

COVID-19: Is Southern Africa prepared for Winter?

Most countries today find themselves in a precarious position with the COVID-19 pandemic. Country lockdowns have been put in place in many countries with the hope of slowing down the spread of the virus. As of 6 April, 8,515 confirmed cases have been recorded in Africa, with South Africa reporting the highest number of cases in the southern hemisphere and the incident rate rising rapidly in North Africa.¹ Lockdowns can have adverse implications for current and future economic performance, especially for developing countries. According to a recent research briefing², a lockdown lasting just three weeks and affecting more than half of a country's population can reduce consumption by 3-8 % in a three month period. Countries are faced with decreased productivity and increased unemployment, with the worst affected likely to be small local businesses. The industrial and agricultural sectors in Africa may be negatively affected by delays in delivering of imports essential for their activities due to partially closed borders. Market closures and movement restrictions within country borders also limit market access for farmers. In many African countries, the main agriculture season starts in May/June: if the restrictions continue, farmers will struggle to get access to agricultural inputs such as improved seed and fertilizers, threatening food security in the near future. All these adverse effects put pressure on government to provide financial relief to local businesses and individuals. In developing countries with already strained resources and high unemployment rates, finding ways to minimize the economic costs associated with extended lockdowns is vital, especially taking into account that returning to normal economic activity once the lockdowns are lifted may take time.

Although the pandemic is spreading in Africa, the current number of cases in Africa is low compared to other parts of the world. While encouraging measures are being taken by many African countries, particularly South Africa and Rwanda, it is beneficial to have an idea of what to expect over the coming months, when the traditional influenza that is associated with cold weather arrives in Southern Africa. Some evidence suggests that warmer weather correlates with a slower spread of the coronavirus. It remains unclear whether the warmer temperature in Africa is the one of the reasons behind the slower pandemic. According to the World Health Organization, influenza cases typically increase during the colder seasons in the southern hemisphere and there is evidence that influenza compromises immune systems which can make people more susceptible to contracting COVID-19.³

It is with the many concerning issues in mind that we conducted this brief study. We compiled global data on confirmed cases and deaths resulting from COVID-19 in January to March 2020, and compared these case incidences and death rates to historical average temperatures for March across various countries.⁴ The figure below shows that the most severe outbreaks thus far are clustered in countries where the weather is cold. Countries with historically lower temperatures also had more deaths. For instance, during March, temperatures in the U.S and Italy, who have recorded the highest cases of

¹ John Hopkins University COVID-19 data.

² May, B. (2020). "How lockdowns are strangling the global economy." Research Briefing, Oxford Economics.

