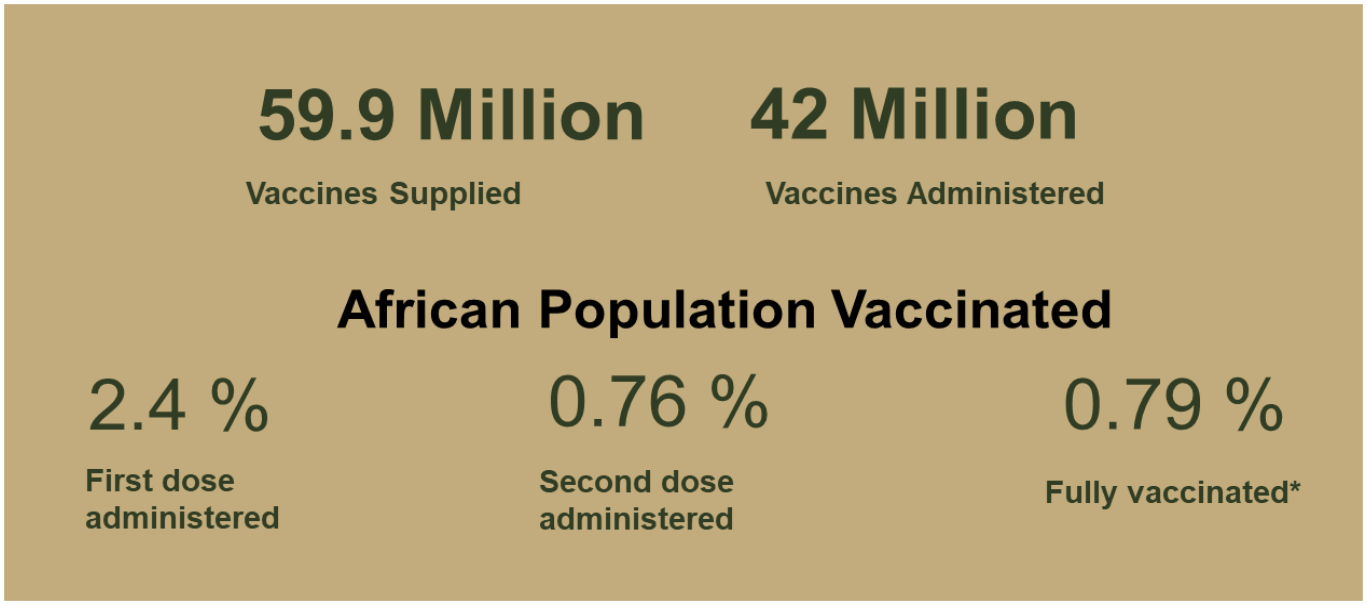
COVID-19 Scientific and Public Health Policy Update[1] – (22 June 2021)

In addition to the Weekly Outbreak Brief and other documents on the spread of COVID-19 and the actions that the African Union/Africa CDC and WHO/AFRO are taking to help African Union Member States, we share a biweekly brief detailing the latest developments in scientific knowledge and public health policy from around the world, as well as updates to the latest guidance from Africa CDC, WHO and other public health agencies. Contents of this document are not intended to serve as recommendations from the African Union-Africa CDC or WHO/AFRO; rather, it is a summary of the scientific information available in the public space to Member States. It is important to note that the outbreak is evolving rapidly and that the nature of this information will continue to change. We will provide regular updates to ensure Member States are informed of the most critical developments in these areas.

