

Antibiotic Arrivals in Africa

A Case Study of Yaws and Syphilis in Malawi, Zimbabwe and Uganda

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Abstract

The mass production of antibiotics in the 1940s enabled their travel beyond Europe and America, but to date the significance of the ways in which these medicines co-constituted colonial regimes at the time has not been systematically described. Through a case study of yaws and syphilis, this research article traces arrivals of antibiotics in three countries of Eastern Africa—Malawi, Zimbabwe, and Uganda. We draw attention to the emergent roles of antibiotics at the intersection of colonial governance and humanitarianism in these different settings. Through this analysis of archival and ethnographic materials, we explore how antibiotics became ‘infrastructural’ in material, affective, and political ways. Achieving a better understanding of the entanglement of antibiotics with human systems and lives is crucial to address the pressing issue of antimicrobial resistance (AMR). With this article we join in the global multidisciplinary efforts to tackle AMR, pointing out the often-overlooked role of colonial history in the circulation of antibiotic drugs, and opening a line of research that will provide valuable insights for the development of effective measures to prevent and reduce the spread of antibiotic resistance.

Keywords

Antibiotics, Syphilis, Eastern Africa, Colonialism, Public Health.

Introduction

Antimicrobial resistance (AMR) is one of the most pressing issues in biomedicine globally. Microorganisms exposed to increasing amounts of antimicrobial compounds develop means of resisting the effects of these medicines and, in turn, our ability to treat infections caused by these microorganisms is compromised (WHO 2015). The prospect of some of our most trusted medical tools becoming useless raises the spectre of a major reversal in health trends and has shown how entangled antibiotics are with our systems and lives (Jonas et al. 2017). Developing effective measures to address AMR requires a deeper understanding of the ways antibiotics have entered into this entanglement.

Social science research has drawn attention to antibiotic use as causing the emergence of ‘networks’—that is, the often-overlooked connections, processes, and classifications that are co-produced alongside antibiotics. These networks constitute an apparatus (of guidelines, chains, and models) that defines the norm in current antibiotic use (Dixon et al. 2021; Tompson and Chandler 2021). Such networks are notoriously difficult to study, as they are part of the backdrop, and often only made visible through inversion of the status quo (Bowker and Star 2000). The resistance of microbes to antibiotics has provided such an inversion, through which the widespread arrangements into which antibiotics are integrated have begun to come to the fore (Chandler 2019). Understanding how antibiotics came to take on these infrastructural roles requires analysis of the arrangements and structures at work at the time of their introduction.

There is an impressive body of historical research on antibiotics, particularly in the global north (e.g., Bud 2007; Kirchhelle 2020; Podolsky 2015). Through this we see the ways that these medicines became infrastructural both in farming and human health (Kirchhelle 2020), and how they are entangled with political, economic, and other interests. With an increasing focus on encouraging governments and populations in the global south to better steward antibiotic use (World Health Assembly 2015), the need for an understanding of antibiotic histories outside Europe and North America becomes more pressing. While there are various mentions of antibiotics in historical accounts of colonial Africa (Crozier 2007; Iliffe 1998; Vaughan 1991), the historiography is currently thin on how they entered specific countries in Africa. This article initiates a focused attempt to fill out the history of antibiotic arrivals in human medicine. We aim to uncover how and when antibiotics arrived in three countries of Eastern Africa—Malawi, Zimbabwe, and Uganda—and analyse the underlying agendas behind these arrivals. To accomplish this, we look through the lens of post-World War II national and international yaws- and syphilis-management initiatives, paying attention to the

emergent roles of antibiotics at the intersection of colonial governance and humanitarianism.

For colonial states, the disruptive potential of epidemic disease was gauged in economic terms: security of capital, labour productivity, and financial flows. Uneven development patterns in colonial agriculture, mining, and industry gave rise to a dynamic politics of labour migration and urbanisation, as well as colonial anxiety about the maintenance and viability of labour reserves. The concern of colonial governments with the health of Africans in European colonies waxed and waned in relation to the availability of surplus labour, alongside broader concerns associated with fertility and population decline, particularly in the early twentieth century (Doyle 2000; Feierman and Janzen 1992).

There were, however, a wide range of other actors concerned with health aside from colonial governments. In addition to dispensers, import agents, and private medical practitioners, Christian missionaries played a prominent role in spreading hospital-centred care, maternal and child healthcare, and dispensary and survey programmes into rural areas, where the colonial state was largely not interested in organising medical services (Good 2004; Hokkanen 2016; Kalusa 2021). Missionaries offered an alternative route for many novel pharmaceuticals entering into circulation in post-1945 Africa (Manton 2015).

The persistent difficulties in diagnosing and managing syphilis in colonial Africa—in part due to frequent diagnostic confusion with yaws (a common treponemal disease in many parts of sub-Saharan Africa)—offer insights into important social, political, and economic dimensions of antibiotic arrivals. A general lack of diagnostic and surveillance capacity, training, and investment underpinned this confusion. In addition, the vagaries of colonial economies throughout the first half of the twentieth century, combined with limited technical means for treating or interrupting the transmission of either disease, made coherent disease-control policy impractical to sustain (Dawson 1987; McMillen 2015; Okeke 2006). Antibiotics appeared as a rapid, easy, and relatively cheap solution to this problem, allowing the implementation of short-course treatments and, consequently, helping to stabilise colonial enterprises.

