

Center for Nutrition Studies

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Dear well-wisher,

It has been almost a year since we received your generous support. We wish to share some updates on our activities in 2020, which was one of the most challenging years for us as it was for others. Our project in Jharkhand involves supplying rations to poor and extremely undernourished patients with TB and to their family members. The lockdown related to COVID-19 threatened the entire chain of procurement and distribution. We are happy to share that with the extraordinary efforts of our field team, no household experienced disruption of rations, and this prevented both chronic hunger and deaths in some of the poorest households in India.

The research output of the Center this year has been important and relevant. Our re-analysis of the National Family Health Survey data over the last 15 years uncovered high levels of stunting in adolescents which had been missed. Our paper on predicting and preventing the more than 4,00,000 deaths which occur annually in India due to TB has influenced a national initiative on differential care for TB patients. We highlighted early in the COVID-19 pandemic obesity as a risk factor for severe COVID-19 disease. We have pointed out critical gaps in the Ayushman Bharat scheme in the care of seriously ill patients with TB. We were invited by the WHO South East-Asia Regional Office to address TB program managers of 11 member countries on the issue of nutrition in the prevention and care of TB.

We wish you a safe and healthy year ahead and hope you will consider continuing your support for our Center.

Publications

Some of the key publications that were also covered by media are:

1. Bhargava M, Shewade HDS, Bhargava A. Tuberculosis in Indian adolescents (2015-16): results from a nationally representative survey. *Int Jour of Tub and Lung Disease*. 2020 Dec; 24(12).
2. Sinha P, Carwile M, Bhargava A, Cintron C, Acuna-Villaorduna C, Lakshminarayan S, Liu AF, Kulatilaka N, Locks L, Hochberg NS. How much do Indians pay for tuberculosis treatment? A cost analysis. *Public Health Action*. 2020 Sep 21;10(3):110-117.
3. Bhargava M, Bhargava A, Ghate SD, Rao RSP. Nutritional status of Indian adolescents (15-19 years) from National Family Health Surveys 3 and 4: Revised estimates using WHO 2007 Growth reference. *PLoS One*. 2020 Jun 22;15(6): e0234570.
4. Bhargava A, Bhargava M, Meher A. Universal Health Coverage and TB care in India in times of COVID-19: Aligning Ayushman Bharat (National Health Assurance Scheme) to improve case detection, reduce deaths and catastrophic health expenditure. *Nat Med J of India*. 2020 Dec;33(5).
5. Kini G, Karkal R, Bhargava M. All's not well with the "worried well": understanding health anxiety due to COVID-19. *J Prev Med Hyg*. 2020 Oct 6;61(3):E321-E323.
6. Bhargava A, Bhargava M. Obesity and COVID-19 outcomes: a risk factor that needs attention. *Curr Sci (00113891)*. 2020 May;118(9).
7. Bhargava A, Bhargava M, Juneja A. Social determinants of tuberculosis: context, framework, and the way forward to ending TB in India. *Expert Rev Respir Med*. 2020 Oct 20:1-17.
8. Bhargava A, Bhargava M. Tuberculosis deaths are predictable and preventable: Comprehensive assessment and clinical care is the key. *J Clin Tuberc Other Mycobact Dis*. 2020 Feb 26;19:100155.
9. Bhargava A, Shewade HD. The potential impact of the COVID-19 response related lockdown on TB incidence and mortality in India. *Indian J Tuberc*. 2020 Dec;67(4S).
10. Bhargava M, Vaswani V, Vaswani R. Ethics related guidelines for authors and article retraction: How do Indian biomedical journals measure up? *Indian J Med Ethics*. 2019 Nov 25;1-9
11. Sonia J, Zanhali GM, Prasad KS. Low cost paper electrodes and the role of oxygen functionalities and edge-plane sites towards trolox sensing. *Microchemical Journal*. 2020 Jun 13: 158,105164.
12. Dsouza Priya Swetha, P. and Sudhakara Prasad, K. A Non-Enzymatic Disposable Electrochemical Sensor for Pyruvic Acid. *Electroanalysis*. 2020.32(10),2237

Projects and Field work

Here are the projects and some of the key field activities:



RATIONS Project:

Reducing Activation of Tuberculosis by Improvement of Nutritional Status (RATIONS) is a cluster-randomized trial of nutritional support to reduce TB incidence in the household contacts of patients with smear-positive pulmonary TB in communities with a high prevalence of undernutrition. This is the first of its kind globally which seeks to

improve the outcomes in patients and reduce the incidence of TB disease in the household contacts by providing them nutritional support (as dry rations) during therapy. It is being conducted in 28 blocks of 4 tribal-dominated districts of Jharkhand in nearly 3000 families with a patient with pulmonary TB. It is funded by the ICMR and conducted in partnership with Jharkhand State TB cell, NIRT (Chennai), and NIN (Hyderabad). Presently enrolment is nearly complete with the efforts of our field team of more than 60 (picture). We have found high rates of severe undernutrition in patients and also excellent weight gains, high adherence and significantly reduced mortality due to the intervention.



Field activity in Jharkhand: (from the right) body composition measurement using portable BIA machine, height measurement using portable stadiometer, difficult terrain while delivering the food rations

RATIONS Sub-studies:

There are several sub-studies being done within the larger trial to look at dietary intakes in patients and their household contacts at start and end of treatment, body composition using a portable Bio-Impedance Analyzer, hand-grip testing using digital Jamar hand-grip dynamometer, and micronutrient levels of Vitamin A and D. We are also looking at TB-Immunology by evaluating lymphocyte subsets and kinetics of interferon-gamma responses in a subset of the patients and their contacts.

