

Epidemiological Change and Chronic Disease in Sub-Saharan Africa

Social and historical perspectives

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Pathologies of modernisation: Epidemiological imaginaries and the smoking epidemic in postcolonial Africa

David Reubi

Introduction

The critical role that epidemiologists and epidemiology play in global health today has been the focus of a growing body of work in the social sciences and humanities.¹ A lot of this work has been concerned with how epidemiologists have transformed the government of international health efforts over the last 30 years, from innovative techniques to calculate life to new forms of accountability.² In contrast to this work, the present chapter examines how political and social theories have shaped epidemiological imaginaries. A few scholars have started to explore this question.³ The present chapter builds on this burgeoning body of work and examines how modernisation theory, which dominated the field of international development during decolonisation, informs the way epidemiologists and public health experts have imagined the African smoking epidemic.

The hold of modernisation theory on epidemiological and public health imaginaries dates back to the period between the early 1970s and the mid-1990s, when epidemiologists first mapped the incidence of, and attitudes to, smoking in Africa. I begin by charting the expert networks and quantification techniques that underpinned these early mapping efforts and outline how these efforts drew attention to the smoking epidemic spreading across the continent and brought to light a new social category: the African smoker. I then show how these experts

drew on tropes associated with modernisation theory to analyse and narrate the epidemic, linking the rise of smoking in Africa with economic development and industrialisation as well as new urban lifestyles and female emancipation. Drawing on modernisation theory to make sense of the smoking epidemic, I also suggest, was not without consequences. First, it led epidemiologists to believe that tobacco use in Africa would necessarily increase as the continent modernised, mirroring the patterns previously recorded in the West. Second and somewhat ironically, it undermined modernisation theory by linking modernity and economic development with new forms of disease and death. Third, it distracted from the examination of the political economy and, especially, the role of the tobacco industry in the making of the smoking epidemic in Africa. To finish, I show how, despite contradictory data, modernisation theory continues today to inform how epidemiologists and global health experts imagine not just the smoking epidemic but also the wider transition from infectious to non-communicable diseases (NCDs) on the African continent.

Mapping the African smoking epidemic

Between the early 1970s and the mid-1990s, there was a growing number of efforts by physicians and epidemiologists to map the incidence of and the attitudes to smoking in sub-Saharan Africa. Many of these researchers worked in hospitals and medical faculties in large African cities like Abidjan, Cape Town, Lagos and Nairobi. For the most part, their interest in smoking stemmed from their own and others' research on the aetiology of cancer in Africa. This was a burgeoning area of medical research during the decolonisation period in Africa, with cancer registries established in many of the region's newly independent nation-states, studies published in leading cancer journals and international conferences organised across the continent. Informed by the tradition of geographical pathology championed by Oxford epidemiologist Richard Doll, this body of research sought to 'contribute to the knowledge of the causes of cancer' by comparing the incidence and types of the disease among populations living in 'different geographical circumstances and exposed to widely varying nutritional, social, economic and other environment factors'.⁴ For those working within this tradition, the effect that seemingly rising smoking rates could have on the prevalence of lung cancer, which had hitherto been relatively uncommon across the region, was something worth studying.⁵

Besides these African-based researchers, and often collaborating with them, was a smaller group of physicians and epidemiologists working for the World Health Organization (WHO), international medical associations like the International Union against Tuberculosis and Lung Disease (UITLD) and the International Union against Cancer (UICC) or other research institutions in North America and Europe. Their contribution to the mapping of the African smoking epidemic was shaped by their work in the field of international tobacco control. At first, this field was fundamentally a North American and European affair, with smoking and smoking-related diseases deemed to be a problem that was exclusive to the rich, industrialised societies of the West. This changed from the late 1970s onwards, when public health experts realised that, with the tobacco industry working aggressively to establish new markets for its products outside North America and Europe, the smoking epidemic was quickly spreading to the Third World. This led to a reconfiguration of international tobacco control, with international efforts like the UICC Smoking and Lung Cancer Programme and the WHO Tobacco or Health Programme becoming all about educating doctors and political leaders in the developing world. The importance of knowing the prevalence of and attitudes to smoking, together with the epidemiological expertise to generate this knowledge, were critical to these efforts.⁶

Efforts to map the incidence of and attitudes to smoking in Africa were articulated around two major quantification techniques. The first of these techniques was the social survey. Most of the surveys conducted between the early 1970s and mid-1990s were small-scale and isolated efforts carried out by African-based physicians with some occasional help from international tobacco control experts and organisations. A good illustration is the surveys on smoking carried out by Professor Deji Femi-Pearse and his team at the Department of Medicine, University of Lagos, with the technical support of an eminent figure in the international tobacco control movement, Dr Charles Fletcher from the Royal College of Physicians.⁷ Another example is the surveys conducted by Dr W. Lore from the Faculty of Medicine, University of Nairobi, for which he received financial support from the UICC and used one of the WHO's standard smoking questionnaires.⁸ In addition to these small-scale, isolated surveys, larger, multi-country surveys began to be conducted in Africa from the late 1980s onwards. An early example was the smoking survey which Professor John Crofton in Edinburgh and his colleague Paul Fréour in Bordeaux coordinated for the UITLD in 42 countries, including five in sub-Saharan Africa.⁹ The aim of these different surveys was to

measure tobacco use and attitudes towards tobacco among Africans using questionnaires. For example, in their study of smoking habits in Abidjan, Dr D. Schmidt and his team at the Centre Hospitalier Universitaire de Treichville used a questionnaire to record participants' socioeconomic status, tobacco consumption, motivation to smoke and knowledge about the dangers of tobacco.¹⁰ Sometimes, surveys also included physical examinations and histopathological tests in addition to questionnaires, as in Schonland and Bradshaw's work on smoking and lung cancer in Durban.¹¹ For the most part, surveys conducted during this period focused on social groups that were easily accessible and inexpensive to study – students in the medical faculty, children and teachers in local schools, patients at the city's main public hospital – but not representative of the whole population.¹²

The second major quantification method used in early efforts to map smoking in Africa was estimation techniques, which combined epidemiological modelling with the utilisation of existing data. The main example here is the WHO Tobacco or Health Programme. One of the aims of the Programme was to collect and publish reliable epidemiological information about the smoking epidemic in Africa and elsewhere. Efforts in this area began in the early 1980s but it was only after the arrival of Alan Lopez in the late 1980s, and as part of his work with Oxford epidemiologist Richard Peto on global estimates of smoking-attributable mortality, that they really picked up and became more systematic and sophisticated.¹³ A key part of these efforts was to collect and assess the quality of existing data on smoking in Africa. This included: using diplomatic channels to request WHO member states to send their official data on smoking; examining the data on tobacco production, trade and consumption collated by the United Nations' Food and Agriculture Organisation (FAO), the World Bank and the US Department of Agriculture; and searching the scientific literature for any studies on smoking in Africa. Another key part of these efforts was to build epidemiological models of the smoking epidemic in order to compute reliable estimates about smoking prevalence where there was no data or where the existing data was inconsistent. It is as part of these efforts that Lopez and his colleagues articulated their influential model of the cigarette epidemic and produced the WHO's first *Tobacco or Health Global Status Report*.¹⁴

