





## ■ Review Article

# COVID-19 in Uganda: Epidemiology and Response

Esther Ejiroghene Ajari<sup>1,2,3\*</sup> , Andrew Marvin Kanyike<sup>4</sup> , Daniel Ojilong<sup>4</sup> ,  
Ibrahim Olawale Abdulbasit<sup>5</sup> 

<sup>1</sup> College of Medicine, University of Ibadan, Ibadan, Oyo State, Nigeria

<sup>2</sup> The TriHealthon, Ibadan, Oyo State, Nigeria

<sup>3</sup> Center for Contemplative Science, University of Virginia, Charlottesville, United States of America

<sup>4</sup> Faculty of Health Sciences, Busitema University, Mbale, Uganda

<sup>5</sup> College of Health Sciences, Ahmadu Bello University, Zaria, Kaduna State, Nigeria

\* Corresponding author: Esther Ejiroghene Ajari E-mail: [estherejiroghene@gmail.com](mailto:estherejiroghene@gmail.com) ORCID: 0000-0001-8593-3886

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## ABSTRACT

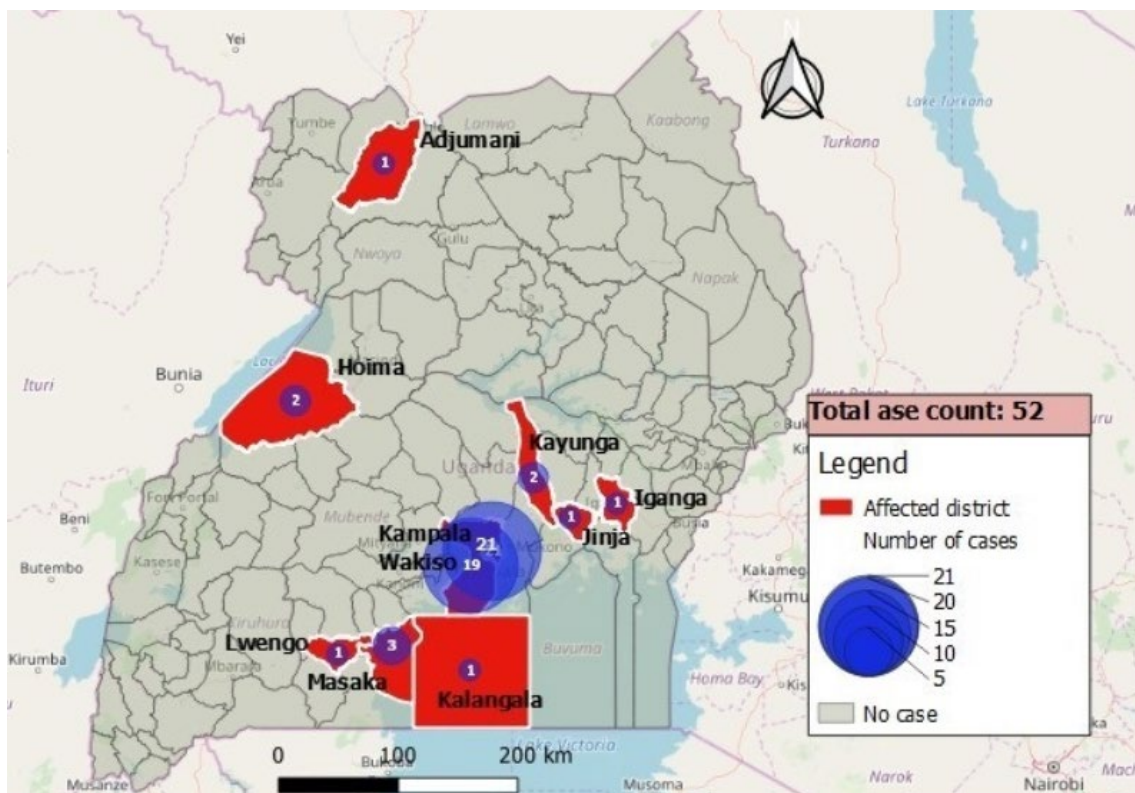
Uganda has had a relatively large share of zoonotic disease outbreaks in the past and this has impacted its preparedness and response level in combatting the COVID-19 outbreak in the country. Compared to most countries in the East African Community, Africa and the world, Uganda seems to be effectively curtailing the spread of the virus and managing the disease despite its relatively weak healthcare system and economy. The first COVID-19 case was confirmed on March 21st, 2020 and as at May 6th, 2020, there has only been 100 cases confirmed from 47,620 tests carried out. Also, as at this date, there has been 55 recoveries and no reported death from the disease. These promising statistics prompts the development of this paper to detail the epidemiology of the disease in the country and discuss the response of the government and other stakeholders to the outbreak.

