

## **EPHI, NATIONAL DATA MANAGEMENT CENTER FOR HEALTH (NDMC):- QUICK UPDATE ON COVID-19, 055<sup>th</sup>**

### **This update summarizes:**

- ***ETHIOPIA'S COVID-19 SITUATION UPDATE.***
- ***GLOBAL AND REGIONAL BURDEN OF COVID-19.***
- **SILENT HYPOXIA IN COVID-19: PATHOMECHANISM AND POSSIBLE MANAGEMENT STRATEGY.**
- **COVID-19 CONTINUES TO DISRUPT ESSENTIAL HEALTH SERVICES IN 90% OF COUNTRIES.**
- **THE POTENTIAL PUBLIC HEALTH AND ECONOMIC VALUE OF A HYPOTHETICAL COVID-19 VACCINE IN THE UNITED STATES**

### **ETHIOPIA'S COVID-19 SITUATION UPDATES.**

- Since the last brief (22 April 2021), 8,804 new confirmed corona virus disease 2019 (COVID-19) cases and 165 new deaths have been reported nationally. To date, a total of 255,288 COVID-19 cases and 3,639 related deaths (case fatality rate (CFR): 1.43) have been reported from 9 regions and 2 city administrations in the country. Compared to the cases and deaths reported a week ago, the national cumulative case and deaths showed increment by 2% and 3% respectively.
- The distribution of cumulative cases by region is top in Addis Ababa (165,858) followed by Oromia (35,310). Over the last seven days, top new case reporting regions were Addis Ababa and Oromia region, each reported more than 4k and 1k new cases respectively. Those two top reporting regions account for 81.1 % of new cases identified over the week (Fig 1).
- There are 56,163 active cases currently, of which 940 (1.67%) of them are critical. So far 196,424 cases have recovered from COVID-19, out of which 12,492 recoveries were over the last one week period which increased by 5% compared to the last week (Fig 2).
- The total number of tests done to date is 2,568,346 showing a 1% increase compared to last week. Among 46,742 laboratory samples tested over the last one week duration, 8,804 of them tested positive for COVID-19, yielding a positivity rate of 18.8%.

