COVID-19 in Continental Africa

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Abstract

Background: In late December 2019, the emerging disease of COVID-19 was first diagnosed in China. It was caused by a coronavirus and caused limitations in most parts of the world.

Objectives: We investigated the epidemiology of COVID-19 in continental Africa.

Methods: This ecological study described the epidemiological features of COVID-19 in Africa. We extracted the data related to identified definitive cases and deaths due to this disease and other information from the reports released by the World Health Organization and transferred the data to the SPSS 24 software. Also, the fatality rate was separately determined for each country.

Results: The highest number of cases diagnosed with COVID-19 was in South Africa with 2907619 cases, and the highest number of deaths due to COVID19 was found in South Africa with 87922 cases. The highest case fatality rate was in Liberia, with 4.93%.

Conclusions: Prevention of COVID-19 transmission is possible by vaccinating most age groups in the community and observing social distance. Upgrading diagnostic equipment and identifying healthy and quarantined carriers is also effective in reducing COVID-19 transmission. The cooperation of health officials and volunteers is effective in more fully identifying patients and enforcing quarantine rules. The World Health Organization provides financial support, diagnostic equipment, and vaccines for low- and middle-income countries in all parts of the world, especially in Africa. Financial support from charitable groups to provide insurance services and medical and pharmaceutical equipment is an effective help in reducing the damage of COVID-19.

Keywords: COVID-19, Coronavirus, Africa

1. Background

The outbreak of acute respiratory syndrome in Wuhan, China, occurred in late 2019 (1-3). After investigating to identify the source of the disease, health officials concluded that the seafood market was the source of the disease (4-7). Acute respiratory syndrome has spread in China and other parts of the world (8). The coronavirus caused this viral respiratory disease, and the World Health Organization (WHO) named it coronavirus disease 2019 (COVID-19) (9). The COVID-19 pandemic was officially announced in March 2019 (4).

Transmission of emerging respiratory disease was done with patients' respiratory droplets and could not be treated with conventional therapies (2, 5, 7, 10). Fever, cough, and shortness of breath are common symptoms of this disease that are seen in patients within two days to two weeks after exposure to the virus (11). Loss of smell and taste is also a mild to moderate symptom of COVID-19. The need for hospitalization and ventilation support is greater in severe patients (12). Obesity, diabetes, heart and kidney disease, cancer, and hypertension are risk factors that increase the risk of severe cases of COVID-19 (12-14).

This contagious disease is currently one of the threats to human health (15). Important factors affecting the transmission rate of COVID-19 are the transmission of the disease by asymptomatic carriers and the lack of complete identification of patients due to insufficient diagnostic tests (1). One of the consequences of the COVID-19 pandemic is the imposition of quarantine restrictions and traffic laws, which have had negative consequences on the global economy, especially in low- and middle-income countries (16-18). According to epidemiological estimates and models, deaths from COVID-19 are likely to be more than one million in densely populated countries (19).

2. Objectives

We described the epidemiology of COVID-19 in Africa.

3. Methods

This ecological study examined the status of the COVID-19 in continental Africa. Data on the total number of definitive COVID-19 cases as well as the total number of deaths due to definitive COVID-19 by country and also the population of Africa were obtained from the WHO reports (20, 21) from the beginning until October 6, 2021. The obtained data were transferred to SPSS 24 software, and the case fatality rate was achieved separately for each country by the following formulas (22): Case fatality rates (percent) = (No. of individuals dying during a specific period after disease onset or diagnosis/of the individuaks.duals with the specified disease) × 100.

4. Results

The total number of countries on the continent, according to the WHO, of 45 countries, the most populous of which is Nigeria with 185990000 people, and the least populous is Seychelles with 94000 people. The highest number of confirmed cases of COVID-19 is related to South Africa with 2907619 cases, the lowest is Sao Tome and Principe with 3564 cases, and the highest number of definitive deaths due to COVID-19 is in South Africa with 87922, and the lowest is in Togo with 37 deaths was reported. The highest case fatality rate in Liberia was 4.93%, and the lowest was 0.14% in the Cayman Islands (Table 1).

