POSHAN
Partnerships and Opportunities to Strengthen and Harmonize Actions for Nutrition in India
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EDITOR'S NOTE

This issue of Abstract Digest brings to you a set of interesting articles on stunting burden, drivers, and learnings from countries that have been successful in reducing stunting, including a case study on Chhattisgarh. In addition, there are studies on anthropometric data quality assessment, and a study describing the health system components required for the delivery of nutrition-specific interventions. This issue also includes studies on COVID-19 and its implications for child nutrition.

In this edition, we have included a Call for Action issued by leaders of four UN agencies to protect children's right to nutrition in the face of the COVID-19 pandemic. In India, a diverse group of nutrition stakeholders have pledged their renewed Commitment to Action for supporting efforts by the government and all of society.

We would like to highlight that we, along with 19 partners, are preparing to co-host the third India-focused implementation research conference on "**Delivering for Nutrition in India: Insights from Implementation Research**". This virtual event will include theme-based sessions convene academics, implementers, development partners, and policy makers from multiple institutes on a common platform to deliberate on selected research studies and implementation experiences focused on the core pillars of POSHAN Abhiyaan, India's National Nutrition Mission, and platforms supporting actions for nutrition. The conference program features 3 outstanding plenary lectures with global and local experts, and 12 thematic sessions based on selected and poster presentations, social hangouts and panels with policymakers and research funders. We invite our readers to REGISTER and participate in this event.

Given below is the list of peer-reviewed articles. Please click on the title if you wish to go straight to the article or scroll down to explore the abstract in the pages that follow.

Stay safe and enjoy reading!

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Comment

Review of the 2019 novel coronavirus (SARS-CoV-2) based on current evidence

Wang, L., Y. Wang, D.Ye, and Q. Liu. 2020. "Review of the 2019 novel coronavirus (SARS-CoV-2) based on current evidence". *International Journal of Antimicrobial Agents* 55(6): 105948. https://doi.org/10.1016/j.ijantimicag.2020.105948

COVID-19, the disease caused by SARS-CoV-2, is a highly contagious disease. The World Health Organization has declared the ongoing outbreak to be a global public health emergency. Currently, the research on SARS-CoV-2 is in its primary stages. Based on current published evidence, this review systematically summarizes the epidemiology, clinical characteristics, diagnosis, treatment and prevention of COVID-19. It is hoped that this review will help the public to recognize and deal with SARS-CoV-2, and provide a reference for future studies.

Comment

Impacts of COVID-19 on childhood malnutrition and nutrition-related mortality

Headey, D., R. Heidkamp, S. Osendarp, M. Ruel, N. Scott, R. Black, M. Shekar, H. Bouis, A. Flory, L. Haddad, and N. Walker on behalf of the Standing Together for Nutrition consortium. 2020. "Impacts of COVID-19 on childhood malnutrition and nutrition-related mortality". *The Lancet*. https://doi.org/10.1016/S0140-6736(20)31647-0

The Standing Together for Nutrition consortium, a multidisciplinary consortium of nutrition, economics, food, and health systems researchers, is working to estimate the scale and reach of nutrition challenges related to COVID-19. These efforts link three approaches to model the combined economic and health systems impacts from COVID-19 on malnutrition and mortality: MIRAGRODEP's macroeconomic projections of impacts on per capita gross national income (GNI);4 microeconomic estimates of how predicted GNI shocks impact child wasting using data on 1·26 million children from 177 Demographic Health Surveys (DHS) conducted in 52 LMICs between 1990–2018; and the Lives Saved Tool (LiST), which links country-specific health services disruptions and predicted increases in wasting to child mortality.

Comment

Child malnutrition and COVID-19: the time to act is now

Fore, H.H., Q. Dongyu, D.M. Beasley, and T.A. Ghebreyesus. 2020. "Child malnutrition and COVID-19: the time to act is now". *The Lancet*. https://doi.org/10.1016/S0140-6736(20)31648-2

The leaders of four UN agencies have issued a call for action to protect children's right to nutrition in the face of the COVID-19 pandemic. This requires a swift response and investments from governments, donors, the private sector, and the UN.

Stunting among Preschool Children in India: Temporal Analysis of Age-Specific Wealth Inequalities

Rajpal, S., R. Kim, W. Joe, and S.V. Subramanian. 2020. "Stunting among preschool children in India: Temporal analysis of age-specific wealth inequalities". *International Journal of Environmental Research and Public Health* 17(13): 4702. https://doi.org/10.3390/ijerph17134702

