





Policy Analysis

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Fighting Tuberculosis in Africa: The Current Situation Amidst the COVID-19 Pandemic

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Abstract

Globally, tuberculosis (TB) is one of the leading infectious causes of mortality, with around 4000 deaths daily. Since the emergence of the coronavirus disease 2019 (COVID-19) pandemic in Africa, the region has experienced a lapse in responses directed at TB control, because the priority has shifted to interventions aimed at managing COVID-19. In addition to an unprecedented burden on the region's already overburdened health systems, another major public health concern is the clinical similarities between COVID-19 and TB, making TB diagnosis increasingly challenging, which may lead to poor prognosis, especially in people with TB and COVID-19 co-infection. A likely implication is that TB patients may stop attending health-care facilities due to fear of contracting or being diagnosed with COVID-19 or to avoid being stigmatized, invariably resulting in a disruption in their access to health-care services. Therefore, massive global support should be provided for TB endemic countries to respond synergistically and strongly to the thousands of TB cases as well as the COVID-19 pandemic.

Tuberculosis (TB) is a chronic disease that has affected humankind for more than 4000 years.¹ It is one of the deadliest infectious diseases worldwide, surpassing human immunodeficiency virus/acquired human immunodeficiency syndrome (HIV/AIDS), leading annually to 10 million new cases and 1.5 million deaths approximately,² which confirm it as a major global public health problem.³ However, on March 11, 2020, after the World Health Organization (WHO) declared coronavirus disease 2019 (COVID-19) a pandemic,⁴ most health services for TB have been suspended.^{5,6}

This has happened in almost every country, especially in African countries,^{5,6} resulting in a devastating effect on the TB diagnosis and treatment. Containing the COVID-19 pandemic has become a top priority, thus, affecting most TB screening programs. Moreover, socioeconomic challenges arising from the pandemic have reflected an increase in the delay of TB diagnosis with an escalation in the severity of cases being detected.⁷

A study conducted 3 mo after the emergence of COVID-19 estimated the implications of COVID-19 on the TB response, suggesting that a 3-mo lockdown and a 10-mon protracted recovery could result in 6.3 million additional TB cases between 2020 and 2025 with 1.4 million additional deaths.⁸ Sadly, the prioritization of COVID-19 has set back at least 5-8 y of progress⁷ and has altered the Sustainable Development Goals (SDGs), making them a big challenge for Africans. The reduction of the TB deaths by 90%, its incidence by 80% and the elimination of catastrophic costs for TB affected families by 2030 are the aims of the WHO End TB Strategy to achieve the health target of the SDGs.⁹

TB and COVID-19 share some clinical similarities and symptoms such as fever, shortness of breath, and cough, making TB diagnosis increasingly challenging, especially in people with TB and COVID-19 co-infection. However, both diseases can be differentiated clinically by the onset of symptoms and incubation period, given that COVID-19 has an incubation period of a few days or weeks and its symptoms develop rapidly, whereas TB symptoms appear after a long period of time. In addition, TB patients usually present with a productive cough that often contains blood, while the cough is commonly dry in those with uncomplicated COVID-19. In this context, the implementation of screening for TB of COVID-19 positive patients is

recommended in areas with a high TB burden, due to the high possibility of co-infection being present.⁸

Burden and Current Status of TB in Africa During the COVID-19 Pandemic

The health systems in many African countries have struggled to contain the high burden of COVID-19. Consequently, many prevention and treatment programs for TB and other existing conditions have been disrupted.¹⁰

Physical distancing and stay-at-home measures have had significant impacts on the delivery of TB care, diagnosis, treatment, and care for communities affected.¹¹ A survey conducted in 20 high-burden TB countries found that most medical care and provision of health facilities have been redirected toward COVID-19. In this context, the TB isolation wards are currently being used to provide care to COVID-19 patients, at the same time that health-care staff have greatly reduced the affordability of care for TB patients. Furthermore, TB testing has faced a shortage as the TB laboratories shifted their attention to and are being used as COVID-19 testing laboratories. In contrast, molecular tests, such as direct antigen rapid tests (DARTs) for COVID-19, have become available in developed countries for self-testing at home.^{12,13} There is also a disruption in TB drug supply and a decrease in critical research activities on the disease in many low- and middle-income countries.¹⁴

The COVID-19 pandemic has also impacted the reporting of TB cases in the region. In Malawi, the emergence of the pandemic has led to a substantial decline in the number of notified TB cases due to several reasons such as general disruption and challenging access to a range of primary health-care services, and delayed or missed TB diagnosis in people with true TB disease.¹⁵ On the other hand, to reduce the displacement of civilians and flatten the COVID-19 curve in Sierra Leone, the government has allowed health facilities to supply patients with sufficient TB medication for weeks. However, such action may lead to a decrease in TB cure rates and the development of drug-resistant TB due to a possible low adherence to treatment, which suggests risks of spread of the disease in the community.¹⁶ Additionally, there has been a visible reduction in clinical visits in many sub-Saharan peripheral health centers.¹⁷ This shift may reflect the civilians' fear of contracting COVID-19 from the testing facilities.

