Introduction

In the cathedral in Santiago de Compostela in Spain there is a polychrome marble statue of St James, the patron saint of Spain, clad in fifteenth century armour and mounted on a warhorse, trampling on a group of cowering Moors. This statue commemorates the liberation of Spain from nearly 800 years of Islamic rule and the iconography could not be clearer. However, as with most iconography, what is not shown is much more interesting than what is. What is not shown is that in the eighth century, the Moors from North Africa brought with them smallpox which spread throughout Spain and nearly eight hundred years later was exported by the Spanish conquistadors to the New World where it destroyed the Aztec and Inca empires. In return, the conquistadors acquired syphilis and brought it to Italy (then a Spanish possession) from whence it spread and wreaked havoc among the royal courts and populations of Europe. This, the best known example of the spread of disease by conquest, is a good story but, as is so often the case, not the whole story.

What is meant by disease?

We will return to Spain later but first it is necessary to define the various terms that will be used. By disease, I mean communicable or infectious diseases i.e. those caused by infection with microorganisms (viruses, bacteria and parasites) that can pass directly or indirectly from one human to another. The outcome of any infection depends on many factors including the ease of transmission, the rate of multiplication of the microorganism, and the ability of the host to mount an immune response. Infectious diseases play important roles in natural selection and our ancestors, as they spread throughout the world, experienced new infections to each of which a proportion of the population was particularly susceptible and died while the others became infected, recovered and were immune on subsequent exposure to the same infection. Because the most susceptible individuals die they cannot contribute their genes to the next generation and thus, over time, the population as a whole becomes increasingly resistant to that infection. This pattern is repeated for each different infection and the outcome varies considerably. Some individuals die, some become sick and carry the infection in a mild form for the rest of their lives, some recover completely and some show few signs of disease. Those that carry the infection present the real problems because they can infect those who are not immune. Infants have poorly developed immune systems for the first months of their lives and are particularly susceptible to infections but are usually protected against those prevalent locally by antibodies and cells passed to them by immune mothers, either while in the womb or with breast milk. Eventually, in any population, most individuals develop some degree of immunity to particular infections resulting in what is called ‘herd immunity’ against those diseases that present the greatest threat at a particular place and time. Natural selection, therefore, favours those best suited for surviving local infections, for example in most of Europe influenza is a minor inconvenience whereas malaria could be a killer but to an individual living in a village in West Africa the reverse would be the case. Factors such as starvation, stress and the presence of other infections can affect the outcome of an infection and the very young and very old are particularly susceptible.

Conquest and disease

So this is why the Amerindians succumbed to smallpox; they had no herd immunity and the new diseases they encountered were so virulent that they had no time to adapt to them. This also happened elsewhere where peoples with no immunity succumbed to the diseases carried by newcomers particularly conquerors. But this is only half of the story. Conquest and trade have been part of human history ever since the emergence of our species and we have records of expansion and trade by land or sea going back over 4000 years. Most of this activity occurred over relatively short distances but the great long-distance conquest and trade routes by sea that began with the seafaring nations of Europe in the fifteenth and sixteenth centuries opened up new opportunities for the spread of disease.

