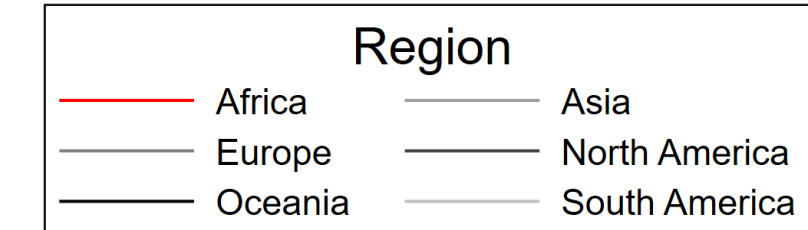
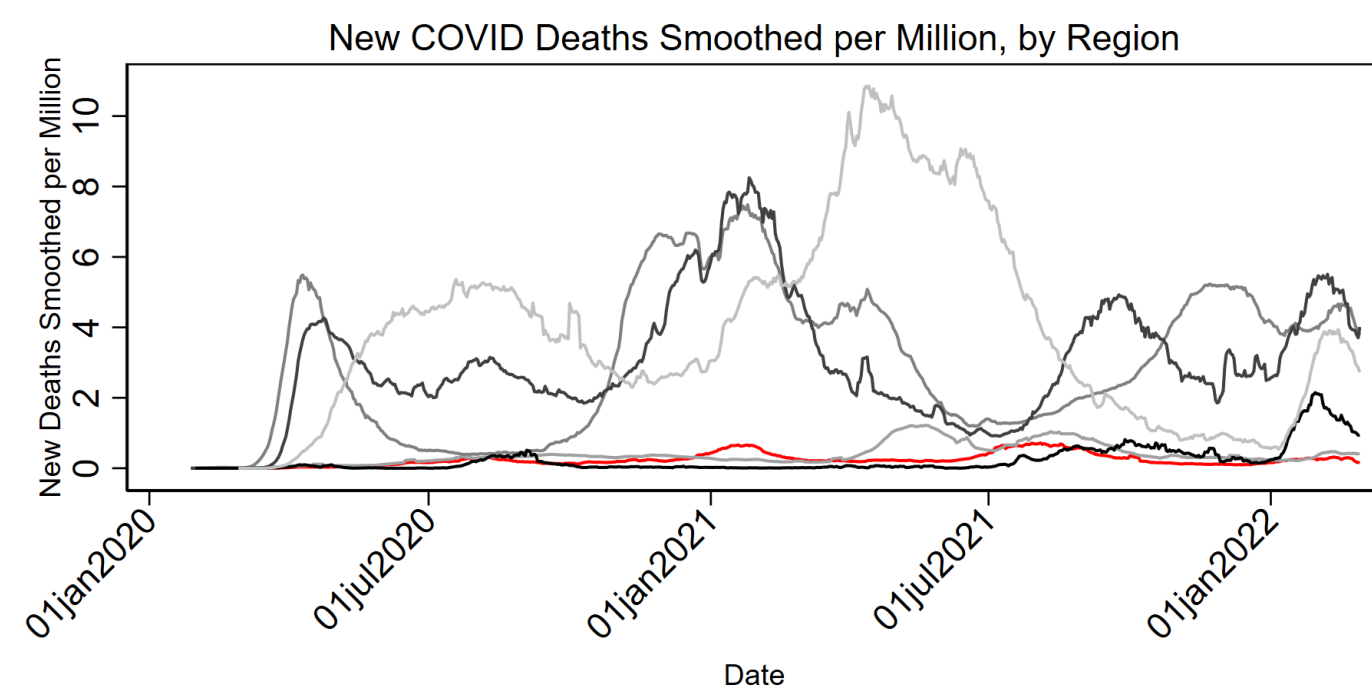


MOTIVATION

- In 2020 global health experts and policymakers warned of an **“African COVID-19 apocalypse.”**
- Widespread COVID-19 transmission projected** throughout the region due to several factors.
- But, worst-case scenarios for African countries have largely **not materialized.**
- Six explanations** proposed for lack of cases and deaths across the region.
- This poster **consolidates** and **evaluates** current research in relation to each explanation and uses publicly available data from Our World In Data to **examine relationships** between theorized predictors and COVID-19 outcomes in the African region.