Current Efforts and Challenges Facing TB Responses in Africa During the COVID-19 Pandemic

Laboratory diagnosis plays an essential role in TB control programs. In high-income countries, the use of rapid diagnostic tests such as DNA aptamer-based diagnostic tests, nucleic acid amplification tests (NAA), and interferon-gamma release assays (IGRAs) has accelerated sampling processing and TB diagnosis and minimized response time delay.^{18,19} In Africa, the pandemic has drastically impacted national and international TB control programs. The WHO reports a reduction in TB testing in the continent by 30% since the pandemic's onset. TB cases have also increased by 400,000 cases in 2020. COVID-19 lockdown has limited the population's mobility, preventing patients from accessing diagnostic and health-care facilities for TB.²⁰ The few selected to participate in the TB testing would have to wait to start treatment due to delays in sample processing. There has also been a 59% redirection of the Genexpert polymerase chain reaction (PCR) test for

TB toward COVID-19 testing. This diversion has led to a 33% reduction in TB diagnoses,²¹ resulting in a 30% decrease in notified cases.²⁰

Moreover, WHO has promoted the acceleration of research into COVID-19 vaccines, diagnostics, and therapeutics.²² Pre-exposure prophylactic therapeutics, such as Tixagevimab/cilgavimab (Evusheld), plus monoclonal antibodies (sotrovimab) and oral antivirals (molnupiravir and paxlovid) have been developed for COVID-19 management.^{23,24} On the other hand, prophylactic programs, such as the isoniazid preventive therapy (IPT) for TB infection, have been suspended.²⁵ Diversion of resources has also created an extensive backlog of TB patients, and this has increased the probability of transmission of the disease through undiagnosed individuals and the possibility of drug resistance.²¹ Laboratories are overwhelmed with respiratory samples,²⁵ and low resources for TB diagnostics are causing misdiagnosis of affected patients. To worsen the situation, community health worker (CHW) programs for TB contact tracing have also been suspended due to insufficient personnel and the fear of CHWs contracting COVID-19.²¹ Moreover, reduced funding for TB programs has led to a reduced procurement and management of supply chains for TB diagnostic kits and maintenance of health centers. COVID-19 lockdowns together with a decrease in tax collection will certainly continue to affect Africa's struggling economy.²⁶

In 2020, the WHO released guidelines on collective management of TB and COVID-19. These guidelines provide recommendations such as noncontact provision of TB medicines through prepacked home deliveries by volunteers to ensure uninterrupted TB management; in what way mobile and rapid testing sites for COVID-19 should be adapted toward testing for TB in high TB burden countries to detect people with TB and COVID-19 co-infection and avoid poor prognosis; using of telehealth services for COVID-19 for transition of the directly observed therapy (DOTs) regimen toward self-administered therapy to minimize the over-reliance on human and economic resources and improve treatment literacy; promoting of entirely oral-based and shorter treatment plans to decrease the probability of the emergence of drug resistant forms of TB; and inclusion of TB counseling in COVID-19 programs.²⁶ Considering that TB in young children is mostly acquired in their own household, the COVID-19 pandemic is likely to result in more contact of children with infectious TB cases due to the social distancing measures, because families may stay together for long periods of time. Therefore, it is essential that contact screening for COVID-19 in the household includes questions about TB as well as preventive therapy (IPT) for TB is implemented in the community to protect young children from additional risks.²⁷ In addition to TB amidst COVID-19, Africa has also faced other viral outbreaks and infectious diseases such as Lassa fever, HIV/AIDS, and pneumonia,^{28–30} along with decline in overall vaccination coverage³¹ and against COVID-19.^{30,32} This added to the serious problem of underreporting of COVID-19 cases on the continent should worsen the current scenario.³²

Conclusions and Recommendations

The COVID-19 pandemic has drastically impacted national and international TB control programs in Africa. Although the impact of the COVID-19 pandemic on TB control has been well pronounced, Africa must not relent in its efforts. Therefore, a massive global support should be provided to enable the TB endemic countries to respond equally, synergistically, and strongly to the COVID-19 pandemic as well as the thousands of TB cases by

promoting bi-directional screening, which means COVID-19 screening for all diagnosed TB patients and TB screening for all COVID-19 positive patients (especially when there is an elevated risk), multi-pathogen testing, and implement connectivity solutions for TB/COVID-19 surveillance.