The picture of smoking in Africa that physicians and epidemiologists painted through their surveys and estimates seemed alarming. It showed that, as some had feared, the continent was in the grip of a serious and mounting epidemic. As Paul Fréour cautioned: 'today's Africa is faced

with a smoking pandemic that is developing right in front of our eyes, just as in the Western world'.¹⁵ To start with, drawing on the data collected by organisations like the FAO and the US Department of Agriculture, Fréour and others pointed out how cigarette consumption in sub-Saharan Africa was rapidly growing. Crofton, for example, warned that tobacco use in Africa was 'increasing at an alarming rate'.¹⁶ Specifically, he noted that while 'global consumption had risen by 7 per cent between 1970 and 1985', African countries like Kenya and others had experienced 'formidable rises' of over 30 per cent.¹⁷ In the same way, Professor Monteiro, a physician from Benin who had worked as a consultant for the WHO Tobacco or Health Programme and participated in the UITLD multi-country smoking survey, alerted his readers to 'the worrying rise in tobacco use' in Africa that would lead to 'so much human suffering, deaths and health expenses'.¹⁸

These physicians and epidemiologists also drew attention to the already disturbingly high smoking prevalence rates among men across the continent. In a report to the WHO Tobacco or Health Programme, a British public health expert stressed that, in Africa, it was 'rare to find less than 40 per cent of males regularly smoking'.¹⁹ Similarly, Crofton pointed out in an article published in the *International Journal of Epidemiology* that, in most African countries, 'some 50 per cent of men are dependent on some form of tobacco use'.²⁰ The prevalence figures used by these experts came from the small-scale smoking surveys that were being carried out in cities across the region at the time. For example, Femi-Pearse and his colleagues' highly cited study of smoking in Lagos showed that about 40 per cent of adult men in the Nigerian city smoked on a regular basis.²¹ These findings echoed those of Henri Baylet and his team in Dakar who reported that 50 per cent of the male population consumed cigarettes.²² Similarly, a study of black factory workers in Johannesburg documented that over 60 per cent smoked, while a survey at Nairobi's Kenyatta National Hospital showed that 50 per cent of the male staff were regular tobacco users.²³

It is important to point out that many health experts had doubts about the reliability of the epidemiological data on smoking in Africa, although this did not usually lead them to question the claim that the continent was in the grip of an epidemic. These doubts were fuelled by a variety of factors. First, many experts pointed to 'broad divergences' in recorded smoking prevalence rates that were 'difficult to explain'.²⁴ So, for example, in Nigeria, recorded prevalence for adult urban males ranged from as low as 7 per cent all the way up to 53 per cent for the same time period.²⁵ Similarly, in Senegal, recorded prevalence rates for adult

urban males ranged from 43 per cent to an incredible 87 per cent.²⁶ Second, many experts felt that some of the prevalence rates recorded were excessively high compared to what they saw on the ground when travelling across Africa. One consultant who had worked for the UICC Smoking and Lung Cancer Program in Africa in the 1980s remembered in an interview with me that he and his colleagues ‘always questioned smoking statistics in those days’ as they showed ‘much higher smoking rates than we would see in the field’. The usually lower prevalence rates of no more than 30 per cent among adult males that were recorded from the late 1980s onwards seem to corroborate these impressions. The UITLD multi-country smoking survey led by Crofton and Fréour, for example, counted about 20 per cent of smokers among male medical students in Benin, Kenya, Madagascar, Nigeria and Senegal.²⁷ Likewise, Lopez and his team estimated that, apart from richer countries like South Africa and Mauritius where rates were close to 50 per cent, smoking prevalence among males in sub-Saharan Africa was ‘possibly as low as 25 per cent’.²⁸ Third, experts were acutely aware of the unreliability and tentativeness of much of the data on mortality and health coming out of Africa. Crofton, for example, was always keen to remind his readers that, when ‘accessing the prevalence of smoking’ in Africa, one ‘should always appreciate the difficulty of having reliable and accurate statistics’.²⁹ Fourth and lastly, experts also stressed the absence of any epidemiological data on smoking for much of the African population. As Alan Lopez and his colleagues at the WHO explained, there is ‘very little survey information available’ on Africa, with ‘reliable data on smoking prevalence’ obtainable for no more than ‘33 per cent’ of the continent’s adult population.³⁰

The African smoker

Besides drawing attention to and measuring the size of the tobacco epidemic spreading across Africa, physicians and epidemiologists also helped trace the contours of a new figure that had emerged with the epidemic – the African smoker. As Joe Pobee, an epidemiologist at the University of Ghana who had studied smoking patterns among civil servants in Accra, explained:

The African smoker ... is an urban male cigarette user who starts in adolescence ... He is likely to belong to a lower socio-economic or to a high-income group, but he is likely to smoke more heavily

if he belongs to the latter group ... The female is not much of a smoker.³¹

As Pobe's quote makes clear, gender was a defining trait of this emerging figure of the African smoker. This was repeatedly commented upon by physicians and epidemiologists working in the field. For example, Derek Yach, a South African health expert who would later be critical of the adoption of the WHO's *Framework Convention on Tobacco Control*, and his colleagues at the Centre for Epidemiological Research in Cape Town explained: 'the strongest determinant of smoking [in Africa] is gender', with 'young girls and women smoking at very low level'.³² Similarly, when discussing the results of their multi-country smoking survey, Fréour, Crofton and their team noted that 'the amount of smoking by women was very different in Europe and Africa', with the proportion of female smokers 'much lower' in the latter.³³ For researchers, the 'very low smoking rate among females' in Africa stemmed from 'socio-cultural factors'.³⁴ Specifically, they pointed out that most communities across the continent deemed smoking to be 'a very bad behavior for women', which was 'not ladylike' and 'linked with lax morals' and 'professionally promiscuous women'.³⁵ So, for example, researchers working on smoking among women in Kenya reported that:

There was nearly universal agreement that it was not acceptable for women to smoke ... [It was thought that] women who smoked were prostitutes or might become prostitutes to obtain the money needed to purchase cigarettes ... [There was a belief that] women's cigarette smoking [was linked] with sexual promiscuity.³⁶