CONCLUSION

- We find **strong evidence** (+) for undercounted cases and deaths and **mixed evidence** (+/-) for all other explanations.

Full paper, refs here →

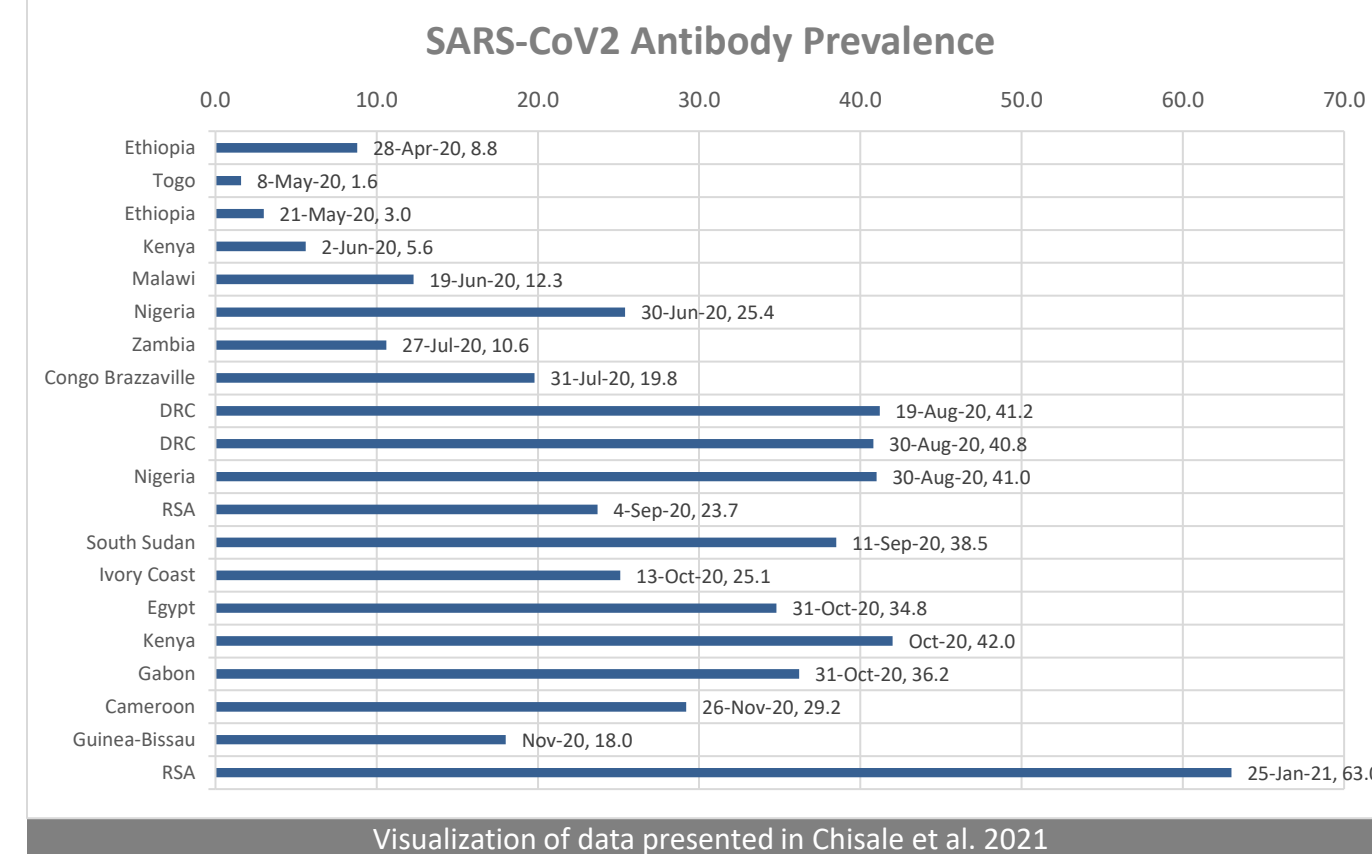
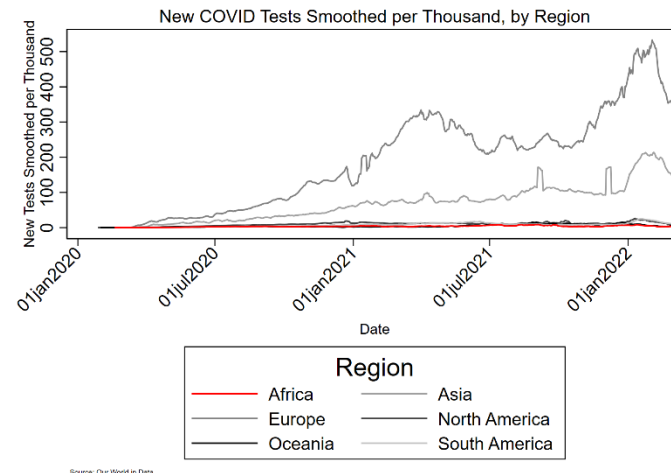


