Update: May 21&22, 2020

UPDATE ON GLOBAL REGIONAL AND NATIONAL DEVELOPMENTS ON COVID-19

THE KNOWLEDGE SYNTHESIS TEAM

CDT-AFRICA, ADDIS ABABA UNIVERSITY

www.cdt-africa.org

Summary

- As of May 22, 12:00 GMT, the pandemic affected 213 countries and territories around the world with a total of (5,219,887) confirmed cases and 335,103 deaths and 2,097,138.
- The number of new cases has shown a trend of increase since May 17. This could be related to reopening.
- Brazil has now become the country with the 2nd most cases. The initial response to the pandemic may account for this increase.
- The lack of adequate PPE in Wuhan, where most with infection were initially healthcare workers. It is suspected that the initial spread was because of this.
- More than 100,000 (100,330) people are infected with Novel corona virus in Africa causing 3,101 deaths and 39,416 recoveries as of May 22, 4:00 PM EAT.
- SARS-CoV-2 RNA was detected in breast milk from one of the mothers on a study and SARS-CoV-2 positive diagnostic test of the new born was found. But the mode of transmission is unclear.
- The largest study by far (n=96 032 patients) of the association of hydroxychloroquine and chloroquine with mortality and cardiac arrythmia has just been published in the Lancet (22nd May 2020). Both drugs are associated with increased mortality and increased de-novo novo ventricular arrhythmia during hospitalisation.
- A study done in New York City has shown that people who had recovered from COVID-19 have generated varying amounts of antibodies against the virus.
- The prevalence of COVID-19 was higher in health care workers without adequate PPE (were only wearing just surgical masks) in Wuhan, China at the beginning of the spread. Not having adequate preparation for protection of healthcare workers may have been the reason for initial spread of the disease.

Recommendations

- Protection of healthcare workers should be given priority as one of the pillars of controlling the spread of COVID-19 in the population.
- The increase in COVID-19 new cases in the US since May 17th may be a reflection of the way the reopening is happening. The unavoidable reopening has to be planned for very carefully. It is not too early to develop a reopening roadmap that would be revised constantly learning from countries that reopen.

- The warning about the risk of hydroxychloroquine and chloroquine about increasing mortality and ventricular arrythmia should be taken very seriously. Routine use of these drugs should be reconsidered until results of the ongoing clinical trials are published. Although a large study with 40,000 healthcare workers is proposed to look at prophylactic role of hydroxychloroquine and chloroquine, the Lancet report just published should be a warning.
- Three-layer cotton masks may be useful for public use—based on an initial evidence from the UK.

Update on pathogenesis

Disease transmission

- A recent study which examined milk from two nursing mothers infected with COVID-19 revealed that SARS-CoV-2 RNA was detected in milk from one of the mothers at days 10 (left and right breast), 12, and 13 following admission and delivery.
- The recovery rate in whole milk was reduced by up to 89·2% while it's 51·5% in skimmed milk, suggesting that the actual viral load in whole milk of this mother could be even higher than detected.
- The study also reported, the detection of viral RNA in milk from the mother coincided with mild COVID-19 symptoms and a SARS-CoV-2 positive diagnostic test of the newborn. However, whether the new born was infected by breastfeeding or other modes of transmission remains unclear [Groß, R.,2020].

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

Global

- As of May 22, 12:00 GMT, the pandemic affected 213 countries and territories around the world with a total of 5,219,887 confirmed cases and 335,103 deaths.
- The total number of new cases reported in the previous 24 hours (107,085 new cases) was significantly higher than the previous two consecutive days (100,474 and 94,813 new cases).
- In contrast, the number of new deaths (4,934 deaths) is only marginally increased compared to May 20th (4,685 deaths) and May 21th (4,589 deaths) report.
- Persistently, the highest number of cases (1,621,669) and deaths (96,377) were reported from United States of America (USA) which accounted for 31.1% of total cases and 28.8% of total deaths in the world.
- Almost one fourth 366,357 (22.6 %) of the total cases in USA were reported from New York state. New Jersey and Illinois are the second and third most affected states with a total of 153,441 & 102,686 cases respectively.