**Keywords:** Coronavirus, Uganda, epidemiology

## INTRODUCTION

SARS-CoV-2, the novel coronavirus, previously designated as 2019-nCoV, was identified as a cause for a string of pneumonia-like cases in Wuhan City of Hubei Province, China in December, 2019 [1]. It is a highly infectious and transmissible virus, with R0 of up to 6.49 (R0 being the average number of new infections produced by an infectious person without any control measures) [2]. As at May 6th, 2020, there has been 3,588,773 confirmed cases of COVID-19 globally with 247,503 deaths, 33,973 cases in Africa with 1,202 deaths, and 1,441 cases in East African

Community (EAC) with 42 deaths [3]. The Coronavirus Disease 2019 (COVID-19) outbreak in Uganda occurs at such a time when the country has had a relatively large share of zoonotic disease outbreaks, all in regular successions, over the past few years. Between 2009 to 2014, the country experienced eight of such outbreaks [4] and three more between 2017 to 2018 [5]. Also, the country successfully managed six outbreaks of Ebola Virus Disease in 2000, 2001, 2007, 2008, 2012 and 2018 [6]. Furthermore, the country sent a delegation of 20 experts to Liberia and Sierra Leone to help combat the deadliest Ebola outbreak, yet, in West



**Figure 4.** Distribution of the confirmed COVID-19 cases in Uganda by place of residence. Retrieved May 6th, 2020. (Source: <https://covid19.gou.go.ug/>)

of testing in the country. The latter issue could also increase the chances of resurgence when the lockdown is lifted. The WHO Director-General supports this hypothesis when he called on all countries that have enforced the lockdown measures to explore aggressive measures for isolating, testing and tracing suspected carriers of the virus as well as treating patients infected with the virus [61]. He further acknowledged that this is the fastest way out of the extreme social and economic restrictions necessitated by the virus and the best way to prevent future transmission of the virus [61]. Also, a study, utilizing a mathematical model design, showed that a one-time lockdown of a country will be insufficient to curtail spread of the virus yet intermittent distancing measures without other interventions can only control the pandemic up to 2022 [62]. Therefore, Uganda needs to lay witty strategies for phased lifting of the lockdown, upgrade preventive and management strategies, introduce novel interventions, and carefully monitor and evaluate outcomes before conclusions can be made that the country has effectively managed the virus.

#### DECLARATION OF CONFLICT OF INTEREST

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#### REFERENCES

1. Gupta PK, Bhaskar P, Maheshwari S. Coronavirus 2019 (COVID-19) Outbreak in India: A Perspective so far. *J Clin Exp Invest.* 2020;11(4):em00744. (doi: 10.5799/jcei/8220).
2. Liu Y, Gayle AA, Wilder-Smith A, Rocklöv J. The reproductive number of COVID-19 is higher compared to SARS coronavirus. *J Travel Med.* 2020; 27(2):1-4. (doi: 10.1093/jtm/taaa021).
3. World Health Organisation. Coronavirus disease 2019 (COVID-19) Situation Report – 91. 2020;(06 May). Available at: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>
4. Nabukenya I, Lukwago L, Okot C, Wamala JF, Malimbo M, Namukose EM, et al. Is Uganda a hub for zoonotic disease outbreaks? Lessons and challenges from ebola, marburg, yellow fever and anthrax outbreaks. *Int J Infect Dis.* 2014;21:238. (doi: 10.1016/j.ijid.2014.03.916).
5. Mbonye AK, Sekamatte M. Disease outbreaks and reporting in Uganda. *Lancet.* 2018;392(10162):2347-8. (doi: 10.1016/S0140-6736(18)32414-0).