SCAN ME

Undercounted Cases

Exp 1: The true count of cases exceeds official counts.

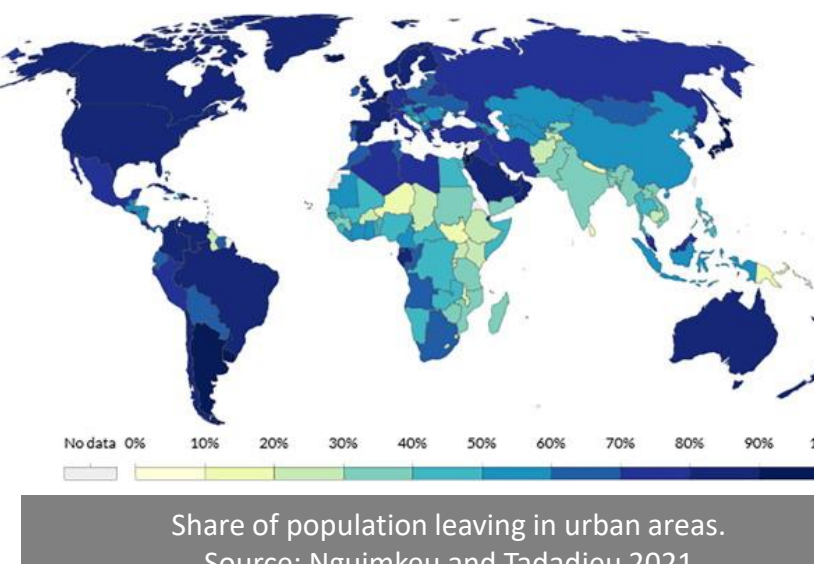
- COVID-19 tests per population remain very low** across the African region.
- Despite scale up of testing capacity, **most countries test fewer than 10 people per 10,000 population.**
- Studies measuring seroprevalence of antiSARS-CoV2 antibodies** from 2020 and 2021 consistently show high population exposure to COVID-19 (Chisale et al. 2021).
- As of September 2021, **SARS-CoV2 antibody prevalence was estimated at 65.1%** [56.3-73.0%] in the African region (Lewis et al. 2022).



Geographic Factors

Exp 4: Variation in population density, distribution, and connectedness limit introduction of COVID-19 and spread from urban centers.

