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Partnerships and Opportunities to Strengthen and Harmonize Actions for Nutrition in India

Abstract Digest

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EDITOR'S NOTE

This issue of the Abstract Digest features several systematic reviews, a special *Maternal and Child Nutrition* supplement, several interesting research articles, and reports. Many articles in this issue reiterate the importance of prenatal conditions and maternal nutrition to ensure healthy child growth. Here are some highlights:

- Knaul and colleagues (2016) in a thoughtful commentary, question the current global definition of maternal health, which narrowly focuses on the period of pregnancy and child birth. They call for an inclusive person-centred approach rather than ailment-focused priority setting for an inclusive and integrated global health to ensure complete care for women.
- Gernand et al (2016) reviewed micronutrient intake recommendations in pregnancy, risks and consequences of deficiencies especially in the low- and middle-income countries, and the effects of interventions with a particular emphasis on offspring. The authors identify an array of gaps in evidence (e.g., biological pathways and effects of single and multiple micronutrient interventions; identifying effective delivery strategies to influence diets and nutritional status in the context of food aversions and cultural practices during pregnancy) that need urgent attention to ensure optimum nutritional environment for growth. In a systematic review, Rahman et al (2016) find that maternal anemia remains a significant health problem adversely affecting birth and health outcomes in low- and middle-income countries.
- In a cluster-randomized study, Tripathy et al (2016) report that participatory women's groups facilitated by accredited social health activists (ASHAs) are helpful in reducing neonatal mortality.
- Using longitudinal multi-country data from Young Lives, Krishna et al (2016) show that the gap in the height-for-age Z score between low birth weight children and normal weight children narrows but remains, and is not influenced by wealth status.
- Based on a systematic review, Kristjansson et. al (2016) suggest that supplementary food is effective for children under two years of age and for those who are poor or less well-nourished. The success of supplementary food programs depends on the quality and quantity of food and a reliable supply chain. Another systematic review finds that home fortification with multiple micronutrients in powder in complementary feeding has good adherence and is well accepted by caregivers (de Barros et al 2016). Weber et al (2016) examine the acceptability of locally produced ready-to-use therapeutic foods (RUTF) in four countries and find that the local RUTF is well tolerated in India. Based on literature review and qualitative analysis of the studies, Suri et al (2016) find fortified blended foods (FBF) with dairy to be beneficial in the treatment of children with moderate acute malnutrition.
- Nandi et al (2016) find that children born in villages exposed to a food supplementation program were more likely to be enrolled in school and completed more years of schooling than children born in the control villages.
- Using mixed methods, Srivastava et al (2016) examine the functionality of the Village Health, Sanitation, and Nutrition Committees (VHSNCs) and identify weaknesses (such as lack of role clarity, training, supportive supervision, linkages with the community and the health system) that require urgent attention, to make the VHSNCs effective.
- The *Maternal & Child Nutrition* supplement on Stop Stunting in South Asia is a must-read that brings together a rich compendium of research that emphasizes the equal need for economic growth to invest in the public sector and an equal imperative to make the necessary program and policy investments to improve child feeding, women's nutrition, and household sanitation.

Enjoy Reading!

Warm regards,
Dr. Rasmi Avula

PEER-REVIEWED STUDIES

Rethinking Maternal Health

Knaul, F.M., A. Langer, R. Atun, D. Rodin, J. Frenk, and R. Bonita. 2016. *The Lancet Global Health* 4 (4): e227–e228. doi: http://dx.doi.org/10.1016/S2214-109X(16)00044-9

http://www.thelancet.com/journals/langlo/article/PIIS2214-109X(16)00044-9/abstract

Women's health has gone through a major epidemiological transition in the past decades. It is now time to rethink how global health defines maternal in order to encompass challenges to the health of all women, as well as their transformative potential as productive members of society.

Micronutrient Deficiencies in Pregnancy Worldwide: Health Effects and Prevention

Gernand, A.D., K.J. Schulze, C.P. Stewart, K.P. West Jr, and P. Christian. 2016. *Nature Reviews Endocrinology* 12: 272–289. doi: 10.1038/nrendo.2016.37

http://www.ncbi.nlm.nih.gov/pubmed/27032981

Micronutrients, vitamins and minerals accessible from the diet, are essential for biologic activity. Micronutrient status varies widely throughout pregnancy and across populations. Women in low-income countries often enter pregnancy malnourished, and the demands of gestation can exacerbate micronutrient deficiencies with health consequences for the fetus. Examples of efficacious single micronutrient interventions include folic acid to prevent neural tube defects, iodine to prevent cretinism, zinc to reduce risk of preterm birth, and iron to reduce the risk of low birth weight. Folic acid and vitamin D might also increase birth weight. While extensive mechanistic and association research links multiple antenatal micronutrients with plausible materno–fetal health advantages, hypothesized benefits have often been absent, minimal or unexpected in trials. These findings suggest a role for population context in determining health responses and filling extensive gaps in knowledge. Multiple micronutrient supplements reduce the risks of being born with low birth weight, small for gestational age or stillborn in undernourished settings, and justify micronutrient interventions with antenatal care. Measurable health effects of gestational micronutrient exposure might persist into childhood but few data exist on potential long-term benefits. In this review, we discuss micronutrient intake recommendations, risks and consequences of deficiencies, and the effects of interventions with a particular emphasis on offspring.

