

Assessment of Burden of COVID-19 Infection and the Dynamics in African Union Member States

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BACKGROUND

COVID-19 remains a threat to the public health

Africa is vulnerable to COVID-19 and its consequent economic catastrophe because of its weak healthcare systems.

No study have compared within Africa, country-specific adaptive factors nor evaluated the burden of COVID-19 across countries during the first one-year of the pandemic.

Understanding the impact of the pandemic across African countries could help build on specific gaps experienced in the first one-year and provide a more practical road map for future pandemic preparedness and response efforts.

OBJECTIVES

- This study assessed:
 - The real-world burden of COVID-19 infection in African Union (AU) member states and
 - Highlighted the distributional patterns of the epidemiological measures of the disease across countries and regions during the first one-year of the pandemic.

METHODS

Study Population:

- Africa, the second largest and populous continent
- 1.39B people, population density of 45.30 persons/km²

Data Source

- The Africa Centers for Disease Control and Prevention (Africa CDC)
- Our World In Data

Study variables

- Country name, population, and geographical region
- Confirmed reported cases of COVID-19 infection (RC), active cases (AC), recoveries (R), deaths, and COVID-19 test data.

Measures

- Morbidity and mortality rates (MMR), case fatality rate (CFR), and case ratios (CR).

METHODS CONT'D

Statistical Analysis

- Countries were stratified based on COVID-19 morbidity experienced in the first year of the pandemic
- Low burden (<100 per 10⁵ pop), medium burden (100-349 per 10⁵ pop), and high burden (>350 per 10⁵ pop)
- Descriptive and inferential measures were conducted on epidemiological measures (MMR, CFR, and CR)
- SAS JMP Statistical Discovery™ Software version 16.2 (SAS Institute, Cary, North Carolina, USA).

RESULTS

Table 1: Epidemiological Measures of COVID-19 Infection by Burden of COVID-19

Measures	Overall (AU) (N=53)			Burden of COVID-19 Infection			P-Value
	Total	Mean	95% CI	Low (n=26)	Medium (n=15)	High (n=12)	
Reported Cases (RC)	3,196,615	60,313	8,102-112,525	13,703 ^a	45,836 ^b	179,399 ^c	0.0374*
Recoveries (R)	2,582,368	48,724	5,669-91,778	10,003 ^a	35,377 ^b	149,303 ^c	0.0321*
Active Cases (AC)	536,759	10,128	1,880-18,375	3,443	9,264	25,689	0.1011
Deaths (Number)	77,486	1,462	29-2895	257	1,194	4,408	0.0685
R/RC Ratio	---	0.767	0.713-0.822	0.750	0.740	0.838	0.3676
AC/RC Ratio	---	0.211	0.156-0.265	0.224	0.239	0.145	0.4253
Case-Fatality Rate (CFR) (%)	---	2.214	1.702-2.727	2.579	2.053	1.625	0.3195
Morbidity Rate (per 10 ⁵ pop)	17,359	327.524	178-477	43.38 ^a	165.13 ^b	1146.16 ^c	<0.0001****
Mortality Rate (per 10 ⁵ pop)	315.933	5.961	2.726-9.196	0.872 ^a	3.453 ^b	20.122 ^c	<0.0001****
COVID-19 tests (per 1,000 pop)	---	16.775	7.694-25.856	7.208 ^a	9.009 ^b	43.314 ^c	<0.0001****
Total COVID-Tests Performed (no.)	83,828,061	---	---	16,048,411 ^a	15,442,540 ^a	52,337,110 ^b	<0.0001****
Total Test Performed (%) [§]	---	---	---	19.150 ^a	18.410 ^a	62.420 ^b	<0.0001****
Population (Million/Billion)	1.394 [§]	26.307	16.247-36.368	31.835	29.250	10.653	0.2381

Note: Burden of COVID-19 Infection: Low, n=26 Countries; Moderate, n=15 Countries; High, n=12 Countries.

^aBillion; Pop: Population.; [§]As a percentage of the total COVID-19 test conducted in AU during the period under review.

Within the Burden of COVID-19 Infection, means with different superscripts (a, b, c) are statistically different (p<0.05)

.Significance Level: *p<0.05; ****p<0.0001.