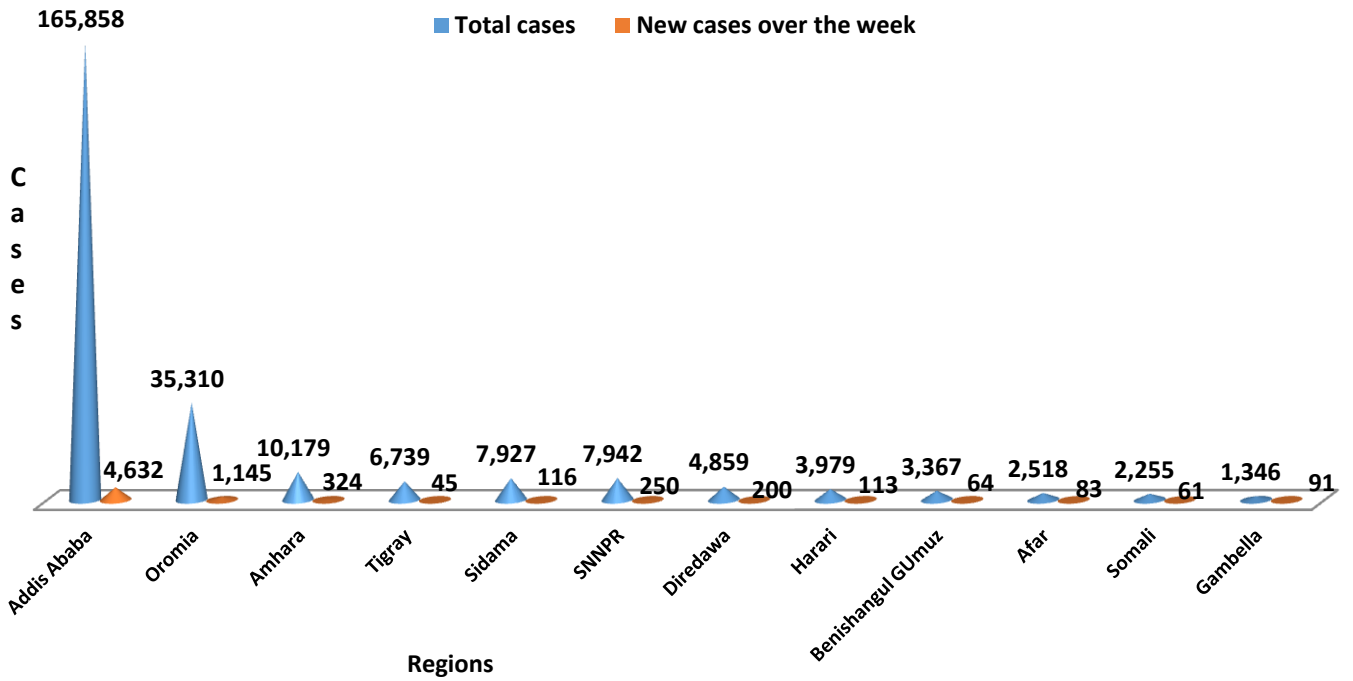


Fig1: Total cases and new cases (over a week time) by region.

- The highest single day positivity rate within the last week was recorded in Sidama (81%), while the least was in Benishangul-Gumuz (2%). In Addis Ababa and Oromia, where the top new case reporting regions over the week, the highest single day positivity rate was 21% and 49% respectively.

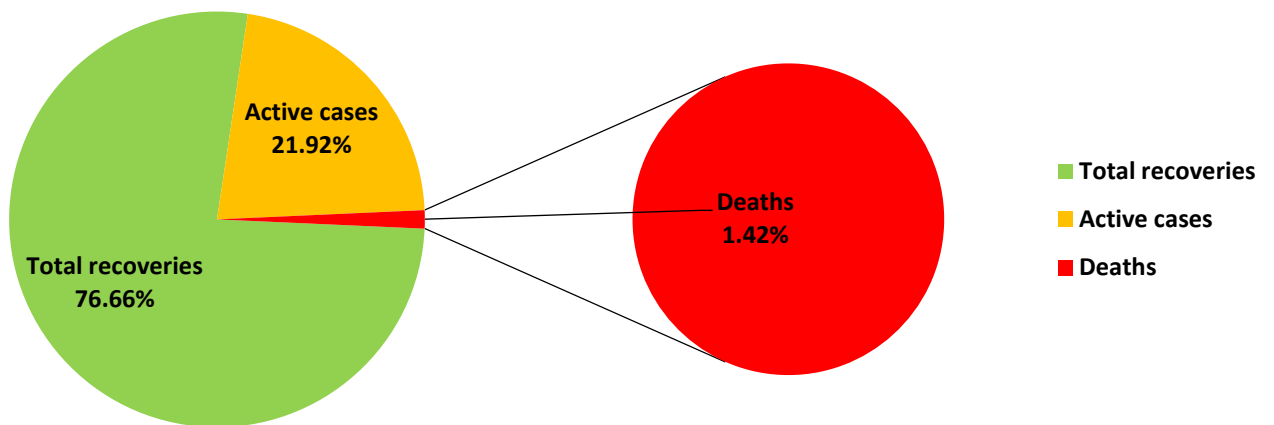


Fig 2: Proportions of active cases, recoveries and death as of April 22, 2021.

### **Case Management and Infection Prevention Control (Ipc).**

- There are total of 55, 223 active cases in the country currently as of April 29, 2021
- This week, April 23- April 29, 2021, there are 9,564 newly recovered cases bringing the total number of COVID-19 recovered cases to 196, 424
- There are 940 patients in severe condition as of April 29, 2021 and all the other patients are on medical care in stable condition

### **Home Based Isolation and Care (HBIC).**

Since Home Based Isolation and Care (HBIC) is started in Ethiopia:

- A total 163, 093 COVID-19 confirmed cases are followed in the HBIC as of April 29, 2021.
- 144,684 of them have recovered in the HBIC as of April 29, 2021.
- 19,614 cases are currently on HBIC.
- 29 COVID-19 related deaths have occurred in the HBIC.
- 2012 cases have been transferred from treatment centers to HBIC.  
705 cases have been transferred from HBIC to treatment centers.

### **EPHI and FMOH COVID 19 response highlights of the week /trainings and supply.**

- There is on-going distribution of PPE, Viral Transport Media (VTM), swabs, pharmaceuticals and other medical supplies to isolation and treatment centers.