A. Trending Topics

Status of Vaccines in Africa

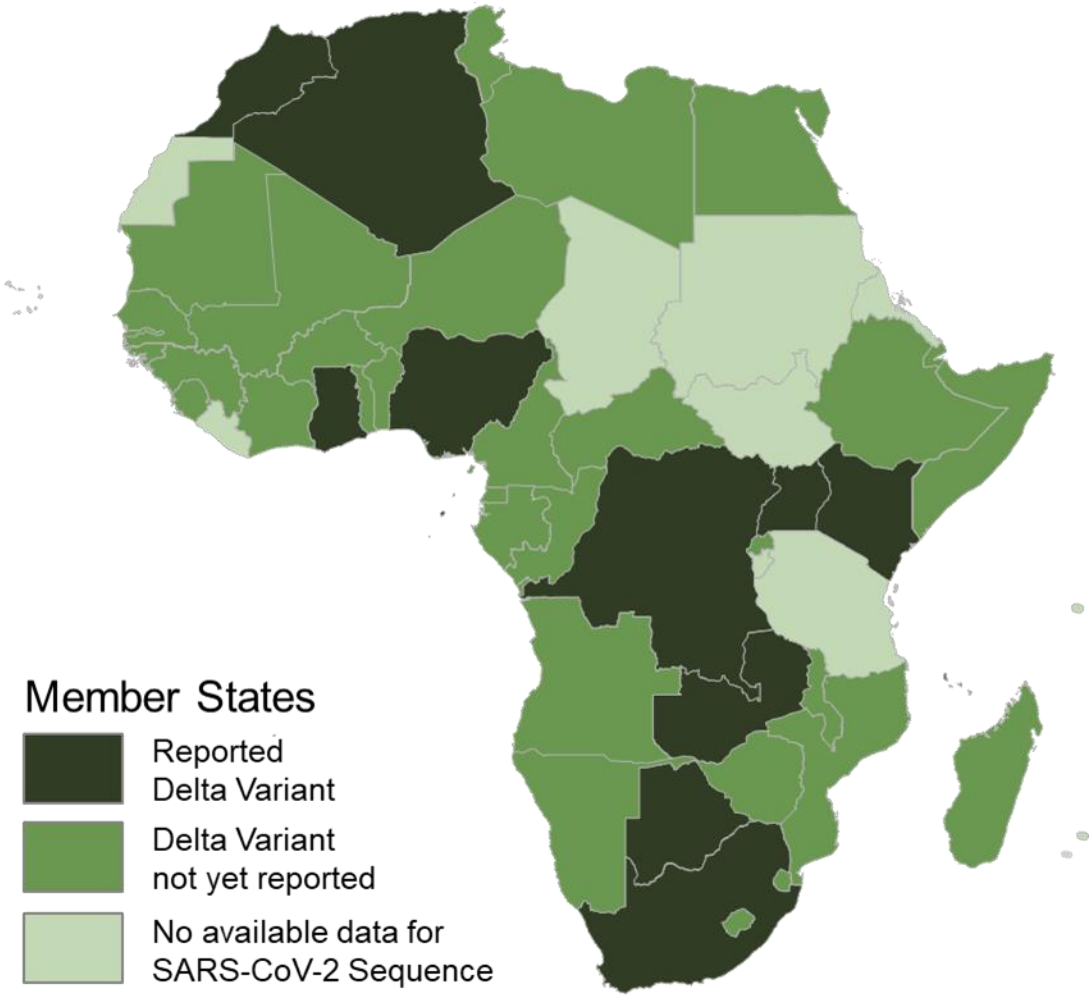


*Received two doses/ one dose of Johnson & Johnson vaccine
https://africacdc.org/covid-19-vaccination/
Updated 21 June 2021

Variants of Concern

- The B.1.617.2 (Delta variant), first reported in India, has spread to more than 80 countries worldwide; 11 Member States in Africa have reported this variant. https://africacdc.org/institutes/africa-pathogen-genomics-initiative/

[1] This update compiled for use by African Union Member States and is developed collaboratively by the African Union-Africa CDC and World Health Organization - Regional Office for Africa. **This is a preliminary summary of information and not considered policy, guidance, or final conclusions of the African Union- Africa CDC or WHO/AFRO**.



Updated 21 June 2021

B. New guidelines and resources

Since 5th June 2021,

- Africa CDC has published new guidance and resources on:
  - Handbook for Public Health Emergency Operations Center Operations and Management
  - Public Health Emergency Operations Center (PHEOC) Legal Framework Guide
  - Adapted Africa Joint Continental Strategy for COVID-19 Pandemic
- US CDC has published new guidance and resources on:
  - Testing Strategies for SARS-CoV-2
  - Interim Guidance on Breastfeeding and Breast Milk Feeds in the Context of COVID-19
  - Evaluating and Caring for Patients with Post-COVID Conditions: Interim Guidance
  - Management of Post-COVID Conditions
  - Guidance for Reporting SARS-CoV-2 Sequencing Results
  - Recommendations for Quarantine Duration in Correctional and Detention Facilities
  - Interim Guidance for SARS-CoV-2 Testing in Correctional and Detention Facilities
  - Interim Guidance on Management of Coronavirus Disease 2019 (COVID-19) in Correctional and Detention Facilities
  - Interim Guidance on People Experiencing Unsheltered Homelessness
  - Interim Guidance for Antigen Testing for SARS-CoV-2

- Considerations for Restaurant and Bar Operators
- Agriculture Workers and Employers
- Interim Laboratory Biosafety Guidelines for Handling and Processing Specimens Associated with Coronavirus Disease 2019 (COVID-19)

- WHO has published new guidance and resources on:
  - Hypertension and COVID-19
  - Interim recommendations for use of the Pfizer–BioNTech COVID-19 vaccine, BNT162b2, under Emergency Use Listing
  - Interim recommendations for the use of the Janssen Ad26.COV2.S (COVID-19) vaccine
  - Interim recommendations for use of the Moderna mRNA-1273 vaccine against COVID-19
  - Considerations for implementing and adjusting public health and social measures in the context of COVID-19
  - Technical specifications for selection of essential in vitro diagnostics for SARS-CoV-2
  - COVID-19 Vaccine Introduction and deployment Costing tool (CVIC tool)
  - Young people and COVID-19: Behavioural considerations for promoting safe behaviours

- FDA has issued press releases on:
  - As of 15th June, 384 tests and sample collection devices are authorized by the FDA under emergency use authorizations (EUAs).
  - The FDA has authorized 11 antigen tests and three molecular tests for serial screening programs.
  - The FDA has also authorized 534 revisions to EUA authorizations.
  - FDA Takes Steps to Increase Availability of COVID-19 Vaccine
  - FDA Issued authorization (EUA) for the Janssen COVID-19 vaccine, of an additional batch of vaccine drug substance manufactured at the Emergent facility.
  - On 10th June, the FDA issued a safety communication warning the public to stop using the Innova SARS-CoV-2 Antigen Rapid Qualitative Test for diagnostic use
  - FDA added sodium citrate tubes used in blood specimen collection (product codes GIM and JKA) to the testing supplies and equipment–specimen collection category on the device shortage list

- ECDC has issued new resources on:
  - COVID-19 Aviation Health Safety Protocol: Operational guidelines for the management of air passengers and aviation personnel in relation to the COVID-19 pandemic
  - Overview of the implementation of COVID-19 vaccination strategies and deployment plans in the EU/EEA
  - Rapid risk assessment: Assessing SARS-CoV-2 circulation, variants of concern, non-pharmaceutical interventions, and vaccine rollout in the EU/EEA, 15th update
  - Suspected adverse reactions to COVID-19 vaccination and the safety of substances of human origin
  - Reducing COVID 19 transmission and strengthening vaccine uptake among migrant populations in the EU/EEA

- PHE has issued new guidance and press releases on:
  - Guidance for providers of supported living services during coronavirus (COVID-19)
  - How to protect care home residents and staff during the coronavirus outbreak
  - New national surveillance of possible COVID-19 reinfection

- Vaccines highly effective against hospitalization from Delta variant
- Confirmed cases of COVID-19 variants identified in UK

The full list of latest guidance and resources from WHO and other public health institutions can be found in this link.