Maternal Anemia and Risk of Adverse Birth and Health Outcomes in Low- and Middle-Income Countries: Systematic Review and Meta-Analysis

Rahman, M.M., S.K. Abe, M.S. Rahman, M. Kanda, S. Narita, V. Bilano, E. Ota, S. Gilmour, and K. Shibuya. 2016. *The American Journal of Clinical Nutrition.* doi: 10.3945/ajcn.115.107896

http://ajcn.nutrition.org/content/early/2016/01/06/ajcn.115.107896.abstract?cited-by=yes&legid=ajcn%3Bajcn.115.107896v1

Background: Anemia is a leading cause of maternal deaths and adverse pregnancy outcomes in developing countries. **Objectives:** We conducted a systematic review and meta-analysis to estimate the pooled prevalence of anemia, the association between maternal anemia and pregnancy outcomes, and

the population-attributable fraction (PAF) of these outcomes that are due to anemia in low- and middle-income countries. **Design:** PubMed, EMBASE, CINAHL, and the British Nursing Index were searched from inception to May 2015 to identify cohort studies of the association between maternal anemia and pregnancy outcomes. The anemic group was defined as having hemoglobin concentrations <10 or <11 g/dL or hematocrit values <33% or <34% depending on the study. A metaregression and stratified analysis were performed to assess the effects of study and participant characteristics on adverse pregnancy risk. The pooled prevalence of anemia in pregnant women by region and country-income category was calculated with the use of a random-effects meta-analysis. **Results:** Of 8182 articles reviewed, 29 studies were included in the systematic review, and 26 studies were included in the meta-analysis. Overall, 42.7% (95% CI: 37.0%, 48.4%) of women experienced anemia during pregnancy in low- and middle-income countries. There were significantly higher risks of low birth weight (RR: 1.31; 95% CI: 1.13, 1.51), preterm birth (RR: 1.63; 95% CI: 1.33, 2.01), perinatal mortality (RR: 1.51; 95% CI: 1.30, 1.76), and neonatal mortality (RR: 2.72; 95% CI: 1.19, 6.25) in pregnant women with anemia. South Asian, African, and low-income countries had a higher pooled anemia prevalence than did other Asian and upper-middle-income countries. Overall, in low- and middle-income countries, 12% of low birth weight, 19% of preterm births, and 18% of perinatal mortality were attributable to maternal anemia. The proportion of adverse pregnancy outcomes attributable to anemia was higher in low-income countries and in the South Asian region. **Conclusion:** Maternal anemia remains a significant health problem in low- and middle-income countries.

Short- and Long-Run Associations Between Birth Weight and Children's Height

Krishna, A., G. Fink, L.F. Berkman, and S.V. Subramanian. 2016. *Economics & Human Biology* 21: 156–166. doi: 10.1016/j.ehb.2016.02.004

http://www.sciencedirect.com/science/article/pii/S1570677X16300053

Much evidence suggests that the 1000 days spanning from conception to children's second birthdays are critical for physical development. Whether influence of the exposures occurring during this window lasts later in life is unclear. Our study investigates changes in associations between birth weight and height, one measure of physical development, over different life-stages and whether greater household wealth promotes better growth for low birth weight (LBW) children. Using longitudinal data from Young Lives, we analyzed associations between birth weight and physical growth and examined differences across ages and by household wealth for 3999 children from Ethiopia, India, Peru, and Vietnam. At 6–18 months, LBW children had 0.53-SD (Standard error [SE]: 0.08) lower HAZ. Over time, the gap between normal and LBW children narrowed significantly to 0.21-SD (SE: 0.05) and 0.24-SD (SE: 0.05) at 4–5 years and 7–8 years, respectively. Prenatal experiences are most salient in establishing the greatest height deficits within the first year. Although disparities in height are reduced in the first year, height differences at age 4–5 years remain at 7–8 years of age. Even among wealthier families, there was no recovery in height for LBW children during the first year and no catch-up growth for these children in later childhood. These findings suggest that prenatal conditions, reflected in birth weight, are more important in setting height trajectories in comparison to postnatal factors, which do not help children recover fully from early growth deficits.

Adherence to and Acceptability of Home Fortification with Vitamins and Minerals in Children Aged 6 to 23 Months: A Systematic Review

de Barros, S.F., and M.A. Cardoso. 2016. *BMC Public Health* 16 (299). doi: 10.1186/s12889-016-2978-0

https://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-016-2978-0

Background: Vitamin and mineral deficiencies affect more than two million people worldwide. In 2011, based on recent scientific evidence and the low effectiveness of current strategies, the World Health Organization recommended home fortification of foods with multiple micronutrients in powder (MNP) as a new strategy to prevent and control anaemia during childhood. This systematic review assessed adherence to and acceptability of home fortification with multiple micronutrients in powder (MNP) in complementary feeding. **Methods**: Adherence was assessed based on number or percentage of prescribed sachets that were consumed, and acceptability was assessed according to perceptions of caregivers and children about MNP. **Results:** In summary, the studies indicated that home fortification with MNP has good adherence, ranging from 50 % to over 90 % of the prescribed sachets and that MNP was well accepted by caregivers. Caregivers reported side effects in 3 % to 32 % of children taking MNP in many studies; diarrhoea, vomiting, and constipation were the most common. **Conclusions:** Home fortification with MNP has good adherence and acceptability in infants, with higher adherence in non-daily or flexible administration regimens. Characteristics of the target population and increased diarrhoea burden should be considered for planning public health programs with long term use of MNP. Acceptability of the MNP is satisfactory, when the use and perceived beneficial effects on children's health are considered.

