

Supplementary Table 2: Summary of key features of articles included in the full-text review

Reference	Data Source or Study Location	Design	Topic	Summary
WHO Working Group on the Growth Reference Protocol (2000)	The WHO Multinational Study of Breastfeeding and Lactational Amenorrhea	Longitudinal Study	Breast Feeding Practices	Longitudinal growth information from breastfeeding cohorts in 7 countries, including Guatemala. Data show similar growth profiles, including linear growth, in all countries for the cohorts, which were all educated and reasonably well off with no overt risks of impaired growth.
Ruel et al (2002)	DHS	Cross-Sectional Study	Breast Feeding Practices, Complementary Feeding Practices	Created composite age-specific feeding index using DHS data from 5 Latin American countries. This index showed a strong and significant association between feeding practices and child height-for-age z-scores, it was also conditioned by other characteristics, such as household socioeconomic status, maternal ethnicity and maternal schooling.
Li et al (2003)	INCAP Study	Cluster Randomized Trial, Single Level Intervention	Educational Attainment, Supplementary Feeding	Analysis of INCAP Study that provided supplementary feeding, concluded that supplementary feeding during early childhood improved adult educational attainment (knowledge, numeracy, and several reading tests), but only among those who completed primary school.
Li et al (2003)	INCAP Study	Longitudinal Study	Intrauterine environment, NCD Risk Factors, Socio-demographic Correlates	Analysis of follow-up data on adults who had participated in the INCAP Study, showing that prenatal growth (birth weight, length at 15 days) and postnatal growth (length at 2 years) were positively associated with adult weight, height, and fat free mass.
Kuklina et al (2004)	INCAP Study	Longitudinal Study	Complementary Feeding, Early Child Development	Data collected from 1991 - 1999 from children whose mother received supplementation as part of the INCAP Study was analyzed with multivariate regression models, concluding that better diet quality and better growth was associated with better development periods (attainment of gross motor milestones).
Li et al (2004)	INCAP Study	Longitudinal Study	Educational Attainment	Study of the effect of child growth (measured at birth, 2 years, and adulthood) on educational attainment of women who participated in the INCAP Study. Early postnatal growth, size at 2 years and schooling were positively associated with EA.
Conlisk et al (2004)	INCAP Study	Cluster Randomized Trial, Single Level Intervention	NCD Risk Factors, Supplementary Feeding	Study of the effect of supplementation on fasting plasma glucose levels in subjects that participated in the INCAP Study. Reported reduced fasting glucose among men who had participated in the prior childhood supplementation trial on birth length. Among supplemented women, the effect was only seen among those born thin.

Stein et al (2004)	INCAP Study	Longitudinal Study	Supplementary Feeding, Intergenerational Effects	This study assessed the growth up to 36 months of both mothers and their children for mothers who had participated in the INCAP Study. They found a positive correlation between length of mother and child at the same age, children grew faster than their mothers, and children of mothers who had been in the supplementation group grew faster.
Kuklina et al (2006)	INCAP Study	Longitudinal Study	Complementary Feeding, Early Child Development	Data collected from 1991 - 1999 from children whose mother received supplementation as part of the INCAP Study was analyzed, finding the birth height-for-age Z-score score a significant predictor of motor development and neurodevelopmental delay even after adjustment for postnatal growth.
Sereebutra et al (2006)	Urban Community Setting	Cross-Sectional Study	Infection-Nutrition Interaction, Socio-demographic Correlates	Cross-sectional study assessing children (aged 30-80 months) in a suburban community close to Guatemala City. Illiteracy of primary caretaker and household size with more than 4 children were important predictors of stunting. <i>Giardia lamblia</i> infection was not correlated with stunting.
Stein et al (2006)	INCAP Study	Cluster Randomized Trial, Single Level Intervention	NCD Risk Factors, Obesity	Follow-up of the INCAP Study cohort, divided into urban and rural groups, to measure incidence of metabolic syndrome (body mass index, fasting glucose, blood pressures, low density lipoprotein cholesterol concentration and blood lipid concentration). Concluded that nutritional supplementation interventions are unlikely to increase the risk for cardiovascular disease and may be beneficial in some cases.
Schooley et al (2007)	Rural Community Setting	Qualitative study	Behavior Change, Implementation Science	A literature review on the use of the Positive Deviance/Hearth methodology to instill social and behavioral change in health areas, including child malnutrition. Discusses qualitative data from Project Concern International's use of Positive Deviance methods with Maya families with malnourished children in rural Guatemala.
Stein et al (2007)	INCAP Study	Longitudinal Study	NCD Risk Factors, Obesity	Prospective study of the association between prenatal and postnatal growth with adult BMI, studying adults that participated as children in the INCAP Study. An increase in BMI between ages 3-7 had a stronger positive association with adult percentage of body fat and abdominal circumference, and an increase in length prior to 3 years with fat-free mass.
Van de Poel et al (2007)	DHS	Cross-Sectional Study	Socio-demographic Correlates	The study documents the magnitude of rural-urban disparities in child nutritional status and under 5 mortality across 47 developing countries. Stunting is more common in rural areas, but this disparity largely disappears after adjusting for socioeconomic status and other demographic correlates.
Hoddinott et al (2008)	INCAP Study	Cluster Randomized	Economic Productivity	An economic study of adults (aged 25-42 years) between 2002 and 2004 who had been