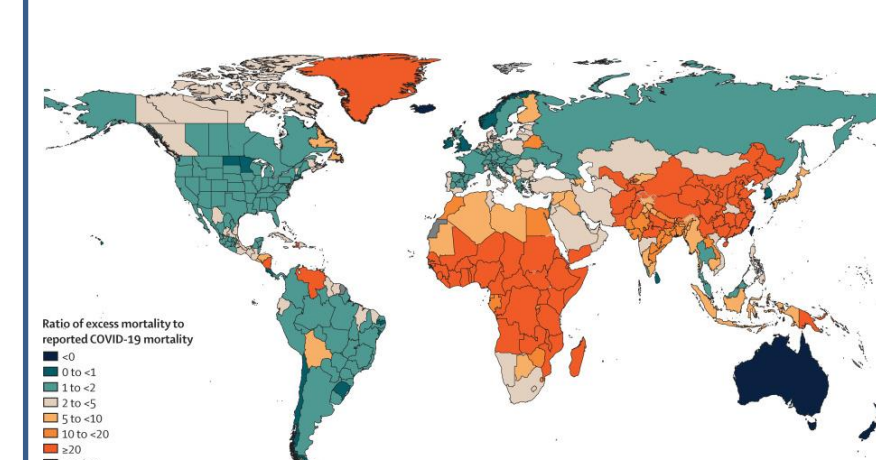
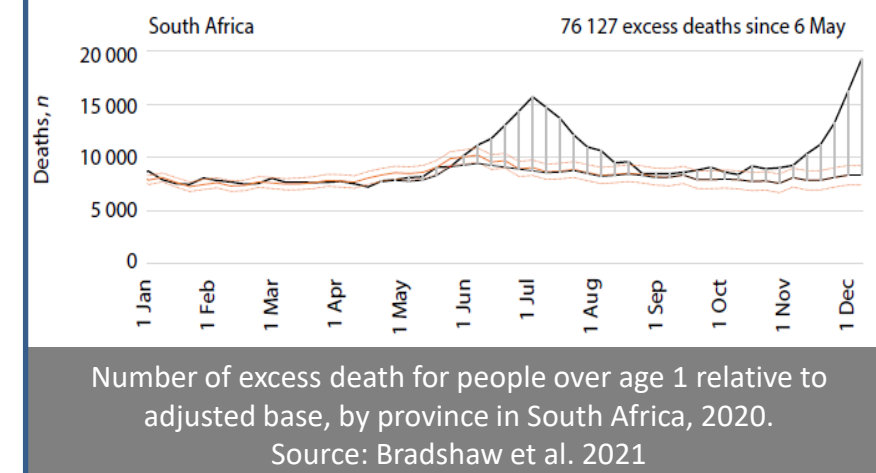
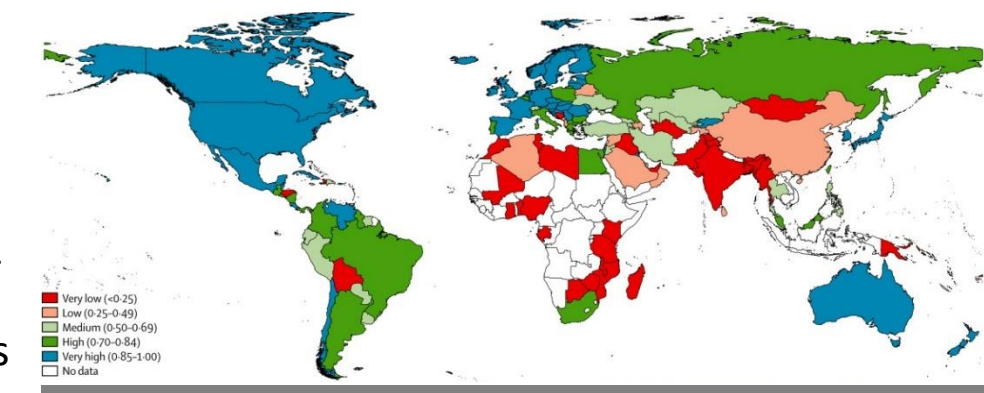
- Dense communities, urban congestions and colder weather may **favor** the transmission of viruses of respiratory viruses.
- African countries are less dense, less urban, and warmer** than countries in other regions.
- Population density, urbanicity, and Jan-March temperature** predicted active COVID cases in 2020 (Nguimkeu & Tadadjeu 2021).
- COVID-19 antibody prevalence is lower in rural areas in Africa (Lewis et al. 2022).
- Protective effect decreases **with pandemic duration** and may even increase risks for isolated communities once exposed (Nguimkeu & Tadadjeu 2021).
- Higher attack rate in rural areas at second wave in South Africa** (Kleynhans et al. 2021).
- 60% of urban population lives in crowded slums** with limited access to clean water, sanitation (UN 2015).