5. Discussion

According to the results of this study, the highest definitive cases of COVID-19 detected in Africa belonged to three countries of South Africa, Ethiopia, and Kenya, respectively. In a study by Nachega et al., which examined COVID-19 in Africa, most patients were men with a mean age of 40 years, which led to a lower mortality rate than the global average. At the beginning of the pandemic, most importers of COVID-19 from the European Union and the United States transmitted the disease to Africa (23). According to Maeda and Nkengasong, who assessed the challenges of COVID-19 in Africa, poor health systems, insufficient financial resources, lack of human resources, and challenges related to indigenous diseases in Africa, including AIDS, tuberculosis, and malaria, have led to taking measures to control COVID-19 and have caused problems in Africa (24). Ataguba examined the COVID-19 consequences on the African continent's economy, and they reported that the COVID-19 diagnosis and treatment

costs had affected household economies in Cameroon, Comoros, Equatorial Guinea, and Nigeria, where most people lacked insurance. In South Africa, the closure of official businesses due to traffic restrictions led to the closure of shops, restaurants, and hotels, and the closure of sporting and educational events and companies related to transportation and tourism, which had a devastating effect on the country's gross domestic product (25). The results of a study by Elhadi et al., which examined the COVID-19 in Libya, showed that the study of international travelers at the country's borders is an important step in reducing the emission of COVID-19 in Libya (26). According to a study by Getaneh et al. on the COVID-19 in Ethiopia, due to the limited ability of the health system to identify and treat COVID-19 patients, local participation in the implementation of accurate social distance and active participation of religious institutions and youth mobilization in raising public awareness about COVID-19 are of great importance (27). Nas et al. conducted an epidemiological study on COVID-19 in Nigeria and showed that COVID-19 is more common in men than women, which may be due to their chances of exposure because of the greater presence of men outdoors. Women in Nigeria are mostly housewives and less likely to be outdoors (28).

Footnotes

Table 1. Frequency Distribution of Identified Definite Cases, Death, Case Fatality Rates of Coronavirus Disease 2019 in Continental Africa

Country	Population	Total Case COVID-19	Total Death COVID-19	Case Fatality Rates
South Africa	56015000	2907619	87922	3.02
Ethiopia	102403000	350204	5811	1.66
Kenya	48462000	250380	5150	2.06
Zambia	16150000	209199	3650	1.74
Nigeria	185990000	206561	2731	1.32
Algeria	40606000	204046	5831	2.86
Botswana	2250000	180197	2374	1.32
Mozambique	28829000	150826	1919	1.27
Ghana	28207000	127878	1157	0.90
Namibia	2480000	127862	3517	2.75
Uganda	28813000	124190	1290	1.04
Cameroon	23439000	95399	1517	1.59
Senegal	15412000	73806	1860	2.52
Malawi	18092000	61629	2286	3.71
Democratic Republic of the Congo	78736000	57083	1086	1.90
Angola	28813000	59895	524	0.87
Eswatini	1343000	46152	1226	2.66
Madagascar	24895000	43610	960	2.20
Cabo Verde	540000	37718	345	0.91
Mauritania	4301000	36229	782	2.16
Gabon	1980000	31058	94	.30
Guinea	12396000	30452	383	1.26
Tanzania	55572000	25957	723	2.79
Togo	7606000	25623	37	0.14
Benin	10872000	24335	445	1.83
Seychelles	94000	21626	70	0.32
Lesotho	2204000	21363	650	3.04
Mayotte	18092000	20373	180	0.88
Burundi	10524000	18825	160	0.85
Mauritius	1262000	16083	100	0.62
Mali	17995000	15338	551	3.59
Congo	5126000	14561	199	1.37
Burkina Faso	18646000	14356	191	1.33
Equatorial Guinea	1221000	12532	150	1.20
South Sudan	12231000	12080	130	1.08
Central African Republic	4595000	11391	100	0.88
Gambia	2039000	9939	338	3.40
Eritrea	4955000	6725	42	0.62
Sierra Leone	7396000	6396	121	1.89
Guinea-Bissau	1816000	6112	135	2.21
Niger	20673000	6057	204	3.37
Liberia	4614000	5799	286	4.93
Chad	14453000	5051	174	3.44
Comoros	796000	4156	147	3.54
Sao Tome and Principe	200000	3564	55	1.54

References

1. Dhar Chowdhury S, Oommen AM. Epidemiology of COVID-19. *Dig Endosc*. 2020;**11**(1):3–7. https://doi.org/10.1055/s-0040-1712187.

