

# Renaissance to the New World

18 April 2024

# 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

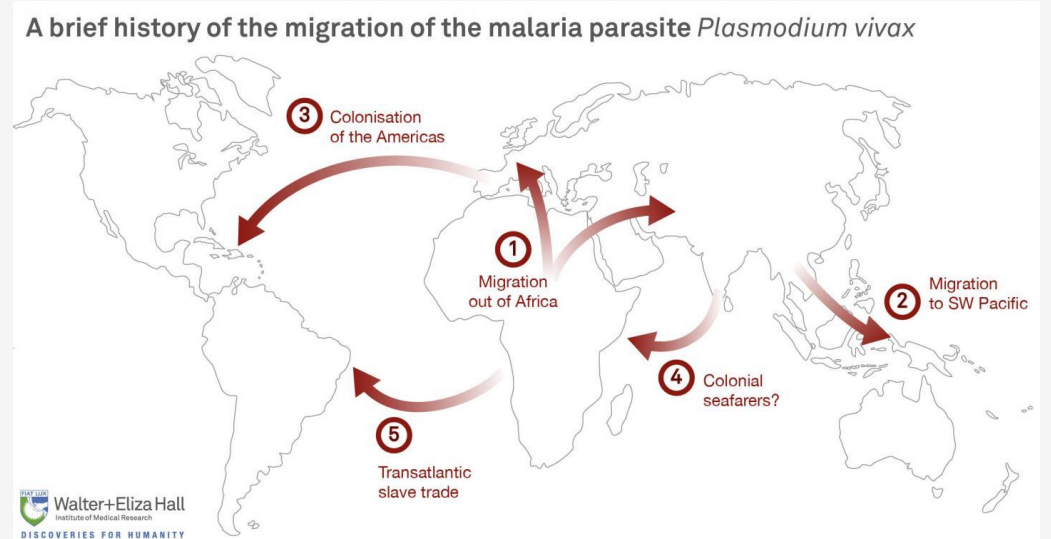
Mostly diseases of Europe that the colonists bring with them:

- 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



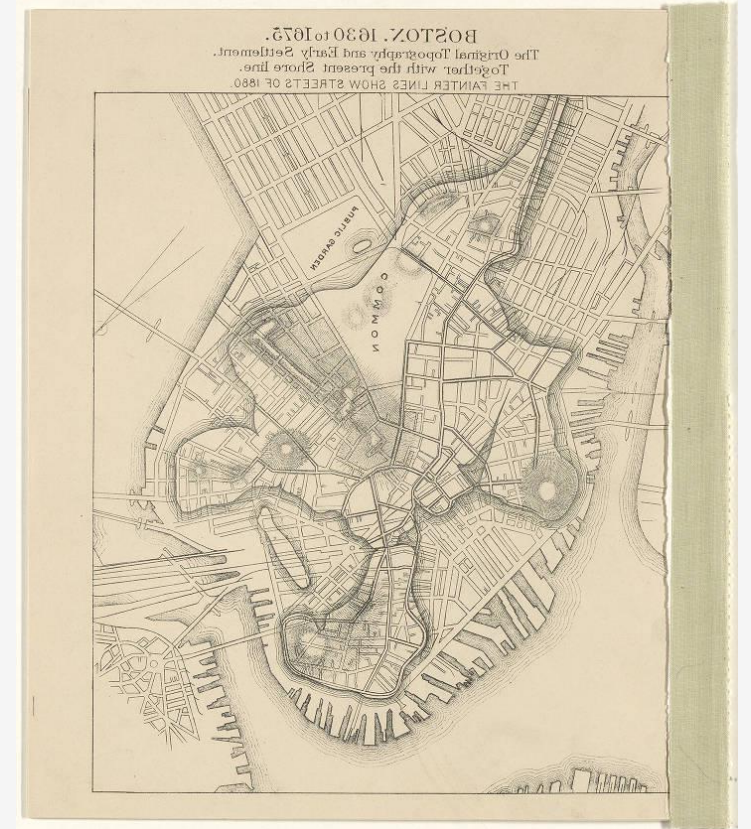
# Boston has to deal with the problems of cities

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

6<sup>th</sup> Century—Increased trade with China and Korea brings smallpox to Japan.

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

11<sup>th</sup> Century—Crusades further spread smallpox in Europe.

15<sup>th</sup> Century—Portugal occupiees part of western Africa, bringing smallpox.

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

17<sup>th</sup> Century—European settlers bring smallpox to North America.

18<sup>th</sup> Century—Explorers from Great Britain bring smallpox to Australia.

