Section One

Epidemics and Syndemics in Africa: Disease in Context

This first section of the book provides a context for epidemics and health conditions in Africa. It initially offers a brief history of some of the world’s deadliest epidemics, showing how far the global health status has come – from a time when an outbreak would cause millions of deaths to the present time when control of epidemics means mortality is limited. Although there has been great improvement in health conditions across the globe and in Africa, there remains a disproportionate burden of disease in sub-Saharan Africa. This section explores the reasons behind the imbalance and also offers alternative frameworks for understanding the prevalence of epidemics in Africa.

Chapter 1, which is the introductory chapter of the book, argues that epidemics do not occur in a context-free vacuum. Zamanzima Mazibuko shows how underlying structural drivers have rendered certain
populations, especially African women, vulnerable to disease. This argument is further supported by Bill Kinsey’s chapter, which describes how diseases often interact with one another and are exacerbated by the social, economic, environmental, and political situations of affected populations (Figure 1). This interrelationship is referred to as ‘syndemics’, and is drawn on throughout the book to help understand the extent to which social conditions and health are synergistic.

Chapter 1 also explores so-called ‘zoonotic’ diseases, namely those diseases which are transmitted between humans and animals. Mazibuko points to the World Health Organization’s (WHO) call for greater resources, including research, to fight these emerging diseases, and warns of the danger of these becoming the diseases of the future. She argues for the importance of taking into account the factors that promote zoonotic diseases when analysing how best to counter epidemics and strengthen health care systems in Africa.

In Chapter 2, Kinsey uses the syndemics perspective and examines
undernutrition in Zimbabwe to show the multifactorial issues that result in worsened health conditions. Kinsey argues for broader conceptual frameworks that take account of varied factors in order to better address health concerns.

This first section lays the foundation for the rest of the volume and for a comprehension of how and why the African continent is vulnerable to disease. The two chapters challenge conventional thinking and medical understanding to push for a more multifaceted understanding that acknowledges the context of illness on the continent. The authors argue that this syndemic approach will assist in the development of inclusive public health policies and will improve the probabilities of effective interventions.
ONE

Introduction

Epidemics and Health Systems in Africa

ZAMANZIMA MAZIBUKO

‘Epidemics do not just happen. They are not random events. They have histories.’
(Barnett & Whiteside, 2006: 65)

These words are eminently true for epidemic outbreaks that have occurred in Africa. Often details of these outbreaks are presented without the relevant backdrop, or reference to the chains of preceding triggering and facilitative events and conditions. As De Waal (2017) notes, it is as if an epidemic disease ‘simply arises from the miasmas of Africa’s forests, in a context-free vacuum’. Africa’s vulnerability to disease can be attributed to several factors which influence both the spread and prevalence of disease, as well as to the effectiveness or lack thereof of measures for prevention, reduction, or elimination (Fonn, 2018). These factors are a function of historical, political, environmental, and economic forces (Dzingirai et al., 2017; Fonn, 2018). It is important that the underlying foundation and structural
drivers of Africa’s vulnerability to diseases be stated clearly. Disease occurs commonly because of political and economic influences. These factors have a strong bearing on the way diseases are managed and controlled and on what happens to the affected populations (Mackey et al., 2014; De Waal, 2017; Dzingirai et al., 2017).

Historical interventions such as exclusionary urbanisation, in forcing certain populations out of their homes and displacing them into areas where they are vulnerable to disease, are described by Dzingirai and colleagues (2017), underpinning their argument: conditions that are ripe for the spread of disease among poor and marginalised people are commonly created by the state (through poor governance) and by the private sector (in its quest for accumulation and industrialisation). Poverty, low status, and inequality, together with forced migrations (Farmer, 2004), have been linked to vulnerability to infection.

Syndemics is a conceptual framework used to describe and understand the impact of the above phenomena by highlighting the effect of macro-level social factors on disease clustering, and the effects of this on both entire population groups as well as on individuals (Mendenhall et al., 2017). Adopting a syndemics approach, and so interrogating such phenomena, would enhance comprehension of the connection between disease and society. It would lead to a more exhaustive understanding of the foundational drivers of disease, and equip societies and decision-makers for their better prevention and control. Going further, mainstream medicine and its framework for disease, which is often preferred over alternative ways of understanding and practising medicine, should also be interrogated as these have implications for how treatment is given and, in turn, received.

This is the basis for the reasoning – now widely accepted – that efforts to counter outbreaks of disease and epidemics in sub-Saharan Africa need to be expanded beyond the biomedical approach. More valuable would be to integrate the biomedical approach with understanding and incorporating structural factors closely associated with susceptibility to disease.

It is important to emphasise that diseases do not occur in isolation. Diseases interact with one another, as well as with multiple social and/or environmental factors (Singer et al., 2017). Often, co-infection
occurs with two or more pathogens and this affects the pathway of each infection, causing them to deviate from their natural courses (Corbett et al., 2003). This is commonly observed with HIV infections where exposure to other pathogens, particularly tuberculosis, exacerbates infections and increases transmission of both pathogens (Corbett et al., 2003). In recent years the burden of epidemics has been worsened by a significant increase in non-communicable diseases (NCDs) such as heart disease, stroke, cancer, and diabetes. Previously thought of as diseases of the more affluent, NCDs are on the rise in sub-Saharan Africa (Ezzati et al., 2018). Mental illness, which is often neglected, is another NCD that needs to be addressed. There is thus an increased risk of the interplay of diseases (both communicable and non-communicable); the impact of this interplay is aggravated by the social, economic, environmental, and political conditions in which a population finds itself (Sharma, 2017).

HISTORY OF EPIDEMICS IN THE WORLD AND IN AFRICA

Medical research, technology, and innovation have improved health across the globe. Throughout history, epidemics of diseases that are now (mostly) under control have caused the deaths of millions of people globally within short periods of time. Epidemic diseases, which can be viral or bacterial, are highly communicable and they rapidly infect large numbers within a population. The number of cases reported in one area is generally higher than expected (Newman, 2002; Wilke, 2017). Outbreaks of some of the worst and deadliest epidemics in history impacted permanently on the population at the time that they occurred (Pariona, 2018). One of the earliest recorded was the Antonine Plague, which killed about 2,000 people a day in Rome, totalling 5 million deaths over the period 165–180 AD (Wilke, 2017). The Plague of Justinian, which struck from 541–542 AD, is recorded as an epidemic in which the highest number of lives was lost, with an estimated 20–25 million deaths in the Roman Empire (Horgan, 2014; Wilke, 2017). This plague was carried across the world by rodents on trading ships, resulting in the infection spreading rapidly from China to Northern Africa and throughout the Mediterranean (Pariona, 2018).
Introduction

Today, influenza is far from being the deadly disease it was a century ago when the Great Flu Epidemic of 1918 took its punishing toll. Spread by soldiers returning from around the world at the end of World War 1 (Wilke, 2017), it killed between 20 and 40 million people. Among other epidemics which caused millions of deaths were The Black Death (1334); the Cocolitzli Epidemic (1576); the Third Cholera Pandemic (1852–1860); the Third Plague Pandemic (1855); Typhus fever in the later years of World War 1 (1917); the Asian Flu Pandemic (1957); and lastly, the HIV/AIDS global pandemic (1960s–present), which has killed an estimated 25 million people and infected 65 million people since it was first reported in 1981 (Wilke, 2017).