Adequate nutritional intake for mothers during pregnancy and for children in the first two years of life is known to be crucial for a child's lifelong physical and neurodevelopment. In this regard, the global nutrition community has focused on strategies for improving nutritional intake during the first 1,000 day period. This is largely justified by the observed steep decline in children's height-for-age z scores from birth to 23 months and presumed growth faltering at later ages as a reflection of earlier

deprivation that is accumulated and irreversible. Empirical evidence on the age-stratified burden of child undernutrition is needed to re-evaluate the appropriate age for nutrition interventions to target among children. Using data from two successive rounds of National Family Health Surveys conducted in 2006 and 2016, the objective of this paper was to analyze intertemporal changes in the age-stratified burden of child stunting across socioeconomic groups in India. We found that child stunting in India was significantly concentrated among children entering preschool age (24 or above months). Further, the temporal reduction in stunting was relatively higher among children aged 36–47 months compared to younger groups (below 12 and 12–23 months). Greater socioeconomic inequalities persisted in stunting among children from 24 months or above age-groups, and these inequalities have increased over time. Children of preschool age (24 or above months) from economically vulnerable households experienced larger reductions in the prevalence of stunting between 2006 and 2016, suggesting that policy research and strategies beyond the first 1000 days could be critical for accelerating the pace of improvement of child nutrition in India.

Stunting in childhood: an overview of global burden, trends, determinants, and drivers of decline

Vaivada, T., N. Akseer, S. Akseer, A. Somaskandan, M. Stefopulos, and Z. A. Bhutta. 2020. "Stunting in childhood: an overview of global burden, trends, determinants, and drivers of decline." *The American Journal of Clinical Nutrition*. https://doi.org/10.1093/ajcn/nqaa159

Background: Progress has been made worldwide in reducing chronic undernutrition and rates of linear growth stunting in children under 5 y of age, although rates still remain high in many regions. Policies, programs, and interventions supporting maternal and child health and nutrition have the potential to improve child growth and development. **Objective:** This article synthesizes the available global evidence on the drivers of national declines in stunting prevalence and compares the relative effect of major drivers of stunting decline between countries. **Methods:** We conducted a systematic review of published peer-reviewed and gray literature analyzing the relation between changes in key determinants of child linear growth and contemporaneous changes in linear growth outcomes over time. **Results:** Among the basic determinants of stunting assessed within regression-decomposition analyses, improvement in asset index score was a consistent and strong driver of improved linear growth outcomes. Increased parental education was also a strong predictor of improved child growth. Of the underlying determinants of stunting, reduced rates of open defecation, improved sanitation infrastructure, and improved access to key maternal health services, including optimal antenatal care and delivery in a health facility or with a skilled birth attendant, all accounted for substantially improved child growth, although the magnitude of variation explained by each differed substantially between countries. At the immediate level, changes in several maternal characteristics predicted modest stunting reductions, including parity, interpregnancy interval, and maternal height. **Conclusions:** Unique sets of stunting determinants predicted stunting reduction within countries that have reduced stunting. Several common drivers emerge at the basic, underlying, and immediate levels, including improvements in maternal and paternal education, household socioeconomic status, sanitation conditions, maternal health services access, and family planning. Further data collection and in-depth mixed-methods research are required to strengthen recommendations for those countries where the stunting burden remains unacceptably high.

How countries can reduce child stunting at scale: lessons from exemplar countries

Bhutta, Z. A., N. Akseer, E. C. Keats, T. Vaivada, S. Baker, S. E. Horton, J. Katz, P. Menon, E. Piwoz, M. Shekar, C. Victora, and R. Black. 2020. "How countries can reduce child stunting at scale: lessons from exemplar countries". *The American Journal of Clinical Nutrition* nqaa153. https://doi.org/10.1093/ajcn/nqaa153

Background: Child stunting and linear growth faltering have declined over the past few decades and several countries have made exemplary progress. **Objectives:** To synthesize findings from mixed methods studies of exemplar countries to provide guidance on how to accelerate reduction in child stunting. **Methods:** We did a qualitative and quantitative synthesis of findings from existing literature and 5 exemplar country studies (Nepal, Ethiopia, Peru, Kyrgyz Republic, Senegal). Methodology included 4 broad research activities: 1) a series of descriptive analyses of cross-sectional data from demographic and health surveys and multiple indicator cluster surveys; 2) multivariable analysis of quantitative drivers of change in linear growth; 3) interviews and focus groups with national experts and community stakeholders and mothers; and 4) a review of policy and program evolution related to nutrition. **Results:** Several countries have dramatically reduced child stunting prevalence, with or without closing geographical, economic, and other population inequalities. Countries made progress through interventions from within and outside the health sector, and despite significant heterogeneity and differences in context, contributions were comparable from health and nutrition sectors (40% of change) and other sectors (50%), previously called nutrition-specific and -sensitive strategies. Improvements in maternal education, maternal nutrition, maternal and newborn care, and reductions in fertility/reduced interpregnancy intervals were strong contributors to change. A roadmap to reducing child stunting at scale includes several steps related to diagnostics, stakeholder consultations, and implementing direct and indirect nutrition interventions related to the health sector and nonhealth sector. **Conclusions:** Our results show that child stunting reduction is possible even in diverse and challenging contexts. We propose that our framework of organizing nutrition interventions as direct/indirect and inside/outside the health sector should be considered when mapping causal pathways of child stunting and planning interventions and strategies to accelerate stunting reduction to achieve the 2030 Sustainable Development Goals.

