EPHI, National Data Management Center for health (NDMC)
Quick update on COVID 19, 015

This update summarizes	Ethiopia's COVID-19 situation update
	Global and regional buden of COVID 19
	COVID-19 risk perception, knowledge and behaviour: Evidence from South Africa
	Interpretation of COVId-19 RT-PCR results in the community
	Face Masks in the Fight against COVID-19

Ethiopia's COVID-19 situation update

As of July 23, 2020 there were a total of 11,933 COVID-19 cases and 197 deaths across the country. Compared to the cases and deaths reported on July 15, 2020, a 26% increase in cases and 23% increase in deaths have been reported. So far 5,645 cases have recovered from COVID-19. Of the 6,154 active cases, 65 are critical. The total number of tests stands at 357,058, showing a 13% increase compared to last week.

EPHI and FMOH COVID 19 response highlights of the week

- July 19-21, 2020; PPEs have been distributed to Wollo University, SNNPR Public Health Institute, Harari Regional Health Bureau, Dire Dawa City Administration and Addis Ababa city Administration Health Bureau and Amahara Public Health Institute.
- Since July 21, 2020; there has been an ongoing distribution of PPE, Viral Transport Media, swabs, pharmaceuticals and other medical supplies to quarantine, isolation and treatment centers.
- July 20, 2020; Group discussion conducted among the logistic section team members on Inter-Action Review of National Public Health Emergency Operation Center on COVID-19 preparedness and response incident management system of EPHI.
- COVID-19 sample taking video was prepared for Health Care Workers on July 20, 2020;.
- So far a total of 6,474 Health Extension Workers (HEWs) and supervisors are enrolled to the Mobile based COVID-19 training and 4,899 of them have completed their training from Addis Ababa, Afar, Amhara, Oromia, Tigray, SNNPR and Benishangul Gumuz Regions. On July19,2020 alone, 75 of the HEWs and their supervisors were enrolled and 88 completed the training.

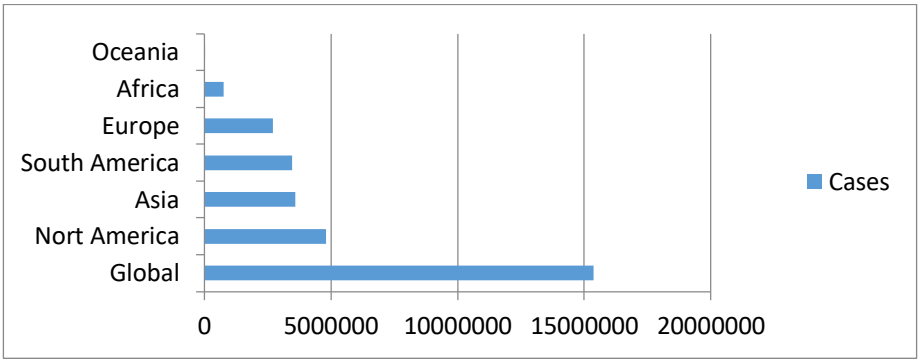
- July 16,2020; 600 bottles of 100ml Alcohol-Based-Hand-Rubs were produced and distributed by the Traditional and Modern Medicines and Research Directorate in EPHI.
- EPHI received COVID-19 health commodities including 50,000 surgical masks, 705 disposable protective clothing and 98 safety goggles on July 16; 2020 form the Government Chinese.

