# Cholera in Nineteenth-Century Mozambique: The Third Pandemic, 1859

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## 1.0 Introduction

Over the last decade a number of important studies of the history of cholera have appeared that significantly add to our knowledge of this pernicious disease in Africa. Christopher Hamlin offers a global overview of cholera in the Oxford series of "Biographies of Disease" that enables us to locate Africa in a wider context.[1] For a more focused historical study of cholera pandemics in Africa, Myron Echenberg's pioneering monograph stands as a landmark in the history of medicine in Africa.[2] One of Echenberg's strengths is his meticulous periodization of the seven pandemics that have affected Africa. This article focuses on the Third Pandemic (1839-1861) as it affected Portugal's colonial footholds in northern Mozambique. For historians of East Africa, Echenberg also reminds us of the monumental contribution of Dr. James Christie's *Cholera Epidemics in East Africa*.[3] Curiously neglected until very

[1] Christopher Hamlin. *Cholera, the Biography* (Oxford: Oxford University Press, 2009), Kindle version.
[2] Myron Echenberg. *Africa in the Time of Cholera: A History of Pandemics from 1817 to the Present* (Cambridge: Cambridge University Press, 2011).
[3] James Christie. *Cholera Epidemics in East Africa: An Account of the Several Diffusions of the Disease in that Country from 1821 till 1872* (London: Macmillan, 1876). Christie's fluency in Kiswahili enabled him to interrogate many different East African inhabitants, while his ethnographic sensibility facilitated his appreciation of communal hygienic differences. Christie is perhaps best known by historians of East

recently, Christie's meticulous research, which was based on a decade-long residence on Zanzibar (1865-1874), is now acknowledged as a worthy nineteenth-century parallel to John Snow's pioneering 1855 study of cholera in London.[4] Snow is remembered mainly for having first identified contaminated water as the key to the spread of cholera, whereas Christie's most notable contribution to cholera studies may be his recognition that cultural sanitary practices were an important factor in understanding who was most vulnerable to cholera contagion. Since his residence in Zanzibar post-dated the Third Pandemic, however, Christie only notes: "The epidemic extended as far as the Portuguese settlements, but I had no means of ascertaining the limits of its southern extension beyond the fact that it did not spread beyond the Zambezi…."[5]

Based on official reports in the *Boletim Oficial do Governo Geral da Provincia de Moçambique* and unpublished documentation

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Africa for the careful way in which he tracked the diffusion of cholera along both maritime and terrestrial trade routes. For a solid biography, see Edna Robertson. *Christie of Zanzibar: Medical Pathfinder* (Glendaruel, Scotland: Argyll Publishing, 2010).

[4] John Snow. *On the Mode of Communication of Cholera, 2nd edition, Much Enlarged* (London: J. Churchill, 1855).

[5] Christie, *Cholera Epidemics*, p.115. Because of his extensive interrogation of coastal merchants, however, Christie was able to trace more effectively the course of the contemporary Fourth Pandemic (1863-1879) beyond the Cape Delgado boundary of Zanzibar's coastal empire and across the Mozambique Channel to northwest Madagascar and the Comoro Islands. Ibid., 115, 434-447. Although Myron Echenberg briefly notes the extension of these two cholera pandemics into Mozambique, Malyn Newitt ignores them altogether. Echenberg, *Africa in the Time of Cholera*, pp. 19, 21, 50, 58, 60; Malyn Newitt. *A History of Mozambique* (Bloomington & London: Indiana University Press, 1995). To date, as Eduardo Medeiros comments, no one has yet attempted such a study of these pandemics for northern Mozambique. Eduardo da Conceição Medeiros. *História de Cabo Delgado e do Niassa (C. 1836-1929)* (Maputo, 1997), p. 39.

in the Arquivo Histórico de Moçambique, Maputo, I seek to reconstruct the history of the Third Cholera Pandemic in northern Mozambique during the first quarter of 1859, including both the demographic impact of the pandemic and Portuguese public health measures to control the spread of the disease. While doing so, I try to assess the state of public health knowledge of cholera at this time, both in Portugal and in Mozambique. As I undertake this analysis, I am alert to the fact that contemporary Mozambique remains a hotspot of cholera incidence in Africa.[6] Since the Seventh Pandemic (1971-present) reached Mozambique in 1973, cholera has become endemic, although it remains significantly influenced "by pandemic waves originating in the Indian subcontinent."[7] The situation in recent years has been further exacerbated both by the devastating effects of cyclones and the violent disruption caused by civil war.[8] Understanding how cholera impacted

[6] World Health Organization, "Cholera – Mozambique," *Disease Outbreak News*, p. 19. February 2018. https://www.who.int/csr/don/19-february-2018-cholera-mozambique/en/#:~:text=Cholera%20outbreaks%20have%20occurred%20in,case%20fatality%20rate%3D%200.2%25); Edgar Manuel Cambaza et al, "An Update on Cholera Studies in Mozambique," *http://dx.doi.org/10.5772/intechopen.88431*, both accessed 14 January 2021.

[7] For the Seventh Pandemic, see Echenberg, *Africa in the Time of Cholera*, pp. 87-183, especially pp. 134-139 for Mozambique; François-Xavier Weill et al, "Genomic history of the seventh pandemic of cholera in Africa," *Science* 358 (2017): pp. 785-789; the quote is from João Paulo Langa, Cynthia Sema, Nilsa De Deus, Mauro M. Columbo, Elisa Taviani, "Epidemic waves of cholera in the last two decades in Mozambique," *The Journal of Infection in Developing Countries* 9, no. 6 (2015): pp. 635-641, at 635: doi:10.3855/jidc.6943. See also Lorna Gujral et al, "Cholera Epidemiology in Mozambique Using National Surveillance Data," *The Journal of Infectious Diseases* 208, Supplement 1. Cholera in Africa: Microbiology, Epidemiology, Prevention and Control (1 November 2013): S107-S114. http://www.jstor.com/stable/42569615.

[8] Carlos Serra, *Cólera e catarse: Infra-structuras sociais de um mito nas zonas costeiras de Nampula (1998/2002)* (Maputo: Imprensa Universitária UEM, 2003); Rene F. Najera, "Cholera in Mozambique in the Wake of Cyclone Adai," 4 April 2019, https://www.historyofvaccines.org/content/blog/cyclone-idai-cholera-mozambique;

Mozambique in the nineteenth century may offer some insight into the challenges faced by the government of Mozambique in combatting this disease today.

