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DAILY UPDATE ON GLOBAL AND NATIONAL DEVELOPMENTS ON COVID-19

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Summary

- Globally, as of 7.00 GMT, 06 April 2020, 1,275,265 confirmed cases, 69,501 deaths and 264,833 recoveries have occurred.
- Many epidemiological and mathematical models predict that the virus will not be contained, and even up to 70% of the world might be infected.
- But this is being challenged by some epidemiologists who believe that the maximum infection rate will be below 20% by considering the existing public health interventions.
- A total of 8,736 confirmed cases, 399 deaths, and 747 recoveries were reported from Africa.
- Medical students from Germany have used an interesting initiative called Corona Taxi. This is believed to have contributed to the lower mortality rate in Germany.
- Interest is growing in antibody test and many companies are working to develop the tests.
- Antibody testing is multipurpose: it can verify that vaccines are working as intended during clinical trials, or be used in contact tracing weeks or longer after a suspected infection.
- Ivermectin has been found to have antiviral action against the SARS-CoV-2 clinical isolate in vitro, with a single dose able to control viral replication within 24-48 hours.
- Convalescent plasma (CP) and hyperimmune globulin are the two antibody-rich blood products derived from human blood that the FDA is taking the lead on investigating.
- Control measures should uniquely consider the potential predisposition of low-income household of the population to complications secondary to the pandemic
- Recommendation of WHO has not been changed against wearing face masks although CDC's new guidance recommends people should wear cloth face coverings.

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

Global

- According to Worldometer, there are currently 1,275,265 confirmed cases, 69,501 deaths and 264,833 recoveries as of April 06, 7:00 GMT.
- More than one fourth [336, 851(26.4%)] of the total cases were reported from the United States of America. Spain (131,646), Italy (128,948), Germany (100,123), France (92,839) and China (82,641) continue to lead the count.
- Many epidemiological and mathematical models predict that the virus will not be contained, and even up to 70% of the world might be infected. However, few epidemiologists are challenging this projection by referencing the diamond princess cruise ship statistics which reported only 21% developed coronavirus under the most perfect conditions for infection spread. Therefore, their argument is the maximum infection rate will be below 20% by considering the existing public health interventions. In addition, the New York Times presented a set of data examining new cases by day of coronavirus in different countries across the world. The graphs suggest that almost all countries are having consistent pattern. Based on this, they make the argument that all countries will go the same route as China and Korea--a few cases initially, a spike in cases a few days later, and then a rapid decline (Lai KKR, 2020).
- Even though the pattern of the pandemic should be observed for an extended duration of time, their argument appears to be correct according to worldometer daily update. In the last 24 hours, a total of 71,418 new cases were reported worldwide. This number is slightly declining as compared to total number of cases reported on April 04 (82,821) and April 03 (101,566). Countries which are severely affected by the virus including USA, Spain, Germany and France are reporting lower number of new cases in the past few

days suggesting that the curve is steadily flattening. Similarly, the total number of new deaths that occurred on April 05 (4,737 new deaths) is significantly reduced as compared to April 04 report (5,799 new deaths).

- Nearly 10,000 people have died from coronavirus in USA and the country also reported the highest number of deaths (1,165) that occurred in a single day.
- Two third 46,224 (66.5%) of the total deaths that occurred in the world were reported from Italy (15,887), Spain (12,641), USA (9,618) and France (8,078).
- The mortality rate in Germany has been remarkably low compared to those neighbouring countries. So far, only 1,584 people have died from coronavirus in the country.
- The New York Times April 05 report described about one of the effective methods Germany's used in order to reduce the mortality rate. It's called Corona Taxi- medical students outfitted in protective gear (Bennhold K, 2020).
 - They are driving around to check on patients who are at home, five or six days into being sick with the coronavirus.
 - They take a blood test, looking for signs that a patient is about to go into a steep decline.
 - They might suggest hospitalization.

Africa

- As of April 05, 5:00 PM EAT, a total of 8,736 confirmed cases, 399 deaths, and 747 recoveries were reported.
- Currently 51 countries are affected and South Africa is still the first leading country with a total of 1,655 cases and 11 deaths.
- Algeria became the second most affected country with 1,320 cases and 152 deaths followed by Egypt (1,173), Morocco (1,021), Cameroon (650) and Tunisia (574).
- Like other western countries, the number of new cases is also declining in most of African countries that have been reporting large numbers of case: South Africa (80 to 70), Algeria (80 to 69), Morocco (128 to 102) and Tunisia (58 to 21). But it's slightly

increasing in Egypt (85 to 103) and Cameroon (46 to 95) based on Worldometer daily update.