RESULTS CONT'D

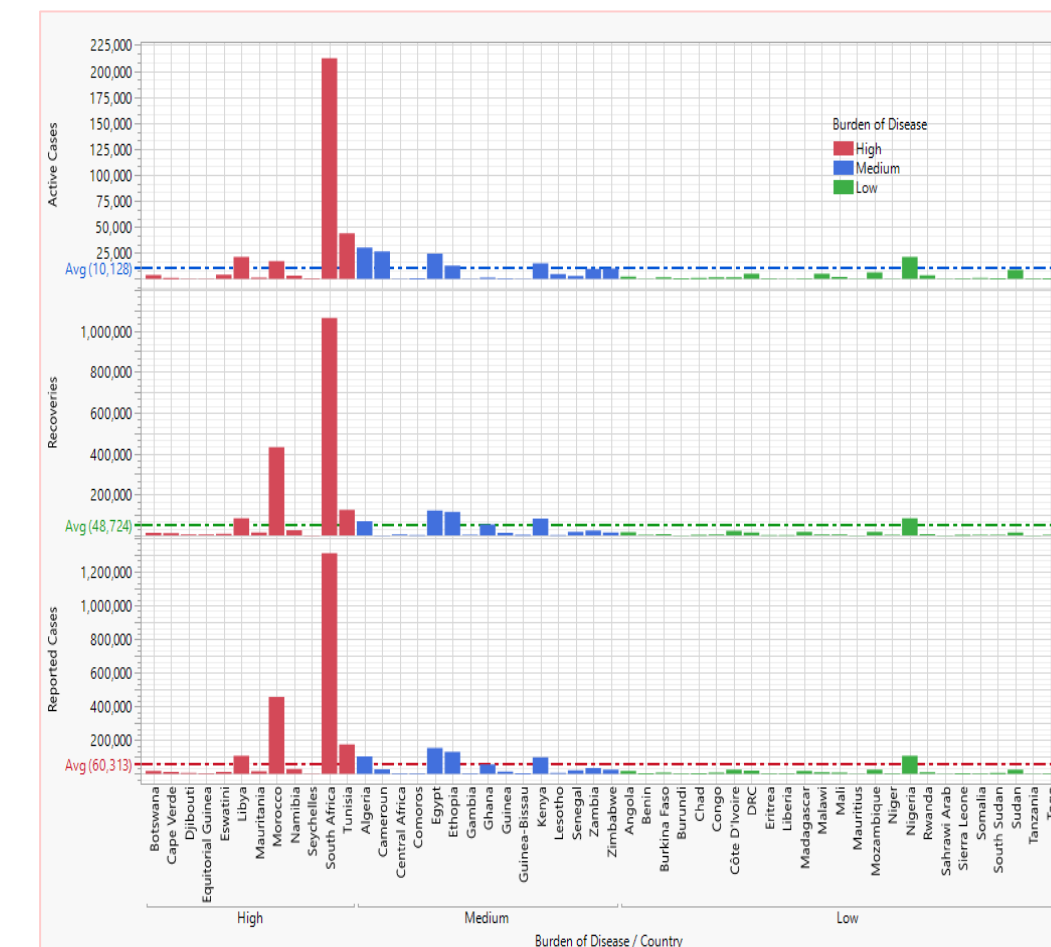


Figure 1: Reported, Recoveries, and Active Cases of COVID-19 in AU Member Countries by Burden of COVID-19 Infection

