

EDITOR'S NOTE

Welcome to the first Abstract Digest of 2015! This issue features commentaries and research articles on maternal nutrition, sanitation, and nutrition programming in India.

The *Global Nutrition Report* (International Food Policy Research Institute, 2014) is the first in an annual series, produced by an Independent Expert Group. It is global in scope and offers a number of findings regarding progress on nutrition status, scaling-up nutrition action, meeting commitments made by signatories to the Nutrition for Growth Compact, and reducing data gaps.

Sundaram and Rawal (2014) identify three policy priorities crucial to ending malnutrition – expansion of social protection, making smallholder agriculture more nutrition sensitive, and focusing on under-five child and maternal nutrition deficiencies. In addition, Smith and Haddad (2015) recommend investments in safe drinking-water and sanitation, women's education, gender equality, and quantity and quality food along with income growth and governance, to accelerate reductions in stunting. Darmstadt et al. (2014) call for a greater focus on improving coverage, quality and equity of care at birth—particularly obstetric care during labor and childbirth, and care for small and sick newborns.

A new study shows the importance of intergenerational effects on growth in that maternal height and weight prior to conception have significant impact on birth outcomes (Addo et al. 2014). Another shows that growth faltering continues after the first 1,000 days until 5 years of age and contributes to 30 percent of the absolute deficit accumulated in height at 60 months (Leroy et al. 2014).

Potdar et al (2014) demonstrate that well-nourished women are likely to have better birth weight improvements when exposed to improved dietary quality before conception and throughout pregnancy compared to undernourished women. Das et al. (2014) show that in addition to dietary needs, pregnant women have other health and information needs that are unmet because the focus is typically on the unborn child and not on women's health. Acharya et al. (2014) demonstrate that community-based efforts such as mothers' group meetings are effective in increasing care-seeking and improving healthy behaviors.

We also feature three articles from a special issue of the Asia Pacific Journal of Clinical Nutrition on food and nutrition information. Antier et al (2014) assess viability of a decentralized production model for complementary foods by women's self-help groups, Bhagwat et al (2014) examine a large-scale voluntary staple food fortification in two Indian states, and Chaturvedi et al (2014) analyze nutrition training needs of the frontline workers of the Integrated Child Development Services (ICDS) program. On the sanitation front, Clasen et al. (2014) find that increasing toilet coverage alone is insufficient to reducing exposure to fecal pathogens.

Happy reading!

Warm regards,

Dr. Rasmi Avula

PEER-REVIEWED STUDIES

Global Nutrition Report: Actions And Accountability To Accelerate The World's Progress On Nutrition

International Food Policy Research Institute. 2014. Washington, DC

<http://www.ifpri.org/sites/default/files/publications/gnr14.pdf>

This Global Nutrition Report is the first in an annual series. It tracks worldwide progress in improving nutrition status, identifies bottlenecks to change, highlights opportunities for action, and contributes to strengthened nutrition accountability. The report series was created through a commitment of the signatories of the Nutrition for Growth Summit in 2013. It is supported by a wide-ranging group of stakeholders and delivered by an Independent Group of Experts in partnership with a large number of external contributors. This report has a number of unique features. First, it is global in scope. Nearly every country in the world experiences some form of malnutrition, and no country can take good nutrition for granted. Second, because global goals require national action, the report aims to speak to policymakers, practitioners, scientists, and advocates in all countries. It assembles copious country-level data and other information in an accessible manner and highlights the experiences of a large number of countries from Africa, Asia, Europe, Latin America and the Caribbean, North America, and Oceania. Third, a key focus of the report concerns how to strengthen accountability in nutrition. Many of the core features of malnutrition—including its long-term effects, the need to work in alliances to counter it, and the invisibility of some of its manifestations—make accountability challenging. We thus identify actions to strengthen key mechanisms, actors, and information in ways that will help hold all of us to account in our efforts to accelerate improvements in nutrition status. Finally, the report is delivered by an Independent Expert Group charged with providing a view of nutrition progress and an assessment of nutrition commitments that areas independent and evidence based as possible.

India country profile: http://globalnutritionreport.org/files/2014/11/gnr14_cp_india.pdf

Nutrition: What Needs To Be Done?

Sundaram, J.K., and V. Rawal. 2014. *Economic & Political Weekly XLIX (42): 46–53.*

<http://www.epw.in/perspectives/nutrition-what-needs-be-done.html>

About 805 million people—one in nine people worldwide—remain chronically hungry. Ending hunger and malnutrition requires strong political commitment at the highest level, effective coordination among various ministries and partners, and broad-based social participation. Three policy priorities are crucial to ending malnutrition—expansion of social protection; making smallholder agriculture more nutrition sensitive; and focusing on under-five child and maternal nutrition deficiencies. An integrated approach is needed to ensure that food consumed is nutritious, wholesome, acceptable, safe and affordable, especially to the poorest and most vulnerable.

