Chapter 1

Historical overview of global infectious diseases and geopolitics

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Following the migration of Homo sapiens out of Africa, our species interbred with other archaic humans while spreading through present-day Europe, Africa, Asia, and Australia, ultimately arriving in the New Worlds of current-day North and South America. Over subsequent millennia, national boundaries have largely been shaped by discrete populations of our human species, through the retention or acquisition of strategically important land areas necessary to satisfy their needs for resources such as food, settled agriculture and trade. Wars and conquest, for which we have only relatively recent information covering the past few millennia, have played important roles in these events. However, a number of infectious diseases, including cholera, leprosy, typhoid, typhus, plague, tuberculosis, measles, smallpox, yellow fever, and malaria, have also played significant roles in important historical events that we know of. This chapter highlights ways in which infectious diseases have influenced the course of recent human history and often changed political maps of the world.

Introduction

Superimposed upon physical maps of the world are political maps that show not only natural boundaries, but also boundaries created by humans through their acquisition of territories by conquest and colonization or subjugation by force. Geopolitics, a term that has had many meanings, some politically extreme, is concerned with “…power relationships in international politics including, inter alia, the acquisition of natural boundaries, the control of strategically important land areas and access to sea routes” – Kjellen’s original definition that will be adopted here [1,2].

The present-day political maps of the world have been determined largely by earlier human migrations, and ultimately both military successes and failures. Throughout history, civilian casualties and deaths have been regarded as unfortunate consequences of conflicts. The role played by disease among both armies and civilians is seldom acknowledged despite the fact that in virtually all wars, morbidity and loss of life from disease have massively exceeded losses caused by weapons [3,4]. It can, therefore, be argued that disease within civilian populations, during and as an aftermath of conflict, has been as important in shaping the political maps of the world as military successes or failures [5].

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Most anthropologists agree that our species, *Homo sapiens*, emerged in Africa about 150–200,000 years ago and from c. 70,000 BC dispersed in waves throughout the world until by the end of the last ice age, c. 10,000 BC, we had occupied most of the inhabitable planet except New Zealand and some other isolated islands [6]. The world’s population of modern humans was then about 1 million, but increasing and discrete populations began to covet territory that others already occupied, thus leading to conflict and occupancy – the beginnings of geopolitics. Acquisition of territory became more important as the population of the world grew to about 10 million by 3000 BC and nearly 500 million by AD 1500 when the political world as we know it today began to take shape [7]. Nearly all that we know about the epidemiology and effects of infectious diseases dates from about 1500.

The most important diseases in the past, as now, were those caused by microbial pathogens (broadly speaking, viruses, bacteria and protozoa) that multiply within their hosts, causing an immediate threat unless brought under control by an immune response. Individuals differ in their degree of susceptibility or resistance to infection and, over time, as more susceptible individuals die out, those who are more resistant pass on their genes. Thus whole populations develop “herd immunity” which protects them against diseases prevalent in their particular environment and communities [8]. When such individuals move into areas where there are infections to which they have not developed herd immunity, they rapidly succumb and, conversely, spread their own infections among susceptible local inhabitants. This is an oversimplification that takes no account of such factors as the role of nutrition, which markedly affects an individual’s capacity to resist infection. It has been argued that improvements in nutrition have, over the centuries, enabled populations to withstand diseases that would have killed their ancestors [9]. This is a study in itself and will not be considered further in this chapter.

Of approximately 150 common infectious diseases, 28 that are caused by viruses, 35 by bacteria and six by protozoa are the most serious [10,11]. Of these, cholera, leprosy, typhoid, typhus, plague, tuberculosis, measles, smallpox, yellow fever, and malaria in particular have, in turn, markedly affected the course of history [12]. Region by region, the following sections will discuss ways in which some of these diseases exerted profound changes upon the history of the world. The topics covered are, of necessity, selective and for more information, particularly regarding the background, the reader is referred to the following references: [2, 5, 9, 10, 13–24], for historical continuity [25–27], and for more information on disease and geopolitics [28].

