Available online at www.sciencedirect.com

ScienceDirect

journal homepage: www.elsevier.com/locate/mjafi

Perspective

Impact of COVID-19 on child health and healthcare services

Himashree Bhattacharyya [a], *Rashmi Agarwalla* [b], *Ankur Khandelwal* [c,*]

[a] *Associate Professor (Community & Family Medicine), All India Institute of Medical Sciences (AIIMS), Guwahati, Assam, India*

[b] *Assistant Professor (Community & Family Medicine), All India Institute of Medical Sciences (AIIMS), Guwahati, Assam, India*

[c] *Assistant Professor (Anaesthesiology & Critical Care), Sharda University School of Medical Sciences & Research, Greater Noida, Uttar Pradesh, India*

ARTICLE INFO

Article history:
Received 9 September 2021
Accepted 3 October 2021

COVID-19 has crippled mankind with a devastating effect on all age groups, including children and adolescents. The impact of COVID-19 may not be completely reflected in indicators of morbidity and mortality; however, this crisis can have a profound effect on the overall well-being, including serious repercussions on child survival. These effects can be primarily grouped into: (a) decreased access to vital child healthcare services like newborn care and immunization, (b) nutritional deprivation, (c) poverty, orphans and strays, and (d) mental impairment and compromised learning. In the long term, targets of Sustainable Development Goals may perhaps be missed. Children from low socioeconomic populations and those in already destitute or vulnerable situations suffer a harder blow as they are the ones who might be more impoverished or deprived of essential healthcare services. Children seem to be the greatest victim in this universal crisis. The problem that had started as a public health emergency has grown in tremendous magnitude over time such that it demands major policy reforms in child health and overall development.[1]

COVID-19: child health and health services

The last two years have witnessed an almost complete shutdown of vital child health and welfare services in terms of nutritional programs, maternal and newborn care, immunization services, and community-based child protection programs. With the closure of the schools, the usual learning, as well as opportunities for social interactions, have been seriously disrupted. In India, since the onset of the lockdown in March 2020, the focus of all the healthcare workers has shifted toward the pandemic. Routine immunization is one of the worst affected services, with at least 68 countries globally experiencing disruptions. This has possibly resulted in an estimated 80 million children being left unvaccinated following the pandemic.[2] Analysis of data from the Health Management Information System in India shows that monthly immunizations dropped by 70% nation-wide in April 2020, but then rebounded substantially.[3] The Ministry of Health and Family welfare issued a guidance note in April 2020 regarding the continuation of essential services, including immunization. Immunization strategies were clearly outlined as per designated areas, which included: (a) Containment and Buffer zone, and (b) Areas beyond Buffer zone and Green zone.[4] India is already lagging behind in terms of immunization of the under-five age population. As per the

* *Corresponding author.*
E-mail address: ankurchintus@gmail.com (A. Khandelwal).

https://doi.org/10.1016/j.mjafi.2021.10.006

latest National Family Health Survey (NFHS-4), merely 62% of the children aged between 12 and 23 months were found to have all basic vaccinations, and only 54% received all the basic vaccinations by the age of 12 months. This percentage is much lower than India's global comparators like China, Bangladesh, and Vietnam.[5] A recent retrospective observational study in Rajasthan found a substantive decline in the rate of immunization in the state during the lockdown. This decline was higher in children from a poorer, less educated background and residing in COVID-19 red zones.[6]

The prolonged lockdown also led to economic insecurity, thereby causing food shortages and a rise in the prices of food items. This is preventing many families from providing their children with the nutrition that is needed for their physical and mental development. This can have lifetime implications for children. As of 2019, 114 million children under age five were stunted, and 14 million children under age five were affected by severe wasting.[7] Overall, 6.7 million additional children under age five suffered from wasting during the first year of the pandemic (i.e. a 14.3% increase in the number of children who are wasted) in the absence of timely action, leading to an estimated 10,000 additional child deaths per month during this same period.[8] A policy brief published on the impact of COVID-19 in children in India revealed that there were 1,315 children admitted across 966 Nutrition Rehabilitation Centers (NRCs) in April 2020, which is only 9% of the 15,796 children admitted in April 2019.[9] Only 14.9% of the children between 6 and 59 months received iron and folic acid supplementation by the last quarter of 2019–20, and only 9.1% had received it by the end of the first quarter of 2020–21. Only 2.9% of the children in the same age group received deworming tablets in 2019–20.[10] It has been predicted that child malnutrition would increase by 10-20% because of COVID-19, and an additional 6000 children probably would die every day from preventable causes because of the disruption in healthcare services.[11]

