How did the Delta variant affect children in the US

There were two spikes of admissions in children with COVID-19 in the US in 2021. One was in January and the second was in August. The second spike was largely due to the Delta variant. A look at the admissions in the two peaks gives us some insight into whether the delta variant causes a more severe disease than the previous variants.

The peak admissions were similar with about 1.4/100000 children and adolescents being admitted in August. This was 5-times higher than the admission rate in June, 2021.Younger children between 0-4 years required more admissions with an admission rate of 1.9/100000 children. The severity of illness was also not different. In August, when the delta variant was predominant, 23% of children admitted required intensive care admission, 10% required ventilation and 2% died. In the pre delta variant period in January, about 27% required admission, 6% required ventilation and 1% died.

In the US two-dose vaccine coverage in adults is 53%, for adolescents 16-17 years it is 46%, and for those between 12-15 years, 37%. Hospitalizations were 10-times higher among the adolescents who were not vaccinated compared to those who had received both doses.

In summary, it appears the delta variant did not cause a more severe disease in children and adolescents and the role of vaccination in children appears significant in reducing severity of illness.
(*www.cdc.gov 10 September, 2021*)

How wildfires are contributing to mortality

In the last couple of years, there have been an unprecedented increase in the number of wildfires from many corners of the world. These have included Australia-where millions of acres were burnt down, California-which documented destruction of nearly 3 million acres, the Amazon rainforest and the Siberian forests. This appears to be due to the hotter drier climates which are becoming increasingly common with progressive climate change. Wildfire associated particulate matter PM 2.5 is considered particularly toxic since they enter the lungs and translocate through the alveolar epithelium.

An International study in 43 countries looked at the increase in all-cause mortality due to PM 2.5 released in wildfires. Overall, 0·62% (95% CI 0·48-0·75) of all-cause deaths, 0·55% (0·43-0·67) of cardiovascular deaths, and 0·64% (0·50-0·78) of respiratory deaths were annually attributable to the acute impacts of wildfire-related PM 2·5 exposure during the study period. Another article in the same journal found that children were more vulnerable to wildfire associated PM2.5 injury with highest impact in Nigeria, India, Congo, Uganda and Indonesia.

We live in an interconnected world and climate change is a huge challenge to world health which needs urgent action.
(*Lancet Planetary Health 1 September, 2021*).

How does immunity after natural infection compare with vaccination?

There is a huge global discussion about why someone who has had the COVID-19 infection needs a vaccine. There is good data to suggest that immunity after natural COVID-19 infection is robust and durable. However, the CDC still recommends that all people get vaccinated as soon as they are eligible citing that immune response was variable from person to person.

An NIH funded study from La Jolla Institute of Immunology found a good immune response upto 8 months in 95% of people who had previous infection with COVID-19. An influential paper in Science detected that though antibodies reduced over 8 months, memory B cells increased. Real-world data also suggests that immunity after natural infection parallels vaccination. Of the 50000 employees of Cleveland Clinic, infection rates were similar in those who had natural infection versus vaccine. A population-wide database from Israel also concluded that there was no difference to the risk of infection in those vaccinated versus those who had natural infection.

Some countries like Israel have suggested that after a natural infection one may take a single dose of the mRNA vaccine after 3 months. They are offering the vaccine passport to all those with anti-Covid antibodies irrespective of whether it is post-infection or vaccine.

It appears paradoxical to assume that someone exposed to the entire virus would have poorer immune response compared to someone exposed to just a portion of the spike protein. The decision to insist on two doses for all seems to be more related to administrative ease than anything else. The downside of insisting on vaccinating previously infected persons include a 56% higher rate of adverse effects post-vaccine, and a possible exhaustion of T cells as suggested by some researchers.

There is a lot to still understand about the best vaccine strategy in COVID-19!
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