## 2.0 The Swahili Coast

Classic cholera is an infectious, waterborne diarrheal disease caused by the *Vibrio cholerae* bacteria. Endemic to the Ganges Basin of India, the modern disease erupted into what became the First Cholera Pandemic (1817-1826), reaching Zanzibar in 1821. It returned at the end of the Second Pandemic (1828-1836) through the conduit of existing maritime commercial links with Oman and Mecca.[9] During the Third Pandemic (1839-1861) cholera again reached the Swahili coast, seemingly with disastrous consequences. The British political agent at Zanzibar, Christopher Palmer Rigby, was an observer. He noted in his diary for 10 January 1859 that "the cholera broke out and raged for a long time with the utmost severity, not only in the Town and all parts of the Island, but many towns on the mainland were almost depopulated by it." In addition to innumerable deaths in the town itself, he wrote that "ships lost their entire crews. One vessel bound for Mozambique lost three

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Edgar Cambaza et al, "Outbreak of Cholera due to Cyclone Kenneth in Northern Mozambique, 2019," *International Journal of Environmental Research and Public Health* 16, no.16 (2019): https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6720437/pdf/ijerph-16-02925.pdf, 9 pp; "Mozambique Situation Report, 10 September 2020," https://reliefweb.int/report/mozambique/mozambique-situation-report-10-september-2020, all accessed 14 January 2021; "Cabo Delgado Weekly: 4-10 January 2021," https://acleddata.com/2021/01/17/cabo-ligado-weekly-4-10-january-2021/?utm_source=Armed+Conflict+Location+%26+Event+Data+Project&utm_campaign=b9683fe6bc-Email Campaign 2018_09_21_06_50_Copy_01&utm_medium=email&utm_term=0_26a454684a-b9683fe6bc-348487997, accessed 18 January 2021.

[9] Echenberg, *Africa in the Tine of Cholera*, p. 55.

crews, and was at last run ashore and abandoned." By the beginning of February, he observed that 250 persons were dying daily: "The dead are buried amongst the living, by the roadsides in long lines of shallow graves, the earth scarcely covering the toes."[10] Looking back at the pandemic in July he reported that "in the spring of 1859 it carried off about twenty thousand persons in the Island of Zanzibar, and almost depopulated several towns on the opposite coast. It was introduced from the Red Sea at the commencement of the north-east monsoon, and travelled slowly down the coast; after it had nearly ceased at Zanzibar, it travelled south, and caused great mortality at Keelwa, Mozambique, etc."[11]

Contemporary details of the havoc at Kilwa are confirmed by Richard Burton, who in February sailed in a small dhow to Kilwa starting from the coast opposite Zanzibar. Although the critical role of contaminated water was not yet known, Burton expressed his concern that "the drinking water stood in an open cask, no joke, considering that the action of a special infectant was to be feared, and that the germs of cholera poison are so easily conveyed in liquids and in dust." Not unlike the ship for Mozambique described by Rigby, four of the crew of seven manning Burton's dhow soon died.[12] When he reached Kilwa Kivinje, Burton "did not wonder that cholera during the last 15 days had killed off half the settlement." His informants agreed that it had arrived by ships coming from Zanzibar; no one

[10] Mrs. Charles E.B. Russell (ed.), *General Rigby, Zanzibar and the Slave Trade with Journals, Dispatches, etc.* (London: George Allen & Unwin, 1935), pp. 78-79.
[11] Ibid., p. 337.
[12] Richard F. Burton, *Zanzibar; City, Island and Coast*, Vol. II (Honolulu: University Press of the Pacific, 2003 [1872], p. 334.

would visit them aboard their dhow. Although the disease seemed to be in decline, "yet the wealthier classes still clung to their mashamba, where the water is good and clean as it is filthy in the towns…" Although Burton was familiar with cholera, he confessed that he had never seen "such ravages as it committed at Kilwa."[13] When he then visited Kilwa Kisiwani on 20 February, his vessel sailed "out of the fetid harbor, through the floating carcasses…."[14] He quickly returned to Zanzibar. [15] As a result, we have no further information from Zanzibari sources for the spread southwards from Kilwa.

## 3.0 Mozambique, Island and Mainland

To understand how cholera did reach the Mozambique coast, we must instead turn to the Portuguese sources. These make it clear that at precisely the same time that Burton visited Kilwa, news of the dreaded disease had already reached Mozambique. According to the final report on the cholera epidemic in Mozambique by the Interim President of the Provincial Board of Health of Mozambique, Antonio Leal, Mozambique had been spared the earlier global pandemics.[16] At the end of 1858, however, they had learned that cholera had diffused from India to the Persian Gulf and Arabia, carried mainly by pilgrims at Mecca, down the Red Sea and Gulf of Aden until it descended upon the East African coast, "devastating Malindi, Zanzibar, and Kilwa in January of this year [1859]." Evidence of the

[13] Ibid., pp. 343-344; he provides gory details of the "hideous sights about Kilwa at that time" at 345-346.
[14] Ibid., p. 355.
[15] Ibid., p. 368.
[16] Leal was a second-class surgeon of the Royal Navy: *Boletim do Governo Geral da Provincia de Moçambique* (hereafter *BGGPM*), No. 7 (12 February 1859), p. 27, Item 25.

rapidity with which the disease spread south is attested by the fact that "on 2 February the first case of cholera in Mozambique [Island and city] was observed in the neighborhood of the Vaniyas, in a young Caucasian-Indian woman, aged fourteen."[17] Her symptoms progressed rapidly through the night, and on the following day, she perished. On that same day, "three slaves near the deceased's house were afflicted, and on the 4th, in addition to various infected persons, there were five others deceased from cholera." Leal then recorded: "From the neighborhood of the Vaniyas cholera appears to have propagated itself by spreading out to the other different neighborhoods of the city." In the following days, the first Europeans succumbed to the disease. The epidemic continued for the next fortnight, and then started to decline. The last three attacks took place on 20 March, and the final two deaths on the 23rd. "On that day the scourge (*flagello*) ended. The city began to breathe."[18]

How did the Portuguese authorities handle this public health crisis? Recognizing the dangerous threat to public health, on 5 February 1859, Governor General João Tavares d'Almeida published a "Supplement to the Official Bulletin No. 6. Popular Instructions as to the means to prevent cholera morbus, and to begin to treat it before the physician arrives."[19] What this

[17] The *Relatório* by Antonio Justino de Faria Leal to Governor General, Moçambique, 30 April 1859 was published in three issues of *BGGPM*, Nos. 24-26 (11-26 June 1859); these passages are from *BGGPM*, No. 25 (18 June 1859), p. 98. All translations are my own.