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References

- Kochi A. The global tuberculosis situation and the new control strategy of the World Health Organization. *Tubercle*. 1991;72(1):1-6. doi: [10.1016/0041-3879\(91\)90017-m](https://doi.org/10.1016/0041-3879(91)90017-m)
- World Health Organization (WHO). Global tuberculosis report. Geneva: WHO; 2019. Accessed September 20, 2021. <https://apps.who.int/iris/bitstream/handle/10665/329368/9789241565714-eng.pdf>
- Wood R. Challenges of TB diagnosis and treatment in South Africa. *South Afr J HIV Med*. 2007;8(2):44-48.
- World Health Organization (WHO). WHO Director-General's opening remarks at the media briefing on COVID-19-11 March 2020. Geneva: WHO; 2020. Accessed September 20, 2021. <https://www.who.int/director-general/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19-11-march-2020>
- World Health Organization (WHO). Pulse survey on continuity of essential health services during the COVID-19 pandemic: interim report, 27 August 2020. Geneva: WHO; 2020. Accessed September 20, 2021. https://www.who.int/publications/i/item/WHO-2019-nCoV-EHS_continuity-survey-2020.1
- The Global Fund. Mitigating the impact of COVID-19 on countries affected by HIV Tuberculosis and Malaria. Geneva: The Global Fund to Fight AIDS, Tuberculosis and Malaria; 2020. Accessed September 20, 2021. https://www.theglobalfund.org/media/9819/covid19_mitigatingimpact_report_en.pdf
- McQuaid CF, McCreesh N, Read JM, et al. The potential impact of COVID-19-related disruption on tuberculosis burden. *Eur Respir J*. 2020;56(2):2001718. doi: [10.1183/13993003.01718-2020](https://doi.org/10.1183/13993003.01718-2020)
- World Health Organization (WHO). World Health Organization (WHO) Information Note - Tuberculosis and COVID-19. Geneva: WHO; 2020. Accessed September 20, 2021. <https://www.who.int/docs/default-source/documents/tuberculosis/infonote-tb-covid-19.pdf>
- World Health Organization (WHO). WHO: Global TB progress at risk. Geneva: WHO; 2020. Accessed September 20, 2021. <https://www.who.int/news/item/14-10-2020-who-global-tb-progress-at-risk>
- World Health Organization (WHO). World TB day 2020. Geneva: WHO; 2020. Accessed September 20, 2021. <https://www.who.int/campaigns/world-tb-day/2020>
- Zumla A, Marais BJ, McHugh TD, et al. COVID-19 and tuberculosis-threats and opportunities. *Int J Tuberc Lung Dis*. 2020;24(8):757-760. doi: [10.5588/ijtld.20.0387](https://doi.org/10.5588/ijtld.20.0387)
- MacLean EL, Villa-Castillo L, Ruhwald M, et al. Integrated testing for TB and COVID-19. *Med (N Y)*. 2022;3(3):162-166. doi: [10.1016/j.medj.2022.02.002](https://doi.org/10.1016/j.medj.2022.02.002)
- Harmon A, Chang C, Salcedo N, et al. Validation of an at-home direct antigen rapid test for COVID-19. *JAMA Netw Open*. 2021;4(8):e2126931. doi: [10.1001/jamanetworkopen.2021.26931](https://doi.org/10.1001/jamanetworkopen.2021.26931). Erratum in: *JAMA Netw Open*. 2021;4(10):e2132776.
- Malik AA, Safdar N, Chandir S, et al. Tuberculosis control and care in the era of COVID-19. *Health Policy Plan*. 2020;35(8):1130-1132. doi: [10.1093/heapol/czaa109](https://doi.org/10.1093/heapol/czaa109)
- Soko RN, Burke RM, Feasey HRA, et al. Impact of COVID-19 on tuberculosis notifications in Blantyre Malawi: an interrupted time series analysis and qualitative study with healthcare workers. bioRxiv. 2021. doi: <https://doi.org/10.1101/2021.03.15.21253601>
- Buonsenso D, Iodice F, Sorba Biala J, et al. COVID-19 effects on tuberculosis care in Sierra Leone. *Pulmonology*. 2021;27(1):67-69. doi: [10.1016/j.pulmoe.2020.05.013](https://doi.org/10.1016/j.pulmoe.2020.05.013)
- Adepoju P. Tuberculosis and HIV responses threatened by COVID-19. *Lancet HIV*. 2020;7(5):e319-e320. doi: [10.1016/S2352-3018\(20\)30109-0](https://doi.org/10.1016/S2352-3018(20)30109-0)
