



Safety measures in selected radiotherapy centres within Africa in the face of Covid-19

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Abstract

Radiotherapy is life-saving treatment which ought to be guaranteed for all cancer patients who are indicated. While this is so, it is incumbent on the management of radiotherapy centres to ensure that patients, patient care-givers and radiotherapy personnel are at all times safe within the radiotherapy facility. Cancer patients are known to have increased risk for respiratory viruses like Covid-19 due to the compromised immune state of such persons. It is thus important to institute adequate safety measures in radiotherapy centres to prevent infection of cancer patients during the global Covid-19 pandemic. A survey conducted in 12 radiotherapy centres in 8 African countries has highlighted key measures needing implementation to ensure safety against Covid-19 infections. The safety measures were indexed on a 16-point questionnaire covering 5 main areas of staffing, radiotherapy environment, equipment and treatment protocols, patient condition and scheduling, and education/sensitization. The study shows that use of personal protective equipment, provision of hand washing and sanitizing facilities, social distance observance, restrictions for patient care-givers, provision of isolation unit meant for holding suspected Covid-19 cases, existence of working protocols, and Covid-19 safety education for staff are fully complied with by the surveyed radiotherapy centres. A greater portion of the centres, are however, without radiotherapy facilities solely dedicated for suspicious and confirmed Covid-19 cases. Strict adherence of the safety measures is highly essential to contain the spread and prevent infection of the disease to patients, care-givers and staff of the radiotherapy departments.

Keywords Covid-19 · Radiotherapy · Cancer · Personal protective equipment · Africa

1 Introduction

The World Health Organization (WHO) describes severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) as a novel, highly infectious strain of corona virus which was first detected in man in the latter part of 2019 [1]. This strain of coronavirus was first discovered in Wuhan,

China and causes a highly infectious severe respiratory symptoms called coronavirus disease 2019 (Covid-19). The disease has clinical symptoms of fever, fatigue, dry cough, myalgia and dyspnea [2]. Most people infected with Covid-19 will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people and those with underlying medical problems, like cardiovascular disease, diabetes, chronic respiratory disease and cancer, are more likely to develop serious illness [1, 3–5].

At about 30.3 million km², Africa covers 6% of Earth's total surface area and 20% of its land area. Africa accounts for about 16% of the world's human population with 1.33 billion people [6]. Africa, being the world's second-largest and second-most populous continent after Asia, has recorded less than 3% of the total confirmed cases of Covid-19 worldwide, making it one of the least affected continents in the global pandemic [7]. This notwithstanding, the disease has presented one of the biggest existential threats to human life and economies in Africa, given the fragile healthcare infrastructure and resources within the

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region. There is concern about the impact of the pandemic on countries with friable or weak health systems and those experiencing complex emergencies.

In the midst of the difficult times Covid-19 presents, radiotherapy (RT) centres in several African countries are putting in place strict preventive and containment measures to ensure that health services are continually delivered without compromising safety of patients, health personnel and the general public to the claws of Covid-19. Experts in radiotherapy have suggested practices such as hypo-fractionation, scheduling of cancer patients for treatment, reducing workforce per shift and frequent disinfection of radiotherapy centres as some of the key and immediate measures to be instituted in radiotherapy centres in the face of Covid-19 era [8, 9]. This is to ensure a delicate balance between providing adequate radiotherapy delivery while mitigating the potential risk of Covid-19 infection.

The objective of this study is to analyze safety measures and practices being put in place in some radiotherapy (RT) centres in the Africa region to ensure that radiotherapy services are continually delivered at optimally safe levels while reducing Covid-19 infection spread between patients, caregivers and within the workforce.

2 Demographics of countries with radiotherapy in Africa

Radiotherapy has been an important component of cancer control programmes in Africa, with countries in the southern and northern parts of the continent having the most concentration of the facilities (Fig. 1). Of the 54 countries in Africa, a total of 240 radiotherapy centres exist in 29 countries [10]. The Directory of Radiotherapy Centres (DIRAC), a computerized platform created by the International Atomic Energy Agency in 1995, collates data on existing radiotherapy facilities worldwide. The platform provides a registry of the world's most comprehensive database on radiotherapy resources. The directory is estimated to include over 90% of existing radiotherapy facilities worldwide [11, 12].