The role of the state government, civil society and programmes across sectors in stunting reduction in Chhattisgarh, India, 2006–2016

Kohli, N., P.H. Nguyen, R. Avula, and P. Menon. 2020. "The role of the state government, civil society and programmes across sectors in stunting reduction in Chhattisgarh, India, 2006–2016". *BMJ Global Health* 5(7). http://dx.doi.org/10.1136/bmjgh-2019-002274

Introduction: Childhood stunting has declined in India between 2006 and 2016, but not uniformly across all states. Little is known about what helped some states accelerate progress while others did not. Insights on subnational drivers of progress are useful not just for India but for other decentralised policy contexts. Thus, we aimed to identify the factors that contributed to declines in childhood stunting (from 52.9% to 37.6%) between 2006 and 2016 in the state of Chhattisgarh, a subnational success story in stunting reduction in India. **Methods**: We examined time trends in determinants of stunting using descriptive and regression decomposition analysis of National Family Health Survey data from 2005 to 2006 and 2015–2016. We reviewed nutrition-relevant policies and programmes associated with the drivers of change to construct a policy timeline. Finally, we interviewed multiple stakeholders in the state to understand the changes in the drivers of undernutrition. **Results**: The regression decomposition analysis shows that multiple factors explain 66% of the change in stunting between 2006 and 2016. Improvements in three key drivers—health and nutrition services, household assets, and sanitation and hygiene—explained 47% of the change in stunting. A shared vision for impact, political stability and capable bureaucracy, state-level innovations, support from development partners and civil society, and community mobilisation were found to contribute to improvements in programmes for health, poverty and sanitation. **Conclusion**: Change in multiple sectors is important for stunting reduction and can be achieved in subnational contexts. More work lies ahead to close gaps in various determinants of stunting.

Antenatal Iron-Folic Acid Supplementation Is Associated with Improved Linear Growth and Reduced Risk of Stunting or Severe Stunting in South Asian Children Less than Two Years of Age: A Pooled Analysis from Seven Countries

Nisar, Y. B., V. M. Aguayo, S. M. Billah, and M. J. Dibley. 2020. "Antenatal Iron-Folic Acid Supplementation Is Associated with Improved Linear Growth and Reduced Risk of Stunting or Severe Stunting in South Asian Children Less than Two Years of Age: A Pooled Analysis from Seven Countries". *Nutrients* 12(9): E2632. https://doi.org/10.3390/nu12092632

In South Asia, an estimated 38% of preschool-age children have stunted growth. We aimed to assess the effect of WHO-recommended antenatal iron, and folic acid (IFA) supplements on smaller than average birth size and stunting in South Asian children <2 years old. The sample was 96,512 mothers with their most recent birth within two years, from nationally representative surveys between 2005 and 2016 in seven South Asian countries. Primary outcomes were stunting [length-for-age Z-score (LAZ) < -2], severe stunting [length-for-age Z-score (LAZ) < -3], length-for-age Z score, and perceived smaller than average birth size. Exposure was the use of IFA supplements. We conducted analyses with Poisson, linear and logistic multivariate regression adjusted for the cluster survey design, and 14 potential confounders covering the country of the survey, socio-demographic factors, household economic status, maternal characteristics, and duration of respondent recall. The prevalence of stunting was 33%, severe stunting was 14%, and perceived smaller than average birth size was 22%. Use of antenatal IFA was associated with a reduced adjusted risk of being stunted by 8% (aRR 0.92, 95% CI 0.89, 0.95), of being severely stunted by 9% (aRR 0.91, 95% CI 0.86, 0.96) and of being smaller than average birth size by 14% (aRR 0.86, 95% CI 0.80, 0.91). The adjusted mean LAZ was significantly higher in children whose mothers used IFA supplements. Maternal use of IFA in the first four months gestation and consuming 120 or more supplements throughout pregnancy was associated with the largest reduction in risk of child stunting. Antenatal IFA supplementation was associated with a significantly reduced risk of stunting, severe stunting, and smaller than average perceived birth size and improved LAZ in young South Asian children. The early and sustained use of antenatal IFA has the potential to improve child growth outcomes in South Asia and other low-and-middle-income countries with high levels of iron deficiency in pregnancy.

The Impact of Nutrition-Specific and Nutrition-Sensitive Interventions on Hemoglobin Concentrations and Anemia: A Meta-review of Systematic Reviews

Moorthy, D., R. Merrill, S. Namaste, and L. Iannotti. 2020. "The Impact of Nutrition-Specific and Nutrition-Sensitive Interventions on Hemoglobin Concentrations and Anemia: A Meta-review of Systematic Reviews". *Advances in Nutrition*: nmaa070. https://doi.org/10.1093/advances/nmaa070

