

THE ALCIVAX

Alcimed explains the debate between public safety and rare events in the fight to accelerate the use & distribution of COVID vaccines.

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The Problem of the Common Good

The constant struggle in public health has always been making policies seeking the best outcome for the whole population while knowing that there is a small subsection of the population that could be harmed. This has been prominently on display these last few weeks with COVID vaccines, as rare but serious side effects have emerged in people receiving either the AstraZeneca and J&J vaccines. This week we dedicate the whole Alcivax to exploring the reasons for the concern and how it could potentially impact worldwide vaccine efforts.

The Nature of the Problem

Cerebral venous sinus thrombosis (CVST)

occurs when a blood clot forms in the brain and prevents blood from draining out of the brain. As a result, blood cells may break and leak blood into the brain tissues, forming a hemorrhage, which can be fatal

Thrombocytopenia

a condition occurring due to low blood platelet count (<150,000 per microliter), which can lead to dangerous internal bleeding when platelet counts fall below 10,000 platelets per microliter and though rare, severe thrombocytopenia can cause bleeding into the brain, which can be fatal

In Europe, the rate of CVST for mRNA vaccines is 4 per 1M vaccines, but the rate of developing a CVST from a COVID-19 infection is 39 per 1M, so 8 to 10 times higher. So why is there no safety outcry over the mRNA vaccines? The difference is the combination of CVST and thrombocytopenia seen in adenoviral vectors (J&J & AstraZeneca) that isn't seen in mRNA vaccines (Moderna & Pfizer), which increases the likelihood of fatality.

According to the British Adverse reporting system, 19 blood clot related fatalities have been reported after AstraZeneca vaccination, and 14 of them had CVST with thrombocytopenia. Under other conditions, CVST is rarely associated with thrombocytopenia, making the vaccine reactions unique, largely occur in women between 20-50 with no obvious other risk factors. Fatalities have been resulted for both vaccines.

Adenoviral related CVST Hypothesis

So how can an adenoviral vector cause CVST? Two studies from the New England Journal of Medicine have leveled some hypothesis. The first study looked at patients in Germany and Austria and the second a different cluster of patients.

The combined consensus is that the AstraZeneca vaccine can result in a rare syndrome with similar clinical manifestations as "autoimmune heparin-induced thrombocytopenia," and have labeled the syndrome as "vaccine induced immune thrombotic thrombocytopenia" (VITT).

For now, the J&J vaccine's emergency use authorization has been suspended by the CDC pending further data.

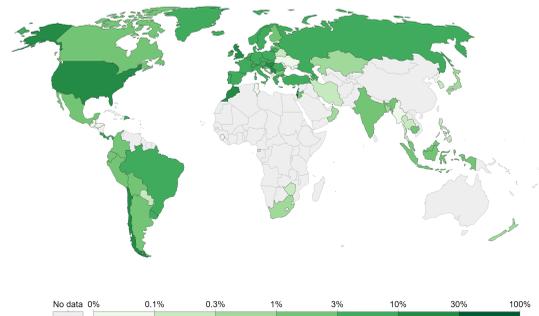
6 CVST with thrombocytopenia cases have been reported to the CDC's Vaccine Adverse Event Reporting System or VAERS, as of April 12th, which is a rate of 0.87 per 100K vaccinated. 62 cases of CVST with thrombocytopenia have also been reported with the AstraZeneca vaccine according to the EMA, which is a rate of 5 per 1 M.

No reports of CVST have been reported to VAERS for the Pfizer vaccine and 3 cases of CVST have been reported for Moderna but none with thrombocytopenia.

The COVID Vaccine Race In Graphs

Turn the world green! 841 M vaccines to date

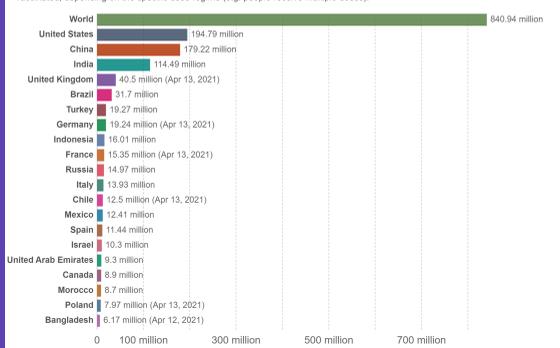
Share of the population fully vaccinated against COVID-19, Apr 14, 2021
Share of the total population that have received all doses prescribed by the vaccination protocol. This data is only available for countries which report the breakdown of doses administered by first and second doses.



