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Disease Outbreaks in Africa. Prioritising Prevention Over Control and Self-reliance Over Aid Dependency

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Oyewale Tomori DVM, PhD*
Senior Fellow, Scowcroft Institute of International Affairs, Bush School of Government and Public Service, Texas A&M University, College Station. TX 77843-4220, USA
*DVM, FRCPath (UK), FCVSN, FASTMH, FAS (Nigeria), NNOM, NAM

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By: Oyewale Tomori DVM, PhD

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1.0. INTRODUCTION

Africa is a verdant pasture for infectious diseases, and outbreaks of diseases are common and regular[1]. It is estimated that Africa carries 25% of the world's disease burden[2]. Between 2020 and 2024, African countries accounted for ninety-eight (41%) of the two hundred and thirty-nine disease outbreaks notified to the WHO[3]. Some of the diseases notified to WHO, were first reported in Africa, and include Yellow Fever (around 1778)[4], Lassa Fever (1969)[5], Ebola Virus Disease (1986)[5], and mpox (1970)[5] These and other diseases, continue to ravage different communities in Africa. Figure 1

Many health workers in Africa have over the years, gained experience and acquired relevant skills in investigating, detecting and controlling these disease outbreaks. Instances occur, where through appropriate preparedness, spread of sporadic cases have been stopped and potential outbreaks prevented[6]. However, many countries in Africa, are still unable to prevent or effectively control the outbreaks of some of these diseases. Consequently, these diseases have often spread internationally and become public health events of international concerns (PHEICs).[7]

A complex interplay of factors influences the recurrence of disease outbreaks in Africa. Apart from climate change, microbial adaptation, human susceptibility, demographic shifts, and environmental changes, other factors include poverty, inadequate healthcare systems, and social inequality[8]. All these factors contribute to the prevalence and severity of outbreaks. When disease outbreaks eventually occur, weak surveillance systems, inadequate healthcare infrastructure,

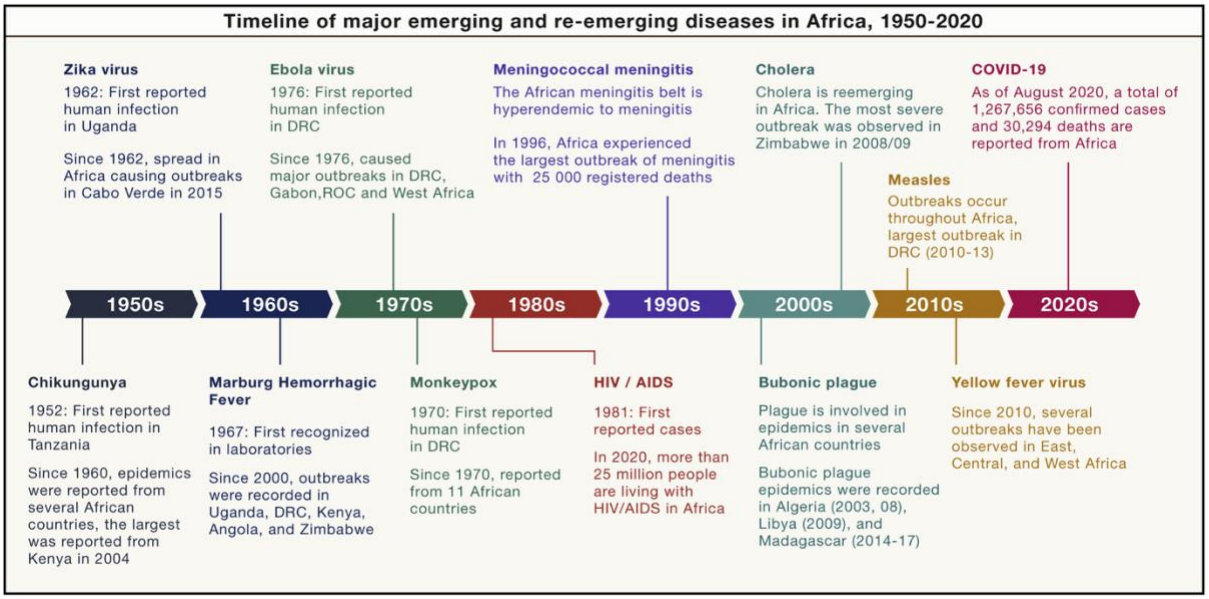


Figure 1: Timeline of major emerging and re-emerging diseases in Africa, 1950-2020. Source-Reference 1

resource constraints, misplaced priorities, and cultural beliefs continue to hamper effective disease prevention and ability to rapidly and efficiently control the outbreaks in Africa[9]