2. Omer SB, Malani P, Del Rio C. The COVID-19 Pandemic in the US: A Clinical Update. *JAMA*. 2020;**323**(18):1767–8. [PubMed ID: 32250388]. https://doi.org/10.1001/jama.2020.5788.

3. Zumla A, Niederman MS. Editorial: The explosive epidemic outbreak of novel coronavirus disease 2019 (COVID-19) and the persistent threat of respiratory tract infectious diseases to global health security. *Curr Opin Pulm Med*. 2020;**26**(3):193–6. [PubMed ID: 32132379]. [PubMed Central ID: PMC7147276]. https://doi.org/10.1097/MCP.0000000000000676.

4. Bai Y, Yao L, Wei T, Tian F, Jin DY, Chen L, et al. Presumed Asymptomatic Carrier Transmission of COVID-19. *JAMA*. 2020;**323**(14):1406–7. [PubMed ID: 32083643]. [PubMed Central ID: PMC7042844]. https://doi.org/10.1001/jama.2020.2565.

5. Wang W, Tang J, Wei F. Updated understanding of the outbreak of 2019 novel coronavirus (2019-nCoV) in Wuhan, China. *J Med Virol*. 2020;**92**(4):441–7. [PubMed ID: 31994742]. [PubMed Central ID: PMC7167192]. https://doi.org/10.1002/jmv.25689.

6. Wang C, Horby PW, Hayden FG, Gao GF. A novel coronavirus outbreak of global health concern. *Lancet*. 2020;**395**(10223):470–3. [PubMed ID: 31986257]. [PubMed Central ID: PMC7135038]. https://doi.org/10.1016/S0140-6736(20)30185-9.

7. She J, Jiang J, Ye L, Hu L, Bai C, Song Y. 2019 novel coronavirus of pneumonia in Wuhan, China: emerging attack and management strategies. *Clin Transl Med*. 2020;**9**(1):19. [PubMed ID: 32078069]. [PubMed Central ID: PMC7033263]. https://doi.org/10.1186/s40169-020-00271-z.

8. Dong Y, Mo X, Hu Y, Qi X, Jiang F, Jiang Z, et al. Epidemiological characteristics of 2143 pediatric patients with 2019 coronavirus disease in China. *J Emerg Med*. 2020;**58**(4):712–3.

9. Pettit NN, MacKenzie EL, Ridgway JP, Pursell K, Ash D, Patel B, et al. Obesity is Associated with Increased Risk for Mortality Among Hospitalized Patients with COVID-19. *Obesity (Silver Spring)*. 2020;**28**(10):1806–10. [PubMed ID: 32589784]. [PubMed Central ID: PMC7362135]. https://doi.org/10.1002/oby.22941.

10. Kuki Á, Nagy L, Zsuga M, Kéki S. Fast identification of phthalic acid esters in poly(vinyl chloride) samples by Direct Analysis In Real Time (DART) tandem mass spectrometry. *Int J Mass Spectrom*. 2011;**303**(2-3):225–8. https://doi.org/10.1016/j.ijms.2011.02.011.

11. Spinato G, Fabbris C, Polesel J, Cazzador D, Borsetto D, Hopkins C, et al. Alterations in Smell or Taste in Mildly Symptomatic Outpatients With SARS-CoV-2 Infection. *JAMA*. 2020;**323**(20):2089–90. [PubMed ID: 32320008]. [PubMed Central ID: PMC7177631]. https://doi.org/10.1001/jama.2020.6771.

12. Simonnet A, Chetboun M, Poissy J, Raverdy V, Noulette J, Duhamel A, et al. High Prevalence of Obesity in Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) Requiring Invasive Mechanical Ventilation. *Obesity (Silver Spring)*. 2020;**28**(7):1195–9. [PubMed ID: 32271993]. [PubMed Central ID: PMC7262326]. https://doi.org/10.1002/oby.22831.

13. Sattar N, McInnes IB, McMurray JJV. Obesity Is a Risk Factor for Severe COVID-19 Infection: Multiple Potential Mechanisms. *Circulation*. 2020;**142**(1):4–6. [PubMed ID: 32320270]. https://doi.org/10.1161/CIRCULATIONAHA.120.047659.

