

EDITOR'S NOTE

This issue of *Abstract Digest* features several interesting articles, including two systematic reviews, and two special sections bringing together topics on nutrients, measurements, and interventions.

Using the Demographic Health Survey data, Coffey (2015) explains the alarming weight status of an average Indian woman before and during pregnancy. The author estimates that an average Indian woman ends a full-term pregnancy weighing less than an average Sub-Saharan African woman beginning pregnancy. Wendt et al. (2015) find in a national program in Bihar that women's consumption of iron and folic acid supplements was dependent on the timing, frequency, and quality of antenatal care received and the availability of supplements.

Bentley et al. (2015) describe the poor state of undernutrition and feeding practices in 40 urban informal settlements in Mumbai, where 45 percent children were stunted and only 5 percent of the children had received a minimally acceptable diet. Rah et al. (2015) reiterate the importance of the association between sanitation and hygiene practices and stunting in rural India using three large cross-sectional survey data sets at the household level that are representative of different administrative units (national, state, and district). In Bihar, Burtscher and Burza (2015) look into local mothers' and family members' beliefs about the condition and causes of severely malnourished children, affecting their care-seeking behavior. Aguayo et al. (2015) find a mid-upper-arm circumference of less than 115 millimeters to be an effective measure for identifying children with severe acute malnutrition, particularly among the 6–23 month age group.

Holla-Bhar et al (2015) present detailed cost estimates for implementing the *2003 WHO and UNICEF Global Strategy for Infant and Young Child Feeding* and outline the World Breastfeeding Costing Initiative Financial Planning Tool. In another interesting study, resources, population, infrastructure, and operational issues were identified to be the major constraints to implementing the National Food Security Act in India (Tanksale et al. 2015).

The two systematic reviews featured in this Abstract Digest issue focus on vitamin and food supplementation. Perez-Lopez et al (2015) find that vitamin D supplementation is associated with higher birth weight and length but not with other maternal or neonatal outcomes, suggesting the need for larger and well-designed randomized control trials to reach definitive conclusions. The *Cochrane Review* on food supplementation by Kristjansson et al. (2015) shows that supplementary food might work effectively for children under two years in low-and middle-income countries, but good implementation of such programs is required.

This issue also features abstracts presented at an annual conference sponsored by the American Society for Nutrition, which are based on work from India on the determinants of undernutrition, poverty, food security, diet quality, multiple micronutrient supplements, and scaling-up of interventions.

Lastly, there is a special section of this issue on a debate about whether to rethink vitamin A supplementation. This was sparked by an article (Mason et al. 2015) in the *International Journal of Epidemiology* that was followed by a number of accompanying letters to its editor debating the article.

Happy reading!

Warm regards,

Dr. Rasmi Avula

PEER-REVIEWED STUDIES

Prepregnancy Body Mass and Weight Gain during Pregnancy in India and Sub-Saharan Africa

Coffey, D. 2015. *Proceedings of the National Academy of Sciences* 112 (11): 3302-3307. doi/10.1073/pnas.1416964112.

<http://www.pnas.org/content/112/11/3302.abstract>

Despite being born into wealthier households, Indian children are significantly shorter and smaller than African children. These differences begin very early in life, suggesting that they may in part reflect differences in maternal health. By applying reweighting estimation strategies to Demographic and Health Surveys, this paper reports the first estimates of prepregnancy body mass index and weight gain during pregnancy for India and Sub-Saharan Africa. On average, 42.2 percent of prepregnant women in India are underweight compared with 16.5 percent of prepregnant women in Sub-Saharan Africa. Levels of prepregnancy underweight for India are almost seven percentage points higher than the average fraction underweight among women 15–49 year olds. This difference in part reflects a previously unquantified relationship among age, fertility, and underweight; childbearing is concentrated in the narrow age range in which Indian women are most likely to be underweight. The average woman in India ends pregnancy weighing less than the average woman in Sub-Saharan Africa when she begins her pregnancy. Poor maternal health among Indian women is of global significance because India is home to one fifth of the world's births.

Effect of Vitamin D Supplementation during Pregnancy on Maternal and Neonatal Outcomes: A Systematic Review and Meta-Analysis of Randomized Controlled Trials

Perez-Lopez, F.R., V. Pasupuleti, E. Mezones-Holguin, V.A. Benites-Zapata, P. Thota, A. Deshpande, and A.V. Hernandez. 2015. *Environment and Epidemiology*.