Anemia is a multifactorial condition arising from inadequate nutrition, infection, chronic disease, and genetic-related etiologies. Our aim was to assess the impact of nutrition-sensitive and nutrition-specific interventions on hemoglobin (Hb) concentrations and anemia to inform the prioritization and scale-up of interventions to address the multiple causes of anemia. We performed a meta-review synthesis of information by searching multiple databases for reviews published between 1990 and 2017 and used standard methods for conducting a meta-review of reviews, including double independent screening, extraction, and quality assessment. Quantitative pooling and narrative syntheses were used to summarize information. Hb concentration and anemia outcomes were pooled in specific population groups (children aged <5 y, school-age children, and pregnant women). Methodological quality of the systematic reviews was assessed using Assessing the Methodological Quality of Systematic Reviews (AMSTAR) criteria. Of the 15,444 records screened, we identified 118 systematic reviews that met inclusion criteria. Reviews focused on nutrition-specific interventions (96%). Daily and intermittent iron supplementation, micronutrient powders,

malaria treatment, use of insecticide-treated nets (ITNs), and delayed cord clamping were associated with increased Hb concentration in children aged <5 y. Among children older than 5 y, daily and intermittent iron supplementation and deworming, and in pregnant women, daily iron-folic acid supplementation, use of ITNs, and delayed cord clamping, were associated with increased Hb concentration. Similar results were obtained for the reduced risk of anemia outcome. This meta-review suggests the importance of nutrition-specific interventions for anemia and highlights the lack of evidence to understand the influence of nutrition-sensitive and multifaceted interventions on the condition.

Dietary Variation among Children Meeting and Not Meeting Minimum Dietary Diversity: An Empirical Investigation of Food Group Consumption Patterns among 73,036 Children in India

Beckerman-Hsu, J. P., R. Kim, S. Sharma, and S. V. Subramanian. 2020. "Dietary Variation among Children Meeting and Not Meeting Minimum Dietary Diversity: An Empirical Investigation of Food Group Consumption Patterns among 73,036 Children in India". *The Journal of Nutrition* nxaa223. https://doi.org/10.1093/jn/nxaa223

Background: Minimum Dietary Diversity (MDD) is a widely used indicator of adequate dietary micronutrient density for children 6–23 mo old. MDD food-group data remain underutilized, despite their potential for further informing nutrition programs and policies. **Objectives**: We aimed to describe the diets of children meeting MDD and not meeting MDD in India using food group data, nationally and subnationally. **Methods:** Food group data for children 6–23 mo old (n = 73,036) from the 2015–16 National Family Health Survey in India were analyzed. Per WHO standards, children consuming ≥5 of the following food groups in the past day or night met MDD: breast milk; grains, roots, or tubers; legumes or nuts; dairy; flesh foods; eggs; vitamin A–rich fruits and vegetables; and other fruits and vegetables. Children not meeting MDD consumed <5 food groups. We analyzed the number and types of foods consumed by children meeting MDD and not meeting MDD at the national and subnational geographic levels. **Results:** Nationally, children not meeting MDD most often consumed breast milk (84.5%), grains, roots, and tubers (62.0%), and/or dairy (42.9%). Children meeting MDD most often consumed grains, roots, and tubers (97.6%), vitamin A–rich fruits and vegetables (93.8%), breast milk (84.1%), dairy (82.1%), other fruits and vegetables (79.5%), and/or eggs (56.5%). For children not meeting MDD, district-level dairy consumption varied the most (6.4%–79.9%), whereas flesh foods consumption varied the least (0.0%–43.8%). For children meeting MDD, district-level egg consumption varied the most (0.0%–100.0%), whereas grains, roots, and tubers consumption varied the least (66.8%–100.0%). Conclusions: Children not meeting MDD had low fruit, vegetable, and protein-rich food consumption. Many children meeting MDD also had low protein-rich food consumption. Examining the number and types of foods consumed highlights priorities for children experiencing the greatest dietary deprivation, providing valuable complementary information to MDD.

High Coverage and Low Utilization of the Double Fortified Salt Program in Uttar Pradesh, India: Implications for Program Implementation and Evaluation

Cyriac, S., R. Haardörfer, L. M. Neufeld, A. W. Girard, U. Ramakrishnan, R. Martorell, and M. N. N. Mbuya. 2020. "High Coverage and Low Utilization of the Double Fortified Salt Program in Uttar Pradesh, India: Implications for Program Implementation and Evaluation". *Current Developments in Nutrition*: nzaa133. https://doi.org/10.1093/cdn/nzaa133

Background: Double Fortified Salt (DFS) is efficacious in addressing iron deficiency, but evidence of its effectiveness is limited. The few published evaluations do not include details on program implementation, limiting their utility for programmatic decisions. **Objective:** We sought to