Advancing the Newborn and Stillbirth Global Agenda: Priorities for the Next Decade

Darmstadt, G.L., J. Shiffman, and J.E. Lawn. 2014. *Archives of Disease in Childhood* 100: S13–S18. doi: 10.1136/archdischild-2013-305557.

http://adc.bmj.com/content/100/Suppl_1/S13.full

Remarkable advances have been made over the past decade in defining the burden of newborn mortality and morbidity and stillbirths, and in identifying interventions to address the major risk factors and causes of deaths. However, progress in saving newborn lives and preventing stillbirths in countries lags behind that for maternal mortality and for children aged 1–59 months. To accelerate progress, greater focus is needed on improving coverage, quality and equity of care at birth—particularly obstetric care during labour and child-birth, and care for small and sick newborns, which gives a triple return on investment, reducing maternal and newborn lives as well as stillbirths. Securing national-level political priority for newborn health and survival and stillbirths, and implementation of the Every Newborn Action Plan are critical to accomplishing the unfinished global agenda for newborns and stillbirths beyond 2015.

Reducing Child Undernutrition: Past Drivers and Priorities for the Post-MDG Era

Smith, L.C., and L. Haddad. 2015. *World Development* 68: 180–204.

<http://www.sciencedirect.com/science/article/pii/S0305750X14003726>

As the post-MDG era approaches in 2016, reducing child undernutrition is gaining high priority on the international development agenda, both as a maker and marker of development. Revisiting Smith and Haddad (2000), we use data from 1970 to 2012 for 116 countries, finding that safe water access, sanitation, women's education, gender equality, and the quantity and quality of food available in countries have been key drivers of past reductions in stunting. Income growth and governance played essential facilitating roles. Complementary to nutrition-specific and nutrition-sensitive programs and policies, accelerating reductions in undernutrition in the future will require increased investment in these priority areas.

Progress in Reducing Child Under-Nutrition: Evidence from Maharashtra

Jose, S., and K.S. Hari. 2014. *Economic & Political Weekly* L (3): 23–26.

http://www.im4change.org.previewdns.com/siteadmin/tiny_mce/uploaded/Progress_in_Reducing_Child_UnderNutrition.pdf

Assessing the progress made in reducing under-nutrition among children who are less than 2 years old in Maharashtra between 2005-06 and 2012, this article points out that child undernutrition, especially stunting, declined significantly in the state during this period. It holds that this decline can be associated with the interventions initiated through the Rajmata Jijau Mother-Child Health and Nutrition Mission, which began in 2005, and that this indicates the critical role the state can play in reducing child under-nutrition in India.

Linear Growth Deficit Continues to Accumulate beyond the First 1000 Days in Low- and Middle-Income Countries: Global Evidence from 51 National Surveys

Leroy, J.L., M. Ruel, J.P. Habicht, and E.A. Frongillo. 2014. *The Journal of Nutrition* 144 (9): 1460–1466.

<http://jn.nutrition.org/content/144/12/2093>

Growth faltering is usually assessed using height-for-age Z-scores (HAZs), which have been used for comparisons of children of different age and sex composition across populations. Because the SD (denominator) for calculating HAZ increases with age, the usefulness of HAZs to assess changes in height over time (across ages) is uncertain. We posited that population-level changes in height as populations age should be assessed using absolute height-for-age differences (HADs) and not HAZs. We used data from 51 nationwide surveys from low- and middle-income countries and graphed mean HAZs and HADs by age. We also calculated annual changes in HAZs and HADs and percentage of total height deficit accumulated annually from birth to age 60 mo using both approaches. Mean HAZ started at 20.4 Z-scores and dropped dramatically up to 24 mo, after which it stabilized and had no additional deterioration. Mean HAD started at 20.8 cm, with the most pronounced faltering occurring between 6 and 18 mo, similar to HAZ. However, in sharp contrast to HAZ, HAD curves had continued increases in the deficit of linear growth from 18 to 60 mo, with no indication of a leveling off. Globally, 70% of the absolute deficit accumulated in height (HAD) at 60 mo was found to be due to faltering during the first “1000 days” (conception to 24 mo), but 30% was due to continued increases in deficit from age 2 to 5 y. The use of HAZ masks these changes because of age-related changes in SD. Therefore, HAD, rather than HAZ, should be used to describe and compare changes in height as children age because detecting any deficit compared with expected changes in height as children grow is important and only HAD does this accurately at all ages. Our findings support the current global programmatic momentum to focus on the first 1000 d. Research is needed to better understand the dynamics and timing of linear growth faltering using indices and indicators that accurately reflect changes over ages and to identify cost-effective ways to prevent growth faltering and its consequences throughout the lifecycle.

