

## **African Universities Response to COVID-19, Emerging and Re-emerging Global Epidemics and Pandemic**

### **Summary**

Global epidemics and pandemics are on the rise and so are natural environmental crises. Most assessments point to Africa's vulnerability owing to a myriad constraints including limited internal and resident scientific capacity and advancement. Education, research, science, technology and innovation play a critical role in bolstering a region's capacity to withstand emergencies, organise, rebuild and recover and be resilient. Africa amidst the current ongoing global COVID-19 crisis as well as projected trends and challenges is in urgent need of strengthening its capacity in education, research, science, technology and innovation. African Universities propose four priority areas of response: (1) Preparedness, response, and monitoring of disease outbreaks in Africa and capacity needs in transdisciplinary approaches and high level laboratory infrastructure; (2) Invasive pests and crop-livestock diseases in Africa; (3) Reimagining higher education in the post COVID-19 pandemic crisis and build a revolutionarized teaching, learning and research environment in Africa; and (4) Nexus approaches for helping farmers and rural communities make better decisions and gain from food value chains and transforming agrifood systems. These response actions are based on collaboration and partnership leveraging on national, regional and international comparative strengths. These efforts should involve, amongst others, engaging the capacities of African universities in research and education to build the requisite skills and innovations to enhance responsiveness of the continent.

### **Background**

The world has always experienced pandemics such as Cholera, bubonic plague, smallpox, and influenza, which have been some of the most brutal killers in human history. Normally, outbreaks of these diseases across international borders, wreck serious economic and social havoc. For example, smallpox, throughout history, has killed between 300-500 million people in its 12,000 year existence<sup>1</sup>. At the end of December 2019, in the region of Wuhan, China, we were confronted with yet another 'invisible killer', a new ("novel") coronavirus, which began appearing in human beings. It was named COVID-19, a shortened form of "coronavirus disease of 2019." The spread of this new virus is incredibly quick between people. This being new, as with previous outbreaks, no one on earth has an immunity to Covid-19. The fast spread of the deadly virus worldwide within months, gave the world a big shock whilst the World Health Organisation (WHO) declared it a pandemic in March<sup>2</sup>.

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<sup>1</sup> National Geographic. Smallpox: The disease, now eradicated, was once one of the world's deadliest. <https://www.nationalgeographic.com/science/health-and-human-body/human-diseases/smallpox/>

<sup>2</sup> Cucinotta, Vanelli M (2020). WHO Declares COVID-19 a Pandemic. <https://www.ncbi.nlm.nih.gov/pubmed/32191675>

In just three months, the world saw more than a half-million people infected and nearly 30,000 deaths<sup>3</sup>; these infections became exponential reaching over 4 million by the first week of May 2020 with 284,000 deaths<sup>4</sup>. As a result, many activities including international travel, public travel of various forms, schools and other public gatherings were all suspended in many countries. While no one knows when this pandemic will end, the effects of the disruption on the various economic and social activities continue to widen and many people have been affected economically and socially. A case in point is education, which is grappling to cope with the effect of COVID-19. Without a deliberate response, this will erode the hard-earned gains and threaten social and economic stability, especially for young women and men, who depend on education as a foundation for future success. Already they are edging at the margins throughout Africa due to poverty.

Africa region has equally struggled with a number of diseases some of which are neglected and yet with significant effects. For example, the nodding that was first documented in Tanzania in the 1960s<sup>5</sup>. It has since spread from Tanzania to Sudan, South Sudan and northern Uganda with marginal success in control. The region has similarly reeled from the 1980s to the present day with HIV/AIDS with improving case management but rising infections in some countries and among younger age groups. Non-Communicable Diseases such as cancer today are forming an additional layer of silent killers across the continent. In many public health facilities, cancer patients are on the rise and it has been projected that NCDs will account for roughly 40% of the disease burden in Africa by 2030<sup>6</sup>; this pointing to the need to bring these at the centre of public health interventions across the continent.