Supplementary Feeding for Improving the Health of Disadvantaged Infants and Children. What Works and Why?

Kristjansson, E., D. Francis, S. Liberato, T. Greenhalgh, V. Welch, M.B. Jandu, M. Batal, T. Rader, E. Noonan, L. Janzen, B. Shea, G.A. Wells, and M. Petticrew. 2016. *Supplementary feeding for improving the health of disadvantaged infants and children: what works and why?* 3ie Systematic Review Summary 5. London: International Initiative for Impact Evaluation.

http://www.3ieimpact.org/media/filer_public/2016/03/30/srs5-supplementary-feeding.pdf

This report – a summary of a systematic review and a realist review – examines the evidence on whether supplementary feeding, a strategy to provide additional food to disadvantaged children, can improve the health of children between three months and five years of age. It covers both physical health (including weight, height and illness) and psychosocial health (including mental development, attention, language and memory). Children who survive early and persistent undernutrition may experience lifelong consequences: undernutrition may cause permanent changes in physiology and metabolism, and has been increasingly linked to chronic diseases including obesity, hypertension, diabetes, stroke and coronary heart disease. These long-term consequences of undernutrition highlight the need for governments, funding agencies and non-governmental organisations to intervene early in childhood.

Acceptability of Locally Produced Ready-To-Use Therapeutic Foods in Ethiopia, Ghana, Pakistan and India

Weber, J.M., K.N. Ryan, R. Tandon, M. Mathur, T. Girma, M. Steiner-Asiedu, F. Saalia, S. Zaidi, S. Soofi, M. Okos, S.A. Vosti, and M.J. Manary. 2016. *Maternal and Child Nutrition*. doi: 10.1111/mcn.12250

http://onlinelibrary.wiley.com/doi/10.1111/mcn.12250/abstract?userIsAuthenticated=false&deniedAccessCustomisedMessage

Successful treatment of severe acute malnutrition has been achieved with ready-to-use therapeutic food (RUTF), but only 15% of children with severe acute malnutrition receive RUTF. The objective of this study was to determine whether new formulations of RUTF produced using locally available ingredients were acceptable to young children in Ethiopia, Ghana, Pakistan and India. The local RUTFs were formulated using a linear programming tool that allows for inclusion of only local ingredients and minimizes cost. The study consisted of 4 two-arm, crossover, site-randomized food acceptability trials to test the acceptability of an alternative RUTF formula compared with the standard peanut-based RUTF containing powdered milk. Fifty children with moderate wasting in each country were enrolled in the 2-week study. Acceptability was measured by overall consumption, likeability and adverse effects reported by caregivers. Two of the four RUTFs did not include peanut, and all four used alternative dairy proteins rather than milk. The ingredient cost of all of the RUTFs was about 60% of standard RUTF. In Ethiopia, Ghana and India, the local RUTF was tolerated well without increased reports of rash, diarrhoea or vomiting. Children consumed similar amounts of local RUTF and standard RUTF and preferred them similarly as well. In Pakistan, local RUTF was consumed in similar quantities, but mothers perceived that children did not enjoy it as much as standard RUTF. Our results support the further investigation of these local RUTFs in Ethiopia, Ghana and India in equivalency trials and suggest that local RUTFs may be of lower cost.

The Role of Dairy in Effectiveness and Cost of Treatment of Children with Moderate Acute Malnutrition: A Narrative Review

Suri, D.J., D. Moorthy, and I.H. Rosenberg. 2016. *Food and Nutrition Bulletin*. doi: 10.1177/0379572116633327

http://fnb.sagepub.com/content/early/2016/02/29/0379572116633327.abstract

Background: Dairy is recommended in specially formulated supplementary foods to treat children with moderate acute malnutrition (MAM) but with limited evidence and added cost. **Objective:** Review studies of ready-to-use foods (RUFs) versus fortified blended foods (FBFs) to determine whether inclusion of dairy modifies the comparative effectiveness and cost. **Methods:** We reviewed literature comparing FBF and RUF in treatment of MAM among children younger than 5 years in developing countries. Outcomes of recovery from MAM, weight, and length gain were compared among treatment categories: FBF with dairy (FBF+), FBF without dairy (FBF–), RUF with dairy (RUF+), and RUF without dairy (RUF–). Supplement cost was compared per 500 kcal. **Results:** Eight studies were included. Rations were heterogeneous in energy and type of dairy. Overall, RUF+, RUF–, and FBF+ performed similarly, with higher recovery and weight gain compared with FBF–. RUF+ had higher recovery (in 5 of 6 comparisons), weight gain (4 of 4), and length gain (1 of 4) versus FBF–. The RUF+ had higher recovery (1 of 2) versus FBF+, with no other differences. The RUF– versus FBF+ had no differences (0 of 2). The RUF– had higher recovery (1 of 2), weight gain (2 of 2) versus FBF–. Four studies reported supplement costs, which averaged US$0.15 (FBF–), US$0.18 (FBF+), US$0.18 (RUF–),

and US$0.37 (RUF+) per 500 kcal. **Conclusions:** There is a consistent benefit of FBF that include dairy in treatment of children with MAM. Benefits of dairy in RUF require further investigation. Evidence from rigorous quantitative analysis of existing data, cost-effectiveness, and prospective trials will be essential in determining policy on treatment for children with MAM.