3 Status of Covid-19 infections in Africa

Africa's first Covid-19 case was recorded in Egypt on 14 February 2020, reaching the continent through travellers returning from hotspots in Asia, Europe and the United States. Since then all 54 countries in the region have reported confirmed cases. The number of infections in Africa as at 10th

Fig. 1 Number of radiotherapy machines per million population as at June 1, 2020 [10]

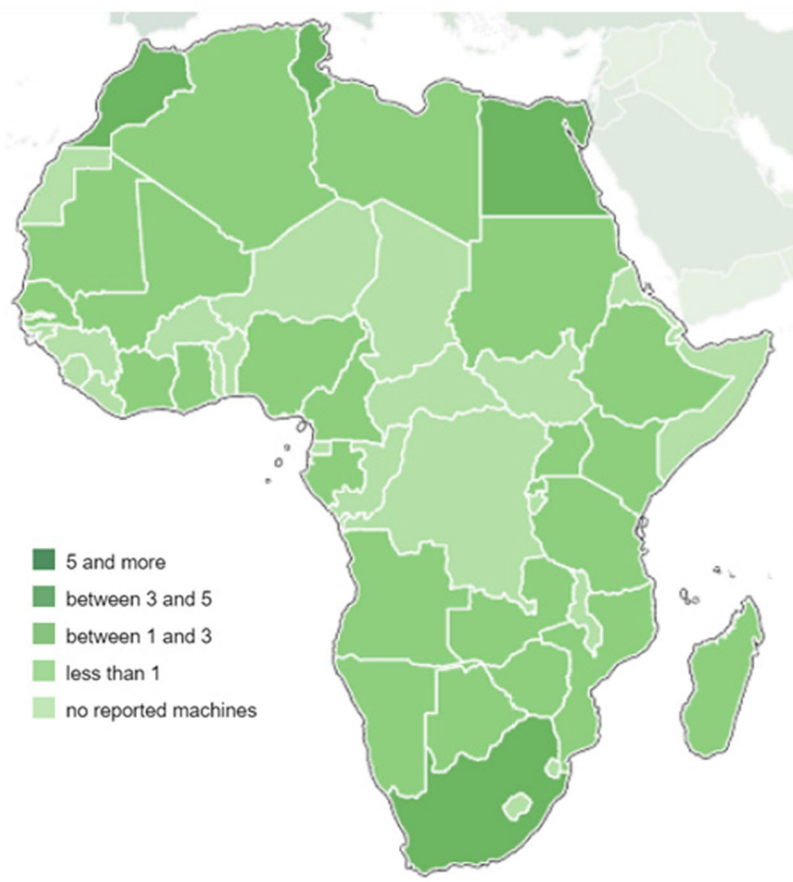
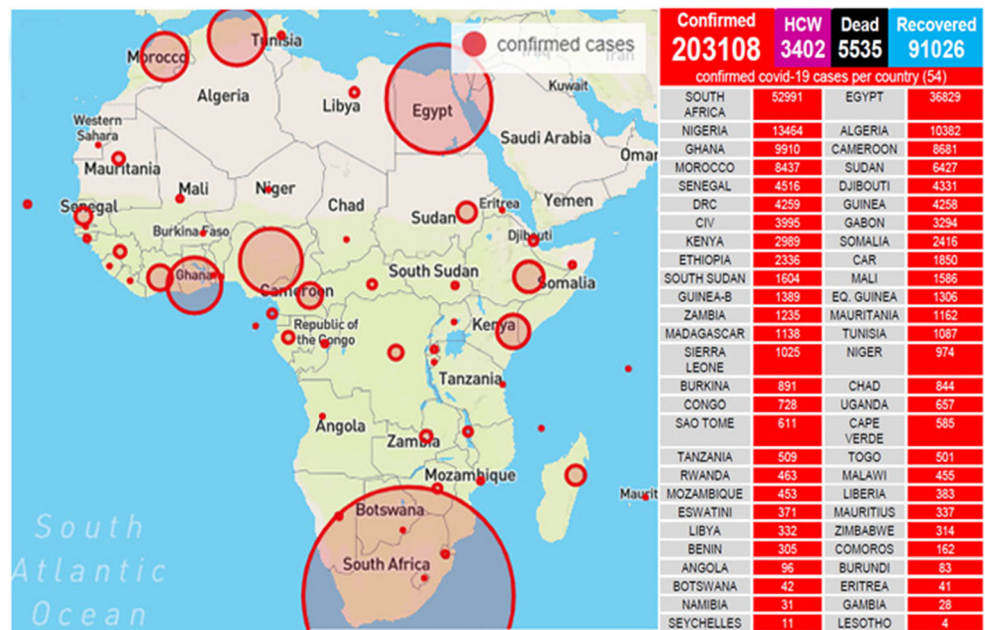