## THE SPREAD AND ERADICATION OF SMALLPOX

**3<sup>rd</sup> CENTURY BCE**  
Smallpox is present in the Egyptian Empire.

**4<sup>th</sup> CENTURY BCE**  
Increased trade with China and Korea introduces smallpox into Japan.

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

**7<sup>th</sup> CENTURY**  
Smallpox spreads to Asia Minor, the area of present-day Turkey.

**10<sup>th</sup> 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.

**11<sup>th</sup> 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.

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

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

**16<sup>th</sup> CENTURY**  
European colonization imports smallpox into North America.

**17<sup>th</sup> CENTURY**  
Variolation is introduced into England by Lady Mary Wortley Montagu, a wife of the British ambassador in Turkey.

**18<sup>th</sup> CENTURY**  
Smallpox is widespread in Africa, Asia, and South America in the early 1800s, while Europe and North America have smallpox largely under control through the use of mass vaccination.

**20<sup>th</sup> CENTURY**  
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.

West African god of smallpox Shitala was thought to bring the disease upon humans due to his "divine displeasure."

A container used to store the powdery variolation material in Ethiopia.

Traces of smallpox pustules were found on the head of a 3,000-year-old mummy of the Pharaoh Ramses V.

A written description of a disease that clearly resembles smallpox appears in China.

Smallpox is widespread in India. Arab expansion spreads smallpox into northern Africa, Spain, and Portugal.

The Ottoman Empire in 1801 extended from Turkey (Anatolia) to Greece, Hungary, Bulgaria, Romania, northern Africa and parts of Middle East. Smallpox is thought to arrive here from Asia through major trade routes, like the Silk Road.

Japanese woman defeats the "smallpox demon" by wearing net. In Japan, families who fell sick with smallpox set up shrines in their homes to appease the demon.

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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.

Edward Jenner (1749-1823)

Introduction of smallpox into Mexico by the Spanish around 1520 was one of the factors that led to the demise of Aztec Empire. Franciscan missionary Bernardino de Sahagun, who lived there from 1545 until his death in 1590, illustrated this in his accounts of the Aztec history entitled "General History of the Things of New Spain."

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

World Health Organization (WHO) logo

# 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.

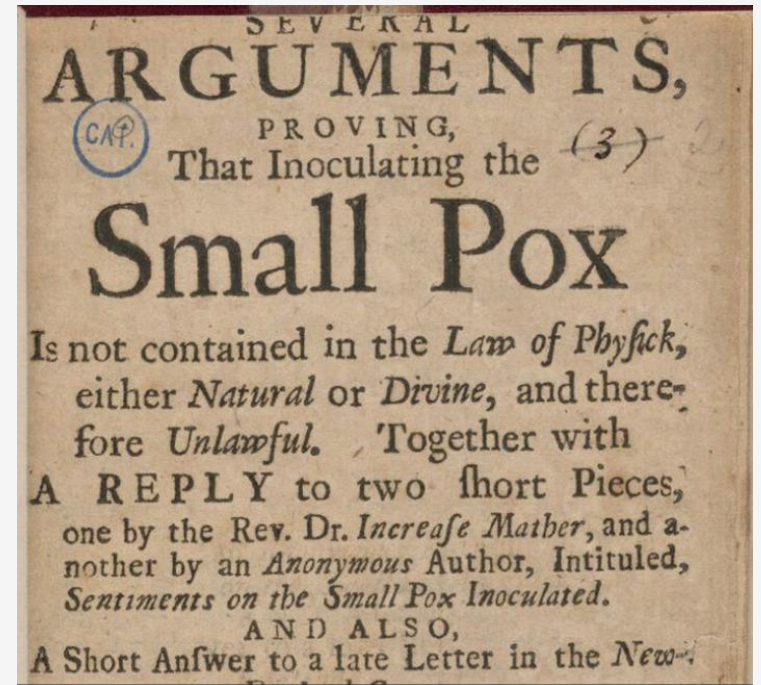
# Cotton Mather and Variolation

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*

# Quarantine Measures

In 1699, the Massachusetts General Court passes a law "Preventing the spread of infectious sickness"