Early Childhood Nutrition Is Positively Associated with Adolescent Educational Outcomes: Evidence from the Andhra Pradesh Child and Parents Study (APCAPS)

Nandi, A., A. Ashok, S. Kinra, J.R. Behrman, and R. Laxminarayan. 2016. *The Journal of Nutrition*. doi: 10.3945/jn.115.223198

http://jn.nutrition.org/content/early/2016/03/09/jn.115.223198.abstract

Background: India's Integrated Child Development Scheme, which provides supplementary nutrition and other public health services to >91 million women and children aged <6 y, is the largest program of its kind in the world. **Objective:** We estimated the long-term associations of maternal and early childhood nutrition provided under the Integrated Child Development Scheme with educational outcomes when the children became adolescents. **Methods:** We used longitudinal data from a controlled nutrition trial conducted near the city of Hyderabad, India. From 1987 to 1990, a balanced protein-energy supplement (corn-soya meal, called upma) was offered to pregnant women and children aged <6 y in 15 intervention villages, whereas no supplementation was offered in 14 control villages. Both groups had equal access to other public programs such as immunization and anemia control in pregnancy. Children born during the original trial period were resurveyed (654 intervention and 511 control group children) in 2003–2005. We used propensity score matching methods to correct for estimation bias in our regression models to assess the associations of supplementary nutrition with school enrollment, schooling grades completed, and academic test performance of these adolescents. **Results:** Children born in intervention villages were 7.8% (95% CI: 0.1%, 15.4%; $P < 0.05$) more likely to be enrolled in school and completed 0.84 (95% CI: 0.28, 1.39; $P < 0.005$) more schooling grades than children born in control villages. We found no association between supplementary nutrition and academic performance, as measured by school test scores. **Conclusion:** Offering a nutritional supplement to pregnant women and children <6 y of age during the Hyderabad Nutrition Trial was associated with improved school enrollment and completion of more schooling grades when the children became adolescents.

Are Village Health Sanitation and Nutrition Committees Fulfilling Their Roles for Decentralised Health Planning and Action? A Mixed Methods Study from Rural Eastern India

Srivastava, A., R. Gope, N. Nair, S. Rath, R. Sinha, P. Sahoo, P.M. Biswal, V. Singh, V. Nath, H.P.S. Sachdev, J. Skordis-Worrall, H. Haghparast-Bidgoli, A. Costello, A. Prost, and S. Bhattacharyya. 2016. *BMC Public Health* 16 (59). doi: 10.1186/s12889-016-2699-4

http://bmcpublichealth.biomedcentral.com/articles/10.1186/s12889-016-2699-4

Background: In India, Village Health Sanitation and Nutrition Committees (VHSNCs) are participatory community health forums, but there is little information about their composition, functioning and effectiveness. Our study examined VHSNCs as enablers of participatory action for community health in two rural districts in two states of eastern India – West Singhbhum in Jharkhand and Kendujhar, in Odisha. **Methods:** We conducted a cross-sectional survey of 169 VHSNCs and ten qualitative focus group discussions with purposively selected better and poorer performing committees, across the two states. We analysed the quantitative data using descriptive

statistics and the qualitative data using a Framework approach. **Results:** We found that VHSNCs comprised equitable representation from vulnerable groups when they were formed. More than 75 % members were women. Almost all members belonged to socially disadvantaged classes. Less than 1 % members had received any training. Supervision of committees by district or block officials was rare. Their work focused largely on strengthening village sanitation, conducting health awareness activities, and supporting medical treatment for ill or malnourished children and pregnant mothers. In reality, 62 % committees monitored community health workers, 6.5 % checked sub-centres and 2.4 % monitored drug availability with community health workers. Virtually none monitored data on malnutrition. Community health and nutrition workers acted as conveners and record keepers. Links with the community involved awareness generation and community monitoring of VHSNC activities. Key challenges included irregular meetings, members' limited understanding of their roles and responsibilities, restrictions on planning and fund utilisation, and weak linkages with the broader health system. **Conclusions:** Our study suggests that VHSNCs perform few of their specified functions for decentralized planning and action. If VHSNCs are to be instrumental in improving community health, sanitation and nutrition, they need education, mobilisation and monitoring for formal links with the wider health system.

Effect of Participatory Women's Groups Facilitated by Accredited Social Health Activists On Birth Outcomes in Rural Eastern India: A Cluster-Randomised Controlled Trial

Tripathy, P., N. Nair, R. Sinha, S. Rath, R.K. Gope, S. Rath, S.S. Roy, A. Bajpai, V. Singh, V. Nath, S. Ali, A.K. Kundu, D. Choudhury, S.K. Ghosh, S. Kumar, R. Mahapatra, A. Costello, E. Fottrell, T.A.J. Houweling, and A. Prost. 2016. *The Lancet Global Health* 4 (2): e119–e128. doi: http://dx.doi.org/10.1016/S2214-109X(15)00287-9

http://www.thelancet.com/journals/langlo/article/PIIS2214-109X(15)00287-9/abstract