It is likely that the already-stretched health system will pivot to prioritize the COVID-19 response, potentially resulting in a spike in other childhood diseases and outbreaks. A global survey reported that people had faced substantial barriers in accessing healthcare services during the pandemic in terms of closure of healthcare centers (10%), long queues at healthcare centers resulting in not being assessed or treated (12%), and a shortage of required medication at healthcare centers and pharmacies (15%).[7] Home-based, facility-based, and zonal-based quarantine and isolation measures can all negatively impact children and their families to seek quality healthcare services. A substantial reduction in pediatric emergency care utilization has raised concerns regarding potential delays in seeking healthcare services with increased rates of morbidity and mortality.[12] Nationwide lockdown and lack of comprehensive guidelines for maternal and child healthcare (MCH) have left these vulnerable populations in need of essential healthcare services. These have led to an exacerbation of childhood diseases like acute respiratory infections, diarrhea, and other water-borne diseases, not to mention the upsurge of vaccine-preventable diseases, which can claim considerable lives in the days ahead. India bears one-sixth of the global under-five mortality burden with an estimated 882 thousand under-five deaths in 2018. Of them, nearly 550 thousand newborns die within the first 28 days after birth.[2] The child healthcare services become more compromised when a pandemic such as the one we are encountering now hits the population. The recent Global Financing Facility brief indicated that if the coverage of all essential MCH interventions reduced in a similar way, India might observe an increase of 40% in child mortality.[13]

COVID-19: mental health of children

COVID-19 has brought with it issues like closure of schools, postponement and cancellation of exams, quarantine and isolation of children and adolescents along with adults. Children with a lack of technology and internet services have found it difficult to cope with online classes. These issues have led to huge challenges to consider in terms of mental health and behavioral issues in children. The psychological effects of COVID-19 on children have a wide spectrum from mood fluctuations, conduct disorders, anxiety disorders to suicidal tendencies.

Some of the studies have highlighted the challenges faced by children and adolescents during these 1.5 yrs of the COVID-19 pandemic. In a study by Jiao *et al*., parents of young children revealed that children suffered from sleep disturbances, loss of appetite, and separation-related anxiety and felt fearful and lonely during the COVID-19 pandemic.[14] It seems that increasing screen time use correlates positively with unhealthy eating, lack of physical exercise, more total ill-being, as well as attention and physical problems. A study found that older adolescents and youth are anxious regarding the cancellation of examinations, exchange programs, and academic events.[15]

As mentioned by the Centers for Disease Control and Prevention (CDC) 2019, children with special needs are encountering special challenges during this pandemic. These children have a low tolerance to uncertainties, and there is an aggravation of symptoms due to the enforced restrictions.[16] Children are also psychologically affected due to quarantine and isolation while being separated from parents or caregivers. The children may develop feelings of sadness, anxiety, fear of death, fear of parents' death, and fear of being isolated in the hospital, which may have a very detrimental effect on their psychological development.[16]

A web-based study conducted in Punjab among 400 parents revealed that 73.15% and 51.25% of the children were having signs of increased irritation and anger, respectively, and 18.7% and 17.6% of the parents also mentioned the symptoms of depression and anxiety, respectively, among their children, which were also augmented by the changes in their diet, sleep, weight and more usage of the electronic equipment.[17] Closure of schools and activity centers for long periods have deprived the children of educational, psychological and developmental attainment.[18]

There is a lack of a database worldwide and from India regarding the effect of COVID-19 on the mental health of children. The long-term effects of the psychological issues in children and adolescents will be a big burden and a very difficult challenge to tackle the post-COVID-19 pandemic.

COVID-19: poverty and orphanhood

The lockdowns due to COVID-19, which seemed inevitable, made a large section of children vulnerable to poverty. The poor and marginalized children have been hit hard by the consequences of the lockdown. While the stringent lockdown during the first wave pushed the families into poverty, the brutal second wave left many children orphans. As per the UNICEF report on COVID-19, the global socioeconomic crisis caused by the pandemic could push 142 million more children into monetarily poor households in developing countries. The total number of children living in poor households globally could reach just over 725 million in the absence of any mitigating policies, and nearly two-thirds of these children live in sub-Saharan Africa and South Asia. The report has also highlighted the fact that the harmful effects of this pandemic will not be distributed equally. The poorest countries and in places where children are already living in disadvantaged and vulnerable positions will see severe damages.[19] Child poverty is strongly associated with parental employment status also. A joint report by the International Labor Organization and United Nations Children's Fund estimates that a 1% rise in poverty leads to at least 0.7% increase in child labor.[20] The coronavirus pandemic is forcing India's children out of school and into farms and factories to work, worsening a child-labor problem that was already one of the most critical in the world.

