

## EDITOR'S NOTE

Dear readers,

In this issue of POSHAN's Abstract Digest we share with you rich discussions and scientific learning from global and Indian contexts on maternal and child nutrition; featuring **two** special supplements that are open access, six special commentaries, arguments, and evidence-based results. The *Maternal & Child Nutrition* Supplement reflects on the challenges presented by the World Health Assembly global stunting reduction goal and approaches to address the stunting goal through transdisciplinary approaches, advocacy, and effective programming and evaluation. The *Food & Nutrition Bulletin* Supplement presents field-tested design, implementation, and evaluation frameworks for rapid scale-up of programs to improve infant and young child feeding (IYCF) practices. The supplement has several in-depth articles on how these large-scale programs were designed, successfully scaled up, and how they are being evaluated in Bangladesh, Ethiopia and Vietnam from 2009 to 2013. With special relevance to India, the six commentaries in *Economic & Political Weekly* debunk the myths and questions raised in the light of arguments against the use of the WHO growth references for estimating undernutrition among Indian children. The commentaries provide robust arguments for why the growth reference, which includes Indian children in it, is indeed applicable to India. In other India specific studies, one highlights the reasons for lack of full immunization coverage by parsing out coverage for different types of immunizations and the other finds that children receiving folic acid alone or in combination with vitamin B-12 are at increased risk for the incidence of persistent diarrhea. Two studies suggest increased absorption of micronutrients among children and young women upon consumption of biofortified pearl millets. We hope you find this issue useful and look forward to your feedback!

Warm regards,

Dr. Rasmi Avula

### About the POSHAN Abstract Digest:

*In each issue, the POSHAN Abstract Digest brings to your fingertips 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.*

### About POSHAN

POSHAN (*Partnerships and Opportunities to Strengthen and Harmonize Actions for Nutrition in India*) is a 4-year initiative which aims to build evidence on effective actions for nutrition and support the use of evidence in decision-making. It is supported by the Bill & Melinda Gates Foundation and led by IFPRI in India.



The Institute for Development Studies, Sussex is a POSHAN partner who bring global expertise in mobilizing knowledge for development.



PUBLIC  
HEALTH  
FOUNDATION  
OF INDIA

The Health Communication Division at the Public Health Foundation of India is a POSHAN partner who brings national level communications and advocacy experience in India.

## PEER-REVIEWED LITERATURE

### Special Open Access Issue of *Maternal and Child Nutrition* — Promoting healthy growth and preventing childhood stunting

Maternal & Child Nutrition, Volume 9, Issue Supplement S2 Pages 1–149, September, 2013

<http://onlinelibrary.wiley.com/doi/10.1111/mcn.2013.9.issue-s2/issuetoc>

#### Editorial: Promoting healthy growth and preventing childhood stunting: a global challenge

Onyango, AW. *Maternal & Child Nutrition*, 9(S2): 1-5, 2013

<http://onlinelibrary.wiley.com/doi/10.1111/mcn.12092/pdf>

#### The World Health Organization's global target for reducing childhood stunting by 2025: Rationale and proposed actions

de Onis, M, Dewey, KG, Borghi, E, Onyango, AW, Blössner, M, Daelmans, B et al. *Maternal & Child Nutrition*, 9(2): 6-26, 2013.

doi: 10.1111/mcn.12075

<http://onlinelibrary.wiley.com/doi/10.1111/mcn.12075/pdf>

#### Contextualising complementary feeding in a broader framework for stunting prevention

Stewart, CP, Iannotti, L, Dewey, KG, Michaelsen, KF, Onyango, AW. *Maternal & Child Nutrition*, 9(2): 27-45, 2013. doi:

10.1111/mcn.12088

<http://onlinelibrary.wiley.com/doi/10.1111/mcn.12088/pdf>

#### Multi-sectoral interventions for healthy growth

Casanovas, CM, Lutter, CK, Mangasaryan, N, Mwadime, R, Hajebehoy, N, Aguilar, AM et al. *Maternal & Child Nutrition*, 9(S2): 46-57, 2013. doi: 10.1111/mcn.12082