Now to return to Spain and the Spanish conquests of Mesoamerica. By the end of the fifteenth century, Europe had survived successive waves of plague, measles, smallpox and malaria and had massive wealth and was looking for new lands to conquer.
Spain, emboldened by its success routing the Moors, wholeheartedly embraced this new crusading spirit and embarked on the colonisation of the recently discovered American continent with the intention of spreading Christianity and opening up new trade routes. Plunder on a vast scale was an afterthought. In 1492, Christopher Columbus landed on the densely populated West Indian islands and a year later set out to settle these islands, particularly Hispaniola (Haiti and the Dominican Republic), and to subjugate their peoples. Over the next few years the Spanish established themselves in Puerto Rico (1508), Jamaica (1509) and Cuba (1511). They then turned their attention to Mesoamerica and in 1517 Córdoba reached Yucatan in south eastern Mexico and in 1519 Hernán Córtés with 508 men arrived in Central Mexico. Here they encountered a civilization, the Aztecs, that had developed in isolation for at least 3000 years and was, and probably always had been, virtually free from viral diseases. On the other hand the Spaniards were walking disease time bombs. Smallpox swept through the indigenous population killing the emperor and nobles and 50% or more of the population. Those who died were mainly infants, children and the elderly but it also affected large numbers of otherwise healthy adults. The disease then spread overland and was instrumental in Francisco Pizarro's defeat of the Incas in Peru in 1531. These smallpox epidemics although devastating were short lived but later importations of measles, typhus, mumps and malaria all caused massive devastation and within a few decades two of the world's greatest civilisations had been swept away largely by diseases brought from Europe. In both Mexico and Peru smallpox had enabled the Spaniards to win decisive victories against numerically superior armies but elsewhere smallpox moved ahead of the invaders and, as they moved north-eastwards towards the Mississippi and Massachusetts, they encountered no opposition from native Indians many of whose villages had been deserted. Smallpox continued to spread killing huge numbers of native Indians in and along the Great Lakes and, after a lull, remerged and 1755 is remembered as the year of the Great Smallpox Epidemic that took a massive toll of Indians and settlers alike.

The story of smallpox and the Americas was just a foretaste of what was to follow with the introduction and spread of other diseases common in Europe including tuberculosis, measles, mumps, rubella, scarlet fever, pneumonia, pertussis, anthrax, influenza and typhus into Canada, the Pacific islands, Australia and New Zealand in the eighteenth and nineteenth centuries. As one example, in the early nineteenth century a combination of diseases including tuberculosis, venereal and gastrointestinal infections and pneumonia reduced the population of New Zealand from 100,000-200,000 to about 40,000. So prevalent was this pattern of events that Charles Darwin wrote

>'Besides the several causes of destruction, there appears to be some more mysterious agency at work. Wherever the European has trod, death seems to pursue the aboriginal. We may look to the wide extent of the Americas, Polynesia, the Cape of Good Hope and Australia and we find the same result...Nor is it the white an alone that acts the destroyer'

Charles Darwin  The Voyage of the Beagle. Chapter XIX, Australia (1836)

Contemporary orthodoxy places all the blame for these disasters on those whose aim was to conquer and colonise but this would be unfair as trade was equally, or more frequently, to blame. Between the fifteenth and nineteenth centuries the world population was growing at an unprecedented rate and trade was beginning to impinge on even the smallest and most isolated populations. Trade had already been responsible for the spread of plague, smallpox, cholera, measles and other diseases throughout Europe and the Mediterranean regions and it would have only been a matter of time before those regions that fell to conquerors would have become entangled in the network of trade routes that had begun to embrace the whole of the world.

### Disease as a weapon of conquest

Even without knowing the cause of disease it occurred to military leaders that it might be possible to infect the enemy and thus gain an advantage. There are a number of such suggestions from the early literature that corpses had been used for this purpose but these are difficult to substantiate except in the much-cited example from 1348 when the Tartars catapulted the corpses of plague victims over the walls of the citadel of the Crimean city of Caffa (now Theodosia) causing plague to flare up among the Christians. There are written records from the French-Indian war in North America in 1763 that the French considered sending smallpox-contaminated blankets and handkerchiefs to the native Indians but it not clear whether or not this actually happened. Certainly, both of these strategies would have worked because the smallpox virus can survive for a long time on cloth, and fleas would have deserted the dead bodies to search for living hosts and thus spread plague. Whether or not this kind of biological warfare was used, or used widely, it drew widespread condemnation and such practices which were banned in the Declaration of St Petersburg in 1868, the forerunner of the Hague Conference in 1907.