China, US, & India administer 3-4M vaccines/day, 2.8%, 10%, & 2.4% of their total pop. respectively.

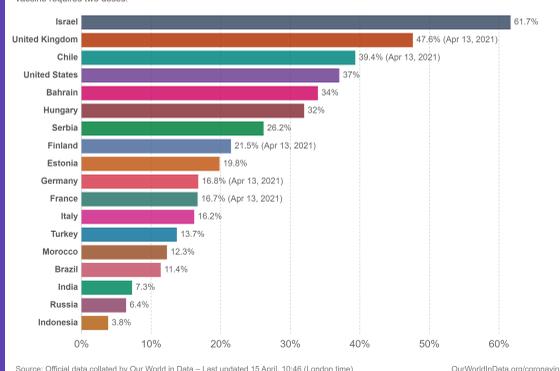
COVID-19 vaccine doses administered, Apr 14, 2021

Total number of vaccination doses administered. This is counted as a single dose, and may not equal the total number of people vaccinated, depending on the specific dose regime (e.g. people receive multiple doses).



Israel crests 60% of its population vaccinated and 5 other countries have completed more than 30%.

Share of people who received at least one dose of COVID-19 vaccine, Apr 14, 2021
Share of the total population that received at least one vaccine dose. This may not equal the share that are fully vaccinated if the vaccine requires two doses.

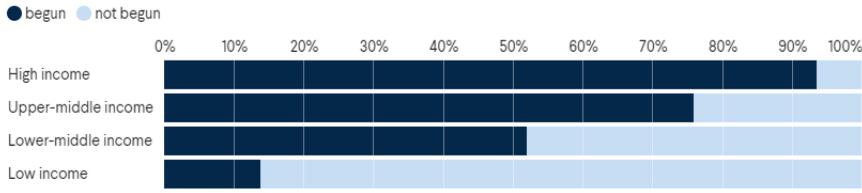


Potential Vaccine Side Effects Fallout

While the likelihood of VITT from adenoviral vector vaccines is rare, the news has made people uneasy enough to put the global vaccine effort at risk. As of now, Cameroon has paused use of the AstraZeneca vaccine, and reports from other countries suggest that as many as 33% of people haven't shown up for their vaccine appointments.

AstraZeneca and J&J are current crucial to the global vaccine effort due to their ease of distribution: Here is a breakdown of why it matters from Think Global Health:

Higher-Income Countries Have Left Lower-Income Countries Behind in Vaccinations



Income groups are based on World Bank classifications.

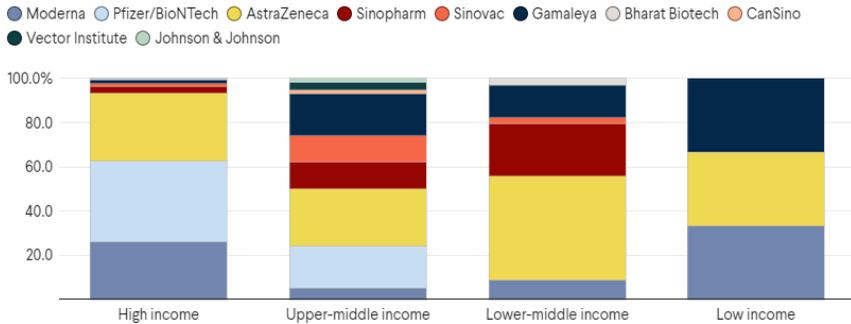
Last updated: March 4, 2021

Chart: Priyanka Sethy

Think Global Health

Lower and middle income countries are really far behind other countries in beginning vaccination campaigns. AstraZeneca makes up 30.6% of vaccine in High income countries, 47.1% in lower-middle and 33.3% in low income countries, placing lagging vaccine efforts even further behind.