<http://www.ncbi.nlm.nih.gov/pubmed/25813278>

Objective: To assess the effects of vitamin D supplementation during pregnancy on obstetric outcomes and birth variables. **Design:** Systematic review and meta-analysis of randomized controlled trials (RCTs). **Setting:** Not applicable. **Patient(s):** Pregnant women and neonates. **Intervention(s):** PubMed and five other research databases were searched through March 2014 for RCTs evaluating vitamin D supplementation ± calcium/vitamins/ferrous sulfate vs. a control (placebo or active) during pregnancy. **Main Outcome Measure(s):** Circulating 25-hydroxyvitamin D [25(OH)D] levels, preeclampsia, gestational diabetes mellitus (GDM), small for gestational age (SGA), low birth weight, preterm birth, birth weight, birth length, and cesarean section. Mantel-Haenszel fixed-effects models were used, owing to expected scarcity of outcomes. Effects were reported as relative risks and their 95percent confidence intervals (CIs). **Result(s):** Thirteen RCTs (n = 2,299) were selected. Circulating 25(OH) D levels were significantly higher at term, compared with the control group (mean difference: 66.5 nmol/L, 95percent CI 66.2–66.7). Birth weight and birth length were significantly greater for neonates in the vitamin D group; mean difference: 107.6 g (95percent CI 59.9–155.3 g) and 0.3 centimeters (95percent CI 0.10–0.41 centimeters), respectively. Incidence of pre-eclampsia, GDM, SGA, low birth weight, preterm birth, and cesarean section were not influenced by vitamin D supplementation. Across RCTs, the doses and types of vitamin D supplements, gestational age at first administration, and outcomes were heterogeneous. **Conclusion(s):** Vitamin D supplementation during pregnancy was associated with increased circulating 25(OH) D levels, birth weight, and birth length, and was not associated with other maternal and neonatal outcomes. Larger, better-designed RCTs evaluating clinically relevant outcomes are necessary to reach a definitive conclusion.

Individual and Facility-Level Determinants of Iron and Folic Acid Receipt and Adequate Consumption among Pregnant Women in Rural Bihar, India

Wendt, A., R. Stephenson, M. Young, A. Webb-Girard, C. Hogues, U. Ramakrishnan, and R. Martorell. 2015. *PLOS One* 10 (3): e0120404. doi: 10.1371/journal.pone.0120404.

<http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0120404>

Background: In Bihar, India, high maternal anemia prevalence and low iron and folic acid supplement (IFA) receipt and consumption have continued over time despite universal IFA distribution and counseling during pregnancy. **Purpose:** To examine individual and facility-level determinants of IFA receipt and consumption among pregnant women in rural Bihar, India. **Methods:** Using *District-Level Household Survey (2007–08)* data, multilevel modeling was conducted to examine the determinants of two outcomes: IFA receipt (any IFA receipt vs. none) and IFA consumption (≥ 90 days vs. < 90 days). Individual-level and facility-level factors were included. Factor analysis was utilized to construct antenatal care (ANC) quality and health sub-center (HSC) capacity variables. **Results:** Overall, 37percent of women received any IFA during their last pregnancy. Of those, 24percent consumed IFA for 90 or more days. Women were more likely to receive any IFA when they received additional ANC services and counseling, and attended ANC earlier and more frequently. Significant interactions were found between ANC quality factors (odds ratio (OR): 0.37, 95percent confidence interval (CI): 0.25, 0.56) and between ANC services and ANC timing and frequency (OR: 0.68, 95percent CI: 0.56, 0.82). No HSC factors were significantly associated with IFA receipt. Women were more likely to consume IFA for ≥ 90 days if they attended at least 4 ANC check-ups and received more ANC services. IFA supply at the HSC (OR: 1.37, 95percent CI: 1.04, 1.82) was also significantly associated with IFA consumption. **Conclusions:** Our findings indicate that individual and ANC factors (timing, frequency, and quality) play a key role in facilitating IFA receipt and consumption. Although HSC capacity factors were not found to influence our outcomes, significant variation at the facility level indicates unmeasured factors that could be important to address in future interventions.

Malnutrition and Infant and Young Child Feeding in Informal Settlements in Mumbai, India: Findings from a Census

Bentley, A., S. Das, G. Alcock, N.S. More, S. Pantvaidya, and D. Osrin. 2015. *Food Science & Nutrition*. doi: 10.1002/fsn3.214.

<http://onlinelibrary.wiley.com/doi/10.1002/fsn3.214/abstract>

Childhood malnutrition remains common in India. We visited families in 40 urban informal settlement areas in Mumbai to document stunting, wasting, and overweight in children under five, and to examine infant and young child feeding (IYCF) in children under 2 years. We administered questions on eight core WHO IYCF indicators and on sugary and savory snack foods, and measured weight and height of children under five. Stunting was seen in 45percent of 7,450 children, rising from 15percent in the first year to 56percent in the fifth. About 16percent of children were wasted and 4percent overweight. 46percent of infants were breastfed within the first hour, 63percent were described as exclusively breastfed under 6 months, and breastfeeding continued for 12 months in 74percent. The indicator for introduction of solids was met for 41percent of infants. Only 13percent of children satisfied the indicator for minimum dietary diversity, 43percent achieved minimum meal frequency, and 5percent had a minimally acceptable diet. About 63percent of infants had had sugary snacks in

the preceding 24 hours, rising to 78percent in the second year. Fried and salted snack foods had been eaten by 34percent of infants and 66percent of children under 2. Stunting and wasting remain unacceptably common in informal settlements in Mumbai, and IYCF appears problematic, particularly in terms of dietary diversity. The ubiquity of sugary, fried, and salted snack foods is a serious concern: substantial consumption begins in infancy and exceeds that of all other food groups except grains, roots, and tubers.