Background: A quarter of the world's neonatal deaths and 15% of maternal deaths happen in India. Few community-based strategies to improve maternal and newborn health have been tested through the country's government-approved Accredited Social Health Activists (ASHAs). We aimed to test the effect of participatory women's groups facilitated by ASHAs on birth outcomes, including neonatal mortality. **Methods:** In this cluster-randomised controlled trial of a community intervention to improve maternal and newborn health, we randomly assigned (1:1) geographical clusters in rural Jharkhand and Odisha, eastern India to intervention (participatory women's groups) or control (no women's groups). Study participants were women of reproductive age (15–49 years) who gave birth between Sept 1, 2009, and Dec 31, 2012. In the intervention group, ASHAs supported women's groups through a participatory learning and action meeting cycle. Groups discussed and prioritised maternal and newborn health problems, identified strategies to address them, implemented the strategies, and assessed their progress. We identified births, stillbirths, and neonatal deaths, and interviewed mothers 6 weeks after delivery. The primary outcome was neonatal mortality over a 2 year follow up. Analyses were by intention to treat. This trial is registered with ISRCTN, number ISRCTN31567106. **Findings**: Between September, 2009, and December, 2012, we randomly assigned 30 clusters (estimated population 156 519) to intervention (15 clusters, estimated population n=82 702) or control (15 clusters, n=73 817). During the follow-up period (Jan 1, 2011, to Dec 31, 2012), we identified 3700 births in the intervention group and 3519 in the control group. One intervention cluster was lost to follow up. The neonatal mortality rate during this period was 30 per 1000 livebirths in the intervention group and 44 per 1000 livebirths in the control group (odds ratio [OR] 0.69, 95% CI 0·53–0·89). **Interpretation:** ASHAs can successfully reduce neonatal mortality through participatory meetings with women's groups. This is a scalable community-based approach to improving neonatal survival in rural, underserved areas of India.

SPECIAL ISSUE

Maternal & Child Nutrition

Supplement: Stop Stunting In South Asia. Improving Child Feeding, Women's Nutrition And Household Sanitation

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Issue edited by: Victor M. Aguayo, Purnima Menon

INTRODUCTION

Stop Stunting: Improving Child Feeding, Women's Nutrition And Household Sanitation In South Asia

Aguayo, V. M. and P. Menon. Maternal and Child Nutrition. 3–11.

http://onlinelibrary.wiley.com/doi/10.1111/mcn.12283/epdf; DOI: 10.1111/mcn.12283

REVIEW ARTICLES

Childhood Stunting: A Global Perspective

de Onis, M. and F. Branca. Maternal and Child Nutrition. 12–26

http://onlinelibrary.wiley.com/doi/10.1111/mcn.12231/epdf; DOI: 10.1111/mcn.12231

Reducing Stunting By Improving Maternal, Infant And Young Child Nutrition In Regions Such As South Asia: Evidence, Challenges And Opportunities

Dewey, K.G. Maternal and Child Nutrition. 27–38

Http://Onlinelibrary.wiley.com/Doi/10.1111/Mcn.12282/Epdf; Doi: 10.1111/Mcn.12282

Feeding Practices For Infants And Young Children During And After Common Illness. Evidence From South Asia

Paintal, K. and V.M. Aguayo. Maternal and Child Nutrition. 39–71.

http://onlinelibrary.wiley.com/doi/10.1111/mcn.12222/epdf; DOI: 10.1111/mcn.12222

Improving Women's Nutrition Imperative For Rapid Reduction Of Childhood Stunting In South Asia: Coupling Of Nutrition Specific Interventions With Nutrition Sensitive Measures Essential

Vir, S.C. Maternal and Child Nutrition. 72–90.

http://onlinelibrary.wiley.com/doi/10.1111/mcn.12255/epdf; DOI: 10.1111/mcn.12255

Can Water, Sanitation And Hygiene Help Eliminate Stunting? Current Evidence And Policy Implications

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Preventing Environmental Enteric Dysfunction Through Improved Water, Sanitation And Hygiene: An Opportunity For Stunting Reduction In Developing Countries

Mbuya, M.N.N. and J.H. Humphrey. Maternal and Child Nutrition. 106–120

http://onlinelibrary.wiley.com/doi/10.1111/mcn.12220/epdf; DOI: 10.1111/mcn.12220

ORIGINAL ARTICLES

Determinants Of Stunting And Poor Linear Growth In Children Under 2 Years Of Age In India: An In-Depth Analysis Of Maharashtra's Comprehensive Nutrition Survey

Aguayo, V.M., R. Nair, N. Badgaiyan and V. Krishna. Maternal and Child Nutrition. 121–140.

http://onlinelibrary.wiley.com/doi/10.1111/mcn.12259/epdf; DOI: 10.1111/mcn.12259

Achieving Behaviour Change At Scale: Alive & Thrive's Infant And Young Child Feeding Programme In Bangladesh

Sanghvi, T. R. Haque, S. Roy, K. Afsana, R. Seidel, S. Islam, A. Jimerson and J. Baker. Maternal and Child Nutrition. 141–154

http://onlinelibrary.wiley.com/doi/10.1111/mcn.12277/epdf; DOI: 10.1111/mcn.12277

Evidence-Based Evolution Of An Integrated Nutrition-Focused Agriculture Approach To Address The Underlying Determinants Of Stunting

Haselow, N.J., A. Stormer and A. Pries. Maternal and Child Nutrition. 155–168

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Estimating The Cost Of Delivering Direct Nutrition Interventions At Scale: National And Subnational Level Insights From India

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The Costs Of Stunting In South Asia And The Benefits Of Public Investments In Nutrition

Shekar, M., J.D. Eberwein and J. Kakietek. Maternal and Child Nutrition. 186–195

http://onlinelibrary.wiley.com/doi/10.1111/mcn.12281/epdf; DOI: 10.1111/mcn.12281

Understanding The Null-To-Small Association Between Increased Macroeconomic Growth And Reducing Child Undernutrition In India: Role Of Development Expenditures And Poverty Alleviation

