PERSPECTIVES

Mammograms are used to diagnose breast cancer, but such procedures have become even more limited owing to COVID-19 restrictions in Africa.

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VIEWPOINT: COVID-19

COVID-19 and cancer in Africa

The impacts of COVID-19 present substantial challenges and opportunities in global oncology

By **Beatrice Wiafe Addai**[1,2] *and* **Wilfred Ngwa**[3]

The COVID-19 pandemic has had a major impact on cancer prevention and control in Africa, with immediate and anticipated long-term ramifications. The pandemic reached Africa when the continent was already struggling to deal with a growing cancer crisis, epitomized by more than 1 million new cancer cases and ~700,000 deaths from cancer per year across Africa (*1*). The response to COVID-19 immediately exacerbated the challenges in oncology at different levels—including prevention, treatment, and palliative care—and will undoubtedly result in increased late-stage presentation of cancer and a surge in mortality. Meanwhile, efforts to address these challenges have highlighted key opportunities where greater investment could substantially increase access to care and avail global oncology.

At the start of the COVID-19 pandemic, many African governments responded quickly by shutting their borders, grounding airlines, and limiting travel. These drastic, but necessary, mitigation measures and the diversion of health care resources to address the pandemic resulted in calls by leading hospitals and nonprofit organizations for equal attention to be given to the ongoing cancer epidemic (*2*). The impact of the COVID-19 measures on oncology was immediate, beginning with cancer prevention, which is particularly important in Africa.

Using Ghana as an example, cancer prevention activities—including awareness, early detection screening, and vaccination—were curtailed. Vital nongovernmental organizations such as Breast Care International (BCI) had to suspend all outreach programs. The literacy rate of ~64% [according to United Nations Educational, Scientific and Cultural Organization (UNESCO)] is relatively low in sub-Saharan Africa (SSA), and cancer is often viewed with superstitions, myths, and misconceptions, which have to be dispelled through outreach programs for education and awareness. Moreover, many African countries lack early detection and screening programs, so it is only through outreach that people can be educated and clinically examined and/or screened. Such outreach was banned to mitigate COVID-19 spread (*2*). With many women now at home, BCI started using virtual forms of education—including social media, radio, and other electronic media—to teach women and encourage routine breast self-exams as part of breast cancer screening. The 5-year breast cancer survival rate in SSA is <40% compared with >86% in the United States.

In many countries, screening for cervical cancer, a leading cause of cancer death in Africa (*3*), was also halted, and medical camps, which can normally screen up to 200 women in a day, could now screen no more than 15 per day because of social distancing guidelines (*4*). With crucial cancer prevention outreach limited, this will undoubtedly lead to upstaging (that is, diagnosis of more advanced cancers). Because cancer mortality is reduced when it is treated early, this will likely increase cancer mortality. In response to this challenge, some centers are now offering screening and routine human papillomavirus (which causes cervical cancer) immunization when women come to health care facilities for other reasons to limit the number of visits (*4*). This practice will likely continue

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beyond the COVID-19 era.

COVID-19 restrictions also reduced cancer diagnostic services, with hospitals postponing diagnostic evaluation or having longer turnaround times because of reallocation of scarce hospital-based resources to tackle COVID-19. In many African countries, biospecimens are transported abroad for diagnostic pathology. During the COVID-19 lockdown, air travel was canceled, so these activities were halted. After the ease of restrictions, some local laboratories have taken the opportunity to improve their services, such that there is now no need to send biospecimens out of the country.

Considering treatment, COVID-19 restrictions resulted in limited access, including reductions in patients traveling to receive treatment and in financial resources to access care. Most people in Africa work in the informal sector, and the restrictions from COVID-19 reduced their income, limiting their ability to pay for treatment. (There is no universal health coverage.) There were considerable reductions in cancer surgery because most clinics were converted to COVID-19 centers. Along with suspension of elective surgical procedures, this has left no time and space for cancer management. Cancer surgeries were triaged into high, medium, and low priorities, and others were canceled.

Radiotherapy (RT) is needed in the treatment of >50% of cancer patients in Africa. RT returned to antiquated two-dimensional (2D) techniques from more effective 3D image-guided RT in some centers owing to limitations in acquiring computed tomography (CT) images, because the scarce CT scanners were being used for COVID-19 patients. Some centers have adopted hypofractionated radiotherapy (HFRT) (*5*), using higher doses in fewer treatment sessions, owing to limited staff and to reduce the number of times patients need to travel for treatment. Furthermore, patients with concurrent chemoradiotherapy only received RT to minimize possible additional risks of contracting COVID-19 (*5*).