Health-Seeking Behaviour and Community Perceptions of Childhood Undernutrition and a Community Management of Acute Malnutrition (CMAM) Programme in Rural Bihar, India: A Qualitative Study

Burtscher, D., and S. Burza. 2015. *Public Health Nutrition*: 1-10. doi:10.1017/S1368980015000440.

<http://www.ncbi.nlm.nih.gov/pubmed/25753193>

Objective: Since 2009, Médecins Sans Frontières has implemented a community management of acute malnutrition (CMAM) program in rural Biraul block, Bihar State, India that has admitted over 10,000 severely malnourished children but has struggled with poor coverage and default rates. With the aim of improving program outcomes we undertook a qualitative study to understand community perceptions of childhood undernutrition, the CMAM program and how these affected health-seeking behavior. **Design:** Semi-structured and narrative interviews were undertaken with families of severely malnourished children, non-undernourished children and traditional and allopathic health-care workers. Analysis of transcripts was by qualitative content analysis. **Setting:** Biraul, Bihar State, India, 2010. **Subjects:** 150 people were interviewed in individual or group discussions during 58 interviews. **Results:** Undernutrition was not viewed as a disease; instead, local disease concepts were identified that described the clinical spectrum of undernutrition. These concepts informed perception, so caregivers were unlikely to consult health workers if children were 'only skinny'. Hindu and Muslim priests and other traditional health practitioners were more regularly consulted and perceived as easier to access than allopathic health facilities. Senior family members and village elders had significant influence on the health-seeking behavior of parents of severely malnourished children. **Conclusions:** The results reaffirm how health education and CMAM programs should encompass local disease concepts, beliefs and motivations to improve awareness that undernutrition is a disease and one that can be treated. CMAM is well accepted by the community; however, programs must do better to engage communities, including traditional healers, to enable development of a holistic approach within existing social structures.

Mid Upper-Arm Circumference is an Effective Tool to Identify Infants and Young Children with Severe Acute Malnutrition in India

Aguayo, V.M., S. Aneja, N. Badgaiyan, and K. Singh. 2015. *Public Health Nutrition*: 1-5. doi:10.1017/S1368980015000543.

<http://www.ncbi.nlm.nih.gov/pubmed/25757562>

Objective: To assess the appropriateness of current mid upper-arm circumference (MUAC) cut-offs to identify children with severe acute malnutrition in India. **Design:** The analysis concerned 6,307 children admitted to nutrition rehabilitation centers (2009–2011) where they received therapeutic care as per guidelines by WHO and the Indian Academy of Pediatrics. **Setting:** States of Jharkhand, Madhya Pradesh and Uttar Pradesh, India. **Subjects:** Children aged 6–59 months with bilateral pitting edema or weight-for height Z-score (WHZ)

<-3 or MUAC <115 mm at admission. **Results:** Children aged 6–23 months represented ~ 80 percent of the admissions. Among them, the proportion with WHZ <-3 was similar to that with MUAC <115 mm (85.7percent v. 81.8 percent); the proportion with MUAC <115 mm whose WHZ was <-3 was 82.6 percent ; and the proportion with WHZ <-3 whose MUAC <115 mm was 78.8 percent. MUAC <115 mm was as effective as WHZ <-3 in identifying 6–59-monthold children with medical complications (32.2percent v. 31.6 percent , respectively), the most important risk factor of death among edema-free children. Furthermore, death rates in children with MUAC <115 mm were higher than in children with WHZ <-3 (0.61 percent v. 0.58 percent , respectively) and 91 percent of the deaths among edema free children were deaths of children with MUAC <115 mm. **Conclusions:** In populations similar to those included in our analysis, MUAC <115 mm appears to be an appropriate criterion to identify children with severe acute malnutrition who are at a greater risk of medical complications and death, particularly among children 6–23 months old.

Community-based Management of Severe Acute Malnutrition in India: New Evidence from Bihar

Burza, S., R. Mahajan, E. Marino, T. Sunyoto, C. Shandilya, M. Tabrez, K. Kumari, P. Mathew, A. Jha, N. Salse, and K. N. Mishra. 2015. *American Journal of Clinical Nutrition*. doi: 10.3945/ajcn.114.093294.