**The Near East and North Africa**

Human civilizations emerged somewhere between 12,000 and 10,000 years ago in this region and by 2000 BC there were great cities and populations that stretched over Mesopotamia, Egypt, North Africa and the Mediterranean. For nearly 30 centuries, great empires including Babylonian, Phoenician, Persian, Greek, and Roman came and went until the rise of Islam in the seventh century AD. We know both from military and civilian records and archaeological evidence that several infectious diseases, including tuberculosis, leprosy (brought from India by the troops of Alexander III), typhus, typhoid, and malaria, existed in the region, but there appear to have been no epidemics that could have significantly altered the course of history. There is, however, one intriguing possibility. Alexander III (the Great), having amassed a great empire and having conquered the Greek, Persian, Syrian, Phoenician, and Egyptian peoples, was on the brink of bringing much of Asia and parts of Europe under his control when he died suddenly in 323 BC. He had successfully led his Macedonian troops in conquests but died following an 11-day illness contracted after sailing down the Euphrates River, while inspecting marshlands near the Arabian border. Although most commentators believe that he was poisoned, some feel that he died of typhoid or malaria [10, 29]. Because he experienced continuous fevers during the illness, it is more compatible with typhoid. After Alexander’s death, his empire was divided among his generals and began its terminal decline. If this decline resulted from Alexander’s death caused by an infection, this could be the earliest documented example of an infectious disease changing the course of history. There is a need for some caution here because many historians believe that his death merely accelerated an historical process that would have inevitably occurred within the next decade or two.
The rise of Islam in the seventh century might also be traced back to the effects of an infectious disease. By 632 AD most of the Arab world had converted to Islam and the next target for conversion was the Byzantine empire, the successor of the Roman West (see below), and its capital, Damascus, which fell after a siege in 634. The origins of this defeat can be traced back to 542 when the “Justinian Plague” (see below) frustrated plans to reunite the Roman empire after which neither the Roman nor Byzantine armies ever recovered. By 634 each was so weakened that Damascus surrendered with hardly a fight. What followed was an Islamic golden age during which Islam spread throughout the Mediterranean area and into Spain and southern France. It is tempting to speculate that if the fall of Damascus can be traced back to the Justinian Plague of 542, and had Damascus not fallen, the advance of Islam might have been halted.

Europe

By 7000 BC, farming was established in Europe and for the next 6000 years people lived in small tribes on farms or within small villages. Several infectious diseases must have been prevalent but, because of the scattered nature of the population, it is unlikely that there were any significant epidemics. This situation changed with the development of the first city states which brought people together in large numbers and witnessed the growth of military expeditionary forces. The first European city state, Athens, emerged as a major power in about 750 BC and flourished until it was defeated by its rival, Sparta, in the Peloponnesian wars (431–405 BC), after which it fell into decline [30].

The outcome of the wars was determined less by superior military achievements than by the arrival from Africa, via Egypt, Libya, and Persia, of the “Plague of Athens” that killed an estimated one-quarter to one-third of the population of Athens. Pericles, then ruler of Athens, attempted to hold back his troops and sit out a siege by the Spartans until they requested a truce. Having fortified and protected Athens, along with its port of Piraeus, inside wooden walls, the Athenians experienced an unexpected influx of refugees from the countryside as the Spartans advanced. The city rapidly became overcrowded, setting the stage for the oldest epidemic ever recorded. It was documented by Thucydides and included the loss of both Pericles and about a quarter of the Athenian frontline troops and cavalry [10]. The cause was possibly louse-borne typhus, for which besieged Athens’ crowded and humid conditions were ideal. Measles and smallpox have also been suggested but the actual cause will probably never be known [31]. We do know, however, that the Spartans were spared.