Another, important characteristic of the African smoker besides gender was youth and urbanicity. As Crofton explained, the 'increase in smoking prevalence' in Africa happened 'especially in the young and especially in towns'.³⁷ In the minds of doctors and epidemiologists working on the issue, cities in Africa – characterised by rapid, chaotic growth; a young, often unemployed population fuelled by migration from the countryside; and new Western forms of living – represented an environment that was propitious to the smoking epidemic. Monteiro, for example, speaking about Cotonou in Benin, lamented that:

With the introduction of Western customs, and all the attendant false values, young people in the cities imitating film heroes or advertising posters have begun to smoke on a large scale ... [It is

among] this rootless youth of the towns [that smoking has been on the rise in Africa].³⁸

This was echoed by Paul Fréour, who believed that ‘the new Western forms of smoking’ (*le nouveau tabagisme à l'occidentale*) spreading across Africa were an ‘urban form of smoking practised by young people’ (*un tabagisme citadin, un tabagisme des jeunes*) who lived in the poor, sprawling ‘shantytowns’ (*bidonvilles*) found in most of the continent’s cities.³⁹

As the work of physicians and epidemiologists showed, these young, urban smokers started to use tobacco from a very young age. For example, surveys in townships in Cape Town conducted by Yach and his colleagues showed that ‘schoolboys take up the smoking habit in their early teens’ and that, ‘by adulthood, over half of all men are smokers’.⁴⁰ For these young urban smokers, the preferred mode of tobacco use was smoking cigarettes rather than smoking pipes or chewing tobacco. As Baylet and his team noted in relation to their work on smoking habits among students at the University of Dakar: ‘young people prefer to smoke cigarettes. To be cool in nightclubs or at the movies, you cannot chew tobacco or smoke the pipe.’⁴¹ Similarly, speaking about black male workers in a factory near Johannesburg, Baker, Johnston and Turner reported that ‘the younger generation is smoking more and more cigarettes, as opposed to pipes’.⁴² Last but not least, the number of cigarettes consumed by these young, male smokers living in cities across the continent tended to be remarkably low. Alan Lopez and his team, for example, noted that ‘the number of cigarettes smoked by daily smokers is a low of 10 per day in the African region’.⁴³ Likewise, Crofton pointed out that, ‘because of poverty’, smokers in Africa ‘can only afford a few cigarettes per day’.⁴⁴

Smoking and modernity

Modernisation theory came to dominate the field of international development and the government of political, economic and social life in Africa during the decolonisation period.⁴⁵ Modernisation theory was certainly not the preserve solely of development specialists in Western aid agencies and universities; it was also enthusiastically embraced by political leaders and intellectuals in Africa. As Frederick Cooper has argued, this enthusiasm stemmed from the possibility of change that modernisation theory seemed to encompass.⁴⁶ Indeed, while colonial administrators had imagined Africans as immutably fixed in race,

customary laws and tribal structures, modernisation theorists believed that Africans could, through the process of development, free themselves from tradition and become, in the words of Swedish economist Gunnar Myrdal, 'new', 'modern men'.⁴⁷

For modernisation theorists and their followers, tradition and modernity referred to societal forms that stood at opposite ends on the scale of human progress and were characterised by contrasting political, economic, social, technological and demographic traits.⁴⁸ Specifically, tradition was associated with the simple, rural societies believed to be typical of Africa and distinguished by: extended family and tribal structures where women had few rights and responsibilities outside the home; subsistence, agrarian economies with archaic production methods; residence in villages with poor, unsanitary living standards; fatalism, superstition and religion; as well as young populations with high fertility and low life expectancy. In contrast, modernity was coupled with the imagined advanced societies of North America and Europe characterised by: strong, centralised nation-states where women were educated and emancipated; market-based, industrialised economies centered around technological innovation and mass consumption; residence in cities with high living standards and consumer goods like automobiles and televisions; rationality, science and entrepreneurship; as well as older populations with low fertility and high life expectancy. In the dichotomous world of modernisation theory, the task of development experts and political leaders was to lead Africa's newly independent nations from poverty and tradition to economic growth and modernity by investing in large physical infrastructure and industrialisation projects.⁴⁹

Modernisation theory had a clear influence on the epidemiologists and physicians who sought to map the incidence of and attitudes to smoking in Africa between the early 1970s and the mid-1990s. This influence can be seen in the way these epidemiologists and physicians drew on ideas and models of modernisation to analyse and explain the spread of the African smoking epidemic. To start with, many of them saw a strong causal relationship between industrialisation and economic growth on the one hand and smoking prevalence on the other hand. Femi-Pearse and his collaborators, for example, noted that because of the 'improved cash economy consequent upon industrialisation', 'smoking is on the increase' in many 'African towns'.⁵⁰ A case in point, they argued, was 'metropolitan Lagos' where 'the nation's foremost seaport' and over '70 per cent of the nation's industries were located'.⁵¹ Hassam Gareebo at the Ministry of Health in Mauritius made a similar point in relation to

their island-state, arguing that increases in smoking prevalence were 'due largely to the rapidly improved economic situation', with the 'economy having shifted from purely agricultural to mainly industrial'.⁵² In a similar spirit, Bradshaw and Schonland noted that 'the phenomenal growth of industry in South Africa since the second world war' has 'created economic opportunities', with a 'huge number of African males' becoming 'wage earners' and adopting 'tobacco smoking'.⁵³ This was echoed by David Nostbakken, the lead of the UICC tobacco control efforts in Africa in the 1980s, who stated that 'economic prosperity and growth [are] important predictors of cigarette consumption' in the region, with 'evidence suggesting that per capita consumption increases as per capita income increases'.⁵⁴

Epidemiologists and physicians working on tobacco in Africa also often associated rising smoking rates with urbanisation and the uptake of Western lifestyles on the continent. For example, drawing on his research on smoking in Senegal, d'Hondt suggested that there is a 'close relationship' between 'tobacco smoking and the growing adoption of Western values and ways of life concomitant with urbanisation'.⁵⁵ Similarly, Derek Yach thought that 'urbanisation [and] westernisation' have 'led to an increase in smoking in many African countries'.⁵⁶ Specifically, these epidemiologists and physicians believed that rural areas were associated with 'more primitive', 'traditional patterns of life' governed by 'local custom'.⁵⁷ People in these areas consumed tobacco but prevalence was low and forms of use were 'traditional' like pipe smoking and tobacco chewing.⁵⁸ By contrast, they associated cities with the loss of tradition and the adoption of a more 'advanced', 'Western manner of life'.⁵⁹ There, smoking prevalence was higher and took the form of the 'modern', 'industrial cigarette'.⁶⁰ So, after surveying and comparing smoking behaviours between 'urban subjects' (*les sujets urbanisés*) in Dakar and 'rural subjects living in customary villages' (*les ruraux des centres coutumiers*) in the Niakhar region of Senegal, Baylet and his team concluded that:

Urbanisation has led to changes both in the forms of smoking, with people abandoning traditional forms and preferring cigarettes, and in smoking incidence, which is higher in the urban milieu. The urban subject who can afford cigarettes is often in a stronger economic position and has, therefore, taken up a more evolved way of life. With urbanisation, the Western mode of smoking has replaced the traditional form of smoking like the pipe and chewing.⁶¹

Similarly, McGlashan and Harington remarked that, in South Africa, as 'blacks' migrate from rural towns to 'major cities' for work, their 'exposure to Western customs' and 'urban lifestyles' like 'that of cigarette smoking' increases greatly.⁶² Paul Fréour made a similar point for Africa in general:

Besides traditional forms of smoking (*tabagisme traditionnel*), there are now Western forms of smoking (*tabagisme à l'occidentale*) which spread so rapidly that they represent a real epidemic. The drivers of these Western forms of smoking are industrially manufactured cigarettes (*la cigarette industrielle*) and the large number of young people who do not integrate well in the traditional economy and migrate to cities where they hope to find work and live a Western lifestyle (*vivre à l'occidentale*).⁶³

Finally, epidemiologists and physicians also associated smoking patterns among African women with the shift from tradition to modernity in the region. They held that existing low smoking prevalence rates among African women were due to traditional sex roles, which imposed a range of restrictions on female behaviour, including the prohibition of tobacco use. As Waldron argued: 'traditional sex roles, including men's greater social power and generally greater restrictions on women's behavior, has contributed to widespread social pressures against women smoking'.⁶⁴ The few women who did smoke on the continent were deemed to be modern, educated and urban. For example, Simon Chapman, who worked for the UICC Smoking and Lung Cancer Programme in Africa, remarked that smoking among African women is generally 'confined to the small proportion who are culturally or economically elite'.⁶⁵ Similarly, Baylet and his collaborators noted that the few women who smoked in Senegal were 'very urbanised, young women' (*jeunes femmes très urbanisées*) and 'intellectuals' (*intellectuelles*) who 'contested what they saw as a limit to their liberty'.⁶⁶ Given these beliefs, it is no wonder that epidemiologists and physicians predicted that female smoking in Africa would pick up as the region modernised and women liberated themselves. So, Kaplan and her colleagues assumed that 'modernisation [would] lead to increasing sexual equity in the future' and that this would 'result in increased cigarette smoking among women' in Africa.⁶⁷ This was echoed by Collishaw and Lopez at the WHO, who believed that the low prevalence rates among women in Africa would 'increasingly be challenged by modernisation and industrialisation'.⁶⁸

The most influential attempt at narrating the African tobacco epidemic within the framework of modernisation was Lopez and his

colleagues' model of the smoking epidemic published in the journal *Tobacco Control* in 1994. As I have examined elsewhere,⁶⁹ this model was a product of international efforts at WHO and beyond to develop more reliable numbers for global smoking use and mortality. Based on the historical, statistical data available for Western countries, the model outlines how the smoking epidemic develops in any national population in the world over a 100-year period. As with many models of modernisation, such as Rostow's *Stages of Economic Growth*, the Lopez model identifies four successive, 25-year phases – which Lopez and his colleagues call Stage I, Stage II, Stage III and Stage IV – through which the epidemic unfolds. For all four stages, the epidemic is characterised through three explicit variables – smoking prevalence, smoking-attributable deaths, and public attitudes to smoking and the state of tobacco control policies, with the first two of these variables further broken down by gender. Stage I represents the start of the epidemic, when smoking becomes widely acceptable, with male prevalence rising to 15 per cent, while female prevalence remains low and tobacco control measures are non-existent. Stage II sees the epidemic develop further, with male prevalence peaking at 60 per cent, female prevalence jumping to 30 per cent and male smoking-attributable mortality starting to rise, mirroring prevalence with a 20-year time-lag due to the late onset of lung cancer. Stage III is a turning point in the epidemic: male prevalence begins to decline to about 40 per cent; female smoking plateaus; smoking-related mortality continues to climb; there is growing public awareness about the dangers of tobacco; and tobacco control measures are finally put in place. Stage IV represents the tail end of the epidemic as tobacco control measures harden and smoking prevalence for both sexes continues to decline. Crucially for us, the Lopez model further characterises the epidemic along a fourth, implicit variable: the level of economic development of a country, which seems to rise in tandem with smoking prevalence and mortality. So, Lopez and his colleagues thought that 'developing countries ... in sub-Saharan Africa are currently in Stage I', while countries that are further in their economic development 'such as China ... and other countries of Asia [and] Latin America' are in Stage II and most of the rich, industrialised 'countries of Western Europe along with Australia, Canada and the US are nearing the end of Stage III or [have passed] into Stage IV'.⁷⁰

Analysing and explaining the African smoking epidemic through the lens of modernisation had important consequences. In relation to the smoking epidemic on the continent, it meant that its future development was, in the minds of epidemiologists and physicians working on the issue,

already known and established. Specifically, they believed that, as Africa modernised, smoking rates and smoking-attributable mortality on the continent would rise accordingly. For example, a Nigerian colleague of Femi-Pearse claimed that:

Already young Africans are smoking more than their forebears ... An improved cash economy, industrialisation and aggressive advertising by international tobacco companies are likely to further increase acceptance of the cigarette smoking habit in African countries and the incidence of bronchial carcinoma is likely to increase.⁷¹

This was echoed by Diop and his colleagues working up the coast in Senegal, who asserted that:

In the current context, the health consequences of tobacco use are still invisible. But, with the rise of smoking prevalence due to urbanisation, it is to be feared that diseases associated with tobacco use will emerge as countries in Africa develop socially and economically.⁷²

Epidemiologists' belief that the African smoking epidemic would spread in the foreseeable future was compounded by their conviction that future smoking patterns on the continent would follow the patterns that had been previously observed in the West. Paul Fréour, for example, believed that the African smoking epidemic was driven by 'Western forms of smoking' (*un tabagisme à l'occidentale*) that were spreading across the continent and contributing to 'tobacco-attributed pathologies' (*une pathologie tabagique*) that 'were very similar to the Western model'.⁷³ Similarly, American economist and tobacco control specialist Kenneth Warner mused that African countries 'give a sense of déjà vu' because the countries' 'experiences are often quite comparable to our own three decades ago'.⁷⁴ But perhaps the best example was the Lopez model itself, which assumed that African countries, now in Stage I, would, if no action was taken, necessarily move to the next stages of the epidemic, which were modelled on how the epidemic had unfolded in North America and Europe in the past.⁷⁵ As two epidemiologists working for the US Centers for Disease Control and Prevention (CDC) and specialising in tobacco control explained:

Africa falls into Stage I [of the Lopez model] where the health consequences are not yet apparent on a large scale and fewer

women than men have taken up [smoking] ... If the epidemic continues [into the next stages], more women will smoke in the future, and the incidence of smoking related diseases in men and women will increase substantially.⁷⁶