India's economy contracted by almost 24% last quarter, and schools remain closed across the country as thousands of new COVID-19 cases continue to be recorded daily. Millions of families have been forced to consider child marriage to alleviate poverty. Up to 2.5 million more girls around the world are at risk of marriage in the next 5 years because of the COVID-19 pandemic, the organization "Save the Children" has warned.[21]

As per the "Save the Children" survey, the closure of schools is also putting increased pressure on families to provide food for children who may otherwise have received free school meals. Around 89% of the respondents in the survey from 37 countries whose children had been out of school for 20 weeks or more reported that they had trouble paying for food. Many vulnerable children rely on food provided at schools as their only or main meal of the day, so it substantially contributes to their daily nutrition intake. With more children out of school, and COVID-19 resulting in even more families sliding into poverty, hunger and malnutrition among children will continue to increase, thus forming a vicious cycle.[21]

Orphanhood and the death of caregivers is a hidden issue of COVID-19. Orphanhood, as defined by UNICEF, is death of one or both the parents. As per the Lancet report, it was estimated that globally, from March 1, 2020, to April 30, 2021, around 1,134,000 children (95% credible interval 884,000–11,85,000) experienced the death of primary caregivers, including at least one parent or custodial grandparent. Around 1,562,000 children (1,299,000–1,683,000) experienced the death of at least one primary or secondary caregiver.[22] As per the BBC news reports, many children have been orphaned in India too. Children lost one or both their parents to COVID-19, and these children are now susceptible to poverty, abuse, and trafficking thus leaving a long-term effect of COVID-19.[23]

Way forward

The policymakers should ensure affordable and equitable access to healthcare services with prioritization for vulnerable children and their families, especially those with pre-existing health conditions, as the public health emergency continues.

The public health investment should be increased such that safe and nutritious food is affordable and accessible for all. Scaling up of social protection schemes, providing information on nutrition and guidance on infant and young child feeding, involvement of civil society organizations and communities in the monitoring of service provision, addressing the livelihood and food system/supply challenges are some of the key issues to be addressed in order to build up a strong and resilient public health and nutrition system as a response to any public health emergency.

The government should ensure that there is no disruption of essential healthcare services, which are critical for child survival in terms of immunization, child health, nutrition, education, etc. Clear-cut guidelines should be issued by the respective state and district health authorities regarding the availability of routine immunization services. Any policy changes in the wake of COVID-19 should be clearly communicated to the public. The safety of clinics and hospitals should be ensured so that parents are encouraged to come for consultation and vaccination of their children.

Separate task forces for testing, contact tracing, and patient care in the context of COVID-19 should be formulated so as to free the frontline healthcare workers from providing the much-needed essential services at the primary and secondary health centers. Investments should be made in data and technology infrastructure to expand the reach of telehealth and teleconsultation in rural areas.[7]

Children and young adolescents need to be educated about COVID-19 and preventive behavior, which will be helpful in the long run. Mental health check-ups of children and students need to be conducted, and there is an urgent requirement of coordinated and innovative mental healthcare delivery for children and adolescents. Policies should be formulated taking into account the developmental stage of the child e.g. preschoolers, school age, adolescents. School reentry and opening guidelines should be well formed, keeping in mind key points regarding social distancing and hygiene. Children of the lower socioeconomic background will have to be supported to get back to school through the help of community workers and NGOs.

Conclusion

Children and young adolescents may not be directly affected by the COVID-19 pandemic in terms of mortality and morbidity, but the burdens of other dimensions are heavily borne by them. Collaborative work of parents, psychiatrists, psychologists, pediatricians, and community health workers will be required to counter the post-COVID challenges in this vulnerable age group. The underprivileged section will require special attention. Continuity of healthcare along with an integrated approach can go a long way in delivering quality healthcare to children during such health emergencies.

Disclosure of competing interest

The authors have none to declare.

