



Health and WaSH

The Neolithic revolution and health in Africa

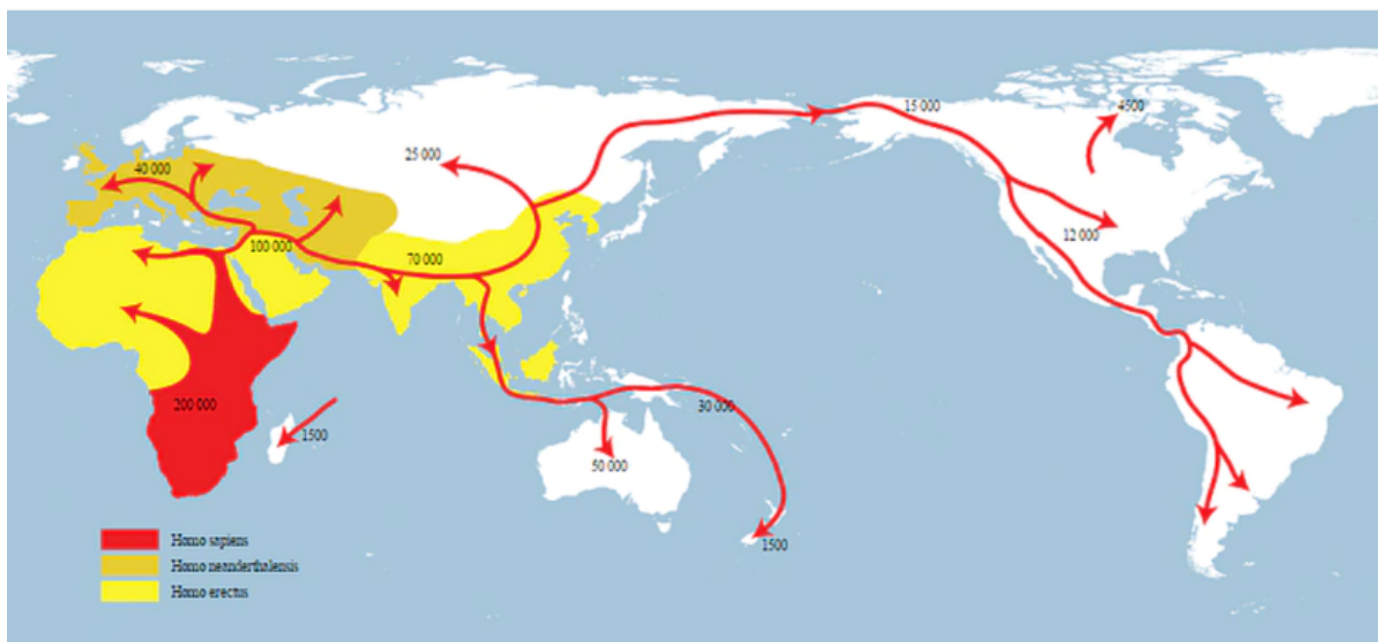
The Neolithic revolution and health in Africa

Early humans gained an initial health reprieve when, many thousands of years ago, their ancestors moved out of Africa into cooler regions with fewer insect-borne diseases and 'the many parasites and disease organisms that had evolved in parallel with the human species.'[1] As a result, humanity multiplied rapidly in these new areas, and eventually the large number of people required a more organised way of food production. Population increases gave rise to the first agricultural (or Neolithic) revolution that allowed humans, approximately 12 000 years ago, to slowly change from hunter-gatherer lifestyles into permanent settlements. It also enabled humans to transition from wild harvesting to cultivation techniques such as rudimentary irrigation systems, the selection of crops for cultivation, animal domestication, and the development of a secure food production, storage and the barter system.

Agriculture was developed several different times and in different places such as in Mesopotamia, South and Central America and elsewhere. Most prominent were the changes that occurred in the region subsequently known as the Fertile Crescent, covering the modern-day countries of eastern Turkey, Iraq, and south-western Iran. Sometimes it spread to other suitable locations through migration and trade but, with the exception of the Nile Delta, generally did not progress above certain levels in much of Africa since the demand, large human settlements, was generally absent.

Surplus food production allowed humans to establish permanent settlements and led to even higher population densities and eventually the emergence of larger groups, even civilisations. It was accompanied by commerce, a division of labour, systems of property ownership and a tiered political system. Competition spurred innovation and technological advancement. However, higher population density also bred new diseases and also led to competition, and sometimes conflict, between people over land, food, status and trade.[2]

Chart 1: Journey of Homo sapiens from Africa



Source: World History Encyclopedia, <https://www.worldhistory.org/article/1070/early-human-migration/>

In contrast to what was generally happening elsewhere, large parts of ancient Africa's interior were consistently characterised by low population densities due to its high disease burden and subsequent slow agricultural transition since relatively low population densities did not require more productive agricultural systems.