2.0 EXAMPLES OF AFRICA'S UNFINISHED BATTLES WITH INFECTIOUS DISEASES.

2.1 YELLOW FEVER (YF) DISEASE

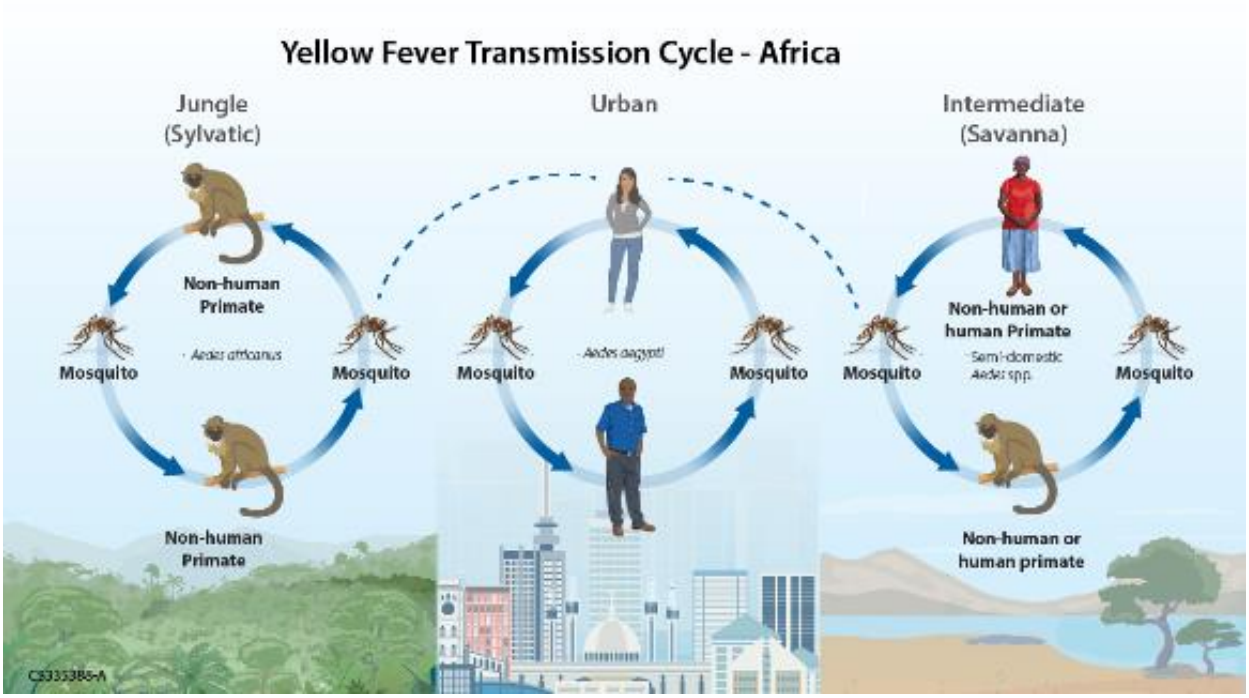
Yellow fever (YF) is a zoonotic disease caused by an arborvirus and transmitted to humans and monkeys by infected female mosquitoes[10]. The disease is currently endemic in Africa and South America, but YF ravaged North America and Europe until the early 20th century. The virus was first isolated in 1927, and the 17D live attenuated YF vaccine strain was developed in 1937. Yellow fever is responsible for 200,000 infections with about 30,000 deaths annually. About 90% of the cases occur in Africa[4]. According to W.H.O., about one billion persons live in yellow fever endemic areas[10]. Genomic studies indicate that YF evolved in Africa around 3,000 years ago[11]. The first reported outbreak was in 1494 in Canary Islands off the African coast. The disease was imported in the 1600s into the western hemisphere on slave ships from West Africa. Severe YF outbreaks were reported in the United States, (New York-1668, Boston-1691, and Charleston-1699. The disease spread to Europe in the 1700s, with the Spain epidemic killing over 2000 people. Other epidemics were reported in the seaports of Britain and France. In 1778 there were reports of YF outbreaks among French soldiers in St. Louis Senegal[4]. Other outbreaks were reported between 1815-1835 in Sierra Leone, Senegal, Gambia, Fernando Po[12].

There are three transmission patterns of the disease, as illustrated in Figure 2a (Africa) and Figure 2b (South America)[10,11].

- Jungle Yellow Fever occurs primarily between nonhuman primates in the jungle and mosquito vectors in the same habitat. Humans can act as accidental hosts, if bitten by the infected mosquitoes, when visiting or working in the jungle

- Urban Yellow Fever occurs among human beings, when YF infected urban mosquitoes, especially *Aedes aegypti, bite susceptible humans.*

- Intermediate (Savanna): This is found only in Africa and involves transmission of virus from mosquitoes to humans living or working in jungle border areas. Transmission here is from monkey to human or from human to human through mosquito bites.