<http://onlinelibrary.wiley.com/doi/10.1111/mcn.12082/pdf>

#### Parental height and child growth from birth to 2 years in the WHO Multicentre Growth Reference Study

Garza, C, Borghi, E, Onyango, AW, de Onis, M. *Maternal & Child Nutrition*, 9(S2): 58-68, 2013. doi: 10.1111/mcn.12085

<http://onlinelibrary.wiley.com/doi/10.1111/mcn.12085/pdf>

#### The economic rationale for investing in stunting reduction

Hoddinott, J, Alderman, H, Behrman, JR, Haddad, L, Hortan, S. *Maternal & Child Nutrition*, 9(S2): 69-82, 2013.

doi:10.1111/mcn.12080

<http://onlinelibrary.wiley.com/doi/10.1111/mcn.12080/pdf>

#### The principles and practices of nutrition advocacy: evidence, experience and the way forward for stunting reduction

Pelletier, D, Haider, R, Hajebehoy, N, Mangasaryan, N, Mwadime, R, Sarkar, S. *Maternal & Child Nutrition*, 9(S2): 83-100. doi:

10.1111/mcn.12081

<http://onlinelibrary.wiley.com/doi/10.1111/mcn.12081/pdf>

#### Key principles to improve programmes and interventions in complementary feeding

Lutter, CK, Iannotti, L, Creed-Kanashiro, H, Guyon, Daelmans, B, Robert, R et al. *Maternal & Child Nutrition*, 9(S2): 101-115, 2013. doi: 10.1111/mcn.12087

<http://onlinelibrary.wiley.com/doi/10.1111/mcn.12087/pdf>

#### Designing appropriate complementary feeding recommendations: tools for programmatic action

Daelmans, B, Ferguson, E, Lutter, CK, Singh, N, Pachón, H, Creed-Kanashiro, H et al. *Maternal & Child Nutrition*, 9(S2): 116-130, 2013. doi: 10.1111/mcn.12083

<http://onlinelibrary.wiley.com/doi/10.1111/mcn.12083/pdf>

#### Introducing infant and young child feeding indicators into national nutrition surveillance systems: lessons from Vietnam

Hajebehoy, N, Nguyen, PH, Tran, DT, de Onis, M. *Maternal & Child Nutrition*, 9(S2): 131-149. doi: 10.1111/mcn.12086

<http://onlinelibrary.wiley.com/doi/10.1111/mcn.12086/pdf>

## Special Open Access Issue of Food and Nutrition Bulletin- Designing large-scale programs to improve infant and young child feeding in Asia and Africa: Methods and lessons of Alive & Thrive

EDITED BY: ELLEN PIWOZ, JEAN BAKER, AND EDWARD A. FRONGILLO

Food and Nutrition Bulletin, Volume 34, Supplement 2, pages S143–S230, September 2013

<http://www.ingentaconnect.com/content/nsinf/fnb/2013/00000034/a00203s2>

**Documenting large-scale programs to improve infant and young child feeding is key to facilitating progress in child nutrition**

Piwoz, E, Baker, J, Frongillo, EA. Food & Nutrition Bulletin, 34(2): 143S-145S, 2013

<http://www.ingentaconnect.com/content/nsinf/fnb/2013/00000034/A00203s2/art00001:jsessionid=7778uql1jqain.alice>

**Using an evidence-based approach to design large scale programs to improve infant and young child feeding**

Baker, J, Sanghvi, T, Hajeebhoy, N, Martin, L, Lapping, K. Food & Nutrition Bulletin, 34(2): 146S-155S, 2013

<http://www.ingentaconnect.com/content/nsinf/fnb/2013/00000034/A00203s2/art00002:jsessionid=7778uql1jqain.alice>

**Strengthening systems to support mothers in infant and young child feeding at scale**

Sanghvi, T, Luann, M, Hajeebhoy, N, Abrha, TH, Yewelsew, A, Haque, R et al. Food & Nutrition Bulletin, 34 (2): 156S-168S, 2013.

<http://www.ingentaconnect.com/content/nsinf/fnb/2013/00000034/A00203s2/art00003:jsessionid=7778uql1jqain.alice>

**Tailoring communication strategies to improve infant and young child feeding practices in different country settings**

Sanghvi, T, Jimerson, A, Hajeebhoy, N, Zewale, M, Nguyen, GH. Food & Nutrition Bulletin, 34 (2):169S-180S, 2013.