Despite this condemnation there is one particularly nasty event in relatively recent times. In 1940 Italy entered the Second
World War on side of Germany but changed sides in 1943 leaving Italy an occupied country. Expecting the allied forces to invade from the south to take the symbolic target of Rome, the Germans decided to flood the Pontine Marshes in order to hinder their progress. For centuries the Pontine Marshes had been a hotspot of malaria but the disease had been virtually eradicated by the Italians who constructed a series of pumps that drained the marshes where the malaria mosquitoes bred. All the Germans needed to do was to destroy the pumps but, instead, they reversed them causing the marshes to become slightly saline resulting in conditions suitable for the breeding of *Anopheles labranchiae* the most important malaria vector in the area. This was despite pleas from Italian malarialogists and resulted in a full scale malaria epidemic. That this was deliberate is illustrated by the fact that the Germans also confiscated Italy's supplies of quinine. The most appalling feature of this whole episode is that it must have been done with the connivance of the German malarialogists who had listened to the pleas of their former Italian colleagues. Suspicion falls on a distinguished professor from the University of Hamburg. The case never came to trial as a war crime, which it certainly was, possibly because the allies had bigger fish to fry.

**Colonisation, colonialism and empires**

Words like empire, colonialism and colonisation are often used interchangeably but they are in fact very different concepts as explained by Stephen Howe. Empires, he states, are large multi-ethnic or multinational political units. Colonialism is exclusive sovereignty of one group over another at a distance whereas colonisation refers to situations where the colonisers establish privileges over the inhabitants of the occupied country while maintaining strong links with their country of origin. In this lecture the word colonisation is used according to this strict definition as it implies rights and responsibilities for both the colonisers and colonised.

**The threat of exotic diseases**

So, Europeans were responsible for introducing new diseases to places where they had never been prevalent causing massive death and morbidity but there is another side to the story, the effects of indigenous diseases on foreign invaders and traders. This happened with syphilis in the Americas, but is particularly important in the tropics which were regarded as unhealthy places inhabited by primitive people and inimical for Europeans even before the causes of infectious diseases were understood. Stories of invading forces being overcome by mysterious diseases go back to biblical times and in the writings of Greek, Roman and Persian physicians but become more common and reliable with the advent of European explorations in the fifteenth and sixteenth centuries. Spanish conquistadors, missionaries and writers recorded the presence of yellow fever, malaria and cholera in the Americas long before their arrival and in the eighteenth century naval surgeons described diseases that we now know to be sleeping sickness and yellow fever along the coasts of Africa. Africa has always been a mysterious place and the colonisation of Africa by European countries that had began cautiously with trading posts established by the Portuguese, French and British suddenly became a scramble that resulted in the partition of Africa between Britain, Belgium, France, Germany, Italy, Portugal and Spain in the 1880s. All colonial powers experienced the same problems, excess deaths among their troops, civil servants and traders. At first these deaths were attributed to the climate and the inability of Europeans to survive in the tropics but this changed as a result of scientific advances during the second half of the nineteenth century when it became apparent that these seemingly intractable diseases were caused by infectious organisms, bacteria, ‘filterable agents’ (viruses) and parasitic protozoa and that that mosquitoes and other insects could transmit diseases. This knowledge led to the development of drugs, vaccines and methods of insect control and the colonial powers wholeheartedly embarked on disease control programmes involving health improvements such as the provision of clean water, sewage disposal systems, insect control, vaccination and the provision of appropriate drugs. Initially these improvements were introduced for the protection of colonial troops and civil servants, then for the local people working for the colonial power and eventually for the whole population. Improved health care also included the provision of hospitals and, as for the other measures, these were initially for the military, then for expatriates and finally for the local people. The first country to adopt these measures was India (now India, Pakistan and Bangladesh) which had been under British rule, through the agency of the British East India Company, since the early nineteenth century. From the beginning of the twentieth century onwards, the elimination or control of disease in tropical countries became a driving force for all colonial powers and this culminated in the second half of the century in bold plans that would enable the newly independent States plans to inherit effective health systems. It is against this background that the Royal Society of Tropical Medicine and Hygiene and other similar societies came into existence.

