EPHI, National Data Management Center for health (NDMC) Quick update on COVID 19, 016

| This update summarizes	Ethiopia's COVID-19 situation update
	Global and regional buden of COVID 19
	Demography, Social Contact and the Health systems
	Update on Development of an mRHA vaccine against SARS-CoV2
	Global Evidence on Determinants of Public Trust in Governments during the COVID-19 pandemic

Critical reflection: *COVID-19 pandemic appears plateauing in Sudan, Djibouti & Somalia (fig 3). It is very different from what have been seen in the other part of the world if the data is true. Further exploration could benefit future Ethiopia's pandemic response.*

Ethiopia's COVID-19 situation update

As of July 30, 2020 there were a total of 15,810 COVID-19 cases and 253 deaths across the country. Compared to the cases and deaths reported a week ago, the cumulative case has increased by 24% and cumulative deaths by 22%. So far 6,685 cases have recovered from COVID-19 (Fig 1). Of the 8, 936 active cases, 66 are critical. The total number of tests stands at 403,611, showing an 11% increase compared to last week.
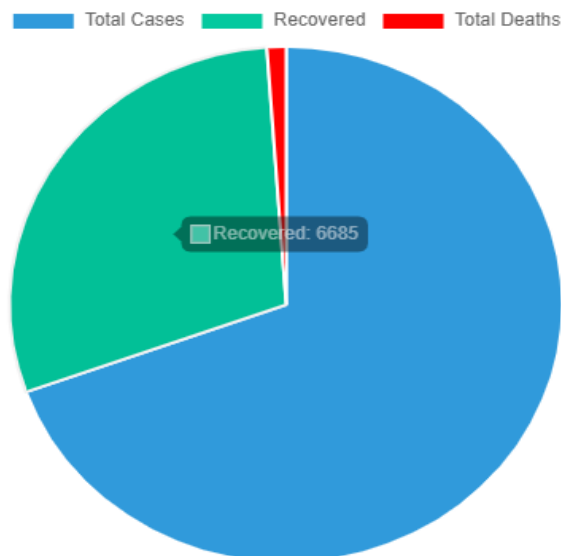
Fig. 1. Showing cumulative cases, recoveries and deaths (Source https://www.covid19.et/covid-19/*)*

**EPHI and FMOH COVID 19 response highlights of the week**

- One million laboratory commodities and one million detection kits has got custom clearance on July 28/2020.
- On July 28/2020; EPHI functionalize You Tube channel, to ease dissemination of public health information https://www.youtube.com/channelUCvvTzeYIJiQfEFBULH9Mkw.
- Health professionals working on IPC in selected transport corridor areas of Afar and Amhara regions have completed Risk communication and community engagement training on July28/2020.
- The 3rd group for a total of 21 health care workers 15 from Addis Ababa Police and 6 from INSA health facilities have completed two days basic COVID-19 training on July 28/2020
- A total of 7,341 Health Extension Workers (HEWs) and supervisors are enrolled to the Mobile based COVID-19 training and 5,856 completed the training from Addis Ababa, Afar, Amhara, Oromia, Tigray, SNNPR and Benishangul Gumuz Regions. Among these, 341 HEWs and their supervisors were enrolled and 251 completed the training on July 27/2020.
- July 27/2020; training on COVID-19 risk communication provided for 16 Mass Media professionals.
- Orientation on COVID-19 prevention and control provided, in collaboration with JHU, for 52 hotel and restaurant managers, airport quarantine coordination team and 21 media professionals working in Tigray region on July 26/2020;
- 25 Health Care workers from federal and defense force health facilities have completed five days TOT on IPC for on July 25/2020 in Addis Ababa.