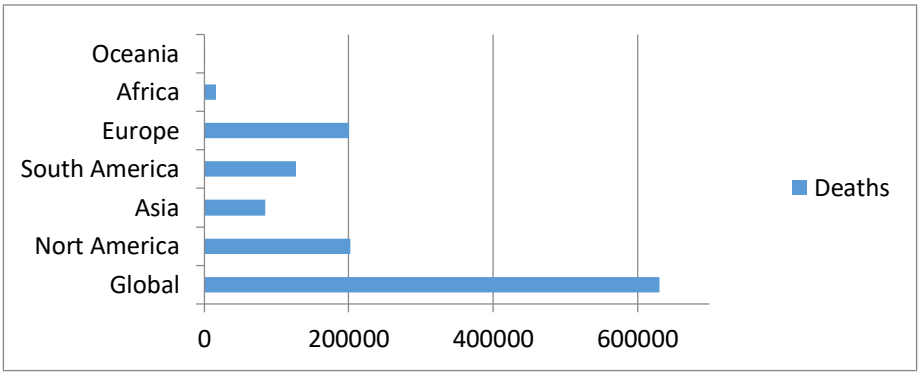
References

1. PUBLIC HEALTH EMERGENCY OPERATIONS CENTER (PHEOC), ETHIOPIA
2. https://www.africanews.com

Global and regional burden of COVID-19

- Globally the total number of cases has increased to 15,379,943 as of July 23, 2020. A total of 9,354,882 cases recovered and 630,313 people died since the beginning of the outbreak. Globally, in a week time, from 16 July to 23 July 2020, COVID-19 cases increased by 12% and the deaths by 7.4%. North America is the leading in terms of cases followed by Asia and South America. The number of deaths is higher in North America than the rest of the world.





- In the USA, the increasing trend has continued. The country has recorded the highest number of cases (4,100,875 cases, 146,183 deaths) that accounts 26.7% of the total global cases and carried 23.2% of global deaths as of July 23, 2020.

- Brazil has continued reporting the second highest COVID-19 case and death burden in the world following USA. The number of cases in Brazil has increased in a week time by 13% (1,970,909 to 2,231,871) and deaths by 9.8% (75,523 to 82,890).

- Russia has continued reporting the highest number of cases in Europe, with 789,190 cases. The epidemic in the other European countries have shown a diminishing tendency COVID-19 case reports compared to the other parts of the regions. For example, Spain (304,574 to 314,631), Italy (243,506 to 245,032), France (173,304 to 178,336 cases), UK (291,911 to 296,377 cases) and Germany (201,252 to 204,470 cases) showed a gradual increment from 16 July 2020 to July 23, 2020.

- The COVID 19 cases India has increased 27.8% (970,169 to 1,239,684) and deaths by 19.9% (24,929 to 29,890) in a week time. The country has the third highest cases in the world recording over a million cases.

- The share of Africa from the global COVID-19 pandemic has still been low (only 5% of the global cases and 2.6% of deaths as of July 23). However, within the continent the number of cases has increased by 19.6% in a week time (from 646,973 to 773,659 cases). Similarly, the total number of deaths in Africa has increased from 14,029 to 16,487, showing a 17.5% increase in a week time. Total recoveries stand at 438,314. South Africa is still leading with 394,948 cases and 5,940 deaths in the continent, Egypt (89,745 cases, 4,440 deaths), Nigeria (38,344 cases, 813 deaths), Ghana (29,672 cases, 153 deaths), Algeria (24,872 cases, 1,111 deaths), Cameroon (16,522 cases, 382 deaths showed declined from last week), are still in the leading pack in reporting COVID-19 cases and deaths. (See table below)

Africa	**July 16**		**July 23**	
	Cases	**Death**	**Cases**	**Deaths**
South Africa	311,049	4,453	394,948	5,940
Egypt	84,843	4,067	89,745	4,440
Nigeria	34,259	760	38,344	813
Ghana	25,430	139	29,672	153
Algeria	20,770	1,040	24,872	1,111
Cameroon	16,262	259	16,522	382

- In East African countries, COVID-19 cases and deaths have shown fast progress in Ethiopia and Kenya, while Djibouti and Somalia showed insignificant increase. In a week time, COVID-19 cases and deaths increased respectively by 6.7% and 6% in Sudan, 31.6% and 24.4% in Kenya, 40.9% and 28.8% in Ethiopia and 0.9% and 3.6% in Djibouti, 2.5% and 0% in Somalia. (See table below)