The next great power to emerge in Europe was the Roman empire. By the third century AD, its dominance had spread until it included nearly all of Western Europe, North Africa and the Near East [32]. Under a series of ambitious military emperors, however, the empire grew so large that it became almost un governable and by the beginning of the fourth century it had split into the West, centered on Rome, and the East, centered on Constantinople. By the end of the fifth century, the empire had begun to disintegrate. Most of the West had succumbed to the invading Visigoths, while the East became the precursor of the Byzantine empire. In 540, one final abortive attempt to restore the old Roman empire was begun by the Emperor Justinian. By then he had regained most of the former Mediterranean possessions and hoped to retrieve the more important Eastern section. He was, however, stopped in his tracks by the arrival of the “Plague of Justinian” (541–2). Because we have the writings of Procopius of Caesarea and his detailed descriptions of its signs and symptoms, most experts agree that this was bubonic plague that had spread from Alexandria to Constantinople, where it killed an estimated 5–10000 people every day. This may have been the first epidemic of bubonic plague in Europe that continued for 200 more years. Because of the “plague” Justinian could not raise the armies required for his campaign and was forced to abandon his ambitious plans. This eventually led to the terminal decline of the Roman empire. The estimated overall death toll in the two empires is estimated to have been 100 million [10].

Bubonic plague spread through Western Europe, beginning in 547, and continued to recur sporadically for the next 200 years until it virtually disappeared there for 600 years. However, plague returned
with a vengeance in 1347 as the “Black Death.” The origins of this epidemic are obscure, but it appears to have emerged around 1300 along the Caspian Sea and spread to both the Crimea and Constantinople by 1346–7. On the Black Sea, while the Tartar army was laying siege to Kaffa in the Crimea, it was caught up in the plague pandemic. The invaders catapulted the bodies of plague victims into the city – perhaps one of the first examples of germ warfare [33,34]. Beginning inconspicuously with the arrival of infected Genoese merchants from the Black Sea at the port of Messina, Sicily, the infection spread with amazing rapidity throughout Europe. In less than 10 years, it had reduced Europe’s population from about 75 million people to less than 50 million. The plague was particularly hard on the populations of great cities such as Venice, Florence, Genoa, London, Paris, and Barcelona, some of which lost half their population. Plague also affected even the most remote rural areas, taking with it princes, clergy, and peasants, leaving Europe in a state of chaos. Agriculture failed and millions who had survived the plague died of starvation. As a result of plague, the former feudal system fell into abeyance; a shortage of labour occurred and peasants realized that labourers were worth their wages – with implications that lasted for centuries. Other long-lasting effects included the irrevocable loss of whole villages, migration to larger conurbations and a diminution of the authority of Church and state which could not control the disease [34].

The cause of plague was unclear and the Church had very little to offer in terms of protection or therapy, so people turned on the Jews of central Europe, blaming them for plague. Persecution drove whole Jewish populations further east into Poland and Russia where their cultures flourished until World War II. The plague may have also delayed the further European discovery of North America by contributing to the extinction of the Norse on Greenland where they had farmed for 500 years. The fourteenth century had some of the coldest temperatures known in Greenland over the past 700 years. Short summers and the gradual loss of land productivity took their toll on these remote Norse Greenlanders who were then living at the edge of their sustainable existence. When Europeans arrived once again, there were no human colonies remaining at the former Norse eastern and western Greenland settlements following the introduction of plague [34]. Iceland was devastated twice in the fifteenth century when ships from England carried plague to this cold Arctic habitat that did not prevent it from spreading across the entire island. Plague continued to rumble on in waves across Europe about every 15–20 years from the mid-1550s until the 1670s, causing the deaths of over half the inhabitants of many cities, and it persisted at insignificant levels until about 1800 [35]. Like the Black Death, plague in Europe brought with it starvation and severely curtailed the economies of affected countries. The final outbreak of plague in Western Europe occurred during 1720 in southern France in the port city of Marseilles.

Influenza viruses that are adapted to humans circulate continuously among them but they can cause outbreaks that reach pandemic proportions. The last great epidemic to strike Europe was the 1918 influenza pandemic, also known as Spanish flu [36]. We do not know where that lethal strain of H1N1 originated in 1918 but it is clear that it had undergone at least 10 mutations that allowed it to both infect and proliferate in human cells. The first epidemic records are from the United States and Austria in 1917, the rest of Europe in 1918 and worldwide in two waves, the second more virulent than the first. Survivors of the first wave had some protection against the more dangerous form, but by the time the pandemic ended, in the summer of 1920, influenza had infected between one-quarter and one-fifth of the world’s population and killed 50–100 million people. This epidemic might also have affected the outcome of the final stages of the First World War (1914–18) as it seems to have adversely affected German and Austrian forces more than the Allies. The impact of this epidemic on the economies of European countries cannot be overestimated. It took decades before its effects wore off and it may even have influenced the advent of a worldwide economic depression during the 1930s.

