

# Exposure and infection by SARS-Cov-2 in HIV-positive patients investigated for TB in Uganda

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# Background

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- The Severe Acute Respiratory Syndrome Corona Virus-2 (SARS-CoV-2), the causative agent of Corona Virus Disease 2019 (COVID-19) emerged from Wuhan, Hubei province in China at the end of 2019, and in March 2020, the World Health Organization declared COVID-19 a pandemic
- COVID-19 pandemic has dominated global attention, impacting pre-existing public health concerns such as Tuberculosis (TB).
- Clinical presentation of TB and COVID-19 overlap, creating additional diagnostic challenges.
- Real world data on TB and COVID-19 diagnosis is important for understanding the impact of the pandemic on vulnerable populations.

**Objective:** To assess the prevalence of exposure and infection by SARS-CoV-2 among HIV patients investigated for TB.

# Methods

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- Prospective study including adult ambulatory HIV positive clients presenting with a least one TB symptom between October 2020 and September 2021
- All patients received clinical examination, AlereLAM, sputum Xpert MTB/RIF, culture (sputum or urine) and chest X-ray. Optional SARS-CoV-2 PCR testing (nasopharyngeal or oropharyngeal) testing was offered.
- SARS-CoV-2 antibody testing was considered at the first consultation, and HIV-positive clients with symptoms of TB were also proposed a SARS-CoV-2 PCR
- SARS-CoV-2 antibody testing was done using Abbott ELISA method
- SARS-CoV-2 PCR was done using Gene Xpert (SARS-COV-2 Xpert<sup>®</sup> Xpress)

# Methods

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## Definitions

- COVID-19 exposure: This is defined by detectable circulating antibodies in the participants' serum samples. A positive or reactive ELISA was indicative of an exposure risk.
- COVID-19 infection: This is defined as a positive PCR for a participants nasal pharyngeal sample.
- TB/COVID-19 overlapping symptoms: cough and fever.
- TB symptoms only: night sweats and weight loss.

Additional COVID-19 symptoms: sore throat, fatigue, headache, abdominal pain, vomiting or diarrhea, and other clinical signs.

# Results

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- 795 clients (August 2020 to September 2021)
- Among them, 86.8% (690/795) accepted SARS-CoV-2 antibody testing.
- Of the 690 patients, results were available for 671 (97.2%) patients (as of Feb 2022)

## SARS-CoV-2 Serology results

	<b>Group 1</b>	<b>Group 2</b>
	<b>TB symptoms</b>	<b>No TB symptoms &amp; advanced HIV</b>
	<b>N=539, %(n)</b>	<b>N=256, %(n)</b>
Antibody testing acceptance	82.4 (444)	96.1 (246)
Positive	21.7 (94)	15.5 (38)
Negative	78.3 (339)	84.2 (202)
<b>Serology among microbiologically confirmed TB-HIV clients</b>		
Positive	11.8 (4/34)	30.0 (3/10)

# Results

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## SARS-CoV-2 antibody test results per CD4 count in group 1

	<200 (N=66)	200-350 (N=51)	>=350 (N=316)	Total (N=433)
<b>Serology result</b>				
Negative	58 (87.9%)	35 (68.6%)	246 (77.8%)	339 (78.3%)
<b>Positive</b>	<b>8 (12.1%)</b>	<b>16 (31.4%)</b>	<b>70 (22.2%)</b>	<b>94 (21.7%)</b>

## SARS-CoV-2 antibody test results per Xpert/Culture (MTB) result in group 1

	Negative (N=399)	Positive MTB (N=34)	Total (N=433)
<b>Serology result</b>			
Negative	309 (77.4%)	30 (88.2%)	339 (78.3%)
<b>Positive</b>	<b>90 (22.6%)</b>	<b>4 (11.8%)</b>	<b>94 (21.7%)</b>

## SARS-CoV-2 antibody test results per Xpert/Culture (MTB) result in group 2

	Negative (N=230)	Positive MTB (N=10)	Total (N=240)
<b>Serology result</b>			
Negative	195 (84.8%)	7 (70.0%)	202 (84.2%)
<b>Positive</b>	<b>35 (15.2%)</b>	<b>3 (30.0%)</b>	<b>38 (15.8%)</b>

# Results

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## SARS-CoV-2 PCR results

- PCR consent: Among patients included in **group 1**, we defined consent to PCR for SARS-CoV-2 if a result of PCR test is available (PCR was only proposed systematically to patients in group 1, PCR was proposed to patients in group 2 if they had symptoms of Covid-19).
- 267/539 (49.5%) patients consented for PCR testing in group 1. In addition, 4 consented in group 2. In total, 271 patients accepted a PCR test.

	Group 1 (N=267)	Group 2 (N=4)	Total (N=271)
<b>PCR result</b>			
Negative	243 (91.0%)	2 (50.0%)	245 (90.4%)
<b>Positive</b>	<b>24 (9.0%)</b>	<b>2 (50.0%)</b>	<b>26 (9.6%)</b>

# Results

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## PCR test results per CD4 count in group 1

	<200 (N=32)	200-350 (N=24)	>=350 (N=211)	Total (N=267)
PCR result				
Negative	30 (93.8%)	20 (83.3%)	193 (91.5%)	243 (91.0%)
<b>Positive</b>	<b>2 (6.2%)</b>	<b>4 (16.7%)</b>	<b>18 (8.5%)</b>	<b>24 (9.0%)</b>

## PCR test results per Xpert/Culture (MTB) result in group 1

	Negative (N=249)	<b>Positive MTB (N=18)</b>	Total (N=267)
PCR result			
Negative	229 (92.0%)	14 (77.8%)	243 (91.0%)
<b>Positive</b>	<b>20 (8.0%)</b>	<b>4 (22.2%)</b>	<b>24 (9.0%)</b>



# Conclusion

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- Differentiating COVID-19 and TB based solely on clinical presentation is challenging. Additional diagnostic tests are required to aid prompt diagnosis and reduce morbidity and mortality.
- Exposure to SARS-CoV-2 is moderate among patients investigated for TB in Uganda.
- Severely immunosuppressed patients with TB symptoms had a lower prevalence of a positive antibody test than those less immunosuppressed.
- A considerable proportion of patients infected by SARS-CoV-2 were diagnosed with TB.
- Patients with symptoms of TB should also be tested for SARS-CoV-2.

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