East Africa	July 16		July 23	
	Cases	Deaths	Cases	Deaths
Sudan	10,527	668	11,237	708
Kenya	11,252	209	14,805	260
Ethiopia	8,181	146	11,524	188
Djibouti	4,985	56	5,030	58
Somalia	3,083	93	3,161	93

References

1. John Hopkins, Corona Virus Resources **https://coronavirus.jhu.edu/map.html**
2. Worldometer, Corona Virus **https://www.worldometers.info/coronavirus/**

Africa CDC: COVID 19 Surveillance; https://au.int/covid19

COVID-19 risk perception, knowledge and behaviour: Evidence from South Africa

- The rapid spread of COVID-19 could amplify South Africa's an unequal and polarised health system, with the poor and vulnerable populations bearing a greater burden of the COVID-19 infections and mortality. Available evidence suggests that preventative measures would have a protective effect against the spread of the virus. However, the success of these measures depends on whether the public receives, internalizes and acts on appropriate messages.
- A study conducted in South Africa considered risk perceptions, knowledge and behaviour of high-risk groups such as the elderly and those suffering from chronic diseases; and considered the role of resources by examining differences across the income strata.

    - **Forty and fifty-year olds underestimate their relative infection risk.** Respondents in the middle age group tend to underestimate their risk of others.
    - **Underestimated infection risk tied to underinvestment in preventative behaviour.** Those that did not change any of their behaviour in response to COVID-19 (did not enact preventative behaviours) were significantly less likely to think that they would contract the virus or were unaware of their infection risk.
    - **Affluent South Africans have exaggerated perception of infection risk compared to their poor counterparts.** Affluent individuals in the top household income per capita quintile are almost twice as likely (52%) to believe that they will contract COVID-19 cf. those in the poorest quintile (25%).
    - **Knowledge about the three most common COVID-19 symptoms, and in particular tiredness, is limited.** Although 64% of respondents listed coughing as a symptom, and 63% listed fever, only 11% listed tiredness as a symptom. This implies that many people would not be in a good position to make decisions about when it would be vital to quarantine and/or seek care for COVID-19 symptoms. This is

expected to have negative consequences for individuals but also more broadly for society because it hampers the containment of the disease.

- **Compliance with effective preventative behaviour is low.** While 91% of respondents reported changing their behaviour in some way to try and prevent contracting or spreading the virus, much of this effort is expended on low-impact strategies. As droplet transmission is the most common means of spreading the disease, the best strategies are widely acknowledged to be avoiding large groups of people, physical distancing and mask-wearing. Of those that reported changing behaviour, only 35% reported enacting a high-impact set of preventative behaviours.
- **There is little evidence on well-targeted information campaigns.** Knowledge of symptoms and compliance with preventative behaviour were not significantly higher amongst high-risk groups such as the elderly and those with chronic health conditions.
- **News media is the most trusted source of information.** Almost four in five respondents listed news media as their trusted source of information about COVID-19. Other trusted information sources include government (14%), social media (13%) and discussions with health workers (11%).
- **Sources of information matter for conveying knowledge and preventative behaviour.** Those who are reliant on health workers, social media and government sources of information have more accurate knowledge of symptoms and are more likely to follow best prevention strategies.

Policy recommendations

- A multifaceted approach to behaviour change is necessary because multiple factors influence behaviour. Therefore, government must considers adopting the following approaches or policies:
    - Clear, concise and consistent communication is required.
    - Reduce barriers to access to information on COVID-19 symptoms.
    - Provide specific and actionable recommendations on key preventative behaviours - with a focus on mask-wearing and physical distancing.
    - News media should be used more effectively in COVID-19 communications.
    - Enhance reliance on government and health workers as a trusted source of information.
    - Provide recommended preventive health products such as masks for free to ensure mass uptake.
    - Restructure the delivery of services to promote physical distancing.
    - Local ownership and champions are required for changing social norms.
    - Anchor messages in hope and a positive vision for the future.