### **References**

1. *Public Health Emergency Operations Centers (PHEOC), Ethiopia.*
2. [https://twitter.com/lia\\_tadesse](https://twitter.com/lia_tadesse).
3. <http://www.covid19.et/covid-19/>.
4. *EPHI's PHEM daily COVID-19 SITREP report.*

### **GLOBAL AND REGIONAL BURDEN OF COVID-19.**

- Globally the total number of cases is extended to 150,242,628 as of April 29, 2021. A total of 128,304,355 cases recovered and 3,164,170 people died since the beginning of the outbreak. Globally, in a week time, from April 22 to April 29, 2021, COVID-19 cases increased by 4% and deaths by 3%. In the past week, Europe was the leading in terms of cases followed by Asia and North America. Europe continued to be became a lead in terms of the number of deaths followed by North and South America (Table 1).

Table 1. Cases and deaths in selected global countries reported as of April, 2021.

	<b>COVID cases</b>	<b>Weekly % change</b>	<b>Deaths</b>	<b>Weekly % change</b>
Global	150,242,628	4.0	3,164,170	3.0
Europe	44,300,021	2.3	1,008,082	2.2
North America	38,177,095	1.3	859,325	1.0
Asia	38,500,759	9.6	510,498	6.7
South America	24,629,090	3.6	663,606	4.4
Africa	4,572,189	1.6	121,452	1.9
Oceania	62,753	1.3	1,192	0.7

- USA has recorded the highest number of cases 1.2% (32,602,051 to 32,983,695 cases) and 0.9% (583,330 to 588,337 deaths) that accounts 22% of the total global cases and carried 18.6% of global deaths as of April 29, 2021.
- India is the 2<sup>nd</sup> highest in terms of cases in a week time by 15.4% (15,930,965 to 18,376,524) and deaths by 10.9% (184,672 to 204832.0).
- Brazil became the 2<sup>3d</sup> rand worldwide with increased number of cases in a week time by 2.8% (14,122,795 to 14,523,807) and deaths by 4.4% (381,687 to 398343.0).
- France ranked 4<sup>th</sup> globally with 5,565,852 cases and 103918.0 deaths.
- Russia ranked 5<sup>th</sup> globally replaced France with 4,787,273 cases and 109367.0 deaths.
- The line share of Africa to the global COVID-19 pandemic was 3% and 3.8% of the global cases and deaths as of April 29). The cases in the continent have increased by 1.6% in a week time (4,501,027 to 4,572,189 cases). Similarly, the total number of deaths in Africa has increased from 119,230 to 121,452 showing 1.9%. Total recoveries stand at 4,095,129.
- South Africa is the leading in the continent with 1,578,450 cases and 54,285 deaths. Morocco (510,465 cases, 9,015 deaths), Tunisia (305,313 cases, 10,563 deaths), Ethiopia (255,288 cases, 3,639 deaths) and Egypt (225,528 cases, 13,219 deaths) are the most four leading countries next to South Africa in reporting COVID-19 cases in Africa. (See table below).

Table 2. Cases and deaths in selected African countries reported as of April, 2021.

Africa	April 22		April 29	
	Cases	Deaths	Cases	Deaths
South Africa	1,569,935	53,940	1,578,450	54,285
Morocco	507,338	8,969	510,465	9,015
Tunisia	291,833	9,993	305,313	10,563
Ethiopia	246,484	3,474	255,288	3,639
Egypt	218,902	12,866	225,528	13,219

- In East African, COVID-19 cases and deaths have shown fast progress. As of March, Ethiopia and Kenya continued to be the major drivers of the COVID 19 burden in east African countries.