- The highest number of deaths occurred in Algeria (152), Egypt (78) and Morocco (70) which accounted for three fourth of the total deaths reported in the continent.

Ethiopia

- According to the Ministry of Health description, Ethiopia reported the first coronavirus death; a 60 years old woman and 56 years old male Ethiopian patients who were admitted in the Intensive Care Unit for the last couple of days have passed away yesterday April 5, 2020.
- As of April 06, 1:00 PM EAT, no additional confirmed cases were reported and currently, there are 43 corona cases, 2 deaths and 4 recoveries in the country.
- Out of the total active cases, 34 of them are mild cases and 1 serious/ critical cases who are under medical treatment in the designated treatment center. Two of the cases returned back to their home country.

Update on Diagnosis

- According to FIND diagnostics, as of 6th April 2020 [10:50am, East Africa time], there are 182 molecular assay tests commercialized and 35 tests under development for COVID-19. Also, there are, 158 immunoassay tests commercialized and 46 tests under development (FIND, 2020).
- PCR tests detecting viral RNA, indicating current viral infection, are being used to diagnose cases of COVID-19 and are an essential part of contact tracing and testing. However, there are global supply challenges, with huge demand for the PCR primers, as well as for the positive controls needed to ensure the performance of individual machines. A report on the lancet indicates that in contrast to PCR tests, the technology behind antibody tests is fundamentally distinct and generally harder to get right. Antibody tests are different because they require some knowledge of the proteins that form the viral coat, specifically, those proteins to which the immune system responds, triggering the production of antibodies that flag or neutralise the virus. Those sections of the viral protein coat must then be produced in the laboratory, using cell lines, for inclusion in an immunoassay (eg,

ELISA) that detects whether antibodies are present. Such immunoassays will form the basis of home testing kits for people who think they have had COVID-19. But their development takes time. It is noted expressing the protein in the right structure is often the most difficult step. The report also mentions the questions being raised about which antigens (proteins) are best for this purpose since there is a lot hanging on the uniqueness of the spike protein. In terms of the specificity of serological tests in which it is used, the more unique it is, the lower the odds of cross reactivity with other coronaviruses false positives resulting from immunity to other coronaviruses. The most similar of these is severe acute respiratory syndrome coronavirus (SARS-CoV), which led to the SARS outbreak of 2002. But another four coronaviruses cause the common cold, and ensuring there is no cross-reactivity to these is essential (Petherick A, 2020).

- The evidence on antibody tests are also emerging:
- A study conducted in Chongqing, China, surveyed a cohort of 164 close contacts and identified 4.3% (7/164) patients with occult infection which were missed by symptoms screening and nucleic acid test. This indicates serologic test is helpful for the diagnosis of SARS-CoV-2 infection in suspects and close contacts (Long Q-x, 2020).

Update on Treatment

- Ivermectin inhibits the replication of SARS-CoV-2 in vitro: Ivermectin is an FDA approved broad spectrum anti-parasitic agent. Ivermectin has antiviral action against the SARS-CoV-2 clinical isolate in vitro, with a single dose able to control viral replication within 24-48 hours. Researchers hypothesize that this is likely through inhibiting IMP α / β 1-mediated nuclear import of viral protein in to the human cell. The study showed that a single treatment was able to effect ~5000-fold reduction in virus at 48h in cell culture. However, in dengue patients in Thailand, in which a single daily dose was found to be safe but did not produce any clinical benefit. However, the investigators noted that an improved dosing regimen might be developed, based on pharmacokinetic data. Although DENV is different to SARS-CoV-2, this trial design should inform future work going forward. Altogether the current report, combined with a known-safety profile, demonstrates that ivermectin is worthy of further consideration as a possible SARS-CoV-2 antiviral (Caly L, 2020).