Joe, W., R. Rajaram and S. V. Subramanian. Maternal and Child Nutrition. 196–209.

http://onlinelibrary.wiley.com/doi/10.1111/mcn.12256/epdf; DOI: 10.1111/mcn.12256

Drivers Of Nutritional Change In Four South Asian Countries: A Dynamic Observational Analysis

Headey, D. J. Hoddinott and S. Park. Maternal and Child Nutrition. 210–218.

http://onlinelibrary.wiley.com/doi/10.1111/mcn.12274/epdf; DOI: 10.1111/mcn.12274

Rethinking Policy Perspectives On Childhood Stunting: Time To Formulate A Structural And Multifactorial Strategy

Subramanian, S.V., I. Mejía-Guevara and A. Krishna. Maternal and Child Nutrition. 219–236.

http://onlinelibrary.wiley.com/doi/10.1111/mcn.12254/epdf; DOI: 10.1111/mcn.12254

COMMENTARIES

Stop Stunting: Situation And Way Forward To Improve Maternal, Child And Adolescent Nutrition In Afghanistan

Higgins-Steele, A., P. Mustaphi, S. Varkey, H. Ludin, N. Safi and Z. A. Bhutta. Maternal and Child Nutrition. 237–241.

http://onlinelibrary.wiley.com/doi/10.1111/mcn.12288/epdf; DOI: 10.1111/mcn.12288

Imperatives For Reducing Child Stunting In Bangladesh

Ahmed, T. M. Hossain, M. Mahfuz, N. Choudhury and S. Ahmed. Maternal and Child Nutrition. 242–245.
http://onlinelibrary.wiley.com/doi/10.1111/mcn.12284/epdf; DOI: 10.1111/mcn.12284

Reducing Stunting In Bhutan: An Achievable National Goal

Dzed, L. and K. Wangmo. Maternal and Child Nutrition. 246–248.
http://onlinelibrary.wiley.com/doi/10.1111/mcn.12287/epdf; DOI: 10.1111/mcn.12287

Reducing Stunting In India: What Investments Are Needed?

Avula, R., N. Raykar, P. Menon and R. Laxminarayan. Maternal and Child Nutrition, 249–252.
http://onlinelibrary.wiley.com/doi/10.1111/mcn.12291/epdf; DOI: 10.1111/mcn.12291

Stop Stunting: Pakistan Perspective On How This Could Be Realized

Das, J.K., A. B. K. Achakzai and Z. A. Bhutta. Maternal and Child Nutrition. 253–256
http://onlinelibrary.wiley.com/doi/10.1111/mcn.12285/epdf; DOI: 10.1111/mcn.12285

Stunting In Nepal: Looking Back, Looking Ahead

Devkota, M.D., R.K. Adhikari and S. R. Upreti. Maternal and Child Nutrition. 257–259
http://onlinelibrary.wiley.com/doi/10.1111/mcn.12286/epdf; DOI: 10.1111/mcn.12286

NON-PEER REVIEWED

The First 1000 Days Researchers' Forum Report

Arabena, K., S. Panozzo, and R. Ritte. 2015. *The First 1000 Days Researchers' Forum Report*. Melbourne: Onemda VicHealth Group.

http://www.onemda.unimelb.edu.au/sites/default/files/2%20%20The%20First%201000%20Days%20Researchers'%20Forum%20Report.pdf

This report details the program, proceedings and outcomes of the First 1000 Days Researchers' Forum, the second of four symposiums to be held at, and led by, the University of Melbourne. The aim of the Forum was to enable researchers and implementers of projects operating across different national sites to develop both an understanding of what data is currently being collected and why it is being collected. Further to this, the Forum provided the opportunity to discuss current datasets and birth cohort studies and the development of core data that can be used in comparisons across jurisdictions and regions in Australia.

Can Iron-Fortified Salt Control Anemia? Evidence from Two Experiments in Rural Bihar

Banerjee, A., S. Barnhardt and E. Duflo. 2016.

https://www.povertyactionlab.org/sites/default/files/publications/417%20Iron%20Fortified%20Salt%20Bihar%20Mar2016.pdf

Iron deficiency anemia is frequent among the poor worldwide. While it can be prevented with the appropriate supplement or food fortification, these programs often do not consistently reach the poorest. This paper reports on the impact of a potential strategy to address iron deficiency anemia in rural areas: double fortified salt (DFS) — salt fortified with iron and iodine. We conducted a large-scale experiment in rural Bihar. In 200 villages, randomly selected out of 400, DFS was introduced at a price that was half the regular retail price for DFS. After two years, we find no evidence that either selling DFS in villages or providing it for free directly to households has an economically meaningful or statistically significant impact on hemoglobin, anemia, physical health, cognition or mental health. For the sales experiment, we can reject at the 95% level a reduction of 2.5 percentage points in the fraction anemic in the entire sample, and 3.7 percentage points among those who were previously anemic. Using an IV strategy, we find a statistically significant, though relatively small, increase in hemoglobin and reduction in the fraction anemic for adolescents, a subgroup that has responded well to supplements and fortification in earlier studies. These disappointing results are explained both by relatively low take up and by low impact of DFS even when consumed more regularly for the majority of the population.