<http://www.ingentaconnect.com/content/nsinf/fnb/2013/00000034/A00203s2/art00004:jsessionid=7778uql1jqain.alice>

**Developing evidence-based advocacy and policy change strategies to protect, promote, and support infant and young child feeding**

Hajeebhoy, N, Rigsby, A, McColl, A, Sanghvi, T, Abrha, TH et al. Food & Nutrition Bulletin, 34 (2): 181S-194S, 2013

<http://www.ingentaconnect.com/content/nsinf/fnb/2013/00000034/A00203s2/art00005:jsessionid=7778uql1jqain.alice>

**Bringing rigor to evaluations of large-scale programs to improve infant and young child feeding and nutrition: The evaluation designs for the Alive & Thrive initiative**

Menon, P, Rawat, R, Ruel, M. Food & Nutrition Bulletin, 34(2): 195S-211S, 2013.

<http://www.ingentaconnect.com/content/nsinf/fnb/2013/00000034/A00203s2/art00006:jsessionid=7778uql1jqain.alice>

**Learning how programs achieve their impact: Embedding theory-driven process evaluation and other program learning mechanisms in Alive & Thrive**

Rawat, R, Nguyen, PH, Ali, D, Saha, K, Alayon, S et al. Food & Nutrition, 34(2): 212S-225S, 2013

<http://www.ingentaconnect.com/content/nsinf/fnb/2013/00000034/A00203s2/art00007:jsessionid=7778uql1jqain.alice>

**Learning from the design and implementation of large-scale programs to improve infant and young child feeding**

Baker, J, Sanghvi, T, Hajeebhoy, N, Abrha, TH. Food & Nutrition, 34(2): 26S-230S, 2013

<http://www.ingentaconnect.com/content/nsinf/fnb/2013/00000034/A00203s2/art00008:jsessionid=7778uql1jqain.alice>

**Six commentaries in *Economic & Political Weekly* (September, 2013) respond to questions raised against the use of the WHO growth reference to estimate prevalence of undernutrition in India in “Does India really suffer from worse child malnutrition than sub-Saharan Africa?” by Panagariya, A. *Economic & Political Weekly*, XLVIII (18), May 4, 2013** <http://blogs.isb.edu/cems/files/2013/07/Panagariya-EPW.pdf>

**Methodologically deficient, ignorant of prior research**

Wable, G. *Economic & Political Weekly*, XLVIII (34), 2013

<http://www.epw.in/discussion/methodologically-deficient-ignorant-prior-research.html>

**Myths and realities of child nutrition**

Gillespie, S. *Economic & Political Weekly*, XLVIII (34), 2013

<http://www.epw.in/discussion/myths-and-realities-child-nutrition.html>

### Stunting among children facts and implications

Coffey, D, Deaton, A, Drèze, J, Spears, S, Tarozzi, A. Economic & Political Weekly, XLVIII (34), 2013.

<http://www.epw.in/discussion/stunting-among-children.html>

### Reality of higher malnutrition among Indian children

Lodha, R, Jain, Y, Sathyamala, C. Economic & Political Weekly, XLVIII (34), 2013

[http://www.im4change.org/siteadmin/tiny\\_mce/uploaded/Reality\\_of\\_Higher\\_Malnutrition\\_among\\_Indian\\_Children.pdf](http://www.im4change.org/siteadmin/tiny_mce/uploaded/Reality_of_Higher_Malnutrition_among_Indian_Children.pdf)

### Are child malnutrition figures for India exaggerated?

Gupta, A, Patnaik, B, Singh, D, Sinha, D, Holla, R, Srivatsan, R, Jain, S, Garg, S, Dand, S, Nandi, S, Prasad, V, Shatrugna, V. Economic & Political Weekly, XLVIII (34), 2013

[http://www.im4change.org/siteadmin/tiny\\_mce/uploaded/Are\\_Child\\_Malnutrition\\_Figures\\_for\\_India\\_Exaggerated.pdf](http://www.im4change.org/siteadmin/tiny_mce/uploaded/Are_Child_Malnutrition_Figures_for_India_Exaggerated.pdf)