<http://ajcn.nutrition.org/content/early/2015/02/25/ajcn.114.093294.abstract>

Background: An estimated one-third of the world's children who are wasted live in India. In Bihar state, of children under 5 years old, 27.1percent are wasted and 8.3percent have severe acute malnutrition (SAM). In 2009, Médecins Sans Frontières (MSF) initiated a community-based management of acute malnutrition (CMAM) program for children aged 6–59 months with SAM. **Objective:** In this report, we describe the characteristics and outcomes of 8,274 children treated between February 2009 and September 2011. **Design:** Between February 2009 and June 2010, the program admitted children with a weight-for-height z score (WHZ) <-3 standard deviations (SDs) and/or mid-upper arm circumference (MUAC) <110 millimeters (mm) and discharged those who reached a WHZ >-2 SDs and MUAC >110 mm. These variables changed in July 2010 to admission on the basis of an MUAC <115 mm and discharge at an MUAC ≥ 120 mm. Uncomplicated SAM cases were treated as outpatients in the community by using a WHO-standard, ready-to-use, therapeutic lipid-based paste produced in India; complicated cases were treated as inpatients by using F75/F100 WHO-standard milk until they could complete treatment in the community. **Results:** A total of 8,274 children were admitted including 5,149 girls (62.2percent), 6,613 children aged 6–23 months (79.9percent), and 87.3percent children who belonged to Scheduled Caste, Scheduled Tribe, or Other Backward Caste families or households. Of 3,873 children admitted under the old criteria, 41 children (1.1percent) died, 2,069 children (53.4percent) were discharged as cured, and 1485 children (38.3percent) defaulted. Of 4,401 children admitted under the new criteria, 36 children (0.8percent) died, 2,526 children (57.4percent) were discharged as cured, and 1,591 children (36.2percent) defaulted. For children discharged as cured, the mean (\pm SD) weight gain and length of stay were 4.7 ± 3.1 and 5.1 ± 3.7 g \cdot kg $^{-1} \cdot$ d $^{-1}$ and 8.7 ± 6.1 and 7.3 ± 5.6 wk under the old and new criteria, respectively ($P < 0.01$). After adjustment, significant risk factors for default were as follows: no community referral for admission, more severe wasting on admission, younger age, and a long commute for treatment. **Conclusions:** To our knowledge, this is the first conventional CMAM program in India and has achieved low mortality and high cure rates in nondefaulting children. The new admission criteria lower the threshold for severity with the result that more children are included who are at lower risk of death and have a smaller WHZ deficit to correct than do children identified by the old criteria. This study was registered as a retrospective observational analysis of routine program data at <http://www.isrctn.com> as ISRCTN13980582.

Food Supplementation for Improving the Physical and Psychosocial Health of Socio-economically Disadvantaged Children aged Three Months to Five Years

Kristjansson, E., D.K. Francis, S. Liberato, M.B. Jandu, V. Welch, M. Batal, T. Greenhalgh, T. Rader, E. Noonan, B. Shea, L. Janzen, G.A. Wells, and M. Petticrew. 2015. *Cochrane Database of Systematic Reviews* (3): 1-172. doi: 10.1002/14651858.CD009924.pub2.

<http://onlinelibrary.wiley.com/doi/10.1002/14651858.CD009924.pub2/abstract;jsessionid=4D20C93A500C98321851EF112C66574E.f03t01>

Background: Undernutrition is a cause of child mortality; it contributed to the deaths of more than 3 million children in 2011. Furthermore, it can lead to higher risk of infection, poorer child development and school performance, and to chronic disease in adulthood. Evidence about the effectiveness of nutrition interventions for young children, therefore, is fundamentally important; not only for governments, funding agencies and nongovernmental organizations, but also for the children themselves. **Review question:** How effective are supplementary food programs for improving the health of disadvantaged children? What factors contribute to the effectiveness of such programs? **Methods:** We included studies that compared children who were given supplementary feeding (food, drink) to those who did not receive any feeding. We followed careful systematic review methodology, including the use of broad searches. At least two people were involved in every stage of the review. Where possible, we performed analyses to combine results of several studies and get an average effect. We looked carefully for factors that may have impacted on the results (child age, sex and disadvantage, family sharing food, amount of energy given, etc.). The evidence is current to January 2014. **Study characteristics:** We included 32 studies; 21 randomized controlled trials (in which children were randomly assigned to receive either supplementary feeding (intervention group) or not (a control group), and 11 controlled before-and-after studies (in which outcomes were observed before and after treatment in a group of children who were not randomly assigned to an intervention and a control group). The number of children in them ranged from 30 to 3,166. Most studies were from low- and middle-income countries; three were from high-income countries. **Key findings:** We found that, in low- and middle-income countries, providing additional food to children aged three months to five years led to small gains in weight (0.24 kilograms a year in both RCTs and CBAs) and height (0.54 centimeters a year in RCTs only; no evidence of an effect in other study designs), and moderate increases in hemoglobin. We also found positive impacts on psychomotor development (skills that involve mental and muscular activity). We found mixed evidence on effects of supplementary feeding on mental development. In high-income countries, two studies found no benefits for growth. The one effective study involved Aboriginal children. We found that food was often redistributed ('leakage') within the family; when feeding was home-delivered, children benefited from only 36percent of the energy given in the supplement. However, when the supplementary food was given in day care centers or feeding centers, there was much less leakage; children took in 85percent of the energy provided in the supplement. When we looked at different groups supplementary food was more effective for younger children (under 2 years old) and for those who were poorer or less well nourished. Results for sex were mixed. Feeding programs that were well-supervised and those that provided a greater proportion of required daily food for energy were generally more effective. **Quality of the evidence:** We judged evidence from the RCTs to be of moderate quality and evidence from the CBAs to be of low quality.