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Update on Interpretation of COVId-19 RT-PCR results in the community

- There is wide consensus that expanding COVID-19 testing is a key for controlling the pandemic. In countries like Ethiopia beside availing the test, proper interpretation and monitoring test accuracy is equally important as an inaccurate COVID 19 PCR diagnostic tests can undermine all efforts to contain the pandemic.

- False positive COVID 19 RT-PCR result erroneously labels a person infected, with consequences including unnecessary quarantine and contact tracing. False negative COVID 19 RT-PCR results are more dangerous, because infected persons who might be asymptomatic may not be isolated and can disseminate the infection for the community (1)

- To determine the accuracy of a given test understanding the concepts of analytic and clinical performance of a given test is crucial.

    - Analytic sensitivity indicates the likelihood that the test will be positive for material containing any virus strains and the minimum concentration the test can detect (1)
    - Analytic specificity indicates the likelihood that the test will be negative for material containing pathogens other than the target virus (1)
    - Clinical sensitivity is the proportion of positive tests in patients who in fact have the disease in question (1,2).

- Systematic review of 5 studies enrolling 957 patients has indicated the pooled false negative estimate of COVID 19 tests as 0.085 95% CI= (0.034 to 0.196) (3).

    - With imperfect COVID 19 tests (as there is no perfect test existed), a negative result means only that a person is less likely to be infected (1).
    - To interpret a negative COVID 19 test, there are two key concepts pretest probability (the person's chance of being infected before tested which depends on local Covid-19 prevalence, SARSCoV-2 exposure history, and symptoms), and test sensitivity (1,2).
    - Assume that a COVID 19 RT-PCR test was perfectly specific (always negative in people not infected with SARS CoV-2) and that the pretest probability for someone who, say, was feeling sick after close contact with Covid-19 patient was 20% (See Figure 1). If your COVID 19 RT-PCR test sensitivity is 95% (5% of infected peoples can be missed), the post-test probability of infection for person with a negative test

would be only 1%, which might be low enough to consider someone uninfected (Figure 1).

- At 95% COVID 19 test sensitivity, the post-test probability would remain below 5% even if the pretest probability were as high as 50% (Figure 1). But sensitivity for many available COVID 19 RT PCR tests appears to be substantially lower (70-98%) (2). Thus, considering a lower sensitivity test with 70% sensitivity would give a better interpretation understanding
- At this sensitivity level, with a pretest probability of 50%, the post-test probability of someone from a community with a negative test would be 23% far too high to safely assume someone is uninfected (Figure 1) (2). If the pretest probability in certain community gets too high (above 50%, for example), testing loses its value because negative results cannot lower the probability of infection enough to reach the threshold (1). That is why the countries need to reduce the pretest probability estimate value by appropriate intervention including social distancing, wearing mask, hand hygiene and stay at home (1).
- The graph shows how the post-test probability of infection varies with the pretest probability for tests with low (70%) and high (95%) sensitivity. The horizontal line indicates a probability threshold below which it would be reasonable to act as if the person were uninfected