Although the overall pattern of events, the need to protect troops and civil servants followed by the desire to protect the whole
of the population was similar in nearly all colonies the actual ways in which these objectives were achieved and the actual outcomes were very different. This is best illustrated by a number of examples, Indian sub-continent, West Africa, East Africa, Singapore, Hong Kong and Taiwan.

The Indian sub-continent

The inhabitants of the Indian sub-continent already had a well developed system of medicine and health, based on traditional Hindu ayurvedic principles, well before the arrival of European colonisers. In 1510 the Portuguese had brought Western medicine to Goa and had established a hospital which became a medical school in 1842. In the meantime the British, through the agency of the East India Company, had established hospitals in Madras (Chennai) in 1664, Bombay (Mumbai) in 1670 and Calcutta (Kolkata) in 1707. The Bengal Medical Service was set up in 1763 and the need for local medical practitioners was recognised a few years later. At first locals were trained as 'dressers' or country doctors and given lowly tasks but by 1813 it was realised that there was a need for fully trained local doctors and the first Native Medical College, which later became the Calcutta Medical College, was opened in 1822 and by 1857 the first medical degrees were awarded to both men and women. Western medicine was taught in English, the official language. One of the most important elements of health provision in India was the Indian Medical Service (IMS) which was primarily military but 'lent' its doctors for civil purposes. The IMS was complemented by an elite corps, the Army Medical Department, later to become the Royal Army Medical Corps, whose duty was to look after British troops leaving the care of Indian troops, and later civilians, to the IMS. The military undertook to provide good hygiene, sanitary and medical services and set standards that were later adopted by the local populations. By the middle of the nineteenth century, the Indian sub-continent had in place a fully fledged colonial medical service based on authority, training and dependence on an appreciation of imperial values. Health provision served as a vehicle for cultural change by combining humanitarianism with beneficence and, by deploying the latest discoveries in medicine such as vaccines and drugs, some of which like quinine which were manufactured locally, gradually subjugated and marginalised traditional medical practice. With the opening of the Calcutta School of Medicine in 1921 the transition to a tradition of Western medicine capable of dealing with both cosmopolitan and local diseases was complete.

West Africa (with special reference to Ghana)

The countries of West Africa had long had familiarity with organised health care and had benefitted from input from both Western and Islamic medicine since the fifteenth century. Important trade routes had brought British, Dutch, French, German and Swedish ships to West African trading posts where the Europeans gained first hand experience of the local diseases. Sierra Leone for a time was known as the 'white man's grave' and one version of an old jingle goes 'the Bight of Benin, the Bight of Benin, were one comes out where ten went in'. This familiarity with local diseases and the initiative of European doctors, mainly Scottish, led to the realisation that local doctors were required and from 1813 West African doctors were trained in Edinburgh and later a medical school was set up in Freetown in Sierra Leone in 1872. Britain became the sole European power in Ghana in 1874 and the first civil hospital was opened in the 1880s, with separate wards for Europeans and Africans, and thereafter regional hospitals and dispensaries were opened until by 1919 there were over twenty properly built and equipped hospitals which served both as hospitals and dispensaries, roles that frequently changed. Provision, however, was very uneven and in 1915 there was one doctor for every seventeen Europeans compared with one for every twenty two thousand Africans. Hospital care was largely in the hands of Europeans together with a few African doctors while the bulk of health care was provided African dispensers, dressers and nurses. With the coming of independence in 1957 Ghana had the basis of a modern health system based on medicine, hygiene and sanitation. Political instability, however, temporarily halted progress but by the 1990s Ghana had two large tertiary hospitals with medical schools in Accra and Kumasi together with about seventy quasi-government hospitals, unfortunately not all well-equipped or in a good state of repair.