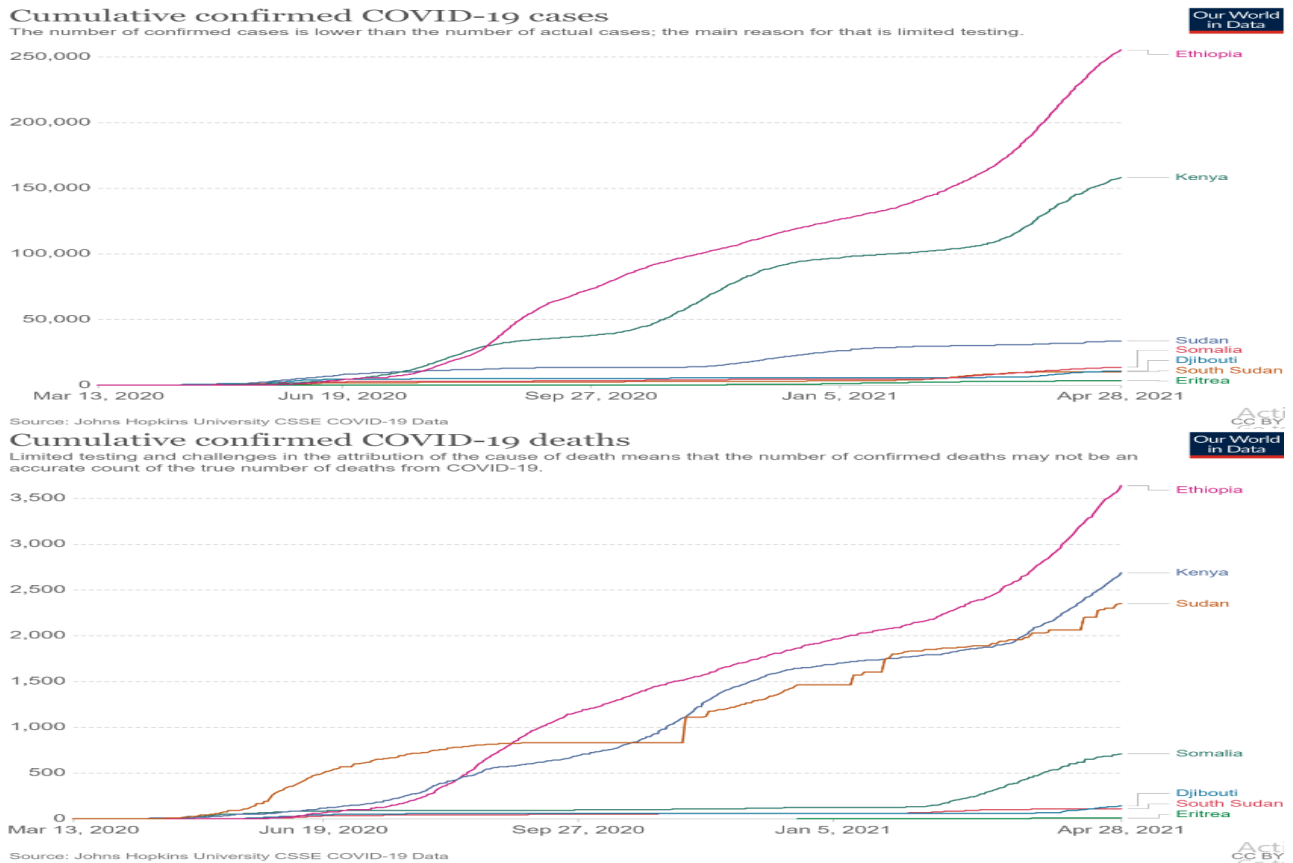


Figure 3: Cases (top) and deaths (bottom) in selected African countries reported as of April, 2021.

## 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>
4. Our World: <https://ourworldindata.org/covid-cases>

## SILENT HYPOXIA IN COVID-19: PATHOMECHANISM AND POSSIBLE MANAGEMENT STRATEGY.

- Silent hypoxia in SARSCoV-2 infected patients can be diagnosed with the help of a pulse oximeter, blood gas levels, and a 6-min walking test. The novel coronavirus pandemic caused by the SARSCoV-2 has affected people with different health conditions around the globe, but patients that develop silent hypoxia due to viral pathomechanism are possibly the worst sufferers.
- The underlying symptoms of a COVID-19 associated silent hypoxia slightly differ from that of normal hypoxia. Unlike normal hypoxic patients, patients with silent hypoxia do not experience any tachypnoea or dyspnoea. This does more damage to the patients by providing a short spanned feeling of comfort but long-lasting severe damage to the lungs. Several reports seem to suggest that silent hypoxia is well prevalent in COVID-19 patients but the reason behind this phenomenon is yet to be properly understood.
- There are several factors associated with silent hypoxia and COVID-19 infection. Some of underlying factors are (i) silent hypoxic COVID-19 patients having a slightly increased level of carbon dioxide (~34–41 mm Hg, while the normal blood carbon dioxide concentration is ~22–29 mm Hg). The alteration in carbon dioxide level triggers a hypoxia threshold resulting in precipitation of the lung damage indicator of dyspnoea symptoms. Whereas in normal hypoxic conditions, even minute imbalance in the PaCO<sub>2</sub> levels rapidly evokes large increases in minute ventilation and brief respiratory alkalosis, which provokes dyspnoea. However, normal hypoxia-induced dyspnoea does not evoke a stronger and excessive volume like hypercapnia does. This might be the reason for COVID-19 patients not showing any sign of distress even during the low oxygen saturation level; (ii) the virus having an impact on the brain and nervous system; altering the mechanisms in our brain responsible for regulating respiration; (iii) the virus having an effect on blood vessels and causing “lack of hypoxic