Disease burdens over the continent is further exacerbated by global environmental change, shrinking health ecosystems and dramatic environmental hazards and disasters such as floods, cyclones and storms<sup>7</sup>, landslides that further weaken adaptive and absorptive capacities of communities as well as governments to deal with the pressing challenges. These global and regional dynamics and changes seem to have influenced the outbreaks and invasion of invasive pests and diseases of the Africa region lately. Recent outbreaks of fall army over the Africa as well as desert locusts over the Horn Africa have been devastating. Deserts locusts have hit a region whose population of about 20 million people already experience food insecurity in; Ethiopia, Kenya, Somalia, South Sudan, Uganda and Tanzania will escalate the situation. These and other emergencies have a huge cost economically and socially on the continent calling for strategic interventions that are well coordinated to respond, mitigate and manage at various levels and frontiers.

## **Capacity of higher education to respond to pandemics and other emergencies**

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<sup>3</sup> Jenny L, R., Sara J. (2020). COVID-19 — a timeline of the coronavirus outbreak.

<https://www.devex.com/news/covid-19-a-timeline-of-the-coronavirus-outbreak-96396>

<sup>4</sup> Dillard, R. 2020. The COVID-19 Pandemic: Over 4 Million Infections Worldwide; Projected Death Toll Continues to Rise; and More <https://www.docwirenews.com/home-page-editor-picks/the-covid-19-pandemic-over-4-million-infections-worldwide-projected-death-toll-continues-to-rise-and-more/>

<sup>5</sup> WHO. [https://www.who.int/onchocerciasis/symptoms/nodding\\_syndrome/en/](https://www.who.int/onchocerciasis/symptoms/nodding_syndrome/en/)

<sup>6</sup> Schneidman, M.

<sup>7</sup> The East African Commission (2017). Floods and Conflicts the major cause of Disasters in East Africa.

<https://www.eac.int/press-releases/144-environment-natural-resources/863-floods-and-conflicts-the-major-cause-of-disasters-in-east-africa>

The outbreak of COVID-19 and other emergencies has highlighted the vulnerability, in terms of skills gap, of higher education institutions to address such emergencies. Higher education has been significantly affected as almost all institutions of learning have been forced to close and most students cannot have access to education given that social distancing is not possible as most of them rely on face-to-face learning within the campuses of institutions offering education. Besides, the COVID-19 outbreak, other emergencies such as floods and the desert locust as recently seen some of the countries losing their resources immensely while trying to respond to them. Responding to the effect of the COVID-19 pandemic, other health related pandemics, and other emergencies requires skills, resources and partnerships that must be harnessed at regional level in Africa and at global level. Emerging and re-emerging epidemics and pandemics at regional and global level are not bound to stop as models have shown a projected increase, severity and intensity especially those of infectious disease nature. The World Health Organization (WHO) indicates that on a monthly basis there are 7,000 new signals of potential outbreak<sup>8</sup>; this tells us of the potential risk at hand that humanity must be prepared to deal with. RUFORUM has generated four possible response areas for African higher education institutions as reflected in the next section.

#### **Possible response directions for African higher education, Governments and Private sector**

- 1. Preparedness, response, and monitoring of disease outbreaks in Africa and capacity needs in transdisciplinary approaches and high level laboratory infrastructure.** Infectious diseases emergence and re-emergence will continue globally and COVID-19 is an example of the disruptiveness infectious diseases of zoonotic origin than can cause widespread pandemics with devastating impacts on social, economic and livelihoods. In the outbreak of the COVID-19 pandemic and other previous coronaviruses such as MERS and SARS, Africa's limited preparedness, response and surveillance and monitoring capacity has been highlighted. In line with the World Health Organisation and Africa Centres for Disease Control and Prevention (Africa CDC) a coordinated action and focus on the immediate, mid-term and long-term priorities to contribute to control disease outbreak and manage the impacts are required in the Africa context. Within the context of preparedness, response and surveillance capacity Africa linked to the rest of the shall need to strengthen its capacities in the following; (i) building molecular and genetics analysis capacity; (ii) Building capacity for analysis and monitoring virus natural history, (iii) transmission and diagnostics, and associated animal and environmental research on the virus origin, and management measures at the human- animal interface, (iv) epidemiological studies that among others describe transmission dynamics of covid-19 and understand spread of the disease and others nationally, regionally and globally, establish suitable cohorts and prospectively collect longitudinal laboratory and outcome data, perform rapid population cross-sectional surveys to establish extent of virus transmission using standardised sampling framework, use m-health and GIS mapping technology to characterise disease spread patterns, describe disease severity and susceptibility to facilitate effective clinical public health response to COVID-19- identify groups at risk of severe infections; (v) clinical management for example defining the natural history of COVID-19 infection (prognostic factors for severe disease, special