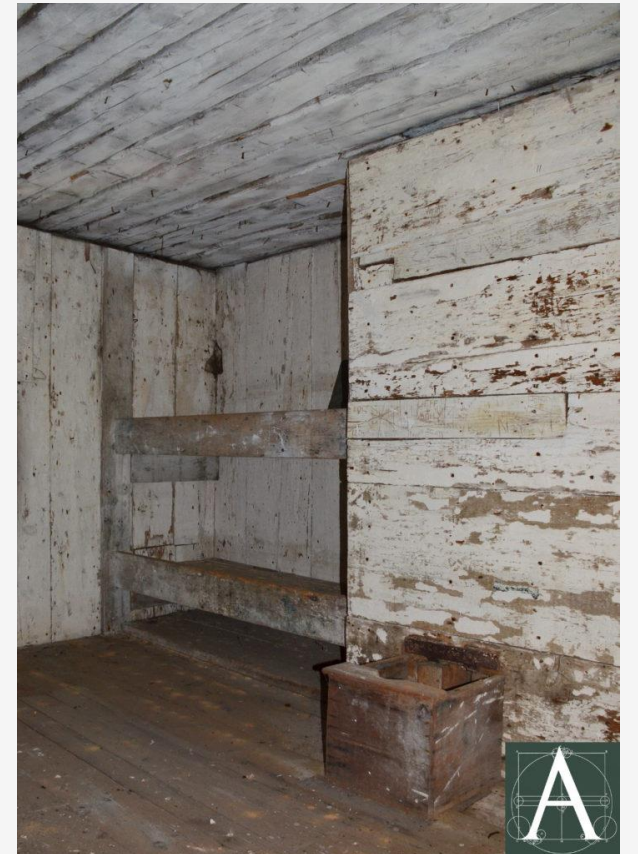
- Ships arriving with sick passengers aboard or from "infected ports" were not allowed to land people or cargo without permission from the local authorities
- The British government disallows the law on the grounds that the 100 pound fine was too expensive

In 1701 however, a modified law was accepted that also included provisions for isolating the sick

- If necessary, the local authorities could preempt a house and place the sick there

These laws were generally strengthened and by 1717 a dedicated pesthouse was built which was replaced by an even more robust one in 1737

*Massachusetts has the most robust quarantine program in the New World*



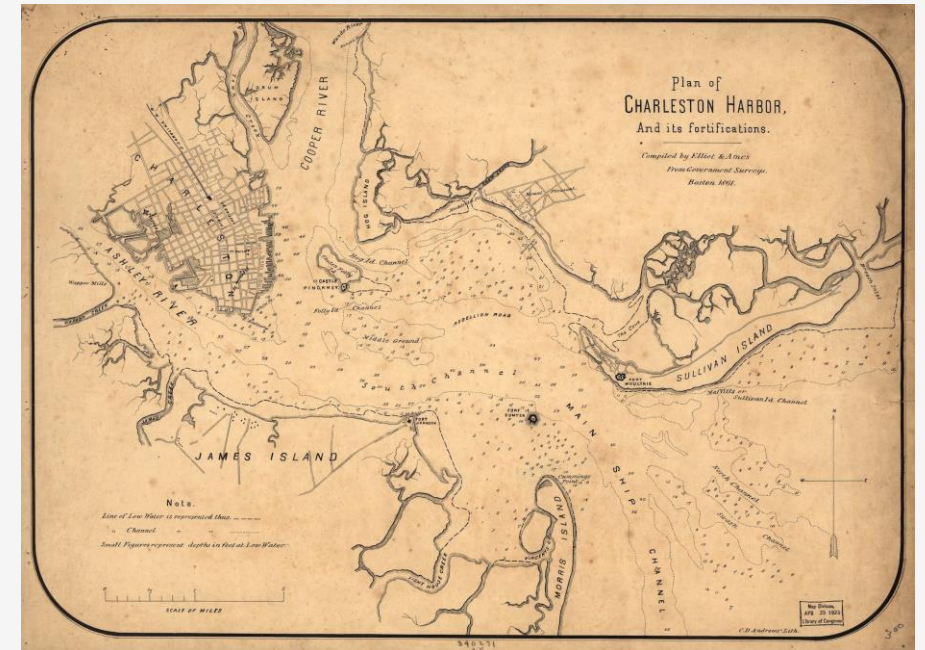
# Quarantine Expands

Charleston, by 1698 requires ship captains to report any sick sailors on their ships and make provisions for them

In 1712 the city appoints a quarantine officer and establishes a temporary pesthouse and by 1721 harbor pilots have to inquire about sick sailors

These measures, like many local measures were temporary, but by 1747 the Carolina Assembly revises the law and appoints 6 physicians to inspect all incoming vessels to Charleston, an effort that was expanded to other SC ports by 1752

*-Quarantine of merchant vessels is the primary large-scale public health effort*