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 continued to increase. As of July 30, there 17,189,752 cumulative cases, a total of 10,701,139 recoveries and 670,256 deaths since the beginning of the outbreak. Globally, in a week time, from 23 July to 30 July 2020, COVID-19 cases increased by 11.8% and deaths by 6.3%. North America is the leading in terms of cases followed by Asia and Europe. The numbers of deaths are still high in North America followed by Europe than the rest of the world (Fig 2).
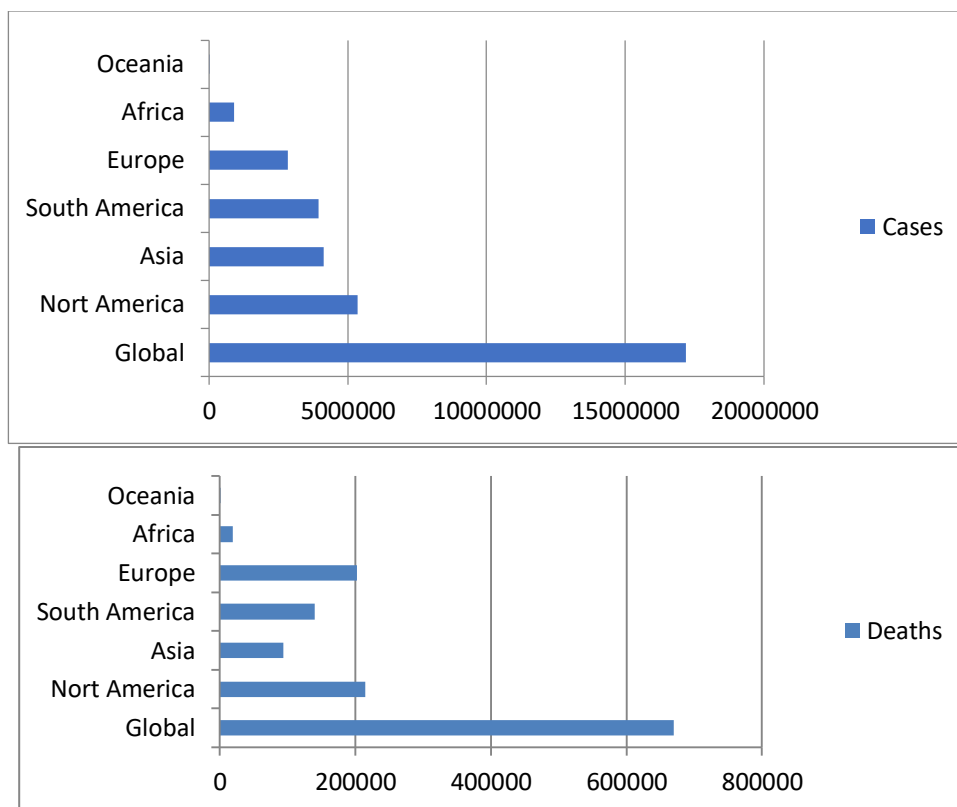
Fig 2. Global cases (top) and deaths (bottom) reported as of July 2030.

- In the USA, the increasing trend has continued. The country has recorded the highest number of cases (4,568,037 cases, 153,840 deaths) that accounts 26.6% of the total global cases and carried 23% of global deaths as of July 30, 2020.

- Brazil has continued reporting the second COVID-19 case burden in the world following USA. The number of cases in Brazil has increased in a week time by 14.5% (2,231,871 to 2,555,518) and deaths by 8.8% (82,890 to 90,188).

- India has recorded a 27.8% (1,239,684 to 1,584,384) increase in the number of cases in a week time and deaths by 17.1% (29,890 to 35,003)

- Russia has continued reporting the highest number of cases in Europe, with 828,990 cases. In general, the epidemic growth has continued to decline in Europe. Consequently, the cases numbers in most of the worst affected European countries showed insignificant increase in a week time i.e For example, Spain (from 314,631 to 329,721), UK (from 296,377 to 301,455 cases), Italy (from 245,032 to 246,776), Germany (from 204,470 to 208,811 cases) and France (from 178,336 to 185,196 cases) between 23 and 30 July, 2020.