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<sup>8</sup> Morhard, R. 2019. The global economy is woefully unprepared for biological threats. This is what we need to do. <https://www.weforum.org/agenda/2019/03/our-economy-is-woefully-underprepared-for-biological-threats/>

populations, triage and clinical processes, sampling strategy), (vi) infection prevention and control, including health care workers' protection; (vii) candidate therapeutics R&D, and (viii) candidate vaccines R&D<sup>9</sup>. Translating these priorities will require collaborative efforts and partnerships and in the case of technical capacities, urgently mounting regional Masters and PhD programmes that leverage on the comparative strengths of African Universities with technical backstopping from other countries with advanced systems and training capabilities.

- 2. Invasive pests and crop-livestock diseases in Africa.** Africa is under unprecedented times with mounting challenges of invasive pests, crop and livestock diseases occasioned by increased globalisation. Prevalence of emerging and re-emerging zoonotic diseases of transboundary importance (transboundary animal diseases-TADs) has increased and it further projected to increase as humans get into close contact with wildlife. Recent incursion of locusts and fall army ravaging the Horn of Africa are an illustration of the imminent danger to food security that these invasive pests pose on the populations of the continent. An analysis conducted by the Dean Paini of Australia's Commonwealth Scientific and Industrial Research Organisation in Canberra on 1,300 agricultural invasive species reveals that sub-Saharan Africa is most vulnerable to invasive species<sup>10</sup>. It is critical at regional level to; (i) focus attention on policy arrangements and cooperation agreement for control and management of invasive species, TADs (ii) building technical capacity in terms of entomologist-training, recruitment and retention, ecologists, virologists, pathologists and modellers-both mathematical and social dynamics modellers and inter-section between trade in particular rising trade volumes and trade ties with invasive species and disease distribution; (iii) institutional capacity in terms of coordination and accountability; for example what is the institutional strength of the Desert Locust Organisation for the Horn of Africa, effective coordination mechanisms by the Regional Economic Communities (RECs) such as IGAD and what political accountability do these institutions have. Urgently, Africa needs to take look at the role of interdisciplinary sciences (including political economy) in bolstering Africa's preparedness, response, surveillance and management capacities at various levels for invasive species which is urgently required.

- 3. Reimagining higher education in the post COVID-19 pandemic crisis and build a revolutionized teaching, learning and research environment in Africa.** Paying close attention to innovations that address critical issues including: equity, accessibility, affordability, connecting learning and assessment priorities, flexibility, resilience, and sustainability. Whilst recognising the underlying fact that majority of the students in the developing countries have limited access to online learning systems and where they exist affordability is a critical challenge. In particular the cost of bandwidth and infrastructure is prohibitive to remote learning and the culture of physical contact supersedes the current intentions for transitions. Whilst reimagining higher education in the post COVID-19 period (it could be any other

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<sup>9</sup> WHO. 2020. A coordinated global research roadmap: 2019 novel coronavirus [https://www.who.int/blueprint/priority-diseases/key-action/Coronavirus\\_Roadmap\\_V9.pdf](https://www.who.int/blueprint/priority-diseases/key-action/Coronavirus_Roadmap_V9.pdf)

<sup>10</sup> Paini, D. R., Sheppard, A. W., Cook, D. C., De Barro, P. J., Worner, S. P., & Thomas, M. B. (2016). Global threat to agriculture from invasive species. *Proceedings of the National Academy of Sciences*, 113(27), 7575-7579.