C. Scientific updates

Basic Science

- This study aimed to investigate how human antibody responses to vaccines are influenced by viral mutations. The authors used deep mutational scanning to compare the specificity of polyclonal antibodies elicited by either two doses of the mRNA-1273 COVID-19 vaccine or natural infection with SARS-CoV-2. The neutralizing activity of vaccine-elicited antibodies was found to be more targeted to the receptor-binding domain (RBD) of the SARS-CoV-2 spike protein compared to antibodies elicited by natural infection. However, within the RBD, binding of vaccine-elicited antibodies was more broadly distributed across epitopes compared to infection-elicited antibodies. This greater binding breadth means that single RBD mutations have less impact on neutralization by vaccine sera compared to convalescent sera.
- This cross-sectional study aimed to assess immune memory of all three branches of adaptive immunity ($CD4^+$ T cell, $CD8^+$ T cell, and humoral immunity) among 188 recovered COVID-19 cases, extending up to eight months post-infection. They analyzed 254 samples, including 43 samples at ≥ 6 months post-infection. Their findings showed that IgG to the spike protein was relatively stable over 6+ months. Spike-specific memory B cells were more abundant at 6 months than at 1-month post symptom onset. SARS-CoV-2-specific CD4+ T cells and CD8+ T cells declined with a half-life of 3-5 months. They observed that each component of SARS-CoV-2 immune memory exhibited distinct kinetics. [*not peer reviewed*]
- This cohort study of 417 persons who had received the second dose of BNT162b2 (Pfizer–BioNTech) or mRNA-1273 (Moderna) vaccine at least 2 weeks previously, report to have identified 2 women with vaccine breakthrough infection. Despite evidence of vaccine efficacy in both women, symptoms of COVID-19 developed, and they tested positive for SARS-CoV-2 by polymerase-chain-reaction testing. Viral sequencing revealed variants of likely clinical importance, including E484K in 1 woman and three mutations (T95I, del142–144, and D614G) in both. These observations indicate a potential risk of illness after successful vaccination and subsequent infection with a variant virus, and they provide support for continued efforts to prevent and diagnose infection and to characterize variants in vaccinated persons.
- This case-control autopsy series aimed to study skeletal muscle and myocardial inflammation in patients with COVID-19 who had died. The authors found that 26 of 43 individuals (60%) who had died with a diagnosis of COVID-19 showed signs of muscle inflammation, ranging from mild to severe inflammatory myopathy. Inflammation was more pronounced in patients who were chronically ill and those who had seroconverted to SARS-CoV-2 than those who died after acute or subacute courses of COVID-19 and those who died of other illnesses, and no evidence was found for a direct infection of muscle tissue. This suggests that SARS-CoV-2 may be associated with a post infectious, immune-mediated myopathy.
- This study used a mouse model of SARS-CoV-2, the authors engineered an IgM antibody (IgM-14) for intranasal administration that potently neutralized B.1.1.7, P.1, B.1.351, and 21 other variant receptor binding domains (RBDs), many of which are resistant to IgG monoclonal antibodies authorized for emergency use. IgM-14 was >230-fold more potent than its parental IgG-14 in neutralizing B.1.1.7. The engineered IgM can improve efficacy, reduce resistance, and simplify the prophylactic and therapeutic treatment of COVID-19.

- This study characterized 2943 S-reactive T cell clones from 34 individuals. The authors found that the receptor-binding domain (RBD) is highly immunogenic and that 33% of RBD-reactive clones and 94% of individuals recognized a conserved immunodominant S346–S365 region comprising nested human leukocyte antigen DR (HLA-DR) and HLA-DP restricted epitopes. Using pre and post COVID-19 samples and S proteins from endemic coronaviruses, they identified cross-reactive T cells targeting multiple S protein sites. The immunodominant and cross-reactive epitopes identified can inform vaccination strategies to counteract emerging SARS-CoV-2 variants.
- This study exploited a specific affinity between very late antigen–4 (VLA-4) and VCAM-1 to produce a biomimetic nanoparticle formulation capable of targeting inflammation. A model anti-inflammatory drug, dexamethasone, is encapsulated into the Nanoformulation, enabling improved delivery of the payload to inflamed lungs and significant therapeutic efficacy in vivo. Their work leverages the unique advantages of biological membrane coatings to engineer additional targeting specificities using naturally occurring target-ligand interactions.
- This study aimed to assess how well mRNA vaccines induce B and plasma cell responses in dialysis patients (DP) or kidney transplant recipients (KTR) compared to healthy controls (HC). They studied the humoral and B cell responses of 35 HC, 44 DP and 40 KTR. Markedly impaired anti-BNT162b2 responses were identified among KTR and DP compared to HC. Their results indicate that immunosuppression resulted in impaired protective immunity after mRNA vaccination, including Ig induction with corresponding generation of plasmablasts and memory B cells.

