Update: May 23-25, 2020

UPDATE ON GLOBAL REGIONAL AND NATIONAL DEVELOPMENTS ON COVID-19

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Summary

- As of May 25, 13:00 GM, 5,529,098 cases and 347,163 deaths have been reported globally.
- Reported number of new cases has been decreasing in the past three days.
- Africa reported, a total of 111,348 cases, 3,348 deaths as of May 25 4:00 PM EAT.
- A prospective study conducted with relatively large sample size (20,133) supported previous evidence regarding risk factors such as age, being male, comorbid conditions and obesity.
- Challenges with antibody testing kits has continued.
- The largest study so far conducted on people taking chloroquine and hydroxychloroquine (n=96.032) has found higher mortality and de-novo ventricular arrythmia among patients who have taken these drugs.
- The WHO just announced it has halted the hydroxychloroquine arm of the Solidarity clinical trial.
- A Phase I clinical trial conducted in china to assess the safety, tolerability, and immunogenicity of a recombinant adenovirus type-5 (Ad5) vectored COVID-19 vaccine has found satisfactory safety profile within 28 days post-vaccination. However, protection from the specific antibodies or T cells induced is not determined.
- It was noted that most cloth masks reduce droplet and aerosol transmission and may be effective in reducing contamination of the environment by any virus, including SARS-CoV-2 but no direct evidence is available.

Recommendations

- It is important to reconsider the use of chloroquine and hydroxychloroquine on compassionate grounds or in routine care. With the current evidence, it is not possible to justify use of these drugs
- In line with the WHO recommendation, planned trials that use either chloroquine or hydroxychloroquine have to be halted until further guidance.

Update on pathogenesis

Risk factors

- Previous smaller scale epidemiological studies identified several risk factors for hospital admission and poor prognosis of COVID-19. A larger scale prospective study conducted among 20,133 COVID-19 cases who were diagnosed and treated in 208 acute care

hospitals in England, Wales, and Scotland between 6 February and 19 April 2020 has confirmed the previously identified risk factors.

- The median age of patients admitted to hospital with COVID-19, or with a diagnosis of COVID-19 was 73 years suggesting that increasing age is a risk factor for hospital admission and mortality from COVID-19.
- More men were admitted than women (men 60%; women 40%)
- The commonest comorbidities were chronic cardiac disease (31%), uncomplicated diabetes (21%), non-asthmatic chronic pulmonary disease (18%), and chronic kidney disease (16%) and only (23%) had no reported major comorbidity.
- Obesity is a major additional risk factor for hospital admission and mortality.

- Overall, 41% of patients were discharged alive, over a quarter (26%) of inpatients had died at the time of reporting, and nearly a third (34%) remained in hospital [Docherty, A. 2020].

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

Global

- As of May 25, 13:00 GMT, 5,529,098 cases and 347,163 deaths were reported globally.
- The number of new cases is persistently declining in the last three consecutive days; from 107,521 new cases on May 22nd to 96,505 on May 24th. Similarly, the number of new deaths significantly decreased from 5,252 to 2,826 deaths on May 24th.
- The United States of America (USA) continues to be by far the leading country with both high number of cases and deaths in the world. As of May 25, 13:00 GMT, more than 1.6 million (1,688,290) people were infected with the virus and 99,348 deaths were reported in the country accounting for 30.6% and 28.6 % of total cases and deaths respectively.
- Comparing the last three days' report, both the number of new cases and new deaths in the USA were decreasing; with a total of 24,002 new cases and 1,293 deaths on May 22nd and 19,608 new cases and 617 deaths on May 24th.
- Brazil has become the second most affected country in the world with a total of 365,213 cases followed by Russia (353,427), Spain (282,852) and the United Kingdom (259,559).
- Countries with high number of deaths from COVID-19 include; United Kingdom (36,793 deaths), Italy (32,785 deaths), Spain (28,752 deaths) and France (28,367 deaths). The death in Brazil was 22,746.