- The share of Africa to the global COVID-19 pandemic has still been low (only 5.2% of the global cases and 2.8% of deaths as of July 30). However, within the continent the number of cases has increased by 15.7% in a week time (from 773,659 to 881,157 cases). Similarly, the

total number of deaths in Africa has increased from 16,487 to 18,604, showing a 14.7% increase in a week time. Total recoveries stand at 544,168. South Africa ranked 5th in the world in terms of cases and leading in the continent with 471,123 cases and 7,497 deaths. Egypt (with 93,356 cases, 4,728 deaths), Nigeria (with 42,208 cases, 873 deaths), Ghana (with 35,142 cases, 175 deaths), Algeria (with 29,229 cases, 1,186 deaths) and Morocco (with 22,213 cases, 334 deaths) are still on the leading pack in reporting high COVID-19 burden in Africa. (See table below)

Africa	July 23		July 30	
	Cases	Death	Cases	Deaths
South Africa	394,948	5,940	471,123	7,497
Egypt	89,745	4,440	93,356	4,728
Nigeria	38,344	813	42,208	873
Ghana	29,672	153	35,142	175
Algeria	24,872	1,111	29,229	1,186
Morocco			22,213	334

- In East African, COVID-19 cases and deaths have shown fast progress. In a week time, COVID-19 cases and deaths increased by 29.2% and 19.6% in Kenya and by , 37.2% and 34.6% in Ethiopia. As of July 30, Ethiopia and Kenya are the major drivers of the COVID 19 burden east African countries. The epidemic appear plateauing in Sudan, showing an increase of only 2.3% cases and 2.4% deaths and 1% cases and 0% death increase in Djibouti and only 1.6% cases and non-increase in death in Somalia respectively in a week time. (Fig 2).
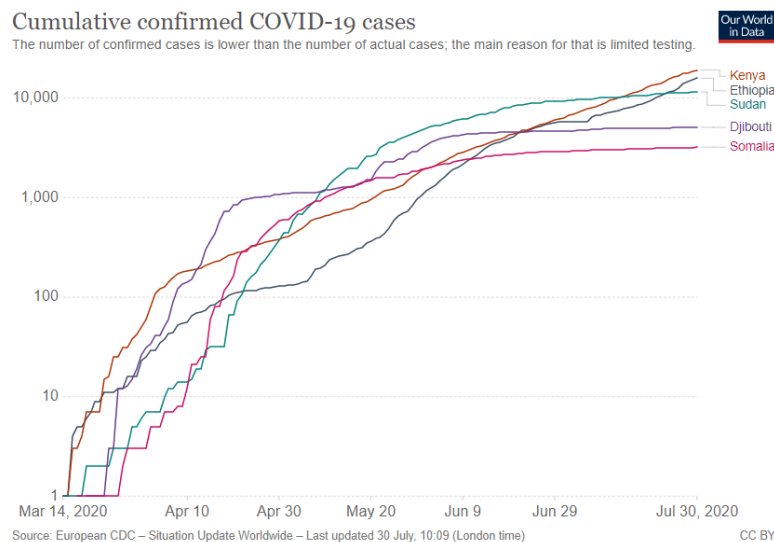
Fig 2. Cumulative COVID 19 cases in East Africa

References
1. John Hopkins, Corona Virus Resources **https://coronavirus.jhu.edu/map.html**
2. Worldometer, Corona Virus **https://www.worldometers.info/coronavirus/**
3. Africa CDC: COVID 19 Surveillance; https://au.int/covid19

Demography, Social Contact and the Health systems

- The global community is experiencing an ongoing COVID-19 pandemic as the worst threat to public health in history. There are many uncertainties about the spread of Severe Acute Respiratory Syndrome - Coronavirus – 2 (SARS-CoV-2), which causes the respiratory illness COVID-19. Understanding demographic, social contact and health systems patterns are crucial to clear out some of the uncertainties and to design strategies for reducing the spread of COVID-19.

- A study which combines data on demography, contact patterns, disease severity and health care capacity and quality to understand the impact of COVID-19 and inform strategies for its control, found that low income countries younger populations may reduce overall risk of the pandemic as these countries have small proportion of populations above 65 years old.