Household Sanitation and Personal Hygiene Practices are Associated with Child Stunting in Rural India: A Cross-sectional Analysis of Surveys

Rah, J.H., A.A. Cronin, B. Badgaiyan, V.M. Aguayo, S. Coates, and S. Ahmed. 2015. *BMJ Open* 5 (2): e005180. doi:10.1136/bmjopen-2014-005180.

<http://bmjopen.bmj.com/content/5/2/e005180.full>

Objectives: Increasing evidence suggests that water, sanitation and hygiene (WASH) practices affect linear growth in early childhood. We determined the association between household access to water, sanitation, and personal hygiene practices with stunting among children aged 0–23 months in rural India. **Setting:** India. **Participants:** A total of 10,364, 34,639 and 1,282 under-2s who participated in the 2005–2006 National Family Health Survey (NFHS-3), the 2011 Hunger and Malnutrition Survey (HUNGaMA), and the 2012 Comprehensive Nutrition Survey in Maharashtra (CNSM), respectively, were included in the analysis. **Primary outcome measures:** The association between WASH indicators and child stunting was assessed using logistic regression models. **Results:** The prevalence of stunting ranged from 25percent to 50percent across the three studies. Compared with open defecation, household access to toilet facility was associated with a 16–39percent reduced odds of stunting among children aged 0–23 months, after adjusting for all potential confounders (NFHS-3 (OR=0.84, 95percent CI 0.71 to 0.99); HUNGaMA (OR=0.84, 95percent CI 0.78 to 0.91); CNSM (OR=0.61, 95percent CI 0.44 to 0.85)). Household access to improved water supply or piped water was not in itself associated with stunting. The caregiver's self-reported practices of washing hands with soap before meals (OR=0.85, 95percent CI 0.76 to 0.94) or after defecation (OR=0.86, 95percent CI 0.80 to 0.93) were inversely associated with child stunting. However, the inverse association between reported personal hygiene practices and stunting was stronger among households with access to toilet facility or piped water (all interaction terms, $p < 0.05$). **Conclusions:** Improved conditions of sanitation and hygiene practices are associated with reduced prevalence of stunting in rural India. Policies and programming aiming to address child stunting should encompass WASH interventions, thus shifting the emphasis from nutrition-specific to nutrition-sensitive programming. Future randomized trials are warranted to validate the causal association.

Investing in Breastfeeding – The World Breastfeeding Costing Initiative

Holla-Bhar, R., A. Iellamo, A. Gupta, J.P. Smith, and J.P. Dadhich. 2015. *International Breastfeeding Journal* 10 (8): 1-23. doi:10.1186/s13006-015-0032-y.

<http://www.internationalbreastfeedingjournal.com/content/pdf/s13006-015-0032-y.pdf>

Despite scientific evidence substantiating the importance of breastfeeding in child survival and development and its economic benefits, assessments show gaps in many countries' implementation of the 2003 WHO and UNICEF Global Strategy for Infant and Young Child Feeding (Global Strategy). Optimal breastfeeding is a particular example: initiation of breastfeeding within the first hour of birth, exclusive breastfeeding for the first 6 months; and continued breastfeeding for 2 years or more, together with safe, adequate, appropriate, responsive complementary feeding starting in the sixth month. While the understanding of "optimal" may vary among countries, there is a need for governments to facilitate an enabling environment for women to

achieve optimal breastfeeding. Lack of financial resources for key programs is a major impediment, making economic perspectives important for implementation. Globally, while achieving optimal breastfeeding could prevent more than 800,000 deaths under 5 annually, in 2013, US\$58 billion was spent on commercial baby food including milk formula. Support for improved breastfeeding is inadequately prioritized by policy and practice internationally. **Methods:** The World Breastfeeding Costing Initiative (WBCi) launched in 2013, attempts to determine the financial investment that is necessary to implement the Global Strategy, and to introduce a tool to estimate the costs for individual countries. The article presents detailed cost estimates for implementing the *Global Strategy*, and outlines the WBCi Financial Planning Tool. Estimates use demographic data from UNICEF's *State of the World's Children 2013*. **Results:** The WBCi takes a programmatic approach to scaling up interventions, including policy and planning, health and nutrition care systems, community services and mother support, media promotion, maternity protection, *WHO International Code of Marketing of Breastmilk Substitutes* implementation, monitoring and research, for optimal breastfeeding practices. The financial cost of a program to implement the *Global Strategy* in 214 countries is estimated at US\$17.5 billion (US\$130 per live birth). The major recurring cost is maternity entitlements. **Conclusions:** WBCi is a policy advocacy initiative to encourage integrated actions that enable breastfeeding. WBCi will help countries plan and prioritize actions and budget them accurately. International agencies and donors can also use the tool to calculate or track investments in breastfeeding.

Implementing National Food Security Act in India: Issues and Challenges

Tanksale, A., and J.K. Jha. 2015. *British Food Journal* 117 (4): 1315-1335. doi:10.1108/BFJ-07-2014-0239.