Parental Childhood Growth and Offspring Birthweight: Pooled Analyses from Four Birth Cohorts in Low and Middle Income Countries

Addo, O.Y., A.D. Stein, C.H.D. Fall, D.P. Gigante, A.M. Guntupalli, B.L. Horta, C.W. Kuzawa, N. Lee, S.A. Norris, C. Osmond, P. Prabhakaran, L.M. Richter, H.P.S. Sachdev, and R. Martorell. 2014. *American Journal of Human Biology* 27 (1): 99–105. doi: 10.1002/ajhb.22614

<http://onlinelibrary.wiley.com/doi/10.1002/ajhb.22614/full>

Objective: Associations between parental and offspring size at birth are well established, but the relative importance of parental growth at different ages as predictors of offspring birth weight is less certain. Here we model parental birth weight and postnatal conditional growth in specific age periods as predictors of offspring birth weight. **Methods:** We analyzed data from 3,392 adults participating in four prospective birth cohorts and 5,506 of their offspring. **Results:** There was no significant heterogeneity by study site or offspring sex. 1SD increase in maternal birth weight was associated with offspring birth weight increases of 102 g, 1SD in maternal length growth 0–2 year with 46 g, and 1SD in maternal height growth Mid-childhood (MC)-adulthood with 27 g. Maternal relative weight measures were associated with 24 g offspring birth weight increases (2 year- MC) and 49 g for MC-adulthood period but not with earlier relative weight 0–2

year. For fathers, birth weight, and linear/length growth from 0–2 year were associated with increases of 57 and 56 g in offspring birth weight, respectively but not thereafter. **Conclusions:** Maternal and paternal birth weight and growth from birth to 2 year each predict offspring birth weight. Maternal growth from MC-adulthood, relative weight from 2-MC and MC-adulthood also predict offspring birth weight. These findings suggest that shared genes and/or adequate nutrition during early life for both parents may confer benefits to the next generation, and highlight the importance of maternal height and weight prior to conception. The stronger matrilineal than patrilineal relationships with offspring birth weight are consistent with the hypothesis that improving the early growth conditions of young females can improve birth outcomes in the next generation.

Improving Women's Diet Quality Preconceptionally and During Gestation: Effects on Birth Weight and Prevalence of Low Birth Weight—A Randomized Controlled Efficacy Trial in India (Mumbai Maternal Nutrition Project)

Potdar, R.D., S.A. Sahariah, M. Gandhi, S.H. Kehoe, N. Brown, H. Sane, M. Dayama, S. Jha, A. Lawande, P.J. Coakley, E. Marley-Zagar, H. Chopra, D. Shivshankaran, P. Chheda-Gala, P. Muley-Lotankar, G. Subbulakshmi, A.K. Wills, V.A. Cox, V. Taskar, D.J.P. Barker, A.A. Jackson, B.M. Margetts, and C.H.D. Fall. 2014. *The American Journal of Clinical Nutrition* 100 (5): 1257–1268. doi: 10.3945/ajcn.114.084921.

<http://ajcn.nutrition.org/content/early/2014/09/17/ajcn.114.084921.full.pdf+html>

Background: Low birth weight (LBW) is an important public health problem in undernourished populations. **Objective:** We tested whether improving women's dietary micronutrient quality before conception and throughout pregnancy increases birth weight in a high-risk Indian population. **Design:** The study was a nonblinded, individually randomized controlled trial. The intervention was a daily snack made from green leafy vegetables, fruit, and milk (treatment group) or low-micronutrient vegetables (potato and onion) (control group) from ≥ 90 d before pregnancy until delivery in addition to the usual diet. Treatment snacks contained 0.69 MJ of energy (controls: 0.37 MJ) and 10–23% of WHO Reference Nutrient Intakes of beta-carotene, riboflavin, folate, vitamin B-12, calcium, and iron (controls: 0–7%). The primary outcome was birth weight. **Results:** Of 6,513 women randomly assigned, 2,291 women became pregnant, 1,962 women delivered live singleton newborns, and 1360 newborns were measured. In an intention-to-treat analysis, there was no overall increase in birth weight in the treatment group (+26 g; 95% CI: –15, 68 g; $P = 0.22$). There was an interaction ($P < 0.001$) between the allocation group and maternal prepregnant body mass index (BMI; in kg/m^2) [birth-weight effect: –23, +34, and +96 g in lowest (< 18.6), middle (18.6–21.8) and highest (> 21.8) thirds of BMI, respectively]. In 1,094 newborns whose mothers started supplementation ≥ 90 d before pregnancy (per-protocol analysis), birth weight was higher in the treatment group (+48 g; 95% CI: 1, 96 g; $P = 0.046$). Again, the effect increased with maternal BMI (–8, +79, and +113 g; P -interaction = 0.001). There were similar results for LBW (intention-to-treat OR: 0.83; 95% CI: 0.66, 1.05; $P = 0.10$; per-protocol OR = 0.76; 95% CI: 0.59, 0.98; $P = 0.03$) but no effect on gestational age in either analysis. **Conclusions:** A daily snack providing additional green leafy vegetables, fruit, and milk before conception and throughout pregnancy had no overall effect on birth weight. Per-protocol and subgroup analyses indicated a possible increase in birth weight if the mother was supplemented ≥ 3 mo before conception and was not underweight. This trial was registered at www.controlled-trials/isrctn/ as ISRCTN62811278.