REFERENCES

1. Policy Brief. *The Impact of COVID 19 on Children*. United Nations; 15 April, 2020. Available at: https://unsdg.un.org/sites/default/files/202004/160420_Covid_Children_Policy_Brief.pdf.
2. https://www.who.int/news/item/22-05-2020-at-least-80-million-children-under-one at risk-of-diseases-such-as-diphtheria-measles-and-polio-as-covid-19-disrupts-routine vaccination-efforts-warn-gavi-who-and-unicef.
3. Kumar Chandan, Sodhi Chhavi, Abdul Jaleel CP. Reproductive, maternal and child health services in the wake of COVID 19: insights from India. *J Glob Health Sci*. 2020;2:e28.
4. https://www.mohfw.gov.in/pdf/3Immunization ServicesduringCOVIDOutbreakSummary150520202.pdf.
5. National family health survey 4. Available at: http://rchiips.org/nfhs/pdf/nfhs4/india.pdf.
6. Jain R, Chopra A, Falézan C, Patel M, Dupas P. COVID-19 related immunization disruptions in Rajasthan, India: a retrospective observational study. *Vaccine*. 2021 13;39:4343–4350. https://doi.org/10.1016/j.vaccine.2021.06.022.
7. Report: protect A Generation. The impact of COVID-19 on children's lives. Save the Children International. Available at: https://www.savethechildren.org/content/dam/usa/reports/emergencyresponse/protect-a-generation-report.pdf.
8. Headey D, Heidkamp R, Osendarp S, et al. Impacts of COVID-19 on childhood malnutrition and nutrition-related mortality. *Lancet*. 2020;396(10250):519–521. https://doi.org/10.1016/S0140-6736(20)31647-0.
9. *Impact of COVID 19 on Child Nutrition in India: What Are the Budgetary Implications? A Policy Brief*. Centre for Budget and Governance Accountability (CBGA) and Child Rights and You. (CRY); 2021. Available at: https://www.cbgaindia.org/wp-content/uploads/2021/01/Impact-of-COVID-19-on-Child-Nutrition-in-India-What-are-the-Budgetary-Implications.pdf.
10. Anaemia Mukt/Bharat (AMB) portal: https://anemiamuktbharat.info/resources/.
11. *News Paper Brief: "Covid-19 Pandemic Can Increase Malnutrition in Indian Children by 10-20%: UNICEF Nutrition Chief."*. THE HINDU; 20th September, 2020.
12. Conlon C, McDonnell T, Barrett M, et al. The impact of the COVID-19 pandemic on child health and the provision of Care in Paediatric Emergency Departments: a qualitative study of frontline emergency care staff. *BMC Health Serv Res*. 2021;21:279. https://doi.org/10.1186/s12913-021-06284-9.
13. Global Financing Facility. Our response to COVID 19. Available at: https://www.globalfinancingfacility.org/covid19.
14. Jiao WY, Wang LN, Liu J, et al. Behavioral and emotional disorders in children during the COVID-19 epidemic. *J Pediatr*. 2020;221:264–266.e1. https://doi.org/10.1016/j.jpeds.2020.03.013.
15. Lee J. Mental health effects of school closures during COVID-19. *Lancet Child Adolesc Health*. 2020;4:421. https://doi.org/10.1016/S2352-4642(20)30109-7.
16. CDC. *Data and Statistics on Children's Mental Health*. CDC. Centers Dis. Control Prevent; 2019. https://www.cdc.gov/childrensmentalhealth/data.html.
17. Sama BK, Kaur P, Thind PS, Verma MK, Kaur M, Singh DD. Implications of COVID-19-induced nationwide lockdown on children's behaviour in Punjab, India. *Child Care Health Dev*. 2021;47:128–135. https://doi.org/10.1111/cch.12816.
18. Singh S, Roy D, Sinha K, Parveen S, Sharma G, Joshi G. Impact of COVID-19 and lockdown on mental health of children and adolescents: a narrative review with recommendations. *Psychiatry Res*. 2020;293:113429. https://doi.org/10.1016/j.psychres.2020.113429.
19. COVID 19 and Children: UNICEF data hub. Available at: https://data.unicef.org/covid-19-and-children/.
20. Child Labour: Global estimates 2020, trends and the road forward - executive Summary. Available at: https://www.ilo.org/wcmsp5/groups/public/—ed_norm/—ipec/documents/publication/wcms_800278.pdf.
21. Cousins S. 2·5 million more child marriages due to COVID-19 pandemic. *Lancet*. 2020;396(10257):1059. https://doi.org/10.1016/S0140-6736(20)32112-7.
22. Hillis SD, Unwin HJT, Chen Y, et al. Global minimum estimates of children affected by COVID-19-associated orphanhood and deaths of caregivers: a modelling study. *Lancet*. 2021;398(10298):391–402. https://doi.org/10.1016/S0140-6736(21)01253-8.
23. Coronavirus: The Indian children orphaned by Covid-19. Available at: https://www.bbc.com/news/world-asia-india-57264629.