[18] Ibid. For the initial announcement of the end of the cholera epidemic, see *BGGPM*, No. 14 (2 April 1859), pp. 54-55, Bulletin of the Health Department, Leal, Moçambique Military Hospital, 31 March 1859.

[19] *BGGPM*, No. 6, 5 February 1859.

official notice indicates quite clearly (and as is confirmed by Leal's final report) is that colonial officials at the island-capital of Mozambique were well informed about the spread of cholera in East Africa—undoubtedly alerted by the regular communication between Mozambique, Zanzibar, and maritime traffic from the Swahili coast to the north of Cape Delgado—and that they had a well-developed plan for confronting this deadly disease that drew upon prior scientific and governmental practices. To understand the specific measures that were declared in these instructions to the public, we need to look more carefully at the Portuguese antecedents that informed its drafting.

In the middle of the nineteenth century, imperial Portugal was just beginning to assert more meaningful control over its African provinces, partly in response to British pressure to abolish the slave trade and slavery itself, partly as a reflection of modernizing tendencies within the Portuguese government. One aspect of this transition from an early modern empire to a modern colonial empire was the ordering of territorial censuses, a process that dates to the late eighteenth century but gained momentum from the middle of the nineteenth century.[20] Another feature was the promulgation of a royal decree in 1854 to abolish slavery, a decree communicated to Mozambique in late 1855 that eventually led to the formal abolition of slavery in the Portuguese empire in 1876. A key

[20] See Filipa Ribeiro da Silva, "From church records to royal population charts: The birth of 'modern demographic statistics' in Mozambique, 1720s-1820s," *Anais de História de Além-Mar* 16 (2015): pp. 125-150; Ana Paula Wagner, "População no Império Português: recenseamentos na África Oriental Portuguesa na segunda metade do século XVIII," (Ph.D. thesis, Universidade Federal do Paraná, Curitiba, 2009).

element in this quarter-century process was the registration of both slaves and freedmen (*libertos*) in the colonies.[21] Each of these measures marked the steady extension of metropolitan control over Portugal's distant African territories.

Still another feature of this larger nineteenth-century trend was the implementation of new health services and the bureaucratic construction of a system of regular reporting to the metropolitan centre, both from within Portugal itself and also from each of the colonies. Critical aspects of this slowly evolving public health regime included sanitation and hygiene in urban areas, construction and maintenance of hospitals and infirmaries, as well as pharmacies. It also addressed the challenges posed by infectious diseases, for which isolation was the usual response. In tropical Africa, as Ana Cristina Roque explains: "The climate, indicated as the primary cause of all diseases, was combined in all districts with a lack of sanitation and public hygiene, the proximity of swamps, the absence of sewers and the accumulation of garbage on the streets, the poor quality of water and food, and the promiscuity in which the majority of the population lived."[22] Colonial health services were designed in the first instance to protect the settler population and the military, but in practice they affected all inhabitants of Portuguese colonial population centers. Moreover, as Roque emphasizes, "the model of the Health

[21] Daniel Domingues da Silva (Rice University) and I are currently collaborating on a study of this topic in Mozambique.

[22] Ana Cristina Roque, "Disease and cure in Mozambican health service reports from the end of the nineteenth century," *História, Ciências, Saúde – Manguinhos*, Rio de Janeiro 21, no. 2 (2014): pp. 1-22, quoted at 11. http://dx.doi.org/10.1590/S0104-59702014000200006.

Service that was attempted to be implemented in Mozambique was based fundamentally on what was known and applied in Portugal."[23] This experience determined how Portuguese authorities in Mozambique sought to confront the cholera epidemic of 1859.

Portugal had been afflicted by both the second and the third cholera pandemics, the second reaching Portugal in 1831, the third in 1854. The characteristic defense of the Portuguese government in 1854-1855 was to establish *cordons sanitaires* by imposing quarantines and *lazarettos* (contagion hospitals) on both land and sea frontiers. The measures taken included the temporary occupation of buildings "to establish cholera hospitals or other health services."[24] An important consequence of these actions was that, compared to the earlier 1831-1833 epidemic (which some sources claim killed as many as 40,000 persons), this epidemic recorded 8,718 deaths, some 45 per cent of those infected with the disease. Accordingly, in 1854 the Royal Ministry strengthened the medical authority of the Public Health Commission, which then further reformed the sanitary administration of the country.[25] Another interesting feature of this epidemic in Portugal was the degree to which information

[23] Roque, "As histórias que ficaram por contar: Saúde, crescimento urbano e ambiente em Moçambique na viragem do século XIX," *Atas do Congresso Internacional Saber Tropical em Moçambique: História, Memória e Ciência* (IICT-JBT/Jardim Botânico Tropical, Lisboa, 24-26 outubro de 2012), 4/15. A royal decree dated 14 September 1844 established the structure of health services for Portugal's Overseas Provinces: *Boletim do Conselho, Ultramarino, Legislação Novissima*, Vol. 1 (1834/1851) (Lisboa: Imprensa Nacional, 1867), pp. 382-385. Thanks to Ana Roque for this reference.

[24] Laurinda Abreu, "A luta contra as *invasões* epidémicas em Portugal: políticas e agentes, séculos XVI-XIX," *Ler História* 73 (2018), quoted at 12/23, §25. https://journals.openedition.org/lerhistoria/4118.

[25] Ibid., 12/23, §26.

about the disease was being disseminated in the press, which published "daily official reports on the sanitary conditions of international ports," where all ships "arriving from one of the infected harbours had to be subjected to quarantine."[26] One recurrent theme of these newspaper stories, and indeed of many official reports, was the "degeneration, perversion, excessive consumption, dirtiness, unruliness and an excess of cucumbers and salads as the main cause of cholera," all of which were attributed to the poorer classes.[27] As Maria Almeida emphasizes, it is important to remember that "hygiene measures and proper nourishment were recommended, but the most important subject, namely clean water and sanitation, was scarcely mentioned," as "Snow's work on the link between contaminated water and the disease, and on the need for clean water and sewage treatment, although already known within the British scientific community, had not yet reached the rest of the world, where debate was to continue for several decades to come."[28]

Returning to Mozambique, let us look first at the public health situation at Mozambique in the 1850s before turning in some detail to the instructions published in the Official Bulletin on 5 February 1859. Although the economy of Mozambique was still plagued by the slave trade, the Portuguese administration was finally committed to ending the traffic and seeking to establish