characterize the coverage of a DFS program implemented through the Public Distribution System (PDS) in Uttar Pradesh (UP), India, and understand the drivers of DFS adherence. **Methods:** After eight months of implementation, we surveyed 1202 households in five districts and collected data on sociodemographic characteristics, asset ownership, food security and regular PDS utilization. We defined 'DFS program coverage' as the proportion of PDS beneficiaries who had heard of and purchased DFS, and 'DFS adherence' as DFS use reported by households. We used principal components analysis to create an asset-based index of relative wealth, and categorized households into higher/lower relative wealth quintiles. We conducted path analyses to examine the drivers of DFS adherence, particularly the mediated influence of household wealth on DFS adherence. The evaluation is registered at RIDIE-STUDY-ID-58f6eeb45c050. **Results:** The DFS program had good coverage – 83% respondents had heard of DFS, 74% had purchased it at least once and yet, only 23% exclusively used DFS. Respondents had low awareness about DFS benefits and considered DFS quality as poor. Being in a lower household wealth quintile and being food insecure were significant drivers of DFS adherence and regular PDS utilization acted as a mediator. Adherence was lower in urban areas. **Conclusions:** We observed significant heterogeneity in DFS implementation as reflected by high coverage and low adherence. Learnings from this process evaluation informed the design of an adaptive impact evaluation, and provided generalizable insights for ensuring the potential for impact is realized. Efforts are needed to increase awareness, improve product quality as well as mitigate against the sensory challenges identified.

Making the health system work for the delivery of nutrition interventions

King, S. E., T. Sawadogo-Lewis, R. E. Black, and T. Roberton. 2020. "Making the health system work for the delivery of nutrition interventions". *Maternal & Child Nutrition.* https://doi.org/10.1111/mcn.13056.

Addressing malnutrition requires strategies that are comprehensive and multi-sectoral. Within a multi-sectoral approach, the health system is essential to deliver 10 nutrition-specific interventions, which, if scaled up, could substantially reduce under-5 deaths in high-burden countries through improving maternal and child undernutrition. This study identifies the health system components required for the effective delivery of these interventions, highlighting opportunities and challenges for nutrition programmes and policies. We reviewed implementation guidance for each nutrition-specific intervention, mapping the delivery process for each intervention and determining the health system components required for their delivery. We integrated the components into a single health systems framework for nutrition, illustrating the pathways by which health system components influence household-level determinants of nutrition and individual-level health outcomes. Nutrition-specific interventions are typically delivered in one of four ways: (i) when nutrition interventions are intentionally sought out, (ii) when care is sought for other, unrelated interventions, (iii) at a health facility after active community case finding and referral, and (iv) in the community after active community case finding. A health system enables these processes by providing health services and facilitating care seeking for services, which together require a skilled and motivated health workforce, an effective supply chain, demand for services and access to services. The nutrition community should consider the processes by which nutrition-specific interventions are delivered and the health system components required for their success. Programmes should encourage the delivery of nutrition interventions at every client–provider interaction and should actively generate demand for services—in general, and for nutrition services specifically.

Anthropometric data quality assessment in multisurvey studies of child growth

Perumal, N., S. Namaste, H. Qamar, A. Aimone, D.G. Bassani, and D.E. Roth. 2020. "Anthropometric data quality assessment in multisurvey studies of child growth". *The American Journal of Clinical Nutrition*. Doi: nqaa162. https://doi.org/10.1093/ajcn/nqaa162

Background: Population-based surveys collect crucial data on anthropometric measures to track trends in stunting [height-for-age z score (HAZ) < −2SD] and wasting [weight-for-height z score (WHZ) < −2SD] prevalence among young children globally. However, the quality of the anthropometric data varies between surveys, which may affect population-based estimates of malnutrition. **Objectives**: We aimed to develop composite indices of anthropometric data quality for use in multisurvey analysis of child health and nutritional status. **Methods**: We used anthropometric data for children 0–59 mo of age from all publicly available Demographic and Health Surveys (DHS) from 2000 onwards. We derived 6 indicators of anthropometric data quality at the survey level, including 1) date of birth completeness, 2) anthropometric measure completeness, 3) digit preference for height and age, 4) difference in mean HAZ by month of birth, 5) proportion of biologically implausible values, and 6) dispersion of HAZ and WHZ distribution. Principal component factor analysis was used to generate a composite index of anthropometric data quality for HAZ and WHZ separately. Surveys were ranked from the highest (best) to the lowest (worst) index values in anthropometric quality across countries and over time. **Results**: Of the 145 DHS included, the majority (83 of 145; 57%) were conducted in Sub-Saharan Africa. Surveys were ranked from highest to lowest anthropometric data quality relative to other surveys using the composite index for HAZ. Although slightly higher values in recent DHS suggest potential improvements in anthropometric data quality over time, there continues to be substantial heterogeneity in the quality of anthropometric data across surveys. Results were similar for the WHZ data quality index. **Conclusions**: A composite index of anthropometric data quality using a parsimonious set of individual indicators can effectively discriminate among surveys with excellent and poor data quality. These index can be used to account for variations in anthropometric data quality in multisurvey epidemiologic analyses of child health.