Vaccines

- This single-arm open-label vaccination sub-study within the protocol of the larger phase 2/3 trial COV002 aimed to explore the safety and immunogenicity of ChAdOx1 nCoV-19 in 54 adults aged 18–55 years with HIV. Eligible participants were required to be on antiretroviral therapy (ART), with undetectable plasma HIV viral loads (<50 copies per mL), and CD4 counts of more than 350 cells/μL. All outcomes were compared with an HIV-uninfected group from the main COV002 study within the same age group. The authors found no difference in magnitude or persistence of SARS-CoV-2 spike-specific humoral or cellular responses. This study showed ChAdOx1 nCoV-19 was safe and immunogenic, supporting vaccination for those well controlled on ART.
- This study reports on the humoral and cellular immune responses from 20 Ad26.COV2.S vaccinated individuals from the COV1001 phase 1/2 clinical trial against the original SARS-CoV-2 strain WA1/2020 as well as against the B.1.1.7, CAL.20C, P.1., and B.1.351 variants of concern. Their findings show that neutralizing antibody responses induced by Ad26.COV2.S has reduced potency against the B.1.351 and P.1 variants, but functional non-neutralizing antibody responses and T cell responses were largely preserved against SARS-CoV-2 variants. These findings have implications for vaccine protection against SARS-CoV-2 variants of concern.
- This matched cohort study aimed to examine the distribution of VOCs in infections of BNT162b2 mRNA vaccines from Clalit Health Services (Israel) using viral genomic sequencing. They hypothesized that if vaccine effectiveness against a VOC is reduced, its proportion among breakthrough cases would be higher than in unvaccinated controls. The authors analyzed 813 viral genome sequences from nasopharyngeal swabs, they showed that vaccinees who tested positive at least 7 days after the second dose were disproportionally infected with B.1.351, compared with controls. Those who tested positive between 2 weeks after the first dose and 6 days after the second dose were disproportionally infected by B.1.1.7. These findings suggest reduced vaccine effectiveness against both VOCs within particular time windows.
- This study aimed to characterize the initial safety of mRNA Covid-19 vaccines in pregnant persons. The authors used data from the "v-safe after vaccination health checker" surveillance system, the v-safe pregnancy registry, and the Vaccine Adverse Event Reporting System (VAERS) from 14th December 2020 to 28th February 2021. Preliminary findings did not show obvious safety signals among pregnant

persons who received mRNA Covid-19 vaccines. However, more longitudinal follow-up, including follow-up of large numbers of women vaccinated earlier in pregnancy, is necessary to inform maternal, pregnancy, and infant outcomes.

- This study reports on findings in 23 patients who presented with thrombosis and thrombocytopenia 6 to 24 days after receiving the first dose of the ChAdOx1 nCoV-19 vaccine (AstraZeneca). All the patients had low or normal fibrinogen levels and elevated d-dimer levels at presentation. No evidence of thrombophilia or causative precipitants was identified. Testing for antibodies to platelet factor 4 (PF4) was positive in 22 patients (with 1 equivocal result) and negative in 1 patient. Based on the pathophysiological features observed, the authors recommend that treatment with platelet transfusions be avoided because of the risk of progression in thrombotic symptoms and that the administration of a non-heparin anticoagulant agent and intravenous immune globulin be considered.
- This case series describes the response to IVIG therapy in three of the first patients in whom vaccine-induced immune thrombotic thrombocytopenia (VITT) was identified in Canada after the receipt of the ChAdOx1 nCoV-19 vaccine. The patients were between the ages of 63 and 72 years; one was female. At the time of this report, Canada had restricted the use of the ChAdOx1 nCoV-19 vaccine to persons who were 55 years of age or older based on reports that VITT had occurred primarily in younger persons. Two of the patients presented with limb-artery thrombosis; the third had cerebral venous and arterial thrombosis. Variable patterns of serum-induced platelet activation were observed in response to heparin and platelet factor 4 (PF4), indicating the heterogeneity of the manifestations of VITT in serum. After the initiation of IVIG, reduced antibody-induced platelet activation in serum was seen in all three patients.
- This randomized, double-blind, placebo-controlled, phase 3 trial aimed to assess vaccine efficacy against moderate to severe–critical Covid-19. The per-protocol population included 19,630 SARS-CoV-2–negative participants who received Ad26.COV2.S and 19,691 who received placebo. Ad26.COV2.S protected against moderate to severe–critical Covid-19 with onset at least 14 days after administration (116 cases in the vaccine group vs. 348 in the placebo group; efficacy, 66.9%; adjusted 95% confidence interval [CI], 59.0 to 73.4) and at least 28 days after administration (66 vs. 193 cases; efficacy, 66.1%; adjusted 95% CI, 55.0 to 74.8). Safety appeared to be similar to that in other phase 3 trials of Covid-19 vaccines.
- This preliminary analysis of a SARS-CoV-2 longitudinal study among UK healthcare workers (n = 250) in January 2021 aimed to determine vaccine-induced NAb escape by B.1.617.2 and compare activity to previous strains with existing estimates for population-based vaccine efficacy. Serum samples were tested for neutralization against wild-type and four variants: D614G, B.1.1.7, B.1.351, and B.1.617.2. Neutralization was compared after either 1 dose (n = 149) or 2 doses (n = 159) of Pfizer/BioNTech BNT162b2. The authors found that 2 doses of the Pfizer/BioNTech BNT162b2 vaccine-elicited lower neutralizing antibody titers (NAbT) against SARS-CoV-2 variants compared to wild-type SARS-CoV-2. Older age correlated with reduced NAbT against wild-type SARS-CoV-2 and all variants. Compared with 2 doses, NAbTs following 1 dose were significantly lower, and median NAbT against B.1.351 and B.1.617.2 were below the quantitative limit of detection.