6. CDC. Ebola Virus Disease Distribution Map: Cases of Ebola Virus Disease in Africa Since 1976. 2019 [cited 2020 May 1]. Available at: <https://www.cdc.gov/vhf/ebola/history/distribution-map.html>
7. Paulat L. Uganda Sends 20 Experts to Aid in Ebola Crisis | Voice of America - English. [cited 2020 Apr 26]. Available at: <https://www.voanews.com/science-health/uganda-sends-20-experts-aid-ebola-crisis>
8. Byaruhanga C. Ebola outbreak: What Uganda can teach West Africa - BBC News. [cited 2020 Apr 24]. Available at: <https://www.bbc.com/news/world-africa-28743595>
9. Jacobsen KH, Alonso Aguirre A, Bailey CL, Baranova AV, Crooks AT, Croitoru A, et al. Lessons from the ebola outbreak: Action items for emerging infectious disease preparedness and response. *EcoHealth*. 2016;13:200-12. (doi: 10.1007/s10393-016-1100-5).
10. Ugandan Ministry of Health. Update on the Covid-19 Outbreak in Uganda – Ministry of Health | Government of Uganda. [cited 2020 May 8]. Available at: <https://www.health.go.ug/cause/update-on-the-covid-19-outbreak-in-uganda-4/>
11. World Health Organization. International Health Regulations. 2005 [cited 2020 May 1]. Available at: [https://www.afro.who.int/sites/default/files/2017-06/international\\_health\\_regulations\\_2005.pdf](https://www.afro.who.int/sites/default/files/2017-06/international_health_regulations_2005.pdf)
12. Uganda Ministry of Health. Update on the COVID-19 response in Uganda – Ministry of Health | Government of Uganda. [cited 2020 May 1]. Available at: <https://www.health.go.ug/cause/update-on-the-covid-19-response-in-uganda/>
13. Jane Ruth A. Update on Uganda’s preparedness situation following the 2019 Novel Coronavirus outbreak in China and other countries around the World | WHO | Regional Office for Africa. 2020 [cited 2020 Apr 24]. Available at: <https://www.afro.who.int/news/update-ugandas-preparedness-situation-following-2019-novel-coronavirus-outbreak-china-and>
14. Legido-quigley H, Asgari N, Teo YY, Leung GM, Oshitani H, Fukuda K, et al. Are high-performing health systems resilient against the COVID-19 epidemic? *Lancet*. 2020;395(10227):848-50. (doi: 10.1016/S0140-6736(20)30551-1).
15. The Independent. Timeline of Uganda’s response to COVID-19. 2020 [cited 2020 Apr 24]. Available at: <https://www.independent.co.ug/timeline-of-ugandas-response-to-covid-19/>
16. World Health Organization. WHO Timeline - COVID-19. [cited 2020 Apr 24]. Available at: <https://www.who.int/news-room/detail/08-04-2020-who-timeline---covid-19>
17. Xu Z, Shi L, Wang Y, Zhang J, Huang L, Zhang C, et al. Pathological findings of COVID-19 associated with acute respiratory distress syndrome. *Lancet Respir Med*. 2020;8(4):420-2. (doi: 10.1016/S2213-2600(20)30076-X).
18. Guan W, Ni Z, Hu Y, Liang W, Ou C, He J, et al. Clinical Characteristics of Coronavirus Disease 2019 in China. *N Engl J Med*. 2020; 382:1708-1720. (doi: 10.1056/NEJMoa2002032).
19. Backer JA, Klinkenberg D, Wallinga J. Incubation period of 2019 novel coronavirus (2019-nCoV) infections among travellers from Wuhan, China, 20–28 January 2020. *Euro Surveill*. 2020;25(5):pii=2000062. (doi: 10.2807/15607917.ES.2020.25.5.2000062).
20. Ministry of Health Uganda.:: MoH:: COVID-19 Information Portal [Internet]. 2020 [cited 2020 Apr 24]. Available at: <https://covid19.gou.go.ug/?pg=docs&d=press>
21. Uganda National Media Center. President Museveni COVID-19 Guidelines to the Nation on Corona Virus | Uganda Media Centre [Internet]. 2020 [cited 2020 Apr 24]. Available at: <https://www.mediacentre.go.ug/media/president-museveni-covidc19-guidelines-nation-corona-virus>
22. Tedros A. G. WHO Director-General’s opening remarks at the media briefing on COVID-19 - 11 March 2020. World Health Organization. 2020. Available at: <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---11-march-2020>
23. Kigongo J. Six Chinese convicted for escaping from COVID-19 quarantine in Uganda - Daily Monitor [Internet]. 2020 [cited 2020 May 2]. Available at: <https://www.monitor.co.ug/News/National/Six-Chinese-convicted-escaping-from-Covid-19-quarantine/688334-5530970-1157v16/index.html>