In turn, the belief that smoking prevalence and smoking-attributable diseases would soon be increasing markedly in the region led many epidemiologists and physicians to think that Africa presented them with the opportunity to prevent the tobacco epidemic from happening altogether for the first time in history. Put differently, 'tobacco control in Africa' offered unique 'opportunities for prevention'.⁷⁷ So, for example, in an editorial for the WHO Tobacco or Health Initiative's newsletter, the Nigerian Minister of Health, Professor Ransome-Kuti, argued that:

Tobacco use worldwide is currently killing three million people each year and the African contribution to this figure ... is rising rapidly. [We need to] recognis[e] the need for preventive action to avoid the looming epidemic ... The challenge facing ... African countries is to prevent smoking from reaching the scale found in developed countries.⁷⁸

Lopez and his colleagues made a similar point, suggesting that African countries had the opportunity to 'prevent history from repeating itself' by taking 'strong public health measures to arrest the growth of tobacco consumption'.⁷⁹ Indeed, they 'have the advantage of knowing the serious health consequences of smoking' and of having at their disposal an array of already existing 'effective prevention interventions' to address the problem.⁸⁰

The way of reading and narrating smoking in Africa through the lens of modernisation theory also had an important consequence for the latter. Until the 1970s, modernisation and modernity had been viewed as something that nations in Africa aspired to and actively pursued. But this changed thereafter, with modernisation and modernity increasingly questioned and critiqued.⁸¹ This critique came from a variety of sources: neoliberal thinkers opposed to the central role of the state in modernisation efforts; environmentalists concerned about the ecological destruction associated with large physical infrastructure projects and industrialisation; development experts who believed that modernisation efforts should be about social progress, not just economic growth; and Marxists and dependency theorists who held that modernisation efforts simply perpetuated the underdevelopment of the periphery and

its exploitation through the metropole. Epidemiologists' and physicians' early efforts to map and understand smoking in Africa further fuelled this critique of modernisation. Indeed, their work suggested that modernisation and modernity was not just something desirable, which brought about prosperity and progress, but also something darker, which led to increased disease and death. Their use of the term 'pathologies of development' (*pathologies du développement*) to refer to smoking-related diseases like cancer made this association between disease and modernity particularly clear.⁸² Schmidt and his team in Abidjan, for example, spoke about 'a pulmonary pathology linked to development' when they sought to warn against lung cancer among Africans due to higher cigarette consumption.⁸³ In the same way, another epidemiologist working in West Africa argued that the advent of smoking-attributable lung cancer in Africa was a typical case of a 'pathology of development', where 'the evolution in the population's mode of life' had transformed 'cancerogenic risk factors' and led to the 'emergence of a new pathology'.⁸⁴ Others spoke about a modernisation that was taking place too rapidly or imperfectly to convey this unfortunate relationship between modernity and disease. Warner, for example, suggested that, in their 'rapid adoption of smoking', countries in Africa are 'modernising all too quickly'.⁸⁵ Similarly, anthropologist Kenyon Rainer Stebbins argued that 'the rise in chronic diseases' associated with smoking in Africa and elsewhere was best viewed as the product of a 'defective modernisation' that 'prioritises economic growth ahead of human welfare'.⁸⁶

This talk of smoking and smoking-related diseases as pathologies of development echoed but differed in important ways from the belief held by doctors in late-colonial British Africa that 'civilisation was sending Africans mad'.⁸⁷ These doctors felt that, in the late-colonial period, the incidence of insanity was rising among 'educated, urbanised' Africans, while it remained very low among 'traditional' Africans. Drawing on theories of acculturation, they thought that the reason for these trends was that Africans were emotionally unstable and could easily become insane when trading their cultural traditions for a Western education and an urban lifestyle. As Megan Vaughan has shown, these ideas were part of wider fears that the upheavals of colonialism – industrialisation, education, urbanisation – were leading to the destruction of traditional African structures and a loss of social control.⁸⁸ More importantly, she also showed that these ideas were articulated around a notion of racial difference whereby Africans, unlike Europeans, had an 'innate psychological inferiority' that made them unable 'to cope with civilisation'.⁸⁹ In contrast, talk of smoking and

smoking-related diseases as pathologies of development was based on a concept of sameness, with modernisation theorists suggesting Africans could be modern on a par with Europeans.⁹⁰ There is, in the West, a long history of associating smoking and smoking-related diseases with modernity. Many physicians in Nazi Germany, for example, viewed cancer as a 'disease of civilisation' that could be traced to 'excessive smoking' and was 'rare among the primitive races of the world'.⁹¹ In the postwar period, health experts believed that the rise in chronic disease was exclusive to the West and the result of the 'affluent, self-indulgent American lifestyle' characterised by 'city living', 'driving', 'habits of indolence [and] the abuse of alcohol, tobacco and drugs'.⁹² The identification of smoking and smoking-related diseases as pathologies of development made it possible for Africans to now share these health risks and diseases with Europeans.

To finish, it is important to note that, while the modernisation framework made it possible for epidemiologists and physicians to link smoking to economic growth, industrialisation, urbanisation and female emancipation, it did not really encourage them to examine the political economy of the African tobacco epidemic and, especially, the role of the cigarette industry in the making of the epidemic. As a matter of fact, only a few of them made more than a cursory allusion to the impact that transnational tobacco corporations might have on smoking prevalence rates on the continent. This, of course, is not to say that no one recognised and examined the role of the tobacco industry in the making of the African smoking epidemic. Indeed, at about the same time that epidemiologists started mapping smoking in Africa, another network of experts began analysing how transnational tobacco corporations both incited African governments to increase tobacco cultivation and worked hard to establish new markets for their products on the continent.⁹³ Drawing on ideas from neo-Marxist thought, dependency theory and the environmental movement, the economists, anthropologists and development experts that made up this network were highly critical of the tobacco industry and its impact on African development. They depicted how multinational cigarette companies bankrupted small farmers and pushed them into debt by controlling production and prices thanks to their oligopolistic position in the market. They also outlined how tobacco cultivation led to severe environmental damage, from pesticides poisoning water supplies to soil erosion and deforestation. Furthermore, they described how the tobacco industry lured Africans to smoke through aggressive marketing strategies, vast distribution networks and corruption practices to thwart tobacco control efforts.

These concerns were progressively picked up by international tobacco control activists during the 1980s and 1990s and, by the turn of the century, they had become part of standard public health thinking, where they shared the stage, sometimes uneasily, with modernisation tropes.