Projects and Field work

Adolescent Nutrition Project:

Information on adolescent nutrition is scant, NFHS has data on boys and girls of 15-19 age group, but clubs them with adults and has applied BMI cut-offs also of adults. We re-analyzed NFHS-3 and 4 data-sets using age and sex appropriate WHO standards and found that thinness may have been over-estimated by more than 2-fold. Stunting (poor height for age) was found to be more than 30% in NFHS-4 which has increased as compared to NFHS-3.

Adolescent Tuberculosis:

Adolescent tuberculosis has not received it due attention in India. We found from our analysis of self-reported tuberculosis in NFHS-4 that it was 136/100,000 population and further there were 1.6% of adolescents that had a household exposure to TB. Poverty and urban residence were of significance. Moreover, chronic undernutrition was highly prevalent among adolescents with self-reported as well as house-hold exposure of TB.

Student Projects:

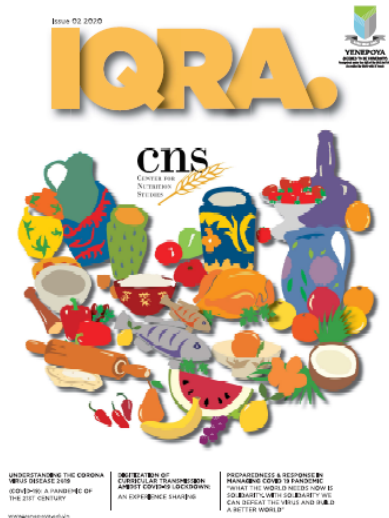
Three undergraduate medical students benefitted from CNS resources for pursuing their short research projects:

1. Neck circumference in adults: its utility and acceptability compared to standard nutritional assessment techniques in screening for overweight-obesity (This was also presented in 32nd KACH-2020 and received the KACH Millenium Award in Undergraduate category).
2. Prevalence of sarcopenia in an elderly population in rural South India: a cross-sectional study (This was presented in the 32nd State level annual conference of Karnataka Association of Community Health: KACH-2020).
3. Acceptability of nutritional assessment methods: Deciphering perceptions of women in coastal Karnataka (supported as ICMR - Short term studentship award)

National/International involvements

1. CNS participated in several consultations with Central TB Division, WHO (India), PATH, HSTP and Wadhvani AI for comprehensive health system strengthening to reduce TB mortality in Jharkhand and India.
2. CNS was also invited to be part of the Technical Advisory Group for USAID-MUKTI Project of TB-nutrition in Madhya Pradesh.
3. CNS was involved in WHO-GOI organized TB Mini-Epi review in Nov 2019 and Joint Monitoring Mission.
4. We also represented India in the Strategic Advisory Group of Experts on In Vitro Diagnostics (SAGE IVD) 2020

CNS featured in the University Magazine



CENTER FOR NUTRITION STUDIES

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“IF WE COULD GIVE EVERY INDIVIDUAL THE RIGHT AMOUNT OF NOURISHMENT AND EXERCISE, NOT TOO LITTLE AND NOT TOO MUCH, WE WOULD HAVE FOUND THE SAFEST WAY TO HEALTH” HIPPOCRATES

This advice by the Father of Medicine rings true even two and a half thousand years later as problems related to nutrition continue to be the largest single contributor to the disease burden at the global and at the national level. In India, problems of under-nutrition are an underlying contributor to the high burden of infectious diseases in children and adults. Every third malnourished child in the world lives in India, and almost

half of the 4.5 million deaths in children under-five are related to under-nutrition. On the other hand the prevalence of overweight and obesity is also increasing and generating epidemics of diabetes, hypertension and cardiovascular disease. Micronutrient deficiency is widespread especially in women and children. Our poor rank in the Human Development Index where according to 2018 figures, we

are 129th among 189 countries is partially because of low life expectancy related to early life mortality. Early life nutrition in the first 1000 days of life is closely linked to cognitive development and learning abilities and the biggest brain drain in India is of the loss of intellectual capacity of our young children because of malnutrition. There is need for academic institution

Coverage of CNS publications in National Media

COVID impact on TB and Nutrition

<https://timesofindia.indiatimes.com/india/india-to-miss-goal-of-75-reduction-in-tb-deaths-by-2025-experts-report/articleshow/78852623.cms>

<https://www.thehindubusinessline.com/news/covid-19-related-lockdown-may-potentially-lead-to-two-lakh-additional-tb-cases-in-india-study/article32196088.ece>

<https://www.deccanherald.com/opinion/panorama/as-we-count-covid-19-numbers-we-have-taken-our-eyes-off-tb-the-silent-killer-911050.html>

<https://theprint.in/health/covid-lockdown-could-lead-to-over-1-8-lakh-new-tb-cases-88000-additional-deaths-study/says/473294/>

NFHS Adolescent nutrition re-analysis

<https://indianexpress.com/article/cities/pune/thinness-in-adolescents-may-have-been-overestimated-2-5-times-in-national-survey-study/>

Obesity and COVID-19

<https://timesofindia.indiatimes.com/india/obesity-puts-young-at-risk-of-severe-corona-infection/articleshow/75240758.cms>

<https://www.thehindubusinessline.com/news/centre-mulls-study-on-obesity-link-to-covid-19/article31415481.ece>

<https://www.telegraphindia.com/science-tech/coronavirus-outbreak-obese-patients-at-higher-risk/cid/1766367>