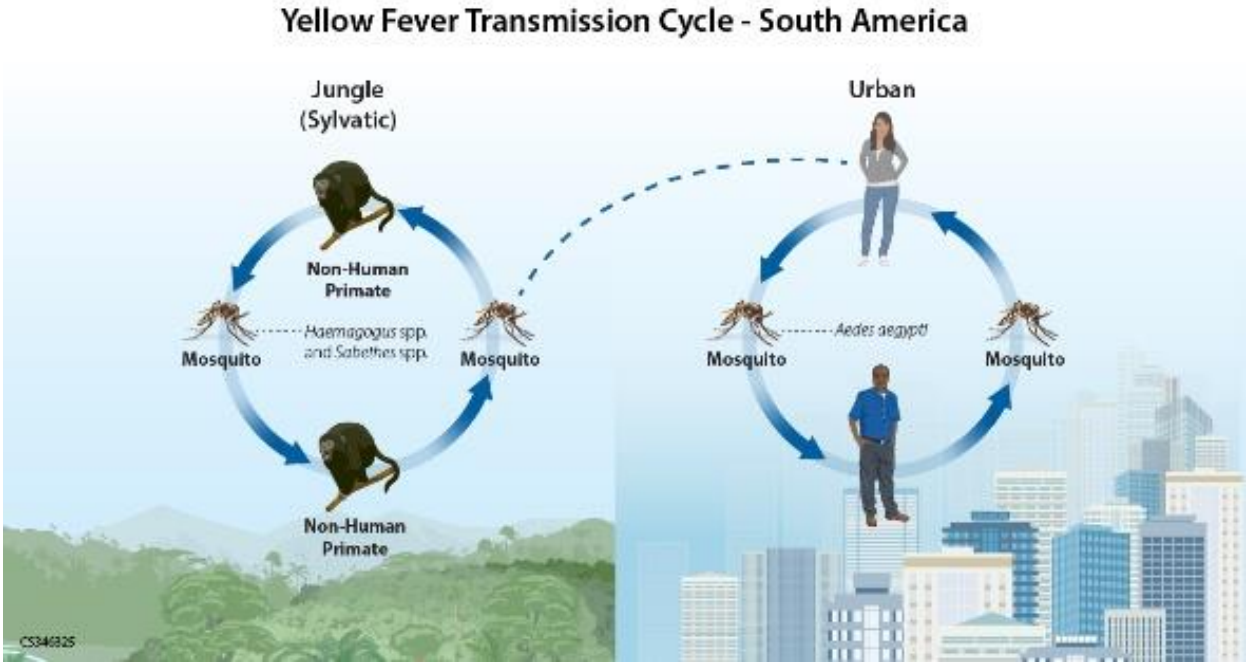


Figure 2a YF transmission (Africa)
Figure 2b. YF transmission (S. America)
Source Reference 12

African countries have been reporting YF outbreaks to WHO since 1948. The endemic disease frequently erupts into pandemics, especially in West and Central Africa.[4] Between 1960 and 2000, notable YF epidemics were reported principally from West Africa, with a shift to East and Central Africa from 2000 onwards. These

epidemics occurred in Nigeria 1984-1995, with at least 10 outbreaks and 5,143 deaths reported during that period Nigeria and other African countries (Ghana, Benin, Burkina Faso and Kenya) continue to report significant yellow fever outbreaks in subsequent years. Major outbreaks occurred in 2016 in Angola and Democratic Republic of the Congo (DRC), with exportation to Kenya and China[13]. Since the beginning of 2023, a total of 13 countries in the WHO African Region have documented probable and confirmed cases of yellow fever (YF), namely Burkina Faso, Cameroon, the Central African Republic, Chad, Republic of the Congo, Côte d'Ivoire, the Democratic Republic of the Congo (DRC), Guinea, Niger, Nigeria, South Sudan, Togo and Uganda[14].

Despite the availability of a safe and highly efficacious YF vaccine, the disease remains a significant public health threat in Africa due to various factors. These include virus and vector adaptation, failures in vector control, insufficient vaccine supply and distribution, suboptimal immunization coverage, and ongoing outbreaks in endemic areas[15]. Other factors include poor disease surveillance, inadequate laboratory diagnostic backup etc. These factors contribute to the presence of susceptible populations and the potential for disease spread, even with a good vaccine available. Delayed detection and laboratory confirmation of YF cases result in late and inadequate control response.
Current YF vaccine manufacturing capacities are unlikely to meet the demand if an outbreak of similar magnitude to those seen in the recent past were to occur now. YF remains capable of spreading internationally and is therefore a potential threat to global health and a significant public health concern, despite being a vaccine-preventable disease.

2.2 LASSA FEVER

Lassa fever is an acute viral illness caused by Lassa virus that was first identified in 1969 in Nigeria[15]. The virus belongs to the virus family *Arenaviridae*. Lassa fever is endemic in Benin, Ghana, Guinea, Liberia, Mali, Nigeria and Sierra Leone, but probably exists in other west African countries as well. The estimated annual number of Lassa virus infections in West Africa ranges from 100,000 to 300,000. However, these are gross underestimates because of challenges related to Lassa fever surveillance. The symptoms are similar to other diseases affecting the region, like malaria. There is also limited access to specialised diagnostic laboratories in affected countries.

Lassa virus is transmitted to humans via contact with food or household items contaminated with rodent urine or faeces. Person-to-person transmission occurs, particularly in health care settings lacking adequate infection prevention and control measures. The overall case fatality rate is 1% but observed case fatality rate among patients hospitalized with severe diseases of Lassa fever is 15% and above. Mild symptoms can include fever, tiredness, and headache. Severe cases may involve bleeding, breathing problems, and other complications. Antiviral medication like ribavirin can be effective if administered early in the course of the illness. Preventive measures include avoiding areas with rodents, properly disposing of food, and practicing good hygiene[15].

Lassa fever remains a major cause of morbidity and mortality in Nigeria with seasonal variation and annual escalating number of suspected cases[16]. Between 2018 and 2024, the proportion of suspected cases with laboratory confirmation ranged from 11.1% to 18.6%, while mortality rate among laboratory confirmed cases range from 16.1% to 26.1%

There is currently no Lassa fever vaccine licensed for human use. However, there are ongoing efforts to develop and test vaccine candidates, including a Phase 2A clinical trial in Nigeria, Liberia, and Ghana[17].