<http://www.emeraldinsight.com/doi/abs/10.1108/BFJ-07-2014-0239>

Purpose: The National Food Security Act 2013 (NFSA) is a unique step taken by the Indian government to fight against hunger and protect the rights of the people for food. With its peculiarities like the life cycle approach, women empowerment, consideration of vulnerable sections in society and proposed reforms in public distribution system (PDS), NFSA is a promising effort for food security in India. The purpose of this paper is to put forth various aspects of NFSA and to identify issues and challenges for its implementation in the light of Indian PDS. **Design/methodology/approach:** Understanding the implications of NFSA, mapping the existing system of food grains distribution in India and analyzing existing literature and secondary data available from assorted sources are the steps followed in this endeavor. **Findings:** Limited resources and exponentially increasing population, lack of infrastructure, operational inefficiencies and poor performance of the PDS are the major hurdles in successful implementation of the proposed act. This study gives emphasis on the need of major reforms in procurement, storage, movement and distribution of food grains strategies. **Research limitations/implications:** This paper focusses mainly on the operational and strategic aspects of PDS and its implications on NFSA. There is a wide scope for future research on sustainability of the act through agricultural and biotechnological innovations, financial analysis and strategic aspects. **Originality/value:** This study is a unique attempt of mapping and auditing of the entire complex value chain of the Indian PDS for implementation of NFSA. As NFSA is going to redefine the food security aspects, this pioneering work will be useful for researchers and policy makers working in this field in India and other developing countries.

SPECIAL SECTION:**Vitamin A supplementation discussion**

Mason et al. (2015) argue that the Vitamin A policies need to be revisited in the light of limited evidence of its effectiveness on mortality in the changing disease landscape. West and colleagues (2015) refute the argument, while Bhutta et al. (2015) caution against premature abandoning of the program in the absence of strong evidence for or against current supplementation. Schooling and Jones (2015) recommend examining the effect of the delivery mode for Vitamin A to examine its long-term health effects.

Vitamin A Policies Need Rethinking

Mason, J., T. Greiner, R. Shrimpton, D. Sanders, and J. Yukich. 2015. *International Journal of Epidemiology* 44 (1): 283-292. doi:10.1093/ije/dyu194.

<http://ije.oxfordjournals.org/content/44/1/283.abstract>

The prevalence of vitamin A (VA) deficiency, which affects about one-third of children in developing countries, is falling only slowly. This is despite extensive distribution and administration of periodic (4- to 6-monthly) high-dose VA capsules over the past 20 years, now covering a reported 80percent of children in developing countries. This massive program was motivated largely by an expectation of reducing child mortality, stemming from findings in the 1980s and early 1990s. Efficacy trials since 1994 have in most cases not confirmed a mortality impact of VA capsules. Only one large-scale program evaluation has ever been published, which showed no impact on 1–6-year-old mortality (the DEVTA trial, ending in 2003, in Uttar Pradesh, India). Periodic high-dose VA capsules may have less relevance now with changing disease patterns (notably, reductions in measles and diarrhea). High-dose VA 6-monthly does not reduce prevalence of the deficiency itself, estimated by low-serum retinol. It is proposed that: (i) there is no longer any evidence that intermittent high-dose VA programs are having any substantial mortality effect, perhaps due to changing disease patterns; (ii) frequent intakes of vitamin A in physiological doses—e.g., through food-based approaches, including fortification, and through regular low-dose supplementation—are highly effective in increasing serum retinol (SR) and reducing vitamin A deficiency; (iii) therefore a policy shift is needed, based on consideration of current evidence. A prudent phase-over is needed towards increasing frequent regular intakes of VA at physiological levels, daily or weekly, replacing the high-dose periodic capsule distribution programs. Moving resources in this direction must happen sooner or later: it should be sooner.

Commentary: Vitamin A Policies Need Rethinking

West Jr., K.P., A. Sommer, A. Palmer, W. Schultink, and J.P. Habicht. 2015. *International Journal of Epidemiology* 44 (1): 292-294. doi:10.1093/ije/dyu275.

<http://ije.oxfordjournals.org/content/44/1/292.extract>

Reply to West et al. Vitamin A Policies Need Rethinking

Mason, J., T. Greiner, R. Shrimpton, D. Sanders, and J. Yukich. 2015. *International Journal of Epidemiology* 44 (1): 294-296. doi:10.1093/ije/dyv008.

<http://ije.oxfordjournals.org/content/44/1/294.extract>

Premature Abandonment of Global Vitamin A Supplementation Programs is not Prudent!

Bhutta, Z.A., and S.K. Baker. 2015. *International Journal of Epidemiology* 44 (1): 297-299. doi:10.1093/ije/dyu274.

<http://ije.oxfordjournals.org/content/44/1/297.extract>

Could Child Vitamin A Supplementation have Long-term Health Effects?

Schooling, C.M., and H.E. Jones. 2015. *International Journal of Epidemiology* 44 (1): 365-366. doi:10.1093/ije/dyu278.

<http://ije.oxfordjournals.org/content/44/1/365.extract>

Response to: J Mason et al. Vitamin A Policies Need Rethinking

Benn, C.S., A.B. Fisker, and P. Aaby. 2015. *International Journal of Epidemiology* 44 (1): 366-367. doi:10.1093/ije/dyu279.