[26] Maria Antónia Pires de Almeida, "The Portuguese 'Cholera Morbus' Epidemic of 1853-56 as seen by the Press," *Notes and Records of the Royal Society of London* 66, no. 1 (2012): pp. 41-53, quoted at 44.
[27] Almeida, "The Portuguese 'Cholera Morbus' Epidemic of 1853-56 as seen by the Press": p. 49.
[28] Ibid.: p. 51.

an alternative colonial economy. Local Portuguese authorities also struggled to enforce the royal decrees to register slaves and freedmen. The Third Pandemic also has to be seen in the context of other local disasters. Mozambique had suffered an outbreak of smallpox on both the island and mainland in 1856 that left more than 5,000 dead; a devastating cyclone swept across the coast in April 1858.[29] When world traveler Carlos Caldeira visited Mozambique Island in March 1852, he commented on his stroll through the African neighborhood of Missanga. He asserted that "this site is infected by the filthy habits of the blacks, and piling up of houses, despite recent orders regarding the demolition of various huts in order to allow more air to circulate in the neighborhood."[30] Caldeira's impression was extended by the lusophobic British Consul, Lyons McLeod, who resided at Mozambique for about nine months in 1857-1858, and who called the city "exceedingly dirty…the filthiest city in the universe."[31] By the time that Francisco Bordalo compiled his comprehensive mid-century report on Portugal's East African province, certain sanitary measures had recently been adopted to protect the residents of the city. "Some filthy huts in the old neighborhood (*bairro*) of Missanga were demolished; the Maragonha cistern, which held stagnant and dirtied waters, was blocked up, another public

[29] For the smallpox epidemic, see Francisco Maria Bordalo and José Joaquim Lopes de Lima, *Ensaios sobre a Estatistica das Possessões Portuguezas no Ultramar*, II Serie, Livro IV, Bordalo, "Ensaio sobre a Estatistica de Moçambique" (Lisboa: Imprensa Nacional 1859), 133; for the frequency of cyclones at Mozambique, see Alpers, *East Africa and the Indian Ocean* (Princeton: Markus Wiener, 2009), p. 171.

[30] Carlos José Caldeira, *Apontamentos d'uma Viagem de Lisboa á China e da China á Lisboa*, Parte Segunda (Lisboa: Typographia de Castro & Irmão, 1853), p. 88.

[31] Lyons McLeod, *Travels in Eastern Africa, with the Narrative of a Residence in Mozambique* (London: Hurst and Blackett, 1860), Vol. 1, p. 292.

place for washing clothes being opened in a more appropriate place," while a new cemetery was built at the end of the island, away from the main settlement, as well as another specifically for the non-Christian Africans, Vaniyas, and Parsis (*gentios, baneanes e parsees*).[32] Both Caldeira and Bordalo noted in passing that the hospital and infirmary facilities on the island were barely adequate.

It is apparent, then, that when the government of Mozambique issued its instructions about cholera in February 1859, the local public health system was fragile and that most previous efforts to improve matters reflected contemporary theories about miasmatic airs and dirt as being responsible for disease. The "Popular Instructions" were promulgated over the signatures of the Interim President of the Provincial Board of Health of Mozambique, Antonio Leal and Joaquim Francisco Collaço.[33] It begins by recording that several cases of cholera first appeared in the city on 3 February.[34] While noting that its progress was often quickly fatal, it emphasized (§1) that cholera was not a contagious disease, that although people should take care around those affected by the disease, it was not spread by contact.[35] Curiously, however, the instructions go on to state (§2): "Cholera is propagated by infection, and is carried by the accumulation of sick individuals, or even healthy, in narrow,

[32] Bordalo, "Ensaio sobre a Estatistica de Moçambique," 191. Maragonha was the adjacent neighborhood to Missanga.

[33] Collaço shared the same medical rank of second-class surgeon in the provincial military as did Leal in the Royal Navy. *BGGPM*, No. 7 (12 February 1859), p. 27, Item 25.

[34] Unless noted otherwise, the following paragraphs are based entirely on the Supplement published in *BGGPM*, No. 6 (5 February 1859).

[35] On theories of contagionism, see Hamlin, *Cholera*, Locs.2117-2150.

humid, poorly ventilated places, lacking access, which encourages the intensity of the illness and its propagation by closeness." The next instruction (§3) assures the public that the authorities will clear around and clean their houses, streets, and yards, "but for the specific interest of their families and slaves, individuals ought to voluntarily use every means so that the cleanliness of their homes is always perfect." The next item (§4) identifies that "rapid chills, indigestion, and the use of bad foods are the determining causes of cholera." These cautionary words leave no doubt that officials at Mozambique had no real idea of what caused cholera nor of how it actually spread. The Instructions then advises the wealthy inhabitants of the capital that this is all they need to know, but that masters ought to provide warm housing and blankets for their slaves; that they should not allow them to get chilled while resting suddenly outdoors after working or carrying loads and are covered in sweat; that they should not feed them too soon after they undertake tiring work; and that they should sacrifice to provide their slaves with good quality food." Clearly, each of these admonitions reflect official concerns about keeping the economy working, but also reflect sensitivity to the interests of slave owners at a time when the latter were being pressured to register their slaves and freedmen.

The next sections (§5-6) of the Instructions advises people to be on the alert for any signs of cholera, such as diarrhea, stomach, or intestinal disorders. It further advises them to treat such ailments with a mixture of Sydenham's Laudanum, which was a common medication for treating cholera, albeit completely

useless is arresting the progress of the disease.[36] If symptoms were to persist and worsen, the authorities offer additional steps to take as palliative measures. They also describe these symptoms in some detail. In the end, if none of these home remedies alleviated the progress of the disease, inhabitants were advised to call a physician. The Instructions conclude by noting that most cases occurred "in poorly fed and clothed people," which emphasized "yet another reason to pay attention to the hygienic principles." The Board of Health was preparing the Military Hospital as an isolation infirmary, "where both the poor and slaves have been and will continue to be received." In addition, they also planned to open a temporary hospital to house any patient overflow.

This detailed document makes it quite evident that the public health strategies to be followed at Mozambique were focused on quarantine and sanitation, and that the motivating purpose of these measures was to protect the Portuguese community, in particular its slave-holders. It is no less clear, as Echenberg comments, that the operative trope incorporated "a moral argument, that individual and collective behaviors still played a role in creating an infection."[37] The following days witnessed the full implementation of these strategies. A week after the initial instructions were posted, Governor General d'Almeida issued an order to clean all private houses, public squares, streets, markets, and the beaches that surrounded the island

[36] Laudanum is a tincture of opium that was used primarily as a pain medication and cough suppressant: https://en.wikipedia.org/wiki/Laudanum, accessed 23 June 2020. Thomas Sydenham was an influential seventeenth-century physician: Hamlin, *Cholera*, Locs. pp. 413, 2082.