Africa

- As of May 25, 4:00 PM EAT, a total of 111,348 cases, 3,348 deaths and 44,630 recoveries were reported from Africa.

- The number in South Africa accounted for a fifth (n=22,583 cases; 20.3%) of total cases reported in the continent. Based on Wordometer report, the number of new cases in the country is persistently increasing, especially in the last two days.
- Next to South Africa, Egypt 17,265 (15.5%), Algeria 8,306 (7.6%), Nigeria 7,839 (7.0%) and Morocco 7,495 (6.7 %) are other African countries with high number of COVID-19 cases.
- Almost two third 2,219 (66.3%) of total deaths in the continent were reported from these countries; Egypt (764), Algeria (600), South Africa (429), Nigeria (226), and Morocco (200).
- Ethiopia
- According to the Ministry of Health report, a total of 10,649 laboratory tests were carried out in the past three days and 222 additional COVID-19 cases were identified in the country.
- All of the additional cases are Ethiopians, their age ranges from 8 to 75 years and almost two third 143 (64.4%) of them are males.
- Out of the 222 additional cases, more than half 131 (59.0%) of them have no travel or contact history and only 51 (22.9%) & 40 (18.0%) of them have travel and contact history respectively.
- Majority 177 (79.7%) of these cases were reported from Addis Ababa, 15 from Somali, 12 from Tigray, 6 from Oromia, 3 from Afar, 3 from Amhara, and 1 from Harari region and the rest five are cross border drivers.
- The ministry also reported that additional 31 people (15 from Addis Ababa, 9 from Afar, 4 SNNPR, 2 from Tigray and 1 from Oromia) are fully recovered from the disease raising the total number of recoveries to 159.
- Therefore, a total of 83,854 laboratory tests were conducted and 655 confirmed cases, 5 deaths and 159 recoveries were reported as of May 25, 5:00 PM EAT.
- Out of the total 489 active cases, one of them is in the intensive care unit while all the others are having mild form of the disease and receiving medical care in the designated treatment centre.

Update on Diagnosis

- A study compared the dynamic range and the limit of detection) with a 95% repeatable probability between droplet digital-PCR (ddPCR) and RT-PCR in laboratory, and tested the clinical samples from 77 patients by both ddPCR and RT-PCR for comparison. ddPCR showed superiority for clinical diagnosis of SARS-CoV-2 to reduce the false negative reports, which could be a powerful complement to the current standard RT-PCR (Suo et al., 2020).

- Public Health England (PHE) evaluated two antibody tests for COVID-19 developed by the drug companies Roche and Abbott and found they were highly specific but both showed lower sensitivity than was previously reported by the companies. It was reported the Elecsys Anti-SARS-CoV-2 assay gave a specificity of 100% (95%CI 99.1-100) in this evaluation; the manufacturer reported a specificity of 99.81% (95%CI 99.65-99.91). The overall sensitivity of the Roche Elecsys Anti-SARS-CoV-2 assay was found to be 83.9% (95%CI 74.8-90.7). The sensitivity increased slightly from 87.0% (95%CI 77.4-93.6) for samples taken ≥14 days since symptom onset to 87.7% (95%CI 77.9-94.2) for samples taken ≥21 days since symptom onset. However, the manufacturer reported a sensitivity of 100% (95%CI 88.1-100) for samples ≥14 days post-PCR confirmation (PHE, 2020a). Abbott SARS-CoV-2 was also found to be a highly specific assay with a specificity of 100% (95% CI 97.79-100); the manufacturer-reported specificity is 99.63%. PHE's evaluation showed that the sensitivity of the Abbott SARS-CoV-2 IgG assay increased from 93.4% (95%CI 85.3-97.8) for samples collected ≥14 days post symptom onset to 93.9% (95%CI 86.3-98.0) for samples collected ≥21 days post symptom onset. For all samples, the sensitivity in this evaluation was 92.7% (95%CI 85.6-97.0), whereas the manufacturers reported a sensitivity of 86.3% for samples <14 days and a sensitivity of 100% for samples ≥14 days post symptom onset(PHE, 2020b).