### Choice not genes probable cause for the India-Africa child height gap

Jayachandran, S, Pande, R. Economic & Political Weekly, XLVIII (34), 2013

[http://www.im4change.org/siteadmin/tiny\\_mce/uploaded/Choice\\_Not\\_Genes.pdf](http://www.im4change.org/siteadmin/tiny_mce/uploaded/Choice_Not_Genes.pdf)

**Letter to editor in response to the article published in The American Journal of Nutrition by Prentice et al. "Critical windows for nutritional interventions against stunting" published in May 2013 and the authors' response to the letter** <http://ajcn.nutrition.org/content/97/5/911.full.pdf+html>

### Letters to the editor

#### Critical windows for nutritional interventions against stunting

Leroy, JL, Ruel, M, Habicht, JP. American Journal of Clinical Nutrition, 98:854–8, 2013. doi: 10.3945/ajcn.113.066647

<http://ajcn.nutrition.org/content/98/3/854.full.pdf+html>

#### Reply to Leroy et al.

Prentice, AM, Jarjou, LM, Moore, SE, Fulford, AJ. American Journal of Clinical Nutrition, 98:854–8, 2013. doi: 10.3945/ajcn.113.066647

### World Health Organization infant and young child feeding indicators and their associations with child anthropometry: a synthesis of recent findings

Jones, AD, Ickes, SB, Smith, LE, Mbuya, MNN, Chasekwa, B, Heidkamp, RA et al. Maternal & Child Nutrition, 2013. doi: 10.1111/mcn.12070

<http://www.ncbi.nlm.nih.gov/pubmed/23945347>

As the World Health Organization (WHO) infant and young child feeding (IYCF) indicators are increasingly adopted, a comparison of country-specific analyses of the indicators' associations with child growth is needed to examine the consistency of these relationships across contexts and to assess the strengths and potential limitations of the indicators. This study aims to determine cross-country patterns of associations of each of these indicators with child stunting, wasting, height-for-age z-score (HAZ) and weight-for-height z-score (WHZ). Eight studies using recent Demographic and Health Surveys data from a total of nine countries in sub-Saharan Africa (nine), Asia (three) and the Caribbean (one) were identified. The WHO indicators showed mixed associations with child anthropometric indicators across countries. Breastfeeding indicators demonstrated negative associations with HAZ, while indicators of diet diversity and overall diet quality were positively associated with HAZ in Bangladesh, Ethiopia, India and Zambia ( $P < 0.05$ ). These same complementary feeding indicators did not show consistent relationships with child stunting. Exclusive breastfeeding under 6 months of age was associated with greater WHZ in Bangladesh and Zambia ( $P < 0.05$ ), although CF indicators did not show strong associations with WHZ or wasting. The lack of sensitivity and specificity of many of the IYCF indicators may contribute to the inconsistent associations observed. The WHO indicators are clearly valuable tools for broadly assessing the quality of child diets and for monitoring population trends in IYCF practices over time. However, additional measures of dietary quality and quantity may be necessary to understand how specific IYCF behaviours relate to child growth faltering.

## Infant feeding and school attainment in five cohorts from low- and middle-income countries

Horta, BL, Bas, A, Bhargava, SK, Fall, CHD, Feranil, A, Kadt, JD et al. PLOS One, 2013, 8(8): e71548.

doi:10.1371/journal.pone.0071548

<http://www.plosone.org/article/fetchObject.action?uri=info%3Adoi%2F10.1371%2Fjournal.pone.0071548&representation=PDF>