- The number of new cases in the US has shown some increase since May 17th. This could be related with the reopening.
- Brazil has now become the second country with most cases.
- Russia (326,448), Spain (280,117) and United Kingdom (250,908) are among the five countries with high number of Corona cases in the world.
- UK remained the second country with high number of deaths (36,042) next to USA. According to a recent report, care home residents represent around a third of the total number of reported deaths from COVID-19 in England and Wales. This is mainly due to shortages of Personal Protective Equipment (PPE), lack of testing, and majority of care home residents have at least one underlying condition [Burki, T. 2020].
- Other countries with high number of deaths from COVID -19 include; Italy (32,486), France (28,215) and Spain (27,940).

Africa

- More than 100,000 (100,330) people are infected with Novel corona virus in Africa causing 3,101 deaths and 39,416 recoveries as of May 22, 4:00 PM EAT.
- The highest number of cases is reported from South Africa (19,137) followed by Egypt (15,003), Algeria (7,728), Morocco (7,300) and Nigeria (7,016).
- In the last two days, the number of new cases was massively increased in South Africa (803 to 1134), Egypt (745 to 774), Algeria (165 to 186), and Nigeria (276 to 339) while it's reduced in Morocco (110 to 78).
- More than two third 2,204 (71.1%) of the total deaths in the continent were reported from Egypt (696), Algeria (575), South Africa (369), Morocco (197), Nigeria (211) and Cameroon (156).

Ethiopia

- Among the 7,404 total laboratory tests carried out in the last 48 hours, 40 additional COVID-19 cases were identified in the country raising the total number of cases to 429.
- All of the additional cases are Ethiopians, their age ranges from 15 to 60 years and more than three fourth 34 (85%) of them are males.
- Out of the 40 additional cases, 14 of them have travel history and 19 have contact history with confirmed COVID-19 case while the rest six have no travel or contact history.
- More than half 21(52.5%) of these cases were reported from Addis Ababa, 5 from Afar, 4 from Oromia, 4 from Tigray, 2 from Amhara, 1 from Somali and 1 from Harari region and the rest two are cross border drivers.
- The ministry also reported that additional six people from Addis Ababa are fully recovered from the disease raising the total number of recoveries to 128.

- Therefore, a total of 73,164 laboratory tests were conducted and 429 confirmed cases, 5 deaths and 128 recoveries were reported as of May 22, 5:00 PM EAT.
- Currently, all of the active cases (294) are having mild form of the disease and receiving medical care in the designated treatment centre.

Update on Diagnosis

- A review of available diagnostic tests for COVID-19 highlighted it may be helpful to simultaneously use two or more rRT-PCR diagnostic kits that detect different viral genes since mutations occur frequently in SARS-CoV-2 and there is a possibility of false negatives. It was also noted the diagnosis using rRT-PCR is based threshold cycle (Ct) value, the cycle number when the sample fluorescence exceeds a chosen threshold above the calculated background fluorescence, [i.e., the lower the Ct value of a specific gene, the more the gene exists in the sample] and there is no absolute or constant Ct cut-off value, and Ct cut-off values are different for each diagnostic reagent even for the same gene. Hence, the test depends on the skill of the examiner and when there is ambiguity in the Ct value, the result may be interpreted as false negative or false positive depending on the Ct cut-off value. In addition, because the Ct value is inversely proportional to the amount of the target gene, there is also the disadvantage of a sample being interpreted as false negative in the early stages of COVID-19 infection without large amounts of virus multiplication, or depending on the accuracy of the swab. To overcome the limitations of this test, the following were suggested (Chang et al., 2020):
  - ➢ Having detailed standard operating procedures performed by a centralized decision-making body
  - ➢ standardizing the Ct value according to the product for the same virus concentration
  - ➢ obtaining two or more swabs from two or more sites (nasopharyngeal and throat swab) from each patient and perform consecutive tests (while the suspected patient is kept in isolation)
  - ➢ Additional article, a review, considers saliva as a specimen which can provide useful clinical information about the disease and that it could be potentially included in guidelines for sample collection for the diagnosis, disease management, and control of COVID-19 with the development of appropriate sample collection and processing methods and the use of adequate assays(Ceron et al., 2020).