vasoconstriction”; (iv) undergoing hyper-fusion within a lung that has already gone through respiratory damage ; (v) fever caused by COVID-19 having a role in silent hypoxia

- The hypoxic condition can cause severe endothelial damage and contribute to the “cytokine storm”, the characteristic feature of COVID-19 infection, further increasing the damage to body cells. Moreover, the virus also has the potential to increase localized inflammation through combined innate and adaptive immunity and cause the overexpression of Hypoxia-Inducible Factor (HIF) further inducing hypoxic condition in the lungs. All these responses can cause severe damage to several body tissues and ultimately lead to life-threatening situations in the COVID-19 patients. Since the patients with silent hypoxia do not feel any discomfort even when their oxygen saturation level is low, they need to be taken under a strict management process. Without continuous monitoring, it could turn out to be detrimental for the patient and might end up damaging respiratory organs and several other tissues.
- When a patient is diagnosed with COVID-19, he/ she must go through a diagnosis of silent hypoxia immediately with a pulse oximeter, blood gas analysis, or other procedures. For proper management, COVID-19 patients diagnosed with silent hypoxia should be under intensive care including monitoring vital signs of disease severity, oxygen saturation levels, visual signs of discomfort, and deterioration in health conditions.

#### Reference

1. Rahman A, Tabassum T, Araf Y, et al. Silent hypoxia in COVID-19: pathomechanism and possible management strategy. *Mol Biol Rep.* 2021 Apr 23:1–7. Available from <https://pubmed.ncbi.nlm.nih.gov/33891272/>

#### **COVID-19 CONTINUES TO DISRUPT ESSENTIAL HEALTH SERVICES IN 90% OF COUNTRIES.**

- The second round of a World Health Organization “pulse survey“ reveals that over one year into the COVID-19 pandemic, substantial disruptions persist, with about 90% of countries still reporting one or more disruptions to essential health services, marking no substantial global change since the first survey conducted in the summer of 2020.
- Within countries, however, the magnitude and extent of disruptions has generally decreased. In 2020, countries reported that, on average, about half of essential health services were disrupted. In the first 3 months of 2021, however, they reported progress, with just over one third of services now being disrupted.

## **Overcoming disruptions**

- Countries have been working to mitigate disruptions. Many have now stepped up communications efforts to inform the public about changes to service delivery and provide advice about ways to safely seek health care. They are also triaging to identify and better meet the most urgent patient needs.
- More than half the countries consulted say they have recruited additional staff to boost the health workforce; redirected patients to other care facilities; and switched to alternative methods to delivering care, such as providing more home-based services, multi-month prescriptions for treatments, and increasing the use of telemedicine.

## **Persisting causes of disruptions**

- Countries still have to make important decisions when responding to COVID-19 that may negatively affect access to care for other health issues. Redeployment of staff to provide COVID-19 relief and temporary closures of health facilities and services continue.
- Although they may have taken on new staff, 66% of countries continue to report health workforce-related reasons as the most common causes of service disruptions. Supply chains are also still disrupted in nearly one third of countries, affecting the availability of essential medicines, diagnostics, and the PPE needed to safely and effectively provide care.
- Communications efforts need to be further scaled up: more than half of countries report service disruptions due to patients not seeking care and because of community mistrust and fears of becoming infected. Meanwhile, 43% of countries cite financial challenges as major causes for disruptions in service utilization.
- As a result, millions of people are still missing out on vital health care. In terms of services, the biggest impact reported by nearly half of countries is on provision of day-to-day primary care to prevent and manage some of the most common health problems. Long-term care for chronic conditions, rehabilitation, and palliative end-of-life care, is also still badly disrupted - severely affecting older people and people living with disabilities.
- Potentially life-saving emergency, critical and surgical care interventions are still disrupted in about 20% of countries, reflecting the most immediate indirect consequences of the pandemic. Two thirds of countries also report disruptions in elective surgeries, with accumulating consequences as the pandemic is prolonged.