Multiple Micronutrient Supplementation during Pregnancy and Lactation in Low-to-Middle-Income Developing Country Settings: Impact on Pregnancy Outcomes

Salam, R.A., J.K. Das, and Z.A. Bhutta. 2014. *Annals of Nutrition & Metabolism* 65: 4–12. doi: 10.1159/000365792

<http://www.karger.com/Article/Abstract/365792>

Background: Malnutrition, including micronutrient deficiencies, remains one of the major public health challenges, particularly in low-to-middle-income countries. Micronutrient deficiencies affect people of all ages, but its effects appear more devastating in pregnant women and children. Poor maternal nutrition contributes to at least 20% of maternal deaths and increases the probability of poor pregnancy outcomes including intrauterine growth restriction, resulting in low birth weight, stunting, wasting and mortality. **Key Messages:** Several strategies have been employed to provide pregnant women with micronutrients. These strategies include education, dietary modification, food provision, agricultural interventions, supplementation and fortification either alone or in combination. Micronutrient supplementation is the most widely practiced intervention to prevent and manage single or multiple micronutrient deficiencies. Micronutrient supplementation either alone or in combination has shown to be effective in improving maternal, birth and child outcomes. **Conclusions:** There is a need to focus on maternal micronutrient status as a continuum from the periconceptional period throughout pregnancy to lactation. Given the wide prevalence of multiple micronutrient deficiencies in low-to-middle-income countries, the challenge is to implement intervention strategies that combine appropriate maternal and child health interventions with micronutrient interventions.

The Role of Maternal Diet and Iron-folic Acid Supplements in Influencing Birth Weight: Evidence from India's National Family Health Survey

Malhotra, N., R.P. Upadhyay, M. Bhilwar, N. Choy, and T. Green. 2014. *Journal of Tropical Pediatrics* 60 (6):454–60. doi: 10.1093/tropej/fmu051.

<http://tropej.oxfordjournals.org/content/early/2014/09/27/tropej.fmu051.abstract>

Aim: To examine the role of maternal diet in determining low birth weight (LBW) in Indian infants. **Methods:** Data from the National Family Health Survey (2005–06) were used. Multivariate regression analysis was used to analyse the effect of maternal diet on infant birth weight. **Results:** Infants whose mothers consumed milk and curd daily [odds ratio (OR), 1.17; 95% confidence interval (CI), 1.06–1.29]; fruits daily (OR, 1.20; 95% CI, 1.07–1.36) or weekly (OR, 1.13; 95% CI, 1.02–1.24) had higher odds of not having a low birth weight baby. The daily consumption of pulses and beans (OR, 1.18; 95% CI, 1.02–1.36) increased the odds while weekly consumption of fish (OR, 0.79; 95% CI, 0.70–0.89) decreased the odds of not having a LBW infant. Intake of iron-folic acid supplements during pregnancy increased birth weight by 6.46 g per month. **Conclusion:** Improved intake of micronutrient-rich foods can increase birth weight.

Pregnancy-Related Health Information-Seeking Behaviors Among Rural Pregnant Women in India: Validating the Wilson Model in the Indian Context

Das, A., and M. Sarkar. 2014. *Yale Journal of Biology and Medicine* 87: 251–262.

<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4144280/>

Objectives: Understanding health information-seeking behaviors and barriers to care and access among pregnant women can potentially moderate the consistent negative associations between poverty, low levels of literacy, and negative maternal and child health outcomes in India. Our seminal study explores health information needs, health information-seeking behaviors, and perceived information support of low-income pregnant women in rural India. **Methods:** Using the Wilson Model of health information-seeking framework, we designed a culturally tailored guided interview to assess information-seeking behaviors and barriers to information seeking among pregnant women. We used a local informant and health care worker to recruit 14 expectant women for two focus group interviews lasting 45 minutes to an hour each. Thirteen other related individuals including husbands, mothers, mothers-in-law, and health care providers were also recruited by hospital counselors for in-depth interviews regarding their pregnant wives/daughters and daughters-in-law. Interviews were transcribed and analyzed by coding the data into thematic categories. **Results:** The data were coded manually and emerging themes included pregnancy-related knowledge and misconceptions and personal, societal, and structural barriers, as well as risk perceptions and self-efficacy. Lack of access to health care and pregnancy-related health information led participants to rely heavily on information and misconceptions about pregnancy gleaned from elder women, friends, and mothers-in-law and husbands. Doctors and para-medical staff were only consulted during complications. All women faced personal, societal, and structural level barriers, including feelings of shame and embarrassment, fear of repercussion for discussing their pregnancies with their doctors, and inadequate time with their doctors. **Conclusion:** Lack of access and adequate health care information were of primary concern to pregnant women and their families. **Policy Implications:** Our study can help inform policies and multisectoral approaches that are being taken by the Indian government to reduce maternal and child morbidity and burdens.

Evaluating a Large-Scale Community-Based Intervention to Improve Pregnancy and Newborn Health among the Rural Poor in India

Acharya, A., T. Lalwani, R. Dutta, J.K. Rajaratnam, J. Ruducha, L.C. Varkey, S. Wunnava, L. Menezes, C. Taylor, and J. Bernson. 2014. *American Journal of Public Health*: e1–e9. doi: 10.2105/AJPH.2014.302092.

