



Connecting Water and Food Security and Children's Development:

A Review of the Global Extant Literature

Jentry Barrett, Alexandra Martin, Amy Encinger & Helen Raikes, Child, Youth and Family Studies

University of Nebraska—Lincoln

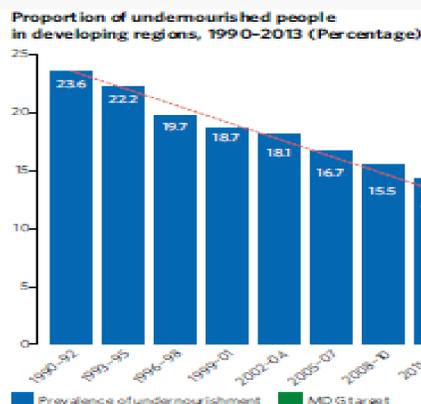


Introduction

Children who experience chronic malnutrition during the critical period of the first 1,000 days of life face stunting and compromised brain development (Bartelt et al., 2013; Dangour et al., 2013; Hammer & Spears, 2013; Galiani et al., 2005; UNICEF, 2013). This is particularly concerning as 250 million children are not developing to their full potential due to poverty, poor nutrition and environmental risk factors.

Food Security

- A target of one Millennium Development Goal (MDG) to eradicate Extreme Poverty and Hunger was to halve the proportion of people who suffer from hunger by 2015. This goal was not met but it is within reach. The proportion of undernourished has decreased from 24% in 1992 to 14% in 2012; however more than one million children under age five are still undernourished and underweight as a result of chronic or acute hunger (MDG Report 2014, United Nations, 2013).
- Household food security has been found to be important to early language acquisition in rural Bangladesh. Children with higher household food security had significantly higher mean scores for language comprehension and expression than those with lower household food security (Saha, et al., 2009).
- Food security is essential for improved infant feeding practices which are important for optimal child development (Saha et al., 2008; Cook & Frank, 2008).



Nutrition

- Malnutrition during the first 1,000 days of a child's life may cause irreversible developmental damage, resulting in compromised brain development, stunting, and impaired immune system functioning (Save the Children, 2012).
- Optimal breastfeeding practice is a cost effective child health intervention that can contribute to decreasing child morbidity and mortality rates in developing countries (Roberts, Carnahan, & Gakidou, 2013; UNICEF, 2013).
- Clean safe complementary feeding given in addition to breastfeeding has been found to significantly reduce stunting during the first two years of life. Stunting rates at 12 months could be cut by 20% if all children in the developing world received adequate complementary feeding (Ramakrishnan et al., 2009; Bhutta et al., 2008)



- Evidence from Bangladesh, Jamaica, Colombia and Pakistan verifies that providing guidance and support to families results in behavior change supporting appropriate, sensitive and responsive (stimulating) feeding practices; while improving child health, nutrition, and development outcomes (Brown, 1992; Aboud, 2007, 2008, 2009; Walker, 2005; Super, Herrera & Mora, 1990; Qazi, 1987).
- Prevention and treatment of micronutrient deficiencies of vitamin A, zinc, iron, iodine, and folic acid through supplements, home fortification of complementary and staple foods aid in child survival, physical and mental development (UNICEF, 2013; Shaheen et al., 2014).
- Aboud (2011) and Affleck (2012) report that integrating responsive (with stimulation) childcare with feeding interventions resulted in improved language development, responsive talking, mouthful eating, hand washing and more weight gains.

Sanitation

- The Millennium Development Goal to Ensure Environmental Sustainability also sought to halve the proportion of the population without access to basic sanitation. It seems the world fell short of the target of 75% sanitation coverage in 2015.
- Over 25% of the world's population gained access to improved sanitation since 1990, but a billion people still resort to open defecation (MGD Report, 2014).

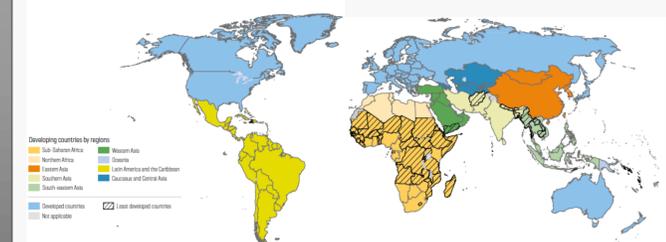


- Open defecation is a sanitation issue affecting many worldwide. It spreads germs that cause disease and stunt children's growth. Most prevalent in Southern Asia, Oceania, and Sub-Saharan Africa, open defecation is of particular importance as child height is an important indicator of overall well-being and is a reflection of early-life health, nutrition, and disease (Spears, 2012; Spears, 2013; MGD Report, 2014).
- Districts in Nepal with poor sanitation (and higher rates of open defecation) tend to have higher than average rates of diarrhea, and these are more often than not the same districts recording slower improvements in nutrition outcomes (wasting and/or stunting in children under 5) (Webb et al., 2012).
- Multiple studies have demonstrated that correct and sustained hand washing with soap reduces diarrhea and poor health outcomes for children (Dangour et al., 2013; Aiello et al., 2008; Stanton & Clemens, 1987; Han & Hlaing, 1989; Shahid, et al. 1996).

Water Quality

- A target of the Millennium Development Goal to Ensure Environmental Sustainability was to halve the proportion of people without access to safe drinking water by 2015. This goal was met in 2010; more than 2.3 billion people have gained access to improved drinking sources –water that is piped to users (MDG Report, 2014). But as of 2012, 748 million people relied on unimproved drinking sources--64% in Sub-Saharan Africa have access (WHO/UNICEF, 2014).
- Long-term exposure to arsenic contamination may result in child death, cognitive impairment, cardiovascular diseases, and cancer (Luby, 2008).
- Lack of clean water leads to diarrhea and pneumonia—two main killers of children under five in developing countries. Both of these lead to malnutrition. Repeated incidences of diarrhea among children under age two may lead to impaired cognitive development (WHO, 2013; Luby, 2008). Lack of clean water has also been linked to poor gut absorption in young children even absent diarrhea (Ngure, et al. 2014).

Improved Drinking-Water and Sanitation Source Status 2014



Conclusion

Pathways to optimal child development include access to clean water, hygienic sanitation facilities and practices, food security, and improved nutrition. The linkages among these pathways are clear and when even one is missing children are at risk for impaired foundational brain and early childhood development. Increasing access and ensuring security to these basic necessities will provide children with the opportunity to not only survive, but also thrive. Great Plains studies on nutrition/water quality and child development need to be conducted.