1163-92-1689 Calistus Ngonghala*. The impact of non-pharmaceutical interventions on COVID-19.

The novel coronavirus (COVID-19), which emerged from China in December 2019 continues to cause devastating public health and socio-economic impact in many parts of the world. In the absence of a safe and effective treatment or vaccine against the virus, non-pharmaceutical interventions (NPIs) are the main tools for controlling and mitigating the burden of the pandemic. We develop and use mathematical models to assess the impact of NPIs such as social distancing, lockdown measures, face-mask use in public, case detection, etc., on the burden of the pandemic in some US states and the entire US. Our results show that pre-symptomatic and asymptomatic humans are the main drivers of the pandemic in the US, thereby emphasizing the need for random testing and contact tracing. Also, our results indicate that a) early lifting of strict lockdown measures could trig- ger a devastating second COVID-19 wave, while extending the lockdown period by a short time, e.g., two weeks, would have suppressed the devastating post-lockdown resurgence in the US; b) wide-scale use of face masks in public could halt the post-lockdown resurgence of COVID-19 in the US; and c) implementing lockdown and mask-use measures two weeks earlier would have prevented the pandemic from taking off significantly in the US. Thus, the study suggests that, like other past Coronavirus outbreaks, COVID-19 might be controllable using basic non-pharmaceutical interventions. (Received September 21, 2020)