Background

By the end of World War I, British imperialism had entered into a period of slow but steady decline. This weakening of the imperial project has been attributed to changes in the global economy, the pressures of World War I (and, afterwards, of World War II), and the continuous loss of territories. By 1947 the British had pulled out of India, been forced to retreat from Palestine, and were beginning to face

active resistance in Malaysia and East Africa. Later on, anti-colonial movements grew stronger in the context of the Cold War (Brown and Louis 1999; Prior 2017; Ranger and Vaughan 1993). Colonial authorities were aware of these challenges to the continuity of the British Empire and attempted to tackle them with a series of governance initiatives aimed at boosting productivity, increasing welfare, and transforming the social order. Colonial governance in African territories therefore focused on responding to the changing terrain that marked these last decades of European imperialism.

The need for national and international legitimisation of the British Empire during these last decades has been well described in the academic literature (Burroughs 1999; Decker 2007; Hodge 2007). One of the main justifications of the colonial and civilising enterprise at the time was that it was part of a greater humanitarian mission (Baughan and Everill 2012; Lester and Dussart 2014). Antibiotics presented great potential as tools to assist in this enterprise. As such, they became inserted within already-established structures of 'dispensation' created for previous forms of 'biomedical humanitarianism' (such as vaccines, arsenic-based drugs, and antimalarials). Besides, they had the added value of being effective against a broad range of bacterial infections, with rapid evidence of efficacy. This led colonial authorities to see antibiotics as 'miracle drugs' coextensive with 'civilisation'—which was itself seen as the ultimate goal of every society, following the teleological vision of development and progress that was widespread in the early to mid-twentieth century (Boisen 2013). Therefore, according to these colonial logics, antibiotics can be regarded as a materialisation of this humanitarianism.

Humanitarianism, as a concept and a practice, has changed greatly over time, extending beyond eighteenth-century anti-slavery movements into current frameworks of community empowerment and collective human rights (Barnett 2011). By the end of World War I, the humanitarian project had started to move away from the nineteenth-century focus on values and the salvation of communities. While some groups remained the target of ethno-politics, the individual became more and more important, and international organisations began to centre a large part of their efforts on individual rights and the relief of suffering. Antibiotic use became widespread immediately after the rise of international humanitarianism of the interwar period and became embedded within the practices set by the International Committee of the Red Cross (ICRC) and the League of Nations Health Organisation (LNHO) after World War I. But the humanitarian work of these organisations also involved a number of vertical, Eurocentric, professionalised and scientised initiatives (Skinner and Lester 2012; Weindling 1995), which allowed colonial powers to partake in these initiatives and to adopt them within their larger governance projects. Velvet's book *Pasteur's*

Empire (2020) offers an extensive description of this new form of ‘techno-humanitarianism’, which brought together ‘Pastorians’ (Pasteur’s disciples), foundations (such as the Rockefeller Foundation), and colonial empires. Likewise, when antibiotics arrived in colonised territories, they became part of colonial governance and the management of populations, enabling (or making more efficient) the control of people’s bodies and movements. The mass yaws and syphilis treatment campaigns promoted by colonial authorities and international organisations are a good example of how this population management was enacted (Asiedu, Fitzpatrick, and Jannin 2014). Another good example is the requirement for individuals to have medical fitness certificates to permit them to travel within regions (Hokkanen 2016).

In the African context, the relationship between colonial states and humanitarian networks deteriorated rapidly with the rise of anti-colonial nationalisms that accompanied the formation of the United Nations (UN) and the World Health Organization (WHO) in the mid-twentieth century. However, it was not until well into the 1960s, with the success of African independence movements, that international humanitarian aid started to be positioned in opposition to the colonial self-interested imposition of values—especially regarding country-specific health planning and initiatives (Manton and Gorsky 2018).

In this research, we explore the intersection between the humanitarian aims and colonial governance in which antibiotics were situated when they arrived in Africa. We argue that the trends of post-war humanitarianism suited the colonial population management imperative and served as a ‘justification’ of the imperial project. Likewise, antibiotics became part of colonial governance by enabling the management of populations and control of people’s bodies, while being championed as a keystone of medical humanitarianism. The examination of the history of these drugs shows us how these two concepts were intertwined within the imperial arena. However, by observing the tensions that arose from the use of antibiotics, we also see how humanitarianism and governance occupied different dimensions (albeit sometimes managed by the same actors). These tensions illuminate the different agendas and interests of humanitarianism and governance and shore up the set of paradigms (about antibiotics in particular, and healthcare and biomedicine in general) that we discuss in this article.

Settings

Malawi, Zimbabwe, and Uganda, on which we focus here, were all at some point part of the British Empire. This gives them a shared colonial background particular to African territories. In comparison with the colonisation processes of Asian and American countries, the incorporation of African colonies was concluded in a relatively short time, with a greater focus on the extraction of material resources

and a 'zero-cost' ideology (Porter 2004; Young 1994). However, the forms of colonisation differed between these settings, as did the interests behind them, and these differences had various implications for healthcare. All this translates into a set of specific and shared characteristics and dynamics within the colonial project that permeated the way of organising and delivering care in each setting.

Such specificity can be observed, for example, in the case of Southern Rhodesia (Zimbabwe). As a self-governed colony, its status was different from Malawi and Uganda, which were protectorates with the system of indirect rule. An important influence on the design of every system in Zimbabwe—including healthcare—was the focus on attracting White settlers, who rapidly became an elite group, demanding modern and adequate health systems (Mlambo 1998). By contrast, Nyasaland (Malawi) and Uganda did not receive many European settlers; as a result, at the beginning of the twentieth century there was little interest or incentive in establishing medical services for these specific African populations. In both countries, missionary organisations were the principal deliverers of medical care up to the end of World War II: for example, the Church Missionary Society was the main source of medical care even among colonial officers in Uganda (Holden 2015).