The Americas

As the last Ice Age came to an end, the land bridges across the Bering Strait were lost to rising sea levels. The indigenous populations, descended from the original migrants who arrived approximately 14,000 years ago, became isolated and cut off from the Old World. The first human arrivals had come
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from northern Eurasia where the “cold filter” prevented many Old World diseases from reaching the continent. However, nowhere have the effects of infectious diseases on geopolitics been more marked than in the Americas [37].

When microbes from the Old World were introduced to the Americas in the fifteenth century, they encountered a population that lacked genetic resistance and they devastated the indigenous populations. We know very little about any of the diseases that afflicted these early peoples who had virtually no contact with the wider world. There is evidence of villages and permanent settlements from about 2000 BC, and civilizations that rivaled those of Mesopotamia, Egypt, and China existed over 2000 years ago in present-day Mexico, Peru, and Ecuador.

When Europeans first arrived in 1500, Central and South America were dominated by two advanced and powerful civilizations: the Aztecs in Mexico and the Incas in Peru and Ecuador. North America was occupied at that time by scattered and sparsely populated Native American tribes. From the beginning of the sixteenth century, successive waves of Spanish troops in small groups overcame the vastly larger Inca and Aztec armies and it is not at all clear why they succumbed so easily. Although infections played major roles, it has been suggested that nutritional, psychological, economic, and religious factors along with the fear of disease also contributed to their defeat.

Spanish conquistadors introduced smallpox into the Caribbean by 1507 and it was almost invariably accompanied by measles. Hernan Cortés was sent into Mexico by the Spanish governor of Cuba to corroborate fantastic stories of a thriving and opulent civilization in Mexico. His small group of 16 horsemen and 600 foot soldiers reached the Aztec capital, but relations quickly deteriorated between the Aztecs and his army. Cortés did not quite turn out to be the “white-skinned god” that Emperor Montezuma had expected and Cortés was forced to withdraw and return to the coast to regroup his forces. While he planned his strategy for counterattack in 1520, smallpox arrived in the Aztec capital, causing massive mortality wherever it appeared, killing between one-quarter and one-third of its victims. The pattern was nearly always the same: disease spread ahead of the invading armies, causing overwhelming mortality and morbidity, leaving the dispirited survivors at the mercy of the invaders, thus clearing the whole region and making it available for colonization by generations of Europeans. When Francisco Pizarro invaded the Inca empire in 1532, he had been aided by its first smallpox epidemic during the 1520s which killed a third of the population, including an absolute monarch worshipped as the Sun God, his family, and military leaders. Hence, “within fifty years of Cortés arrival in central Mexico only one in ten Native Americans survived and the population plummeted from 30 to 3 million” [10]. North America became “virgin territory” ready to be carved up and colonized by Portugal, Spain, Britain, Denmark, France, Sweden, and The Netherlands.

Waves of infected immigrants and slaves added to the disease burden and by the early seventeenth century, smallpox and measles had spread along the coast of North America as far as Massachusetts. By the nineteenth century, these diseases had reached the west and become endemic throughout the Americas. Infectious diseases continued to be significant into the nineteenth century as they spread along the Mississippi as a result of trade and settlement and during the Civil War (1861–5) the majority of deaths were caused by disease.

One disease in particular played an important role in the later history of North America. Yellow fever, carried from Africa by infected slaves, together with its mosquito vector, caused the first reported yellow fever epidemic in the New World in 1647 [38]. It arrived in Yucatan in 1649. From there it spread to Cuba, Hispaniola and across mainland America, reaching Philadelphia in 1793 [35]. By then, Philadelphia was the favored site for a new capital of the new United States that had been established in 1783. However, epidemics of yellow fever and dengue fever in 1793 and during subsequent years were partly responsible for George Washington’s decision in 1800 to locate the new capital elsewhere – within the state of Maryland at what is now Washington DC [39].