Update on treatment

- The largest study published in the Lancet on 22nd May (n=96 032 hospitalised patients (mean age 53·8 years, 46·3% women)) with COVID-19 has reported increase in harm associated with use of chloroquine and hydroxychloroquine (Mehra 2020).

- In this study, 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. 10 698 (11·1%) patients died in hospital. After controlling for multiple confounding factors (age, sex, race or ethnicity, body-mass index, underlying cardiovascular disease and its risk factors, diabetes, underlying lung disease, smoking, immunosuppressed condition, and baseline disease severity), when compared with mortality in the control group (9·3%), hydroxychloroquine (18·0%; hazard ratio 1·335, 95% CI 1·223–1·457), hydroxychloroquine with a macrolide (23·8%; 1·447, 1·368–1·531), chloroquine (16·4%; 1·365, 1·218–1·531), and chloroquine with a macrolide (22·2%; 1·368, 1·273–1·469) were each independently associated with an increased risk of in-hospital mortality. Compared with the control group (0·3%), hydroxychloroquine (6·1%; 2·369, 1·935–2·900), hydroxychloroquine with a macrolide (8·1%; 5·106, 4·106–5·983), chloroquine (4·3%; 3·561, 2·760–4·596), and chloroquine with a macrolide (6·5%; 4·011, 3·344–4·812) were independently associated with an increased risk of de-novo ventricular arrhythmia during hospitalisation.

- A double-blind, randomized, placebo-controlled trial named COPCOV will enrol more than 40,000 healthcare workers and staff from Europe, Africa, Asia and South America who have close contact with patients with COVID-19. The trial aims to determine definitively if chloroquine and hydroxychloroquine are effective in preventing COVID-19. Those enrolled in the study will receive either chloroquine or a placebo (in Asia) or hydroxychloroquine or a placebo (in UK, Europe, and Africa) for 3 months. Participants will take the study drugs each day for a period of three months, and will be followed closely to see how well the drug is tolerated, whether they contract the virus, and if they do, whether they develop mild or more severe COVID-19. If a participant develops COVID-19, they will be treated according to the treatment guidelines in their healthcare facility. The eligibility criteria includes, adults who works in healthcare facility and is delivering direct care to patients with proven or suspected COVID-19 may participate in COPCOV, as long as they have not been diagnosed with COVID-19 or have an acute respiratory infection. The trial is Sponsored by the University of Oxford and is funded by a grant by the COVID-19 Bill & Melinda Gates Foundation, Welcome and MasterCard Therapeutics Accelerator (University of Oxford 2020).

- Researchers at Rockefeller University in New York City studied 68 people who had recovered from SARS-CoV-2 infection and found that they all had generated varying amounts of antibodies against the virus. A fraction of these antibodies strongly blocked the coronavirus from invading human cells. The work has not yet been peer reviewed. People who'd recovered from severe disease had higher levels of these potent antibodies (anti-SARS-CoV-2 RBD antibodies), on average, than people whose illness was milder. But every participant appeared to be capable of making them. Thus it is the recommendation of the researchers to look into vaccines that specifically and efficiently induce antibodies targeting the SARS-CoV-2 RBD antibodies may be especially effective. (Nature news 2020, Robbiani, Gaebler et al. 2020).