General living conditions within the three countries were recognised as inadequate, which ultimately affected the productivity of these populations, upset the social order, and invited international reproof. Colonial authorities sought to tackle these problems with a series of initiatives, such as the 1940 Colonial Development and Welfare Act in Nyasaland. This act implemented mechanisms to improve social conditions (Kalinga 1993), while also enabling increased health spending by the colonial administration for the non-White majority (Messac 2014). It was only within the context of post-World War II internationalism that colonial authorities started to expand their healthcare systems in earnest. They sought to boost the productivity of African workers and limit (or eliminate) traditional healing practices—which activities were considered matters of governance—and to justify their presence in the country, which was considered a humanitarian matter (Manton and Gorsky 2018; Palanco and Chandler 2020).

Another manifestation of the relation of colonial humanitarianism to governance initiatives is uncovered when we examine issues around migration. From the start, African colonies were characterised by a strong reliance on migrant workers. These were both international, being brought from British colonies in Asia, and national, moving from rural areas to urban centres (Adepoju 2006; Kynoch 2003). In Africa, much population movement can be connected to the economic interests of colonial states, which enforced such movement because of labour requirements (Adepoju 1995). This economic importance, together with broader concerns about

international legitimacy and social order, put migrants in the spotlight of colonial healthcare concerns. This can be seen clearly in the case of Uganda, where the Colonial Medical Service implemented a number of campaigns to tackle disease among migrant labourers, aimed at avoiding a drop in productivity (Uganda Medical Department 1945). Although explicitly driven by population management interests, these campaigns directly publicised their humanitarian focus, clearly demonstrating the intersection of colonial healthcare with humanitarianism and governance.

Case study: Syphilis

Syphilis is a sexually transmitted disease (STD) caused by the treponemal bacteria *Treponema pallidum*. The symptoms of this infection—sores, ulcers, skin and genital rashes and, in advanced cases, neurological and cardiac problems—are very similar to those of many other infectious diseases, and practically identical to other treponema-caused infections. This makes clinical identification and diagnosis difficult and requires the additional use of specialised blood tests or dark-field microscopy (Mitjà, Šmajš, and Bassat 2013). There is thus considerable overlap between syphilis and other treponematoses (especially yaws, but also njovera, pinta, and bejel) in the medical literature of the mid-twentieth century (Guthe, Reynolds, and Krag 1953; Guthe and Reynolds 1951; Rein 1953). Indeed, yaws is also referred to as ‘endemic syphilis’ and, even though the two diseases were known to be caused by different microorganisms, there was scientific consensus that they responded to the same treatment and epidemiology, differing only in their clinical manifestations (Guthe, Reynolds, and Krag 1953; Hackett and Guthe 1956). However, even though this consensus facilitated the delivery of treatment, it also reinforced the vision of syphilis as a ‘social disease’ (Kark 1949).

We can see this confusion in the three countries on which this articles focuses. The general belief was that ‘venereal syphilis’ was brought by colonisation and that its ‘endemic’ form was already found there (Davies 1956; Kark 1949). This problematic consideration of ‘venereal syphilis’ as a disease of ‘civilisation’—with the accompanying ‘virgin soils’ view of ‘native’ populations—was also applied to other diseases such as tuberculosis, cholera, and typhoid (McMillen 2015; Sigerist 2018). Given the already-mentioned economic pressures of the post-war period, combined with international questioning of imperialism and the emergence and consolidation of global institutions, in the 1950s colonial governments and international authorities started launching public health campaigns aimed at the eradication of syphilis and yaws (Guthe, Reynolds, and Krag 1953; Hackett and Guthe 1956; Mcletchie 1957; WHO/Department of Communicable Disease Prevention, Control and Eradication 1957; Willcox 1950). These public health campaigns were largely technologically enabled by the improved manufacture of

penicillin (and other antibiotics) developed since the beginning of World War II, which allowed mass production of affordable drugs.

Venereal diseases held a special place of interest for colonial powers, missionaries, and international organisations. On the one hand, because of the way in which they spread, they provoked strong moral reactions. On the other hand, venereal diseases (particularly syphilis and yaws) were considered to have acquired epidemic dimensions after World War II. They were therefore particularly incapacitating for the population groups that constituted the empire's workforce, and therefore seriously affected countries' economic development (Hanley 2017).

The historiography of syphilis management is substantial, with a number of works that have emphasised its importance both globally and within specific (African; European etc.) contexts (Callahan 2003; Rothschild 2005; Wilson 2000). In particular, we observe concerns rising globally about venereal diseases, especially treponematoses, which peaked in the early period after the end of World War II. For instance, the WHO, together with UNICEF, organised several international conferences for the eradication of syphilis and yaws (such as the one in Bangkok in 1952 or Enugu in 1955) which led to a series of global campaigns for tackling venereal and treponemal diseases. This wave of vertical health campaigns officially continued until 1964, and relied heavily on the recently discovered efficacy of antibiotics in treating infectious diseases; throughout this period, one shot of benzathine penicillin was the treatment of choice (Asiedu, Fitzpatrick, and Jannin 2014; Hume and Facio 1956; Thomas 1949; Mcletchie 1957; WHO/Department of Communicable Disease Prevention, Control and Eradication 1957).

Examining the management of syphilis in colonial East Africa reveals how antibiotics were adopted within African countries to support a certain set of public health arrangements that responded to particular agendas, becoming part of the story of colonial humanitarianism and governance and shoring up different paradigms. However, although undoubtedly entangled, governance and humanitarianism can be also considered as different enterprises; looking at the use of antibiotics for syphilis eradication campaigns shows us, nonetheless, that there are problems within and outside each sphere.