Meanwhile, that same year the Spanish West Indian colony of Haiti had been seized by the French against the wishes of the local population. By 1790, there were more than 500000 slaves living in Haiti, outnumbering the white population by a factor of 16 to 1. By 1791, the political events in both Europe and the Caribbean precipitated a slave revolt that led ultimately to independence. The French Emperor, Napoleon, sent massive reinforcements of French troops under General Le Clerc to quell the rebellion. This was disastrous for the French, who succumbed to yellow fever, and out of 40000
soldiers, only 3000 returned to France. By January 1804, Jean-Jacques Dessalines, a former slave, could sign an Act of Independence and be declared Emperor of Haiti. However, what followed was a century of geographic and cultural isolation during which there were few advances in the sciences or medicine [40]. It was also a major, but not fatal, setback for Napoleon's ambitions in the New World and in 1802 he sent an army to claim New Orleans for France. However, 29000 out of 35000 soldiers succumbed to yellow fever, effectively ending France's claims to New Orleans and French aspirations for New World dominance that had begun in the 1530s. It has even been suggested that were it not for yellow fever, Americans would probably be speaking French today [19]. As a result, with his ambitious plans ruined, Napoleon sold the French territories comprising Louisiana for 15 million dollars to the United States – territory that today essentially compromises the entire middle third of the country.

Yellow fever was to have one other major effect on the relationships between France and the United States. From 1879 to 1889, the French had tried to link the Pacific with the Atlantic via a Panama Canal, but had to abandon the scheme partly because of the devastating effects of yellow fever and malaria. The entire project cost the French over 300 million dollars and 28000 lives. Following the discovery by American and Cuban scientists that mosquitoes transmitted yellow fever, the threat of disease was virtually eliminated and work on the Panama Canal was resumed. When it was opened in 1914, the Canal gave the United States unfettered dominance of the entire region [41].

**Australasia**

It is not certain when the first humans arrived in Australia and estimates range from 125000 to 40–50000 years ago. Written history of this area begins with sporadic visits by Europeans in the early sixteenth century. By 1650, Dutch explorers had mapped much of the coastline. When the British arrived in 1769, Australia was sparsely populated, with about 250 well-defined and scattered Aboriginal tribes, each with its own culture and language. The total population at that time was about 350000. Shortly after the colonization of New South Wales in 1788, there was a major and well-documented epidemic of smallpox in Sydney. Thereafter, there were sporadic epidemics of smallpox and measles elsewhere on the continent. In 1798, one particularly severe epidemic of smallpox killed 90% of the Darug (Dharug, Daruk or Dharuk) tribe in the area now including Sydney [42]. Overall, however, disease played only a minor role in the decline of the Aboriginals to about 93000 in 1900, a decline that was mainly due to deliberate killings, starvation, and forcible resettlement. The Aboriginals were largely protected from infectious diseases because their populations were so isolated that infections could not spread easily, and contact between Europeans and Aboriginals was very limited. In addition, because of the distance from Europe, any smallpox carriers would have either died or recovered by the time their ships reached Australia. Also, from about 1798 many of the immigrants from Europe would have been vaccinated against the disease. Finally, Australia never imported large numbers of slaves and their infectious diseases from Africa as had occurred in the Americas, and bubonic plague did not reach Australia until 1900 [43].

New Zealand was actually more fortunate than Australia. The first European contacts occurred in 1672, but it was not until 1679 that they began having any significant impact. In 1769, the local Maori population was 85–110000 but it fell to 70000 by 1840 mainly due to conflict, not disease. The European population was tiny, numbering about 2000, so they presented little or no risk of transmitting disease. By the time Europeans began to arrive in large numbers, between 1850 and 1870, the causes of many infectious diseases and the means of controlling them had been well established. The only significant smallpox epidemic occurred as late as 1913.