A comprehensive history of epidemics in Africa is not easy to compile because data prior to 1970 is inadequate. Table 1 provides a summary of the epidemics in the WHO African region from 1970–2016, along with the number of times they have occurred. Cholera outbreaks have occurred the most frequently (476 times), closely followed by polio (439). Both diseases are now preventable, although a few cases of polio reappear now and then in inaccessible areas or conflict zones where efforts to vaccinate and to maintain disease surveillance are thwarted (Polio Eradication, 2017). Cholera outbreaks remain persistent in sub-Saharan African countries with areas in which conditions of poverty – contaminated water, inadequate sanitation, lack of hygiene – prevail (Lessler et al., 2018).

Table 1: Summary of outbreaks or epidemics reported in the WHO African region period 1970–2016 by known disease

<table>
<thead>
<tr>
<th>Disease</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total disease types: 38; unknown conditions: 2</td>
<td></td>
</tr>
<tr>
<td>Acute Flaccid Paralysis</td>
<td>1</td>
</tr>
<tr>
<td>Acute Jaundice Syndrome</td>
<td>1</td>
</tr>
<tr>
<td>Acute Neurological Syndrome</td>
<td>3</td>
</tr>
<tr>
<td>Acute Respiratory Syndrome/Infection</td>
<td>7</td>
</tr>
<tr>
<td>Aflatoxicosis</td>
<td>1</td>
</tr>
<tr>
<td>Anthrax</td>
<td>46</td>
</tr>
<tr>
<td>Chickenpox</td>
<td>1</td>
</tr>
</tbody>
</table>
Epidemics and the Health of African Nations

<table>
<thead>
<tr>
<th>Epidemic</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chikungunya</td>
<td>13</td>
</tr>
<tr>
<td>Cholera</td>
<td>476</td>
</tr>
<tr>
<td>Crimean-Congo</td>
<td>20</td>
</tr>
<tr>
<td>Dengue Fever</td>
<td>23</td>
</tr>
<tr>
<td>Diarrhoeal Disease</td>
<td>42</td>
</tr>
<tr>
<td>Ebola</td>
<td>31</td>
</tr>
<tr>
<td>Fever with Jaundice (Febrile Icterus)</td>
<td>1</td>
</tr>
<tr>
<td>Hepatitis (undefined)</td>
<td>1</td>
</tr>
<tr>
<td>Hepatitis A</td>
<td>1</td>
</tr>
<tr>
<td>Hepatitis B</td>
<td>2</td>
</tr>
<tr>
<td>Hepatitis E</td>
<td>8</td>
</tr>
<tr>
<td>Influenza</td>
<td>17</td>
</tr>
<tr>
<td>Lassa Fever</td>
<td>28</td>
</tr>
<tr>
<td>Leishmaniasis</td>
<td>2</td>
</tr>
<tr>
<td>Leptospirosis</td>
<td>1</td>
</tr>
<tr>
<td>Malaria</td>
<td>60</td>
</tr>
<tr>
<td>Marburg Disease</td>
<td>12</td>
</tr>
<tr>
<td>Measles</td>
<td>75</td>
</tr>
<tr>
<td>Meningococcal Disease</td>
<td>99</td>
</tr>
<tr>
<td>MERS-CoV</td>
<td>3</td>
</tr>
<tr>
<td>Monkeypox</td>
<td>16</td>
</tr>
<tr>
<td>Nodding</td>
<td>1</td>
</tr>
<tr>
<td>O’nyong-nyong Fever</td>
<td>2</td>
</tr>
<tr>
<td>Plague</td>
<td>47</td>
</tr>
<tr>
<td>Polio</td>
<td>439</td>
</tr>
<tr>
<td>Rift Valley Fever</td>
<td>17</td>
</tr>
<tr>
<td>Schistosomiasis</td>
<td>1</td>
</tr>
<tr>
<td>Typhoid Fever</td>
<td>27</td>
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<tr>
<td>West Nile Fever</td>
<td>4</td>
</tr>
<tr>
<td>Yellow Fever</td>
<td>131</td>
</tr>
<tr>
<td>Zika Virus</td>
<td>1</td>
</tr>
<tr>
<td>Unknown Epidemic</td>
<td>96</td>
</tr>
<tr>
<td>Unknown Haemorrhagic Fever</td>
<td>22</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,779</strong></td>
</tr>
</tbody>
</table>

*Source: WHO, 2016a*
**LEADING CAUSES OF DEATH IN AFRICA**

In Africa, epidemics and endemics remain a public health challenge. Over the years, a plethora of diseases have attacked the continent and some still persist, causing a significant burden of illness, disability, and mortality. These diseases range from periodic outbreaks, such as malaria and cholera, to endemics such as HIV, and even outbreaks of uncommon diseases like listeriosis. Of the ten leading causes of death in Africa as shown in Graph 1, the first seven are epidemics (infectious diseases and NCDs), the two after those relate to maternal deaths, and the last stems from injury (in this graph, road injury) (WHO, 2016b).

If one puts the above statistics into context, it becomes clear that while infectious diseases remain the leading cause of death in Africa the mortality rates in this category are declining, while deaths from NCDs are on the increase. In 2015, out of a total of 9.2 million deaths in Africa, 5.2 million (56.5 per cent) were from infectious diseases. This figure was down from 5.7 million (61.4 per cent) in 2010. In 2015, the deadliest infectious diseases were lower respiratory diseases, HIV/AIDS, diarrhoeal diseases, tuberculosis, and malaria. NCDs accounted for 3.1 million deaths (33.5 per cent), which was an increase from 2.7 million (29.4 per cent) in 2010. The leading causes of death in this group were stroke, ischaemic heart disease, and cirrhosis of the liver. The last category, which is death caused by injury, accounted for 930,000 (10.1 per cent) in 2015, an increase from 841,750 (9.1 per cent) in 2010. These statistics show that, although infectious diseases are still the leading...

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i The constant presence of a disease or infectious agent in a particular geographic area or population group is an endemic. This differs from an epidemic in that epidemics are outbreaks of diseases that attack a large number of people at the same time and spread through one or several communities (http://www.fao.org/wairdocs/ilri/x5436e/x5436e04.htm).

ii A listeriosis outbreak took place in South Africa in 2017–2018 and has been the largest recorded globally (Chersich et al., 2018). The source of the outbreak was identified in March 2018, when traces of a food-borne pathogen – Listeria monocytogenes – were found in a food production facility that produces ready-to-eat processed meat products in Polokwane, Limpopo Province (Department of Health, 2018). It took more than a year for the source of the outbreak to be identified from the time of the first case being reported. By that time, approximately 950 cases of the disease had been reported, with a total of 180 deaths. In early April 2018, a total of 1,011 laboratory-confirmed cases of the disease had been documented, with a mortality rate of 28 per cent among cases with a known outcome (Dramowski et al., 2018).
cause of death in Africa, the percentage of cases is decreasing, while that of NCDs (and to a lesser extent, injuries) is growing. This trend is projected to continue: expectations are that Africa will see a rise in NCDs previously associated with the developed world, especially with increasing urbanisation.