<http://ije.oxfordjournals.org/content/44/1/366.extract>

Response to: Letter to the Editor by Benn, C., A. Fisker, and P. Aaby

Mason, J., T. Greiner, R. Shrimpton, D. Sanders, and J. Yukich. 2015. *International Journal of Epidemiology* 44 (1): 367-368. doi:10.1093/ije/dyu266.

<http://ije.oxfordjournals.org/content/44/1/367.extract>

SPECIAL SECTION:**Update from the Annual Scientific Sessions of the American Society for Nutrition in Boston (March 28 -April 1)**

The American Society for Nutrition is a constituent society of the Federation of American Societies for Experimental Biology (FASEB) and holds its annual scientific session in conjunction with FASEB. Nutritionists from across the world share new developments in the field along the lifecycle and examine issues and innovations in physiological processes to implementation research and policy influence. Here we share with you research on maternal and child nutrition program and policy work pertaining to India that was featured at the conference. The links below are peer-reviewed research abstracts published in the FASEB Journal, 2015.

Do We Have the Wrong End of the Stick on Reducing Undernutrition? Insights on Determinants of Subnational Trends in India

Menon, P., S. Cyriac and S. Kadiyala. *The FASEB Journal* 29 (1) Supplement 31.7.

http://www.fasebj.org/content/29/1_Supplement/31.7

Household Poverty Does Not Correlate with Micronutrient Malnutrition: Preliminary Findings from a Cross- Sectional Survey in Madhya Pradesh

Perumal, N., S. Kaur, R. Sachdeva, R. Sankar and S. Jungjohann. *The FASEB Journal* 29 (1) Supplement 39.2.

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Food Insecurity and Its Association with Depression among Injection Drug Users (IDUs) with or without HIV in Chennai, India

Sackey, J., K. Chui and A. Tang. *The FASEB Journal* 29 (1) Supplement 585.1.

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Quality of the Early Infant Diet across the Eight Low and Middle Income Countries from the Malnutrition and Enteric Disease Study

Chandyo, R., B. Maciel, R. Ambikapathi, C. Patil, A. Bose, C. Amour, M. Islam, A. Turab, P. Bessong and L. Caulfield. *The FASEB Journal* 29 (1) Supplement 901.28.

http://www.fasebj.org/content/29/1_Supplement/901.28

Perspectives of Food Availability, Healthfulness and Modernity among Adolescents in India

Shaikh, N., A. Maxfield, U. Ramakrishnan, S. Patil and S. Cunningham. *The FASEB Journal* 29 (1) Supplement 898.30.

http://www.fasebj.org/content/29/1_Supplement/898.30

The Relationship between Iron Status and Free-Living Physical Activity in Indian School Children B.M.

Denvir, B., S. Luna, S. Udipi, P. Ghugre, E. Przybyszewski and J. Haas. *The FASEB Journal* 29 (1) Supplement 735.4.

http://www.fasebj.org/content/29/1_Supplement/735.4

Multiple Micronutrients and Early Learning Interventions Promote Infant Micronutrient Status and Development

Fernandez-Rao, S., K. Hurley, M. Nair, N. Balakrishna, N. Tilton, V. Radhakrishna, G. Reinhart, K. Harding and M. Black. *The FASEB Journal* 29 (1) Supplement 28.2.

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At-Scale Delivery of Essential Nutrition Interventions in India Is Limited by Variable Gaps in Policy, Design, Implementation and Demand

Avula, R., S.S. Kim, N. Kohli, S. Chakrabarti, P. Tyagi, K. Singh, M. van den Bold, S. Kadiyala and P. Menon. *The FASEB Journal* 29 (1) Supplement 898.32.

http://www.fasebj.org/content/29/1_Supplement/898.32

Frontline Worker (FLW) Knowledge and Motivation Influence Maternal Exposure to Complementary Feeding Counseling at Home

Avula, R., S.S. Kim, P. Tyagi, S. Chakrabarti and P. Menon. 2015. *The FASEB Journal* 29 (1) Supplement 391.5.

http://www.fasebj.org/content/29/1_Supplement/391.5

NON PEER-REVIEWED STUDIES

Is the PDS Already a Cash Transfer? Rethinking India's Food Subsidy Policies

Balasubramanian, S. 2015. *Is the PDS Already a Cash Transfer? Rethinking India's Food Subsidy Policies*. Working Paper No. 2015-16. Hong Kong: HKUST Institute for Emerging Market Studies.

<http://iems.ust.hk/wp-content/uploads/2015/03/IEMSWP2015-16.pdf>

Critics argue that India's mismanaged Public Distribution System (PDS), which sells subsidized cereals to poor families, should be replaced by cash transfers. Others fear cash may be misused. Using National Sample Survey data, this paper demonstrates that families treat additional PDS subsidies wholly as a source of cash—exactly like a cash transfer. More worryingly, cereal consumption has not increased, despite higher real subsidies. Moreover, neither the PDS nor cash transfers are likely to raise total food expenditure in poor families. Finally, therefore, the paper explores how higher food consumption and other objectives of PDS subsidies may be achieved.