- Among the most extensively affected health services (i.e. those for which more than 40% of countries are reporting disruptions) are those for mental, neurological and substance use disorders; neglected tropical diseases; tuberculosis; HIV and hepatitis B and C; cancer screening, and services for other noncommunicable diseases including hypertension and diabetes; family planning and contraception; urgent dental care; and malnutrition.
- Issued ahead of World Immunization Week (which starts 24 April) and World Malaria Day (25 April) the survey reveals that serious gaps also remain in addressing disruptions to services in both these areas. More than one third of countries are still reporting disruptions to immunization services, despite progress in countries reducing disruptions to immunization services in health facilities and “outreach” immunization services by about 20% and 30% respectively compared to 2020. This highlights the need for new and sustained approaches to improving immunization coverage and uptake.
- Meanwhile, nearly 40% of countries are also reporting disruptions to one or more malaria services. While progress compared to 2020 – with about 10% fewer countries reporting disruptions to malaria diagnosis and treatment and 25-33% fewer countries reporting disruptions to malaria prevention campaigns (including distribution of long-lasting insecticide impregnated bed nets, indoor spraying and seasonal malaria chemoprevention), the reported level of disruption is still significant and needs to be urgently addressed.

## Reference

1. *COVID-19 continues to disrupt essential health services in 90% of countries* [Internet]. [cited 2021 Apr 29]. Available from: <https://www.who.int/news/item/23-04-2021-covid-19-continues-to-disrupt-essential-health-services-in-90-of-countries>.

## **THE POTENTIAL PUBLIC HEALTH AND ECONOMIC VALUE OF A HYPOTHETICAL COVID-19 VACCINE IN THE UNITED STATES: USE OF COST-EFFECTIVENESS MODELING TO INFORM VACCINATION PRIORITIZATION.**

- Researchers have been working at unprecedented speed to develop a SARS-CoV-2 vaccine. Here this study assesses the value of a hypothetical vaccine and its potential public health impact when prioritization is required due to supply constraints.

- A Markov cohort model was used to estimate COVID-19 related direct medical costs and deaths in the United States (US), with and without implementation of a 60% efficacious vaccine.
- To prioritize the vaccine under constrained supply, the population was divided into tiers based on age; risk and age; and occupation and age; and outcomes were compared across one year under various supply assumptions.
- The incremental cost per quality-adjusted life-year (QALY) gained versus no vaccine was calculated for the entire adult population and for each tier in the three prioritization schemes.
- The incremental cost per QALY gained for the US adult population was \$8,200 versus no vaccination.
- For the tiers at highest risk of complications from COVID-19, such as those ages 65 years and older, vaccination was cost-saving compared to no vaccination.
- The cost per QALY gained increased to over \$94,000 for those with a low risk of hospitalization and death following infection.
- Results were most sensitive to infection incidence, vaccine price, the cost of treating COVID-19, and vaccine efficacy.
- Under the most optimistic supply scenario, the hypothetical vaccine may prevent 31% of expected deaths. As supply becomes more constrained, only 23% of deaths may be prevented.
- In lower supply scenarios, prioritization becomes more important to maximize the number of deaths prevented.
- A COVID-19 vaccine is predicted to be good value for money (cost per QALY gained <\$50,000). The speed at which an effective vaccine can be made available will determine how much morbidity and mortality may be prevented in the US.

## References

1. *The potential public health and economic value of a hypothetical COVID-19 vaccine in the United States: Use of cost-effectiveness modeling to inform vaccination prioritization.* *Vaccine.* 2021 Feb 12;39(7):1157-1164. doi: 10.1016/j.vaccine.2020.12.078. Epub 2021 Jan 6. PMID: 33483216; PMCID: PMC7832653.