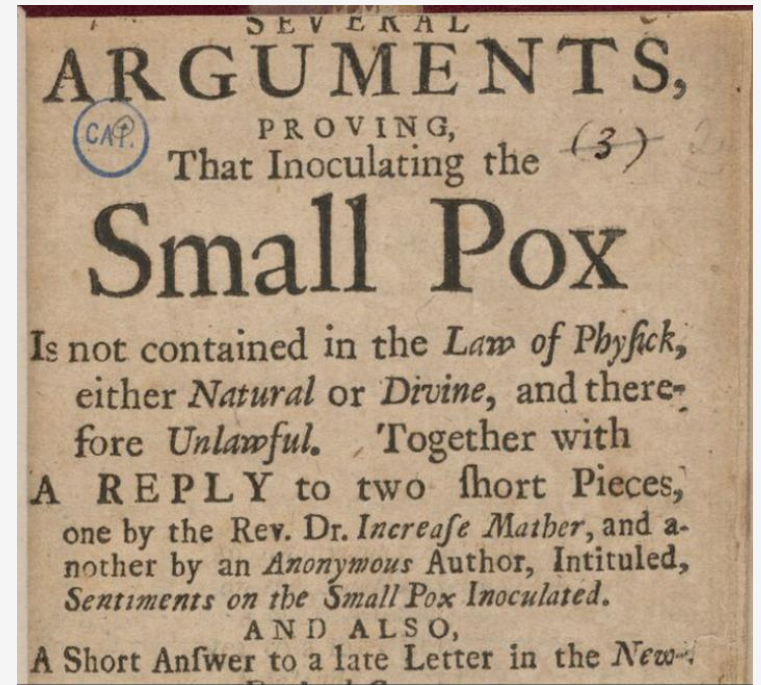
Cotton Mather and Variolation

In response to the Boston outbreaks, the Reverend Cotton Mather began his advocacy of inoculation. The Mathers, Cotton and his father Increase, were characteristic representatives of the early puritan clergymen, and their narrow-minded intolerance was a moving force behind the Salem Witch Trials of 1662. But they were also scholars, and Cotton's interest in science was rewarded when he became the first native-born American to be elected a Fellow of the Royal Society.

Mather had become acquainted with smallpox inoculation 15 years previously. So, when smallpox was quickly spreading throughout Boston, Mather felt the call to action and begins to demonstrate to Colonial physicians including American-born physician Dr. Zabdiel Boylston who immediately adopted the practice and began to perform it widely.

However few others attended, and many criticized the practice. The procedure was initially met with outrage and anger by the community, mainly because it was considered dangerous and could kill. The clergy was strong in their opposition; they thought smallpox was God's way to punish sinful people, and trying to prevent the malady was to interfere in God's plans. The local populace became polarized, and angry words and threats were flying in the newspapers

Indeed, so strong was the opposition to inoculation that Boylston had to go into hiding. Despite that, he was arrested. On one occasion, his wife and children were threatened by a hand-grenade thrown into their home. Mather also got into trouble. His home was firebombed with a message attached to the missile reading: "Cotton Mather, You Dog, Dam you, I'll inoculate you with this, with a Pox to you."



American Opinion Changes

Mather was more than capable of answering this and other attacks, and the few that attended his demonstration continued to inoculate during 1721 and 1722 until smallpox was on the wane. The English were watching his work with great interest, so that in 1724, when Boylston visited England, he received a most cordial welcome and was prevailed upon to record his inoculation experience, because he had already successfully inoculated more persons than any English physician. His data showed that the overall mortality during the 1721 smallpox epidemic in Boston was 1 in 6, while among his inoculated population, it was 1 in 47.

Boylston sailed to London in 1725 to give a report before the Royal Society about the inoculations he had performed in Boston 1721 and 1722. A couple of years later, he published the results of only six deaths among 247 inoculated individuals (a mortality of 2.4%, almost ten times lower than among unprotected people)

In 1759, Benjamin Franklin responded to a request from Dr. William Heberden of London for an update by reporting the results from a new smallpox outbreak in Boston in the early 1750s. He reported that among 5059 un-inoculated white people, 452 had died (a death rate of 8.9%), whereas among 1974 inoculated individuals, only 23 (1.2%) had died. The corresponding mortality rates among blacks were 12.8% and 5.0%, respectively.

When the 1764 epidemic hit, inoculation had become more accepted. Governor Bernard ordered the formation of a group of doctors to arrange for inoculation of Bostonians. *Boston Gazette* advertised on March 5 that inoculations would be available—free of charge for those who could not pay—from that day until the mid of May

-Variolation becomes common in the colonies up through the American Revolution