Anthropometric data quality assessment in multisurvey studies of child growth: A comparison of the Indian diet with the EAT-Lancet reference diet

Sharma, M., A. Kishore, D. Roy, and K. Joshi. 2020. "A comparison of the Indian diet with the EAT-Lancet reference diet". *BMC Public Health* 20: 812. https://doi.org/10.1186/s12889-020-08951-8

Background: The 2019 EAT-Lancet Commission report recommends healthy diets that can feed 10 billion people by 2050 from environmentally sustainable food systems. This study compares food consumption patterns in India, from different income groups, regions and sectors (rural/urban), with the EAT-Lancet reference diet and highlights the deviations. **Methods**: The analysis was done using data from the Consumption Expenditure Survey (CES) of a nationally representative sample of 0.102 million households from 7469 villages and 5268 urban blocks of India conducted by the National Sample Survey Organization (NSSO) in 2011–12. This is the most recent nationally representative data on household consumption in India. Calorie consumption (kcal/capita/day) of each food group was calculated using the quantity of consumption from the data and nutritional values of food items provided by NSSO. Diets for rural and urban, poor and rich households across different regions were compared with EAT-Lancet reference diet. **Results**: The average daily calorie consumption in India is below the recommended 2503 kcal/capita/day across all groups compared, except for the richest 5% of the population. Calorie share of whole grains is significantly higher than the EAT-Lancet recommendations while those of fruits, vegetables, legumes, meat, fish and eggs are significantly lower. The share of calories from protein sources is only 6–8% in India compared to 29% in the reference diet. The imbalance is highest for the households in the lowest decile of consumption expenditure, but even the richest households in India do not consume adequate amounts of fruits, vegetables and non-cereal proteins in their diets. An average Indian household consumes more calories from processed foods than fruits. **Conclusions**: Indian diets, across states and income groups, are unhealthy. Indians also consume excess amounts of cereals and not enough proteins,

fruits, and vegetables. Importantly, unlike many countries, excess consumption of animal protein is not a problem in India. Indian policymakers need to accelerate food-system-wide efforts to make healthier and sustainable diets more affordable, accessible and acceptable.

Building Implementation Science in Nutrition

Warren, A.M., E.A. Frongillo, and R. Rawat. 2020. "Building Implementation Science in Nutrition". *Advances in Nutrition*. Doi: nmaa066. https://doi.org/10.1093/advances/nmaa066

The field of nutrition has been investing in the development of many nutrition-specific and -sensitive policies and programs aimed at improving population-level malnutrition in all its forms. When there is a need to learn about a new system, programmatic context, or target population to understand how to effectively deploy an intervention to help improve nutrition, it is important to be able to ask a broad range of questions, both in topic and in scope. Our aim is to provide a simple and conceptually clear definition and principles to elaborate the science of implementation for nutrition to distinguish it from other ways of knowing and learning and to serve as a guide to the articulation of implementation science questions and methods. Implementation science is a body of systematized knowledge about how to improve implementation that 1) is distinguished by its aims to learn about the process of implementation, 2) uses methods that derive from and fit with the aims, and 3) is built with tacit (as well as expert) knowledge and experiential learning. Implementation science aims to generate the learning needed to improve implementation through facilitating collaboration among stakeholders to articulate and pursue the aims; capturing and using tacit knowledge and experiential learning from stakeholders, systems, providers, and recipients; and applying a mix of methods suited to the aims. This elaboration of the science provides a simple way to help those who already do, or want to do, implementation science understand and communicate how this science is unique and the value that it adds to the current landscape of nutrition priorities, innovations, and the attendant complex learning needs that follow. Implementation science encompasses both discovery- and mission-oriented research, and centers implementation as the object of study for the purposes of broad-based learning.

Identifying spatial variation in the burden of diabetes among women across 640 districts in India: a cross-sectional study

Singh, S., P. Puri, and S.V. Subramanian. 2020. "Identifying spatial variation in the burden of diabetes among women across 640 districts in India- a cross-sectional study". *Journal of Diabetes & Metabolic Disorders*. https://doi.org/10.1007/s40200-020-00545-w

Purpose: Diabetes is one of the leading causes of mortality and morbidity among women in India. The burden of diabetes among women was found to increase with age and exposure to the post-partum period. The present study examines the spatial variation in the prevalence of diabetes among women in the late reproductive age-group of 35–49 years across 640 districts in India. **Methods**: The study utilized data from the recent round of the National Family Health Survey, 2015–16. Age-standardized prevalence rates were calculated, followed by an examination of economic inequality using the poor-rich-ratio (PRR) and Wagstaff's concentration index. Spatial variation in the prevalence of diabetes was explored with a series of quantile maps, univariate, and bivariate LISA cluster maps. Further, to explore the district-level diabetes prevalence among women in the country, Ordinary Least Square and Spatial Autoregressive (SAR) models were used. **Results**: The study findings affirm the presence of spatial clustering in the burden of diabetes among women. The burden is relatively higher among women from the Southern and Eastern parts of the country. Findings establish obesity, hypertension, and living in urban areas as major correlates of diabetes. **Conclusion**: Program with an aim to lower the intensity of community-based prevalence of diabetes,

especially among women in their late reproductive ages, should adopt differential approaches across different states/districts in the context of their lifestyle, dietary pattern, working pattern, and other socio-cultural practices.