Undercounted Deaths

Exp 2: The true count of deaths exceeds official counts.

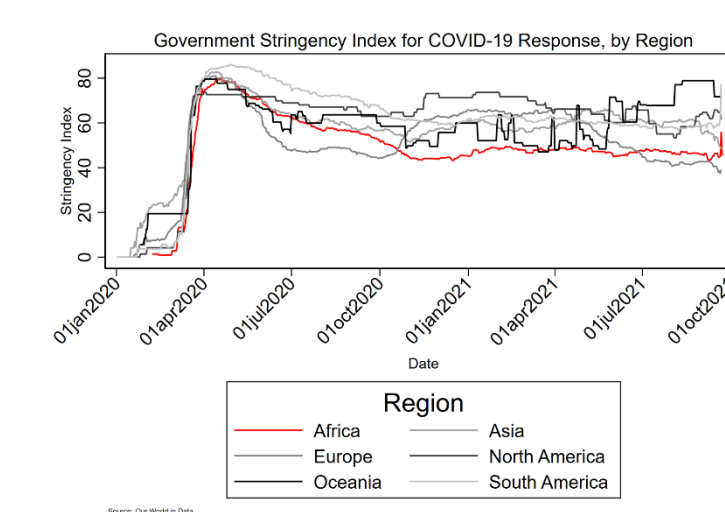
- Mortality data were limited and unreliable** in most African countries pre-pandemic.
- Official estimates of COVID-19 deaths quickly diverged from excess death** estimates in places with better data, like South Africa.
- African hospitals had an additional 11–23 deaths per 100 patients** compared with global average in 2020 (Biccard et al. 2021).
- Sub-Saharan African countries reported 150,000 COVID-19 deaths by Dec 31, 2021. **Estimated excess deaths for same period 2,130,000.**
- The average ratio of estimated excess mortality rate to reported COVID-19 mortality rate is **more than 14:1 for sub-Saharan Africa** and is more than 30:1 in several countries, including Ethiopia, Kenya, Mozambique, and DR Congo. This is **higher than all other regions** (COVID-19 Excess Mortality Collaborators 2022).



Government Response

Exp 5: Swift and strict national responses have limited COVID-19 transmission.