Methods

In this article, we take an anthropological approach to study the historical situation of antibiotics in Malawi, Zimbabwe, and Uganda. This required paying careful attention to the social encounters and social relations across domains and scales that were brought into being through the presence and possibilities of antibiotics. Our analysis joins a growing body of medical anthropology research that engages

historical research in order to explicate what has become ‘commonsensical’ in global health (Geissler and Molyneux 2011; Lynteris 2021; Giles-Vernick and Webb 2013). The findings presented here stem from a wider review of the arrival of antimicrobial drugs to Malawi, Zimbabwe, and Uganda (Palanco and Chandler 2020). This report was derived from archival analyses, oral history interviews, and present-day ethnography, and was prepared for the Improving Human Health Flagship Initiative of the Agriculture for Nutrition and Health research programme at CGIAR. Taking that report’s exhaustive description of the arrival of antibiotics in East Africa as a starting point, this article uses the case of syphilis specifically to analyse the underlying agendas of the different actors who brought these drugs to colonial Africa. The materials used to generate this article’s analysis derive from the following primary sources: the United Kingdom’s National Archives, the Uganda National Records Centre and Archives, Malawi National Archives, the WHO Archives, the British Library, and from online sources such as the IRIS repository. The research took place during the COVID-19 pandemic which limited access to archives. In addition, secondary sources in the form of books and research papers that provide historical accounts related to the topic of syphilis and African colonisation were consulted.

The archival materials consulted allowed us to place the beginning of antibiotic flows (specifically, of the antibiotic penicillin) into Africa in the 1940s; however, extensive use of the drugs was not possible until the mid-1950s. Our analysis therefore covers the period from the 1940s to the 1960s, in which most antibiotic drugs began to spread. Although pharmaceutical markets were expanding globally during the period analysed, industry actors (such as pharmaceutical manufacturers, medical supply companies, and ingredient traders) are largely absent from our sources, both national and international. Rather, the materials reviewed point to colonial institutions as the major actors in the introduction of antibiotics to Africa, which suggests that industrial and commercial companies were marginal or absent. However, we must account for the limitations of archival research: the documents that survive are those preserved by specific actors with specific interests (Decker 2013; Geiger, Moore, and Savage 2010). Therefore, we should consider the possibility that the absence of industry actors corresponds to a certain state-oriented bias within the archives consulted. Moreover, the lack of access to these pharmaceutical and on-site hospital archives limited our ability to document the precise scale of antibiotic use as it gained pace over these decades. The materials were, however, rich and instructive in enabling analysis of the discourses around antibiotics, and their potency and potential at this time, in particular in relation to the case of syphilis.

We have adopted a postcolonial perspective on the archival materials analysed, and have focused on the different ways in which antibiotics have become

'infrastructural' in material, affective, and political ways (Chandler 2019). This necessitated us asking a set of questions: who produced these archival sources that we have examined? Why? To whom were they directed? We have considered these questions in light of the contexts both in which the sources were produced (sociopolitically, historically, economically, etc.) and by which the source came to be analysed (where it was found, its archival situation, and so on). Through this, we have aimed to avoid taking these sources as 'objective' and without context; instead, we aim to situate our sources, just as when we interview present-day actors or interrogate contemporary policy.

In what follows, we describe the role of antibiotics in governance and humanitarianism. Both are considered as a stabilising tool for colonialism (which also enabled the extraction of resources) and as a way of relieving suffering for African populations. Likewise, we will consider in detail how these two dimensions interacted and conflicted, and how they related to the developmental and anti-colonial ideologies that arose in the second half of the twentieth century.

Governance

In political science, the concept of 'governance' refers, broadly, to all the processes and structures of regularisation and rule that go beyond organised government action (Risse 2011). Throughout this article, we have endorsed this definition, highlighting how colonial governance in African territories constituted the substrate in which European enterprises of all kinds were grounded. The ways in which this governance was enacted varied between settings, as it responded to the challenges colonial powers faced in particular contexts. As we have seen, in the middle of the twentieth century these challenges were often economic and related to population decline and low productivity, which threatened the extractivist aim of the metropolis. These challenges agitated colonial concerns about the health of Africans and led to a series of public health initiatives, in which antibiotics played an important role. Looking at this development in terms of the global crusade against venereal disease, we can see to what extent antibiotics—particularly penicillin and PAS (para-aminosalicylic acid)—became a central part of this mission. For instance, by 1945, the Medical Department of Nyasaland had obtained a grant for the provision of free drugs to treat venereal disease under the Colonial Welfare and Development Act—showing how tackling venereal diseases through health policy was a large part of the idea of 'development' (Secretary of State of the Colonies 1945).

One of the cases that best illustrates these economy-based public health initiatives is found within the colonial governments themselves, who carried out their own surveys and assessments. In 1949, with the help of the Rhodesian Secretary of

Health, the British medical doctor Richard Willcox went to Southern Rhodesia in the role of 'venereologist'. The objective was to undertake a survey 'with the express object of ascertaining whether more rapid and more efficient methods of treatment could, in a manner compatible with the increased cost of more modern drugs, be instituted for the African suffering from venereal diseases' (Willcox 1949). Apart from providing information about the incidence of the most common venereal diseases and the conditions for treatment and diagnosis, this wide-range survey attempted to cover the 'social factors' in which venereal disease was rooted—presenting a broad account of how the incidence of venereal diseases related to how African people lived, socialised, and worked.

In this survey, Willcox highlights syphilis as one of the most problematic diseases, both in its 'venereal' form, in congenital manifestations, and in what is referred to as 'endemic' syphilis or njovera (which, as in many contemporary writings, was not clearly differentiated from yaws within the Southern Rhodesian context). Syphilis was understood as a social problem tied to 'native customs' and ways of life, and, curiously, also to the 'detrribalisation' of African men, who were believed to fill the gap left by the loss of the tribe with the consumption of prostitution. This is the colonial paradox: authorities expressed concerns about how 'progress' impacted on 'natives', but this attention to preservation coexisted side-by-side with advocacy for the 'development' of African populations (Qureshi 2011).