Diagnostics

- This study describes a WarmStart colorimetric reverse transcription-loop-mediated isothermal amplification (RT-LAMP) assay for the detection of SARS-CoV-2. The detection limit for the assay was 1 copy/µL SARS-CoV-2. The authors used 37 positive and 20 negative samples to test the clinical sensitivity and specificity of the assay. The WarmStart colorimetric RT-LAMP had 100% sensitivity and specificity. WarmStart colorimetric RT-LAMP provides an opportunity to facilitate virus detection in resource-limited settings without a sophisticated diagnostic infrastructure.
- This study compared the droplet dPCR (QX200) and the digital real-time PCR (LOAA). The copy number values of EGFR variant, SARS-CoV-2, HIV-1 targets were analyzed using two methodologies.

These two approaches showed similar measurement values for selected targets, with a higher sensitivity using digital real-time PCR.

- This study compared diagnostic accuracy of patient self-testing with professional testing using a SARS-CoV-2 Ag-RDT. The authors report sensitivity with self-testing was 82.5% and 85.0% with professional testing. At high viral load (≥7.0 $\log_{10}$ SARS-CoV-2 RNA copies/ml), sensitivity was 96.6% for both self- and professional testing. Most participants (80.9%) considered the Ag-RDT as easy to perform.
- This study was aimed at performance assessment of SARS-CoV-2 IgM and IgG ELISAs, and investigation of their utility for patient diagnosis and sero-epidemiologic investigations. Their results show that IgM detection by the current, most sensitive ELISAs cannot replace molecular diagnosis, but may aid as a supplement test. The available IgG tests are suitable for serosurveys.

Care and Treatment

- This randomized, controlled, open-label platform trial aimed to evaluate the efficacy and safety of REGEN-COV (casirivimab and imdevimab) in 9785 patients admitted to hospital with COVID-19. Patients were randomly allocated to receive usual care plus REGEN-COV 8g (casirivimab 4g and imdevimab 4g) or usual care alone. In patients hospitalized with COVID-19, Monoclonal antibody combination of casirivimab and imdevimab (REGEN-COV) reduced 28-day mortality among patients who were seronegative at baseline. [*not peer reviewed*]
- This retrospective cohort study of 966 hospitalized adult patients with hematologic cancer and COVID-19 aimed to evaluate the association of convalescent plasma treatment with 30-day mortality. After adjustment for potential confounding factors, convalescent plasma treatment was associated with a significantly improved 30-day mortality (HR, 0.60; 95% CI, 0.37-0.97) in the 143 individuals who received it. This association remained significant after propensity score matching (HR, 0.52; 95% CI, 0.29-0.92). The findings suggest a potential survival benefit in the administration of convalescent plasma to patients with hematologic cancers and COVID-19.
- This randomized clinical trial among 289 hospitalized adult patients in Brazil aimed to assess the efficacy and safety of tofacitinib (a Janus Kinase Inhibitor). They assigned the patients in a 1:1 ratio, to receive either tofacitinib at a dose of 10 mg or placebo twice daily for up to 14 days or until hospital discharge. The cumulative incidence of death or respiratory failure through day 28 was 18.1% in the tofacitinib group and 29.0% in the placebo group (risk ratio, 0.63; 95%CI 0.41-0.97). Their findings showed that tofacitinib led to a lower risk of death or respiratory failure through day 28 than placebo among patients hospitalized with Covid-19 pneumonia.
- This study by the Overcoming Covid consortium (consisting of investigators at 58 U.S. hospitals reporting on 518 patients from March through October 2020) aimed to assess the real-world effectiveness of immunomodulatory medications for multisystem inflammatory syndrome in children (MIC-S). The effectiveness of initial immunomodulatory therapy with intravenous immune globulin (IVIG) plus glucocorticoids, as compared with IVIG alone, was evaluated with propensity-score matching and inverse probability weighting, with adjustment for baseline MIS-C severity and demographic characteristics. Their findings showed that initial treatment with IVIG plus glucocorticoids was associated with a lower risk of new or persistent cardiovascular dysfunction than IVIG alone.
- In contrast to the above-mentioned study, the international Best Available Treatment Study (BATS) consortium (consisting of investigators in 32 countries reporting on 614 patients from June 2020 through February 2021) found no statistically significant differences in odds ratios for endpoints of ventilation, inotropic support, or death or for improvement on an ordinal clinical-severity scale for any of three treatments: IVIG alone, a combination of IVIG and glucocorticoids, or glucocorticoids alone. The risk of escalation of immunomodulatory treatment in patients who received IVIG plus glucocorticoids was significantly lower than the risk in patients who received IVIG alone, a finding that was in line with the results of the U.S. study.

- This cohort study aimed to characterize frequency, variation across hospitals, and change over time in venous thromboembolism (VTE) prophylaxis and treatment-dose anticoagulation in patients hospitalized for COVID-19, as well as the association of anticoagulation strategies with in-hospital and 60-day mortality. Findings showed 1127 patients received anticoagulation of the 1351 patients hospitalized, 34.8% missed 2 or more days of VTE prophylaxis. Use of only prophylactic-dose or treatment-dose anticoagulation was associated with lower in-hospital mortality vs no anticoagulation; however, only prophylactic-dose anticoagulation remained associated with lower mortality at 60 days. These findings suggest that prophylactic-dose VTE anticoagulation may be optimal therapy for patients hospitalized with COVID-19.