The enduring spell of modernisation

Sustained and comprehensive efforts to reduce tobacco use in Africa only really picked up in the new millennium, after the adoption of the WHO's *Framework Convention on Tobacco Control* in 2003 and in tandem with the increasing focus on non-communicable diseases in global health.⁹⁴ To begin with, there has been a multiplication of international tobacco control initiatives in the region, from the Africa Tobacco Control Regional Initiative set up by the American Cancer Society together with Cancer Research UK to the Bloomberg Initiative to Reduce Tobacco Use financed by the Gates and Bloomberg foundations. Aimed at strengthening the tobacco control movement in Africa, these initiatives have trained activists across the continent, organised anti-smoking campaigns in countries, coordinated large epidemiological surveys and funded research on regional tobacco taxation policies. Regional organisations like the African Union, the WHO's Regional Office for Africa and the Economic Community of West African States have also expressed a growing concern about tobacco use on the continent, publishing reports and holding high-level meetings on the subject. Similarly, an increasing number of civil society groups across the continent have taken up the issue, drawing the public's attention to the dangers of smoking and lobbying for better tobacco control policies in their countries, often with the support of the African Tobacco Control Alliance. Finally, a growing number of governments in the region, from South Africa, Mauritius and Kenya to Ghana, Senegal and Uganda, have set up national tobacco control commissions and adopted comprehensive tobacco control laws and policies.

The understanding of the African smoking epidemic at the heart of these tobacco control efforts is indistinguishable from the one articulated by epidemiologists and physicians between the early 1970s and mid-1990s and influenced by modernisation theory. Indeed, experts involved in these recent efforts usually assume, drawing explicitly on Lopez' 1994 model, that Africa is in the early stages of the epidemic and that, if nothing is done to prevent it, the region will experience a dramatic rise in smoking, as was the case in the West. For example, at the opening

of the Centre for Tobacco Control in Africa (CTCA) in Kampala in 2011, the head of the WHO Tobacco Free Initiative, Douglas Bettcher, argued that the tobacco epidemic in Africa is 'at an early stage of development' and that 'the CTCA can help prevent this relentless epidemic unfolding the way it has done in other parts of the world'.⁹⁵ Similarly, Nkosazana Dlamini-Zuma, the African Union's Chairperson and former Health Minister for South Africa, outlined in an editorial in the *South African Medical Journal* that 'Africa is still in the early stages of the tobacco epidemic' and that African governments 'must intervene now to prevent [future] tobacco-related death [and] disease'.⁹⁶ This was echoed in a report by the African Union on the impact of tobacco use in Africa which stated that:

Lopez ... outlined a four-stage model describing tobacco use and its effects ... [While] high-income countries have moved into stage 4 ... [and] middle-income countries such as China ... are in stages 2 and 3, ... the African continent is largely in stage 1 ... [This presents] valuable opportunities for prevention ... Without any systematic intervention to prevent smoking ... [the] trajectory [of the epidemic in Africa will] most likely ... [mirror] the experience of high-income countries.⁹⁷

The Gates Foundation, which is one of the biggest donors in tobacco control in Africa, made the same point in its 'Tobacco Control Strategy Overview', claiming that the 'tobacco epidemic in Africa is at a relatively early stage' and that, 'if strong tobacco control measures are not implemented' now, 'tobacco use could double in the coming years'.⁹⁸

For experts involved in contemporary tobacco control efforts on the continent, the reason why smoking prevalence would soon rise was because the region was modernising and developing at pace. First, they believed that economic growth and rising incomes among some segments of the population meant that a growing number of Africans could now afford to purchase and smoke cigarettes. As the Uganda Tobacco Control Alliance suggested, 'sustained economic growth' will 'drive tobacco consumption in Africa to double within the next ten years'.⁹⁹ Likewise, in a report for the Gates Foundation, two economists at the University of Cape Town explained that, in the twenty-first century, 'Africa has experienced some of the strongest economic growth in decades' and that, 'as the economy grows and incomes rise', there is a 'growth in the number of smokers and cigarettes smoked in Africa'.¹⁰⁰ Furthermore, many of these experts also thought that smoking prevalence

increased with the continent's rapid urbanisation and adoption of modern sedentary lifestyles. Yussef Saloojee, a South African tobacco control veteran, argued that 'urbanisation' is one of the 'factors facilitating the adoption of cigarette smoking' and other unhealthy, 'Western lifestyles'.¹⁰¹ In the same vein, development specialists working for the International Development and Research Council in Canada believed that, 'as countries urbanise and modernise', a 'greater numbers of Africans are adopting [unhealthy Western] lifestyles' like cigarette smoking.¹⁰² Finally, many of these experts also associated increased smoking with the emancipation of women in Africa. As two American epidemiologists working on tobacco use in Uganda argued: 'women's empowerment is associated with greater tobacco use'.¹⁰³ The same point was made by two Nigerian researchers about smoking among young women in their country:

[With modernisation,] Western ideas are set as models, traditional culture and ties are weakened and women's emancipation is championed. The effect of these is [women's] adoption of lifestyles simulating that of the West [like] tobacco smoking.¹⁰⁴

My purpose here is to outline the enduring influence of modernisation theory on epidemiological imaginaries of smoking in Africa, not to assess whether these imaginaries are consistent with the reality on the ground. However, it is still worth noting that the outline of the African tobacco epidemic privileged by modernisation theory – where smoking prevalence rises quickly from a low base and which is best exemplified by the Lopez model – does not seem to fit with the epidemiological data on tobacco use collected in the region. Indeed, if we follow the Lopez model, Africa was in the first stage of the epidemic in the early 1990s with male smoking prevalence at 15 per cent and would now be, about 30 years later, in the second stage with male smoking prevalence at 60 per cent.¹⁰⁵ However, if anything, the epidemiological data available for Africa seems to show a decrease in smoking prevalence over this period. So, for example, the WHO's estimates for the late 1970s indicated 40 per cent for male smoking prevalence while its estimates for the late 1990s showed 25 per cent and its estimates for the late 2010s gave 17 per cent.¹⁰⁶ The data from surveys seem to suggest a similar trend. As mentioned earlier, surveys in the 1970s and 1980s measured male smoking prevalence between 40 and 50 per cent, while surveys in the 1990s counted around 20 to 30 per cent of men who smoked.¹⁰⁷ And more recent surveys, like the Demographic and Health Surveys

funded by USAID and the Global Adult Tobacco Surveys run by the CDC, have measured male smoking prevalence rates from about 10 per cent in Ghana, Nigeria and Senegal to about 19 per cent in Kenya, Namibia and Malawi.¹⁰⁸ This downward trend is further confirmed by researchers at the Institute for Health Metrics and Evaluation, who have shown that male smoking prevalence had decreased in most African countries between 1990 and 2015.¹⁰⁹

These discrepancies between the existing epidemiological data and forecasts based on the Lopez model do not necessarily invalidate the former or other modernisation theory-influenced readings of the African smoking epidemic. Indeed, there are possible reasons that can account for these discrepancies. One, which I mentioned earlier, is the serious doubts that many public health experts have about the reliability of much of the epidemiological data on smoking and health that came out of Africa in the twentieth century. Another is the fact that, because of the global economic recession of the 1970s and the structural adjustment programmes imposed by international lenders, most African countries experienced economic decline throughout the 1980s and 1990s.¹¹⁰ This meant that Africans, instead of seeing their incomes rise as the Lopez model assumes, became poorer and, in consequence, reduced their cigarette consumption or stopped smoking altogether. This is not the place to ascertain whether these reasons can justify the discrepancies outlined above. But one might want to point out that, while these reasons could account for differences between epidemiological data and projections based on Lopez' model prior to 2000, they do not seem to be able to explain the decline in smoking prevalence across the continent recorded thereafter.