East Africa

Until the second half of the nineteenth century, medical care and health in East Africa was in the hands of indigenous healers, a diverse and secretive mainly male group, who diagnosed misfortune, part of which was caused by disease, and gave spiritual guidance, and herbalists. With no written tradition there was little or no transfer of information within or between these groups. Western medicine, which was sporadic and thinly spread, initially came from missionaries who had two roles, to save the body
and to save the soul so there was no overall health scheme in any of the countries of East Africa until the colonial powers took control. From the late nineteenth century onwards different parts of East Africa came under European colonial rule. The Germans were the first to create an East African medical service which was essentially military in German East Africa (later Tanganyika and now Tanzania) in 1888 while the medical services established by the British in Uganda in 1897 and Kenya in 1901 were largely civilian. The colonial medical services began to be established from the 1920s onwards. The colonial powers recognised that not only did they need to protect their own nationals but also had to protect the native people who provided the local administrative back up required and also the labour necessary to sustain a thriving economy. These medical services were based on contemporary medical practice in Europe with local modifications. Initially these services were provided by expatriate doctors assisted by tribal dressers and clinical assistants drawn from a wide range of the population often ex-patients who had become accustomed to Western medical practices. Dressers and assistants did not mix with the traditional healers. Over the first half of the twentieth century, the colonial powers established university medical schools in Makerere in Uganda, Nairobi in Kenya and Dar es Salaam in Tanganyika, that provided basic Western medical training which was not regarded as being equivalent to that of the European medical officers. This gradually changed and at the time of independence in 1961-3 Uganda, Kenya and Tanzania had Western-style hospitals and medical schools partially staffed by locally trained doctors and other health workers.

**Hong Kong (Xianggang)**

Hong Kong Island became a British colony in 1892 and from the very beginning the authorities paid particular attention to the well-being of British troops and civil servants while ignoring the Chinese inhabitants who were thought to be degenerate and diseased because of their perceived unsanitary way of life. It was believed that the best way to prevent disease was to avoid or civilize the indigenous people. All this changed with plague that arrived on the island in 1894 and took a toll of both Chinese and expatriates alike. The colonial authorities then focused on public health for all and embarked on ambitious schemes for disease prevention and control but, recognising the interplay between health and the economy, were careful not over-commit themselves. Western medicine and methods of disease control were introduced slowly by the provision of vaccination and improvements in sanitary conditions enforced by regulations but without coercion while respecting the sensibilities of the Chinese who were suspicious of Western medicine. The authorities allowed, and actually encouraged, Chinese medicine and private health schemes, largely provided by charities run by missionaries, with the result that precious public money could be spent on public health infrastructure and targeted control measures such as improvements in sanitary conditions, free vaccinations against the common diseases and carefully focused malaria control programmes without reliance on external sources of funding. The authorities made no attempt to provide comprehensive care for the whole community but nevertheless ensured that the whole population had access to some medical care whoever the providers. These measures were very successful and, for example, malaria had been eliminated from Hong Kong by the time that the WHO abandoned its attempts to eradicate the disease elsewhere. Apart from setbacks due to the Second World War, from which Hong Kong quickly recovered, when it was returned to Chinese rule in 1997 it had some of the best medical provision in the world.