[37] Echenberg, *Africa in the Time of Cholera*, p. 39.

according to "what science advises."[38] In the same order he appointed a Commission for Public Healthfulness composed of eleven colonial officials under the leadership of Surgeon Leal. The main charge of this Commission was to take all measures to improve the hygienic conditions of the lodgings and unsanitary buildings of the city. Accordingly, they were instructed to inspect these buildings and to remedy such conditions, or where necessary to destroy them, removing or burning the materials at the owner's expense. They were also instructed to clean the streets and all public places with the support of the inhabitants and to provide them with appropriate tools if necessary. He further ordered "the destruction or improvement of housing, or straw huts considered to be unhealthy, which are able to be focal points of infection, immediately ordering them to be whitewashed, and to open windows for ventilation."[39] The Sixth Paragraph drives home where the real fears of the government lay. It demanded that residents (*moradores*) clean up the yards and encampments (missangas) of people not needed for domestic service, sanitize the residences of the Africans, and destroy any poorly built huts remaining in these places.[40] Additional orders (§7-8) concerned attending to the removal of all accumulated materials that might negatively affect health in places both

[38] *BGGPM*, No. 7 (12 February 1859), p. 27; the order is dated 10 February 1859.
[39] Ibid., §5.
[40] *Moradores* (sing. *morador*) was a designation for Portuguese and Afro-Portuguese residents of Mozambique, as opposed to other inhabitants; *missangas* here does not refer specifically to the neighborhood called Missanga, but may refer to sandy soil or *mtsānga*, in the ShiNgazidja dialect of ShiComoro, which could reflect the close connections between Mozambique and the Comoros. See Charles Sacleux, *Dictionnaire Swahili-Français* (Paris: Institut d'Ethnologie, 1939), p. 531, *mČānga*; Alpers, *East Africa and the Indian Ocean*, pp. 147-166.

public and private, as well as to the daily emptying of designated places (latrines?) "so that miasmas and bad smell should not develop." This last prescription reveals that local authorities still clung to the ancient belief in "bad air" as a fundamental cause of many diseases. Continuing with his orders (§9) to the newly appointed Commission, the Governor General urged them to visit local warehouses and food storages to disinfect and fumigate where necessary, and to destroy spoiled goods where found. He similarly ordered (§10) them to surveil all goods sold in public, whether in markets or in shops, to verify their quality, or otherwise to destroy them. The final instructions concern seeking assistance where needed and the threat of punishment under the Penal Code for any transgressions.

Complementing the list of orders and precautions issued by the Governor General, the Municipal Council of the City of Mozambique added an edict stating (§2): "That it is absolutely prohibited to carry bodies of deceased blacks through the center of the City; they must be transported along the beaches to the point [of the island] where facilities have been established to receive them." The Council also forbade (§3) the sale of *Nicunha,* or olive oil lees because it was considered to be unhealthy. The same was ordered for coconut, sesame, or peanut husks. Finally, the Council urged the cleaning of yards, expressly forbidding the dumping of "filth or excrement, which

greatly prejudices and can aggravate the epidemic situation in which we find ourselves."[41]

A week later the situation had considerably worsened. In Decree No. 26, the Governor General ordered that because "the epidemic has produced significant mortality among the slaves and other inhabitants of the continent," the Captain-Major Commander of the Mainland had to (§1) "be on guard that the burials of deceased should be made in graves not less deep than 6 palms [18 inches or 45.72 cm] and they should be covered with earth" to avoid future infections. In addition, he should watch out for "isolated houses of the blacks so that they should not keep abandoned dead bodies in them" and the disposal of such bodies whenever they were discovered. Reflecting the bureaucratic exigencies of the colonial state, he further advised the Captain-Major that it was necessary to gather complete information on the mortality and any other ill effects of the epidemic; he ordered him to dispatch his junior officers to collect such data from people, "free, and slaves, with distinction of sex and age, deceased within twenty-four hours." (See Table 2 below).[42]

Having focused attention on the situation at Mozambique Island and on the mainland for the first month of the epidemic, the Governor General subsequently issued a set of guidelines designed to prevent the diffusion of cholera to the subordinate

[41] *BGGPM*, No. 7 (12 February 1859), p. 28, *Edital* signed by Clerk Caetano Paulo Gomes for the President, Duarte Manoel da Fonseca.
[42] *BGGPM*, No. 9 (26 February 1859), Almeida, Moçambique, 19 February 1859.

ports under Portuguese jurisdiction.[43] In framing these requirements, his decree was informed not only by the fear of transmission of the disease by ship and the disruption this could cause to trade, but also by considering measures "that have seemed sufficient in other countries." While this oblique reference lacks specificity, it does show that the Portuguese authorities were certainly aware of the wider context of combatting cholera, as I have suggested above. These requirements were set forth in twelve articles. In the first, the Governor General ordered that while the cholera epidemic persisted, ships and passengers departing from Mozambique "can be subjected to an observational quarantine of three days after arrival at their port of destination when the voyage has lasted three to five days without any case of cholera on board during the voyage." In four subordinate paragraphs to Article No. 1, the orders state that when a voyage takes less than three days, regardless of the presence of infection aboard, the quarantine shall last five days after arrival. Equally, should someone become infected during quarantine, it will be extended another five days, whether the infected person lives or dies. In all of these cases, however, accompanying merchandise could be immediately and freely admitted. Article No. 2 specifies the safe keeping and cleaning of quarantined vessels in the anchorage. According to Article No. 3, if a ship had taken eight days to reach its destination without any case of cholera on board, both ship and passengers were not required to quarantine and could freely disembark. The next article (No. 4)

[43] *BGGPM*, No. 11 (12 March 1859), pp. 41-42, Almeida, Moçambique, 12 March 1859. The following two paragraphs are based on this document.

stated: "No ship can be refused admission to the port, no matter how many sick persons are on board, but are subjected to those precautions that prudency requires, considering the rights of humanity with the interests of public health." In these cases, the ship should be held in an isolated anchorage and watched carefully, providing it with whatever assistance should be possible and safe so that it could resume its voyage. When there is a death on board (Article No. 5), the clothing and bedding of the deceased should be burned, while those effects not used by that individual should be aired and purified before setting sail. The same measures were also required (Article No. 6) in all ports where cholera was present.