<http://ajph.aphapublications.org/doi/abs/10.2105/AJPH.2014.302092>

Objectives: We evaluated the effectiveness of the Sure Start project, which was implemented in 7 districts of Uttar Pradesh, India, to improve maternal and newborn health. **Methods:** Interventions were implemented at 2 randomly assigned levels of intensity. Forty percent of the areas received a more intense intervention, including community-level meetings with expectant mothers. A baseline survey consisted of 12,000 women who completed pregnancy in 2007; a follow-up survey was conducted for women in 2010 in the same villages. Our quantitative analyses provide an account of the project's impact. **Results:** We observed significant health improvements in both intervention areas over time; in the more intensive intervention areas, we found greater improvements in care-seeking and healthy behaviors. The more intensive intervention areas did not experience a significantly greater decline in neonatal mortality. **Conclusions:** This study demonstrates that community-based efforts, especially mothers' group meetings designed to increase care-seeking and healthy behaviors, are effective and can be implemented at large scale.

Child Nutritional Status in Metropolitan Cities of India: Does Maternal Employment Matter?

Rastogi, S., and L.K. Dwivedi. 2014. *Social Change* 44 (3): 355–370. doi: 10.1177/0049085714536799.

<http://sch.sagepub.com/content/44/3/355.short>

Metropolitan cities in India are commonly faced with poverty, rapid urbanization and in-migration that take a toll on the standard of living of households, forcing women out of their houses to seek employment. As a result, women do not find adequate time for child feeding and rearing practices making the health and nutritional status of their children precarious. Using 2005–2006 National Family Health Survey (NFHS) data on eight metropolitan cities, this study examines the impact of maternal employment on the nutritional status of children born in poorer and richer sections of the cities. Using multiple logistic regression analysis, results show that maternal employment in service sector among the poorer section of cities and employment in agriculture/labor sector among the richer section are associated with higher risk of children being underweight. The research concludes that maternal employment, living in slums, low maternal education significantly affect the nutritional status of children in the richer section of the cities whereas these factors do not affect the nutrition of children in poorer section.

Effectiveness of a Rural Sanitation Programme on Diarrhea, Soil-Transmitted Helminth Infection, and Child Malnutrition in Odisha, India: A Cluster-Randomized Trial

Clasen, T., S. Boisson, P. Routray, B. Torondei, M. Bell, O. Cumming, J. Ensink, M. Freeman, M. Jenkins, M. Odagiri, S. Ray, A. Sinha, M. Suar, and W.P. Schmidt. 2014. *The Lancet Global Health* 2 (1): e645–e653. doi: 10.1016/S2214-109X(14)70307-9.

[http://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(14\)70307-9/fulltext](http://www.thelancet.com/journals/langlo/article/PIIS2214-109X(14)70307-9/fulltext)

Background: A third of the 2.5 billion people worldwide without access to improved sanitation live in India, as do two-thirds of the 1.1 billion practicing open defecation and a quarter of the 1.5 million who die annually from diarrhoeal diseases. We aimed to assess the effectiveness of a rural sanitation intervention, within the context of the Government of India's Total Sanitation Campaign, to prevent diarrhoea, soil-transmitted helminth infection, and child malnutrition. **Methods:** We did a cluster-randomised controlled trial between May 20, 2010, and Dec 22, 2013, in 100 rural villages in Odisha, India. Households within villages were eligible if they had a child younger than 4 years or a pregnant woman. Villages were randomly assigned (1:1), with a computer-generated sequence, to undergo latrine promotion and construction or to receive no intervention (control). Randomisation was stratified by administrative block to ensure an equal number of intervention and control villages in each block. Masking of participants was not possible because of the nature of the intervention. However, households were not told explicitly that the purpose of enrolment was to study the effect of a trial intervention, and the surveillance team was different from the intervention team. The primary endpoint was 7-day prevalence of reported diarrhoea in children younger than 5 years. We did intention-to-treat and per-protocol analyses. This trial is registered with ClinicalTrials.gov, number NCT01214785. **Findings:** We randomly assigned 50 villages to the intervention group and 50 villages to the control group. There were 4,586 households (24,969 individuals) in intervention villages

and 4,894 households (25,982 individuals) in control villages. The intervention increased mean village-level latrine coverage from 9% of households to 63%, compared with an increase from 8% to 12% in control villages. Health surveillance data were obtained from 1,437 households with children younger than 5 years in the intervention group (1,919 children younger than 5 years), and from 1,465 households (1,916 children younger than 5 years) in the control group. 7-day prevalence of reported diarrhoea in children younger than 5 years was 8.8% in the intervention group and 9.1% in the control group (period prevalence ratio 0.97, 95% CI 0.83—1.12). 162 participants died in the intervention group (11 children younger than 5 years) and 151 died in the control group (13 children younger than 5 years). **Interpretation:** Increased latrine coverage is generally believed to be effective for reducing exposure to faecal pathogens and preventing disease; however, our results show that this outcome cannot be assumed. As efforts to improve sanitation are being undertaken worldwide, approaches should not only meet international coverage targets, but should also be implemented in a way that achieves uptake, reduces exposure, and delivers genuine health gains. **Funding:** Bill & Melinda Gates Foundation, International Initiative for Impact Evaluation (3ie), and Department for International Development-backed SHARE Research Consortium at the London School of Hygiene & Tropical Medicine.

Is Targeting Access to Sanitation Enough?

Luby, S. 2014. *The Lancet Global Health* 2 (11): e619-e620. doi:10.1016/S2214-109X(14)70326-2.