Health issues are a global concern. When compared to the rest of the world, however, sub-Saharan Africa carries a disproportionately high disease burden. In 2015, 90 per cent of global malaria cases and 92 per cent of malaria deaths (WHO, 2016b) were in the sub-Saharan region; and between 2000 and 2015, 83 per cent of global cholera deaths occurred in sub-Saharan Africa (Lessler et al., 2018). In addition, sub-Saharan Africa has some of the widest gender income disparities in the world and African women are among the poorest people. This makes African women even more vulnerable to infections (see UNESCO, 2015; UNESCO, 2017).

This book aims to explore the reasons behind this imbalance. It focuses on a selection of epidemics from which lessons can be drawn on the importance of a strong health system in preventing, detecting, and responding to calamitous diseases, thereby preventing outbreaks from becoming epidemics. The cases cited also highlight the effects of
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political interference and governmental neglect on the occurrence and prevalence of epidemics. They are a basis for policy analysis. Included in the selection, based on the immensity of its impact, is Ebola, which devastated the West African region in 2014–2016 and provided key lessons for addressing epidemics.

Sections in this book thus use specific cases of epidemic outbreaks to explore how structural and/or political-economic factors play a role in the vulnerability to disease. In their individual chapters the authors demonstrate that at the core of this vulnerability are weakened or weak health systems. At a second level, they show how the interactions between diseases and with socio-economic factors further exacerbate the occurrence and spread of epidemics – the implications being support for a multifaceted approach to addressing epidemics.

The Burden of Epidemics

Together, communicable and non-communicable disease outbreaks cause millions of deaths throughout sub-Saharan Africa yearly (WHO, 2016b) and although the status of health care has improved over the years (WHO, 2014), the burden of disease still afflicts the continent disproportionately (WHO, 2016b). In many parts of the world, diseases that cause epidemics have been eradicated or brought under control (Tatem et al., 2006). Sub-Saharan Africa, however, continues to battle outbreaks and endemics. This is not due to either simple bad luck or purely medical reasons. Rosenberg (1992) argues that epidemic diseases should be regarded as a ‘configuration’ because of the structural and relational characteristics necessary for the transmission of pathogens between persons. This approach moves away from the notion of ‘contamination’, which is the reductive, technical mechanism of transmission; in that framework epidemics are not viewed as a result of the intersection of pathogens and social factors.

Africa was exploited by colonialists, with populations left in poverty and in areas of disrupted ecologies (De Waal, 2017; Dzingirai et al., 2017). Post-colonial development has not made sufficient progress in addressing inequalities and systemic underdevelopment (Obeng-Odoom, 2015), and nor have resilient health systems been established (Dzingirai et al., 2017; Olu, 2017).
Epidemics and the Health of African Nations

Through a few case studies – the 2008–2009 cholera outbreak in Zimbabwe, the 2014–2016 Ebola outbreak in West Africa, the HIV endemic in South Africa, malaria in the Southern African Development Community (SADC) region, and the ever-increasing rise of NCDs on the continent – the authors show how structural drivers affect health services and outbreak response. The aim is to help inform health practitioners, policy makers, and researchers about ineffective as well as successful approaches to disease containment and health care provision in Africa.

Cholera in Zimbabwe: political-economic drivers

The worst cholera outbreak in Africa, which took place in Zimbabwe in 2008–2009, resulted in 98,531 recorded, suspected cases and 4,282 deaths (Youde, 2010). Political and economic choices, more than health-related decisions, were what led to this crisis. A combination of the large-scale collapse of the water and sanitation infrastructure, a weakened health care system, and a struggling economy contributed to the outbreak.

In the years prior to the outbreak, government policies and actions resulted in the disintegration of Zimbabwe’s water and sanitation infrastructure and the incapacity of the health care system to provide even the most basic services (Muzondi, 2014). The ZANU-PF-led national government took over the municipal water supply from the opposition MDC party in order to weaken the latter’s position and to gain more political power (Musemwa, 2008). The Zimbabwe National Water Authority (ZINWA) was established in 1998 to head the development and management of national water resources and associated infrastructure throughout the country (Bulawayo resisted the ZINWA takeover and had very few cholera cases). However, instead of reinforcing the country’s water infrastructure and increasing access to clean and safe water, ZINWA was used as a political tool and a source of funding for ZANU-PF (Youde, 2010). Consequently, the water and sanitation infrastructure deteriorated and access to clean and safe water decreased considerably (Musemwa, 2008; Youde, 2010). The politicisation of water by ZANU-PF thus played a big role in creating conditions for the outbreak of cholera and for the disease to flourish.

A decade later, in 2018, Zimbabwe experienced another cholera
outbreak. Questions arose regarding the reasons behind the recurrence of a preventable disease. What became apparent was that the water and sanitation infrastructure was still dilapidated, with burst pipes gurgling sewage onto the streets (Nyoka, 2018). Water supplies were contaminated by blocked sewers that had been left unattended (Mutsaka, 2018; Nyoka, 2018). The emergence and re-emergence of cholera in Zimbabwe goes far beyond the field of public health. It has to do with a government making political decisions which have a ripple effect, leaving its citizens dying from avoidable infections. This is discussed in more detail in Chapter 3.

**Ebola in West Africa: weak health care systems**

Weakened health systems underpinned the unprecedented spread of the Ebola virus in West Africa in 2014. Calamitous civil wars experienced by Guinea, Liberia, and Sierra Leone led to the collapse of those countries’ health system infrastructures. They were left with the weakest health care system infrastructures in the world, with the lowest human development indices (WHO, 2000; UNDP, 2014). Therefore, when they were hit with the Ebola outbreak, their public health systems were not equipped to control it; in addition to this those countries also lacked a strong health care workforce. Table 2 depicts the poor health systems in the three countries and how they lacked the necessities required to manage an outbreak.

**Table 2: State of health care systems in Guinea, Sierra Leone, and Liberia**

<table>
<thead>
<tr>
<th>Country</th>
<th>Health workforce density (per 10,000 population)</th>
<th>Number of hospital beds (per 10,000 population)</th>
<th>Per capita government expenditure on health per year (US$)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guinea</td>
<td>&lt; 1.5</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>2.2</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>Liberia</td>
<td>&lt; 3.7</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>Minimum required to provide most basic health coverage</td>
<td>22.8</td>
<td>No standard</td>
<td>44</td>
</tr>
</tbody>
</table>

*Source: Shoman et al., 2017; WHO, 2012; WHO, 2014*
The Ebola outbreak further weakened these countries’ health systems by significantly limiting the availability of health care workers, and decreasing financial resources and medical equipment (Save the Children, 2015). A study by Shoman et al. (2017) revealed that Ebola claimed more lives among health care workers than any other viral haemorrhagic fever. Because health care workers were in direct contact with symptomatic patients, not only were they at a high risk of infection and death, but they were stigmatised and rejected by communities. This placed additional strain on the remaining health care workers; nurses became the frontline of the outbreak. An expert who was interviewed as part of the study reported that a lack of investment was the biggest problem: in training health care workers, in infrastructure, in supply chain management, and in community engagement (Shoman et al., 2017). The lack of resources meant that treatment of, and vaccinations against, other infectious diseases were not a priority, which led to additional outbreaks. People suffering from any condition other than Ebola were not provided with adequate health care. Moreover, the stigma attached to health care workers resulted in patients opting out of receiving treatment for other conditions out of fear of becoming infected by the health care workers (Shoman et al., 2017). Inevitably, the weakened health workforce enabled the Ebola virus to cause devastation in Guinea, Liberia, and Sierra Leone.