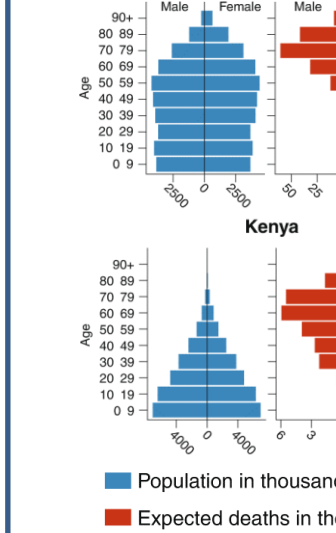
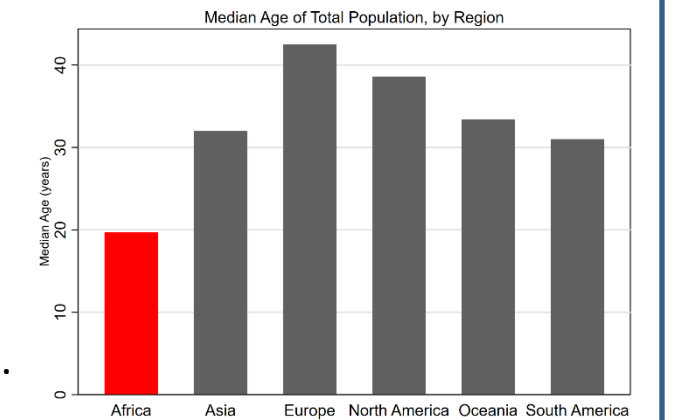
- Early continent-wide leadership**, mobilization, organization.
- Consolidated executive power** to direct action in many contexts.
- Consistent public health messaging.**
- Social welfare** packages implemented quickly in some places (Dafuleya 2020).
- Police/security forces enforced lockdowns** with arrests in several places
 - From March to mid-July 2020, police arrested more than 105,000 people in Zimbabwe for violating COVID-19 regulations.
 - Media reports, human rights reports on police violence against citizens, journalists in Nigeria, Kenya, Zambia, Zimbabwe, Uganda, Namibia.
- At least a few leaders have used COVID-19 as cover to **consolidate power, hoard resources, enact violence** against already marginalized groups.



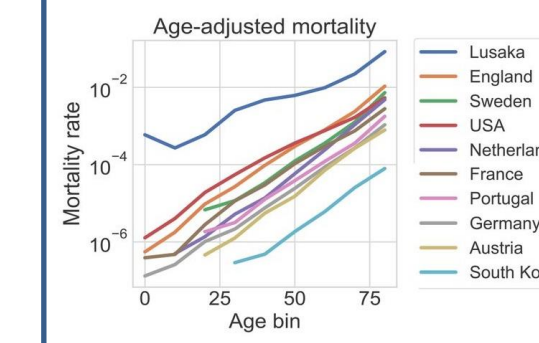
Population Age Structure

Exp 3: Young population age structure limits deaths.

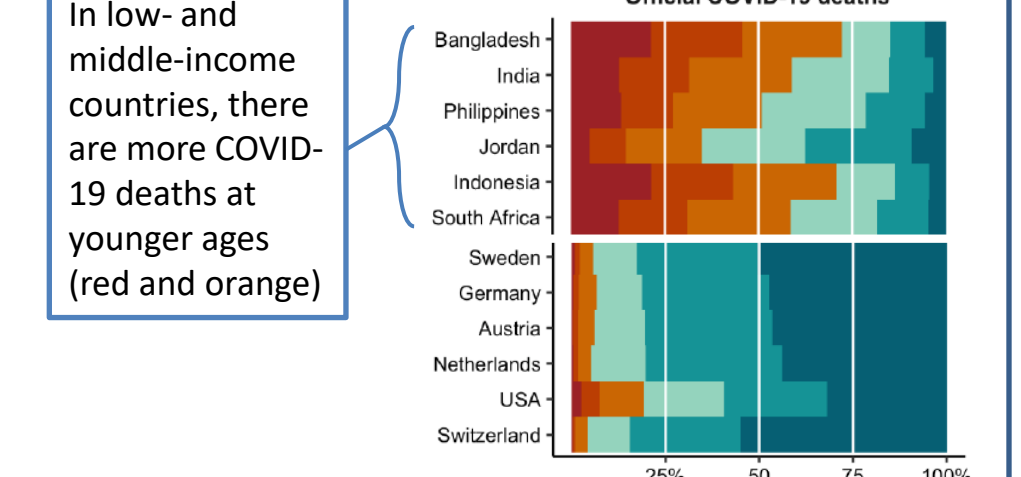
- Older age is a risk factor for severe disease and death from COVID-19.
- The **median age** for sub-Saharan Africa is under 20 years.
- Only 3% of the population in Sub Saharan Africa is over age 65** compared with 16% in the US and 23% in Italy (see Gaye et al. 2020).
- However, recent work suggests that the **age-mortality curve may be flatter** (i.e., there is higher mortality at younger ages) in low- and middle-income countries (Demombynes et al. 2021).
- Age-adjusted mortality is **higher at all ages** in Lusaka, Zambia compared with the USA (Van Gordon et al. 2021).