NON-PEER REVIEWED

Visit POSHAN website to explore issues of our **COVID-19 Nutrition Digest** – a collection of recently published peer- and non-peer-reviewed resources, including research articles blogposts, opinion pieces etc. These are collated from various sources, and analyze the impacts of COVID-19 pandemic on the outcomes, determinants and coverage of interventions related to maternal and child nutrition.

- **COVID-19 Nutrition Digest** (Aug 2020) - http://poshan.ifpri.info/2020/08/11/covid-19-nutrition-digest-august-2020/
- **COVID-19 Nutrition Digest** (July 2020) - http://poshan.ifpri.info/2020/07/20/covid-19-nutrition-digest-july-2020/
- **COVID-19 Nutrition Digest** (June 2020) - http://poshan.ifpri.info/2020/06/05/covid-19-nutrition-digest-june-2020/
- **COVID-19 Nutrition Digest** (May 2020) - http://poshan.ifpri.info/2020/05/21/covid-19-nutrition-digest-may-2020/

POSHAN COVID-19 Monitoring Report

UNICEF, IIT-B, IFPRI, World Food Programme and the World Bank. 2020. *POSHAN COVID-19 Monitoring Report*. New Delhi, UNICEF India. https://poshancovid19.in/Monitoring.html

The POSHAN COVID-19 Monitoring Report presents all relevant data to monitor the effects of COVID-19 on nutrition/food security across both the most populous states affected by both the pandemic and those with the largest burden of malnutrition. The purpose is to present available data to policy makers and programme managers to strengthen the public health nutrition response during the COVID-19 crisis. It is informed by various development partners working in the area of food and nutrition security and compiled by UNICEF, IIT-B, IFPRI, World Food Programme and the World Bank.

POSHAN COVID-19 Resources

UNICEF India. 2020. *POSHAN COVID-19 Resources*. New Delhi, UNICEF India.
https://poshancovid19.in/Resources.html

It is an online repository of government circulars, national and international guidelines and technical documents on programming during the COVID-19 Pandemic. This compilation focuses on nutrition, food security, early childhood development and related issues. The central and state-level policies issued since the start of the COVID-19 outbreak, including those on the continuity of essential services are provided.

Prevention, Early Detection and Treatment of Wasting in Children 0-59 Months through National Health Systems in the Context of COVID-19

Prevention, Early Detection and Treatment of Wasting in Children 0-59 Months through National Health Systems in the Context of COVID-19. United Nations Children's Fund and World Health Organization, New York, 2020.

https://aa9276f9-f487-45a2-a3e7-8f4a61a0745d.usrfiles.com/ugd/aa9276_f8ae809af929450780f08c98793badf5.pdf

This document serves as a tool for implementing the recommendations reflected in existing WHO and UNICEF guidance on the delivery of services through national health systems for the prevention, early detection and treatment of child wasting in the context of COVID-19. This note reflects broad guidance for all levels of the health system, including community health services that offer prevention, early detection and treatment services for child wasting. WHO and UNICEF recognize that context-specific adaptations to these recommendations will be necessary depending on transmission levels, population mobility restrictions, resources, and other national public health measures to respond to and mitigate the effects of the pandemic across different countries. This note therefore offers specific examples of programmatic changes or adaptations that may be temporarily introduced to ensure the continuity and safety of prevention and treatment services.

The State of Food Security and Nutrition in the World 2020: Transforming food systems for affordable healthy diets

FAO, IFAD, UNICEF, WFP and WHO. 2020. *The State of Food Security and Nutrition in the World 2020. Transforming food systems for affordable healthy diets*. Rome, FAO.
https://doi.org/10.4060/ca9692en

Updates for many countries have made it possible to estimate hunger in the world with greater accuracy this year. In particular, newly accessible data enabled the revision of the entire series of undernourishment estimates for China back to 2000, resulting in a substantial downward shift of the series of the number of undernourished in the world. Nevertheless, the revision confirms the trend reported in past editions: the number of people affected by hunger globally has been slowly on the rise since 2014. The report also shows that the burden of malnutrition in all its forms continues to be a challenge. There has been some progress for child stunting, low birthweight and exclusive breastfeeding, but at a pace that is still too slow. Childhood overweight is not improving and adult obesity is on the rise in all regions.
The report complements the usual assessment of food security and nutrition with projections of what the world may look like in 2030, if trends of the last decade continue. Projections show that the world is not on track to achieve Zero Hunger by 2030 and, despite some progress, most indicators are also not on track to meet global nutrition targets. The food security and nutritional status of the most vulnerable population groups is likely to deteriorate further due to the health and socio economic impacts of the COVID-19 pandemic.