Nigeria, on the other hand, which managed to swiftly contain the 2014 Ebola outbreak, succeeded in rallying the country’s health workforce to prevent the disease spreading. Expeditious and meticulous control measures were required to avert the disastrous effect of an Ebola outbreak on Nigeria’s two large cities – Lagos, with approximately 20 million people, and Port Harcourt (> 1 million people). These were successfully implemented, thereby limiting the number of cases (Musa et al., 2016). The accurate and swift diagnosis of the index case by a female physician at the First Consultants Medical Centre (FCMC), Dr Ameyo Stella Adadevoh, allowed for implementation of a much more strategic process and for the virus across the country to be contained (DRASA, 2018). Health care workers were mobilised and deployed to carry out fast and thorough tracing of all potential contacts, to monitor all these contacts continuously, and immediately to confine potentially
infectious contacts (Courage, 2014). The Ebola outbreak in Nigeria clearly illustrates the crucial role of the health workforce in containing a potential epidemic as detailed in Chapter 5.

Chronic diseases: implications for health systems
Non-communicable diseases (NCDs), such as cardiovascular diseases, cancers, diabetes, and chronic respiratory diseases, are predicted to become the leading cause of death in sub-Saharan Africa by 2030 (Marquez & Farrington, 2013). These diseases are caused by modifiable behavioursii such as tobacco use, high consumption of alcohol, a sedentary lifestyle, and an unhealthy diet, which lead to metabolic changes like increased blood pressure, obesity, increased blood glucose levels, and increased levels of fat in the blood (Naik & Kaneda, 2015). As with the previously mentioned health conditions, prevalent social and economic conditions determine a population’s vulnerability to NCDs and associated health outcomes (WHO, 2010a). The rise in cases of NCDs in low-income countries is influenced by such consequences of globalisation as inequitable trade and reckless marketing, as well as hasty and haphazard urbanisation (WHO, 2010b). NCDs are closely linked with poverty. Because they require long-term treatment, household costs that are related to health care increase, and often they result in the loss of breadwinners (WHO, 2010b). Here, too, women bear an inordinate share of the burden of disease. According to the WHO (2010b), women in less developed countries are extremely vulnerable to NCDs, which affect them in their productive years and often cause their premature death. Also, where household or family illness occurs it is women, disproportionately, who assume responsibility for care.

It has already been established that many African countries have weak health systems. Yet these systems need to be robust enough to address the above gender matters and to manage the growing and long-term burden of NCDs. The efficiency of a country’s health system has commonly been evaluated by determining the number of patients who frequent its health facilities (Tapela, 2017). This measure has usually not considered chronic care, but has been based on short-term outbreaks of

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ii Modifiable behaviours are commonly developed during adolescence or young adulthood, creating optimal conditions for NCDs later in life (Naik & Kaneda, 2015).
diseases (Tapela, 2017). The double burden of communicable diseases and NCDs indicates that an integrated approach to addressing health care is required. The prevention and management of NCDs is best implemented at the primary health care level (Temu et al., 2014), where symptoms of NCDs should be diagnosed and controlled.

The management of NCDs has suffered from the insufficient collection of data about successful NCD interventions in African primary health care settings. In developing countries one typically encounters weak mortality surveillance systems; underdeveloped information technology for data collection and analysis; insufficient data on health care quality, cost, and outcomes; and minimal technical capacity to conduct NCD surveillance (Krishnan, 2016). NCDs need to be recognised and prioritised as a public health issue, one that requires decision-makers, programme planners, and policy makers to develop and implement policies and strategies aimed at managing these illnesses.

HIV/AIDS was described as a ‘long-wave disaster’ by Barnett and Blaikie (1991) long before antiretroviral therapy (ART) was widely available. ART became increasingly available in parts of Africa in the mid-2000s, and this changed the course of the illness. By the end of 2009, 37 per cent of people who required ART in sub-Saharan Africa were receiving treatment, compared with only 2 per cent in 2002 (Nixon et al., 2011). In 2016, 60 per cent of people living with HIV in East and Southern Africa (an estimated 11.7 million) were on ART (UNAIDS, 2017) and the number of AIDS-related deaths dropped from 760,000 in 2010 to 420,000 in 2016 (UNAIDS, 2018). The introduction of ART has gradually shifted HIV from being a terminal disease to a chronic illness and this has implications for the capacity of health systems already burdened with other infectious diseases. While people with HIV are now living far longer lives, they are also having new experiences of disability caused by HIV and its related conditions (Nixon et al., 2011). These range from physical, mental, and intellectual disabilities to sensory impairments (Banks et al., 2017). The side-effects of medications may also lead to a range of impairments,
including musculoskeletal weakening, which may restrict activities (e.g. self-care, mobility) and access to health care (Banks et al., 2017).

This chronicity of HIV thus requires health systems designed to efficiently implement HIV-specific programmes while integrating other components of the health system (Doherty et al., n.d.). Disease-specific programmes, such as providing access to ART and the prevention of mother-to-child HIV transmission programmes (PMTCT), can only be effective with the support of a strong health system (Doherty et al., n.d.). It is imperative that in the context of the under-resourced and overburdened health systems that are found widely in Africa, the routines of care for chronic patients are given due consideration.

**STRENGTHENING HEALTH CARE SYSTEMS**

Building resilient health systems should be a priority in all African countries. This is borne out by the two different cases discussed above: one a crisis situation, the other chronic. The West African Ebola outbreak demonstrated how a crisis is exacerbated by a weak health system. The care for patients living with chronic NCDs or HIV exposes how an under-resourced health system affects the health outcomes of patients. According to Olu (2017), the health sector encompasses all activities – in the home, the community, and the formal health sector – that directly enhance health outcomes. Extensive investment into these elements by national governments would contribute towards building a strong health system. Corruption, delayed responses, and neglecting to assign funding to fundamental and strategic national entities are all barriers to well-functioning systems. If strong health systems are to be realised, national governments need to be proactive. They need to allocate appropriate budgets to health care, not just to address outbreaks but also to meet the day-to-day health needs of their citizens. Governments need to do the necessary strategising and planning. And the plans that are made then need to be implemented. This is the underlying message of this book and of all its contributors.

Another theme that runs through this book is the role of the international community (including regional networks and other African initiatives), historically and currently. Organisations such as the
United Nations (UN), World Health Organization (WHO), and African Union (AU) all bear a responsibility and a humanitarian obligation not only to intervene when disaster strikes, but also to assist with building resilient health systems. Often delayed responses to public health emergencies of international concern (PHEICs) result in the spread of disease, a situation that could have been contained had there been a more timely response. National governments as well as the international community need to rethink short-term mobilisation of resources. This mobilisation generally occurs when an emergency calls for it (Hoffman & Silverberg, 2018), but this leaves no resources for building stronger public health systems at a national level, which is the first-line defence against potential outbreaks (Sands, 2017). Greater investment in long-term health system preparedness is required instead of quick solutions. The latter may be effective at the time but the health system will remain vulnerable to epidemics. Dzau and Sands (2016) argue that in fact greater investment in mitigating infectious-disease risks should be seen as a fundamental part of responding to PHEICs, and that outbreaks should not only be viewed as a health issue, but as human dignity and economic security issues as well.