Fig. 2 Spread of COVID-19 cases in Africa as at 10 June 2020 [7]



June 2020 has exceeded 200,000, with 5500 associated deaths (Fig. 2). From initially recording cases mainly confined to capital cities, a significant number of countries in Africa have now reported confirmed cases in multiple provinces [13]. Prior to recording the first case in Africa, the Africa Union (AU) and the Africa Centres for Disease Control and Prevention (Africa CDC) established the Africa Task Force for Novel Coronavirus (AFCOR) to oversee preparedness and response to the global epidemic of Covid-19 [14]. Africa CDC's strategy focused on rapid detection and rapid containment of the disease.

The WHO has worked with governments across Africa to scale up their capacities in critical response areas such as coordination, surveillance, testing, isolation, case management, contact tracing, infection prevention and control, risk communication and community engagement, and laboratory capacity. Egypt, Ethiopia, Ghana, Kenya, Morocco, Nigeria, South Africa and Tunisia, among others have expanded their national testing capacities to multiple labs, allowing for decentralized testing [13]. The Africa CDC has rolled out several measures to support African states to deal with the pandemic. Among the establishment of task force to deal with the situation, other measures taken include training to enhance surveillance at the borders of countries, mobilizing of outbreak response teams, education and sensitization of the continent on Covid-19, collaboration with the AU to accelerate tracing, testing and tracking, and partnerships with several international agencies to strengthen Africa's response to the pandemic. Agencies such as the International Atomic Energy Agency (IAEA), Jack Ma and Alibaba foundations have also assisted several countries in Africa to fight the pandemic by donating equipment such as real-time PCR, rapid test kits and personal protective equipment (PPEs) [14, 15].

The IAEA, International Organization for Medical Physics (IOMP), American Association of Physicists in Medicine (AAPM), among other international and national agencies have recommended several Covid-19 safety measures to be implemented in radiotherapy facilities to guarantee safety of patients, care-givers and staff.

4 Safety measures against Covid-19

Varying safety measures have been instituted in several African countries to deal with the pandemic [16]. These include practices such as frequent washing of hands with soap under running water, regular and thorough cleaning of hands with alcohol-based hand rub, observance of social or physical distancing, avoiding of large gatherings, avoiding touching of eyes, nose and mouth, observance of good respiratory hygiene, staying home and self-isolating, and keeping up to date on latest information from trusted sources. In radiotherapy centres where cancer patients are treated with high doses of radiation, these safety measures are observed in combination with radiation safety practices, to ensure overall safety of the patients, care-givers and staff.

Survey has been conducted by the Federation of Africa Medical Physics Organizations (FAMPO) on Covid-19 safety measures instituted at 12 radiotherapy centres in 8 African countries. A 16-point questionnaire with key indices focusing on staffing, radiotherapy environment, equipment and treatment protocols, patient condition and scheduling, and education/sensitization, was disseminated and the responses presented in Table 1. The surveyed radiotherapy centres are coded alpha-numerically, with the alphabets representing respective countries of the radiotherapy centres.