In temperate zones, such as much of Europe, parts of Asia and North Africa, the annual seasonal fluctuations serve as a

natural constraint on the breeding cycle of parasites, viruses, bacteria and insects,[3] but in sub-Saharan Africa, this cycle is not similarly disrupted. There, vector-borne diseases have been regularly transmitted to humans by mosquitoes, ticks and tsetse flies common in tropical and sub-tropical regions such as Central Africa and places where access to safe drinking water and sanitation is limited.

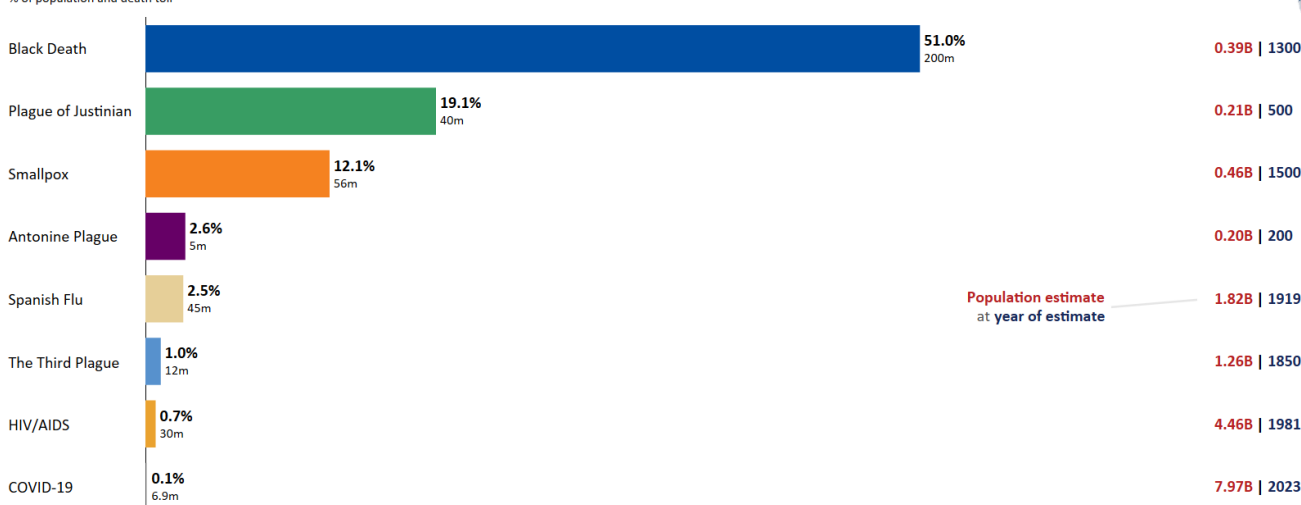
Vector-borne diseases have been endemic in large parts of Africa for thousands of years, which, in addition to their impact on humans, also prevented the use of the horse, ox or camel and so limited opportunities for agriculture and technological progress.[4] Malaria is particularly prevalent in Africa, with around 90% of cases and deaths still occurring here. The continent also accounts for 34 of the 47 countries prone to yellow fever outbreaks and about 40% of the global burden of lymphatic filariasis (elephantiasis), both being diseases spread by mosquitoes in tropical areas. Today, 16 of the 30 countries listed by the World Health Organization (WHO) as having a high burden of tuberculosis are in Africa, although none are in the top five.

In around 1 000 BCE, large populations[5] eventually appear to have grouped in five regions globally: China, the Indian subcontinent, Egypt, the Fertile Crescent, and Europe.[6] The sizable African continent, by contrast, had a much smaller population, perhaps even fewer than 20 million people, half of which was by then concentrated in a single area along the fertile Nile Valley.[7]

Although disease burdens in Europe and Asia were, on average, lower than in Africa, nature eventually reasserted itself in humanity's new habitats outside the continent. Most of today's most prominent infectious diseases, including the predecessors of HIV/AIDS and COVID-19, emerged in the last 11 000 years, following population increases and the rise of agriculture. Larger settlements, such as permanent villages and towns, swept away the spatial limitation on the spread of disease. In particular, introducing domesticated animals, for example dogs, cats, pigs, cattle and horses, increased human exposure to infectious diseases much of which was spread by rats and fleas. Three-quarters of emerging human infectious disease outbreaks are zoonotic, meaning they originate from pathogens infecting animals that then 'jump' species and infect people. Indeed, COVID-19 is a potent modern example of this phenomenon.[8]