Furthermore, Dzau and Sands (2016) argue that acting early in managing outbreaks and building strong defences limits the spread of epidemics. In fact it is much more cost-effective, they conclude, to invest in preparedness than to spend in response. An investment in systems of effective surveillance and contacts at the local level, for instance, would help to identify cases of infections, leading to timely responses (André et al., 2017). In many parts of Africa epidemics and disease outbreak surveillance systems are weak, which makes it difficult to determine the true scope of the problem. If surveillance systems were to be upgraded, this would allow for quicker identification of diseases in communities and the immediate implementation of primary control measures (Wassilak et al., 2017).

According to the WHO, ‘a well-functioning health system working in harmony is built on having trained and motivated health workers, a well-maintained infrastructure, and a reliable supply of medicines and technologies, backed by adequate funding, strong health plans and evidence-based policies’ (WHO, 2016c). These factors are what the
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WHO refers to as Health System Building Blocks. There are six main ones. They are: (1) service delivery, (2) health workforce, (3) information, (4) medical products, vaccines and technologies, (5) financing, and (6) leadership and governance (WHO, 2010). Strengthening the health system (Table 3) involves ‘improving the six health system building blocks and managing their interactions in ways that achieve more equitable and sustained improvements across health services and health outcomes’ (WHO, 2007: 4).

Table 3: The health system building blocks

<table>
<thead>
<tr>
<th>Building blocks</th>
<th>Priority areas addressed</th>
<th>Intended results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service delivery</td>
<td>Packages of essential health services; service delivery models; health infrastructure; management of health services; safety and quality of care; and demand creation for health care.</td>
<td>Ensuring delivery of effective, safe, and quality personal and non-personal health interventions to those who need them, when and where needed, with minimum waste of resources.</td>
</tr>
<tr>
<td>Health workforce</td>
<td>Ministry of health to show leadership for human resource issues through developing good policies and investment plans, advocacy, setting of norms and standards and intelligence. Creating, motivating, and sustaining a productive workforce tackling the priority health needs.</td>
<td>Ensure that the health workforce works in ways that are responsive, fair, and efficient to achieve the best health outcomes possible for the available resources and circumstances. Availability of health workforce in sufficient numbers, skills mix, fairly distributed; competent, responsive, and productive to ensure access to care of good quality.</td>
</tr>
<tr>
<td>Information</td>
<td>Facility and population-based information and surveillance systems; research; global standards; tools; quality and completeness of data.</td>
<td>Availability of a well-functioning health information system that ensures the production, analysis, dissemination, and use of reliable and timely information on health determinants, health systems performance and health status.</td>
</tr>
<tr>
<td>Building blocks</td>
<td>Priority areas addressed</td>
<td>Intended results</td>
</tr>
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<td>-----------------------------------------</td>
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</tr>
<tr>
<td>Medical products, vaccines and</td>
<td>Norms, standards, policies, and regulations; reliable procurement, distribution, and rational use of essential medicines and technologies; equitable access; quality.</td>
<td>Ensure equitable access by all citizens to essential medical products, vaccines, and technologies of assured quality, safety, efficacy, and cost-effectiveness, and their scientifically sound and cost-effective use.</td>
</tr>
<tr>
<td>technologies</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Financing</td>
<td>National health financing policies; tools and data on health expenditures; costing.</td>
<td>Raise adequate funds for health in ways that ensure people can use needed services, and are protected from financial catastrophe or impoverishment associated with having to pay for services; efficient use of resources.</td>
</tr>
<tr>
<td>Leadership and governance</td>
<td>Health sector policies; harmonisation and alignment; oversight and regulation; co-ordinating prioritisation of investments.</td>
<td>Ensuring strategic policy frameworks exist and are combined with effective oversight, monitoring and evaluation; stewardship role at all levels; coalition building, the provision of appropriate regulations, incentives and accountability; co-ordinating operational planning.</td>
</tr>
</tbody>
</table>

*Source: WHO, 2007*

As illustrated in Table 3, each building block is important and contributes to strengthening the health system in different ways. All these components work to ensure effective policy and regulation, enough resources (including human resources), and distribution of care (WHO, 2010). It should be remembered that the building blocks are not exhaustive or all-inclusive; additional sectors are often needed to contribute to a resilient health system. Communicable diseases and NCDs both have an adverse impact on national income, productivity,
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and household expenditure, and both, therefore, influence economic growth (Temu et al., 2014). Health is a crucial factor in economic development, which in turn must be based on an all-encompassing approach that takes cognizance of the role of health in development (Temu et al., 2014). Although the building blocks are a good place to start to monitor and evaluate developments in the health system, the blocks exclude the social and economic factors that affect health outcomes. An analysis of the building blocks would therefore benefit from a syndemics approach, which considers all the interactions of the various factors and their effect on health conditions. Further considerations should be the origins of diseases and the impact of their pathogenesis on future epidemic outbreaks (an adjunct focus of the book) as a fundamental part of preventing and managing epidemics.

Understanding the origins of diseases is a necessary aspect of strengthening health systems; this knowledge will affect how diseases are handled and how epidemic outbreaks are contained. The origins of the disease-related epidemics highlighted in this volume – malaria, cholera, HIV, and Ebola – and of the NCDs discussed have implications for how the epidemics are managed and/or treated. Investigation into pathogenesis assists in developing preventive measures against disease, as well as treatments and/or vaccines.

Epidemic diseases with ancient histories, like malaria, which possibly dates back to 3200 BC (Institute of Medicine, 2004), and cholera, which may go as far back as the 1st century (History.com, 2018), have been studied for many years and their transmission and symptoms are understood. Continuous research improves their management. With malaria, mosquitoes (female Anopheles species) ingest malaria parasites from infected humans through bites and then subsequently transmit malaria parasites when feeding on an uninfected host (Cox, 2010). Therefore, the most widely promoted (and consequently adhered to) malaria preventive measure is the introduction of insecticide-treated nets in malaria-endemic regions; this measure also takes into account that the female Anopheles species bites at night (Malaria Consortium, 2016). With cholera, toxic strains of Vibrio cholerae – a bacterium found naturally in aquatic ecosystems – are responsible for transmission (Reidl & Klose, 2002). Infections occur through ingesting
contaminated water and/or improperly prepared food, resulting in the cholera toxin that causes cells lining the intestines to release increased amounts of water, leading to diarrhoea and rapid loss of fluids and electrolytes (Reidl & Klose, 2002; History.com, 2018).