**Taiwan**

Taiwan is another island with a chequered history and was under Japanese rule from 1895-1945. From the beginning of the occupation, Japanese troops and civilians suffered heavily from malaria which was the most important killing disease on the island causing massive economic problems for the Japanese and the loss of 3.45 million working days each year. The Japanese, like the Chinese, initially attributed malaria to the ‘hostile environment’ in which the local inhabitants lived. In 1897 they had a stroke of good fortune because, in that year, Ronald Ross and malarologists in Italy had discovered that malaria was transmitted by mosquitoes and could be controlled by using anti-mosquito measures and treatment with quinine. This scientific knowledge gave the Japanese superiority over the Chinese who set out to show that they could conquer malaria using the very latest knowledge which would relegate the Chinese concepts of this disease to the realms of ‘pre-modern’. They were able to explain that malaria was not caused by the miasmas arising from the swamps but that malaria was carried by mosquitoes breeding there. The Japanese regarded malaria as an enemy that must be attacked without mercy and realised that by bringing in the local people they could convert them from their ‘pre-modern’ ideas to the superior Japanese way of life and, in doing do, demonstrate the efficiency of colonial rule. The stated policy was ‘to bring ignorant laypeople to enlightenment through racial co-education education’ which they did by attempting to achieve total involvement through educational pamphlets, posters and propaganda backed up by policing the control measures being implemented in the villages. A book, *Du’ Jin Biao* (Getting a
medal), written in 1931, tells the story of a policeman whose efforts to clear his village of mosquitoes, despite opposition from farmers, wins a medal. Malaria, the most serious disease in Taiwan in 1911 had been relegated to tenth place by 1935. The indoctrination of the local people was complete; they could understand and apply the latest discoveries in Western medicine to all diseases and could then abandon their traditional medicines and beliefs as primitive and adopt the Japanese customs and religions. By 1939, Taiwan had a well-informed population and every city had public and private medical provision.

The legacy of colonisation

Colonial health policies arose from the desire to protect troops and civil servants from exotic diseases and the gradual realisation that the health of the indigenous people was also important first because they might serve as sources of infection for those working for the colonial powers and, second, because disease caused economic losses that could be quantified. The main purposes of the different types of health schemes developed in various countries was to ensure 'health for all' but there were a number of hidden agendas including rendering the country suitable for Europeans to inhabit and to civilise the indigenous populations. A single phrase used by many observers 'health as a tool of empire' sums up the situation. Having established health systems on purely pragmatic grounds the colonial powers then turned to altruism and devoted huge sums of money and considerable manpower to the eradication and control of diseases of importance only to the indigenous people after they, the colonists, had departed. Colonial health developed in different ways and at different rates in various countries ranging from a slow and natural evolution to Western-style medicine as in West and East Africa, the gradual integration of local medicine and Western medicine as in Hong Kong and to the rigid imposition of foreign ideals as in Taiwan. However, the end results were the same; the health schemes inherited by the newly independent States were those designed by and largely run by the former colonial powers.

Health in the former colonies today

It is not easy to judge the success or otherwise of the health schemes inherited by then newly independent countries about fifty years ago but two such measures are life expectancy (from the age of 1) and the numbers of doctors per 1000 of the population. These are shown in the table below.

<table>
<thead>
<tr>
<th>Country</th>
<th>Life expectancy (years)*</th>
<th>Doctors/1000 population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hong Kong</td>
<td>82</td>
<td>1.5 (+ Chinese medical framework)</td>
</tr>
<tr>
<td>Singapore</td>
<td>82</td>
<td>1.3 (+0.4/1000 Chinese medicine doctors)</td>
</tr>
<tr>
<td>Ireland</td>
<td>78</td>
<td>1.6</td>
</tr>
<tr>
<td>Taiwan</td>
<td>78</td>
<td>1.4</td>
</tr>
<tr>
<td>India</td>
<td>65</td>
<td>0.4</td>
</tr>
<tr>
<td>Ghana</td>
<td>59</td>
<td>0.4</td>
</tr>
<tr>
<td>Uganda</td>
<td>52</td>
<td>0.25</td>
</tr>
<tr>
<td>Kenya</td>
<td>49</td>
<td>1.25</td>
</tr>
<tr>
<td>Tanzania</td>
<td>46</td>
<td>0.37</td>
</tr>
</tbody>
</table>

What went right and what went wrong?
The first thing to say is that plenty of things went right. Hong Kong, Singapore and Taiwan now have hospitals, life expectancies and numbers of doctors that are the envy of many other nations. It is also interesting to note that these counties have not turned their backs on traditional medicine and have developed health care systems that can cater for all needs. India, that has also maintained some of its traditional medicine, is struggling under the weight of a massively increasing population but is getting on top of most of its medical problems. In all of these countries, non-infectious diseases such as cancers and cardiac disease are now more significant than infectious diseases which, nevertheless, still remain but have moved down the list of the most important causes of death and morbidity. Unfortunately, the same cannot be said for most African countries. What went wrong? There are many reasons and some of these can be attributed to the legacy of the colonial powers, in all these examples, Britain.

