Interventions to Address Maternal and Childhood Undernutrition: Current Evidence

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We undertook a comprehensive review of potential interventions to address undernutrition and micronutrient deficiencies in women and children. We aimed to review the evidence of the potential nutritional interventions and estimate their effect on nutrition-related outcomes of women and children building upon the exercise undertaken in 2006–2007 (Lancet Nutrition Series 2008).

A range of interventions affect outcomes among mothers and newborns. Among the maternal interventions, daily iron supplementation results in a 69% reduction in incidence of anemia, 20% reduction in incidence of low birthweight (LBW) and an improved mean birthweight. There was no effect on incidence of preterm birth or that of small for gestational age (SGA) birth. Evidence also indicates that there is no difference between intermittent iron/iron folic acid supplementation and daily supplementation. Multiple micronutrient (MMN) supplementation during pregnancy has been shown to significantly decrease the number of LBW infants by 14% and SGA by 13%, whereas the impact on preterm births, miscarriage and preeclampsia was nonsignificant. In comparison with standard iron and folate use, MMN supplementation resulted in a significant 11% decrease in the number of LBW and 13% decrease in SGA babies and comparable effects on rates of anemia and iron deficiency anemia. Among the pregnancy care interventions, balanced protein energy supplementation reduces the incidence of SGA by 32% and risk of stillbirths by 45%. Among the maternal malaria prevention interventions, antimalarials when given to pregnant women increase the mean birthweight significantly and were associated with a 43% reduction in LBW and reduced severe antenatal anemia by 38%. Use of insecticide-treated bed nets in pregnancy reduces LBW by 23% and fetal loss in the first to fourth pregnancy by 33%. Smoking cessation interventions reduced LBW by 17% and preterm birth by 14% accompanied by increase in birthweight.
Among the neonatal and child interventions, educational/counseling interventions increased exclusive breastfeeding by 43% at day 1, by 30% until 1 month, and by 90% from 1–6 months. Significant reductions in rates of no breastfeeding were also observed: 32% at day 1, 30% 0–1 month, and 18% for 1–6 months. Vitamin A supplementation (VAS) reduces all-cause mortality by 24% and results in a 14% reduction in the risk of infant mortality at 6 months, while it has a nonsignificant effect at 12 months of age. VAS reduces diarrhea-related mortality by 28% in children 6–59 months of age and also reduces the incidence of diarrhea and measles in this age group. Intermittent iron supplementation in children reduces the risk of anemia by 49% and iron deficiency by 76% and significantly improves hemoglobin and ferritin concentration. The impact on height-for-age and weight-for-age z scores was nonsignificant. Preventive zinc supplementation in populations at risk of zinc deficiency reduces the incidence of premature delivery, decreases morbidity from childhood diarrhea and acute lower respiratory infections, and increases linear growth and weight gain among infants and young children. Therapeutic zinc supplementation as an adjunct in the treatment of diarrhea has been shown to reduce the duration of acute diarrhea by 0.5 days and that of persistent diarrhea by 0.7 days.

Among the supportive interventions, hand washing with soap significantly reduces diarrhea morbidity by 47%, though it depends on access to water. The effect of water treatment on diarrhea morbidity also appears similarly large with a 42% reduction. Recent research has established linkages of preconception interventions with improved maternal, perinatal and neonatal health outcomes, and it has been suggested that several proven interventions recommended during pregnancy may be even more effective if implemented before conception. Targeted preconception care strategies were associated with significant improvement in antenatal care seeking by 39%; breastfeeding initiation and exclusive breastfeeding rates also improved significantly by 45 and 13%, respectively.

These proven interventions, if scaled up, have the potential to reduce the global burden of undernutrition substantially. The key is implementation and effective monitoring and evaluation.