Willcox lists some long-term measures that could be implemented to fix this 'social problem', such as 'tracing and compulsory treatment of native prostitutes who, undoubtedly, provide the main reservoir of infection' (1949, 46). In his reports, Willcox suggests that the greatest government efforts to prevent venereal disease should go towards 'case finding' and to the 'voluntarily imposed' examination and treatment of women. Indeed, African women were considered a risk factor 'beyond dispute', even though 'on rapid clinical examination of them the disease is often difficult to find' (idem, 47). These statements echo those of the Secretary of Health for the Colonies (1946), the Secretary of Health (1947) and the Medical Officer of Health in Bulawayo (1948) in their annual reports, all of which are cited in Willcox's (1949) report. They warn about the pernicious effects of 'detrribalisation' in the behaviour of African men and point to prostitutes as the 'main reservoir of infection' (Secretary of Health for the Colonies 1946; in Willcox 1949, 46).

However, Willcox was aware that these measures were not likely to work immediately, and he proposed a course of action to cope with the disease on a massive scale: the 'single shot' treatment. This treatment, described in more detail in his article 'Treatment of Syphilis of the Masses' (Willcox 1950), involves the use of a 'sterilising' amount of penicillin to stop the subject from passing on the disease—regardless of whether the patient is cured or not (Willcox 1949, 1950,

1951). In line with the discourse of the ‘sociocultural’ origin of disease and the tendencies of ‘unitary’ treatment of African people (Vaughan 1991), this practice was considered to be ‘the only way of addressing the problem of the native infectious pool’ (Willcox 1950). Likewise, there is evidence that ‘preventative’ doses of penicillin were administered to the family members of the patient and, in some cases, to the whole community (Guthe, Reynolds, and Krag 1953; Hume and Facio 1956; Willcox 1950).

Nonetheless, some faults were found with the ‘single shot’ methodology in 1952, when a similar survey was conducted in Nyasaland by order of the Director of Medical Services, J. L. T. Graham, this time focusing on the venereal diseases treated in Zomba African Hospital. This survey took place from February to April 1952 and involved 132 patients diagnosed with syphilis, 32 with gonorrhoea, and three with chancroid. In this report, Graham notes the organisational problems at the Zomba clinic regarding the provision of treatments, and the difficulties of carrying out contact tracing and getting patients to attend treatment. Based on these considerations, as well as ‘the present state of education of most of the African population in this country’, Graham determines that, although the single shot treatment is still ‘ideal’, it brings along ‘danger of frequent reinfection’ and ‘the expenditure of penicillin would be too great to justify its use’; therefore, arsenical and bismuth treatment is recommended (Graham 1952). This resembles the observations Monnais (2019) makes about treatments in contemporary Vietnam: continued use of the earlier-known arsenical drugs, despite the existence of better treatments, shows how drug experience creates drug habits. It seems the dynamics of treatment with arsenicals (involving many injections) created expectations about how treatments should be going forward.

Despite the difficulties of single shot penicillin treatment, there is evidence that it remained an option for preventive purposes. Three years after Graham’s survey in Zomba, the Medical Department of Nyasaland’s colonial government launched a ‘pilot attack’ on venereal diseases (Medical Officer, Domasi 1955). This was a public health campaign aiming to treat syphilis within rural Nyasaland, starting with the Domasi region. The proposed treatment aligns with Willcox’s work: two injections of 4cc of penicillin to be administered in one week that, in the words of the medical officer responsible, ‘it is hoped [...] will render population not-infective if not actually cure them’ (idem).

The ‘single shot’ treatment was addressed by specialist medical publications of the time, such as the *Central African Journal of Medicine*, which described this methodology (‘Treatment of Syphilis in the African’ 1955). And, as a result of the overlapping of diseases and their similarities, the ‘single shot’ also appears in publications about the treatment of yaws and other treponematoses infections.

These publications also mention the goal of containing the disease by rendering people non-infective (Hume and Facio 1956; WHO/Department of Communicable Disease Prevention, Control and Eradication 1957). However, the consensus was not absolute—some advocated for the complete cure of the disease and warned of the dangers of ‘half-solutions’ (Hill 1953). This trial-and-error approach to the study of STDs mirrors previous and contemporary US-promoted initiatives, such as the Tuskegee study or the medical experimentation carried out on non-European populations in Guatemala (see Podolsky 2017; Reverby 2012; Rodriguez and García 2013). We can establish a parallelism in the treatment of populations as ‘unitary’ objects of experimentation, with a narrow and racist approach to public health that ultimately served imperial interests.

This kind of one-shot treatment regime also has many parallels with further short-course treatments carried out throughout the 20th century in Africa, such as the tuberculosis control programmes in Tanzania and Kenya (Gradmann 2019; McMillen 2015). In all these cases, authorities rely on single shots of pharmaceuticals to deal with the ‘thinly spread’ colonial health services and distrust in and non-compliance of populations. Short-course drug regimens were a cheap and efficient solution imposed by a system which lacked real concern for African patients. Colonial authorities found in antibiotics great facilitators for the implementation of these regimens, because of their ease of use, their efficacy, and the low qualifications necessary for their application.

The selection of different treatments depending on what was available was common among our focus countries. We see this in Willcox’s work in Southern Rhodesia (1949): although a wide range of antimicrobial medicines (such as aureomycin and streptomycin) were known to be effective against venereal diseases, most African hospitals and government health clinics used less effective but cheaper treatments—such as weekly administration of neoarsphenamine (a sulphonamide proven to be toxic to humans), which was the oldest and most known syphilis remedy globally before penicillin. Price is widely mentioned in our archival sources as the decisive factor behind the lack of use of these alternative treatments: for example, the use of American-manufactured aureomycin was considered a luxury for British institutions, which were still under the economic pressures of the post-war period (Kirchhelle 2020). Willcox’s suggestions also have a strong economic basis—most of his advocacy for the ‘single shot’ principle was based on the premise that it reduced expense in the long term by decreasing the number of beds required in hospitals.