**Background:** Performance in intelligence tests tends to be higher among individuals breastfed as infants, but little is known about the association between breastfeeding and achieved schooling. We assessed the association of infant feeding with school achievement in five cohorts from low- and middle-income countries. Unlike high-income country settings where most previous studies come from, breastfeeding is not positively associated with socioeconomic position in our cohorts, thus reducing the likelihood of a spurious positive association. **Methodology and Principal Findings:** Participants included 10,082 young adults from five birth cohorts (Brazil, India, Guatemala, the Philippines, and South Africa). The exposures variables were whether the subject was ever breastfed, total duration of breastfeeding, and age at introduction of complementary foods. We adjusted the estimates for age at follow up, sex, maternal age, smoking during pregnancy, birthweight and socioeconomic position at birth. The key outcome was the highest grade achieved at school. In unadjusted analyses, the association between ever breastfeeding and schooling was positive in Brazil, inverse in the Philippines, and null in South Africa; in adjusted analyses, these associations were attenuated. In Brazil, schooling was highest among individuals breastfed for 3–12 months whereas in the Philippines duration of breastfeeding was inversely associated with schooling; and null associations were observed in South Africa and Guatemala. These associations were attenuated in adjusted models. Late introduction of solid foods was associated with lower schooling achievement in Brazil and South Africa. **Conclusion:** Measures of breastfeeding are not consistently related to schooling achievement in contemporary cohorts of young adults in lower and middle-income countries.

## Socioeconomic factors of full immunisation coverage in India

Sharma, S. World Journal of Vaccines, 3: 102-110, 2013. doi:10.4236/wjv.2013.33015

<http://www.scirp.org/journal/PaperInformation.aspx?PaperID=35996>

This paper attempts to understand the factors of the slow progress in the coverage of basic childhood immunisation in India using three rounds of National Family Health Survey (NFHS) data. States are selected on the basis of changes in full immunisation coverage during 1992-2005. Bivariate, multivariate, and dropout rates are used to understand the differentials and changes in immunisation coverage. The result reveals substantial improvement in partial immunisation in most states; however, the increase in full immunisation coverage has been slower. Two crucial determinants of the full immunisation coverage in selected states are availability of health card and antenatal care (ANC) visits of mother. Further, higher drop out of DPT3 and measles are responsible for slow increase in full immunisation coverage in selected states. The dropout rate between BCG-measles remains very high. The measles vaccination is very poorly addressed in India, due to which full immunisation is low. Mother's education, standard of living, mass media exposure, and availability of health card are appeared as significant predictor in explaining the full immunisation coverage irrespective of time. Descriptive statistics and multinomial logistic regression analysis are used in the study. Results indicate a steady increase in coverage of full immunisation in last 14 years, while the increase was higher during 1992-1998 but lower during 1998-2005.

## Poverty and the state of nutrition in India

Varadharajan, KS, Thomas, T, Kurpad, AV. Asia Pacific Journal of Clinical Nutrition, 22 (3):326-339, 2013

<http://apicn.nhri.org.tw/server/APJCN/22/3/326.pdf>

India is often thought of as a development paradox with relatively high economic growth rates in the past few years, but with lower progress in areas of life expectancy, education and standard of living. While serious inequalities in growth, development and opportunity explain the illusion of the paradox at the country level, still, a significant proportion of the world's poor live in India, as do a significant proportion of the world's malnourished children. Poverty and undernutrition coexist, and poor dietary quality is associated with poor childhood growth, as well as significant micronutrient deficiencies. Food security is particularly vulnerable to changes in the economic scenario and to inequities in wealth distribution. Migration from rural to urban settings with a large informal employment sector also ensures that migrants continue to live in food insecure situations. While food production has for the most part kept pace with the increasing population, it has been with



regard to cereal rather than of pulses and millet production. Oil seeds, sugar cane and horticultural crops, along with non-food crops are also being promoted, which do not address nutrition security, and, coupled with the increase in the consumption of preprepared food, may indeed predispose towards the double burden of malnutrition. Access to food is also particularly susceptible to poverty and inequality. Many strategies and policies have been proposed to counter undernutrition in India, but their implementation has not been uniform, and it is still too early to assess their lasting impact at scale.

### Mid-day meals: Looking ahead

Khera, R. *Economic & Political Weekly*, XLVIII (32), 2013.

[http://www.im4change.org/siteadmin/tiny\\_mce/uploaded/Reetika%20Khera.pdf](http://www.im4change.org/siteadmin/tiny_mce/uploaded/Reetika%20Khera.pdf)

The Mid-Day Meal Scheme has been quietly feeding more than 10 crore children every day for more than 10 years. Unfortunately, this popular and relatively successful programme makes it to the headlines only when things go wrong – this time following the tragic death of 23 children in Bihar after eating at school. Recent economic research clearly documents the positive impact of the scheme on enrolment, attendance, retention and nutrition. Hopefully, the Bihar tragedy will provide an opportunity to redress some of the long-standing issues in implementation (food quality and accountability) by learning from states such as Tamil Nadu.

