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COVID-19 Daily Briefing: July 28th

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1. Summary

IMMUNOLOGY

- **IMMUNITY OVER TIME:** The authors of a study in *Nature* analysed the immune responses in patients with moderate (non-ICU) and severe (ICU) COVID-19 and found each group had a different immune response. Severe cases showed more cytokines early on compared to moderate cases. Patients with moderate disease had an early increase in cytokines which subsequently dropped, while patients with a severe case maintained the high level of cytokines. The study also identified the immune response that leads to severe and moderate cases, and the early signs that a case will be severe.
- **VACCINE:** The authors of an article in *Cell* discussed the development of a nanoparticle-based vaccine, called ARCoV. This vaccine is currently in phase 1 clinical trials. Intramuscular use of ARCoV, elicited SARS-CoV-2 antibodies, but at lower levels than sera from COVID-19 patients. Two doses given to mice 14 days apart gave complete protection against a SARS-CoV-2 mouse adapted strain when tested after initial vaccination.
- **ANTIBODIES:** 61 SARS-CoV-2-neutralising monoclonal antibodies have been identified, isolated from five infected patients hospitalized with severe forms of the disease, with 19 of these antibodies being potent at neutralising the SARS-CoV-2 in vitro. One of the more potent antibodies was tested on hamsters infected with SARS-CoV-2, where it was found to decrease the spread of the virus.

MEDICINE

- **ANTI-INFLAMMATORIES:** A review of ten studies on the use of non-steroidal anti-inflammatory drugs and the risk associated with pneumonia complications found a positive association in adults and children. However, the authors say that the results should not be extrapolated as evidence of harm for NSAIDs, including ibuprofen, as there is the need for more methodologically robust studies.
- **INTERFERON:** A retrospective multicentre study on the use of interferon therapy (therapy that uses proteins that “interfere” with viral replication) to treat COVID-19 found that in roughly half of COVID-19 patients, the early use of this therapy improved clinical responses and reduced in-hospital mortality. but not recovery times. However, late interferon therapy increased mortality and delayed recovery.

HYDROXYCHLOROQUINE

- **BRAZIL:** A study from Brazil looked at the use of hydroxychloroquine with or without azithromycin in mild-to-moderate COVID-19 patients. Compared with standard care, the patient's condition after 15 days was not affected by either hydroxychloroquine alone or hydroxychloroquine plus azithromycin.
- **PRIMATES:** A study investigated the use of hydroxychloroquine against SARS-CoV-2 infection in rhesus macaques with different treatment strategies, with the results compared to a placebo. Hydroxychloroquine did not show a significant effect on the viral load levels in any of the tested compartments. When hydroxychloroquine was used as a pre-exposure prophylaxis it did not confer protection against acquisition of infection.
- **CHLOROQUINE:** Chloroquine is an anti-malaria drug that is frequently employed for COVID-19 treatment spread in some kidney cells. Authors of an article in *Nature* found adding one receptor the

coronavirus uses for entry into the lungs to the kidney cells blocks the effect of chloroquine. This indicates that chloroquine does not protect against SARS-CoV-2 in the lungs.

3. Quick Summaries

Indigenous Australians at increased risk of COVID-19 due to existing health and socioeconomic inequities

- **INDIGENOUS POPULATIONS:** *Commentary article.* A comment piece on COVID-19 in Indigenous Australian populations places emphasis on health and socioeconomic inequalities that increased risk to these populations. It argues that the heightened risk of COVID-19 severity and mortality among Indigenous and ethnic minority communities in the United States, the United Kingdom, and Brazil, emphasises existing and pervasive global health inequities. Aboriginal and Torres Strait Islander Australians experience some of the worst health outcomes worldwide and as such are particularly at-risk groups.

Overcoming the arrogance of ignorance: supply-chain lessons from COVID-19 for climate shocks

- **CLIMATE CRISIS:** *Commentary article.* A comment article on the lessons about supply-chains from COVID-19 argues that the pandemic was not a freak incident, but that warnings were ignored, and that parallels exist to the climate crisis. It was found that supply-chains built with greater social responsibility and sustainability were more resilient to the shocks caused by the pandemics. The climate crisis is likely to cause increased risks of climate shocks and this will have impact on the health, livelihoods, food security, water security, and human security of billions of people. The authors suggest changes that can take to reduce the risks to supply-chains caused by climate shocks, including making them more agile, local and transparent.

4. Longer Reading

Evolutionary origins of the SARS-CoV-2 sarbecovirus lineage responsible for the COVID-19 pandemic

- **VIRUS ORIGIN:** *Peer-reviewed journal article.* A study in nature investigated the origins of the SARS-CoV-2 virus, trying to answers questions related to the role of reservoir species, recombination and the time of divergence from animal viruses. It was found that the SARS-CoV-2 is not a recombinant sarbecovirus and its receptor-binding motif, important for specificity to human ACE2 receptors, appears to be an ancestral trait shared with bat viruses and not one acquired recently via recombination. The evolutional history and timeline indicate that the lineage giving rise to SARS-CoV-2 has been circulating unnoticed in bats for decades.