Infectious diseases like HIV/AIDS and Ebola, on the other hand, are not in the category of ancient and well-understood diseases. HIV was first identified in 1981 (Sharp & Hahn, 2011) and Ebola in 1976 (WHO, 2018a). Unlike ancient eminent diseases, HIV and Ebola are far from being under control and they still require extensive research. Of the two, however, HIV has received the most attention over the years. Numerous research and development (R&D) programmes have been put in place and funding made available for learning more about this virus, searching for treatments, and thus decreasing mortality rates. Ebola has not yet received the same attention. The 2014 outbreak in West Africa caught the region and the international community off guard and unprepared. The epidemic had many people questioning the origin and rapid transmission of the outbreak. Various other ‘new’ diseases such as Lassa fever, Legionnaires’ disease, and hantavirus pulmonary syndrome have been identified in the last few decades (Morse, 1995), and archaic diseases (such as tuberculosis, malaria and cholera – including new strains) are re-emerging. This is an indication that the battle against infectious diseases, known and unknown, is far from over.

**The Future of Epidemics in Africa**

Rapid human development, involving a series of changes in demographics and the environment, has led to the emergence of new infectious diseases and also the re-emergence of old ones (Mackey et al., 2014). Migration, travel, and trade are all common features of human development, but increased globalisation has led to their acceleration and escalation. With the growth of the human population and intercontinental migration, and with the mingling and breeding of different animal species for trade, comes the transferral of microorganisms to new locations (Brown, 2004) and thereby prospects for triggering infectious diseases. Industrialisation and the invasion of wildlife terrain have led to an increase in the contact between humans
Introduction

and animals (Mackey et al., 2014). An example of this can be seen in
the study ‘Wildlife–human interactions: from conflict to coexistence
in sustainable landscapes’, which aimed to analyse wildlife–human
interactions in Indian multi-use landscapes (and one Norwegian
landscape) with a view to understanding conflicts and sustaining
mechanisms of co-existence (Nandini, 2010). The shift in the ecology
of human–animal interactions caused by an expanding, increasingly
urbanised global population has given rise to zoonoses (or zoonotic
diseases). These are infectious diseases that can be transmitted between
animals and humans (CDC, 2017). Examples are anthrax, Rift Valley
fever, Ebola, Chikungunya, Zika, and severe acute respiratory
syndrome (SARS), but many others are also in evidence (Halliday et
al., 2015; Kemunto et al., 2018).

In a recent study by the World Health Organization the top
diseases listed that are likely to cause severe epidemics in the current
global health landscape are zoonotic diseases (WHO, 2018b), the
reason being the lack of efficient drugs and/or vaccines to counter a
public health emergency (WHO, 2018b). The following diseases were
identified for accelerated research and development:

- Crimean-Congo haemorrhagic fever (CCHF)
- Ebola virus disease and Marburg virus disease
- Lassa fever
- Middle East respiratory syndrome coronavirus (MERS-CoV)
  and severe acute respiratory syndrome (SARS)
- Nipah and henipaviral diseases
- Rift Valley fever (RVF)
- Zika
- Disease X

Zoonotic Diseases Around the Globe

Some infectious diseases that have historically affected humans,
such as the Black Death (or bubonic plague) and typhoid fever, are
of zoonotic origin. The continuing growth of human populations
and urbanisation since prehistoric times has led to ensuing invasions
of human populations by increasing numbers of different pathogens
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Bubonic plague is a disease of wild rodents in which the bacterial pathogen, Yersinia pestis, is spread by infected fleas (Duncan & Scott, 2005). Typhoid fever is caused by the bacterial pathogen Salmonella, which is commonly found in chickens, pigs, turkeys, and cows, although various species of wildlife – birds, reptiles, frogs, and fish – can also carry the bacteria (Meštrović, 2018). Meat and other animal products that have not been cooked thoroughly are the main vehicle of transmission (Meštrović, 2018). Emerging diseases are incessant and the emergence of diseases such as AIDS, SARS, avian influenza (H5N7), swine flu (H1N1), West Nile virus, and Ebola (EVD) is an indication that infectious diseases remain a global threat. In regions where the population is dense and expanding rapidly, the risk of these diseases spreading is increased.

Over 1,400 species of parasites and microbes have been recorded as pathogenic in humans and more than 60 per cent of these originate from animals (Cleaveland et al., 2001). As has been mentioned above, humans are susceptible to a greater number of pathogens as a result of animal domestication and increased proximity to wildlife. Closer proximity means that person-to-person transmission, subsequent to animal-to-human transmission, is increased.

Globalisation has also had a large impact on the rate, pattern, and geography of epidemics (Morand, 2018). It is estimated that endemic zoonotic diseases will cause more than 2.2 million human deaths and 2.4 billion cases of illness annually (Kemunto et al., 2018). More than 25 per cent of the disability-adjusted life years (DALY) lost to infectious diseases in low-income countries has been reported to be attributable to zoonotic diseases, compared to less than one per cent in high-income countries (Grace et al., 2012). As with other conditions on the disease spectrum, investigations into zoonotic diseases have neglected zoonoses affecting the most vulnerable and disease-burdened populations (Fèvre, 2015; Kemunto et al., 2018). Knowing about and understanding the advent of zoonotic diseases, including their pathogenesis and development, symptoms, diagnostics, and treatment, as well as how to approach their prevention and control, is crucial to managing diseases and containing epidemic outbreaks.

Africa is especially vulnerable to zoonotic diseases, in part because
of its rapid population growth. The continent is projected to have the largest population increase globally, with an estimated 1.68 billion people in 2030, which is 42 per cent larger than the 2015 population of 1.19 billion, which is 25 per cent of the world’s population (Canning et al., 2015; UN, 2015). It is estimated that in 2060 Africa’s population will have grown to 2.8 billion people. The risk in Africa of encountering, contracting, and subsequently spreading infections through population movement and resultant concentration in urban areas is already high, and it is increasing.

This pattern gives zoonotic pathogens continual opportunity to infect new hosts and for new hosts to interact with each other and transfer their infections. Specifically, zoonotic diseases are transmitted to humans in these ways: through scratches or bites from animals; through the ingestion of the meat of an infected animal or dairy products made from the milk of infected animals; by inhaling dust that has been exposed to the faeces, urine, or milk of an infected animal; or through the bite of an infected rodent or flea (Moleko, 2018).

The proximity of humans to animal habitats and animals to human habitats has stemmed from ecological disturbances such as deforestation, soil erosion, desertification, and wetland degradation. This has resulted in animals and humans having to move into unfamiliar areas and to share those spaces. The origins of zoonotic diseases are often historical – a result of decisions made decades ago – allowing conditions to develop that predispose certain populations to transmission. In this book, the impact of politics and socio-economic factors on vulnerability to disease comes up again and again. It is particularly evident with zoonotic diseases.

Going back to the Ebola outbreaks, it is worth considering how this zoonotic disease is suspected to have been transmitted to humans in the first place, and to link this process back to the book’s various themes. This focus holds important lessons for the containment, if not prevention or eradication, of epidemics.

Ebola is likely to have emanated from human interface with wild animals (Edwards et al., 2018). The outbreak in West Africa is believed to have come from the hunting and handling of fruit bats (Leroy et al., 2009; Hogenboom, 2014; Rewar & Mirdha, 2014). Bats
have been reported to host more viruses than any other mammal (Kupferschmidt, 2017). Transmission occurs from bites, scratches, bodily fluids, tissue, and excrement. Moreover, bats can infect other animals like gorillas and chimpanzees through their faeces or fruit they have touched (Hogenboom, 2014) and these primates can in turn infect humans through touch. Bats are ideal hosts for the Ebola virus because it is not lethal to them, unlike for humans and non-human primates (Hogenboom, 2014).