24. Uganda Ministry of Health. MOH press release-21st March 2020-1st COVID-19 case confirmed [Internet]. 2020. Available at: <https://covid19.gou.go.ug/?pg=docs&d=press>
25. Henry GM. Update on the outbreak of COVID-19 in Uganda – COVID-19 | Ministry of Health [Internet]. 2020 [cited 2020 Apr 28]. Available at: <https://www.health.go.ug/covid/2020/03/25/update-on-the-outbreak-of-covid-19-in-uganda/>
26. World Health Organization. Coronavirus disease 2019 (COVID-19) Situation Report-62. 2020;(March). Available at: <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports>
27. Nyeko O. Ugandans Trying to Get Home Forced to Pay for COVID-19 Quarantine | Human Rights Watch [Internet]. 2020 [cited 2020 May 2]. Available at: <https://www.hrw.org/news/2020/03/19/ugandans-trying-get-home-forced-pay-covid-19-quarantine>
28. Vision TN. Coronavirus: 10 Foreigners Bribe Their Way Out of Quarantine [Internet]. 2020 [cited 2020 May 2]. Available at: [https://www.newvision.co.ug/new\\_vision/news/1516840/coronavirus-foreigners-bribe-quarantine](https://www.newvision.co.ug/new_vision/news/1516840/coronavirus-foreigners-bribe-quarantine)
29. Observer T. Museveni imposes 14-day COVID-19 lockdown. The Observer [Internet]. 2020 [cited 2020 May 2]. Available at: <https://observer.ug/news/headlines/64074-museveni-announces-14-day-covid19-lockdown>
30. Ministry of Health- Uganda on Twitter: “The Ethiopian airlines cargo flight carrying the Jack Ma consignment just landed at Entebbe airport. As part of the Jack Ma and @AlibabaGroup support to the fight against #COVID—19, #Uganda received: -100,000 masks -20,089 test kits - 741 PPEs -1,111 face shields #STAYS SAFEUG <https://t.co/ibgZpNXgmg>” / Twitter [Internet]. [cited 2020 Apr 26]. Available at: <https://twitter.com/minofhealthug/status/1242437214354751491>
31. Uganda Ministry of Health. Update on the Covid-19 outbreak in Uganda – Ministry of Health. 2020 [cited 2020 May 2]. Available at: <https://www.health.go.ug/cause/update-on-the-covid-19-outbreak-in-uganda-2/>
32. Bhuckory K, Ojambo F. Uganda, Africa Coronavirus News: Museveni Closes Borders - Bloomberg [Internet]. 2020 [cited 2020 May 2]. Available at: <https://www.bloomberg.com/news/articles/2020-03-22/uganda-to-close-borders-after-reporting-first-virus-infection>
