

COVID-19 in Children and Safety of SARS-CoV-2 Immunization in Children: Statement of the International Pediatric Association

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The global burden of coronavirus disease 2019 (COVID-19) exceeded 271 million cases worldwide, with over 5 million officially confirmed deaths due to COVID-19, with no country of the world spared [1]. According to the American Academy of Pediatrics, about 17.3% of all US cases through 12 December, 2021 were in children, while 0.1-1.8% of all child COVID-19 cases resulted in hospitalization [2]. The global data compiled by the World Health Organization (WHO) in November, 2021, show that children and adolescents represent a small proportion of severe diseases, and of deaths from COVID-19 when compared to older age groups. However, the emerging evidence suggests that COVID-19 disease may not be uniform globally.

In addition to the direct effects of COVID-19, the COVID-19 mitigation measures have had a profound impact on the lives of children and adolescents, affecting their education, mental, emotional, and social health for the last two years, hindering normal child development. Experts suggest that the indirect effects of COVID-19 on children's education, mental and emotional health may be much more important in the long term than the direct effects.

The surge in COVID-19 cases driven by the greater circulation of transmissible variants (e.g., Delta) resulted in an increase in the COVID-19 associated hospitalization in children in many countries [3-5]. The Omicron variant, which has recently emerged, is highly transmissible. With its increased transmissibility, the number of cases, including severe cases, is likely to increase worldwide. Therefore, vaccination of children and adolescents assumes even greater importance given the substantial

and increasing impact of COVID-19 and pandemic response on children and adolescents.

A number of vaccines have been developed and are approved for use in adults in various countries around the world for COVID-19 prevention. Available data suggest that vaccines are highly effective in prevention of serious illness and death. Several vaccines, including Covaxin, Moderna, Pfizer, Sinopharm, Sinovac, and ZyCov-D have recently been authorized for emergency use in children in some countries. Limited published data exist for some of these vaccines, but available data suggest robust immunogenicity, efficacy, and safety in clinical trials [6,7]. Other data have been presented supporting pediatric immunizations to regulatory authorities and National Immunization Technical Advisory Groups (NITAGs). The International Pediatric Association encourages improved access of these data to the public, and peer review publication of these data. Thus far, in those 5 years of age or older, the benefits of COVID-19 vaccines in reducing hospitalizations and deaths due to COVID-19 appear to far outweigh any safety issues.

With several countries extending COVID-19 vaccinations to children, the International Pediatric Association, also supports and recommends vaccination of children, provided the vaccines are approved by regulatory authorities for children and recommended by NITAGs. Children should get the full benefit that COVID-19 vaccines can provide to improve their health and well-being.

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NEWS IN BRIEF

HOW SCHOOL START TIME AFFECTS SLEEP PATTERNS

In 2014, the American Academy of Pediatrics made a remarkable policy statement. They said that school start times for adolescents must be delayed and must not be before 8.30 AM. What was the science behind this important decision and what are the other fallouts of this?

Over the years there has been increasing data that adolescents are chronically sleep deprived. In 2013, a National Sleep Poll in the US found that 59% of sixth to eight graders had insufficient sleep and the number was as high as 87% in high school students. There are both biological and social reasons for the same.

The important biological reason is that with onset of puberty there is a 'phase delay' by 2 hours of the natural sleep onset. The reason is a delay in the release of melatonin in adolescents. Further the 'sleep drive' which accumulates over the day is delayed in teens. This means that the average teenager has great difficulty in falling asleep before 11 PM. However, their average sleep requirements of 8.5-9.5 hours per day do not decrease compared to middle schoolers. This means they need to sleep till about 8 AM to be fully refreshed.

Schools; however, are oblivious to these biological circadian cycles. The chronic sleep deprivation due to early school timings in high school results in daytime somnolence, inattention, depression, mood swings and obesity. Risky behavior due to excessive caffeine consumption and recreational drug use may be linked to this phenomenon.

Recognizing the high cost of sleep loss several schools in the US started delaying school onset timings to suit adolescents.

There have been many studies to demonstrate the benefits of this policy. Academic performance has improved, children have performed better on computerised attention tests and math and reading scores have improved. Car crashes in counties which had changed school start times decreased by 16% as compared to a rise of 7.8% for the rest of the state which did not make that change.

In a recent study from Colorado, USA, called the 'The Changing Start Times: Longitudinal Effects Study (CaSTLES),' researchers have tried to provide a comprehensive evaluation of the impact of changing school start times. They found an interesting outfall of this policy decision. There was a significant improvement in sleep timings and daytime functioning of parents of high school students.

Chronic sleep loss in adolescents is rampant and national level policies may help to tackle this unrecognized problem. (*Sleep Health, Oct 2021*)

RISE IN PEDIATRIC CANNABIS TOXICITY IN CANADA

Canada became the second country to legalize recreational use of cannabis after Uruguay in October, 2018. It happened in a phased manner. In phase 1, between October, 2018 and January, 2020 cannabis flower products, seeds and oils were allowed. After January, 2020, till March, 2021 (Phase 2), the sale of commercial edibles like gummies and cookies became legal. This was done to take the profits out of the hands of criminals.

However, this has badly impacted pediatric health. A recent study in *JAMA Network Open* showed that pediatric emergency visits due to cannabis toxicity rose from 20 in the 2 years pre-legalisation to 29 in phase one of legalisation to 122 in phase two of legalisation. In fact, phase 2 of legalisation overlapped with the COVID pandemic where the cannabis related poisoning rose despite an overall decrease in all other pediatric poisonings. This has occurred despite several strict measures like child resistant packages, a maximum of 10 mg of tetrahydrocannabinol per eatable and market restrictions. Other countries who are advocating legalising marihuana must take note. (*JAMA Network Open. 2022*)

FIRST US PORCINE HEART TRANSPLANT

The University of Maryland was in the news after the transplant of a porcine heart into a 57-year-old man with heart failure who was not eligible for conventional transplants due to life threatening arrhythmias. The pig was genetically modified using CRISPR technology. One of the modifications is to remove certain glycans from porcine endothelial cell surfaces. Human beings have natural preformed antibodies against these glycans, which contribute to the hyperacute rejection. Six human genes were also introduced into the pigs to improve immune tolerance.

An Indian surgeon Dr Baruah was the first person to transplant a porcine heart and lung in a terminally ill patient in Assam in 1997. However, the patient died in 7 days of hyper acute rejection and Dr Baruah was imprisoned for 40 days under the Transplantation of Human Organs Act, 1994.

Xenotransplants using pig organs will be a game changer because pigs are easier to raise than primates, they achieve human heart size in 6 month, and pig heart valves have been used earlier with success. (*The New York Times 10 January 2022*)

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