The practice of hunting and eating bats is common in parts of certain African countries, as either a necessary source of food or, for some, a luxury (Osborne, 2014; Kamins et al., 2015). However, the methods of capturing bats expose hunters and vendors to infections. Hunters often do not wear protective gear such as gloves when capturing and handling live bats, thereby leaving themselves vulnerable to scratches or bites (Osborne, 2014). Sometimes hunters shoot bats, leaving their blood exposed, posing an increased risk of infection to themselves and vendors (Kamins et al., 2015). Further, consuming bat-bitten fruits, or palm sap that has been tasted by fruit bats, can have detrimental health implications (Rajasekaran, 2018).

The case study of Ebola in the Democratic Republic of Congo (DRC) points to directions for future containment. In the DRC, between May and November 2007, an Ebola outbreak affected more than 260 people and caused 186 deaths (Leroy et al., 2009). A study by Leroy et al (2009) identified a mammoth annual fruit bat migration up the Lulua River (a tributary of the Kasai River, near the city of Kananga) prior to the outbreak. Particularly large numbers of fruit bats had migrated into the outbreak area, nesting in the fruit and palm trees of a deserted plantation. These bats were hunted in their numbers by villagers, likely causing the Ebola outbreak (Leroy et al., 2009). The outbreak raises issues of how humans have come to inhabit the same space and consume the same foodstuff as virus-infested creatures.

Bats are driven closer to human habitats by increased biological activity resulting from changes in ecological networks, including in deep forests (Rajasekaran, 2018). Field (2009) reported that deforestation, which is one of the consequences of oil palm planting,
changes the feeding behaviour of bats. It causes them to focus on cultivated crops – thus bringing the interface between bats, humans, and livestock closer. As a case in point, fruit bats in Bangladesh were the most likely transmitters of the Nipah virus to human hosts via urine on the date fruit of planted palm trees (Luby et al., 2009). As the erosion of their habitats and food resources continues and they are forced to settle in unnatural habitats as a result (Rajasekaran, 2018), bats become increasingly malnourished – resulting in an increased viral load – Nipah virus, rabies, and other infectious viruses are then transmitted by these animals.

A similar phenomenon can be witnessed in the spread of Lassa fever in West Africa, this time with rodents as virus reservoirs. The socio-economic dynamics and civil wars in Liberia and Sierra Leone changed housing and agricultural patterns. This led to population displacement to dreadful, overcrowded living conditions, including in urban areas, and to refugee migrations, resulting in expanded human interface with rodents (Dzingirai et al., 2017). These are but a few examples of the impact of demographic, economic, political, and environmental changes on the way in which humans and animals interact and the resultant spread of zoonotic pathogens.

**DIAGNOSIS AND CONTROL OF ZOONOTIC DISEASES**

Despite the fact that zoonotic diseases are rife across tropical regions, particularly in Africa, they are seldom recognised, studied, and incorporated into plans for managing epidemic outbreaks (Halliday et al., 2015).

Zoonotic diseases present with general symptoms such as fever, headache, fatigue, and joint or muscle aches. Because these are common in a wide range of infectious diseases in tropical regions, it is difficult to differentiate them clinically (Halliday et al., 2015). Clinicians are more likely to diagnose patients with malaria or typhoid fever, which have similar symptoms to zoonotic diseases. Patient Zero in the 2014 Ebola outbreak in Nigeria was initially misdiagnosed with malaria, but thanks to Dr Ameyo Stella Adadevoh, who subsequently correctly diagnosed
Apart from the difficulty in differentiating zoonoses from other common diseases, the inability of various health system infrastructures to contain disease becomes apparent (Kock et al., n.d). The lack, in some African countries, of laboratories in which to conduct diagnostics adds to the challenge of detecting zoonotic diseases (Kock et al., n.d). Furthermore, in these areas it is often not common practice to seek urgent medical care; people tend to seek out health care only in the late stages of the infection (Halliday et al., 2015), which is when the detection of pathogens is more difficult. Thus, seeking health care once the infection is advanced decreases the chances of accurate diagnosis (Halliday et al., 2015).

These diagnosis issues are mostly found in low-income countries with adverse socio-economic conditions. Whereas globally various zoonoses have been contained, in many African countries they remain prevalent and disproportionately affect people who are not only at high risk of pathogen exposure, but also have little access to adequate primary health care (Kock et al., n.d). This perpetuates misdiagnosis and underdiagnosis of zoonotic (and other) diseases in Africa, leaving poor communities, which most likely were forced into the areas they occupy, with the burden of these diseases.

A MULTI-LAYERED APPROACH TO ADDRESSING EPIDEMICS

If one is truly to address epidemic diseases, one needs to go beyond interventions that are made during an outbreak. Rather, a more complex approach linked to the roots of the epidemic needs to be taken. Epidemics are more than just a problem of public health. Ultimately, they are a political and social problem and, as such, they require political solutions from both the international community and national governments. Moreover, because epidemics can result from a multitude of influences, addressing them requires a dynamic approach from diverse sectors of society. Stakeholders who should be included would be drawn from those involved in public health, medicine, environmental science, animal health, food safety, economics, and public policy.
Introduction

This book takes a multidisciplinary and transdisciplinary research approach, and the experts contributing to the research project reflect this. They are medical doctors, community health specialists, public health specialists, health science researchers, pharmaceutical scientists, policy analysts, sociologists, and historians. The chapters are divided into four sections, exploring (1) epidemics and syndemics: disease in context; (2) contending with epidemics and health systems in Africa; (3) contending with chronic conditions in African health systems; and (4) the future of health systems in Africa.

The overall aim of the book is to enhance understanding of the intricacies of epidemiological issues such as the reasons why epidemics occur and the underlying structural drivers that allow them to reoccur. Some of the reasons lie in political actions and the effect of public funds being redirected away from essential services. The insights in this volume can thus be used as a basis for improved planning and implementation of national and international strategies. The epidemical diseases discussed and the locations of the outbreaks examined were selected for the lessons that can be drawn from them. In putting forward these case studies, the book aims to assist with developing policies that will provide an enabling environment for the development of strong health systems.

Chapter 2 presents the conceptual framework of syndemics, which is an alternative to more conventional, mainstream epidemic frameworks. The concept of syndemics offers a nuanced approach to understanding the social and economic conditions in which diseases occur and the factors which exacerbate their impact. The author uses chronic undernutrition (stunting) in Zimbabwe – the extent and gravity of this syndrome are not duly appreciated – to highlight how specific local environmental conditions encourage stunting. The chapter highlights the importance of putting diseases and medicine in context in order to understand their subtleties, including that they do not occur in isolation. This also applies to epidemic outbreaks and their containment. An understanding of the underlying structural drivers that make certain populations vulnerable to diseases will inform strategies to contain such diseases.