14. Lighter J, Phillips M, Hochman S, Sterling S, Johnson D, Francois F, et al. Obesity in Patients Younger Than 60 Years Is a Risk Factor for COVID-19 Hospital Admission. *Clin Infect Dis*. 2020;**71**(15):896–7. [PubMed ID: 32271368]. [PubMed Central ID: PMC7184372]. https://doi.org/10.1093/cid/ciaa415.

15. Peeri NC, Shrestha N, Rahman MS, Zaki R, Tan Z, Bibi S, et al. The SARS, MERS and novel coronavirus (COVID-19) epidemics, the newest and biggest global health threats: what lessons have we learned? *Int J Epidemiol*. 2020;**49**(3):717–26. [PubMed ID: 32086938]. [PubMed Central ID: PMC7197734]. https://doi.org/10.1093/ije/dyaa033.

16. Lone SA, Ahmad A. COVID-19 pandemic - an African perspective. *Emerg Microbes Infect*. 2020;**9**(1):1300–8. [PubMed ID: 32458760]. [PubMed Central ID: PMC7473237]. https://doi.org/10.1080/22221751.2020.1775132.

17. Donthu N, Gustafsson A. Effects of COVID-19 on business and research. *J Bus Res*. 2020;**117**:284–9. [PubMed ID: 32536736]. [PubMed Central ID: PMC7280091]. https://doi.org/10.1016/j.jbusres.2020.06.008.

18. Gopinath G. The great lockdown: Worst economic downturn since the great depression. *IMF blog*. 2020;**14**:2020.

19. Goldstein JR, Lee RD. Demographic perspectives on the mortality of COVID-19 and other epidemics. *Proc Natl Acad Sci U S A*. 2020;**117**(36):22035–41. [PubMed ID: 32820077]. [PubMed Central ID: PMC7486771]. https://doi.org/10.1073/pnas.2006392117.

20. World Health Organization. *WHO Coronavirus (COVID-19) Dashboard*. Geneva, Switzerland: World Health Organization; 2021, [cited 2022]. Available from: https://covid19.who.int/table.

21. World Health Organization. *Countries and Centers*. Geneva, Switzerland: World Health Organization; 2021, [cited 2022]. Available from: https://covid19.who.int/table.

22. Gordis L. *Epidemiology*. Philadelphia, USA: Saunders; 2008.

23. Nachega J, Seydi M, Zumla A. The Late Arrival of Coronavirus Disease 2019 (COVID-19) in Africa: Mitigating Pan-continental Spread. *Clin Infect Dis*. 2020;**71**(15):875–8. [PubMed ID: 32227121]. [PubMed Central ID: PMC7184327]. https://doi.org/10.1093/cid/ciaa353.

24. Maeda JM, Nkengasong JN. The puzzle of the COVID-19 pandemic in Africa. *Science*. 2021;**371**(6524):27–8. [PubMed ID: 33384364]. https://doi.org/10.1126/science.abf8832.

25. Ataguba JE. COVID-19 Pandemic, a War to be Won: Understanding its Economic Implications for Africa. *Appl Health Econ Health Policy*. 2020;**18**(3):325–8. [PubMed ID: 32249362]. [PubMed Central ID: PMC7130452]. https://doi.org/10.1007/s40258-020-00580-x.

26. Elhadi M, Momen AA, Alsoufi A, Msherghi A, Zaid A, Ali Senussi Abdulhadi OM, et al. Epidemiological and clinical presentations of hospitalized COVID-19 patients in Libya: An initial report from Africa. *Travel Med Infect Dis*. 2021;**42**:102064. [PubMed ID: 33878449]. [PubMed Central ID: PMC8053220]. https://doi.org/10.1016/j.tmaid.2021.102064.

27. Getaneh Y, Yizengaw A, Adane S, Zealiyas K, Abate Z, Leulseged S, et al. Global lessons and Potential strategies in combating COVID-19 pandemic in Ethiopia: Systematic Review. *medRxiv*. 2020;**Preprint**. https://doi.org/10.1101/2020.05.23.20111062.

28. Nas F, Ali M, azu L, Abdallah M, Yusuf S. Epidemiology of novel COVID-19 in Nigeria. *Microbes and Infectious Diseases*. 2020;**1**(2):49–56. https://doi.org/10.21608/mid.2020.103530.