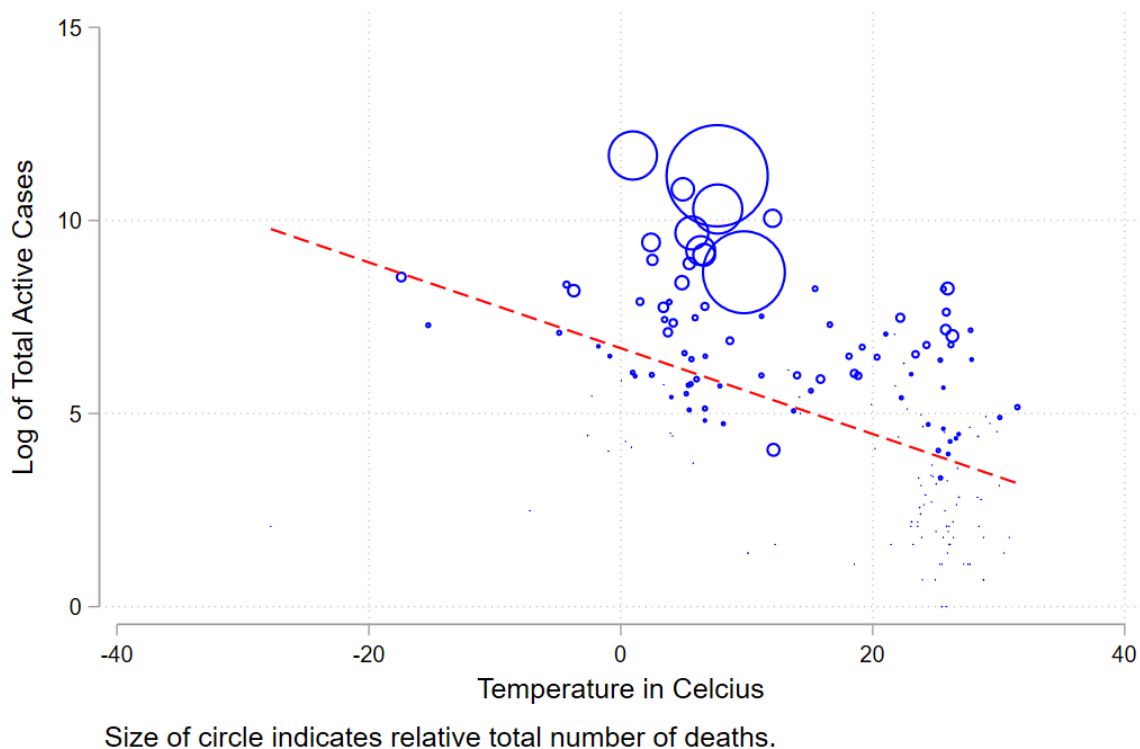
³ FluNet, Global Influenza Surveillance and Response System (GISRS). <https://apps.who.int/flumart/Default?ReportNo=5&Hemisphere=Southern>.

⁴ We also compared to the previous month's average historical temperatures and found similar results.

COVID-19 to date, were averaging 1 and 7 degrees Celsius, respectively. On the other hand, we observe that countries with warmer temperatures are associated with lower cases of COVID-19.⁵

While there are various confounding factors such as population density, wealth of a country and BCG coverage in the correlation, the trend that remains after accounting for those factors is striking: temperature differences predict as much of the variation in infection and death rates as population density, GDP per capita, BCG coverage and rainfall combined. We acknowledge that the data used for the analysis is observational and cross-sectional, and that there may be several confounding issues such as limited testing and under-reporting in many countries in the southern hemisphere. The data covers 108 countries with at least one death from COVID-19. Results are similar when we consider all 172 countries with reported active cases in our data. Our findings support the prediction that warmer temperatures might slow down the spread of virus. Indeed, this is in line with previous related studies. A [study](#) from China, for instance, shows that before government put in place strict containment measures to control the spread of COVID-19, the virus was more contagious in Northern China, where temperatures were relatively low; and less contagious in the warmer cities in the country's Southeast coast.

Figure 1: Temperature and the spread and death rate of COVID-19



These preliminary results should act as a warning to policymakers in the southern hemisphere, where temperatures are already starting to decrease as winter approaches. The cold front in Gauteng last week provided a reminder to South Africans that we are about to enter our colder seasons. The South

⁵ Nigeria reported the first COVID-19 case in February and are currently at 194 cases as of 5 April 2020 (John Hopkins University COVID-19 data), suggesting a slower rate of transmission rate during this period when the average temperature was 27 degrees Celsius in the country.

African government's initial response to the COVID-19 pandemic has been swift and decisive: Lockdown started earlier than in many countries, and government is rolling out an extensive testing and contact tracing plan. Now the momentum needs to be maintained: Healthcare facilities should be equipped with additional beds, ventilators and necessary protective gear; and we have to continue our efforts to raise public awareness on appropriate behaviours and the use of personal protective equipment. If the worst is yet to come, we need to use the time we have to be prepared.

Authors:

Dr Carolyn Chisadza, Senior Lecturer, University of Pretoria, Economics Department

Dr Matthew Clance, Senior Lecturer, University of Pretoria, Economics Department

Dr Nicky Nicholls, Senior Lecturer, University of Pretoria, Economics Department

Dr Eleni Yitbarek, Senior Lecturer, University of Pretoria, Economics Department