Looking at the conception of African populations as ‘pathological’ shows us another way antibiotics enabled colonial governance. Vaughan has written about how the vision of ‘the African body’ as a generic, unitary category prompted the

'pathologization' of African people; the prevalence of epidemic and infectious diseases in the colonies was ascribed to 'Africanness' itself, or the sociocultural foundations of African societies (Vaughan 1991). The presence of diseases such as cholera, tuberculosis, and syphilis, which not long before had wreaked havoc in European countries—and which, in many cases, were still present there among less wealthy groups—was considered to prove this 'underdevelopment', and so justify tight social control in the name of health (Buchanan 1955). This idea also supported providing care according to racial categories, as we can see in the different vaccines and treatments provided to Africans and Europeans in the case of yellow fever, plague (Velmet 2020), and syphilis (Palanco and Chandler 2020). Regarding this, Vaughan notes that, even though the effect of biomedicine on African bodies was often significant, its main power lay in 'its ability to provide a "naturalized" and pathologized account for those subjects. Biomedicine helped produce a concept of "the African" and an account of the effects of social and economic change which was plausible and socially relevant to colonial administrators and, at various points, to individual Africans themselves' (1991, 25).

One of the main problems with this 'unitary' vision of African bodies and health was that, in line with it, health services were framed as 'native services', and were therefore developed only so far as—for the colonial authorities—they fit the subjected and undeveloped population they served (Ncube 2012). These services created quick fixes unique to the colonial context, such as 'dispensaries', which distributed drugs in areas with only a weak formal biomedical network (Monnais 2019; Velmet 2020). Therefore, the public health initiatives formulated to improve the health of African populations were often inadequate for their intended context and unevenly implemented, dependent on the availability of funds and the enthusiasm of the officers on the ground.

It is important to note that economic concerns about productivity were not restricted to the colonial states but were also shared by international actors within a changing global context. One good example of this increasing global scope is the mass yaws and syphilis eradication programmes carried out by the World Health Organization (WHO). Since its official creation in 1948, the WHO had expressed concerns about the impact of venereal diseases, and the capacity of African health systems to tackle them (Hackett and Guthe 1956; WHO 1949), reflecting the worries that had already existed within the Empire and its colonies. As already observed, to a great extent these concerns involved the loss of workforce that venereal diseases in general—and syphilis in particular—were causing in what was understood as the 'underdeveloped' world. This appears clearly in an extensive article published in the *American Journal of Public Health* about the incidence of syphilis in countries other than the United States or those of Western Europe, in which concerns about the loss of productivity dominate its narrative: 'In Northern Rhodesia it has been

estimated that 100,000 man-days of labour are lost each year as a result of venereal disease' (Meleney 1952).

Within a context of post-war economic constraints, a specialist committee of the WHO was assembled to find the most efficient way of managing venereal diseases (WHO 1949). The committee's recommendations focused strongly on economising resources, for example, to reserve purer crystalline penicillin for syphilis and to use the cheaper and more abundant, but less pure, amorphous penicillin for gonorrhoea, a disease easier to treat and less incapacitating. In this way, antibiotics were consolidated within the international arena as a fundamentally 'good' medical technology, legitimising their mass use within colonised populations—which, in turn, would allow colonial powers to implement their population-managing, stabilising, governance initiatives.

Humanitarianism

We have seen that colonial governance projects required some degree of stability to accomplish their extractive goals. This, added to the need for international and national legitimacy, attracted colonial powers towards a sort of 'colonial humanitarianism' characterised by a self-interested altruism. The decades of antibiotic arrival and spread within African settings were also those of the rise of international health politics and the emergence of dedicated international health bodies (such as the WHO). These institutions surveyed the health of colonial populations and intervened in colonial health management, putting pressure on colonial powers to show 'developmental agendas' (Weindling 1995). This rise of 'developmentalism' had much to do with European needs for national economic restoration after the ravages of World War II, and gave way to a series of initiatives to boost productivity within colonial contexts under a philanthropic presentation (Cooper and Packard 2005; Zeleza 1985). A good example of this appears in the Annual Report of the Medical Department of Uganda Protectorate from 1948 (Medical Officer of Health 1948), which describes an investigation into itinerant labour in Uganda that claimed to follow 'clinical and pathological lines'. This investigation warned the authorities about the considerable sickness rate amongst the Banyaruanda-Barundi, relating it to the ecological-biological organisation of the tribes and urging the authorities to act, urging that:

The disease incidence requires attention:

- From the humanitarian point of view.
- Because the immigrant's productivity as a labourer is lowered.
- Because it is bound to harm the indigenous population directly and indirectly (Medical Officer of Health 1948).

This text places explicitly humanitarian motives alongside colonial interests of governance. Moreover, we can infer that this ‘colonial humanitarianism’ is, in a way, an effect of the overall framework of the colonial governance projects—a way in which the problem-solving dimension of governance was carried out. The locally shaped dimensions of governance produced different humanitarian overtones in different settings. This would explain the higher prevalence of development and wealth projects in Uganda and Nyasaland as compared to those in Southern Rhodesia, given the greater stability of the Rhodesian colonial government (Good 1974; Power 2010).