### Folic acid and vitamin B-12 supplementation and common infections in 6-30-mo-old children in India: a randomized placebo-controlled trial

Taneja, S, Strand, TA, Kumar, T, Mahesh, M, Mohan, S, Manger, MS. *American Journal of Clinical Nutrition*, 2013, 98 (3):731-737. doi: 10.3945/ajcn.113.059592

<http://www.ncbi.nlm.nih.gov/pubmed/?term=Folic+acid+and+vitamin+B2+supplementation+and+common+infections+in+6%2E%88%9230-mo-old+children+in+India%3A+a+randomized+placebo-controlled+trial>

**Background:** Young children in low- and middle-income countries frequently have inadequate vitamin B-12 (cobalamin) status. Poor folate status is also common and is associated with increased diarrheal and respiratory morbidity. **Objective:** The objective was to measure the effect of folic acid and/or vitamin B-12 administration on the incidence of diarrhea and acute lower respiratory tract infections. **Design:** One thousand North Indian children (6230 mo of age) were enrolled in a randomized, double-blind, placebo-controlled trial to receive 2 times the Recommended Dietary Allowance of folic acid and/or vitamin B-12 or placebo daily for 6 mo. Children were individually randomly assigned in a 1:1:1:1 ratio in blocks of 16. Primary outcomes were the number of episodes of acute lower respiratory infections, diarrhea, and prolonged diarrhea. **Results:** Folic acid and vitamin B-12 supplementation significantly improved vitamin B-12 and folate status, respectively. Neither folic acid nor vitamin B-12 administration reduced the incidence of diarrhea or lower respiratory infections. In comparison with placebo, children treated with folic acid alone or in combination with vitamin B-12 had a significantly higher risk of persistent diarrhea (OR: 2.1; 95% CI: 1.1, 3.8). **Conclusions:** Folic acid or vitamin B-12 supplementation did not reduce the burden of common childhood infections. In view of the increased risk of diarrhea, the safety of folic acid supplements in young children should be further assessed.

### Total iron absorption by young women from iron-biofortified pearl millet composite meals is double that from regular millet meals but less than that from post-harvest iron-fortified millet meals

Cercamondi, CI, Egli, IM, Mitchikpe, E, Tossou, F, Zeder, C, Hounhouigan, JD, Hurrell, RF. *The Journal of Nutrition*, 143 (9): 1372-86, 2013. doi: 10.3945/jn.113.176826

<http://jn.nutrition.org/content/143/9/1376.full.pdf+html>

Iron biofortification of pearl millet (*Pennisetum glaucum*) is a promising approach to combat iron deficiency (ID) in the millet-consuming communities of developing countries. To evaluate the potential of iron-biofortified millet to provide additional bioavailable iron compared with regular millet and post-harvest iron-fortified millet, an iron absorption study was conducted in 20 Beninese women with marginal iron status. Composite test meals consisting of millet paste based on regular-iron, iron-biofortified, or post-harvest iron-fortified pearl millet flour accompanied by a leafy vegetable sauce or anokra sauce were fed as multiple meals for 5 d. Iron absorption was measured as erythrocyte incorporation of stable iron isotopes. Fractional iron absorption from test meals based on regular-iron millet (7.5%) did not differ from iron biofortified millet meals (7.5%;  $P = 1.0$ ), resulting in a higher quantity of total iron absorbed from the meals based on iron-biofortified millet (1125 vs. 527 mg;  $P <$

0.0001). Fractional iron absorption from post-harvest iron-fortified millet meals (10.4%) was higher than from regular-iron and iron-biofortified millet meals ( $P < 0.05$  and  $P < 0.01$ , respectively), resulting in a higher quantity of total iron absorbed from the post-harvest iron-fortified millet meals (1500 mg;  $P < 0.0001$  and  $P < 0.05$ , respectively). Results indicate that consumption of iron-biofortified millet would double the amount of iron absorbed and, although fractional absorption of iron from biofortification is less than that from fortification, iron-biofortified millet should be highly effective in combatting ID in millet-consuming populations.