Modernisation everywhere

So far, this chapter has focused exclusively on how modernisation narratives have shaped epidemiological understandings of the smoking epidemic in Africa. Here, I want to move beyond smoking and show how these same narratives also influence the way epidemiologists imagine other health issues in the region. Specifically, I want to show how modernisation theory also shapes the way epidemiologists and global health experts construe the NCD epidemic and the transition away from infectious diseases in Africa. Sustained efforts to address the rising chronic disease burden on the continent began in the early twenty-first century, with the publication of reports, the establishment of new NGOs

and the launch of public education campaigns and health programmes.¹¹¹ As I outline below, the understanding of the NCD epidemic in Africa on which these efforts are based is very similar, in terms of the arguments, language and concerns, to how epidemiologists and global health specialists have imagined the smoking epidemic in the region.

First, most official reports and scientific articles about the NCD epidemic in Africa start with numbers about the chronic disease burden in the region. For example, *Uniting Against NCDs*, a report published in 2011 by the WHO's Regional Office for Africa, states that, 'in 2008, NCDs were responsible for the death of 2.8 million people' or about '25 per cent' of all deaths 'in the African region'.¹¹² As with the smoking epidemic, these numbers come from modelling efforts like the Global Burden of Disease (GBD) project or social surveys like the WHO's STEPwise surveys. And, as with the smoking epidemic too, these deaths are imagined to be the beginning of an upcoming epidemic that will grow like it did in the West if nothing is done about it. To quote the WHO's Regional Office for Africa: 'the region is still at an early stage of the [NCD] epidemic', with chronic diseases 'projected to exceed communicable ... diseases as the most common cause of death by 2030'.¹¹³ In the same spirit, epidemiologists working for the GBD project argued that the 'increasing burden of NCDs in Africa shows a growing health iceberg hidden under epidemics of infectious diseases'.¹¹⁴

Second, reports and articles on the African NCD epidemic see the rise in chronic diseases in the region as a (harmful) consequence of economic growth, urbanisation and Western lifestyles, in the same way that smoking has been linked to modernisation. The notion of 'health transition' used by the epidemiologists leading the GBD project – some of whom, like Alan Lopez, worked on smoking in Africa – is a good example given the influence that their research has had in drawing awareness to the NCD epidemic in Africa and beyond. Building on Abdel Omran's concept of epidemiological transition, these epidemiologists use the term 'health transition' to refer to the 'displacement of infections by accidents and chronic diseases' taking place in developing countries in Africa and elsewhere in the global south and which, they believe, is a consequence of the 'general process of industrialisation, urbanisation and modernisation'.¹¹⁵ More specifically, they argue that:

A shift from rural subsistence economy to an urban market-oriented industrial economy is generally associated with reductions in risks to communicable diseases because of better sanitation in urban areas. At the same time, however, economic growth brings

with its new health problems. Very high rates of injuries related to motor vehicles, industrial accidents and toxic chemicals (e.g. pesticides) are one consequence of rapid urbanization, industrialization and mechanization of agriculture. Undernutrition may diminish ... only to be replaced by overnutrition with rising risks of death due to obesity, hypertension, atherosclerosis and diabetes. Rising incomes also bring changes in lifestyle including increases in smoking, alcohol use and substance abuse, all of which are expected to increase the risk for chronic diseases.¹¹⁶

Many of these arguments can also be found in a recent World Bank report on *The Challenge of Non-Communicable Diseases and Road Traffic Injuries in Sub-Saharan Africa*. In this report, the Bank argued that the growing NCD epidemic in the region has been driven by 'rising incomes', 'rapid urbanisation and changing lifestyle practices'.¹¹⁷ As the Bank further pointed out, Africa was the victim of its own success and economic development:

There is a growing optimism about Africa. Since the turn of the century, Africa's growth has been robust, averaging 5–6 per cent GDP growth a year, making important contributions to poverty reduction ... Against this backdrop, [the NCD epidemic] is a growing health challenge for Africa, spurred on in part by its own successes.¹¹⁸

The Bank's report is replete with concrete examples of how the rise in NCDs in Africa was linked to economic development, urbanisation and Western lifestyles. So, using the case of circulatory diseases, the report illustrates how the 'types of disease' present in a country or its population 'reflect [this country's] stage of development':

In countries at the earliest stages of development, circulatory diseases due to nutritional deficiency or infections (such as rheumatic heart disease) predominate. As countries develop, circulatory diseases related to hypertension (such as hemorrhagic stroke) become more common.¹¹⁹

And, later in the report, the Bank argues that, when 'people move away from villages' to cities, they lose their 'traditional family or community safety nets' and become exposed to an 'urban environment ... associated with raised blood pressure, blood sugar and body mass index'.¹²⁰

Conclusion

In this chapter, I discussed how postwar modernisation theory has shaped the way epidemiologists imagine the African smoking epidemic. Specifically, I outlined the way international expert networks did not just map tobacco use among Africans using surveys and estimation techniques but also analysed the unfolding of the smoking epidemic on the continent through the lens of modernisation, associating increases in prevalence with economic growth and industrialisation as well as urbanisation and female emancipation. I also pointed out some of the corollaries of using such a framework to make sense of smoking in Africa – the belief that, as the continent modernises, tobacco use will necessarily rise in the same way it has done in the West; the idea that modernity and modernisation are pathogenic; and the failure to examine the role of the tobacco industry in the making of the African smoking epidemic. To finish, I stressed the enduring and pervasive spell that modernisation theory seems to have over epidemiologists, outlining how it continues up to this day to influence the way they understand the African smoking epidemic and other global health issues like the epidemiological transition and the growing chronic disease burden in the region. More generally perhaps, I hope this chapter will encourage historians and social scientists working in the field to explore not just how contemporary epidemiological practices are reconfiguring the field of global health but also how sometimes long-forgotten political and social philosophies like modernisation theory shape epidemiological imaginaries.