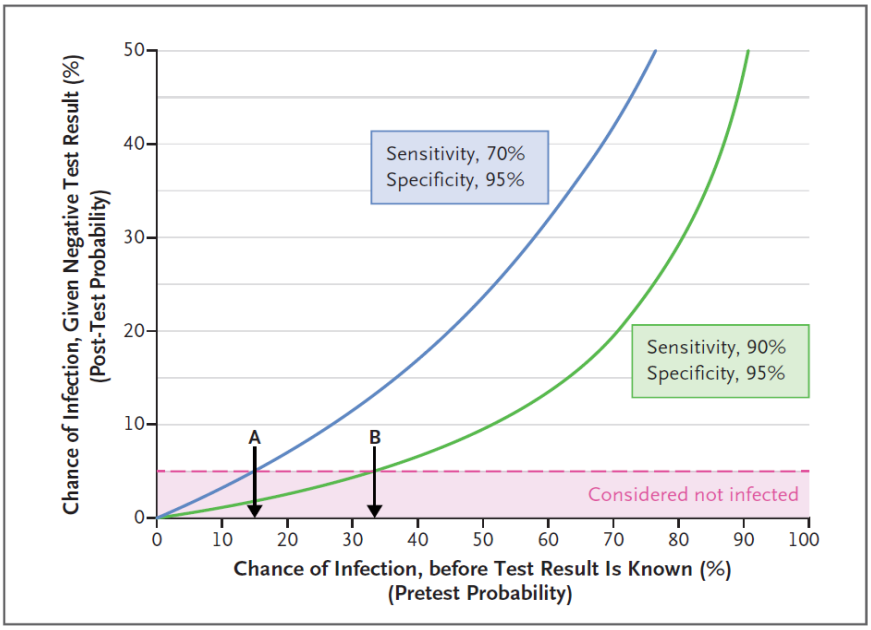

Figure 1 Chance of SARS-CoV-2 Infection, Given a Negative Test Result, According to Pretest Probability. The blue line represents a test with sensitivity of 70% and specificity of 95%. The green line represents a test with sensitivity of 90% and specificity of 95%. The shading is the threshold for considering a person not to be infected (asserted to be 5%). Arrow A indicates that with the lower-sensitivity test, this threshold cannot be reached if the pretest probability exceeds

about 15%. Arrow B indicates that for the higher-sensitivity test, the threshold can be reached up to a pretest probability of about 33%.

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1. Woloshin s et al., False Negative Tests for SARS-CoV-2 Infection — Challenges and Implications. The New England Journal of Medicine, 2020: DOI: 10.1056/NEJMp2015897
2. Watson J interpreting a COVID 19 test result. BMJ 2020;369:m1808 doi: 10.1136/bmj.m1808
3. Arevalo-Rodriguez I, Buitrago-Garcia D, Simancas-Racines D, et al. False-negative results of initial RT-PCR assays for COVID-19: a systematic review. April 21, 2020 https://www.medrxiv.org/content/10.1101/2020.04.16.20066787v1.full.pdf)

Face Masks in the Fight against COVID-19

- Face masks are critical non-pharmaceutical interventions in the fight against COVID-19. In conjunction with existing hygiene, distancing, and contact tracing strategies they have a paramount effectiveness in reducing death toll.

- They are good protections when infectious patients that shows few or no symptoms and who may not realize that they are infected are in the community. However, mask wearing is most effective at reducing spread of the virus and the death toll when public compliance is high.

- Mask wearing also has been shown to reduce the transmission of tuberculosis. Similarly, influenza transmission in the community declined by 44% in Hong Kong after the implementation of changes in population behaviors, including social distancing and increased mask wearing, enforced in most stores, during the COVID-19 outbreak.

- When wearing masks people will tend to develop risk compensation behavior in which they ignore or become less compliant to other preventive measures. This involves neglecting other important preventative measures like physical distancing and hand washing because of misunderstanding of the protection a surgical mask offer or due to an exaggerated or false sense of security.

- The goal of healthcare policy and response in the struggle to contain COVID-19 pandemic is to have an aggregate effect of reducing the effective reproduction number Re to below 1. Efficacy of face masks within community interventions would have an aggregate effect on reducing the reproduction number. If everyone is wearing masks to decrease the chance that they themselves are unknowingly infecting someone, everyone ends up being protected.

- Multiple studies show the filtration effects of cloth masks relative to surgical masks. Particle sizes for speech are on the order of 1 µm while typical definitions of droplet size are 5 µm-10 µm. Generally available household fabrics have between a 49% and 86% filtration rate for 0.02 µm exhaled particles whereas surgical masks filtered 89% of those particles.