Benefits and Costs of the Water Sanitation and Hygiene Targets for the Post-2015 Development Agenda

Hutton, G. 2015. *Benefits and Costs of the Water Sanitation and Hygiene Targets for the Post-2015 Development Agenda*. Water and Sanitation Assessment Paper. Lowell, MA, United States: Copenhagen Consensus Center.

<http://www.copenhagenconsensus.com/publication/post-2015-consensus-water-and-sanitation-assessment-hutton>

Guy Hutton, Senior Economist for the World Bank's Water and Sanitation Program, writes a paper examining the costs and benefits of ending open defecation and providing universal access to water and sanitation. He finds that in general, it is more cost-beneficial to serve rural populations since they save more time from having improved access to water and sanitation facilities. Additionally, it is more effective to provide for the poorest, because they start with poorer health and have greater capacity to improve from access. Regardless of location and income, providing water and sanitation passes a cost-benefit test.

Is More Inclusive More Effective? The “New-Style” Public Distribution System in India

Kishore, A., and S. Chakrabarti. 2015. *Is More Inclusive More Effective? The “New-Style” Public Distribution System in India*. IFPRI Discussion Paper 01421. New Delhi, India: International Food Policy Research Institute.

<http://www.ifpri.org/publication/more-inclusive-more-effective>

In September 2013, the Parliament of India enacted the National Food Security Act (NFSA), which entitles two-thirds of India’s population to 5 kilograms (kg) of rice, wheat, or coarse cereals per person per month at 1 to 3 Indian rupees (Rs) per kg. Foreshadowing the possible impact of this comprehensive reform provides the motivation for this paper. Five states in India—Andhra Pradesh, Chhattisgarh, Tamil Nadu, Odisha, and West Bengal—had already implemented somewhat similar changes in the targeted public distribution system (TPDS) a few years earlier using their own budgetary resources. They made rice—coincidentally, all five states are predominantly rice-eating—available in fair-price shops to a majority of their population at very low prices (less than Rs 3/kg). This paper tries to account for the changes in household consumption patterns associated with the change in PDS policy in these states using data from household consumption surveys by the National Sample Survey Organization (NSSO). These data show improvement in the coverage of TPDS and average offtake of grains from fair-price shops between 2004/2005 and 2009/2010 across all states of India. However, the increase in coverage and offtake was significantly higher in four out of these five states than in the rest of India. An average household in these states purchased 3 kg more rice per month from fair-price shops than its counterpart in nontreated states as a result of more generous TPDS policies backed by administrative reforms. The increase in consumption of PDS rice was the highest in Chhattisgarh, the poster state of public distribution system reforms. Households in Chhattisgarh used money saved on rice to spend more on pulses, edible oil, vegetables, sugar, and nonfood items. We also find evidence that making TPDS more inclusive and more generous is not enough unless it is supported by administrative reforms to improve grain delivery and control diversion to open markets.

UPCOMING EVENTS

47th Annual National Conference of Nutrition Society of India

Theme: Nutrition and Agriculture-The Connect and the Disconnect

Where: National Institute of Nutrition, Hyderabad

When: October 9-10, 2015

For more information: http://www.nutritionsofiasocietyindia.org/Download_files/47th/NSI%20Brochure%20Final.pdf

This conference aims to bring together researchers, policy makers, agriculture scientists, nutritionists, public health experts and social scientists to debate the theme of nutrition and agriculture and to share the latest information from the field of nutrition science, issues of agrarian distress and stagnation.

Asian Congress of Nutrition (ACN)

Where: Yokohama, Japan

When: May 14–18, 2015

For more information: <http://www.acn2015.org/index.html>

ACN is 4 yearly meetings of FANS, which is intended to encourage scientific interchange between food and nutrition researchers of Asian countries and worldwide.

Transforming Nutrition: Ideas, Policy and Outcomes 2015

Where: Institute of Development Studies, Brighton

When: Monday 13 July 2015 - Friday 17 July 2015 9:00 to 17:00

For more information: <http://www.ids.ac.uk/events/transforming-nutrition-ideas-policy-and-outcomes-2015>

Applications are now open for this 5 day course, designed for both for policy makers and practitioners. The course will take participants through new ways of thinking about undernutrition and what to do about it.

Led by IFPRI 

Partnership members:

Institute of Development Studies (IDS)

Public Health Foundation of India (PHFI)

One World South Asia

Vikas Samvad

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.

CONTACT US

Email us at IFPRI-POSHAN@cgiar.org

IFPRI-NEW DELHI INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

NASC Complex, CG Block,
Dev Prakash Shastri Road,
Pusa, New Delhi 110012, India
T+91.11.2584.6565 to 6567
F+91.11.2584.8008

IFPRI-HEADQUARTERS INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

2033 K Street, NW,
Washington, DC 20006-1002 USA
T. +1.202.862.5600
F. +1.202.467.4439
Skype: IFPRIhomeoffice
ifpri@cgiar.org
www.ifpri.org

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