Update on public health control measures

- A study on 335 health care workers (HCWs) in a tertiary hospital in Wuhan, China indicates a disproportionate risk HCWs have for SARS-CoV-2. The study used a mix of data from records of those whose status was determined in prior and they also tested all health care workers at a cross-section.
- At the beginning of the outbreak COVID-19 prevalence among HCWs was significantly higher (1.1%) than the general population (0.81%). Lack of, overall, preparation to respond to the pandemic was the major factor which favoured the spread of the disease (Lia, 2020).
- Further analysis also shade light on which HCWs were more affected. Frontline health workers (who were working in fever clinics and with COVID-19 patients in the wards) were believed to be at a higher risk for the infection. However, more cases were found among the HCWs in the general clinic wards (63%). The justification for this reverse relationship was, frontline HCWs were using fit tested particulate respirators, long-sleeved gowns (equivalent to AAMI level 4), goggles, disposable round caps, latex gloves, and shoe covers as they were in a high contagion area. But those who were in a perceived low contagion area, working non-COVID-19 patient wards, were using surgical masks. This once more signified the pivotal role of PPE in preventing the infection regardless of the risk in the surrounding environment (Lia, 2020).
- From a mass screening of all the HCWs 0.9% were positive for the infestation but were asymptomatic. This group pose a risk of infection to the colleagues and the patients. Because of this the hospital put in place different precautionary measures. Surveillance on the proper use of PPE by HCWs was conducted twice a day. The hospital has also instituted guidelines on when to test HCWs for COVID-19. Those who are working in facilities where two cases of

hospital acquired COVID-19 were reported. Providers who had contact with a confirmed patient or a person with typical COVID-19 symptoms. Providers were also tested twice (at the time of the new assignment and 14 days after) when they were reassigned from fever clinics to elsewhere (Lia, 2020).

Update on personal protective equipment

Face mask use

- A study done in the UK, a pre-print article, tested the effectiveness of different face covers including FFP2 and FFP1 masks, a respirator, a surgical and a hand-made mask, and two types of face shields. The result showed that all face covers, with the exception of the respirator, allow a reduction of the front flow through jet by more than 90%. The respirator has a valve system that filters the inhaled air but it does not filter the exhaled air, and hence it does not protect other people from the exhaled air of the wearer. For the FFP1 and FFP2 masks, which do not have the valve system, the airflow is pushed through the mask material and the front throughflow does not extend by more than half a metre for the FFP1 mask and a quarter of a metre for FFP2 mask. However, if these masks are not correctly fitted, leaking jets are formed but likely to be directed upwards with a negligible horizontal displacement. Conversely, surgical and hand-made masks, and face shields, generate significant leakage jets that have the potential to disperse virus-laden fluid particles by several metres. It was indicated that the different nature of the masks and shields makes the direction of these jets difficult to be predicted, but the directionality of these jets should be a main design consideration for these covers. They all showed an intense backward jet for heavy breathing and coughing conditions. The authors noted to avoid a false sense of security that may arise when standing to the side of, or behind, a person wearing a surgical, or handmade mask, or shield. They added clinicians working around a patient, in the confined space around an intensive care bed or an operating table, are likely to be exposed to these side and backward leakage jets from surgical masks(Viola et al., 2020).
- One study investigated whether cotton mask worn by respiratory infection person could suppress respiratory droplet levels compared to medical mask. Adult volunteers with confirmed influenza and suspected cases of COVID-19 were recruited to wear medical masks and self-designed triple-layer cotton masks in a regular bedroom and a car with air conditioning. The

results showed that there was no significant difference in number of concentration or cough/sneeze counts between volunteers with medical masks and cotton masks in a bedroom or a car. It was concluded that the cotton mask could be a potential substitute for medical mask for respiratory infection person in microenvironment with air conditioning and that healthy people may daily use cotton mask in the community since it is washable and reusable(Ho et al., 2020)