Largely because of its low population densities and the ability to continue with hunter-gatherer lifestyles in its vast interior, the technological developments that accompanied the Bronze Age and the Iron Age bypassed much of sub-Saharan Africa. As a result of its relative isolation from global trade and conquest, Africa was also less affected by population bottlenecks (or near extinction events), such as significant famines, genocidal wars or the great plagues that affected the rest of the world, such as the Plague of Justinian, which reduced Eurasian populations by a quarter from CE 541 to 549.[9]

Chart 2: Global death toll from pandemics
% of population and death toll



Source: N LePan and H Schell, [Visualising the history of pandemics](#), 19 October 2022.

During the bubonic plague, or Black Death, that swept through Asia and Europe in the 14th century, between a quarter and two-thirds of the European population died. However, agriculture was a large enough driver of population growth, and population numbers soon started to increase again.[10]

For a while, it seemed that the African civilisations that had developed in modern-day Ethiopia (such as Aksum) and the west along the Niger River (such as the wealthy Mali Empire) could rival those elsewhere. South of the Sahara, the Bantu people had domesticated cattle and grew sorghum and millet. They had also discovered iron, but they and other groups were, at that point, not technologically advanced enough to resist external intrusion.

More and better food, improved technology and the benefits of trade would see the population of the region today known as sub-Saharan Africa increase to nearly 70 million by the middle of the 15th century, larger than that of Europe and approaching the population size of China but spread over a much larger area. However, in the three centuries that followed, the riches from the conquest of South America and the industrial revolution in Europe and then in North America saw Europe spurt ahead, leaving Africa and much of Asia behind.[11]

But, because of its high disease burden and the result of slavery that reduced productive labour in large tracts of Africa, the continent remained more rural than other regions with significant effects on the provision of safe water, improved sanitation and other basic infrastructure. The impact of these deep drivers of Africa's slow development continue to linger, particularly in considering the linkage between urbanisation and disease.

Endnotes

1. J Reader, *Africa: A Biography of the Continent*, New York: Penguin, 1998, 234
2. J Diamond, *Guns, Germs and Steel: The Fates of Human Societies*, New York: W.W. Norton & Company, 2015, 386.
3. ND Wolfe, CP Dunavan and J Diamond, Origins of major human infectious diseases, in ER Chofnes, DA Relman, LA Olsen, R Hutton and A Mack (eds.), *Improving food safety through a one health approach: Workshop summary*, Institute of Medicine, Washington, DC: National Academies Press, 2012, 349; see also: J Reader, *Africa: A biography of the continent*, New York: Penguin, 1998, 242.
4. C Aydon, *A brief history of mankind: An introduction to 150,000 years of human history*, Philadelphia: Running Press, 2009, 125.
5. Large populations are estimated at approximately 20 million people each out of a world population estimated at between 260 million and 300 million.
6. C Aydon, *The Story of Man*, Philadelphia: Running Press, 2007, 71.
7. A Maddison, *The world economy: A millennial perspective*, Paris: Organisation for Economic Co-Operation and Development, 2003.
8. ND Wolfe, CP Dunavan and J Diamond, Origins of major human infectious diseases, *Nature*, 447, 2007, 279–83. At the time of writing, the origins of COVID-19 are not fully clear, but apparently it is a recombination of two different viruses, likely from bats and pangolins, that had simultaneously infected the same organism and from there infected and spread among humans
9. Regions isolated from Eurasian plagues, such as Japan, Central and South America and parts of sub-Saharan Africa did not suffer the same fate.
10. SA Alchon, *A pest in the land: New World epidemics in a global perspective*, Albuquerque: University of New Mexico Press, 2003, 21. The third, much more recent plague in the late 19th and early 20th century was largely confined to Asia.
11. C Aydon, *The story of man*, Constable, London, 2007, 192–93, 222–23.

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About the authors

Dr Jakkie Cilliers is the ISS's founder and former executive director of the ISS. He currently serves as chair of the ISS Board of Trustees and head of the African Futures and Innovation (AFI) programme at the Pretoria office of the ISS. His 2017 best-seller *Fate of the Nation* addresses South Africa's futures from political, economic and social perspectives. His three most recent books, *Africa First! Igniting a Growth Revolution* (March 2020), *The Future of Africa: Challenges and Opportunities* (April 2021), and *Africa Tomorrow: Pathways to Prosperity* (June 2022) take a rigorous look at the continent as a whole.

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