**Unfulfilled promises.** In the mid 1950s, when these countries were becoming independent, Western countries and the WHO were optimistically stating that the great tropical diseases such as malaria, sleeping sickness, schistosomiasis and filariasis could be eliminated and that smallpox and poliomyelitis would soon be eradicated. Indeed smallpox has been eradicated and poliomyelitis is on its way out but malaria is still a major threat. Given that the WHO expected that tropical diseases would no longer be threats, it is hardly surprising that African countries began to concentrate on the major diseases of developed countries and took their eyes off the ball with respect to diseases like malaria and sleeping sickness.

**Concentration on Western medicine.** Given the expectation that in future medicine would be largely concerned with non-infectious diseases, instruction in the African medical schools was based on the models adopted by British medical schools. Doctors trained in African medical schools were thus ill-equipped to deal with diseases prevalent in the tropics and had to rely heavily on expatriate experience. One unexpected problem was that doctors trained in Western medicine were welcomed in the more developed countries and emigrated from Africa in large numbers.

**Lack of resources.** Western medicine is expensive and even the richest countries in the world sometimes have to struggle. The African countries had additional problems in that they had to build up their infrastructure of transport and trade, and medicine had to share scarce resources.

**Failure to involve indigenous medical practices.** In East and West Africa, the colonial powers created health systems organised from the top by European doctors aided by native assistants and dressers. This marginalised the native healers who were trusted by the indigenous people particularly in the villages. This was in contrast to the situation in Hong Kong and Singapore and latterly Taiwan where the practices of traditional Chinese medicine were incorporated into the overall health schemes thus maintaining contact with people in the villages and freeing up scarce resources for public health schemes.

**Wars, conflicts and refugees.** All over Africa, conflicts have resulted in the curtailment or abandonment of disease control schemes. There have been numerous epidemics of sleeping sickness and malaria, cholera and other diseases. The movements of people such as refugees contribute to the spread of diseases particularly in crowded and unsanitary conditions where those carrying diseases mix with others who may be susceptible to infection particularly infants and the elderly. Many countries are now encountering the terrible trio, Malaria, HIV/AIDS and tuberculosis.

**Population growth.** The growth in population was predicted but there was an expectation that with increased infant survival rates there would be a compensatory decrease in birth rates. This did not happen with the net result that the resources available for health programmes had to be used for the care of the ever increasing population numbers particularly in Africa which is experiencing, and will continue to experience, the most rapid rates of population growth in the world. Population growth also puts extra demands on the production of food which, in some places, is already in short supply.

**Urbanization.** Urbanization leads to crowding and the spread of diseases from and to newcomers and also increases expectations of better health care. Dependency on local traditions gradually decreases while pressure on hospitals increases leading to two tier systems where those living in cities and towns increasingly experience non-infectious western diseases and expect to be treated accordingly whereas villagers are more likely to suffer from infectious diseases which require different kinds of treatment. In addition, doctors trained in Western medicine do not like working in villages.

**Agriculture.** With increasing populations the demand on land for food production increases leading to expansion into virgin territories bringing people into closer contact with animal reservoirs of disease and disease vectors.