Article No. 7 exemplifies the connections that linked Mozambique to the Swahili coast. "As for vessels coming from the ports North of the Coast, like Zanzibar, Mombasa, Malindi, etc., they will not be admitted freely without quarantine for at least three days and five days' maximum following arrival at the port." At such time as Mozambique or any port should remain free of cholera for a period of ten days (Article No. 8), the epidemic will be considered to be extinct and the measures articulated in the previous seven articles revoked. The ninth article required all ship's captains or owners to provide port authorities full information on all aspects of cholera that affected their crew and passengers. Article No. 10 simply required local authorities to report to the Governor General, while Articles Nos. 11 and 12 required them to inform ships

officers about these regulations and for the latter to execute these requirements or face appropriate penalties.[44]

In recognition of what in the current coronavirus pandemic would be called "front line workers," the Government Council authorized payment "for the onerous and extraordinary service" rendered by various officials, and "by the blacks employed in the movement and burial of cadavers."[45] In line with the royal instructions to keep meticulous public health records, the Portuguese published official mortality tables for the city of Mozambique for both February and March 1859.[46] Each table provides daily mortality data organized under two broad headings of "Epidemic" and "Different Diseases," only the first of which interests us here. Deaths were recorded by race and gender. The racial categories listed were Europeans, Asians, Natives, Chinese, Mujojos, and Blacks, who were further subdivided by whether they were free, freed, or slaves (*Livres, Libertos, Escravos*). The category of "Natives" is not entirely clear, but presumably it indicated free African residents of the island-city; Mujojos was a common ethnonym for Comorians. For March the total number of deaths caused by cholera was 707, for April seventy-two, for a total of 779 (Table 1). According to Leal's final report on the epidemic, at the previous census

[44] These regulations were transmitted to Ibo on the same day that they were issued at Mozambique: Arquivo Histórico de Moçambique, Cabo Delgado, Governo do Distrito (hereafter AHM, CD, GD), Códice 11-545, fl. 167-169v.

[45] *BGGPM*, No. 11 (12 March 1859), p. 42, Almeida and members of the Council, Moçambique, 12 March 1859.

[46] "*Mortalidade da Cidade de Moçambique durante o mez de Fevereiro de 1859—extrahida das participações do Administrador do Concelho*," *BGGPM*, No. 13 (26 March 1859), p. 50, Interim Secretary General José Maria Pereira d'Almeida, 1 March 1859; the parallel table for March was published a week later in *BGGPM*, No. 14 (2 April 1859), p. 54, d'Almeida, 1 April 1859.

the city had a total population of 4,522, so that the mortality caused by cholera equaled 17.2 per cent, slightly more than one-sixth of the total population.

These statistics, however, do not incorporate all the cholera fatalities at Mozambique. A separate register was kept for all deaths recorded in the Military Hospital. According to these reports, thirty-seven deaths occurred in February, while another thirteen soldiers perished in March, for a total of fifty deaths among the different categories of soldiers.[47] Leal summarizes the total intake at the Military Hospital during this period as ninety-three soldiers and 171 civilians. Of those who suffered from true cholera, as opposed to related fevers, 163 out of 215 died, while only fifty-two recovered. These figures yield an overall mortality rate of 75.8 percent, which Leal broke down as 70.58 per cent for Europeans and 77.08 per cent for Africans. He also included an analysis of the detailed progress of each of the 163 deaths at this hospital, which indicated that most died within a twenty-four hours of admission (96/193 = 58.9 percent).[48]

Unsurprisingly, data on the mainland territories of the provincial capital are less complete and less reliable. Indeed, it is worth noting that Leal does not include these figures in his final report. Still, what must be considered an abbreviated table of mortality for the mainland recorded a total of 600 deaths

[47] *BGGPM*, No. 13 (26 March 1859), p. 51, Hospital Militar de Moçambique, report by Leal dated 18 March 1859, and No. 14 (2 April 1859), p. 55, report by Leal, 2 April 1859.

[48] *BGGPM*, No. 26 (25 June 1859), p. 104. See also Leal's summary Table for all admissions during this period to the Military Hospita, *BGGPM*, No. 30 (23 July 1859), p. 119.

(Table 2), although the acting Sergeant-Major of the Mainland noted that he was unable to obtain information on Cabaceira Grande and Cabaceira Pequena, two of the largest Portuguese settlements, while he had only a total for the Swahili sheikhdom of Quitangonha.[49] A brief report on the *Te Deum* that took place at Mozambique on 15 April to celebrate the end of the cholera epidemic indicates an additional two hundred deaths for the mainland, although it omits mention of those who died in the Military Hospital: "The mortality that this epidemic produced, according to the official documents already published, was 779 individuals in the city alone, and many more than 800, according to what is believed, on the continent of which there is yet no complete information." Adding these three sets of mortality data yields a total number of recorded deaths at Mozambique Island and mainland in February-March 1859 at 1,742. The same short report added that "Until today it is not known what damage has occurred in any other part of this Province."[50]

[49] *BGGPM*, No. 15 (9 April 1859), p. 59, Frederico Jose Francisco, Infantry Batallion Captain serving as Sergeant-Major, Mossuril, 7 April 1859.
[50] *BGGPM*, No. 16 (16 April 1859).

**Table 1. Mortality caused by Cholera in City of Mozambique, March-April 1859, by Demographic Category**

| Race | Male | Female | Sub-Total |
|---|---|---|---|
| Europeans | 52 | 8 | 60 |
| Asians | 11 | 1 | 12 |
| Natives | 17 | 2 | 19 |
| Chinese | 1 | 0 | 1 |
| Mujojos | 25 | 13 | 38 |
| Free Blacks | 25 | 30 | 55 |
| Freed Blacks | 9 | 1 | 10 |
| Slaves | 321 | 263 | 584 |
| TOTAL | 461 | 318 | 779 |

***Sources:*** *BGGPM*, No. 13 (26 March 1859), 50, and No. 14 (2 April 1859), 54.

**Table 2. Mortality caused by Cholera on the Mainland Territories of Mozambique Island, 1859**

| Settlement | Free Males | Free Females | Male Slaves | Female Slaves | Sub-total |
|---|---|---|---|---|---|
| Mossuril | 10 | 15 | 82 | 159 | 266 |
| Ampoense | 0 | 1 | 6 | 4 | 11 |
| Navevem | 1 | 1 | 11 | 9 | 22 |
| Quitangonha | ___ | ___ | ___ | ___ | 250 |
| Nandoa | 5 | 3 | 15 | 3 | 26 |
| Mutamulamba | 3 | 4 | 10 | 8 | 25 |
| TOTAL | 20 | 24 | 126 | 181 | 600 |

*Source: BGGPM*, No. 15 (9 April 1859), 59.