<http://www.sciencedirect.com/science/article/pii/S2214109X14703262>

Exposure to faecal pathogens including rotavirus, pathogenic strains of *Escherichia coli*, *Vibrio cholerae*, *Shigella* spp, *Salmonella enterica* serotype Typhi, hepatitis E virus, and soil-transmitted helminths can precipitate serious human illness. However, systematic reviews of efforts to reduce exposure to human faeces through improvement of sanitation have shown that the evidence of a health benefit is based on weak study designs that restrict scientific inference and do not provide conclusive evidence that approaches being implemented to improve sanitation in low-income communities actually improve health.

India's Struggle Against Malnutrition—Is the ICDS Program the Answer?

Jain, M. 2014. *World Development* 67: 72–89.

<http://www.sciencedirect.com/science/article/pii/S0305750X14003003#>

Summary: Almost half of India's children are stunted, endangering their life and human capital formation significantly. India's only national program for combating widespread child malnutrition is Integrated Child Development Scheme (ICDS). Using DHS data from 2005 to 2006 on child-level participation in ICDS, I assess the impact of its flagship supplementary nutrition program on children's physical growth. Using matching and difference-in-difference estimators, I find that girls 0–2 years old receiving supplementary feeding intensely are at least 1 cm (0.4 z-score) taller than those not receiving it in rural India. The estimates are similar for boys aged 0–2 but less robust.

An Improved PDS in a 'Reviving' State: Food Security in Koraput, Odisha

Chatterjee, M. 2014. *Economic & Political Weekly XLIX (45): 49–59.*

<http://www.epw.in/special-articles/improved-pds-reviving-state.html>

The public distribution system is widely criticised for being ridden with chronic corruption and failing to deliver benefits in a systematic manner. Using a sample of 793 households in the district of Koraput in Odisha, this article reviews the performance of the PDS in the district and highlights three important points: first, distribution of food grains, specifically rice, through the PDS has undergone vast improvements in the past five years; second, while the PDS is fairly inclusive in the district, households excluded are massively deprived supporting the need for an expansion of coverage; and third, access to grains is fundamentally important in a region where the primary source of livelihood is a combination of subsistence agriculture and casual labour, and where child under-nutrition is rampant.

Capacity of Frontline ICDS Functionaries to Support Caregivers on Infant and Young Child Feeding (IYCF) Practices in Gujarat, India

Chaturvedi, A., N. Nakkeeran, M. Doshi, R. Patel, and S. Bhagwat. 2014. *Asia Pacific Journal of Clinical Nutrition 23: S29-S37.*

<http://apjcn.nhri.org.tw/server/APJCN/23/Supplement%201/S29.pdf>

Improved infant and young child feeding practices have the potential to improve child growth and development outcomes in India. Anganwadi Workers, the frontline government functionaries of the national nutrition supplementation programme in India, play a vital role in promoting infant and young child feeding practices in the community. The present study assessed the Anganwadi Workers' knowledge of infant and young child feeding practices, and their ability to counsel and influence caregivers regarding these practices. Eighty Anganwadi Workers from four districts of Gujarat participated in assessment centres designed to evaluate a range of competencies considered necessary for the successful promotion of infant and young child feeding practices. The results of the evaluation showed the Anganwadi Workers possessing more knowledge about infant and young child feeding practices like initiation of breastfeeding, pre-lacteal feeding and colostrum, age of introduction of complementary foods, portion size and feeding frequency than about domains which appear to have a direct bearing on practices. A huge contrast existed between the Anganwadi Workers' knowledge and their ability to apply this in formal counselling sessions with caregivers. Inability to empathetically engage with caregivers, disregard for taking the feeding history of children, poor active listening skills and inability to provide need-based advice were pervasive during counselling. In conclusion, to ensure enhanced interaction between the Anganwadi Workers and caregivers on infant and young child feeding practices, a paradigm shift in training is required, making communication processes and counselling skills central to the training.

Production of Fortified Food for a Public Supplementary Nutrition Program: Performance and Viability of a Decentralized Production Model for the Integrated Child Development Services Program, India

Antier, C., S. Kumar, S. Bhagwat, and R. Sankar. 2014. *Asia Pacific Journal of Clinical Nutrition* 23: S20-S28. doi: 10.6133/apjcn.2014.23.s1.05.

<http://europepmc.org/abstract/med/25384723>

Integrated Child Development Services in India through its supplementary nutrition programme covers over 100 million children, pregnant and lactating women across the country. Providing a hot cooked meal each day to children aged between 3-6 years and a take-home ration to children aged between 6-36 months, pregnant and lactating women, the Integrated Child Development Services faces a monumental task to deliver this component of services of desired quality and regularity at scale. From intermediaries or contractors who acted as agents for procuring and distributing food to procurement directly from large food manufacturers to using women groups as food producers, different State Governments have adopted a variety of strategies to procure and distribute food, especially the take-home ration. India's Supreme Court, through its directive of 2004, encouraged the Government to engage women's groups for the production of the supplementary food. This study was conducted to determine the operational performance, economic sustainability and social impact of a decentralised production model for India's Supplementary Nutrition Program, in which women groups run small scale industrialised units. Data were collected through observation, interviews and group discussions with key stakeholders. Operational performance was analysed through standard performance indicators that measured consistency in production, compliance with quality standards and distribution regularity. Assessment of the economic viability included cost structure analysis, five-year projections, and financial ratios. Social impact was assessed using a qualitative approach. The pilot unit has demonstrated its operational performance and cost-efficiency. More data is needed to evaluate the scalability and sustainability of this decentralised model.