As has already been mentioned, for the successful accomplishment of the colonial project and its further maintenance, it was crucial for colonial authorities to keep social and civic order. This objective aligned with the developmental mission of ‘bringing progress’ to the African people, which was shared by missionaries and colonial officers in the post-1945 context. To this end, antibiotics worked to move African people away from the traditional healing practices and cultural beliefs that were threatening colonisation, adding to the already existing arsenal of biomedical technologies (such as arsenical drugs or vaccines). Following Velmet’s work on bacteriology and politics in French colonies, we can identify the ‘missionary’ aspect of biomedicine (Velmet 2020), and think about how antibiotics were set up as a champion of civilisation and progress.

By many historical accounts, there was a sharp shift in British imperial doctrines during and right after World War II: metropolitan policy shifted from a straightforward focus on augmenting British power and wealth to a policy that Hodge describes as ‘an attempt to ameliorate colonial conditions’ (2007, 179). This translated into a series of political actions such as the implementation of the Colonial Development and Welfare Act of 1940—actions that followed the principle of development as a colonial state prerogative, in line with earlier considerations of colonialism as the bearer of progress (Cooper and Packard 2005; Hodge 2007; Zeleza 1985).

Unsurprisingly, these ideas of ‘development’ and ‘welfare’ were not completely rooted in philanthropic motivations: commentators and historians have shown that there was more than pure goodwill behind these colonial policies. According to Cooper and Packard, ‘the development concept [...] was at the heart of the conceptual apparatus with which American and European social scientists and policymakers since the 1940s had come to grips with Africa’s place in the world and their own concerns with changing that place’ (1997).

Both missionaries and settlers considered that biomedical technologies in general, and antibiotics in particular, would open the door to Western ways of behaviour and smooth the ‘civilisation process’ that would, among other things, ward off evil

practices of witchcraft and ‘charlatanism’ (Iliffe 1998). From this perspective, the ‘war’ against venereal disease in general—and syphilis in particular—appears paradigmatic, almost like a metaphor of these broader aims of getting rid of ‘primitivism’ and ‘sinful’ practices among African populations (Vaughan 1991). Consequently, it also became a matter of stabilising the imperial project within the different African settings.

The value of antibiotics as stabilising tools for the Empire was increased by the association that they had with democracy in the European context. As such, some authors have commented on the role of antibiotics within international relations as being sometimes almost diplomatic tools (Bud 2007; Santesmases 2018b). This status eased the relationship between colonial self-interested altruism, the ‘salvation of souls’ pursued by missionary organisations, and international developmental humanitarianism. All these logics developed in parallel within the post-World War II imperial arena, sometimes competing with one other, but ultimately reinforcing the benefits of antibiotics. Thus, from the perspective of colonial governments, antibiotics could solve moral and economic obstacles to the success of the colonial enterprise.

In this way, we can see how antibiotics became part of the colonial apparatus across different colonised territories. At the time of their arrival in Africa, antibiotics helped to stabilise colonial enterprises, aiding both governance requirements and self-interested colonial humanitarian aims. However, colonial control over antibiotics was not complete, as colonial medical officers were non-essential intermediaries between patients and drugs (Iliffe 1998). The possibility of acquiring drugs by non-official means (such as through informal markets) highlighted the limitations of colonial governance and the agency of African populations in the early decades of antibiotic use. This autonomy in using medicines became a major concern for colonial governments, missionaries, and international organisations, as they considered that it would lead to ‘irrational use’, irresponsible behaviours towards STDs, and self-medication (Iliffe 1998; Palanco and Chandler 2020; Podolsky 2015).

Tensions between humanitarianism and governance

Despite the broad reliance of international and national organisations on it, the idea of ‘antibiotic developmentalism’ was not as straightforward as it might have seemed in the early stages of antibiotic development and circulation. Given the perceived efficacy of these medicines in curing diseases, concerns began to be raised in Western countries about how antibiotics would affect the morality of the population—having an ‘easy fix’ could eliminate the fear of disease, putting the population in ‘moral danger’. A good example of this is an editorial published in the

Journal of Venereal Disease Information (1950), in which the author complains about antibiotics providing an easy solution to venereal disease without the obligation of changing bad behaviours. The author, although admitting the benefits of the drugs, sees the arrival of antibiotics as beginning the ‘era of self-medication’ and ‘the end of the practitioner’ which, in the long term, would render people ‘careless’ and prone to re-infection.

The discourse of ‘misuse’ around antibiotics was strong and significant. Antibiotics seemed to threaten colonial authorities’ long-standing attempts to displace ‘vernacular’ medicine and establish ‘rational’ biomedical control over the therapeutic market place (Das 2019), as the drugs could be easily administered by people with little scientific knowledge (Iliffe 1998; Palanco and Chandler 2020). These concerns were especially prominent around venereal diseases. In the case of Malawi, Vaughan (1991) describes how the colonial government at times intervened in the private lives of Africans due to the perceived ‘needle mentality’ of the natives, who were accused of discontinuing treatments and not committing to medical science. However, doctors considered this intervention inappropriate, and were more likely to provide curative treatments than to advocate for closer surveillance—similar to the situations described by Velmet in West Africa (2020) and Monnais in Vietnam (2009). The tension between the ‘moral’ and ‘technical’ sides of venereal diseases increased when antibiotics allowed treatments to become easier and less painful, sparking debates about the importance of morality control as opposed to the provision of simple and free chemotherapy.

However, despite their importance, these concerns were not hegemonic. For Willcox, for example, there was no doubt about the handiness of antibiotics to tackle venereal disease. In his survey (Willcox 1949) he notes the beneficial effect of drugs in encouraging people to declare their symptoms: without antibiotics, which allow treatment outside the hospital, patients have to sacrifice work and wages for an indefinite period of time, which disincentivises them from getting checked when showing symptoms.