2.3. MPOX

Mpox, previously known as monkeypox, is a viral illness caused by the monkeypox virus, an enveloped double-stranded DNA virus of the *Orthopoxvirus* genus in the *Poxviridae* family[18], which includes variola, cowpox, vaccinia and other viruses. There are two distinct clades of the virus: clade I (with subclades Ia and Ib) and clade II (with subclades IIa and IIb). In 2022–2023 a global outbreak of mpox was caused by the clade IIb strain. A global outbreak of clade IIb began in 2022 and continues to date, in many countries, including some African countries[19]. The common symptoms of mpox are a skin rash or mucosal lesions which can last 2–4 weeks accompanied by fever, headache, muscle aches, back pain, low energy and swollen lymph nodes[18]. Mpox is transmitted through close contact with someone who has mpox, with contaminated materials, or with infected animals. During pregnancy, the virus may be passed to the fetus, or to the newborn during or after birth[18]. The natural reservoir of the virus is unknown, but various small mammals such as squirrels and monkeys are susceptible. Mpox is treated with supportive care for symptoms such as pain and fever, with close attention to nutrition, hydration, skin care, prevention of secondary infections and treatment of co-infections, including HIV where present. Three vaccines are licensed for mpox vaccination[20]. These are i). MVA-BN (also known as Imvamune®, Imvanex® or Jynneos®). It is given either as a subcutaneous or intradermal injection. ii). LC16m8 (also known as LC16-KMB®). This vaccine involves lightly pricking the skin multiple times with a special bifurcated needle which helps deliver the vaccine just under the skin. iii). ACAM2000. Is licensed in the United States of America for prevention of mpox. Due to known side effects in some people, use of this vaccine is restricted[20].

2.3.1. MPOX IN AFRICA

Before the WHO declaration of mpox as a PHEIC in July 2022 and after the end of the declaration in May 2023, mpox was active in Africa, primarily in DRC. In 2024, apart from DRC, fourteen other African countries (Burundi, Cameroon, CAR, Congo, Cote d'Ivoire, Gabon, Guinea, Kenya. Liberia, Morocco, Nigeria, Rwanda, South Africa and Uganda) reported mpox outbreaks[19]. There was an upsurge in the reported cases of mpox, in DRC and other are also growing outbreaks of clades Ia and Ib affecting the Democratic Republic of the Congo and other countries in Africa.

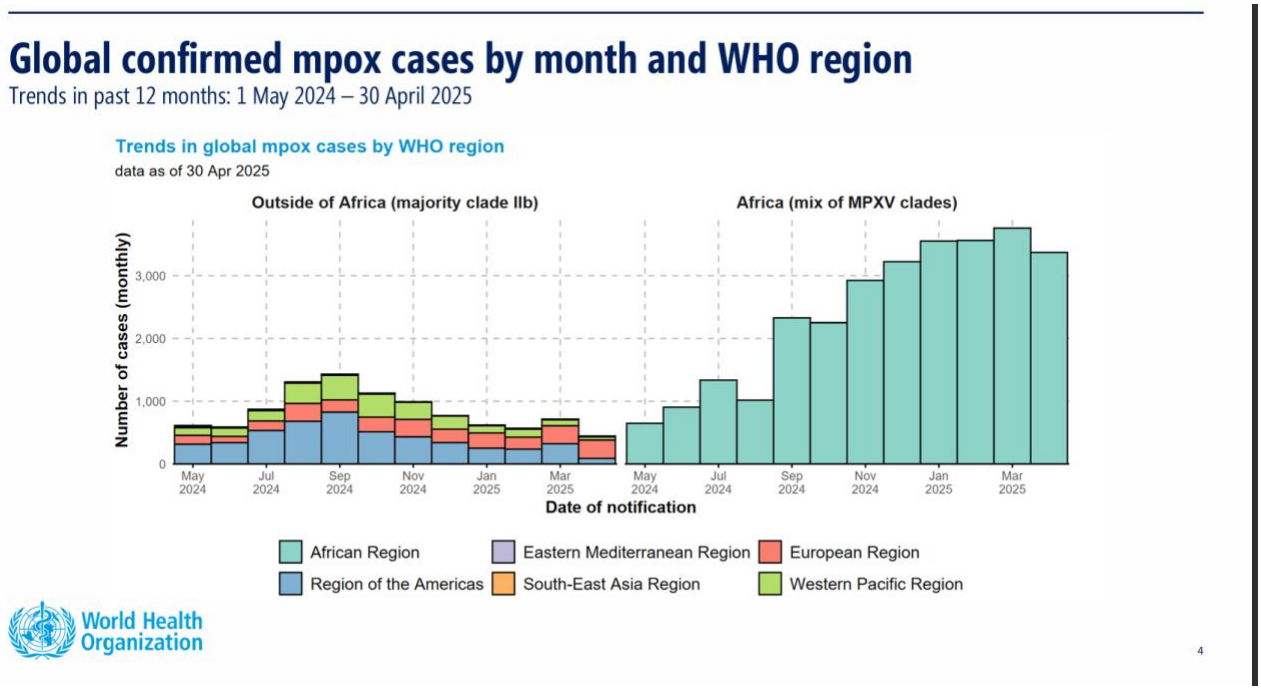
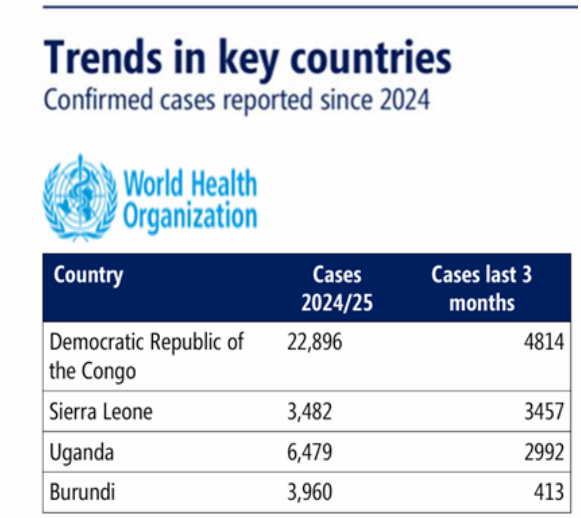