### **Biofortification of pearl millet with iron and zinc in a randomized controlled trial increases absorption of these minerals above physiologic requirements in young children**

Kodkany, BS, Bellad, RM, Mahantshetti, NS, Westcott, JE, Krebs, NF, Kemp, JF, Hambidge, M. *The Journal of Nutrition*, 143 (9): 1489 – 1493. doi: 10.3945/jn.113.176677

<http://jn.nutrition.org/content/143/9/1489.full.pdf+html>

Millet is unusually drought resistant and consequently there is a progressive increase in the use of these grains as a human food staple, especially in large areas of India and sub-Saharan Africa. The purpose of this study was to determine the absorption of iron and zinc from pearl millet biofortified with 2 micronutrients that are typically deficient in nonfortified, plant-based diets globally. The study was undertaken in 40 children aged 2 y in Karnataka, India ( $n = 21$  test/19 controls). Three test meals providing  $\sim 84 \pm 17$  g dry pearl millet flour were fed on a single day for zinc and 2 d for iron between 0900 and 1600 h. The quantities of zinc and iron absorbed were measured with established stable isotope extrinsic labeling techniques and analyses of duplicate diets. The mean ( $\pm$  SD) quantities of iron absorbed from test and control groups were  $0.67 \pm 0.48$  and  $0.23 \pm 0.15$  mg/d, respectively ( $P < 0.001$ ). The quantities of zinc absorbed were  $0.95 \pm 0.47$  and  $0.67 \pm 0.24$  mg/d, respectively ( $P = 0.03$ ). These data did not include absorption of the modest quantities of iron and zinc contained in snacks eaten before and after the 3 test meals. In conclusion, quantities of both iron and zinc absorbed when iron and zinc biofortified pearl millet is fed to children aged 2 y as the major food staple is more than adequate to meet the physiological requirements for these micronutrients.

## NON PEER-REVIEWED LITERATURE

### **Democratic politics and legal rights: Employment guarantee and food security in India**

Khera, R. IEG Working Paper No. 327, 2013.

<http://www.iegindia.org/workpap/wp327.pdf>

This paper focuses on two Indian laws that seek to guarantee socioeconomic rights: the national rural employment guarantee act (NREGA), an important example of India's recent history of legislation of social and economic rights, and the proposed national food security act (NFSA), currently in parliament. Various means of democratic politics, including a ten-year old public interest litigation (PIL) in the supreme court and public mobilisation through the 'right to food campaign', contributed to the emergence of socioeconomic rights (in this case the right to food and work) on the agenda of mainstream politics. It attempts to shed some light on how the concerns of marginalised groups can find space in mainstream politics despite an overall political environment that is not particularly conducive. The paper analyses the parallels between the NREGA and the national food security bill (NFSB) and contrasts the 'successful' enactment of the NREGA within two years with the slow movement on the NFSB tabled only in the third year of the second term. The developments around the food security law show that a favourable outcome cannot be taken for granted even though it may be perceived as a 'populist' measure.

### **The great Indian calorie debate: Explaining rising undernourishment during India's rapid economic growth**

Smith, LC. IDS Working Paper, 2013 (430), 2013

<http://opendocs.ids.ac.uk/opendocs/bitstream/handle/123456789/2877/Wp430.pdf?sequence=1>

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 (HCESs), are reliable. The paper provides supporting literature and empirical evidence that one key factor driving the measured calorie decline is incomplete collection of data on food consumed away from peoples' homes, which is widespread and rapidly increasing. The India example shows that complete measurement of this food source in the HCESs of all countries is vital for accurate measurement of undernourishment and, indeed, poverty at national, regional and global levels.



## UPCOMING EVENTS

### Journal of Health, Population and Nutrition CALL FOR PAPERS on Implementation Research

The editorial board of the Journal of Health, Population and Nutrition has decided to publish a special issue on implementation research in 2014, which is expected to be launched in the Third Global Symposium on Health Systems Research to be held in South Africa in September 2014. Authors will be encouraged to submit their papers for presentation in the icddr, b scientific conference to be held in Dhaka in March 2014 and also in the health system symposium in South Africa

For more information: <http://www.jhpn.net/index.php/jhpn/announcement/view/6>

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