



2nd APRIL 2020

DAILY UPDATE ON GLOBAL AND NATIONAL DEVELOPMENTS ON COVID-19

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Summary

- Structural features of SARS-CoV-2 that might explain why COVID 19 is more infectious than SARs
- Stronger evidence on pre-symptomatic transmission from Singapore
- 937,100 cases and 47,200 deaths (5.0%) globally
- 5,786 cases with 196 deaths (3.4%) reported from 49 affected countries on April 01, 2020
- In Ethiopia, 29 confirmed cases with 0 deaths reported.
- 176 molecular assay tests commercialised and 35 tests under development
- Testing facilities expanded in Ethiopia
- Hydroxychloroquine sulphate & chloroquine phosphate received FDA emergency use authorisation
- UK has established expert panel to assess if wearing face masks by more people can control spread of COVID-19
- Mental wellbeing among patients with COVID-19, the public and healthcare professionals deserves attention

Update on Pathogenesis

- The previous SARS-CoV virus which is responsible for SARS disease in 2003 and the current COVID-19 (SARS-CoV-2) are recognized to have the same receptor - human ACE2 (hACE2). A recent study which compared the SARS-CoV and SARS-CoV-2 Receptor Binding Domain (RBD) revealed that a hACE2-binding ridge in SARS-CoV-2 RBD takes a more compact conformation; moreover, several residue changes in SARSCoV-2 RBD stabilize two virus-binding hotspots at the RBD/hACE2 interface. Therefore, these structural features of SARS-CoV-2 RBD enhance its hACE2-binding affinity and this might be the possible explanation why COVID 19 is more infectious than SARs (Shang J, 2020)

Disease Transmission

- Presymptomatic transmission is defined as the transmission of SARS-CoV-2 from an infected person (source patient) to a secondary patient before the source patient developed symptoms, as ascertained by exposure and symptom onset dates, with no evidence that the secondary patient had been exposed to anyone else with COVID-19. Previous reports of individual cases in China indicated the

occurrence of presymptomatic transmission of SARS-CoV-2. Similarly, a recent study done among 243 COVID-19 cases in Singapore identified seven clusters of cases in which pre-symptomatic transmission is the most likely explanation for the occurrence of secondary cases after clinical and epidemiological histories were examined including symptoms before, during, and after the first positive SARS-CoV-2 test (Wycliffe E, 2020).

Update on Epidemiology (Incidence, mortality, recovery & epidemiologic parameters)

Global

- Approximately one million (937,100) people are affected with COVID 19 which are reported from 203 countries worldwide. The pandemic also caused a total of 47,266 deaths as of April 2, 2020.
- Within 24 hours, 76, 836 new cases and 4,883 new deaths were reported and the graph shows a daily increment in the total number of new cases and deaths in the globe.
- Nearly one fourth 215,003 (22.3%) of the total cases were reported from the United States of America (USA) with 26,473 new cases on April 1, 2020. The country also reported the highest number of deaths (1049) occurred within 24 hrs.
- Next to USA, Italy (110,574), Spain (102,179) and China (82,394) took the second, third and fourth rank in terms of total number of cases worldwide.
- The highest number of deaths occurred in Italy which accounted for 13,155 (27.9%) of total deaths reported in the globe.
- The Case Fatality Rate (CFR) of COVID-19 showed slight increment in Germany (0.6% to 1.1%) and USA (1.4% to 2.2%) but still lower as compared to Italy, Spain and France.

Africa

- In Africa, a total of 5,786 confirmed cases and 196 deaths were reported as of April 1, 2020.
- The percentage of recoveries 412 (67.8%) is lower as compared to the world figure which is reported to be 195,143 (81%).
- Currently 49 countries are affected and South Africa has the largest number of cases (1353) in the continent. Algeria (716) become the second most affected

country with a total of 716 cases. Egypt (710), Morocco (602), Tunisia (394) and Burkina Faso (261) are other African countries with high number of cases.

- Egypt has the highest CFR (6.5%) followed by Algeria (6.1%), Morocco (5.98%) and Burkina Faso (5.4%).

Ethiopia

- Currently, there are 29 confirmed cases, 0 deaths and 2 total recovery. Out of the total cases, 23 were mild cases and 2 serious/ critical cases who are under medical treatment in the designated treatment center. The rest two cases were transported to their country.
- In addition to Addis Ababa, the disease is also distributed to Adama, Bahir Dar and Dire Dawa.

Update on Diagnosis

- According to FIND diagnostics, as of 2nd April 2020 [10:00am, East Africa time], there are 176 molecular assay tests commercialized and 35 tests under development for COVID-19(FIND, 2020).
- On 31st March 2020, news that a company called Bodysphere announced that it had received FDA emergency use authorization (EUA) and that they had begun distributing its 2-minute testing kit for diagnosing COVID-19 surfaced on news outlets like the New York Times(Reuters, 2020), Mass Device(Sean W, 2020) and Axios. However, the company Bodysphere is not listed under FDA webpage announcing EUA(Food and Drug Administration, 2020). Axios one of the sites who posted the news deleted the story and posted a correction that the FDA did not approve 2- minute corona virus test (Axios, 2020).
- The Ethiopia Ministry of Health announced, on 31st March 2020, Armauer Hansen Research Institute and National Animal Health Diagnosis & Investigation Centre received two RT-PCR COVID-19 testing machines each and there is a plan to conduct 400 tests per day.