Figure 4: Source Reference 19



Country	Cases 2024/25	Cases last 3 months
Democratic Republic of the Congo	22,896	4814
Sierra Leone	3,482	3457
Uganda	6,479	2992
Burundi	3,960	413

Figure 5 Source Reference 19

According to WHO, during the period 1 January 2024 -1 June 2025, DRCongo and Uganda reported, respectively 22,896 and 6,479 mpox cases, while Burundi and Sierra Leone reported 3,960 and 3,482 mpox cases respectively. Sierra Leone is the new hotspot for mpox infections in Africa, as over 99% of all the mpox cases in the country was reported in the three-month period between March and May 2025. In contrast, only approximately ten percent of the total number of mpox cases in Burundi was reported in the same three-month period.

3.0. EPIDEMICS THAT DID NOT HAPPEN IN AFRICA

Despite the failure to effectively control incessant outbreaks of different diseases in Africa, there are examples of successes in preventing sporadic cases from spreading and escalating to epidemics which end up as public health events of international concern (PHEIC). African health workers have over 50 years of experience dealing with different and various outbreaks of yellow fever, Ebola

Virus Disease (EVD), mpox and COVID-19. They have acquired the relevant expertise and skills to prevent the spread of epidemics[21]. According to Dr. *Dr. Lucile Imboua, Senegal country coordinator, World Health Organization,* "*Senegal, like all other countries in sub-Saharan Africa, is used to managing outbreaks and has the experience and capacity to respond".* This statement is true for several other African countries. There are at least four instances in African countries where outbreaks were contained before they escalated to emergencies of concern. [22]

3.1. Between 2014 and 2016, West Africa was devastated by the largest epidemic of Ebola Virus Disease (EVD) which remains the largest ever seen in the world. On 20 July 2014, a case of EVD arrived in landed in Lagos, Nigeria, a city of about 21 million. By the end of the month, the first patient had died, another infected individual had flown to a different city and over one thousand contacts had been exposed to the virus. And yet, Nigeria successfully stopped the outbreak in less than three months with only 20 confirmed cases and eight deaths. Nigeria stopped Ebola from spreading nationally, and potentially regionally, with effective communication, coordinated response activities and dedicated leadership.[23]

3.2. In 2019, EVD crossed into Uganda through its busy border with the Democratic Republic of Congo. Uganda rapidly mobilised its response teams and activated its health emergency response system, and within six weeks, limited EVD to the border area, with only five cases and three deaths and stopping the disease from spreading into the country.[24]

3.3. Also in 2019, in a rural area of Kenya, a deadly anthrax outbreak was identified and brought under control within four weeks and with only four cases and one death. The country relied on a trained volunteer who acted quickly backed by a reliable community-based surveillance system.[25]

3.4. In 2019, health officials in Akwa Ibom State, Nigeria, quickly contained, within a month, an outbreak of mpox. This was achieved through a surveillance system anchored on strong collaboration among local, regional and national rapid response teams, all working together with the community. They identified and corrected weaknesses in the response activities and provided education and recommendations to improve future responses.[26]

Other success stories on stopping outbreaks from spreading to epidemic proportions were reported in Senegal (Covid-19) and in Burkina Faso (cholera).[27,28] In 2023, Ghana saw off a Lassa fever outbreak within eleven weeks, with 237 cases and one fatality.[29]

In all these instances, no vaccine was used to contain these outbreaks. These successes were achieved through enhanced surveillance, rapid laboratory confirmation of cases, isolation of cases, as well as awareness campaigns on avoiding contacts with cases. Infection protection and control measures were taken. Effective contact tracing was achieved through community awareness and engagement which helped to limit the spread of the diseases.