As we have already mentioned, different treatments were often applied following racial logics in these colonial contexts. In the article ‘Management of Syphilis in the European and the African’ (Willcox 1955), the treatment of syphilis in Europeans is described as a complex programme that relies on a combination of drugs. In contrast, a single injection of Procaine penicillin with aluminium monstreatate (PAM) was considered adequate for Africans; only ‘if supplies are plentiful’ could this injection be repeated, or half of it given a week later (Ibid.). This example shows how explicitly treatment of Africans with antibiotics depended on the resources available—and how accepted this fact was at that time. Willcox’s article goes on to specify that ‘the circumstances which dictate a somewhat different

approach to the management of these disorders in the two races have been considered, and realistic schedules of treatment to suit these circumstances have been outlined' (Ibid.).

Discussion

In this article, we have aimed to bring a combined historical-anthropological approach to the analysis of antibiotic arrivals in East Africa. Through the case study of syphilis management in Malawi, Zimbabwe, and Uganda, we note the different national and international agendas that shaped the introduction of antibiotics, and the different forces that influenced their dissemination. While concerns were raised about the possibilities of antibiotic misuse, there were also a number of supporters that believed in the potential of these drugs for achieving social and economic development. These tensions reflect the different forces and agendas that influenced antibiotic arrivals in East Africa, and how they interact and flow, sometimes mixing, sometimes conflicted, but always towards similar outcomes.

The selected countries (Malawi, Zimbabwe, and Uganda) have proved to be valuable research sites for the purposes of this project. On one hand, they present unique sets of characteristics in their colonial structures and economies, representing different forms of British colonisation. On the other, they share a common ground that differentiates them from other countries' colonies or British colonies outside Africa. This means a dual characterisation of the three countries within the global historical context, which nuances our understanding of antibiotics as tools and agents within the societies in which they were inserted.

We have seen how the ease of use, efficacy, and affordability of antibiotics enabled short-course treatments for syphilis and yaws, which also provided colonial healthcare services with a way to cope with diagnostic difficulties. Following this, we analysed how colonial governments came to rely on antibiotic drugs as a 'quick fix' to tackle the logistical and material difficulties of providing healthcare for African populations (Denyer Willis and Chandler 2019).

In the same vein, we have observed how antibiotics facilitated colonial governance initiatives of population surveillance and management (Monnais 2019; Velmet 2020). These initiatives were largely economically based, tackling the resource scarcity following World War II by increasing labour productivity in the most cost-effective manner. At the same time, antibiotics served to mitigate the growing international disapproval of imperial projects by foregrounding the humanitarian outcomes of the expansion of biomedicine (Santesmases 2018a). The pro-democratic value given to antibiotics, and its appeal within international

humanitarian projects, can be understood to align with a self-interested altruism of colonial powers which helped to legitimate colonial governance.

However, the arrival and spread of antibiotics in East Africa was not free of problems. As we have seen, moral concerns about the treatment of STDs added to more generalised anxieties about antibiotic misuse by African populations. The clashes between these detractors and more optimistic discourses of development give us an idea of the discontinuities in antibiotic flows that shaped their early use within the studied settings.

Our findings support the consideration of antibiotics as infrastructures, emphasising the contingency involved in making antibiotics work, and showing how the drugs themselves expanded the range of strategies for colonial governance (Chandler 2019). Specifically, this research shows how antibiotics can be framed as tools that enable a particular kind of governmentality. This is clear when we see how antibiotics enabled global disease eradication campaigns to take place (as with those aimed at syphilis and yaws) under the flag of international humanitarianism. As we have seen, antibiotics were the foundation that made possible these campaigns, which aligned with colonial interests and their surveillance and population management programmes. Therefore, antibiotics can be viewed as a stabilising element, allowing colonial governments to adapt to a changing international context that did not favour their existence.

The case of syphilis ties together these logics of colonial governance and international humanitarianism and appears here as a common object that consolidates mutual interests and resources. Anti-syphilis initiatives involved an actor coalition that enabled resources to get into the field and mobilise action. This is particular to a handful of diseases, as many others were not of such concern to organisations and governments, especially when framed by the added moral controversy that surrounded attitudes towards venereal diseases. Considering syphilis as a mobiliser of diverse actors in different ways helps understand how antibiotics appeared as parts of varied agendas and spread in multiple ways.

The semi-resolved diagnostic confusions regarding syphilis—which led to parallel application of antibiotics for a number of treponemal diseases across the globe—helps bring out the specific concerns of late colonialism in East African settings. Because of their globally recognised power as therapeutic substances, we argue that antibiotics in this context can be understood as a novel colonial governance strategy. This conceptualisation illuminates how these drugs were constituted as infrastructural at the time, and helps us understand how they can be considered as infrastructural now.

Above we have here recapped succinctly the history of syphilis treatment in order to focus on the specificity of cases. But there is still ample room for further historical discussion, and it would be useful to consider further the differences and continuities between different treatments. Exploring these questions could bring valuable nuances to our account of the arrival and spread of antibiotics within colonial settings.

Moreover, short-course treatments such as the ones described here have been important throughout the history of public health interventions. While it is not easy to establish continuity, there are undeniable parallels between the 1948 ‘one-shot’ treatment of syphilis and yaws (using penicillin and PAS) and current WHO-recommended treatment and eradication strategies of a number of treponema-caused diseases. Such strategies include the use of one dose of benzathine penicillin G for the treatment of early syphilis (Stamm 2021; Tipple et al. 2015; WHO 2016) or the campaigns that aim for the global eradication of yaws by the mass administration of a single dose of azithromycin (Abdulai et al. 2018; Asiedu, Fitzpatrick, and Jannin 2014; WHO 2012, 2016). Looking at the context and agendas that influenced early mass eradication programmes can teach us important lessons in improving current public health initiatives.

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