Population composition and expected COVID-19 deaths in the population. Source: Gaye et al. 2020.



Age-adjusted COVID-19 mortality in Lusaka, Zambia vs others. Source: Van Gordon et al. 2021

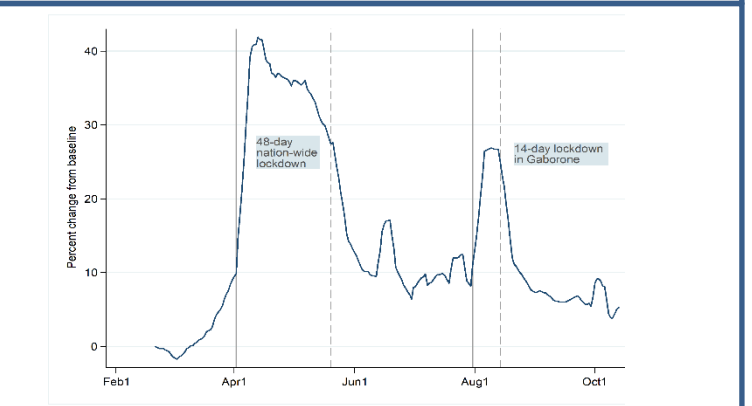


Age Distribution of Official COVID-19 Deaths and Excess Deaths in 2020. Source: Demombynes et al. 2021.

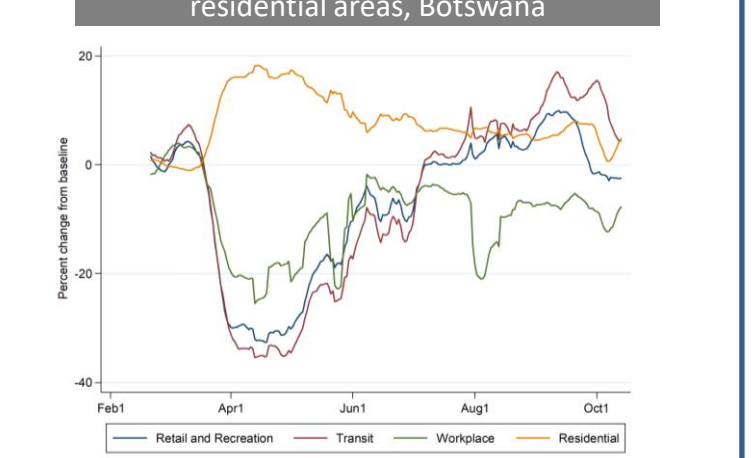
Community Response

Exp 6: Effective responses on the part of African communities have limited the number of cases.

- Time spent at home increased dramatically** during national lockdown in Botswana and in April/May 2020 without lockdown in Cote d'Ivoire (Heitzig 2020).
- Other kinds of mobility also decreased, especially transit and retail.**
- Both retail and transit returned above the baseline from June to Oct 2020.
- Compared to the rest of the world (36 countries), the median sub-Saharan African country (8 countries) returned to baseline+ mobility in retail and transit by August 2020.**
- Many unable to comply with lockdowns, public health measures due to poverty, informal economy, and dense living arrangements.



Percent change in community mobility in residential areas, Botswana.



Percent change in community mobility in residential areas, Cote d'Ivoire. Source: Heitzig 2020.