Table 1 Covid-19 safety measures implemented in surveyed radiotherapy centres

	Centre A1	Centre B1	Centre C1	Centre C2	Centre C3	Centre D1	Centre E1	Centre F1	Centre G1	Centre H1	Implementation rate among RT centres (%)
Staffing											
Placement of staff under shift system to avoid congestion	x	x	x	x	x	x	x	x	x	x	91.7
Use of PPEs by RT staff	x	x	x	x	x	x	x	x	x	x	100.0
Availability of facilities for staff to work virtually / remotely	x	x	x	x	x	x	x	x	x	x	50.0
Radiotherapy environment											
Availability of post for screening patients, care-givers and staff (temperature check, triaging, etc.)	x	x	x	x	x	x	x	x	x	x	91.7
Availability of hand washing and sanitizing facilities	x	x	x	x	x	x	x	x	x	x	100.0
Frequent disinfection of RT facilities after use	x	x	x	x	x	x	x	x	x	x	91.7
Practicing of social / physical distancing protocols in RT centre	x	x	x	x	x	x	x	x	x	x	100.0
Limiting of accompanying patient relatives to the centre	x	x	x	x	x	x	x	x	x	x	100.0
Availability of isolation unit to hold suspected Covid-19 cases	x	x	x	x	x	x	x	x	x	x	100.0
Radiotherapy equipment and treatment protocols											
Availability of dedicated RT equipment for suspicious / confirmed Covid-19 cases	x	x	x	x	x	x	x	x	x	x	16.7
Availability of developed and/or adopted protocols to guide working procedures in RT centre	x	x	x	x	x	x	x	x	x	x	100.0
Patient condition and scheduling											
Re-organization of patient flows based on patient condition	x	x	x	x	x	x	x	x	x	x	75.0
Patient access to RT centre solely by prior appointment	x	x	x	x	x	x	x	x	x	x	83.3
Availability of remote means of patient follow-up after radiation treatment	x	x	x	x	x	x	x	x	x	x	58.3
Education/sensitization											
Orientation of patients and care-givers on protocols / guidelines to follow when in the RT centre	x	x	x	x	x	x	x	x	x	x	91.7
Adequate education of staff on Covid-19 safety measures	x	x	x	x	x	x	x	x	x	x	100.0
Implementation index (N/16) of Covid-19 safety measures per RT centre	0.94	0.81	0.88	0.81	0.94	0.75	0.81	0.81	1.00	0.56	0.88

Country codes: Algeria (A); Egypt (B); Ghana (C); Kenya (D); Namibia (E); Nigeria (F); South Africa (G); Zambia (H) N = No. of safety measures instituted

From the survey, 56% of the 16-point indexed covid-19 safety measures are implemented by all the surveyed radiotherapy centres. These include (i) use of personal protective equipment by staff, (ii) availability of hand washing and sanitizing facilities, (iii) practicing of social and physical distancing protocols in the centre, (iv) limiting of accompanying patient relatives to the centre, (v) availability of isolation unit to hold suspected Covid-19 cases, (vi) availability of developed and/or adopted protocols to guide working procedures in the centre, and (vii) adequate education of staff on Covid-19 safety measures.

Cancer patients visiting the radiotherapy centres include vulnerable individuals whose immunity may be reduced due to advanced conditions of some of the cancer diseases. Additionally, most cancer patients are elderly with co-morbid illnesses. The situation is even more compounded if chemotherapy, which largely impacts on the immunity of patients, is to be administered in management of the cancer. For these reasons, it is instructive to ensure that maximum safety against Covid-19 is assured for patients receiving radiotherapy services.

Estimated implementation rate for the indexed Covid-19 safety measures in the surveyed radiotherapy centres ranged from 0.56 to 1.00, with two of the centres (i.e. B2, G1) achieving full implementation index score of 1. Less than quarter (16.7%) of the surveyed centres were found to have some radiotherapy equipment that are dedicated to handle suspicious or confirmed Covid-19 cases. This is mainly due to the general dominance of less-resourced radiotherapy facilities in the African region, making it impractical for most radiotherapy centres to dedicate some of the facilities solely to deal with Covid-19 cases.

The survey has revealed an appreciable level of implementation of screening measures for patients, care-givers and staff, and also orientation of patients on the guidelines to follow while in the radiotherapy centre for treatment. In addition to the orientation, which in most cases is in the form of verbal communication or posted notices, short video clips in local languages that provide education on Covid-19 safety tips are also recommended. Facilities that will enable staff of radiotherapy centres to work remotely from home ought to be given consideration, and if possible provision made for centres lacking such facility. Also, remote means of patient follow-up after radiation treatment should be encouraged to reduce possible physical contacts which could arise as result of the traditional means of patient follow-up, where the patient visits the hospital.

5 Conclusion

The study has identified good compliance of relevant Covid-19 safety measures and practices instituted in selected radiotherapy centres in the Africa region, with great potential of reduced Covid-19 infection spread upon strictly adherence.

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Authors' contributions All authors contributed to the development of the concept, preparation of survey questionnaire, analysis of survey data and manuscript writing.

Data Availability Yes, there is availability of data from the survey questionnaire.

Compliance with ethical standards

Conflicts of interest No identified conflict of interest in this publication.

Ethics approval Not applicable.

Consent to participate All authors consented to participate in the study.

Consent for publication All authors consented to publication of the study.

Code availability Not applicable.

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