For chemotherapy, regimens transitioned to less-effective outpatient or oral regimens in many cancer centers, with regional disruptions in supply chains and suspension of blood transfusion services. Some hospitals began using courier service to ensure that drugs were delivered to patients, and larger prescriptions were provided to limit refills. In Africa, >70% of patients present with metastatic cancer, and delays in chemotherapy unfortunately result in deaths. COVID-19 has also severely affected palliative care, with patients being discharged to prioritize COVID-19 patients (*4*), and many more patients now, distressingly, die in isolation.

Cancer research in Africa has been substantially scaled down, as seen at the Uganda Cancer Institute (*6*) and in South Africa, one of the countries with high COVID-19 cases. Fundraising by and for cancer patients has also been severely affected. For example, the Zambian Cancer Society and Women4Cancer in Kenya have documented the difficulties they face in providing care and support during the pandemic owing to redeployment of health care workers to the COVID-19 response (*4*). Other areas affected by COVID-19 include linking patients with hospital insurance funds to ensure payment and helping patients get alternative accommodations away from cramped hospital settings. COVID-19 fears and restrictions have added stress to many cancer patients. This is made worse when patients have to delay their cancer treatment. Before COVID-19, the increasing incidence of cancer in Africa had already led to high rates of poor mental health in patients and among family caregivers (*7*). This is worse during the pandemic (*5*).

"...diversion of health care resources to address the pandemic resulted in calls... for equal attention to be given to the ongoing cancer epidemic."

Several opportunities have been highlighted by the effects of the COVID-19 pandemic where greater investment or policy could substantially increase access to cancer care and global oncology. One opportunity is increased adoption of HFRT after the pandemic. Many professional societies and the National Comprehensive Cancer Network recommend that radiation oncology professionals adopt evidence-based treatment guidelines for HFRT to alleviate stress on staff and personnel reductions during the COVID-19 outbreak. Adopting HFRT for cancers with high mortality in Africa, such as breast and prostate cancers, can substantially increase treatment accessibility, reduce treatment cost, and improve patient convenience (*8*). To ensure safety and maximize the benefits of this approach, increased training for oncology health professionals is needed. Because of the limited number of RT machines in Africa, increased adoption of HFRT is likely to have a more substantial effect on treatment accessibility in Africa than in high-income countries (HICs).

Another area for increased investment that is an important and often underestimated part of the African health care system is in phytomedicine, or the use of plants for prevention and treatment of diseases, which are used by >80% of cancer patients in Africa (*9*). With COVID-19 restrictions and populations desperate for treatment, more Africans turned to phytomedicine. Phytomedicine of proven quality, safety, and efficacy is part of the World Health Organization's (WHO's) global health priority of ensuring that all people have access to quality health care. However, phytomedicine use is often driven by anecdotal evidence. Their use delays individuals from seeking health facilities offering conventional treatment, resulting in high rates of advanced stage cancer diagnoses and increased deaths, suffering, and higher cost of treatment. Greater investment is needed in this area, such as supporting implementation of the WHO Traditional Medicine Strategy 2014–2023 (*10*). This translates to increased investment in science for many reasons, including data on safety and efficacy of phytomedicines, while also identifying candidates with therapeutic potential (*11*). Research will also drive better policies regulating and integrating evidence-based products and practice into health systems, as appropriate. Furthermore, research can be integrated into education, addressing cultural beliefs around the use of phytomedicine.

Accelerated adoption of information and communication technologies (ICTs) for telemedicine during COVID-19 restrictions has occurred across the world (*12*). For Africa, which has experienced dramatic gains in ICTs such as mobile phone use and internet in recent years, this presents an important avenue to increase access to health care. Centers in Africa are now using ICTs for remote chemotherapy supervision, symptom management, and palliative care. Where possible, outpatient visits and triage are being shifted to digital consultations to reduce risks of infection. Increasingly, ICTs—such as social media platforms, websites, voice-over messages, and toll-free telecommunication—are being used for oncology services (*6*). For example, the Cancer Association of South Africa launched tele-oncology services for cancer patients left frustrated by limited access to treatment and support owing to the COVID-19 response (*13*). There is also increasing adoption of online learning for clinical oncology trainees—for example, in Kenya, Nigeria, Uganda, and Cameroon—including collaboration with faculty from HICs. It is likely that these technologies will continue to be used in the future. Investments in artificial intelligence, as seen in Rwanda to fight COVID-19 (*12*), could also benefit oncology (*14*).