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Notes

- 1 For example, Adams, *Metrics: What Counts in Global Health*; Storeng and Behague, 'Playing the Numbers Game'.
- 2 For example, Wahlberg and Rose, 'The Governmentalization of the Living'; Reubi, 'Epidemiological Accountability'.

- 3 For example, Kearns, 'HIV, AIDS and the Global Imaginary'; Reubi, 'A Genealogy of Epidemiological Reason'.
- 4 Hutt and Burkitt, 'Geographical Distribution of Cancer in East Africa', 719; Doll, 'Foreword'.
- 5 For example, Baylet et al., 'Conséquences Médicales de la Consommation du Tabac'; Bradshaw and Schonland, 'Smoking, Drinking and Oesophageal Cancer'; Schmidt et al., 'Épidémiologie du Cancer des Bronches'.
- 6 Reubi and Berridge, 'The Internationalisation of Tobacco Control'.
- 7 Femi-Pearse, Adeniyi-Jones and Oke, 'Respiratory Symptoms'.
- 8 Lore, 'Smoking Habits in Kenya I'; Lore and Lwenya, 'Smoking Habits in Kenya II'.
- 9 Tessier et al., 'Smoking Behaviour'.
- 10 Schmidt et al., 'Enquête sur la Consommation Tabagique'.
- 11 Bradshaw and Schonland, 'Oesophageal and Lung Cancers'; Bradshaw and Schonland, 'Smoking, Drinking and Oesophageal Cancer'.
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- 13 For example, WHO, *Tobacco or Health: Report by the Programme Committee*; Masironi and Rothwell, 'Tendances et Effets du Tabagisme'; WHO, *Tobacco or Health: A Global Status Report*.
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- 15 Fréour, 'Tobacco Smoking in Africa'.
- 16 Crofton, 'WHO Technical Advisory Group on Tobacco or Health', paragraph 5.1.
- 17 Crofton, 'Tobacco and the Third World', 164.
- 18 Monteiro, 'Smoking and Health in Benin'.
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- 20 Crofton, 'The Gathering Smoke Clouds', 269.
- 21 Femi-Pearse, Adeniyi-Jones, and Oke, 'Respiratory Symptoms'.
- 22 Baylet et al., 'Enquête sur l'Utilisation du Tabac'.
- 23 Baker, Johnston, and Turner, 'Smoking Habits of Blacks in Industry'; Lore and Lwenya, 'Smoking Habits in Kenya II'.
- 24 Amonoo-Lartson and Pappoe, 'Prevalence of Smoking in Secondary Schools', 1292; Ball, 'Tobacco Consumption in Africa'.
- 25 WHO, *Tobacco Smoking in the World*, 15.
- 26 Wone, Koate, and De Lauture, 'La Lutte Contre le Tabagisme'; WHO, *Tobacco or Health*.
- 27 Tessier et al., 'Smoking Behaviour'.
- 28 WHO, *Tobacco or Health: A Global Status Report*, 11.
- 29 Mackay and Crofton, 'Tobacco', 208.
- 30 WHO, *Tobacco or Health: A Global Status Report*, 11.
- 31 Pobe, Larbi, and Kpodonu, 'The Profile of the African Smoker', 227–9.
- 32 Strebel, Kuhn, and Yach, 'Determinants of Cigarette Smoking', 212.
- 33 Tessier et al., 'Smoking Behaviour', 98–9.
- 34 Onadeko and Awotedu, 'Smoking Patterns in Females', 126.
- 35 Arya and Bennett, 'Smoking Amongst University Students in Uganda', 27; Waldron et al., 'Gender Differences in Tobacco Use', 1272.
- 36 Kaplan, Carriker, and Waldron, 'Gender Differences in Tobacco Use', 309.
- 37 Mackay and Crofton, 'Tobacco', 208.
- 38 Monteiro, 'Le Tabagisme en Milieu Scolaire', 2.
- 39 Fréour, 'Le Tabagisme', 267–70.
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- 45 Cooper, 'Development, Modernization and the Social Sciences'; Ekbladh, *The Great American Mission*.
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- 47 Cited in Arndt, *Economic Development*, 53.
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- 51 Femi-Pearse, Adeniyi-Jones and Oke, 'Respiratory Symptoms', 57.
- 52 Gareeboo et al., 'Epidemiological Studies', 249.
- 53 Bradshaw and Schonland, 'Oesophageal and Lung Cancers', 275.
- 54 Nostbakken, 'UICC Smoking Control Activities', 170.
- 55 D'Hondt and Vandewiele, 'Attitudes of Senegalese Schoolgoing Adolescents', 350.
- 56 Yach, 'Tobacco in Africa', 31–2.
- 57 Oettlé, 'Cancer in Africa', 393; Burkitt, 'Some Diseases', 275; Taha and Ball, 'Smoking and Africa', 991.
- 58 Baylet et al., 'Enquête sur l'Usage du Tabac', 40; Wone et al., 'La Lutte Contre le Tabagisme', 245.
- 59 Oettlé, 'Cancer in Africa', 383; Baylet et al., 'Conséquences Médicales de la Consommation du Tabac', 42.
- 60 Wone et al., 'La Lutte Contre le Tabagisme', 245; Fréour, 'Le Tabagisme', 269.
- 61 Baylet et al., 'Conséquences Médicales de la Consommation du Tabac', 40–2; Baylet et al., 'Enquête sur l'Usage du Tabac', 83.
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- 69 Reubi, 'Modernisation, Smoking and Chronic Disease'.
- 70 Lopez, Collishaw, and Piha, 'Descriptive Model', 245–6.
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- 72 Diop, Baylet, and Hountondji, 'Le Tabagisme en Afrique', 241.
- 73 Fréour, 'Le Tabagisme', 267–70.
- 74 Warner, 'Toward a Global Strategy', 32.
- 75 Cf. Reubi, 'Modernisation, Smoking and Chronic Disease'.
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- 77 Asma and Pederson, 'Tobacco Control in Africa', 353.
- 78 Ransome-Kuti, 'Tobacco Control in Africa'.
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- 80 Lopez, Collishaw, and Piha, 'Descriptive Model', 245.
- 81 Arndt, *Economic Development*; Cooper, 'Development, Modernization and the Social Sciences'; Ekbladh, *The Great American Mission*.
- 82 Gateff and Lebras, 'Problemes Epidemiologiques', 431.
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- 86 Stebbins, 'Transnational Tobacco Companies', 228.
- 87 Vaughan, *Curing their Ills*, 108. Cf. also: Heaton, *Black Skin, White Coats*, Ch.1.
- 88 Vaughan, *Curing their Ills*.
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- 105 Lopez, Collishaw, and Piha, 'Descriptive Model'.
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- 119 World Bank, *The Challenge of Non-Communicable Diseases*, 15.
- 120 World Bank, *The Challenge of Non-Communicable Diseases*, 26.

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