- In line with these concepts, a full range of efficacy *e* and adherence *pm* is shown with the resulting *Re* in Figure 1 below, illustrating regimes in which growth is dramatically reduced (*Re* < 1) as well as pessimistic regimes (e.g. due to poor implementation or population compliance) that nonetheless result in a beneficial effect in suppressing the exponential growth of the pandemic.

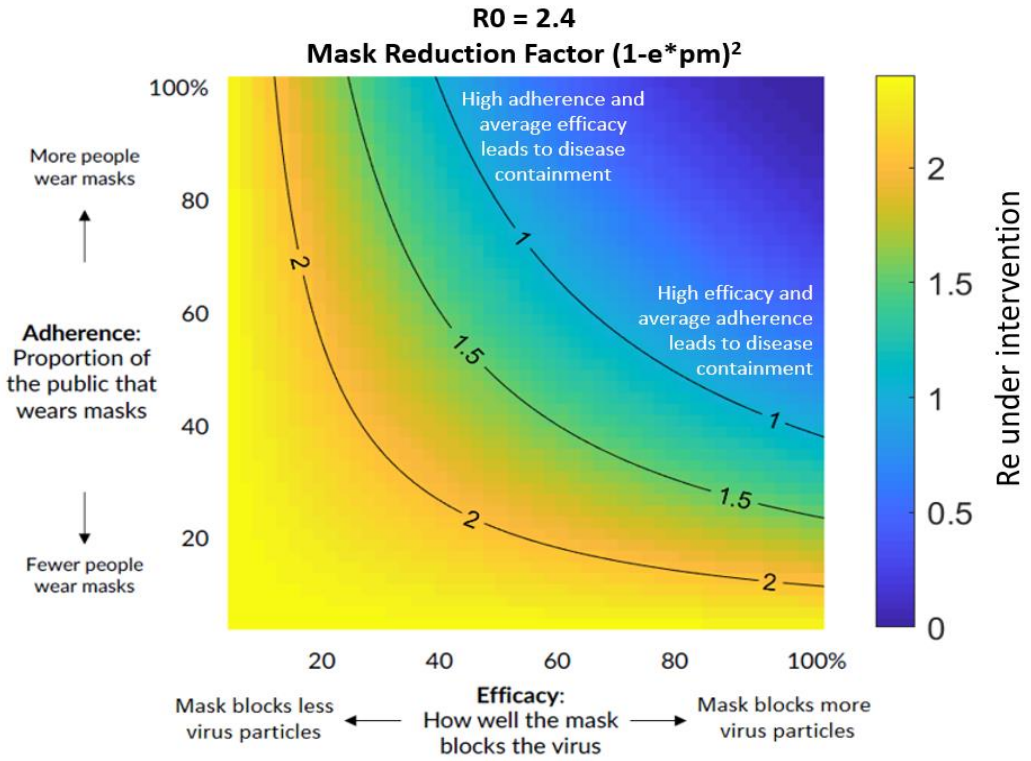

Fig. 1. Impact of public mask wearing under the full range of mask adherence and efficacy scenarios. The color indicates the resulting reproduction number *Re* from an initial R_0 of 2.4. Blue area is what is needed to slow the spread of COVID-19. Each black line represents a specific disease transmission level with the effective reproduction number Re indicated. An *Re* below 1, if sustained, will lead to the outbreak ending.

- Based on these mask adherence and efficacy scenarios an assessment applied to the COVID-19 estimated R_0 of 2.4, postulates 50% mask usage and a 50% mask efficacy level, reduces R_e to 1.35, an order of magnitude rendering a spread comparable to the reproduction number of seasonal influenza.

- To put this in perspective, 100 cases at the start of a month become 31,280 cases by the month's end (R_0 = 2.4) vs. only 584 cases (R_e = 1.35). Such a slowdown in case-load protects healthcare capacity and renders a local epidemic amenable to contact tracing interventions that could eliminate the spread of the virus entirely.

Reference:

Howard, J., et. al. Face Masks Against COVID-19: An Evidence Review. DOI: 10.20944/preprints202004.0203.v1