4.0. WHY DO WE STILL HAVE MANY EPIDEMICS IN AFRICA?

Despite the years of accumulated skills and experience in managing and responding to outbreaks, acquired by health workers, in many African countries, disease outbreaks

and epidemics remain a common feature of life in Africa. Several interrelated factors contribute to disease emergence and outbreaks in Africa. These include environmental factors, socioeconomic issues, weak healthcare systems, and human activities[8]. These factors interact to create a complex web of challenges that make the continent particularly vulnerable to infectious disease outbreaks. The failure to adequately respond and mount control measures against disease outbreaks include arise from neglect of public health and poor-quality health infrastructures. However, perhaps the greatest contributor to the inability to prevent and control disease outbreaks is the low level of preparedness and inadequacy of surveillance systems. Although many African countries have highly experienced health workforce, the enabling environment for the skilled health work force to function and effectively contain these outbreaks does not exist, While it is generally accepted that preventing outbreaks (to substantially reduce the burden of disease), is more cost effective than controlling outbreaks, many African governments fail to provide sufficient funds and resources for preparedness and disease surveillance activities that would help to contain the outbreaks.[8,10]

5.0. DISEASE PREVENTION OR CONTROL: WHICH PRIORITY FOR AFRICA?

Preventing infectious diseases through surveillance is often more cost-effective than responding to and controlling disease outbreaks.[30] Surveillance allows for early detection and targeted interventions. While surveillance requires initial investment in infrastructure and capacity-building, the long-term benefits of preventing outbreaks and reducing the burden of disease outweigh the costs. Controlling outbreaks, on the other hand, can be more costly, as it involves extensive resources, including treatment, isolation, and contact tracing, which may not be needed if the disease is prevented through surveillance. One important consideration that is missed by many African governments is the lives lost through failure to put in place systems that would prevent sporadic cases becoming outbreaks and escalating to pandemics. What is the cost of resources lost when an individual dies from a preventable disease? This is a question to which there is no direct answer.

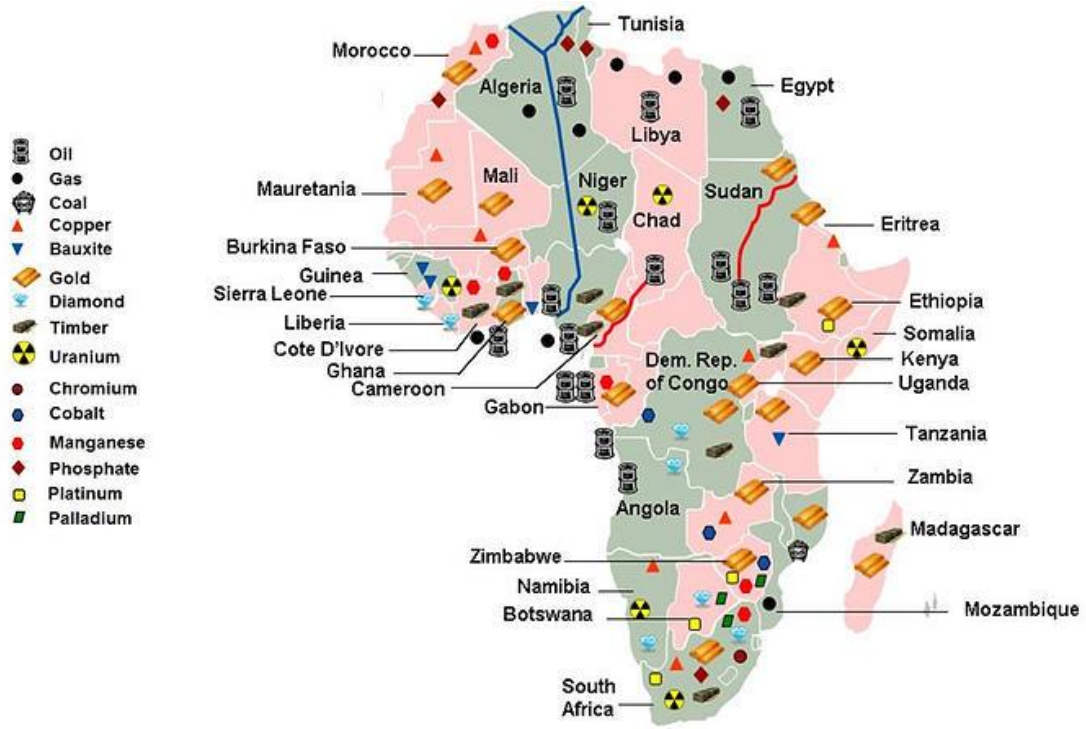
Disease outbreaks can disrupt businesses, schools, and other social activities, leading to economic losses. Setting up and sustaining a robust and resilient surveillance system assures early detection of outbreaks and prompt interventions to prevent the spread of infection. Early detection enables targeted and manageable interventions, such as isolation of few infected individuals, contact tracing, and perhaps, vaccination. The late detection of an infection may result in further spread and escalation to an outbreak or a pandemic, that may eventually overwhelm the fragile health infrastructure and services common in many African countries. Setting up a surveillance system requires resources for field investigation, data management (collection and analysis), personnel training, efficient laboratory diagnostic facilities, and communication. However, human and financial resources invested in surveillance system are not only much lower than investments poured into controlling an outbreak, but also, yield more and higher returns in lives saved, improved economic and better health security. Globally, expenditures for prevention and preparedness are measured in billions of dollars, the cost of a pandemic in trillions. Studies by McKinsey & Company[30] suggest

that spending globally, approximately $85 billion to $130 billion over the next two years and approximately $20 billion to $50 billion annually after that could substantially reduce the likelihood of future pandemics[30]. This equates to an average spend of around $5 per person annually. This cost is affordable, even by the so-called resource limited countries. It is therefore essential (and it should be mandatory) for every country to prioritise surveillance and preparedness over controlling disease outbreaks.