Vaccines Currently Being Administered in Countries by Income Level



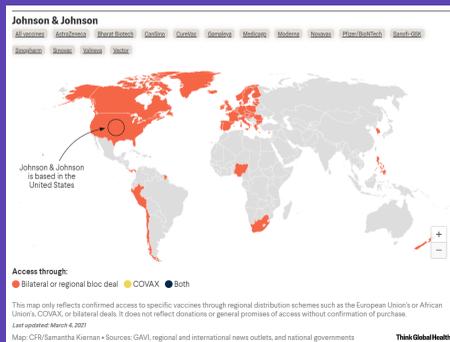
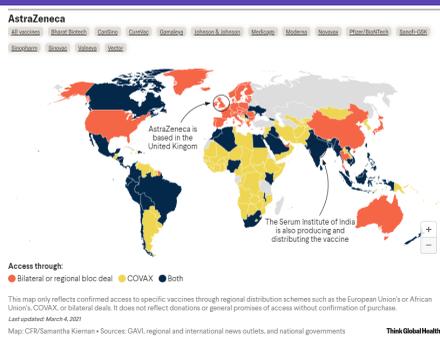
Income groups are based on World Bank classifications. Countries can administer more than one vaccine, so the percentages above reflect vaccines relative to each other by income group and do not represent the total percent of countries in that income group administering a given vaccine.

Last updated: March 4, 2021

Chart: Priyanka Sethy

Think Global Health

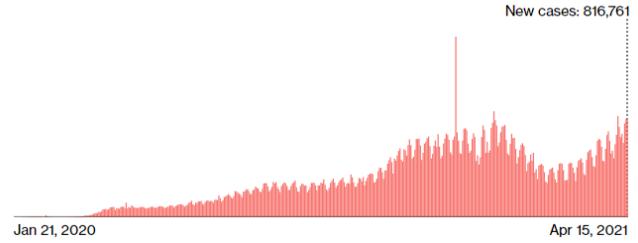
Many African countries who only have access to one or two vaccines are using AstraZeneca or J&J, such as Angola and South Africa. COVAX plans had relied heavily on AstraZeneca, and J&J was going to be the runner up.



The Pandemic isn't over

Globally, 816,761 new COVID cases were reported on April 15th, 2021. Over 217K of them coming from India and more than 73K new cases coming from Brazil and the US each. To put that in perspective the graph below from Bloomberg shows daily cases from the beginning!

Global Cases Added Per Day



- Vaccination programs need to be accelerated. With more than 60% of it's population, Israel's daily cases are below 300 and mask mandates are being lifted.
- Iran is pushing to ramp up vaccine efforts as cases rise.
- India has even approved use of imported vaccines as cases skyrocket in the country.
- Chile, recently relaxing lockdowns, is seen a surge in cases despite vaccination efforts.
- In Brazil, an unusually high mortality rate in children under the age of 9 has been observed, with 1300 fatalities to date, correlating with higher rates of the rare multi-system inflammatory syndrome (MIS).



Variants are no Joke!

A real world evidence study from Israel has demonstrated that prior to full vaccination efficacy, i.e. 14 days after the 2nd dose is received, breakthrough COVID infections have been observed. Vaccinees were 8 times more likely to contract the South African variant of the virus than the other circulating strains.

The CDC has also recorded a >1% breakthrough rate in the US among the vaccinated.

This highlights the need to continue to comply with virus protection protocols for the full two weeks after the vaccination course is received.

Pfizer's CEO Albert Bourla has also speculated this week that those already vaccinated may need a booster within a year of receiving the first two doses, bring further credence to the speculation that yearly COVID vaccination may now be required, much like flu vaccine.

Bourla added: "A likely scenario is that there will be likely a need for a third dose, somewhere between six and 12 months and then from there, there will be an annual revaccination, but all of that needs to be confirmed. And again, the variants will play a key role."

COVID LOVES A CROWD!

Happy Ramadan



Image Credit: Adam/Gulf News

India also loves a crowd



Image Credit: Sandeep Adhwaru

Apathy is not a strategy



Image Credit: sajithkumar

VIP = Vaccination

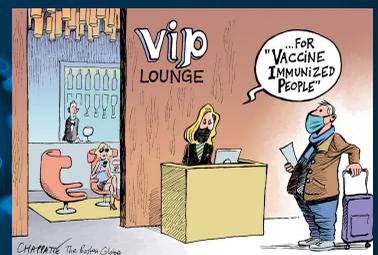


Image Credit: Chappelle