Food Fortification as a Complementary Strategy for the Elimination of Micronutrient Deficiencies: Case Studies of Large Scale Food Fortification in two Indian States

Bhagwat, S., D. Gulati, R. Sachdeva, and R. Sankar. 2014. *Asia Pacific Journal of Clinical Nutrition* 23: S4-S11. doi: 10.6133/apjcn.2014.23.s1.04.

<http://europepmc.org/abstract/med/25384726>

The burden of micronutrient malnutrition is very high in India. Food fortification is one of the most cost-effective and sustainable strategies to deliver micronutrients to large population groups. Global Alliance for Improved Nutrition (GAIN) is supporting large-scale, voluntary, staple food fortification in Rajasthan and Madhya Pradesh because of the high burden of malnutrition, availability of industries capable of and willing to introduce fortified staples, consumption patterns of target foods and a conducive and enabling environment. High extraction wheat flour from roller flour mills, edible soybean oil and milk from dairy cooperatives were chosen as the vehicles for fortification. Micronutrients and levels of fortification were selected based on vehicle characteristics and consumption levels. Industry recruitment was done after a careful assessment of capability and willingness. Production units were equipped with necessary equipment for fortification. Staffs were trained in fortification and quality control. Social marketing and communication activities were

carried out as per the strategy developed. A state food fortification alliance was formed in Madhya Pradesh with all relevant stakeholders. Over 260,000 MT of edible oil, 300,000 MT of wheat flour and 500,000 MT of milk are being fortified annually and marketed. Rajasthan is also distributing 840,000 MT of fortified wheat flour annually through its Public Distribution System and 1.1 million fortified Mid-day meals daily through the centralised kitchens. Concurrent monitoring in Rajasthan and Madhya has demonstrated high compliance with all quality standards in fortified foods.

The Great Indian Calorie Debate: Explaining Rising Undernourishment During India's Rapid Economic Growth

Smith, L.C. 2014. *Food Policy* 50: 53-67. doi:10.1016/j.foodpol.2014.10.011.

<http://www.sciencedirect.com/science/article/pii/S0306919214001535>

The prevalence of undernourishment in India – the percent of people consuming insufficient calories to meet their energy requirements – has been rising steadily since the mid-1980s. Paradoxically, this period has been one of robust poverty reduction and rapid economic growth. The reasons for the apparent reductions in calorie consumption underlying increased undernourishment have been the subject of intense debate both within India and internationally. This paper critically reviews this debate, finding that it has taken place outside of the context of India's recent nutrition and epidemiological transitions, which appear to have brought with them increased, not decreased, food consumption. The debate has also taken place under the unchallenged assumption that the data on which the conflicting trends are based, collected as part of the country's Household Consumption and Expenditure Surveys (HCEs), are reliable. The paper provides supporting literature and empirical evidence that a probable key source of the calorie decline is incomplete collection of data on food consumed away from peoples' homes, which is widespread and rapidly increasing. Complete measurement of this food source in the HCEs of all developing countries is vital for accurate measurement of both undernourishment and poverty – and for resolving the Indian calorie debate.

State-wise Dynamics of the Double Burden of Malnutrition among 15–49 Year-old Women in India: How Much Does the Scenario Change Considering Asian Population-specific BMI Cut-off Values?

Sengupta, A., F. Angeli, T.S. Syamala, C.P. Van Schayck, and P. Dagnelie. 2014. *Ecology of Food and Nutrition* 53 (6): 618-638. doi: 10.1080/03670244.2014.891994.

http://www.tandfonline.com/doi/abs/10.1080/03670244.2014.891994#.VG7H7_mUexV

This article assesses the gravity of the “double burden of malnutrition” across 21 states of India, through a comparative analysis of traditional and Asian population-specific BMI categorizations for overweight and obesity. This study analyzes data on ever-married women (15–49 years) from the National Family Health Survey (NFHS-2, 1998–1999; NFHS-3, 2005–2006). Findings depict that Indian women tilt toward high BMI resulting in a co-existence of under- and overweight populations, which portray a regional pattern. With Asian population-specific cut-offs, 11 states can be classified as “double burden states;” however, following traditional categorization, only 4 states face such dual pressure.

NON PEER-REVIEWED STUDIES

Performance Pay and Malnutrition: Evidence from an Experiment Targeting Child Malnutrition in West Bengal

Singh, P., and S. Mitra. 2014. Amherst, MA: Amherst College, University of Pennsylvania.