Guideline: Daily Iron Supplementation in Adult Women and Adolescent Girls

WHO (World Health Organization). 2016.

http://www.who.int/nutrition/publications/micronutrients/guidelines/daily_iron_supp_womenandgirls.pdf?ua=1

Guideline: Daily Iron Supplementation in Infants and Children

WHO (World Health Organization). 2016.

http://apps.who.int/iris/bitstream/10665/204712/1/9789241549523_eng.pdf?ua=1

Improving Nutrition Outcomes with Better Water, Sanitation and Hygiene: Practical Solutions for Policies and Programmes

WHO (World Health Organization). 2015.

http://apps.who.int/iris/bitstream/10665/193991/1/9789241565103_eng.pdf?ua=1

This publication, jointly prepared by WHO, the United Nations Children's Fund (UNICEF) and the United States Agency for International Development (USAID), summarizes the current evidence on the benefits of WASH for improving nutrition outcomes and describes how WASH interventions can be integrated into nutrition programmes. It provides practical suggestions, targeted at nutrition programme managers and implementers, on both "what" WASH interventions should be included in nutrition programmes and "how" to include them. It also seeks to help the WASH community to better understand their role, both as providers of technical expertise in WASH interventions and in prioritizing longer-term improvements to WASH infrastructure in areas where undernutrition is a concern.

Health Effects of Commercially-Available Complementary Foods: A Systematic Review

Tzioumis, E., M. Kay, M. Wright, and L. Adair. 2016.

http://www.who.int/nutrition/topics/CF_health_effects_commercially_systematicreview.pdf?ua=1

With the broad goal of informing WHO's consideration of inappropriate promotion of foods for infants and young children, this systematic review aimed to locate and synthesize results of scientific literature on the health effects of commercially-available complementary foods (CACF) for infants and young children under 2 years of age. The review addresses 5 specific research questions: Q1. To what degree do commercially-available products replace, rather than complement, the intake of breast milk in children 6-23 months of age? Q2. To what degree do commercially-available products consumed by children 6-23 months of age increase the risk of childhood obesity or chronic disease risk factors? Q3. Are commercially-available products nutritionally inferior or superior to home-prepared and/or local foods? Do they contain higher or lower amounts of trans fat, saturated fat, free sugars, or salt? Do they contain higher or lower amounts of essential micronutrients? Do commercially available products provide nutrients that are generally lacking in the diets of young children? Q4. Are the portion sizes of commercially-available products greater than would be appropriate based on age? Q5. Do commercially-available products reduce the risk of stunting, anemia, or micronutrient deficiencies? We searched the following data bases: PubMed, CINAHL plus, EMBASE, Agricola, CAS (Clinicaltrials.gov), Cochrane, Global Health, WHO Global Library, Business Source Premier, AgEcon, Mintel Oxygen, as well as relevant conference proceedings, and sources of grey literature and reviewed reference lists from highly relevant reviews and articles. Titles and abstracts were extracted and reviewed for relevance. Inter-rater reliability was assessed using Kappa statistics. Outcomes included breast-feeding duration or frequency or breast milk intake for Q1; anthropometric indicators of weight status or biomarkers of chronic disease risk for Q2; nutritional composition of foods or infant intake of nutrients

for Q3; portion sizes of complementary foods (CFs) for Q4, and stunting, anemia, and micronutrient deficiencies for Q5. The Population-Intervention-Comparison-Outcome (PICO) for each question was narrowly defined to compare CACFs to home-prepared or locally-available CFs. CACFs were defined as commercial products developed and marketed for infant consumption, or products developed for studies to closely mimic CACFs. We also included investigator-prepared local foods that mimicked home-prepared foods. For feeding trials, these were necessary to allow for blinding, quality control and safety. We found very few studies that met the PICO criteria, most often because they did not report on direct comparisons of CACFs with similar home-prepared foods. For all of the research questions, the evidence was judged to be of low or very low quality. For Q1, we found limited evidence that CACFs did not displace breast milk intake, but their consumption was associated with shorter duration of breastfeeding. For Q2, limited evidence suggests that high protein intake and intake of milk-cereal drinks are associated with higher child BMI. For Q3, results were highly heterogeneous given the wide variety of CACFs and home-prepared foods that were assessed: some CACFs were nutritionally superior to home-prepared or local foods, while the converse was true for others. We found no studies that addressed Q4. For Q5, we found no evidence that CACFs improved infant nutritional status. More evidence is needed to identify the benefits and potential harms of CACFs. Additional evidence might be brought to bear on the research questions by comparing CACFs and home-prepared foods to reference data rather than to each other.

Stories of Change in Nutrition: A Tool Pool

Gillespie, S., and M. Van Den Bold. *Stories of change in nutrition: A tool pool*. IFPRI Discussion Paper 1494. Washington: International Food Policy Research Institute.

http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/130077

This paper—which draws on inputs to, and discussions at, a methods development workshop—highlights the various concepts, methods, and tools that SoC researchers are considering to measure nutrition-relevant change in their respective countries. The focus is on nutrition-relevant policy and practice. These tools apply to 11 subthemes, which are to some extent sequential within policy/programming cycles: (1) assessing the nutrition problem, (2) stakeholder and institutional analysis/mapping, (3) understanding enabling environments for nutrition, (4) agenda setting and political commitment for nutrition, (5) policy formulation and policy processes, (6) multisectoral coordination, (7) implementation and vertical coherence, (8) scaling up, (9) assessing capacity, (10) assessing finance, and (11) monitoring, evaluation, and accountability. Examining these various methods and tools together allows for a holistic consideration of the processes that—while challenging to document and measure—play a key role in improving nutrition-relevant policy and practice, which, in turn, drives national achievement in reducing malnutrition.