From 1788 onwards, populations on the islands of Oceania began to experience European diseases associated with increases in exploration, trade, missionary activity, and labor movements. The large number of small separated islands meant that epidemics might be serious for a distinct population, but could not spread quickly or widely. Following the smallpox epidemic in Sydney in 1788, the disease arrived in some of the nearby islands and spread throughout Oceania during the nineteenth century, ultimately reaching Hawaii in 1853, Papua New Guinea in 1865, and New Guinea in 1870. Tuberculosis
reached Fiji in 1791 and measles began to spread in the area from about 1800 on. In addition to the common European diseases, malaria and dengue began to move throughout the region and, with the arrival of a labor force in the nineteenth century, there were also new importations of infectious diseases, including malaria from Asia and South America.

Infectious diseases in Australia and Oceania played little part in geopolitics – they did not facilitate colonization nor did they bring about the downfall of governments or powers. However, they did have major impacts on the economic development of all countries in the region simply by their presence.

**Sub-Saharan Africa**

Our hominid predecessors emerged in Africa, interbred with other archaic human species and evolved to become *Homo sapiens*, the species that now inhabits the entire planet. Little is known about the early history of the inhabitants of the continent as, apart from one first century AD document, the “Periplus of the Erythrean Sea,” which describes trade routes down the African coast [44]. There are no written records until about AD 1000 when most of the inhabitants of the interior lived in small, isolated communities that were too small to sustain and spread contagious diseases. They did, however, suffer from both mosquito-transmitted malaria and yellow fever. European diseases reached the African coasts with Portuguese or Arab traders and slavers from the beginning of the sixteenth century and quickly spread inland. They took a disproportionate toll on the indigenous people who had had no opportunity to build up any herd immunity. Although smallpox had been present along African coastal regions from at least the seventh century, the first records of major epidemics are from the Gulf of Guinea in 1680. Thereafter, numerous records of smallpox appear from as far south as Cape Town in 1713. The latter epidemic began when a Dutch ship carrying infected slaves and colonists landed at the Cape and disease quickly spread, killing about a quarter of the European settlers. It had a particularly adverse effect on the Khoikhoi (Khoi or Khoisan people), a genetically distinct population of herdsmen who had inhabited and dominated parts of south-west Africa since the fifth century. Smallpox killed over 90% of the Khoi, who never recovered from their loss, thus allowing settler farmers to take over the territory that they had held for over 1000 years.

Sub-Saharan Africa was to experience other disasters such as cholera and tuberculosis which spread throughout the country after 1900. When the 1918 influenza epidemic arrived in Sierra Leone, it quickly spread and killed an estimated 2 million people.

In some ways, the presence of malaria and yellow fever protected Africa from military invasion because European armies suffered huge losses when they penetrated into an interior so hostile that it permitted little more than the establishment of a few strategically placed forts and garrisons. Parts of West Africa became known as the “white man’s grave” and until about 1900, it was believed that there was something about Africa itself that made it inimical to Europeans. The presence of African diseases prevented or delayed major projects such as the building of roads and railways, leaving some to wonder if, after the ending of the slave trade, Africa was worth the effort of colonizing. It all had been so much easier in the Americas and Australasia. Nevertheless, what has become known as the “scramble for Africa” began followed by the partitioning of Africa among the European powers in 1884–6.

Colonization did have some beneficial effects within Africa. Towards the end of the nineteenth century, herds of cattle were succumbing to a wasting disease called *nagana* (Zulu for “low spirits”), while humans were suffering and dying from a condition known as sleeping sickness or “ negro lethargy.” The extremely high fatality associated with sleeping sickness in general meant that small early African hunter-gatherer groups would have had difficulty surviving within the tsetse fly belt that cuts across central Africa. The question arises as to whether these trypanosomal diseases could have played a major role in the history of early humans by serving as an impetus for human migration out of Africa 50000–100000 years ago [10]. Possibly, the combination of trypanosome, tsetse fly, and sleeping sickness was responsible not only for the very slow growth rates of African hunter-gatherer bands, but also for the eventual migration of hominids out of the East African Rift Valley.
British and Scottish colonial scientists and doctors unraveled the mysteries of both diseases, which were found to be caused by protozoan parasites, the trypanosomes [45]. These are extremely active blood parasites whose name is derived from the Greek *trypanon*, or borer. These discoveries led to measures for the control of the diseases and made it safer for Europeans and Africans to keep their cattle over great swathes of Sub-Saharan Africa, thus contributing to the wealth of the continent.