**Climate change.** Climate change affects everybody but is likely to have a disproportionate adverse effect in tropical countries mainly with the spread of insect vectors of disease, desertification and population movements.
HIV/AIDS. Nobody expected this and most African countries were slow to react and some even denied that this was a problem. HIV/AIDS is now the major problem in many countries and is consuming a disproportionately large amount of health budgets. The WHO has warned that we should be prepared to expect other devastating new diseases to emerge.

Fake drugs. With the health systems failing to provide even basic needs and what is available being expensive many people have turned to cheap non-prescribed drugs. These are often at best useless or at worst, dangerous. Some even hasten the development of drug resistance.

Self-determined but not deserted

After independence, the colonial powers did not abandon their former colonies but continued to provide aid and assistance either through governments or privately. For many years expatriate doctors held the embryonic health services together until the independent countries had trained enough doctors to serve their own national needs. Vast sums of money are now being poured into health services mainly in Africa. The first major donor to recognise the need for such aid was the Rockefeller Foundation nearly a century ago and now there are many donors including the British Government's DIFID programme and the Gates and Carter Foundations which are particularly concerned with HIV/AIDS, malaria and tuberculosis. Pharmaceutical companies such as Merck and Co., GlaxoSmithKline and Pfizer, are also involved in the provision of free drugs and there are a number of private/public partnerships (PPPs) concerned with product development, access to medication and sustaining health systems. The World Health Organization and the World Bank coordinate individual efforts. The Wellcome Trust finances centres in Africa and Thailand. Numerous initiatives are now focusing on particular problems such as river blindness, elephantiasis and leishmaniasis and other 'neglected diseases' many of these are beginning to bear fruit.

As well as the large organizations, many individuals outside the tropics are still concerned with tropical diseases and have grouped themselves into numerous societies of tropical medicine. The members of these societies devote themselves to understanding and controlling diseases that will probably never occur in their own countries. The Royal Society of Tropical Medicine and Hygiene was founded in 1907 and it as well to look once again at the reasons why it was founded. To quote from Sir Patrick Manson, the first President of the Society.

‘All over the British tropical possessions laboratories are being established for the special investigation of tropical diseases and for the assistance of the tropical practitioner. The role of the Society is to try to bring them abreast of what was being done...so as to do justice to tropical patients and to tropical diseases and hygiene and to lend a hand in advancing the subject.’

These reasons are as important now as they were one hundred years ago.

Envoi

We have seen how medicine and health in the colonies developed from the colonist's need to look after its own troops and civil servants to extending this largesse first to those who worked for the colonial powers and then to the whole of the population. This was not initially wholly altruistic and it was realised that health could be a tool of empire. With the coming of independence, the colonial powers handed over heath systems with which they were justifiably very proud and that they considered to be adequate for the needs of the newly independent states. In some cases, such as Hong Kong, Taiwan and Singapore, this worked. Elsewhere, throughout most of Africa, it didn't work.

We can debate endlessly about where the faults lie and the current trend is to blame the ex-colonial powers for everything that went wrong. However many earlier commentators have had no doubt that, although colonisation had its faults, the health systems that the colonial powers had built up were great achievements. Just to quote three observations.

‘The white race has only been in the Tropics a few years but they have done in that time one great feat...they have conquered malaria.’ T.P. Macdonald, 1908

‘Colonisation has its health aspects and was never beyond reproach or without blemish. There is one thing that ennobles it, it is the action of the doctor.’ Hubert Lautey, 1926

‘Whatever political disadvantages colonisation might possess, from the biological standpoint its record is one of the greatest
successes of modern history.' Lewis Gann and Peter Duilan, 1970

Perhaps, I wouldn't go as far as this myself but my own thoughts are best expressed in the words of the Welsh poet, Dylan Thomas.

'We are not wholly bad or good
Who live our lives under Milk Wood,
And Thou, I know, wilt be the first
To see our best side, not our worst.'
- Dylan Thomas, *Under Milk Wood* 1954

This is not an apologia for colonisation but as far as health is concerned it is as good an epitaph as any.

**Selected bibliography**


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