Safety Nets for Food and Nutritional Security in India

Narayanan, S., and N. Gerber. 2016. *Safety Nets for Food and Nutritional Security in India*. Food Secure Working Paper 37.

http://www3.lei.wur.nl/FoodSecurePublications/WP37_safety_net.pdf

This paper brings together existing literature on the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and the Public Distribution System (PDS) in India, offering a narrative review of the evidence

on impacts on food security, health and nutrition of beneficiaries. Both programs operate on a large scale and have the capacity to impact the factors leading to undernutrition. It is evident that despite the deficiencies in implementation, both the MGNREGA and the PDS are inclusive and reach the poor and the marginalized who are likely to also experience greater undernutrition and poor health. Data challenges have however prevented researchers from conducting studies that assess the ultimate impact of these two large-scale programs on health and nutrition. The evidence that exists suggests largely positive impacts indicating a clear potential to make these programs more nutrition sensitive not just by incorporating elements that would explicitly address nutritional concerns but also by directing specific attention to innovations that strengthen critical complementarities and synergies that exist between the two programs.

Public-Private Partnerships and The Reduction of Undernutrition in Developing Countries

Hoddinott, J., S. Gillespie and S. Yosef. 2015. *Public-Private Partnerships and the Reduction of Undernutrition in Developing Countries*. IFPRI Discussion Paper 1487. Washington: International Food Policy Research Institute.

http://ebrary.ifpri.org/cdm/ref/collection/p15738coll2/id/129857

This paper brings structure to the discussion of private-sector engagement in nutrition by clarifying different models of engagement, reviews the evidence base on public-private partnerships (PPPs) for the reduction of undernutrition, and outlines some potential ways forward. We find that there are few independent, rigorous assessments of the impact of commercial-sector engagement in nutrition. Considerable caution is thus warranted when assessing PPPs in nutrition. Looking forward, future progress requires that the private sector recognize that past and current actions by some firms have created an environment of mistrust. It requires that the public sector accept that sustainable PPPs are those which permit private firms to generate profits. There is significant scope for the private sector to drive innovations that could reduce undernutrition, and, more speculatively, there may be scope for the private sector to act as a financier. Underpinning all these efforts must lie open discussions of the objectives, roles, and expectations of all parties along with potential conflicts of interest; an open space or platform where issues and challenges can be discussed and addressed; incentives for the private sector to take on pro-nutrition roles; strong, transparent, and well-enforced monitoring processes; and serious, independent evaluations of these activities.

Multisectoral Approaches to Improving Nutrition: Water, Sanitation, and Hygiene

Chase, C., and F. Ngure. 2016. *Multisectoral Approaches to Improving Nutrition: Water, Sanitation, and Hygiene*. Technical Paper 102935.

http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2016/01/27/090224b084104cce/1_0/Rendered/PDF/Multisectoral00itation00and0hygiene.pdf

Learning from the Past: Framing of Undernutrition in India since Independence and Its Links to Agriculture

Barnett, I., and S. Srivastava. 2016. *Learning from the Past: Framing of Undernutrition in India since Independence and Its Links to Agriculture*. LANSA Working Paper 5.

http://lansasouthasia.org/sites/default/files/Learning_from_Past_Framing_of_%20Undernutrition_in_India.pdf

Understanding policy debates from the past can help to explain and address the challenges of today. Agriculture can play an important role in the reduction of undernutrition in India. However, the nutrition-enhancing potential of agriculture remains underused. In order to understand the roots for the weak links between agriculture and nutrition in contemporary India, this paper follows the evolution of the policy debates on nutrition and agriculture from India's Independence to the present. The frame analysis reveals several substantial shifts in the framing. Undernutrition has been framed as a health issue (1950-'65), a problem of food shortage (1965-'75), a multidimensional poverty challenge (1975-'97) and a nutrition and food security issue (after 1997). The framing of agriculture remained more or less unchanged until the early 2000s, with agriculture being portrayed as a key driver of economic growth and the foundation of food security. During the last 10-15 years the awareness of the potential of agriculture for a balanced, diversified and nutritious diet gradually increased in the policy debates; however, deeply-rooted beliefs and perceptions about agriculture remain and may hinder the development of more nutrition-sensitive agricultural programmes and policies.

UPCOMING EVENTS

Micronutrient Forum Global Conference 2016: Positioning Women's Nutrition at the Centre of Sustainable Development

Where: Cancun, Mexico

When: October 24–28, 2016

For more information: http://micronutrientforum.org/conferences/cancun/

The Micronutrient Global Conference will take place in Cancun, Mexico 24-28 October 2016. Registration and an additional full day of Symposia will proceed the week-long program on Sunday October 23rd. While maintaining the broad interest in all aspects of micronutrients, the theme for the MN Forum will focus on women's nutrition. Women are both a prime focus of nutrition interventions and key partners in the delivery of programs – for children, families and communities. The health and well-being of women and girls are, consequently, critical to achieving several of the Sustainable Development Goals. The time has come to better understand the burden, the context and the most innovative and effective solutions to improve policy, and the design and delivery of programs, for the increased equity, survival, health and well-being of women and girls. There is much to learn and share by bridging scientific discovery and program delivery across multiple sectors.

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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.

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This publication has been prepared by POSHAN with research assistance from Abhilasha Vaid, Research Communications Specialist, and has not been peer reviewed. Any opinions stated herein are those of the author(s) and do not necessarily reflect the policies of the International Food Policy Research Institute. Please contact Dr. Rasmi Avula at IFPRI with any questions: r.avula@cgiar.org.