- Lavania S, Das R, Dhiman A, et al. Aptamer-Based TB antigen tests for the rapid diagnosis of pulmonary tuberculosis: potential utility in screening for tuberculosis. *ACS Infect Dis*. 2018;4(12):1718-1726. doi: [10.1021/acscinfdis.8b00201](https://doi.org/10.1021/acscinfdis.8b00201)
- Whitworth HS, Scott M, Connell DW, et al. IGRAs—the gateway to T cell based TB diagnosis. *Methods*. 2013;61(1):52-62. doi: [10.1016/j.ymeth.2012.12.012](https://doi.org/10.1016/j.ymeth.2012.12.012)
- World Health Organization (WHO) Regional Office for Africa. Rapid Policy Brief Number: 010-02 — Effects of COVID-19 on tuberculosis healthcare service delivery. Brazzaville: Information Management Cell, of the WHO Regional Office IMST and the Cochrane Africa Network; 2020. Accessed September 21, 2020. <https://apps.who.int/iris/bitstream/handle/10665/338774/WHO-AF-ARD-DAK-04-2021-eng.pdf>
- Abdool Karim Q, Abdool Karim SS. COVID-19 affects HIV and tuberculosis care. *Science*. 2020;369(6502):366-368. doi: [10.1126/science.abd1072](https://doi.org/10.1126/science.abd1072)
- Agrawal S, Goel AD, Gupta N. Emerging prophylaxis strategies against COVID-19. *Monaldi Arch Chest Dis*. 2020;90(1). doi: [10.4081/monaldi.2020.1289](https://doi.org/10.4081/monaldi.2020.1289)
- Fishbane S, Hirsch JS, Nair V. Special considerations for Paxlovid treatment among transplant recipients with SARS-CoV-2 infection. *Am J Kidney Dis*. 2022;79(4):480-482. doi: [10.1053/j.ajkd.2022.01.001](https://doi.org/10.1053/j.ajkd.2022.01.001)
- Persad G, Peek ME, Shah SK. Fair allocation of scarce therapies for COVID-19. *Clin Infect Dis*. 2021;ciab1039. doi: [10.1093/cid/ciab1039](https://doi.org/10.1093/cid/ciab1039)
- Togun T, Kampmann B, Stoker NG, et al. Anticipating the impact of the COVID-19 pandemic on TB patients and TB control programmes. *Ann Clin Microbiol Antimicrob*. 2020;19(1):21. doi: [10.1186/s12941-020-00363-1](https://doi.org/10.1186/s12941-020-00363-1)
- Keene C, Mohr-Holland E, Cassidy T, et al. How COVID-19 could benefit tuberculosis and HIV services in South Africa. *Lancet Respir Med*. 2020;8(9):844-846. doi: [10.1016/S2213-2600\(20\)30311-8](https://doi.org/10.1016/S2213-2600(20)30311-8)
- Togun T, Kampmann B, Stoker NG, et al. Anticipating the impact of the COVID-19 pandemic on TB patients and TB control programmes. *Ann Clin Microbiol Antimicrob*. 2020;19(1):21. doi: [10.1186/s12941-020-00363-1](https://doi.org/10.1186/s12941-020-00363-1)
- Uwishema O, Alshareif BAA, Yousif MYE, et al. Lassa fever amidst the COVID-19 pandemic in Africa: a rising concern, efforts, challenges, and future recommendations. *J Med Virol*. 2021;93(12):6433-6436. doi: [10.1002/jmv.27219](https://doi.org/10.1002/jmv.27219)
- Uwishema O, Taylor C, Lawal L, et al. The syndemic burden of HIV/AIDS in Africa amidst the COVID-19 pandemic. *Immun Inflamm Dis*. 2022;10(1):26-32. doi: [10.1002/iid3.544](https://doi.org/10.1002/iid3.544)
- Uwishema O, Onyeaka H, Alshareif BAA, et al. Current context of pneumonia amidst the COVID-19 pandemic in Africa. *J Contemp Stud Epidemiol Public Health*. 2021;2(2):ep21007. doi: <https://doi.org/10.30935/jconsep/11281>
- Khawaja UA, Franchi T, Pedersini P, et al. Declining rates of global routine vaccination coverage amidst the COVID-19 pandemic: a serious public health concern. *Einstein (Sao Paulo)*. 2022;19:eED6552. doi: [10.31744/einstein_journal/2021ED6552](https://doi.org/10.31744/einstein_journal/2021ED6552)
- Tovani-Palone MR, Garoli F, Shah PA, et al. Underreporting of cases during the COVID-19 pandemic: a worrying warning for Africa. *J Contemp Stud Epidemiol Public Health*. 2022;3(1):ep22001. doi: [10.30935/jconsep/11467](https://doi.org/10.30935/jconsep/11467)