33. Segawa M. More people in Uganda to die of hunger than Coronavirus – Watchdog Uganda [Internet]. 2020 [cited 2020 May 2]. Available at: <https://www.watchdoguganda.com/op-ed/20200327/89771/more-people-in-uganda-to-die-of-hunger-than-coronavirus.html>
34. Agaba J. Uganda’s ‘urban poor’ fear dying of hunger during COVID-19 lockdown - Alliance for Science [Internet]. 2020 [cited 2020 May 2]. Available at: <https://allianceforscience.cornell.edu/blog/2020/04/ugandas-urban-poor-fear-dying-of-hunger-during-covid-19-lockdown/>
35. Uganda Bureau of statistics. Urban Labour Force Survey 2015. 2015. [cited 2020 May 3] Available at: <https://www.ubos.org/>
36. Etukuri C. Security Urges Ugandans To Abide By The Curfew Directive. New Vision [Internet]. 2020 [cited 2020 May 2]. Available at: [https://www.newvision.co.ug/new\\_vision/news/1517785/security-urges-ugandans-abide-curfew-directive](https://www.newvision.co.ug/new_vision/news/1517785/security-urges-ugandans-abide-curfew-directive)
37. Kahungu T. Government to provide maize flour, beans to vulnerable people. Daily Monitor [Internet]. 2020 [cited 2020 May 2]. Available at: <https://www.monitor.co.ug/News/National/Govt-to-distribute-food-1-5m-people-Wakiso-Kampala/688334-5511284-10wt835/index.html>
38. Parliament of Uganda. MPs demand countrywide relief food distribution. 2020 [cited 2020 May 2]. Available at: <https://www.parliament.go.ug/news/4595/mps-demand-countrywide-relief-food-distribution>
39. World Health Organization. Uganda: WHO COVID-19 Dashboard [Internet]. 2020 [cited 2020 May 2]. Available at: <https://covid19.who.int/region/afro/country/ug>
40. Daily Monitor Uganda. Museveni to issue new COVID-19 guidelines before May 5 [Internet]. 2020 [cited 2020 May 6]. Available at: <https://www.monitor.co.ug/News/National/Museveni-COVID19-guidelines-MPs-Kadaga-truckers-/688334-5537312-9c1eyd/index.html>
41. Yoweri Kaguta M. Statement on COVID19 pandemic and latest guidelines | President Yoweri Kaguta Museveni [Internet]. 2020 [cited 2020 May 6]. Available at: <https://www.yowerikaguta.com/statement-covid19-pandemic-and-latest-guidelines>
42. Ugandan Ministry of Health. Update on the Covid-19 Outbreak in Uganda. 2020 [cited 2020 May 6]. Available at: <https://www.health.go.ug/cause/update-on-the-covid-19-outbreak-in-uganda-4/>