Epidemiology

- This modelling study aimed to estimate the association between seasonality and transmission in 143 temperate European regions. They adapted a fully Bayesian method, using two model structures and datasets on non-pharmaceutical interventions covering 72% of the 2020-2021 period in Europe. The authors found strong seasonal patterns, consistent with a reduction in the time-variable R_t of 42.1% (95% CI: 24.7% – 53.4%) from the peak of winter to the peak of summer. These results imply that the seasonality of SARS-CoV-2 transmission is comparable in magnitude to the most effective individual NPIs but less than the combined effect of multiple interventions. [*not peer reviewed*]
- This modelling study presents a global analysis of the spread of recently emerged SARS-CoV-2 variants and estimate changes in effective reproduction numbers at country-specific level using sequence data from the Global Initiative On Sharing All Influenza Data (GISAID) hCoV-19 database. Nearly all investigated countries demonstrated rapid replacement of previously circulating lineages by the World Health Organization-designated variants of concern, with estimated transmissibility increases of 29% (95% CI: 24–33), 25% (95% CI: 20–30), 38% (95% CI: 29–48) and 97% (95% CI: 76–117), respectively, for B.1.1.7, B.1.351, P.1 and B.1.617.2. This means that B.1.617.2 is expected to rapidly outcompete other variants and become the dominant circulating lineage over the coming months.
- This modelling study aimed to better understand the mechanisms that result in a transmission advantage of Alpha and Beta VOCs. The authors measured viral load in 950 individuals and found that infections with variant Alpha exhibit a higher viral load and longer viral shedding compared to non-VOC. They then used a transmission model to analyze the spread of variant Alpha in Geneva, Switzerland, and variant Beta in South Africa. They estimated that Alpha is either associated with a 37% increase in transmissibility or a 51% increase of the infectious duration, or a combination of the two mechanisms. They then assumed a 50% immune evasion for Beta, and estimated a 23% increase in transmissibility or a 38% increase of the infectious duration for this variant. Beta is expected to outgrow Alpha in regions where the level of naturally acquired immunity from previously circulating variants exceeds 20% to 40%. [*not peer reviewed*]
- This study describes the genomic epidemiology using a dataset of 8746 genomes from 33 African countries and two overseas territories. The authors show that the epidemics in most countries were initiated by importations, predominantly from Europe, which diminished following the early introduction of international travel restrictions. As the pandemic progressed, ongoing transmission in many countries and increasing mobility led to the emergence and spread within the continent of many variants of concern and interest, such as B.1.351, B.1.525, A.23.1 and C.1.1. Their findings highlight the importance of not leaving Africa behind in the global pandemic response, otherwise it could become a breeding ground for new vaccine escape variants. [not peer reviewed]
- This cohort study of 6481 hospital employees aimed to determine whether mandatory daily employee symptom attestation data could be used as syndromic surveillance to estimate COVID-19 hospitalizations in the communities where employees lived. The authors found that an increased frequency of COVID-19 symptoms reported by all employees at a single hospital was associated with

increased hospitalizations across 10 hospitals 7 days later. These findings suggest that in a novel pandemic before reliable testing is available, use of nontraditional secondary data sources can be used to estimate hospital demand.

- This retrospective cohort study among 671 children and youths aimed to describe international hospitalization trends and key epidemiological and clinical features of children and youth with COVID-19. The authors found discrete surges in hospitalizations with variable trends and timing across countries. Common complications included cardiac arrhythmias and viral pneumonia, and laboratory findings included elevations in markers of inflammation and abnormalities of coagulation; few children and youth were treated with medications directed specifically at SARS-CoV-2.

Infection Prevention and Control

- This article describes a portable and easy-to-operate system that helps to eliminate droplets or aerosols present in the environment by circulating air through a UV-C reactor. Results showed the microorganisms were eliminated with high efficiency by the air circulation decontamination device, with reductions of 99.9% in the proof-of-principle study, and 84% to 97% at hospital environments study, contributing to reduce people contamination in environments considered to offer risk.

Non-pharmaceutical interventions, social distancing

- This study aimed to assess the economic security, food security, health, and sexual behavior of women at high risk of HIV infection in rural Kenya during the COVID-19 pandemic. The survey included 1725 women. Their findings revealed that COVID-19 lockdowns were associated with declines in employment, income, and numbers of sexual partners and transactional sex partners. Respondents also reported high levels of food insecurity. These findings suggest that COVID-19 lockdowns may negatively impact the economic well-being of vulnerable populations with limited access to social services but may also temporarily reduce the risk of HIV transmission in these high-risk populations.
- This modelling study applied stochastic optimization to recommend policy triggers governing stages of community mitigation to prevent overwhelming hospital surges and ensure adequate capacity in the unlikely case that they occur. They describe the optimization and maintenance of the staged alert system that has guided COVID-19 policy in a large US city (Austin, Texas) since May 2020. Their findings provide a robust strategy for tracking COVID-19 hospital admissions as an early indicator of hospital surges and enacting staged measures to ensure integrity of the health system, safety of the health workforce, and public confidence.
- This study examined the association of community-level social distancing measures and individual face mask use with risk of predicted COVID-19 in a large prospective U.S. cohort study of 198,077 participants. Individuals living in communities with the greatest social distancing had a 31% lower risk of predicted COVID-19 compared with those living in communities with poor social distancing. Self-reported 'always' use of face mask was associated with a 62% reduced risk of predicted COVID-19 even among individuals living in a community with poor social distancing. These findings provide support for the efficacy of mask-wearing even in settings of poor social distancing in reducing COVID-19 transmission.