- As part of the response to COVID 19 pandemic, FDA is taking the lead on the effort to facilitate the development of, and access to, two investigational therapies derived from human blood: convalescent plasma (CP) and hyperimmune globulin and are antibody-rich blood products made from blood donated by people who have recovered from the virus. Based on prior experience with respiratory viruses and on what emerged from China, these products have the potential to lessen the severity or shorten the length of illness caused by COVID-19. There was a pilot study that tested the feasibility of CP transfusion to rescue severely ill patients. The results from 10 severe adult cases showed that one dose (200 mL) of CP was well tolerated and could significantly increase or maintain the neutralizing antibodies at a high level, leading to disappearance of the virus from the blood within 7 days. Meanwhile, clinical symptoms and paraclinical criteria rapidly improved within 3 days. Radiological examination showed varying degrees of absorption of lung lesions within 7 days. These results indicate that CP can serve as a promising rescue option for severe COVID-19 while the randomized trial is warranted. People who have fully recovered from COVID-19 for at least two weeks are encouraged to consider donating plasma, which could potentially help save the lives of up to four patients. Moreover, in order to donate blood for CP the disease recovery should be taken under consideration since study showed that the level of specific neutralizing antibody to SARS-CoV decreased gradually 4 months after the disease process, reaching undetectable levels in 25.6% (IgG) and 16.1% (neutralizing antibodies) of patients at 36 months after disease status. The FDA is facilitating access to CP for treating COVID-19 using multiple pathways. One method is by facilitating access to convalescent plasma through an emergency investigational new drug application (IND) process. The FDA has provided information to help health care providers submit these applications to treat individual patients. The agency is also facilitating the conduct of well-controlled clinical trials at academic institutions to rigorously evaluate the safety and efficacy of convalescent plasma (Coronavirus (COVID-19) Update, 2020, Duan K, 2020, and Mayo Clinic, 2020)

Public health control measures

- Once more the poor will be disproportionately affected by COVID-19 as well. Mapping segments of the population whose livelihood will be affected the

most by the control measures is also important to provide livelihood support as the need arises. These economic interventions could add to the effectiveness of the control measures (Ahmed F, 2020).

- Chronic infectious diseases such as TB, HIV/AIDS and malnutrition are prevalent among marginalised population groups in the developing world. Though we don't have conclusive findings, so far people with underlying diseases were prone to complications and death secondary to COVID-19. Therefore, control measures should uniquely consider the potential predisposition of this group of the population to complications secondary to the pandemic (Ahmed F, 2020).
- Sub-optimal health literacy and awareness is the other characteristic of a poor and marginalized population group. The disproportionately high prevalence of preventable diseases among this group is a sign of inadequate awareness among other determinants. Health information dissemination efforts should be inclusive of this segment of the population. Unique approaches tailored to the needs of low income and marginalized groups should be developed not to leave anyone behind in the effort to raise the community's awareness about COVID-19 (Ahmed F, 2020).

Update on Personal protective equipment

Facemask use

- To date, WHO has not changed its recommendation against wearing face masks although CDC's new guidance recommends people should wear cloth face coverings.
- The following studies on cloth masks are in addition to the evidence presented in the previous updates:
 - Researchers have compared the effectiveness of 44 masks, including N95 equivalent respirators, surgical and dental masks, general cotton masks, and handkerchiefs. Particle penetration tests similar to those used by NIOSH and the European Union were

used. They found that the N95 equivalent mask blocked more than 95% of all particles, as expected. The surgical mask was around 40% effective, with the dental masks coming in at around 60%. Cotton masks were around 30% effective and cotton handkerchiefs ranged from 2% (one layer) to 13% (four layers) (Jung H, 2014).

- A study done in 2010 compared masks made of different types of fabrics. The results showed that masks made from t-shirts blocked about 10% of particles in a wide range, masks made from sweatshirt fabric blocked 20 to 40%, masks made from towels blocked around 40%, and scarves blocked 10 to 20% (Rengasamy S, 2020).

Psychosocial wellbeing of health professionals during COVID 19 outbreak

- World economic forum has published an article entitled "Managing mental health during COVID 19: experts' insight"
 1. Knowing the right source of information is helpful to reduce fear
 2. Try to differentiate which emotions are yours and your patient's
 3. Think about mental health as part of public health response
 4. Pre-existing mental health conditions may be aggravated by social isolation
 5. Shift the narrative from number of death's to number of recoveries

Recommendations

- Despite the reduction in the numbers globally and in Africa, the models so far provide conflicting information. It is appropriate to prepare for the worst.
- Effectiveness of various face coverings is hugely divergent, from as low as 2% for a one-layer handkerchiefs to over 95% for N95 masks. Any recommendation for a universal face covering has to provide detailed guidance on what works and what does not.
- Evidence is also needed on the effectiveness of home-made masks.
 - As indicated in our update yesterday, there are sufficient justifications for recommending the use of face coverings if they are applied appropriately.

- It is not too soon to consider collecting convalescence plasma from recovered volunteers. These could be used on a compassionate basis for critically ill patients until robust contextual evidence is collected.
- There is a need for creative ways of targeting low income households---mobilising some social funds combined with awareness raising measures.
- Any new data on ivermectin would offer another treatment option and should be looked for actively.
- There are lessons to be drawn from the German "corona taxi". Serious thought has to be given on how this may be adapted.

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