## 4.0 Cape Delgado and the Querimba Islands

This brings us to Cabo Delgado and the Querimba Islands, that part of the Portuguese territories nearest to the major towns of the Swahili coast. The former Governor of Cabo Delgado, Jeronymo Romero, who served in that capacity in 1857-1858, composed a valuable account of that district in two parts, including separate sections on public health. He noted that Europeans lived on both the Querimba Islands and the mainland, where "the airs are very healthy." He also observed that there was no pharmacy, druggist, or surgeon in the district, "the important branch of health service is directed by African healers (*curandeiros cafreaes*) who apply certain specific medications for each sickness, the preparation of which from roots, leaves, flowers and the juices of plants whose properties they know and keep secret."[51] Muslims, however, protected themselves against sickness by wearing various amulets, which he described as "prayers written on paper in Arabic, which they call *irivi*," noting specifically one against "foul air."[52] Several years later, Romero considerably expanded on his discussion of public health, motivated by his worry that the government had no coherent health policy and had completely abandoned Cabo Delgado. He noted the generally healthy state of the district, while allowing for the seasonal frequency of certain fevers. He also acknowledged the serious mortality caused by the smallpox epidemic (presumably in 1856), aggravated by the lack

[51] Jeronymo Romero, *Memória acerca do Districto de Cabo Delgado* (Lisboa: Imprensa Nacional, 1856), pp. 32-33.
[52] Ibid., p. 30.

of knowledge of vaccination there.[53] In short, Cabo Delgado was no better prepared to deal with cholera than the capital district of Mozambique.

The island town of Ibo was the administrative capital of the Portuguese district of Cabo Delgado and the Querimba Islands. According to a long report written in mid-February 1859 by Governor João da Cunha Carvalho, the death and burial of an individual slave focused on the problem of where to bury "blacks who are not baptized in the present period when we are threatened with an epidemic and the great mortality that exists among the numerous people coming from the nearby hinterland."[54] Although Carvalho does not specifically name cholera in this report, his wording suggests that it may have already spread into and from the interior—probably overland along regional trade routes—rather than from the coast, a direction of diffusion that Christie reconstructed for the arrival of cholera to Mozambique for the 1870 epidemic.[55] Regardless, a month later cholera had definitely reached Ibo. Carvalho reported to his superiors in Mozambique that cholera had been imported around 15 March 1859 by a Mouro *pangaio* (dhow) from Zanzibar, the captain of which was infected with cholera, that had entered the harbor in search of water. He also noted that cholera now seemed to exist all along the coast. In a separate letter dated on the same day he added that "already

[53] Romero, *Supplemento á Memoria Descriptiva e Estatistica do Districto de Cabo Delgado com um Noticia ácerca do Estabelecimento da Colonia de Pemba* (Lisboa: Typographia Universal, 1860), p. 141.
[54] AHM, CD, GD, Códice 11-280, no.224, João da Cunha Carvalho to Secretaria do Governo Geral (hereafter SGG), Ibo, 13 February 1859.
[55] Christie, *Cholera Epidemics*, pp. 438-439.

the scourge of cholera had affected almost everyone of this town, having put everyone in a state of fright," and that it had lasted twenty days so far.[56] In a subsequent letter, Carvalho commented on the non-Christian population of Cabo Delgado: "The scourge called cholera morbus, origin of such corrosive disasters, kills some of these farmers, but those who are left today will survive," and, he hoped, would continue to be productive.[57] If Governor Carvalho's reports create some uncertainty about the direction of the diffusion of cholera into Cabo Delgado, one explanation may be that Ibo, where he clearly identifies its arrival by an infected ship, lies at the southern end of the string of Querimba Islands, which stretch from just south of Cape Delgado to north of Pemba Bay, so that it may have been the last location in northern Mozambique to become infected, notwithstanding its administrative centrality.

Indeed, a month after Carvalho wrote his February account, he received a warning from Mozambique that cholera had already hit Mozambique Island and much of its continental district, indicating the danger that an epidemic might spread to other ports because of regular maritime communication with the provincial capital and that the governor needed to take appropriate precautions.[58] In response to Carvalho's April report in which he articulated "the disastrous occurrences relative to the scourge of the Asiatic cholera morbus that escaped that district," the Governor General urged Carvalho to

[56] AHM, CD, GD, Códice 11-280, no. 23 & 24, Carvalho to SGG, Ibo, 10 April 1859.
[57] AHM, CD, GD, Códice 11-280, no.26, Carvalho to SGG, Ibo, 10 April 1859.
[58] AHM, CD, GD, Códice 11-1545, fl. 167-169v., *Portaria* (Government Decree), Secretary of the Government General, Moçambique, 12 March 1859.

take all possible measures "to encourage and summon the inhabitants frightened by the scourge" to continue their daily work with care.[59] Unfortunately, there is little further detail on the course of the epidemic either at Ibo or on the numerous mainland settlements of Cabo Delgado. Still, according to a summary table of mortality caused by cholera for the period from 16 March to 26 April 1859 in the town of Ibo, a total of 962 persons perished, 84.7 per cent of whom were slaves (Table 3). The author of this table regretted that there was neither a daily record of mortality, nor that it had been possible to record the religion of the deceased, although he does note that the greatest number of deaths was on 20 March, when more than sixty people died.[60]

**Table 3. Cholera Deaths at Ibo, 1859**

| Sex | Free | Freedmen | Slaves | Sub-total |
|---|---|---|---|---|
| Male | 39 | 7 | 487 | 533 |
| Female | 87 | 14 | 328 | 429 |
| TOTAL | 126 | 21 | 815 | 962 |

***Source:*** *BGGPM*, No. 35 (27 August 1859), 139.

Romero states that the population of Ibo in 1858 was 5,390, making no distinction between free and slave status, although in figures he provided for 1852 approximately four-fifths of the population were slaves.[61] Assuming his figures to be more or less accurate, then the overall mortality rate from the cholera

[59] AHM, CD, GD, Códice 11-1545, fl. 179v., Secretary of the Government General to Governor CD, 2 May 1859.
[60] *BGGPM*, No. 35 (27 August 1859), p. 139, Clerk of the Municipal Council Joaquim Jose Dias, Ibo, 22 July 1859.
[61] Romero, *Supplemento*, p. 58 and *Memória*, pp. 9, 15-16, 20-4, 29.

epidemic for Ibo would have been roughly 17.8 percent, a remarkably similar figure to that for Mozambique. The calculation for the enslaved population, estimated at 4,300, was slightly higher at almost 19 per cent. What the demographic data emphatically demonstrates for both Mozambique Island and continent, as well as for Ibo, is that it was enslaved Africans who suffered the greatest mortality. The other notable piece of information for Ibo is the significantly higher number of free women who died there in comparison to both Mozambique City and continent. This anomaly may reflect the significance of female land ownership at Ibo, a possible remnant of its long history of Crown land grants (*prazos*), which legally required a female Portuguese lineage.[62] The relatively higher number of male to female slaves at Ibo than at the island-capital may reflect the fact that, while the economy of Ibo Island had a significant agricultural component (mainly coconut plantations) that required male labor, Mozambique's administrative role featured a greater demand for domestic labor. Of course, male labor was also engaged in various maritime pursuits in both locations.