43. Leni X. COVID-19 CRISIS: Uganda using chloroquine to treat coronavirus patients. PML Daily [Internet]. 2020 [cited 2020 May 6]. Available at: <https://www.pmeldaily.com/news/2020/04/covid-19-crisis-uganda-using-chloroquine-to-treat-coronavirus-patients.html>
44. Ugandan Ministry of Health. Update on the Covid-19 Outbreak in Uganda. 2020 [cited 2020 May 6]. Available at: <https://www.health.go.ug/cause/update-on-the-covid-19-outbreak-in-uganda-4/>
45. Ugandan Ministry of Health. Press Release Archives - COVID-19. 2020 [cited 2020 May 6]. Available at: <https://www.health.go.ug/covid/category/press-release/>
46. Denyer S, Kim MJ. South Korea is doing 10,000 coronavirus tests a day | The Seattle Times [Internet]. 2020 [cited 2020 Apr 26]. Available at: <https://www.seattletimes.com/nation-world/south-korea-is-doing-10000-coronavirus-tests-a-day/>
47. Julia H, Yoonjung S. South Korea is holding an election during the coronavirus crisis. Other countries are postponing theirs. CNN [Internet]. 2020 [cited 2020 May 3]. Available at: <https://edition.cnn.com/2020/04/13/asia/elections-coronavirus-pandemic-intl-hnk/index.html>
48. Abet T. Covid-19: Government on alert as fake test kits hit market. Daily Monitor [Internet]. 2020 [cited 2020 May 3]. Available at: <https://www.monitor.co.ug/News/National/Covid-19-Government-alert-fake-test-kits-hit-market/688334-5512932-nrc6lz/index.html>
49. Costello A. Mass testing is the only way to stop the virus – it's long overdue. The Guardian [Internet]. 2020 [cited 2020 May 3]. Available at: <https://www.theguardian.com/commentisfree/2020/mar/25/mass-covid-19-testing-is-vital-but-the-data-must-be-localised>
50. Mbabazi FK. Projection of COVID-19 Pandemic in Uganda. *BMJ* Yale. 2020;2. (doi: 10.1101/2020.04.02.20051086).
51. Ampurire P. With No Lockdown, Uganda Could Have Had 18,000 COVID-19 Cases and 566 Deaths by End of April. SoftPower News [Internet]. 2020 [cited 2020 May 6]. Available at: <https://www.softpower.ug/with-no-lockdown-uganda-could-have-had-18000-covid-19-cases-and-566-deaths-by-end-of-april/>
52. World Health Organization Regional Office for Africa. Situation reports on COVID-19 outbreak - Sitrep 07, 15 April 2020. 2020 [cited 2020 Apr 24]. Available at: <https://www.afro.who.int/publications/situation-reports-covid-19-outbreak-sitrep-07-15-april-2020>
53. Wu JT, Leung K, Bushman M, Kishore N, Niehus R, de Salazar PM, et al. Estimating clinical severity of COVID-19 from the transmission dynamics in Wuhan, China. *Nat Med*. 2020;26:506-10. (doi: 10.1038/s41591-020-0822-7).
54. Onder G, Rezza G, Brusaferro S. Case-Fatality Rate and Characteristics of Patients Dying in Relation to COVID-19 in Italy. *JAMA*. 2020. (doi: 10.1001/jama.2020.4683).
55. Santacrose L, Charitos IA, Del Prete R. COVID-19 in Italy: An Overview from the First Case to Date. *Electron J Gen Med*. 2020;17(6):em235. (doi: 10.29333/ejgm/7926).
56. Walter LA, McGregor AJ. Sex- and Gender-specific Observations and Implications for COVID-19. *Western Journal of Emergency Medicine: Integrating Emergency Care with Population Health*, 21(3). (doi: 10.5811/westjem.2020.4.47536).
57. Uganda Bureau of Statistics TN 2014-MR. The National Population and Housing Census 2014-Main Report. 2016 [Cited 2020 May 06]. Available at: [https://www.ubos.org/wp-content/uploads/publications/03\\_20182014\\_National\\_Census\\_Main\\_Report.pdf](https://www.ubos.org/wp-content/uploads/publications/03_20182014_National_Census_Main_Report.pdf)
58. Cowling BJ, Ali ST, Ng TWY, Tsang TK, Julian CM, Li MWF, et al. Impact assessment of non-pharmaceutical interventions against COVID-19 and influenza in Hong Kong: an observational study. *MedRxiv*. 2020. (doi: 10.1101/2020.03.12.20034660).
59. Musinguzi G, Asamoah BO. The Science of Social Distancing and Total Lock Down: Does it Work? Whom does it Benefit? 2020;17(6):17-9. (doi: 10.29333/ejgm/7895).
60. Lau H, Khosrawipour V, Kocbach P, Agata M, Schubert J, Bania J, et al. The positive impact of lockdown in Wuhan on containing the COVID-19 outbreak in China, *Journal of Travel Medicine*, taaa037. (doi: 10.1093/jtm/taaa037).
61. Margaret H, Tedros AG, Michael R, Jamil, Dewillio, Maria VK, et al. World Health Organization: COVID-19 virtual press conference - 25 March 2020. 2020;(February 2019):1–13. Available at: <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---25-march-2020>

62. Stephen K, Christine T, Marc L, Yonatan H G. Social distancing strategies for curbing the COVID-19 epidemic. MedRxiv. 2020;(3). (doi: 10.1101/2020.03.22.20041079).