Improving Young Children's Diets (June 2020)

Nutrition Exchange (NEX) South Asia. 2020. *Improving Young Children's Diets*. ENN & UNICEF.
https://mcusercontent.com/fb1d9aabd6c823bef179830e9/files/15066773-a82a-4c88-963c-719f647c1b7f/2020_ENN_and_UNICEF_NEX_South_Asia_on_improving_young_children_s_diets.pdf

The South Asia region continues to bear the highest burden of child malnutrition in the world, with significant implications for global progress. As with the first issue, this issue follows on from a regional conference, convened by SAARC (the South Asian Association for Regional Cooperation) and UNICEF (United Nations Children's Fund) on 'Stop Stunting: Improving Young Children's Diets in South Asia' in 2019 in Nepal. Poor complementary feeding practices are associated with high rates of child malnutrition in the South Asia region and it is vital therefore to understand how related national policies and programmes are being designed and implemented and share the lessons learned. Through a partnership with UNICEF's Regional Office for South Asia (ROSA), we have

worked closely with a range of authors to support the development of nine articles from six countries – Afghanistan, Bangladesh, Bhutan, India, Nepal and Pakistan – as well as an overview from UNICEF ROSA and a regional perspective on tackling the double burden of malnutrition.

Marketing of breast-milk substitutes: National implementation of the International Code (Status report 2020)

Marketing of breast-milk substitutes: national implementation of the international code, status report 2020. Geneva: World Health Organization; 2020. Licence: CC BY-NC-SA 3.0 IGO.
https://www.unicef.org/sites/default/files/2020-05/Marketing-of-breast-milk-substitutes-status-report-2020.pdf

Despite efforts to stop the harmful promotion of breast-milk substitutes, countries are still falling short in protecting parents from misleading information. The report, produced by WHO, UNICEF and the International Baby Food Action Network (IBFAN), provides an update on the status of implementing the International Code of Marketing of Breast-milk Substitutes and subsequent relevant World Health Assembly (WHA) resolutions ("the Code'") in countries.
Of the 194 countries analysed, 136 have in place some form of legal measure related to "the Code". However, the legal restrictions in most counties do not fully cover marketing that occurs in health facilities. Only 79 countries prohibit the promotion of breast-milk substitutes in health facilities. Given the important role of health workers in protecting pregnant women, mothers and their infants from inappropriate promotion of breast-milk substitutes, the 2020 report provides an extensive analysis of legal measures taken to prohibit promotion of breast-milk substitutes.

Cost-Benefit Analyses of Nutrition Interventions in India's Policy Framework

Kumar, A., and W. Joe. 2020. "Cost-Benefit Analyses of Nutrition Interventions in India's Policy Framework". 2020. IEG working paper no. 406. Population Research Centre, Institute of Economic Growth, Delhi.
http://www.iegindia.org/upload/profile_publication/doc-190820_174628wp406.pdf

The Government of India has launched several important nutrition and health programmes and interventions. This study is an attempt to estimate the costs and benefits accruing from the implementation of the national interventions. The benefits are measured in terms of the number of years of life saved due to decreased child mortality and valued at 3 times the value of GDP/capita. Benefits also include the value of avoiding a brief period of life spent living with the disability arising from nutrition related illness. Productivity benefits for those who avoid stunting have also been estimated. Three alternate scenarios have been created on the basis of specific nutrition based interventions which include counselling for behaviour change, supplementary food and an overall package consisting of both the interventions. Estimated benefits for India from the overall package at 3 times the value of per capita GDP and discounted at 3% are approximately $3070 and estimated costs are approximately $159, resulting in a benefit/cost ratio of approximately 19.4. Every dollar spent on nutrition can yield benefits of more than 19 dollars. To conclude, the coverage of nutrition-based interventions for mothers is not the problem, but the low utilization poses a challenge. On the other hand, the interventions for children need to be scaled up. Promotion and provision of timely and appropriate complementary feeding practices can improve the health outcomes among both women and children.

UPCOMING EVENTS & DEADLINES

Delivering for Nutrition in India: Insights from Implementation Research

When: September 14-18, 2020
Where: Virtual event
Registration open
For more information: http://poshan.ifpri.info/delivering-for-nutrition-in-india-insights-from-implementation-research/

European Society Of Clinical Nutrition And Metabolism 42nd Congress 2020 (ESPEN 2020)

When: September 19-21, 2020
Where: Virtual event
For more information: https://espencongress.com/

ABOUT POSHAN

Partnerships and Opportunities to Strengthen and Harmonize Actions for Nutrition in India (POSHAN) is a multi-year initiative that aims to build evidence on effective actions for nutrition and support the use of evidence in decision-making. It is supported by the Bill & Melinda Gates Foundation and led by IFPRI in India.

ABOUT ABSTRACT DIGEST

In each issue, the POSHAN Abstract Digest brings you some of the new and noteworthy studies on maternal and child nutrition. It focuses on India-specific studies and also brings to you other relevant global or regional literature with broader implications for maternal and child nutrition. The Abstract Digest is based on literature searches to identify selected studies that we think are most relevant to nutrition issues in India and to Indian programs and policies. We share with you a collection of abstracts from articles published in peer-reviewed journals, as well as selected non-peer-reviewed articles by researchers in reputed academic and/or research institutions and which demonstrated rigor in their research objectives, methodology, and analysis. The abstracts in this document are reproduced in their original form from their source, and without editorial commentary about specific articles.

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