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## Vaccination for COVID-19 in children: Denialism or misinformation?



Since March 11, 2020, worldwide, there has been a viral pandemic of COVID-19, decimating the population through respiratory syndrome and severe systemic inflammatory repercussions. Peculiar to pandemic crises, the so-called waves occurred in several countries, sharing the significant increase in cases, deaths, and collapse of the health system by COVID-19, severely impacting the productive, economic, and social sector. (Hale et al., 2021). Historical documents show that growing that immunizations were the most efficient methods the treatment for many diseases, however, skepticism and vaccine hesitancy affect vaccination campaigns against diseases and, in particular, against COVID-19. Then, faced with the uncertain scenario, the race began for a quick and efficient treatment to reduce the number of deaths and hospitalizations. In this sense, several scientific entities and the pharmaceutical biotechnology industry proposed that vaccines would be the most effective means in a short period of time. However, this new therapeutic arsenal's record development generated speculation, and the population was bombarded with information that was not of common interest until then. From this, there was a great spread of untruths, generating discussion about the effectiveness of different immunizations in all media. This feeling of doubt, often instigated by government officials, led to a lack of confidence in vaccines, hesitancy to vaccinate and, a fact never documented, the population's rejection or predilection for immunizers because of the immunizer manufacturer (Fedele et al., 2021).

Even with the approval of vaccines, one cannot exclude the importance of the role of sanitary measures such as social distancing, use of a mask, and hand hygiene, which, for months, were the only effective measures available and which proved to be effective in reducing the circulation of the virus. With the implementation of these measures and the advent of vaccines against the virus, there was a significant reduction in mortality rates in adults and, consequently, a positive impact on case rates, which reveals a window of possibility for post-pandemic recovery. (Bian et al., 2021; Bouton et al., 2021). The successive epidemic waves and extensive circulation of the virus among the population make it possible for new variants of the SARS-CoV-2 virus, increasingly infective but, so far, susceptible to available vaccines. Based on this, two questions were possible in the actual scenery: Why were the children not vaccinated? What is the impact of this on the course of the COVID-19 pandemic?

Epidemiological studies show that, currently, in the childhood age group, SARS-CoV-2 is a disease with a considerable mortality rate, however treatable, as well as others already historically eradicated by vaccination. Even with the successful experience of many countries, Brazil, through its governmental administrative acts, delayed the use of vaccination against SARS-CoV-2, not only in adults but also in children, resulting in a collapse in public health, with the high rate of infected and hospitals overcrowded with critically ill patients. With children still

not vaccinated, the alarming number of deaths confirmed by the virus, and the emergence of variants with a high degree of infectivity, the government of Brazil says that “*there is no death of children that justifies emergency vaccination*” neglecting the need for vaccination of children (Weterman, 2021) and in opposition to evidence demonstrated by other countries.

Epidemiological data show that most children had mild or no clinical symptoms; however, with the emergence of new variants, thousands are being hospitalized; it is observed that there are several deaths due to COVID-19, demonstrating that this age group is equally essential for immunization. In addition, there are children with underlying conditions, such as immunosuppressed individuals and those with comorbidities, who are more likely to suffer diseases and complications from the disease. In addition, the long period of social isolation has made it impossible to practice sports and exercise, which can have repercussions on children's cardiovascular and hormonal systems, making them aware of infectious diseases such as COVID-19 (Thompson & Rasmussen, 2021). Epidemiological studies from the Houston hospital in the USA anteriorly reported that in January, the number of hospitalizations of children with COVID-19 quadrupled with the expansion of infections caused by the Ômicron and Delta variants during the end-of-year festivities, supering the rates found in August 2021, during the wave of the Delta variant (Yan & Caldwell, 2021). Complications of COVID-19 in children are usually associated with a rare post-infectious syndrome, the Multisystem Inflammatory Syndrome or Pediatric Multisystem Inflammatory Syndrome – Temporarily Associated with SARS-CoV-2, which exclusively affects children and leads to the hospitalization in most cases (Radia et al., 2021).

Vaccines, until recently, were only available for the adult population, but recently the immunizing of Pfizer-BioNTech (COMIRNATY) was authorized for children from the age of 12 by U.S. Food and Drug Administration (FDA) due to its expressive results in reducing the death and hospitalization in the children with COVID -19 (Thompson & Rasmussen, 2021). In its clinical studies, this manufacturer also demonstrated effectiveness and safety in children aged 5 to 11 years, thus obtaining approval in December 2021 for immunization of this population, which represents a significant achievement for the pediatric population (Walter et al., 2022). Scientific advances and clinical research have shown society that with an investment in science, with severe and rigorous studies, it is possible to quickly and effectively solve pandemic situations. However, in Brasil, the cut of scientific investments, the skepticism, denialism, and propagation of false information, often by members of a scientific society, based on preliminary or questionable scientific studies, raised and casts doubt on the credibility of the immunization process, mainly aimed at children.

The challenge now is the hesitation of the vaccine by parents and guardians of children. This phenomenon is related to the lack of information or widespread access to fake news content, highly propagated during the pandemic. The fear of adverse reactions to the vaccine is also pointed out as a preponderant factor for family members to refuse to vaccinate their children; however, like adults, children are susceptible to mild symptoms that can be correlated as a reflect an excellent

sign that the immune system is building up protection against this disease (Chaudhary et al., 2021; Thompson & Rasmussen, 2021). On the other hand, the movement of the anti-vaccination of the skeptical public, if contrapose the undeniable veracity observed that the immunizations present high efficacy, which confirms the drastic reduction in the number of hospitalizations and deaths due to the immunization process for all public.

Hesitation to vaccinate leads to a lack of adherence to the vaccination campaign and is directly related to misinformation that can delay the end of the pandemic and give the virus a chance to find more effective ways to infect more people, including children. We understand that negative experiences in childhood can reflect negative outcomes in adult life; therefore, although the levels of infant mortality from COVID-19 are not extraordinary, they must be protected from emotional suffering as a result of social distancing, hospitalization, and parental separation. Brazil is world-renowned for its successful history in immunization, eradicating many diseases that plagued children, such as measles and polio. In this way, vaccination of children against SARS-CoV-2 is urgent and essential to achieving the necessary immunity in the fight against the current global pandemic. Because of the above, we affirm that the attitudes of organized civil society, scientific entities, and the various actors in campaigns that call for and encourage the vaccination of children from 5 years of age to be welcomed and positive. However, it is necessary to share reliable scientific data create advertising campaigns to combat false information that is multiplied, aiming at the end of the transmission chain of COVID-19 and beyond, the well-being and health of the entire population worldwide.

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### Declaration of Competing Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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