There have been differences in the African cancer community's response to COVID-19 compared with that in HICs, which may be attributed to factors such

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as limited resources and health care systems. African countries have seen a more consequential impact of resource prioritization away from cancer patients compared with HICs. A welcome difference in response is the growing involvement of the diaspora in telemedicine, such as in virtual tumor boards and e-consultation. This trend is likely to increase and presents an opportunity for Africa to leapfrog into an era of tele-oncology while turning "brain drain" to "brain circulation," which will strengthen the health system workforce. There is already an emerging vision of building a comprehensive cancer center in the cloud (*15*) for Africa, accessible from anywhere for consultation, second opinion, follow up, continuous education, and so on, with considerable involvement of the diaspora. During the pandemic, apps have also been developed for the African health care setting that can be extended for use in oncology. For example, the surveillance outbreak response management and analysis system (SORMAS) app used during the recent Ebola outbreak for self-diagnosis and tracing could be adapted for applications in oncology, for example, for collecting symptomatic information and promoting cancer prevention and awareness education. Overall, COVID-19 has been a new challenge with opportunities that can be leveraged in Africa to improve oncology and global health. ■

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ACKNOWLEDGMENTS

We thank J. Nkengasong, M. Foote, and oncology health professionals across Africa for helpful discussions.

10.1126/science.abd1016

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CORONAVIRUS

The puzzle of the COVID-19 pandemic in Africa

More data are needed to understand the determinants of the COVID-19 pandemic across Africa

By **Justin M. Maeda** *and* **John N. Nkengasong**

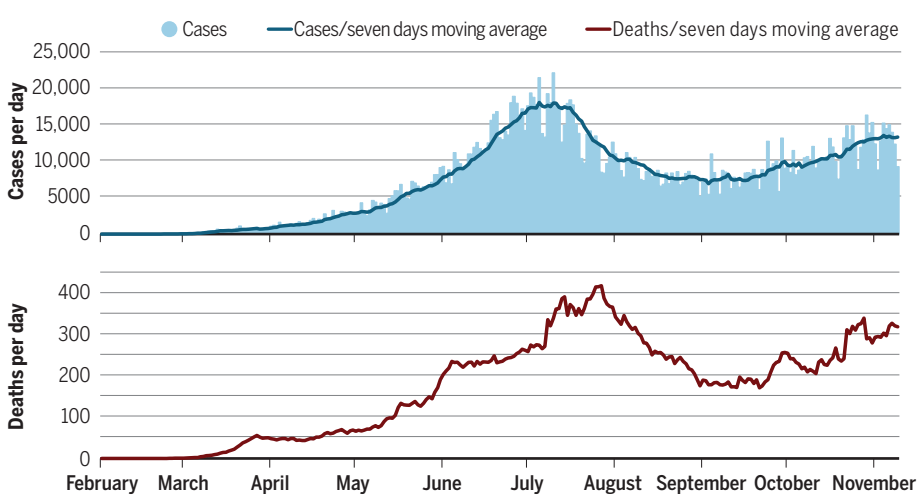
The COVID-19 pandemic has been puzzling to many public health experts because Africa has reported far fewer cases and deaths from COVID-19 than predicted. As of 22 November 2020, the continent of Africa, comprising 1.3 billion people, had recorded 2,070,953 cases of COVID-19 and 49,728 deaths (*1*), representing ~3.6% of total global cases (*2*, *3*). Because of the continent's overstrained and weak health systems, inadequate financing of health care, paucity in human resources, and challenges posed by existing endemic diseases—including HIV, tuberculosis, and malaria—earlier predictions suggested that up to 70 million Africans may be infected with severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) by June, with more than 3 million deaths (*4*). On page 79 of this issue, Uyoga *et al.* (*5*) report a serosurvey study (measuring the occurrence of SARS-CoV-2 antibodies) of blood donors in Kenya that suggested that the incidence of SARS-CoV-2 infection is much higher than expected from case numbers.

Using blood donor samples as a proxy, Uyoga *et al.* estimated that SARS-CoV-2 infections occurred in 5.5% of the population in Kisumu, 7.3% in Nairobi, and 8.0% in Mombasa, with an overall average of 4.3%. This translates to ~2.2 million total possible infections compared with the reported 77,585 infections in the country as of 23 November 2020 (*1*, *3*). Similarly, in October 2020, Mozambique reported less than 3000 confirmed cases of COVID-19; however, serosurveys found that 5% of households in the city of Nampula and 2.5% of households in the city of Pemba had been exposed to the virus (*6*). This suggests that there may be more infections than recorded.

There are several factors that may influence the trajectory of the COVID-19 pandemic in Africa. These include limited testing (which limits detection and isolation, and thus public health measures), a much younger population (and thus fewer severe cases and deaths), climatic differences (which could affect transmission), preexisting immunity, genetic factors, early implementation of public health measures, and timely leadership. Two key aspects that may contribute to our understanding of the pandemic puzzle in Africa include scaling up of

COVID-19 cases and deaths in Africa

The trend of daily reported cases of COVID-19 for the African continent, February to November 2020, shows the first peak of cases occurred July to August (mostly attributed to the Southern African Region) followed by a second peak, which started in October (mostly attributed to the Northern Region).



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Science

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Science **371** (6524), 25-27.
DOI: 10.1126/science.abd1016

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