- This implies that the demand for critical care in lower income settings due to their younger populations will also be low. Though the demand for critical care is low and younger populations in lower income countries may reduce overall risk, limited health system capacity and poor quality of health care coupled with closer inter-generational contact largely negates the benefit of reducing the overall risk.

- Many lower income countries have acted earlier and responded and continue to respond to contain the virus. Nevertheless, mitigation strategies that slow but do not interrupt transmission of the virus will still lead to COVID-19 rapidly overwhelm poor health systems with substantial excess deaths. Hence mitigation strategies need to be maintained or triggered more frequently along with actions to interrupt the transmission of the virus and to keep the impact below available health capacity.

- The study also considers another factor in low income countries which is a household. The study stresses that a household is a key setting for SARS-CoV-2 transmission. The average size of households that have a resident over the age of 65 years is substantially higher in lower income countries compared with middle- and high-income countries. Generally, this increases the potential for the spread of the disease but specifically to this particular vulnerable age-group.

- The study further explains that contact patterns between age-groups differ by country. In high-income settings the number of contacts tends to decline sharply with age. This effect is more moderate in middle-income settings and disappears in low-income settings which indicate that elderly individuals in low and middle income settings maintain higher contact rates with a wider range of age-groups compared to elderly individuals in high-income countries. These contact patterns influences the infection attack rate across age-groups with higher attack rates in the elderly in low-income settings compared to high and middle-income settings.

- The study also estimates infection rate in comorbid conditions using GBD 2017 data and found that unmitigated situation of the disease could lead to 6.1%, 3.8% and 13.3% of

SARS-CoV-2 infections occurring in individuals with cardiovascular disease, chronic obstructive pulmonary disease and diabetes respectively.

- The study states that in the context of high uncertainties about the disease and in relation to these non-communicable diseases as risk factor, it is also good to look into situations of infectious diseases. In younger populations infectious disease are predominant and understanding the extent to which these potential comorbidities make younger populations more vulnerable to severe sequalae of COVID-19 and designing strategies to protect them will be important in adapting pandemic responses to lower income countries.

- In summary, in the absence of vaccine, all governments are likely to face challenging decisions around intervention strategies. Therefore, rapid, decisive and collective actions which consider demography, contact patterns, comorbidities and health systems remains critical to save lives globally. In the foreseeable future COVID-19 will chronically affect the healthcare systems and populations will be needing health care at any given time which means concerted efforts are needed to continue post-pandemic.

Reference:
Walker[1] Patrick G. T., Whittaker Charles, Watson Oliver J., Baguelin Marc, Winskill[1] Peter, Hamlet Arran, Djafaara Bimandra A. The impact of COVID-19 and strategies for mitigation and suppression in low- and middle-income countries. *Science* 24 Jul 2020, Vol. 369, Issue 6502, pp. 413-422   DOI: 10.1126/science.abc0035

Update on Development of an mRHA vaccine against SARS-CoV2

- The urgent need for vaccines prompted an international response, with more than 120 candidate SARS-CoV-2 vaccines underdevelopment just in the first 6 months of 2020. One of these candidates is mRNA-1273 vaccine.

  o The candidate mRNA-1273 vaccine is a lipid nanoparticle encapsulated, nucleoside modified messenger RNA (mRNA) based vaccine that encodes the SARS-CoV2 spike (S) glycoprotein stabilized in its perfusion conformation.
  o The S glycoprotein part of SARS CoV2 mediates host cell attachment and is required for viral entry. It is the primary vaccine target for many candidate SARS-CoV2 vaccines.
  o The mRNA-1273 candidate vaccine, manufactured by Moderna, encodes the S-2P antigen, consisting of the SARS-CoV-2 glycoprotein with a trans-membrane anchor and an intact S1–S2 cleavage site.
  o The phase I trial for Moderna mRNA-1273 vaccine was conducted at the Kaiser Permanente Washington Health Research Institute in Seattle and at the Emory University School of Medicine in Atlanta
  o Phase 1, dose-escalation, open-label clinical trial designed to determine the safety, reactogenicity, and immunogenicity of mRNA-1273. Eligible participants were healthy adults 18 to 55 years of age who received two injections of trial vaccine 28 days apart at a dose of 25 μg, 100 μg, or 250 μg.
  o The author reported that there was no serious adverse events noted, and no pre-specified trial halting rules were met