<http://economics.lafayette.edu/files/2014/11/Performance-Pay-and-Malnutrition.pdf>

We carry out a randomized controlled experiment in West Bengal, India to test three separate performance pay treatments in the public health sector. Performance is judged on improvements in child malnutrition. First, we exogenously change wages of government employed child care workers through a basic level of absolute incentives. The second treatment introduces high absolute incentives. Finally, we also test for the impact of basic relative incentives on child health. All treatments include supplying mothers with recipe books. The main results suggest that high absolute incentives reduce severe malnutrition by about 6.3 percentage points over three months. There are no significant effects on health outcomes of basic absolute or basic relative incentives. Results are robust to controlling for prior trends, propensity score matching and reversion-to-the-mean. This result is consistent with a reported increase in protein-rich diet at home in the high absolute treatment.

Early Childhood Development: Delivering Intersectoral Policies, Programmes, and Services in Low- Resource Settings

Woodhead, M., I. Featherstone, L. Bolton, and P. Robertson. 2014. Oxford, UK: Health & Education Advice & Resource Team, Oxford University.

<http://oro.open.ac.uk/41552/1/Woodhead%20et%20al%202014%20Early-Childhood-Development-Topic-Guide.pdf>

Early childhood development (ECD) has become a priority for research, policy and programming, at national and global level, with increasing recognition of the interconnections between a nation's development goals and the quality of services for all young girls and boys, and their families. The term 'ECD' is increasingly being used to reflect the evidence that young children's survival, health, care and learning involves interconnected and dynamic growth processes from well before the infant is born through into their early school years. ECD is thus a broad and complex field, covering multiple policy sectors, and diverse research traditions, but with the aspirations of constructing more intersectoral, and more integrated models of services delivery. The Topic Guide offers brief summaries of key research, evaluations and case studies, as well as links to more specialist resources relevant to this vision for ECD. It draws on a very broad range of published research and policy studies, spanning health; nutrition; water, sanitation and hygiene (WASH); social protection; and education. It includes experimental trials of innovative programmes as well as policy reports on systemic reform. Despite the ambitious scope, inevitably the Topic Guide is not exhaustive, and for example has limited coverage of child protection issues that are also at the heart of an integrated vision for ECD. Specialist services for specific groups, notably young disabled children are also essential within an integrated and inclusive vision, but detailed discussion is beyond the scope of the guide.

Opinion: Evidence to Inform Nutrition Policy and Programs

Thurnam, D.J. 2014. *Sight and Life* 28 (2): 52-65.

http://www.sightandlife.org/fileadmin/data/Magazine/2014/28_2_2014/8_opinion_evidence_to_inform_nutrition_policy_and_programs.pdf

The old English proverb about leading a horse to water has considerable relevance to the problem of translating well established nutritional evidence into policy and programs. The horse needs essential water, but if it is not thirsty or the water is presented in a way that engenders suspicion or fear, the horse will not drink. Policy is defined as a course or principal of action adopted or proposed by a government party, business or individual. That is, nutrition policy will be the end result of a number of inputs that persuade the relevant government to adopt a course of action. The policy may be clearly directed at managing, solving or ameliorating a nutritional problem, but how that policy is created is the result of a constellation of factors affecting how the problem is identified as well as the potential solutions. The inputs considered will go beyond nutrition: political priorities and the competing interests that make one alternative more attractive than the others will be given due consideration for solving the problem. In many countries, there is a problem of obesity. One often accepted narrative is that obesity is a consequence of lifestyle; the consumption of too many calorie-rich foods and physical inactivity. But what policies should a government adopt in the light of this phenomenon? One potential option would be to balance energy input against energy output; but no government is going to sufficiently increase the cost of food so as to throttle intake any more than it would raise the cost of petrol in order to encourage people to use their cars less. To be effective, the increases would have to be draconian, and their effects on the population would be disproportionate. The wealthy would foot the extra costs and continue their same lifestyle, while the poor would bear the brunt of the additional taxation, and the weak and vulnerable would no doubt end up undernourished.

UPCOMING EVENTS

Experimental Biology 2015, meetings of the American Society for Nutrition

Hosted by The American Society for Nutrition

Where: Boston, Massachusetts

When: March 28- April 1, 2015

For more information: <http://scientificsessions.nutrition.org>

The Experimental Biology is a conference, where the American Society for Nutrition, a constituent society of the Federation of American Societies for Experimental Biology (FASEB), holds its annual scientific sessions. Nutritionists from across the world come together to share new developments in the field.

National Public Health Week 2015

Where: TBC

When: April 6-12, 2015

For more information: <https://www.apha.org/about-apha/contact-us>

During the first full week of April each year, American Public Health Association (APHA) brings together communities across the United States to observe National Public Health Week (NPHW) as a time to recognize the contributions of public health and highlight issues that are important to improving our nation. For nearly 20 years, APHA has served as the organizer of NPHW. Every year, the Association develops a national campaign to educate the public, policymakers and practitioners about issues related to each year's theme. APHA creates new NPHW materials each year that can be used during and after NPHW to raise awareness about public health and prevention.

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Coalition for Sustainable Nutrition Security in India

Save the Children, India

Public Health Resource Network (PHRN)

Vatsalya

Centre for Equity Studies

ABOUT POSHAN

Partnerships and Opportunities to Strengthen and Harmonize Actions for Nutrition in India (POSHAN) is a 4-year initiative that aims to build evidence on effective actions for nutrition and support the use of evidence in decisionmaking. 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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