

### Abstract:

While vulnerability of elderly population in the context of Covid-19 has attracted attention of both policy and academic circles, the same cannot be said in respect of young children. Yet, children under 5 years of age and infants are likely to be vulnerable to Covid-19, particularly those suffering from acute respiratory infection (ARI) and malnutrition. Children in developed nations or in nations with low Infant Mortality Rate (IMR) are unlikely to face this twin condition. However, this will definitely be a problem in India where diarrhea and ARI are the major causes of child mortality <sup>[1]</sup> with 35% stunting and 17% wasting among children aged 0-4 years (CNNS 2019) <sup>[2]</sup>. It stands to reason, that ARI will be a potent co-morbidity that will render these children vulnerable to Covid-19. That we have so far escaped this situation, thanks to the fortuitously better quality of air and the gap of few months before the onset of the ARI season, should not lead to complacency.

We argue that there is a strong need for sharp surveillance, early detection and prepositioning our system to combat this crisis through preventive measures. Massive promotion of colostrum feeding as the first immunity provider, effective and exclusive breastfeeding until 6 month of age as an immunity booster followed by Covid-19 concerned IYCF, are crucial. We will also need new ways of outreach using technology and pedagogy innovatively as the usual methods of promoting these measures may not suffice.

**Covid -19** has taken the societies and the health system by surprise. With no vaccine or effective medicine in sight, and a mounting death toll, the world has changed itself beyond belief, in trying to cope with the pandemic. Health systems have been stretched to their seams in trying to detect and contain the Covid-19 virus and cure those affected.

One **silver lining** in this large dark cloud, however, is the relatively smaller number of children among those affected by the virus, and, more reassuringly, among those succumbing to it. Agent based modelling study, IndiaSIM conducted in Indian population reported 11% of infants, 7% of 1-5y old

children, 4% of 6-15y children and about 18% adults are likely to be effected by severe or critical infection <sup>[3]</sup>.

A very recent modelling study on the indirect effects of the COVID-19 pandemic on maternal and child mortality in low-income and middle-income countries reported an increase of 9.8 - 44.7% and 8.3 - 38.6% in monthly additional under-5 child and maternal deaths across the 118 countries <sup>[4]</sup>.

The fatality is large among the elderly, particularly those above 60 years of age and those with comorbid conditions such as diabetes, respiratory infections or tuberculosis, to name a few.

We already have reports of unusually large fatality rate among the Bhopal gas victims who had respiratory complications. The recent six mortality cases in Madhya Pradesh has raised the concern in this regard as though they survived the disaster but the weakened immune systems made them vulnerable towards novel coronavirus infection<sup>[5]</sup>.

The younger lot, especially in the 10-50 year age group appear less vulnerable even if the incidence among them may not be insignificant<sup>[4][6]</sup>. Why are they less vulnerable? No one really knows the answer.

Reports do suggest however, that children under 5, infants in particular are more vulnerable and that is what we wish to dwell upon.

In countries with low IMR, we do not have high incidence of child malnutrition. But this is not the situation in countries like India. We have a high burden of stunted children (35% as per CNNS, 2016-18)<sup>[2]</sup> signifying chronic malnutrition and wasted children (17% as per CNNS, 2016-18)<sup>[2]</sup> signifying episodic events of acute malnutrition. More worrying, diarrhea and ARI (acute respiratory infections) are two major causes of child mortality in our country<sup>[1][7]</sup>.

The latter group is likely to be highly vulnerable to the virus. ARI will offer the perfect comorbid condition that will render these children vulnerable.

This vulnerability will be higher in the congested urban slums and the densely populated Gangetic plain where winter is harsh. In addition, the worry about the lower levels of child immunization, higher number of home deliveries and the concern about breastfeeding during the pandemic.

This apprehension is strengthened as cases of Covid-19 among young children are already getting detected in UK, Indonesia and in India as well <sup>[8][9]</sup>. In Indonesia, the fatalities have been linked to malnutrition while in UK and in India, children affected by Covid-19 have showed symptoms akin to Kawasaki disease.

We have so far been lucky as far as the fatality among young children is concerned, as the ARI season, typically September onwards, is still away, and as some pediatricians and nutritionists would argue that the air quality is remarkably better due to the lockdown. Both these advantages are likely to be unavailable after a few months and hence taking early preventive steps are highly needed.

**We, therefore, suggest a *three-pronged strategy* for boosting the immunity among infants and young children..**

**First**, it is absolutely necessary to mount a campaign to ensure 100% early breastfeeding and project the colostrum as the first immunity provider<sup>[10]</sup>. Colostrum because of its high level of immunoglobulin protects newborns from respiratory illnesses as well as diarrhea. It also protects premature babies from various life-threatening illnesses. Thus, breastfeeding within initial 1-hour of birth and exclusive breastfeeding for 6 months and nutrient dense complementary foods after 6 months with continued breast feeding has reported to have lower prevalence of ARI <sup>[11]</sup>. What is needed is to propagate this message among all the pregnant women and their family members. We must task the three frontline workers the Anganwadi Worker, the Asha and the ANM. But we must also spread this message through the telephone, radio and the mass media.

**Second**, we must launch a massive campaign to ensure exclusive breastfeeding as the immunity booster for the newborn <sup>[12]</sup>. This is important for two reasons. One is of course, to actually boost immunity of the child to fight infection. The other, equally important reason is to prevent the baby food industry from making a killing out of the crisis through subtle or brazen and unethical push for infant formulas.

