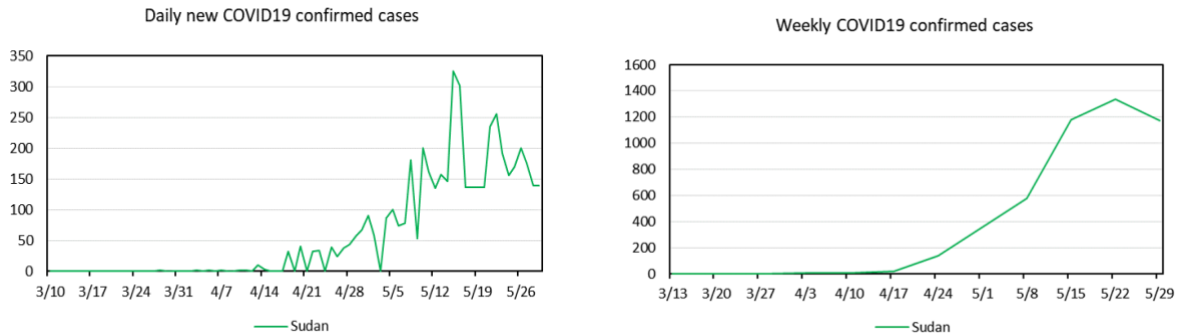


Simple Analysis of COVID-19 Numbers in Sudan-UPDATE

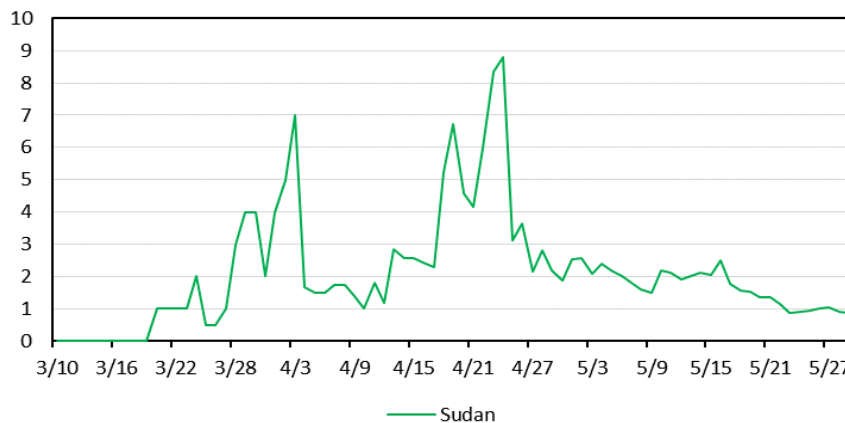
(May 30th, 2020) Elfatih ELTAHIR

Dynamics of COVID-19 Transmission (ASSUMING CONFIRMED CASES NUMBERS ARE REPRESENTATIVE):

The dynamics of disease transmission follows a geometric progression pattern. Viral infection works to propagate the spread of the disease such that each of the existing cases reproduces (infects) multiple new cases denoted by R_0 . The magnitude of the parameter R_0 is controlled by how strictly the public follows the mitigation measures (curfew, masks, social distancing, hygiene, etc). If $R_0 > 1$, disease transmission accelerates. If $R_0 = 1$, then disease transmission rate is stable. If mitigation measures succeed in reducing R_0 to < 1 , then disease transmission decelerates. Estimates of R_0 are used by British health authorities in sharing information with the public.



Proxy for R_0 over Sudan



In the above figure, a proxy measure of R_0 is estimated by the ratio of weekly cases to number of cases in the preceding week. This is a simple but approximate measure, not following rigorous definition of the variable.

On April 18th, a curfew was introduced in Khartoum state. Starting about April 24th, the proxy R_0 started declining, first dropping significantly then declining slowly. Since middle of May, the confirmed cases rate stabilized, and the estimate of proxy R_0 has been around 1 for the last week. This is good news indicating that mitigation measures are working. However, at this level of R_0 , the disease transmission would be steady at the recently observed high rate. In order to control the disease further, and start reducing the rate of confirmed cases, the ongoing mitigation measures will need to be maintained and strengthened for at least 4 more weeks.

Innovative approaches are needed in order to sustain mitigation efforts, while accommodating important economic considerations. In particular, recent evidence suggests an important role for wearing masks in limiting the disease transmission. If everyone wears a mask, and keeps a distance of 2 meters from others, this action in itself may cut the transmission rate by up to 50%. A broad information campaign encouraging all Sudanese to rap their (clean *imma*, *toupa*, or *tarha*) around their nose and mouth, while maintaining other social distancing measures, seems sensible and sustainable, and may prove effective.