6.0. RESOURCE LIMITED OR RESOURCE MISUSE?

The question arises: Does Africa have the local resources to sustain reliable preparedness and surveillance system required to prevent disease outbreaks? Despite labelling many African countries as resource limited, there is sufficient evidence that many African countries can build and sustain a reliable surveillance system with local resources and minimal external aid or support. Many African countries are wrongly tagged as "resource-limited", and "resource-constrained" Africa must not, by a stretch of imagination, be described as resource-limited. Rather, most of these countries are resource-wasteful and resource squandering. Many African countries are endowed and rich in untapped or mismanaged natural and human resources. According to the United Nations, "Africa is home to some 30 percent of the world's mineral reserves, eight per cent of the world's natural Gas and 12 per cent of the world's oil reserves"[31,32]. "The continent has 40 percent of the world's gold and up to 90 percent of its chromium and platinum. The largest reserves of cobalt, diamonds, platinum and uranium in the world are in Africa. It holds 65 per cent of the world's arable land and ten percent of the planet's internal renewable fresh water source"[31,32]. Figures 6 and 7

Figure 6 Mapping Africa's Natural Resources *Source Reference 32*



Yet African countries are classed and regarded as "resource-limited". It seems Africa does not have issue with resource limitation, but rather with poor governance riding on a horse of misplaced priority, resulting in resource-wastage and resource squandering. Poor governance is the recipe for the so called "resource-limited" and resource-constrained" status of many African countries. This has led to many of the governments of African countries over depending on external aid to provide basic and essential health services to their citizens.

warned that the immediate halting of funding to PEPFAR "places millions of lives in jeopardy" and describe the situation as a "matter of life or death, as" stopping PEPFAR funding essentially stops their HIV treatment, and people are going to die, and HIV will resurge"[34].

African leaders meeting in Rwanda, to discuss alternative funding sources for health financing, called for more domestic spending to ensure "more sustainable, predictable financing for public health"[35].

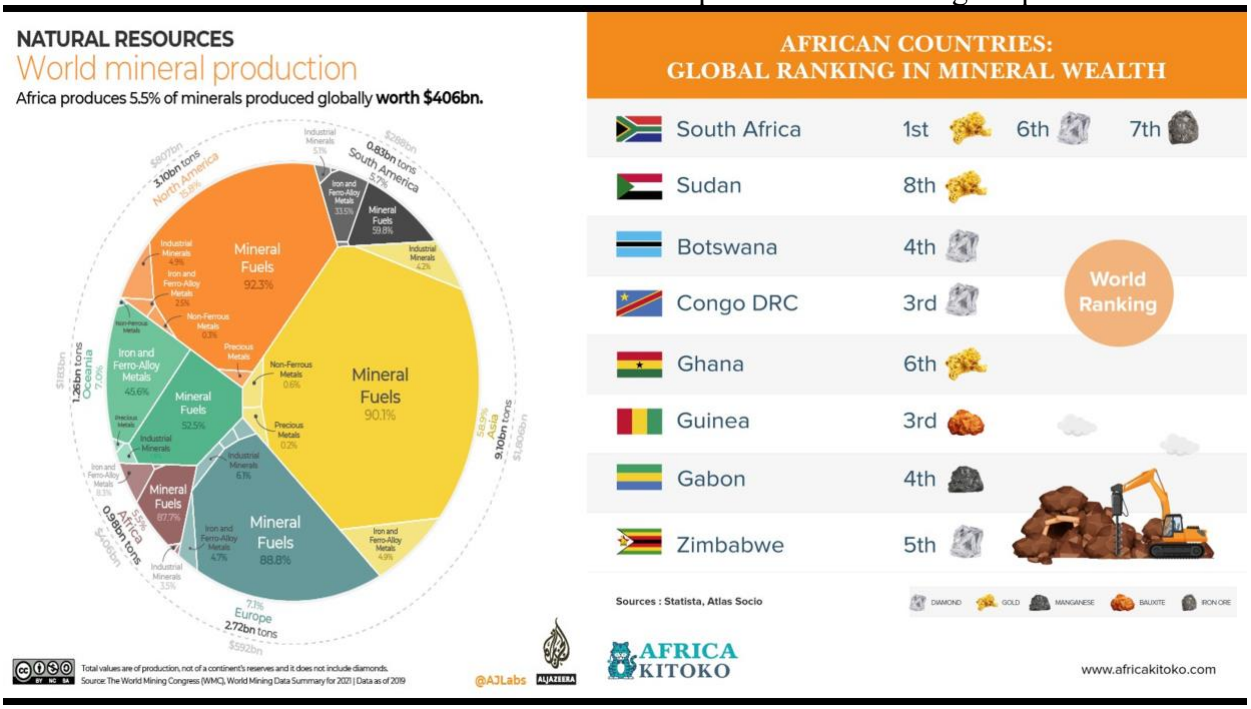


Figure 7 Africa: Natural Resources and Global Ranking in Mineral Wealth
Sources – Reference 32 and 33