Update on Treatment

- On March 28, 2020, FDA issued an Emergency Use Authorization (EUA) to allow Hydroxychloroquine Sulphate and Chloroquine Phosphate products donated to the Strategic National Stockpile (SNS) to be distributed and used for certain hospitalized patients with COVID-19. These drugs will be distributed from the SNS

to states for doctors to prescribe to adolescent and adult patients hospitalized with COVID-19, as appropriate.

- The EUA requires that fact sheets that provide important information about using chloroquine phosphate and hydroxychloroquine sulphate in treating COVID-19 be made available to health care providers and patients, including the known risks and drug interactions (US FDA, 2020).
- Consequently, it was reported that Both hydroxychloroquine and chloroquine reported to be "in shortage" by the US FDA due to a significant surge in demand (GANDER K, The News Week 2020).

Update on Vaccine

- BCG vaccination has been shown to produce broad protection against viral infections and sepsis. According to a study that compared large number of countries BCG vaccination policies with the morbidity and mortality for COVID-19, countries without universal policies of BCG vaccination (Italy, Netherland, USA) were found to be severely affected as compared to countries with universal and long-standing BCG policies. Countries that have a late start of universal BCG policy (Iran, 1984) had high mortality, consistent with the idea that BCG protects the vaccinated elderly population (Miller A, 2020).

Update on Personal protective equipment

- A case report published on 31st March 2020, shows cluster outbreak caused by public transportation exposure when one patient with COVID-19 from Chongqing, China, didn't wear a face mask in the first vehicle and wore a face mask in the second vehicle. The result showed people contracted the virus infected in the first vehicle and no one got infected in the second vehicle (Liu X, 2020).
- An expert panel has been established in the UK to assess if wearing face masks by more people would help slow the spread of coronavirus. The group is set to weigh up research on whether the virus can be projected further than previously thought. The panel chair reportedly indicated that the new research may lead to a shift in advice about masks (David S, 2020).
- The FDA issued an EUA approving a process that would clean much-needed N95 protective face masks and allow them to be reused, to prevent exposure to pathogenic biological airborne particulates when there are insufficient supplies of

filtering facepiece respirators (FFRs) during the COVID-19 pandemic. The approval was granted to Battelle Memorial Institute, based on Columbus-Ohio, to use a "vapor phase hydrogen peroxide" process to decontaminate the masks being used by healthcare providers and others to protect against the spread of COVID-19 (Food and Drug Administration, 2020). There is evidence showing the use of hydrogen peroxide vapor has high virucidal activity for N95 respirators inoculated with aerosolized virus and its use may ease shortages (Kenney P, 2020).

Update on Psychosocial wellbeing

- Psychiatric symptoms, depression and anxiety are known to increase after infections. There is anticipation that COVID-19 will have "rippling effects" on mental health. (<https://www.psychiatristimes.com/psychiatrists-beware-impact-coronavirus-pandemics-mental-health>)
- The Psychiatric Times also notes that "It's easy to blame, it's easy to politicise, it's harder to tackle a problem together and find solutions together". The president of Ethiopia and the WHO have emphasised the need for togetherness.
- Some degree of anxiety and fear is unavoidable; it is healthy; it is protective; it makes us prepare. "The right amount of fear right now is more liable to push us toward necessary action and creative solutions..." (<https://www.psychiatristimes.com/article/covid-19-pandemic-dont-panic>)
- But it is important to make sure that people have the right information to prepare. It is also important to help people manage excessive anxiety and fear. Children are particularly vulnerable. Effective communication is helpful. Parents, in an effort to protect their children, should not avoid talking about the emotion and concerns of their children (<https://www.thelancet.com/action/showPdf?pii=S2352-4642%2820%2930097-3>). Social distancing and isolation for weeks are also likely to affect mental health.

Recommendations

- Stronger evidence on transmission by asymptomatic individuals means it is essential to strengthen the public action towards self- and communal protection
- The recommendation on face masks seems fluid. There is a need for a vigilant monitoring of recommendations on face masks. It will also be necessary to check the quality of locally made face masks.

- The current recommendation on hydroxychloroquine seems to have affected availability in the US. It is therefore important to monitor supply
- It is worth considering clinical trials on chloroquine given the potential toxicity on critically sick patients and implications for control of malaria (particularly vivax)
- Studies on mental health consequences of COVID-19 on affected patients and the public are warranted. Initiatives to address the mental health needs of patients, the public and healthcare professionals have to be encouraged.

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