**South Asia**

The countries of South Asia, present-day India, Bangladesh, Bhutan, Pakistan, the Maldives, Nepal, and Sri Lanka, are separated from the rest of Asia by the Himalayas, and they developed cultures quite distinct from those of the Near East, the Far East, and South-east Asia. Much of what we know about diseases in the past comes from the sixth century BC Ayurvedic texts, the Caraka and Sushruta, which mix spiritual well-being with descriptions of diseases, some of which are difficult to interpret. For the next thousand years or so, trade brought the region in contact with the Arab and European worlds and their diseases, but there are only sporadic references to infectious diseases which probably included cholera, leprosy, typhoid, smallpox, and malaria. Sanskrit medical texts indicate that a disease which may have been smallpox was known in India from about 1500 BC. The first detailed accounts of smallpox in India date from AD 1160. Epidemics of plague occurred in 1443, 1543, and 1573, after which the disease became endemic with occasional epidemics such as that of 1812 that killed half the population of Gujarat.

Cholera is the disease that is most associated with India and the epicenter appears to have been the Ganges delta. In 1600, the British East India Company was established for trade, but after 1857 it was the British government that actually controlled India. Up until British rule in India, *Vibrio cholerae* was restricted to some extent to the Bay of Bengal where the Ganges River empties into the Indian Ocean. However, British trade routes and troop movements changed local cholera outbreaks into epidemics. The first known Indian epidemic occurred in 1503 and in 1817 it killed 4000 people in Calcutta, then spread throughout the subcontinent into the Far East and then to Cuba and Mexico in 1833, Europe in 1835–7, and Africa in 1837. From the nineteenth century onwards, there have been periodic cholera pandemics, nearly all of which originated from the Ganges region where the religious ritual of bathing in that river is thought to have contributed to the spread of the disease.

The European colonization of the Indian subcontinent began in 1498 with the voyages of Vasco da Gama, and later Portuguese traders whose accounts of recognizable diseases appear as more Europeans began to arrive. Because India had already experienced some of the diseases prevalent in Europe, it suffered none of the disastrous epidemics experienced in the Americas and Australasia. India effectively came under British rule from 1765 and inherited a sophisticated health system that it supplemented with the introduction of Western medicine.

Despite its long history of civilization and knowledge of infectious diseases, no particular event in South Asia can be said to have changed the course of world history although diseases that contributed to the outcome of wars that plagued the region throughout its history had significant local consequences. As in Africa they slowed and curtailed the development of roads and railways.

**East Asia**

East Asia encompasses China, Japan, and Korea. Like South Asia, it is a geographically distinct region with both well-defined epidemiology and etiology of diseases. The Chinese civilization emerged about 4000 BC and from 1765 to 1122 BC experienced a growth in both labor-intensive agriculture and the construction of walled cities. By 221 BC, there had been both a massive growth in China’s population and considerable territorial expansion followed by a period during which great dynasties emerged and declined. During the first century BC, China reached as far north as Bengal and by the time of the Tang Dynasty (618–907), there were over 20 cities and a population of about 2 million.
Population growth, the congregation of people in cities, and increasing trade with the outside world created conditions conducive to the spread of infectious diseases; smallpox arrived from the north in 250 BC and from the south in AD 48. Thereafter it became endemic throughout the region. In 1206, Mongol nomads invaded China and established the Yuan dynasty that was replaced in 1368 by the native Ming dynasty, characterized by trade with South-east Asia, South Asia, Africa, and Europe. This period of trading brought new diseases to China and towards the end of the Ming period the pattern of diseases in China resembled that in South Asia and Europe. In 1633, the Ming dynasty came under threat from the Manchu army, descended from non-Chinese Manchurian tribes. The Manchu were so aware of the dangers of smallpox that they used only those soldiers who had recovered from the disease or had been “immunized” against it [46]. This was a successful strategy that ended the Ming dynasty in 1644 and began the Qing dynasty that ruled until 1911. Increased trade and the arrival of Europeans in the seventeenth century did not have the same devastating effects seen in the Americas since the local population had already experienced all the diseases likely to have been carried by foreigners.