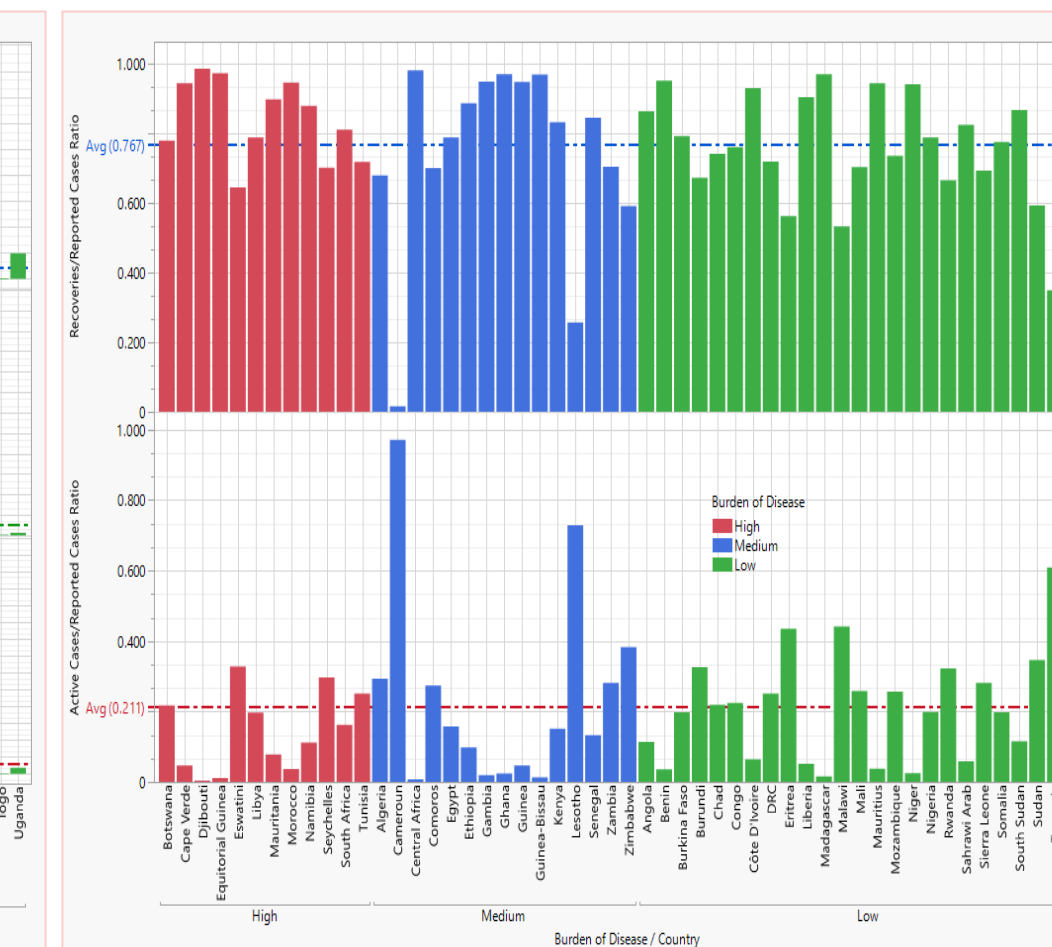


Figure 2: Ratios of Active Cases and Recoveries, and Reported Cases of COVID-19 in AU Member Countries by Burden of COVID-19 Infection