Reference list

- African Union; COVID -19 updates. https://au.int/en/covid19
- Burki, T. (2020). England and Wales see 20 000 excess deaths in care homes. The Lancet, 395(10237), 1602. doi: 10.1016/s0140-6736(20)31199-5
- Center of Disease Control and Prevention Africa https://africacdc.org/covid-19-update/
- CERON, J. J., LAMY, E., MARTINEZ-SUBIELA, S., LOPEZ-JORNET, P., CAPELA, E. S. F., ECKERSALL, P. D. & TVARIJONAVICIUTE, A. 2020. Use of Saliva for Diagnosis and Monitoring the SARS-CoV-2: A General Perspective. J Clin Med, 9.
- CHANG, M. C., HUR, J. & PARK, D. 2020. Interpreting the COVID-19 Test Results: a Guide for Physiatrists. Am J Phys Med Rehabil.
- Ethiopian Public Health Institute CoronaVirus Update; https://www.ephi.gov.et/index.php/public-health-emergency/novel-corona-virus-update
- Groß, R., Conzelmann, C., Müller, J. A., Stenger, S., Steinhart, K., Kirchhoff, F., & Münch, J. (2020). Detection of SARS-CoV-2 in human breastmilk. The Lancet. doi: 10.1016/s0140-6736(20)31181-8
- HO, K. F., LIN, L. Y., WENG, S. P. & CHUANG, K. J. 2020. Medical mask versus cotton mask for preventing respiratory droplet transmission in micro environments. Sci Total Environ, 139510.
- John Hopkins, Corona Virus Resources https://coronavirus.jhu.edu/map.html
- Lai X, Wang M, Qin C, et al. Coronavirus Disease 2019 (COVID-2019) Infection Among Health CareWorkers and Implications for Prevention Measures in a Tertiary Hospital inWuhan, China. JaMA network open 2020; 3(5).

- Mehra MR et al. Hydroxychloroquine or chloroquine with or without a macrolide for treatment of COVID-19: a multinational registry analysis, The Lancet, Available online May 22, 2020. https://doi.org/10.1016/S0140-6736(20)31180-6

- Nature news. (2020). "Coronavirus research updates: Potent human antibodies could inspire a vaccine." Retrieved 22 May 2020, from https://www.nature.com/articles/d41586-020-00502-w.

- Robbiani, D. F., C. Gaebler, F. Muecksch, J. C. C. Lorenzi, Z. Wang, A. Cho, M. Agudelo, C. O. Barnes, S. Finkin, T. Hagglof, T. Y. Oliveira, C. Viant, A. Hurley, K. G. Millard, R. G. Kost, M. Cipolla, A. Gazumyan, K. Gordon, F. Bianchini, S. T. Chen, V. Ramos, R. Patel, J. Dizon, I. Shimeliovich, P. Mendoza, H. Hartweger, L. Nogueira, M. Pack, J. Horowitz, F. Schmidt, Y. Weisblum, H.-H. Hoffmann, E. Michailidis, A. W. Ashbrook, E. Waltari, J. E. Pak, K. E. Huey-Tubman, N. Koranda, P. R. Hoffman, A. P. West, C. M. Rice, T. Hatziioannou, P. J. Bjorkman, P. D. Bieniasz, M. Caskey and M. C. Nussenzweig (2020). "Convergent Antibody Responses to SARS-CoV-2 Infection in Convalescent Individuals." bioRxiv: 2020.2005.2013.092619.

- University of Oxford. (2020, 21 May 2020). "Oxford leads on UK trial sites testing potential COVID-19 preventatives." Retrieved 22 May 2020, from http://www.ox.ac.uk/news/2020-05-21-oxford-leads-uk-trial-sites-testing-potential-covid-19-preventatives.

- VIOLA, I. M., PETERSON, B., PISETTA, G., PAVAR, G., AKHTAR, H., MENOLASCINA, F., MANGANO, E., DUNN, K., GABL, R., NILA, A., MOLINARI, E., CUMMINS, C., THOMPSON, G., LO, M., DENISON, F., DIGARD, P., MALIK, O., DUNN, M. J. G. & MEHENDALE, F. 2020. Face Coverings, Aerosol Dispersion and Mitigation of Virus Transmission Risk. arXiv.org.

- Worldometer, Corona Virus https://www.worldometers.info/coronavirus/