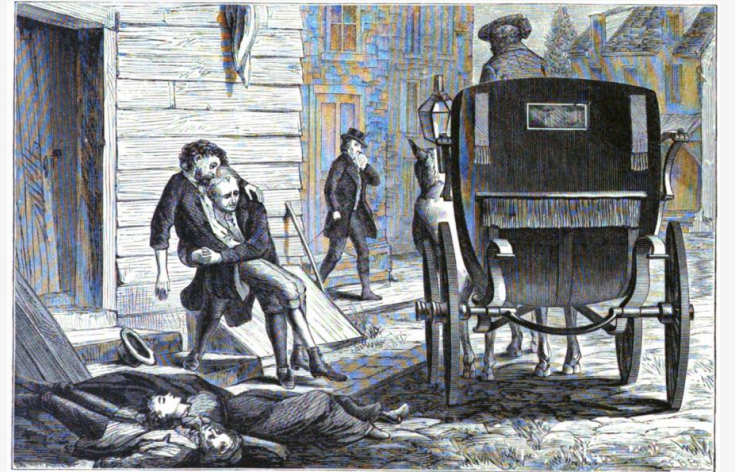


# Yellow Fever

Yellow Fever arrives in the American colonies in the late 17<sup>th</sup> century with outbreaks reported on the eastern coast, including in New York City (1668), Boston (1691), and Charleston (1699).

By the early 18<sup>th</sup> century, Yellow Fever is endemic in most colonial cities, especially those in the south along the gulf coast.

Most outbreaks occurred in the summer months, but some summers would pass without incident. Nonetheless, it becomes one of the dominant public health threats up through the end of the 19<sup>th</sup> century, rivalling smallpox in the minds of Americans



# Yellow Fever

The first stages of yellow fever are similar to the common flu: headache, fever and muscle aches. This lasts for two to three days and then the victim feels better, even to the point of thinking that their flu has passed.

Some people only experience this mild disease but others will progress on to a second, more difficult phase

The second "toxic" phase begins one or two days later, as the virus attacks the internal organs such as the kidneys and liver. Victims become jaundiced and yellowed, hence the name yellow fever. Excessive internal bleeding can cause the victim to vomit blood, which was called the "black vomit."

Death occurs from internal hemorrhaging, usually five to ten days into the second phase, even today killing 1 in 5 of it's victims and in colonial times, more.

Those who recover generally have lifelong immunity



**Preventions & Treatment with Natural Remedies**  
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## YELLOW FEVER

**SIGNS AND SYMPTOMS**

- Headaches
- Muscle aches
- Joint aches
- Chills
- A fever
- Flushing
- A loss of appetite
- Shivers
- Backaches
- Decreased urination
- Abdominal pain
- Vomiting (sometimes with blood)
- Heart rhythm problems
- Seizures
- Delirium
- Bleeding from the nose, mouth, and eyes

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# Yellow Fever

Yellow fever is a virus that is transmitted to humans by particular species of mosquitoes — in North American outbreaks, the *Aegis Egyptae*.

Female mosquitoes with infected parents can be born with the disease, or they can feed on infected humans, acquiring the disease along with the human blood.

The virus replicates in the mosquito's digestive tract, and is then carried through the bloodstream to the salivary glands. This cycle takes between seven and seventeen days, during which the mosquito can not transmit the virus.

After the virus has spread to the salivary glands of the insect, the next time the mosquito feeds, she will transmit the virus into the human skin. From the skin, the virus multiplies and is carried into the lymph nodes, which carries it into the bloodstream. Then symptoms appear.





# Sanitation Emerges

In New York, with population near 10,000 in the 1730s, the connection between dirt and disease occupied many educated and well-meaning citizens.

New Yorker Cadwallader Colen recognized that yellow fever outbreaks were in proximity to swampy areas and made recommendations on draining these areas. It was not yet clear, however, that yellow fever was carried by mosquitoes that bred in swamps, but these observations are consistent with the miasmatic theory of disease and/or the epidemic constitution concept ultimately advanced by founding father Dr. Benjamin Rush

New York street cleaning laws were passed in 1731 and, in 1744, and a formal Sanitation Act moved animal trades and slaughtering outside the city limits.

A study group looked at the drainage issues in New York in 1751 but a comprehensive program was deemed too expensive although drainage of some swampy areas does take place. It is also recommended that the harbor slips be dredged so that at least 12 inches of water remained at low tide.

Through the century, in New York, as in the other American colonies, smallpox and yellow fever were constant threats. Enhancing quarantine laws in 1730, New Yorkers quarantined smallpox sufferers and refused docking to ships carrying small pox, and ramp up quarantine measures when they hear of outbreaks.

By 1755 the provincial authorities in New York authorize the appointment of a health officer and the creation of a pesthouse which opened in 1760.

Despite these measures, yellow fever still rages

# Changes

By 1700 many cities have a physician for the poor and by 1750 nearly all cities had a scavenger and a street cleaning program

As the number of immigrants coming into the colonies increases and diversifies quarantine laws become more widespread.

The first true hospitals emerge:

- Charity Hospital in New Orleans (1736)
- Chareleston (1738)
- Philadelphia (1752)

-Two schools of thought and areas of activity: Isolation and Sanitation