Cholera is a preventable and treatable disease yet outbreaks still occur periodically. Chapter 3 uses the 2008–2009 outbreak of cholera
in Zimbabwe (and references the 2018 outbreak) to demonstrate the crucial role political factors play in creating conditions for an epidemic outbreak. The economic crisis in Zimbabwe and the collapse of the health system and water and sanitation facilities there – and these factors being undergirded by political agendas – made conditions ripe for a prolonged outbreak and the deaths of thousands of people. This example illustrates how resources in a country can be politicised to gain power, with disregard for the well-being of citizens.

A lack of preparedness for outbreaks is common across various African countries. Many have weak health systems, which means that avoidable diseases are not being contained timeously. When regions suffer extreme floods or experience unusually high temperatures, the risk of a malaria outbreak is omnipresent, yet many health systems have not been strengthened sufficiently to anticipate or contain an outbreak. However, over the years actions have been taken in southern Africa to control outbreaks (and these attempts are continuously strengthened). Cross-border and regional collaborative efforts have led to the implementation of interventions to advance southern Africa’s transition to malaria elimination. Chapter 4 describes successful strategies applied within the SADC region and emphasises the importance of networks in successful campaigns.

Creating strong health systems includes improving surveillance systems to help with the early detection of disease. There has been solid progress in this regard, albeit with occasional relapses. Nigeria’s successful containment of the Ebola virus can be attributed to the meticulous diagnosis of the index patient by Dr Adadevoh, followed by a quick response and action and deployment of a health care workforce. There is a stark contrast between Nigeria’s response strategies and those of the three other West African countries that experienced Ebola in the same period. Nigeria’s response reveals the importance of good and decisive leadership when faced with an outbreak. This success story is analysed and systematically presented in Chapter 5.

Increasing chronicity on the continent places a different type of burden on national health systems to that which comes with epidemic outbreaks. NCDs, which are on the rise in sub-Saharan Africa, require long-term treatment and monitoring. Given the predicted increase
in NCDs, and given health systems that are under-resourced, an evaluation of long-term care within the African setting is required. Health systems are now required to manage these chronic conditions and at the same time be prepared to contain any possible epidemic outbreaks. With HIV gradually becoming a chronic illness with similar implications to those of NCDs, health systems need to encompass long-term care. Lessons on addressing chronic illnesses can be drawn from examining care practices in health facilities, communities, and homes in response to long-term HIV. Health workers play a big role in rolling out disease-specific programmes such as the distribution of ART; thus they are central to the efficiency of health systems. Health care workers and nurses, who are at the frontline of both epidemic outbreaks and chronic care, are also expected to carry out administrative duties and these duties can outweigh their health care responsibilities. Chapters 6, 7 and 8 address these issues in depth.

Some of the building blocks of a strong health system are addressed in the last three chapters and in the book’s conclusion. One of the building blocks is ensuring equitable access to medical products, vaccines, and technologies of assured quality, safety, efficacy, and cost-effectiveness, and their scientifically sound and cost-effective use. Nanotechnology has been shown to provide cost-effective, safe, and efficient treatment of certain diseases. Chapter 9 explores the potential of this technology to provide solutions to the need for accessible and efficient treatment. Contaminated water, which causes diarrhoeal diseases, can be treated using nanotechnology. Nanotechnology can therefore be used for both treatment and prevention.

Another important building block is financing the health system. The national health insurance (NHI) schemes in Rwanda and Ghana, which are reviewed in Chapter 10, serve as case studies of the implementation of national health insurance in Africa. Chapter 11 explores South Africa’s health system, and assesses proposals for the anticipated NHI against current health needs. The chapter also explores South Africa’s readiness to deal with known epidemics and those of the future. With all the common diseases the South African health system has to contend with, there are other conditions, like listeriosis, for example, which occur less frequently, and mental health,
which is a neglected area. Both have exposed cracks in the SA health system. While the NHI is a ray of hope for people who anticipate that it will be a solution to equitable access to health care, there is also fear that it will worsen a health system that might be described, as the author of Chapter 11 demonstrates, as dysfunctional. The state of the South African health system and also what is required to enhance its capabilities is outlined in this chapter.

In shining a light on some of the structural and political drivers of disease in Africa, the authors of this compilation go some way to demystifying the notion that the continent must always bear an inevitable burden of sickness, manifesting from time to time in a well-publicised epidemic. The argument is made that a syndemic, multifaceted approach to disease is required in order to expose these drivers and to suggest how solutions might be developed. Through varied case studies, the authors demonstrate that Africa can only combat the epidemics that plague it by developing a different narrative about sickness, one that offers a wider, deeper understanding of the context for disease. Multiple lessons are drawn for the effective control and elimination of epidemics on the continent, and so are the limitations of the panicked, short-term responses that diseases in Africa so often evoke. The contributors, who are drawn from across sub-Saharan Africa, make a convincing case for the fact that we already have the knowledge and capacity to save the many lives lost to epidemics in Africa.

REFERENCES


Introduction

Transactions of the Royal Society of London, Series B, Biological Sciences, 372 (1725), 20160172.


Epidemics and the Health of African Nations


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Krishnan, A. 2016. ‘Sustainable surveillance systems for noncommunicable diseases in developing countries: A bridge too far or a realizable dream?’. International Journal of Non-Communicable Diseases, 1 (2), 53–54.


Introduction


increasing chronicity of HIV in sub-Saharan Africa: Re-thinking “HIV as a long-wave event” in the era of widespread access to ART”. Globalization and Health, 7 (41), 1–5.


of global security – a framework for countering infectious-disease crises’. 

Save the Children. 2015. ‘A wake-up call: Lessons from Ebola for the 
world’s health systems’, https://www.savethechildren.net/sites/default/ 
files/libraries/WAKE%20UP%20CALL%20REPORT%20PDF.pdf, 
accessed 27 November 2018.


Bushman, F. D., Nabel, G. J & Swanstrom, R. (eds.): *Cold Spring Harbor 

Shoman, H., Karafillakis, E. & Rawaf, S. 2017. ‘The link between the West 
African Ebola outbreak and health systems in Guinea, Liberia and Sierra 
Leone: A systematic review’. *Globalization and Health*, 13 (1), DOI: 

Singer, M., Bulled, N., Ostrach, B. & Mendenhall, E. 2017. ‘Syndemics and the 

Tapela, N. 2017. ‘Africa must reboot its health systems to cope with non-
africa-must-reboot-its-health-systems-to-cope-with-non-communicable-

Tatem, A. J., Rogers, D. J. & Hay, S. I. 2006. ‘Global Transport Networks and 

Temu, F., Leonhardt, M., Carter, J., & Thiam, S. 2014. ‘Integration of non-
communicable diseases in health care: Tackling the double burden of 
disease in African settings’. The Pan African Medical Journal, 18, 202. DOI: 

UNAIDS. 2017. ‘Ending AIDS: Progress towards 90-90-90 targets’. UN 
AIDS.

9 December 2018.

United Nations (UN). 2015. ‘Population 2030: Demographic challenges and 
opportunities for sustainable development planning’. *UN Department of 
Economic and Social Affairs*, New York.

Development Programme*, http://hdr.undp.org/en/content/table-1-human-

Epidemics and the Health of African Nations

11 December 2018.