Update on Vaccine and Treatment

- A Phase I clinical trial was conducted in china to assess the safety, tolerability, and immunogenicity of a recombinant adenovirus type-5 (Ad5) vectored COVID-19 vaccine expressing the spike glycoprotein of a severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) strain. The trial was a dose-escalation, single-centre, open-label, non-randomised, phase 1 trial. A total of 108 healthy adults were enrolled into the study. The participants were divided and allocated to one of three dose groups (5×10^{10}, 1×10^{11}, and $1{\cdot}5 \times 10^{11}$ viral particles) to receive an intramuscular injection of vaccine where each dose group consisted of n=36 study participants. The primary outcome was adverse events in the 7 days post-vaccination. Safety was assessed over 28 days post-vaccination. The results indicated that the most common adverse reactions were fever, fatigue, headache, and muscle pain with no significant difference in the incidence of adverse reactions across the groups. Most adverse reactions that were reported in all dose groups were mild or moderate in severity and were well tolerated. No serious adverse event was noted within 28 days post-vaccination. The other primary outcome was the immunogenicity of the vaccine, ELISA antibodies and neutralising antibodies increased significantly at day 14, and peaked

28 days post-vaccination. Specific T-cell response peaked at day 14 post-vaccination. Currently, correlates of protection for a vaccine against COVID-19 are unknown, and the roles of the specific antibodies or T cells in building effective protection are not yet defined. Furthermore, we are unable to predict the protection of the Ad5 vectored COVID-19 vaccine on the basis of the vaccine-elicited immune responses in this study. Overall, the findings suggest that the Ad5 vectored COVID-19 vaccine warrants further investigation to study its safety and efficacy on patients who tested positive for COVID 19(Zhu, Li et al. 2020).

- A multinational registry analysis of the use of hydroxychloroquine or chloroquine with or without a macrolide for treatment of COVID-19 was published in the Lancet this weekend. The registry comprised data from 671 hospitals in six continents. The study included patients hospitalised between Dec 20, 2019, and April 14, 2020, with a positive laboratory finding for SARS-CoV-2. Patients who received one of the treatments of interest within 48 hr of diagnosis were included in one of four treatment groups (chloroquine alone, chloroquine with a macrolide, hydroxychloroquine alone, or hydroxychloroquine with a macrolide), and patients who received none of these treatments formed the control group. 96, 032 patients with COVID-19 were hospitalised during the study period and met the inclusion criteria. Of these, 14 888 patients were in the treatment groups (1868 received chloroquine, 3783 received chloroquine with a macrolide, 3016 received hydroxychloroquine, and 6221 received hydroxychloroquine with a macrolide) and 81 144 patients were in the control group. According to the study, no superior benefit was observed from taking hydroxychloroquine or chloroquine, when used alone or with a macrolide, on in-hospital outcomes for COVID-19. More importantly, each of these drug regimens was associated with decreased in-hospital survival and an increased frequency of ventricular arrhythmias when used for treatment of COVID-19 (Mehra, Desai et al. 2020).

Update on personal protective equipment

Face mask use

- One new commentary indicates that there is high-quality, consistent evidence that many (but not all) cloth masks reduce droplet and aerosol transmission and may be effective in reducing contamination of the environment by any virus, including SARS-CoV-2 but no direct evidence indicates that public mask wearing protects either the wearer or others. It was suggested that the possible benefit of a modest reduction in transmission likely

outweighs the possibility of harm, given the severity of this pandemic and the difficulty of control. The major proposed mechanisms are reduced outward transmission and reduced contamination of the environment. The authors also recognized the potential for unintended consequences, such as use of formal personal protective equipment by the general public, incorrect use of cloth masks, or reduced hand hygiene because of a false sense of security and that these can be mitigated by controlling the distribution of personal protective equipment, clear messaging, public education, and social pressure(Clase et al., 2020).

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