- o After the first vaccination, solicited systemic adverse events were reported by 5 participants (33%) in the 25-µg group, 10 (67%) in the 100-µg group, and 8 (53%) in the 250-µg group; all were mild or moderate in severity.
- o Solicited systemic adverse events were more common after the second vaccination and occurred in 7 of 13 participants (54%) in the 25-µg group, all 15 in the 100-µg group, and all 14 in the 250-µg group, with 3 of those participants (21%) reporting one or more severe events
- o Binding antibody IgG geometric mean titers (GMTs) to S-2P increased rapidly after the first vaccination, with sero-conversion in all participants by day 15
- o The S-2P ELISA GMTs at day 57 (299,751 [95CI (206,071 - 436,020)] in the 25-µg group, 782,719 [95% CI, (619,310 - 989,244)] in the 100-µg group, and 1,192,154 [95% CI, (924,878-1,536,669)] in the 250-µg group)
- o Neutralizing antibody response after the first vaccination, were detected in less than half the participants, and a dose effect was seen (50% inhibitory dilution [ID_{50}]
- o After the second vaccination, neutralizing antibody responses were identified in serum samples from all participants. The lowest responses were in the 25-µg dose group, with a geometric mean ID_{50} of 112.3 [(95% CI, 71.2 -177.1)] at day 43. The higher responses in the 100-µg and 250-µg groups were similar in magnitude (geometric mean ID_{50}, 343.8 [95% CI, (261.2 -452.7)] and 332.2 [95% CI, (266.3-414.5)] respectively at day 43.

- The authors concluded that mRNA-1273 vaccine induced anti–SARS-CoV-2 immune responses in all participants, and no trial-limiting safety concerns were identified

References
Jackson L et al., An mRNA Vaccine against SARS-CoV-2 — Preliminary Report. The New England Journal of Medicine, July 2020; DOI: 10.1056/NEJMoa2022483

Global Evidence on Determinants of Public Trust in Governments during the COVID-19 pandemic

- Using the Worldwide COVID-19 attitudes and beliefs dataset covering 108,918 respondents from 178 countries, the brief examines the determinants of public trust in governments during the COVID-19 using two measures of Trust
  - o Truthfulness of Government Communication (TGC) and Trust in Government (TIG).
- TGC measure captures the responses to the question, "How much do you trust your country's government to take care of its citizens?" and TIG captures the answers to the question, "How factually truthful do you think your country's government has been about the coronavirus outbreak?"

- Healthy people trust their governments more and people with poor health condition have less trust to their governments during the COVID-19. Giving that COVID-19 is a health crisis in the early stages, governments should focus on the most vulnerable people. At this stage, more incentives on health expenditures and higher effectiveness in health care for people with poor health conditions can increase the level of trust in governments.

- In general people with higher education have less trust to their governments. Governments should provide consistent, credible, and transparent communication about the COVID-19 developments. Moving the communication channels to different news platforms could enhance the public interest & help to gain the trust from educated people.

- With respect to age, as age increases public trust in governments also increases. This evidence also means that young people have less trust to their governments. Therefore, there is a significant divergence among the generations in terms of trust in governments during the COVID-19. Redistribution among generations can help to increase public confidence in government.

- Income is negatively correlated to TGC and TIG, as income increases trust decrease.

- Number of household, being married, and identifying as male are positively correlated to TGC and TIG, although it is statistically less significant.

- Determinants of public trust in governments are robust to consider the states at different stages of economic development as well to varying levels of globalization, institutional quality, and the freedom of the press.

Reference

Giray Gozgor, 2020. "Global Evidence on the Determinants of Public Trust in Governments during the COVID-19," CESifo Working Paper Series 8313, CESifo.https://ideas.repec.org/p/ces/ceswps/_8313.html