epidemic/pandemic episode), it is vital to be cognizant of the direct, indirect and induced effects of that epidemic and/or pandemic in higher education in economic terms because this has underlying effect on the pace with which institutions take on the innovations and/or reform their processes owing to the knock on effect on the income streams. Transitions are expensive; skills required to facilitate online learning, access to stable and affordable internet for students and academics and universities/learning institutions must dramatically afford new software and provide computing equipment to ensure that all students can learn online and higher education institutions must contend with this amidst stark disparities in institution resources.

**4. Nexus approaches for helping farmers and rural communities make better decisions and gain from food value chains and transforming agrifood systems.** Africa's food is supplied by at least 80% smallholder farmers but whose productivity is among the world's lowest, estimated at 30% of their potential due to lack of financing and market integration<sup>11</sup>. In spite of this, they smallholder farmers in Africa remain at the centre of the continent's food and nutrition security as well as agribusiness. Disruptions caused by COVID-19 underpin the need to reimagine Africa's agriculture and market integration. In particular, smallholder farmers require; (i) support to both enhance their productivity and market the food they produce<sup>12</sup>; (ii) e-commerce channels to minimise the associated food losses and increase rural market connectivity; (iii) innovations that reduce logistical bottlenecks in Africa's agrifood system are urgently required in the current crisis period and further consolidated in the post COVID-19 period; (vi) innovations within affordable range for value addition and post-harvest management/handling to extend shelf-life of agri-products within the smallholder producers ecosystem; (v) innovations that support multiple agricultural and social protection interventions to address short-term needs as well as speed up medium- to long-term recovery efforts<sup>13</sup>. Higher education institutions must become agile to innovate within the current restrictions and rapidly evolving agricultural development space as well as dramatically changing commerce environment; they need to provide dependable solutions.

## Translating responses to actions

The Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) is currently reaching out to its members and partners to hold dialogue on translating various possible response priorities into tangible actions with a prioritisation from immediate actions, mid-term and long-term interventions. RUFORUM sees a collaborative approach leveraging on the regional strengths of African higher education institutions as pivotal to achieving immediate needs whilst

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<sup>11</sup> CGIAR, 2020. COVID-19: Flattening the food insecurity curve. <https://www.cgiar.org/news-events/news/covid-19-flattening-the-food-insecurity-curve>

<sup>12</sup> Cullen, M.T. 2020. COVID-19 and the risk to food supply chains: How to respond? FAO, Rome. <http://www.fao.org/3/ca8388en/CA8388EN.pdf>

<sup>13</sup> Savastano, S. 2020. Shaping a holistic response to COVID-19: Protecting food systems and rural producers. <https://www.ifad.org/en/web/latest/blog/asset/41863743>

steadily ramping up capacity for medium-term and long-term priorities. In that regard, the following are envisaged:

1. Pan-African online dialogue on priority setting for immediate needs for higher education institutions taking cognizance of institutional disparities in resource endowments. This dialogue will be complemented by an online survey of capacity gaps, needs and priorities for member universities.
2. Mobilise development partners and governments to respond to support a response to the immediate needs and priorities to in particular help reduce potential marginalisation of the already disadvantaged and vulnerable students from the lower income quintile.
3. Focus higher education skills to provide urgently required innovations in e-learning including teaching and assessments, virus detection, surveillance and management within a contextualised African experience and resources and institutional policies to support the urgent transitions.
4. Set-focus on the medium-term actions in particular capacity development for grossly limited skills in the continent; epidemiologists, virologists, entomologists, pathologists, and transdisciplinary scientists, and laboratories by bolstering capabilities of the existing ones to undertake viral diagnostics, among others.
5. A long-term action towards building sustainable and resilient systems in higher education; reimagining higher education; teaching, research and innovation ecosystem in the context of global disruptions and building long-term cooperation agreements for interconnected engagement at a global level.

We invite for input and possible engagement to advance the ideas forward

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