From its earliest times, China was in conflict with its neighbor to the east, Japan. It all came to a head with the Sino-Japanese war (1894–5) when the two countries went to war over Korea. The Chinese were decisively defeated and this marked the beginning of Japan as a world power. The Japanese despised the Chinese and this led to the creation of the infamous “Unit 731,” the objective of which was to manufacture biological weapons for use against the Chinese [47]. Between 1940 and 1942, the Japanese bombed over 12 Chinese cities with a variety of agents, including plague-infested fleas: in one attack on Quzhou, 50,000 died and in Ningbo 97% of the population were killed. Altogether, 200–400,000 people perished. The Allied defeat of Japan in 1945 brought these activities to an end.

Humans have inhabited Japan for over 10,000 years but our knowledge of diseases during the early history of Japan is very limited because of the country’s self-imposed isolation. When coupled with distribution of the population within small groups, it rendered Japan relatively free from infectious diseases. Early chronicles dating from about 710–720 BC refer to diseases which might have been malaria, tuberculosis, and leprosy but the whole period 200 BC–AD 495 seems to have been free of any significant impact of any diseases despite population growth over this period. However, in 495 AD smallpox arrived from Korea, but did not spread very far because population movements were limited, largely due to the nature of Japanese terrain. Between 700 and 1050, Japan suffered from a series of 10 devastating “plagues.” These included smallpox in 735–7 (“the great smallpox epidemic”), 790, 812–14, 833, and 853, bubonic plague in 808, influenza between 862 and 1015, and measles in 998 and 1025. The 735–7 great smallpox epidemic alone killed 30–40% of those infected. These plagues had effects similar to those of the Black Death in Europe, including economic stagnation. In addition, Chinese influence declined and Buddhism was adopted. These plagues also allowed the population to build up their herd immunity; between 1050 and 1260, infectious disease had ceased to dominate people’s lives and smallpox had become a disease of childhood. With the expansion of trade routes and the arrival of Europeans in 1543, the only disease passed on to the naive population of Japan was syphilis.

The Japanese economy continued to thrive and with one exception (apart from the venture into biological warfare discussed above), disease played little role in the development of the country or its economy. The exception occurred in the early twentieth century when the Japanese used their knowledge of malaria to persuade the population of Taiwan to abandon their way of life and to become more Japanese [48].

Korea was established in the late third millennium BC by people from northern China and was conquered by the Chinese in 108 BC, by the Mongols in 1231, and became a Japanese protectorate in 1904–5. The first records of smallpox epidemics, via India and China, are from the third century BC. There were epidemics in 552 AD, 585–7, 735–7, and 765, from whence the disease passed to Japan. There were further epidemics in 1418, between 1424 and 1675 and 1680, all with devastating effects, during which kings, princes, and other important leaders died. The population of Korea had not been exposed to European diseases in the same way as the Japanese and in 1707 and between 1752 and 1775, there were epidemics of measles, called “dot eruption disease.” By 1883, smallpox had become a
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childhood disease and virtually everyone had scars from the disease or inoculation. By the end of the century, smallpox had been virtually eradicated and the pattern of infectious diseases in Korea closely resembled that which occurred in the Americas. Infectious diseases in Korea, although they had important effects locally and in the neighboring countries, made negligible impact on world history.

Conclusion

Migration, genetics, conflict, and infectious diseases have played significant roles in determining the political maps of the world that have evolved over millennia. Cholera, leprosy, typhoid, typhus, plague, tuberculosis, measles, smallpox, yellow fever, and malaria have all contributed to important historical events such as the decline of the powers of Athens and Rome, the rise of Islam, the end of the feudal system in Europe, the colonization of the Americas, Africa, and Australasia, the end of French colonialism in the Americas and numerous examples of disruption of economic development and subsequent political consequences. In addition, there must have been thousands, if not millions, of minor recorded and unrecorded events, the effects of which have not been evaluated, that might have turned out differently had disease not intervened.

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References