7.0. WHAT AFRICA MUST TO DO TO PREVENT DISEASE OUTBREAKS

Recently, the Trump Administration halted U.S. President's Emergency Plan for AIDS Relief (PEPFAR), programme that has over the years provided support for HIV/AIDS, Tuberculosis and Malaria diagnosis and treatment. The President of the International AIDS Society (IAS)

The leaders also planned to establish an African epidemic fund and identify new sources of support to fill any gap left by a US withdrawal[35]. However, the leaders seem to be more focussed on looking outward, rather than inside. According to them, "...we will be exploring the opportunities of also broadening the resource mobilization of those other countries that are really willing to step in."[35] However, a few countries are

putting in place measures to offset the shortfall, arising from the action by President Trump. According to recent reports, Nigerian leaders approved US$200 million to fill the gap from US aid gap[36]. This is a commendable effort, and more countries must be encouraged to take a similar action

Africa must prioritize disease surveillance activities over disease control activities and focus on harnessing local resources rather than on external aid. Ther is an urgent need for sustained investment in public health systems, first to prevent failure which effectively respond to outbreaks. African countries must identify the gaps in disease surveillance, diagnostics, data sharing, and medical recordkeeping. Community-level surveillance must be prioritised, as stronger health infrastructure are built.

Another area that needs attention is capacity retention. African countries have utilised huge external and local financial resources to train skilled workforce but failed to provide the enabling environment equipment, materials and facilities, including security needed to utilise their skill and perform their duties Building an enabling environment for health workers is a national duty achieved with local resources and not through donor funding.

8. CONCLUSON

Good governance is a core issue in disease outbreak prevention and control. With good governance, available resources are spent for intended purposes, on identified national priorities, judiciously, transparently and with accountability. Under good governance, international aid is seen as more beneficial to the donor than to recipient, and while there is certainly a need for targeted and mutually agreed upon aid, no aid can surpass that self -reliance. Finally, African countries must appreciate the tremendous human capacity, capability skill and talent accumulated over the years of unceasing disease control efforts and activities. African countries musts provide the enabling environment and resources to enhance and fully utilise this strength, rather than focus on begging and pleading for aid to control disease outbreaks they fail to prevent in the first place.

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Oyewale Tomori, Ph.D.

Oyewale Tomori is a past President of the Nigerian Academy of Science with experience in virology, disease prevention, and control. He was at the University of Ibadan from 1971 to 1994 and later served as the pioneer Vice-Chancellor of the Redeemer's University in Nigeria from 2004 to 2011. From 1994 to 2004, he was the virologist for the WHO Africa Region, establishing the African Regional Polio Laboratory Network. He has served and continues to serve on numerous national and global health advisory committees. He has authored/co-authored over 180 scientific publications. He is currently President, West Africa Network of National Academies.

The Bush School of Government and Public Service

John B. Sherman, Dean

The Bush School of Government & Public Service opened its doors on the Texas A&M University campus in 1997. The university's service and leadership ideals reflect those of our namesake, George H.W. Bush, whose philosophy that "public service is a noble calling" is a guiding force in our curriculum, research and student experience. In January 2021, the Bush School launched its Washington, D.C. teaching site to draw upon the wealth of resources in the nation's capital. Additionally, the Bush School's online certificate and degree programs offer the convenience of global access with the valuable connection and networking of in-person residency weeks. As a leading international affairs, political science, and public affairs institution, the Bush School prepares students to become principled leaders in their fields and to reflect the value of public service throughout their careers.

Texas A&M University

Mark A. Welsh III, President and Holder of the Edward & Howard Kruse Endowed Chair

Texas A&M University is a community of scholars dedicated to solving diverse, real-world problems through determination, innovation, and above all, fearlessness. Texas A&M opened its doors in 1876 as the state's first public institution of higher education and is today a tier-one research institution holding the elite triple land-, sea- and space-grant designations. Research conducted at Texas A&M represented annual expenditures of almost $1 billion in fiscal year 2021. Texas A&M's 79,000 students and half a million former students are known for their commitment to service, as well as dedication to the university's core values and rich traditions.

The Scowcroft Institute of International Affairs

Andrew S. Natsios, Director and E. Richard Schendel Distinguished Professor of the Practice

The Scowcroft Institute of International Affairs is a research institute housed in the Bush School of Government and Public Service at Texas A&M University. The Institute is named in honor of the late Lt. Gen. Brent Scowcroft, USAF (Ret.), who had a long and distinguished career in public service serving as National Security Advisor for Presidents Gerald Ford and George H.W. Bush. The Institute's core mission is to foster and disseminate policy-oriented research on international affairs by supporting faculty and student research, hosting international speakers and major scholarly conferences, and providing grants to researchers to use the holdings of the Bush Library.

"*We live in an era of tremendous global change. Policy makers will confront unfamiliar challenges, new opportunities, and difficult choices in the years ahead I look forward to the Scowcroft Institute supporting policy-relevant research that will contribute to our understanding of these changes, illuminating their implications for our national interest, and fostering lively exchanges about how the United States can help shape a world that best serves our interests and reflects our values*."
– Lt. Gen. Brent Scowcroft, USAF (Ret.)

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