## 5.0 Final Considerations

What is undoubtedly true is that Africans, whether free or enslaved, were the principal victims of the cholera epidemic at Mozambique and Ibo, both absolutely and proportionately. As Leal himself recognized: "The African race was both absolutely and relatively more attacked than either whites or Indians," with the slaves of both Europeans and Vaniyas succumbing at

[62] See the discussion in Newitt, *Portuguese Settlement on the Zambesi: Exploration, Land Tenure and Colonial Rule in East Africa* (London: Longman, 1973), pp. 62-68.

rates of more than half to two-thirds. More generally, Leal concluded that during the epidemic, "cholera showed a definite predilection for poorly fed and clothed individuals, living in cramped and falling down shacks."[63] What no one at Mozambique yet recognized, of course, was the critical importance of a clean water supply in the prevention of cholera.[64]

Finally, speaking at the opening of a meeting of the General Council of the Province on 5 October 1859, the Governor General reviewed the terrible scourge of the cholera epidemic. While he celebrated the measures taken to combat the disease and the success in limiting its diffusion beyond Ibo, he also noted the great economic loss suffered by some landowners, virtually the only comment to this effect.[65] Unstated, of course, is that the specific cost to these individuals was the loss of much, or most, of their enslaved African labor force, and this at a time when the Crown was imposing the registration of slaves and freedmen on masters. What is never mentioned in the official documentation, however, is how cholera was perceived or understood by anyone other than colonial officialdom, whether Vaniyas, Muslims, Comorians, or Africans. What measures did individuals from these communities take? Did they appeal to traditional healers, as Romero's evidence suggests, or in any way resist official quarantine measures?

[63] *BGGPM*, No. 25 (18 June 1859), p. 99.

[64] See Roque, "As histórias": 1/15 for the insightful observations about the need for clean water by the Cirugião Mor of Quelimane and Rios de Sena in 1845.

[65] *BGGPM*, No. 52 (29 December 1860), p. 214. A footnote explains that this report was not published in a timely manner because of lack of space. See also the Royal communication praising the efforts of the Governor of Ibo for his efforts in combatting cholera in *BGGPM*, No. 1 (7 January 1860), p. 1.

I have already suggested that the cholera epidemic may have spread to Cabo Delgado overland before it reached Ibo by sea. What about Mozambique? The question of diffusion that so occupied Christie in his analysis of the Fourth Pandemic in East Africa certainly engaged Antonio Leal, as well.

> Was cholera imported? There is no probability in favor of this opinion. The only ship that arrived at Mozambique before the cholera invasion from an infected port was the yacht *Águia*, coming from Zanzibar; but the crew of the *Águia* arrived in perfect health, and only thirteen days after did the cholera begin to infect people, while no relations had existed either with the ship or its crew.[66]
>
> At the same time as the cholera punished the Island, it also devastated the nearby mainland; however, despite some indications that were made in this respect I found it impossible to explain whether the cholera began on the continent some day before or after having begun on the island. On the 5th there were certainly deaths due to cholera on the continent.[67]

[66] According to the regular feature of "*Movimento do Porto de Moçambique*," the 79-tonne *Águia* set sail from Mozambique on 29 December 1858 captained by Achumia Gulamo with a crew of thirteen and two Portuguese merchants with two servants; it returned from Zanzibar on 20 January after a three-day voyage with the same master, a crew of nine, one Portuguese passenger and servant, carrying a cargo of beads, gunpowder, and arms. *BGGPM*, No. 1 (3 January 1859), p. 4 and No. 4 (21 January 1859), p. 16.

[67] *BGGPM*, No. 25 (18 June 1859), pp. 98-99.

Allowing for Leal's uncertainty, plus the similar indications from Cabo Delgado, it strikes me as very likely that cholera initially diffused from the Swahili coast to northern Mozambique along the network of trade routes that linked coast and interior, rather than directly by sea from the Swahili coast, exactly as Christie demonstrated for the spread of the Fourth Pandemic to Mozambique in 1870. To what extent this traffic may have been linked to the slave trade remains speculative, but what we know about population movement and dislocation in the southern interior of Tanzania and northern Mozambique as a consequence of both Nguni and Yao migration in these years strongly suggests a possible link to the spread of cholera.[68] Another possibility may be that the disease spread along river networks linking southern mainland Tanzania to northern Mozambique, at least with respect to the wider Cabo Delgado region.[69]

Although it is certain that the colonial data on mainland mortality in northern Mozambique from the 1859 cholera epidemic are not comprehensive, it does appear that these communities were spared the extreme devastation that visited the towns of the Swahili coast. To this we must attribute Portuguese colonial public health efforts.

[68] See Marek Pawełczak, *The State and the Stateless. The Sultanate of Zanzibar and the East African Mainland: Politics, Economy and Society, 1837-1888* (Warszawa: Instytut Historyczny Uniwersytetu Warszawskiego, 2010), pp. 186-195; Medeiros, *História de Cabo Delgado e do Niassa*, pp. 48-57, 81-97.

[69] For a geographical "model that explicitly accounts for the role of the river network in transporting and redistributing *V. cholera* between several human communities," in this case the Thukela River basin in Kwa Zulu-Natal Province of South Africa, see E. Bertuzzo et al, "On the space-time evolution of a cholera epidemic," *Water Resources Research* 44 (2008), WO1424, doi: 10.1029/2007WR006211.

Nevertheless, when the Fourth Cholera Pandemic first reached Mozambique in 1870, there is no clear evidence that either the colonial authorities or the inhabitants of Portuguese East Africa, free and enslaved, were better able to deal with the Third Pandemic scourge that had visited those shores in 1859.[70]

[70] In writing this paper I have been struck by the similarity of official responses to cholera at Mozambique in 1859 and the SARS-CoV-2 (coronavirus) pandemic in the United States (and, no doubt, elsewhere) in 2020.