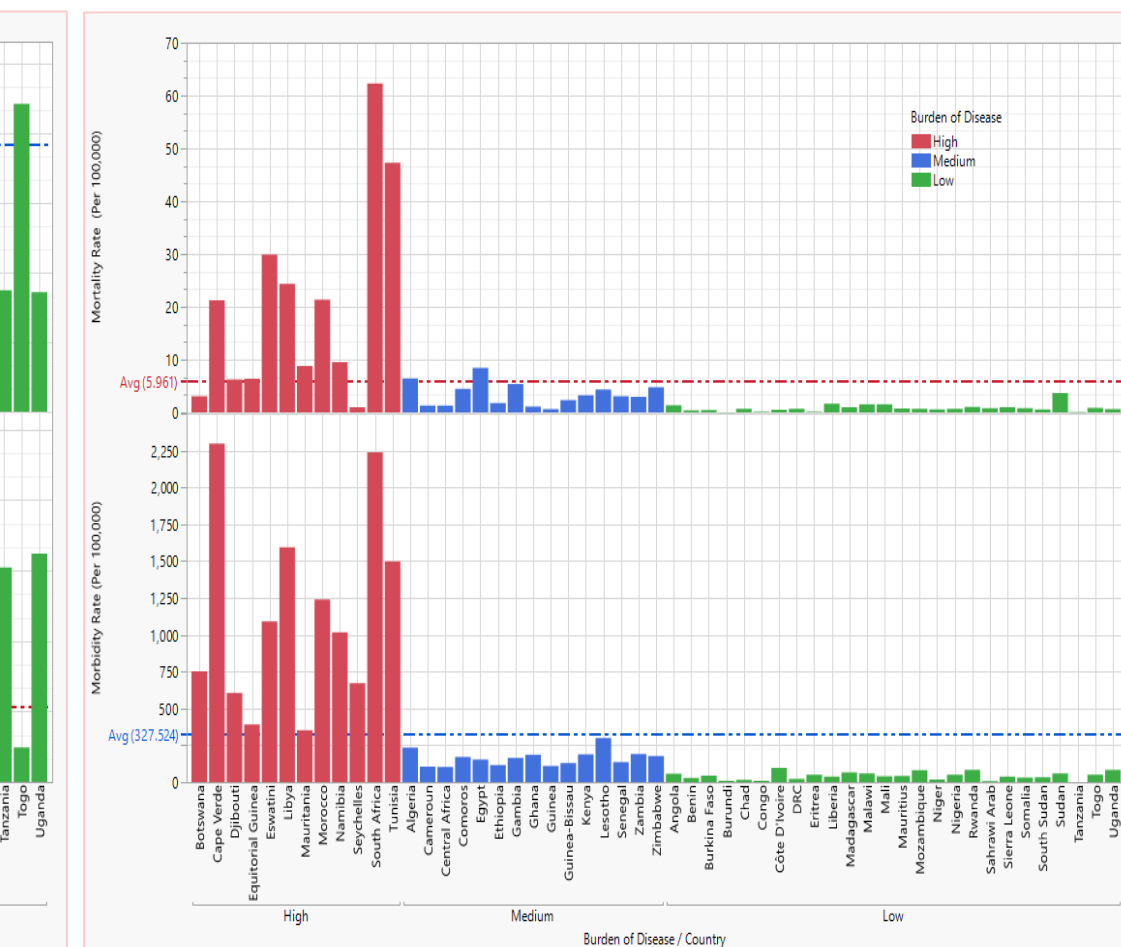


Figure 3: Morbidity and Mortality Rates of COVID-19 in African Union Member Countries by Burden of COVID-19 Infection

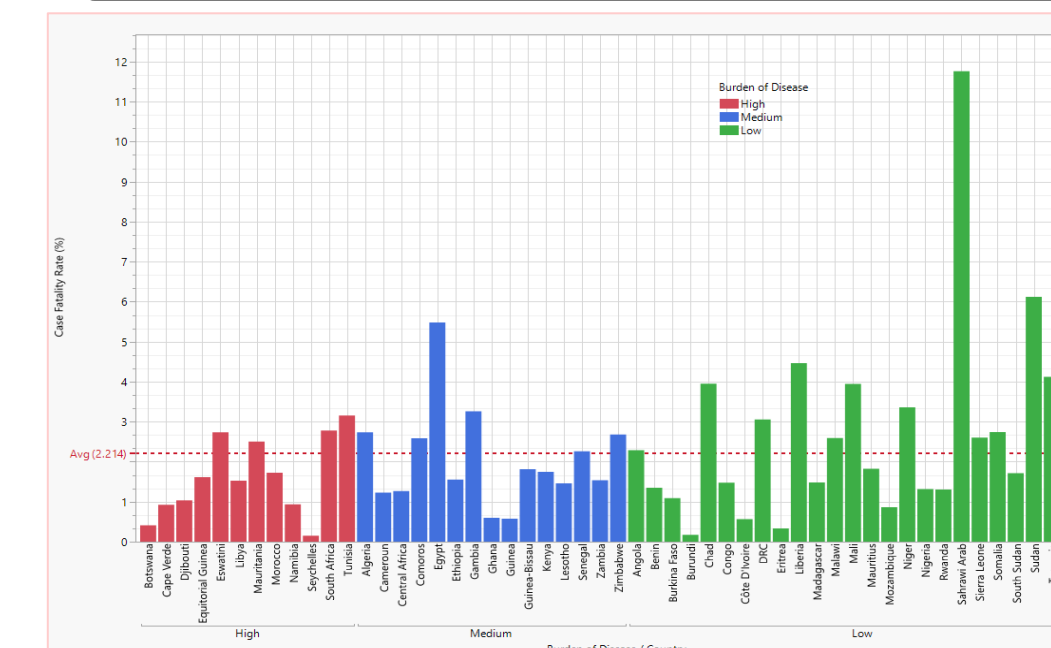


Figure 4: Case-Fatality Rates of COVID-19 in AU Member Countries by Burden of COVID-19 Infection

- A total of 83.8 million COVID-19 tests were performed in the AU States during the first one-year of the COVID-19 pandemic. Of this number, the high-burden countries had the most COVID-19 tests (62.43%, n=52.3 million), compared to low (19%, n=16 million) and medium (18.42%, n=15.4 million) burden countries (p<0.0001).
- The overall COVID-19 morbidity rate for the continent during the period under review was 17,359 per 100,000 population (Mean = 327.52/10⁵ population).

CONCLUSIONS

- Our findings indicate that although the African continent was the last to be hit by the COVID-19 pandemic, the disease quickly spread to all AU member countries within the first one-year.
- The swift and effective response by African countries, despite their limited resources, helped slow the disease's spread.
- Understanding the actual burden of COVID-19 in AU countries is essential for establishing the impact of the pandemic in the African continent and for intervention planning and deployment of resources, including vaccines.

REFERENCES