D. Clinical Trials Updates

Key updates:

Vaccine trials:

- On 18th June 2021, CureVac N.V. (Nasdaq: CVAC) announced results of the second interim data analysis of its international pivotal Phase 2b/3 study of CureVac's first-generation of COVID-19 vaccine candidate, CvnCoV which showed vaccine efficacy of 47% against COVID-19 disease and thus, did not meet prespecified statistical success criteria. The assessment was done in a total of 134 COVID 19

cases which of these a total of 124 COVID-19 cases for which scientists obtained a genetic sequence, only one was caused by the original version of SARS-CoV-2. The study enrolled approximately 40,000 participants in ten countries in Latin America and Europe. The CvnCoV vaccine is made using mRNA backbones and includes potential variants in multivalent vaccine formats as well as combination vaccines for potential protection against multiple infectious diseases in one vaccine.

- On 16th June 2021, the National Commission for Vaccination and Epidemiology (CNVE) decided that Costa Rica, for the time being, will not acquire a vaccine against COVID-19 from Sinovac Life Sciences. This came after analysis of the effectiveness, efficacy and details of the clinical studies currently available. They said that the Ministry of Health of Costa Rica had already indicated about the need for the vaccines that arrive in country to have a vaccination effectiveness of at least 60% for the prevention of contagion, a requirement that Sinovac does not reach (51%) as indicated by the World Health Organization (WHO). Additionally, CNVE pointed out that there is still no peer review of the clinical studies that support the authorization of the vaccine provided by the World Health Organization and that it is also necessary to know the analyzes carried out in nations that have had a high vaccination coverage predominantly with the Sinovac vaccine, without obtaining control of its epidemic situation.
- On 10th June 2021, Pfizer Inc. (NYSE: PFE) and BioNTech SE (Nasdaq: BNTX) announced plans to provide the U.S. government at a not-for-profit price 500 million doses of the companies' COVID-19 vaccine, 200 million doses in 2021 and 300 million doses in the first half of 2022, to further support the multilateral efforts to address the surge of infection in many parts of the world and to help end the pandemic. As part of the plan, the United States will allocate the vaccine doses to 92 low- and lower middle-income countries and economies as defined by Gavi's COVAX Advance Market Commitment (AMC) and the 55 member states of the African Union.

Therapeutics trials:

- On 16th June 2021, Regeneron Pharmaceuticals, Inc. (NASDAQ: REGN) welcomed the positive results from the largest UK RECOVERY trial which found that REGEN-COV reduced risk of death by 20% in patients hospitalized with COVID-19 who had not mounted their own immune response against SARS-CoV-2, compared to usual care on its own. REGEN-COV is a combination of 2 monoclonal antibodies (casirivimab and imdevimab). RECOVERY trial which is a randomized, controlled, open-label platform trial, is the first trial large enough to definitively determine whether REGEN-COV reduces mortality in patients hospitalized with severe COVID-19.
- On 16th June 2021, Pfizer Inc. (NYSE: PFE) and The Academic Research Organization (ARO) from the Hospital Israelita Albert Einstein announced positive findings from the STOP-COVID study (NCT04469114) which demonstrated a lower cumulative incidence of death or respiratory failure through day 28 – the primary outcome of the study – with tofacitinib (18.1%) compared to placebo (29.0%) (risk ratio 0.63; 95% confidence interval [CI], 0.41 to 0.97; p=0.04). Death from any cause through day 28 occurred in 2.8% of patients in the tofacitinib group and in 5.5% in the placebo group (hazard ratio 0.49; 95% CI, 0.15 to 1.63). The multi-center, randomized, double-blind, placebo-controlled trial enrolled 289 hospitalized adult patients with COVID-19 pneumonia who were not on ventilation. Patients were randomized in a 1:1 ratio to receive either tofacitinib 10 mg twice daily plus standard of care or placebo twice daily plus standard of care for up to 14 days or until hospital discharge.
- On 14th June 2021, Humanigen, Inc. (NASDAQ: HGEN) announced that it has initiated a rolling review submission for Marketing Authorization (MA) by the MHRA for its lead drug candidate, lenzilumab. This application follows Humanigen's submission for Emergency Use Authorization (EUA) to the U.S. Food and Drug Administration (FDA). A monoclonal antibody, lenzilumab is designed to neutralize granulocyte-macrophage colony-stimulating factor (GM-CSF). The latest application to the MHRA is based on favorable results from the Phase III LIVE-AIR clinical study. Data from this trial showed that lenzilumab met the primary goal with a 54% relative improvement in the chances of survival without ventilation (SWOV) versus placebo.
- On 8th June 2021, Glenmark Pharmaceuticals, a research-led, global integrated pharmaceutical

company, announced its interim data of 503 patients from its Post Marketing Surveillance (PMS) study on Favipiravir in India. The PMS study is a prospective, open-label, multi-centre, single-arm study that aims to evaluate safety and efficacy of Favipiravir in mild to moderate Covid-19 patients. It began in July 2020 and has enrolled a total of 1,083 subjects at 13 centres. The interim data reveals no new safety signals or concerns with the use of Favipiravir and already-known side effects such as weakness, gastritis, diarrhea and vomiting which were found to be mild in nature. The time to fever resolution was seen on day 3, while two-third of the patients achieved clinical cure on day 7. The mean age of patients was 40 years, with the most common age group being 30-45 years.