***We must protect our little ones from the wrath of malnutrition in the post pandemic era. The solutions are easy and doable. It just requires a will to do it !***

The Spoken Tutorial project together with faculty from CTARA (Centre for Technology Alternatives for Rural Areas) at IIT Bombay has already made audiovisual modules in multiple languages to educate mothers about 'breastfeeding during Covid-19' (Link: <https://www.youtube.com/watch?v=UJ-T6oEWSN0>) and on techniques of effective breastfeeding' (Link: <https://spoken-tutorial.org/watch/Health+and+Nutrition/Breastfeeding+latcing/English/>). The forthcoming occasion of breastfeeding week in 1<sup>st</sup> week of August 2020, will be an ideal occasion to launch such a campaign.

The **third** area is to train the mothers in Covid centric IYCF (infant and young child feeding practices). This is where we will need to focus on the requirement of food-based micronutrients among young children mainly as immunity providers and immunity boosters. This will require a massive effort from the nutrition community, baby-friendly pediatricians and the Civil Society at large. There is a need to make the nutritious food convenient and make the convenience food nutritious while making both these affordable. The nutrition group at CTARA is working in that direction but there are adequate number of regional institutions having expertise and mandate in this area. They must rise to the occasion.

## Authors



**Dripta Roy Choudhury** is a Post Doctoral Research Fellow at CTARA, IITB. She is a public health nutritionist. Her research interest in child nutrition, anemia, nutrition intervention studies and community trials.



**Dr. Rupal Dalal** is an adjunct faculty at CTARA, IITB. She is a pediatrician. She works in the area of maternal, infant and young nutrition, importance of correct breastfeeding techniques, behavior change of caregivers, through counselling and training.



**Dr. Satish B. Agnihotri** is an Emeritus Professor at CTARA, IITB. He has been a career bureaucrat for Government of India and State Government of Odisha under several capacities. His work interest lies in child malnutrition, technology scale-up for rural development and use of mapping techniques in planning and public policy.

## References

1. Liu L, Chu Y, Oza S, Hogan D, Perin J, Bassani DG, Ram U, Fadel SA, Pandey A, Dhingra N, Sahu D. National, regional, and state-level all-cause and cause-specific under-5 mortality in India in 2000–15: a systematic analysis with implications for the Sustainable Development Goals. *The Lancet Global Health*. 2019 Jun 1;7(6):e721-34.
2. Ministry of Health and Family Welfare (MoHFW), Government of India, UNICEF, Population Council. New Delhi. Comprehensive National Nutrition Survey (CNNS) National Report. [https://www.popcouncil.org/uploads/pdfs/2019RH\\_CNNSreport.pdf](https://www.popcouncil.org/uploads/pdfs/2019RH_CNNSreport.pdf). 2019.
3. Klein E, Lin G, Tseng K, Schueller E, Kapoor G, Laxminarayan R. *COVID-19 for India updates* (Doctoral dissertation, Princeton University). (Available at: <https://cddep.org/wp-content/uploads/2020/03/covid19.indiasim.March23-2-eK.pdf>)
4. Robertson T, Carter ED, Chou VB, Stegmuller AR, Jackson BD, Tam Y, Sawadogo-Lewis T, Walker N. Early estimates of the indirect effects of the COVID-19 pandemic on maternal and child mortality in low-income and middle-income countries: a modelling study. *The Lancet Global Health*. 2020 May 12.
5. <https://www.ndtv.com/india-news/coronavirus-bhopal-six-dead-in-bhopal-from-covid-19-all-were-exposed-to-union-carbide-gas-leak-2214508>.
6. Dong Y, Mo X, Hu Y, Qi X, Jiang F, Jiang Z, Tong S. Epidemiology of COVID-19 among children in China. *Pediatrics*. 2020 Jun 1;145(6).
7. World Health Organization. Health situation in the South-East Asia region 1994-1997. WHO; 1999.
8. Götzinger F, Santiago-García B, Noguera-Julián A, Lanaspá M, Lancella L, Carducci FI, Gabrovská N, Velizarova S, Prunk P, Osterman V, Krivec U. COVID-19 in children and adolescents in Europe: a multinational, multicentre cohort study. *The Lancet Child & Adolescent Health*. 2020 Jun 25.
9. Smith N. Alarm in Indonesia over high number of Covid-related deaths among children. *The Telegraph*. (Available at: <https://www.telegraph.co.uk/global-health/science-and-disease/alarm-indonesia-high-number-covid-related-deaths-among-children/>)
10. Thai JD, Gregory KE. Bioactive Factors in Human Breast Milk Attenuate Intestinal Inflammation during Early Life. *Nutrients*. 2020 Feb;12(2):581.
11. Ahmed KY, Page A, Arora A, Ogbo FA, Global Maternal and Child Health Research collaboration (GloMACH). Associations between infant and young child feeding practices and acute respiratory infection and diarrhoea in Ethiopia: A propensity score matching approach. *PloS one*. 2020 Apr 1;15(4):e0230978.
12. Jackson KM, Nazar AM. Breastfeeding, the immune response, and long-term health. *The Journal of the American Osteopathic Association*. 2006 Apr 1;106(4):203-7.



## Contact us

Prof Satish B Agnihotri  
 Nutrition Discussion Group, CTARA,  
 IIT Bombay, Powai Mumbai 400076  
 Email ID: [sbagnihotri@gmail.com](mailto:sbagnihotri@gmail.com) , [sbagnihotri@iitb.ac.in](mailto:sbagnihotri@iitb.ac.in)  
 Phone No: 9810307353 (Mobile), 022 576 6476