- On 7th June 2021, OliX Pharmaceuticals, Inc. (KOSDAQ: 226950), a leading developer of RNAi therapeutics, announced that the Company's subsidiary mCureX has signed memorandums of understanding with Samyang Holdings to advance development of a messenger ribonucleic acid (mRNA) vaccine for COVID-19 and with GC Pharma to develop mRNA vaccines and therapeutics for respiratory infections and other diseases more broadly. mCureX, in close collaboration with Samyang Holdings, is developing a COVID-19 vaccine that will effectively target viral variants. In collaboration with GC Pharma, mCureX will research and develop mRNA vaccines and treatments for respiratory infections and other diseases based on its proprietary mRNA technology.
- On 4th June 2021, Regeneron Pharmaceuticals, Inc. (NASDAQ: REGN) announced that the U.S. Food and Drug Administration (FDA) updated the Emergency Use Authorization (EUA) for REGEN-COV™, lowering the dose to 1,200 mg (600 mg casirivimab and 600 mg imdevimab), which is half the dose originally authorized. As part of the updated EUA, REGEN-COV should be administered by intravenous (IV) infusion; subcutaneous (SC) injections are an alternative when IV infusion is not feasible and would lead to a delay in treatment. REGEN-COV is authorized for use under an EUA to treat mild-to-moderate COVID-19 in adults and pediatric patients (12 years of age and older weighing ≥40 kg) with positive results of direct SARS-CoV-2 viral testing, and who are at high risk for progression to severe COVID-19, including hospitalization or death.
- On 1st June 2021, NRx Pharmaceuticals (NASDAQ: NRXP) (NRx), a clinical stage pharmaceutical company, announced that it has filed an application with U.S. Food and Drug Administration (FDA) requesting Emergency Use Authorization (EUA) for ZYESAMI™ (Aviptadilacetate), to treat Critically Ill COVID-19 patients suffering with respiratory failure. The randomized, double-Blind, multicenter trial enrolled one hundred ninety-six participants who were treated with either ZYESAMI™ or placebo, in addition to maximal standard of care at 10 US hospitals. The study identified a statistically significant increase in the likelihood that patients treated with ZYESAMI™ would be alive and free of respiratory failure at 60 days, compared to those treated with placebo, and identified a significantly shorter median hospital stay.

For further detailed information for each country, refer to the full table here

E. Public Health and Social Measures

The table below highlights changes in public health and social measures (PHSMs) based on data from the Oxford COVID-19 Government Response Tracker. An up arrow indicates new PHSMs were announced; a horizontal arrow indicates PHSM were extended; a down arrow indicates PHSMs were loosened/expired. Member States are organized by tiers based on current epidemiological data from 12-17 June 2021.

Country	PHSM Trend	PHSM Change
Tier 4 (High Alert): Daily case incidence per 1M people/day ≥ 80 and/or positivity rate ≥ 12%		
Congo	↑	Authorities in **Congo** have imposed a 20-person limit on public gatherings and closed nightclubs amid increasing COVID-19 transmission.

DRC	↑	Additional restrictions were imposed in the **Democratic Republic of Congo** to combat rising transmission, including closure of nightclubs and a two-week ban on funerals.
Eswatini	↑	**Eswatini** implemented measures to reduce the spread of COVID-19, including restrictions on alcohol sales, public gatherings, religious institutions, and arts and sporting events.
Mauritius	↓	**Mauritius** announced they will reopen their air borders for international travellers on 15 July.
Namibia	↑	Lockdown measures were imposed on the capital city of **Namibia**, Windhoek. Restrictions include limits on public gatherings to just 10 people, the closure of schools and institutes of higher education, and restrictions on spectators at sporting events.
Rwanda	↑	**Rwanda** instituted stricter COVID-19 restrictions, including a nightly curfew, capacity limits on public transportation, and restrictions on religious gatherings. Media reports of increased enforcement of individual protective measures as well.
South Africa	↑	Amid rising cases, officials in **South Africa** have tightened some COVID-19 restrictions. The nightly curfew has been lengthened by an hour, alcohol sales are limited, and capacity restrictions for indoor public gatherings were reduced to 50 people indoors and 100 people outdoors.
Zimbabwe	↑	**Zimbabwe** reimposed lockdown measures amid rising cases, including a ban on all public gatherings except funerals (which have a capacity limit of 30 people).
Tier 3 (Moderate Alert): Daily case incidence per 1M people/day is 20 to <80 and/or positivity rate is 5% to <12%		
Kenya	↑	Officials in **Kenya** lengthened the nightly curfew by 3 hours in 13 counties most affected by rising COVID-19 transmission.
Tier 2 (Low Alert): Daily case incidence per 1M people/day is 5 to <20 and/or positivity rate is 3% to 5%		
Burundi	↓	**Burundi** lifted the mandatory quarantine period for travellers, both international and domestic.
Tier 1 (Standard Precautions): Daily case incidence per 1M people/day is <5 and/or positivity rate is <3%		
Madagascar	→/↓	The state of health emergency in **Madagascar** was extended for an additional 15 days. This means that the nightly curfew is renewed, although some other restrictions have been loosened. Public gatherings, for example, are now limited to 200 people compared to the earlier 100-person limit.

Contributors

In alphabetical order:
Alimi, Yewande; Dadji, Kwami Hoenoukpo; Hussein, Ally K; Loembé, Marguerite Massinga; Camara Neema; Nshimirimana, Jean Claude; Onwuekwe, Ezinne; Sounga, Carine Sylvie; Tshangela, Akhona; Waya, Chimwemwe.

For any queries, kindly contact: Akhona Tshangela (AkhonaT@africa-union.org)