		Trial, Single Level Intervention		enrolled as children in the INCAP study during 1969–77; concluded that supplementary feeding in men before 3 years of age was associated with higher hourly wages (a 46% increase in average wages).
Victora et al (2008)	INCAP Study	Metanalysis	Educational Attainment, Economic Productivity, NCD Risk Factors, Obesity	Metanalysis of cohort data from Brazil, Guatemala (INCAP study), India, the Philippines, and South Africa; presenting a strong association between maternal and child undernutrition (including stunting) with educational attainment and economic productivity and for early stunting with final attained height. Evidence for associations between stunting and adult BMI, blood pressure, and serum glucose were less strong.
Stein et al (2008)	INCAP Study	Cluster Randomized Trial, Single Level Intervention	Educational Attainment, Supplementary Feeding	Authors administered tests of reading comprehension and abstract reasoning to adults who had participated in the INCAP Study; concluding that adults who had received supplementary feeding as children performed better.
Stein et al (2008)	Urban Community Setting	Cross-Sectional Study	Obesity, Secular Trend	Analysis of a series of cross-sectional surveys (1968-2007) on child growth administered in the communities where the INCAP study was conducted. Documented significant improvements (73% to 21%) in the secular trend for child stunting and stability in children's BMI throughout the observed time period.
Bégin et al (2008)	Urban Community Setting	Individually Randomized Control Study, Single Level Intervention	Micronutrient Supplementation	Reports results from an individually randomized trial evaluating micronutrient and dietary supplements containing bovine serum concentrate (immunoglobulins) versus multiple micronutrient powder. The multiple micronutrient reduced rates of anemia, but no other effects on growth from any of the supplements were seen.
Bennett (2009)	Rural Community Setting	Dissertation	Community Perceptions, Implementation Science	Uses the theoretical framework of a “syndemic” to examine stunting in a rural Maya community. Finds that improvements in classic intervention targets, like maternal education, do not correlate well with improvements in stunting. Highlights the need to also address geographic isolation, environmental and WASH infrastructure, and inadequacy of subsistence agriculture to provide food security.
Campos et al (2009)	Urban Community Setting	Cross-Sectional Study	Double Burden of Malnutrition	Cross-sectional assessment of a sample of school-age children in Guatemala, assessing the double burden of malnutrition (undernutrition/obesity). The prevalence of stunting was 0.8% and more than 10% for obesity.
Maluccio et al (2009)	INCAP Study	Cluster Randomized Trial, Single	Educational Attainment,	Authors used data from the INCAP Study to examine the effect of an early childhood nutritional intervention on adult educational

		Level Intervention	Supplementary Feeding	outcomes, showing positive effects of supplementation from 0 to 3 y on completed grades (for women) and higher scores on reading comprehension and nonverbal cognitive ability (for women and men).
Behrman et al (2009)	INCAP Study	Cluster Randomized Trial, Single Level Intervention	Intergenerational Effects, Supplementary Feeding	Authors examined the growth characteristics of children born to mothers who participated in the INCAP study as children. The children of women from intervention communities had improved growth outcomes (including height-for-age) compared to control.
Martorell et al (2010)	INCAP Study	Longitudinal Study	Educational Attainment	Authors used cohort data from Brazil, Guatemala (INCAP study), India, Philippines, and South Africa to re-analyze the impact of stunting on educational attainment and additionally explore the impact of birthweight and postnatal weight gain. In adjusted models, stunting at 2 years was associated with a 0.9-year reduction in educational attainment and increased risk of failing grades.
Mazariegos et al (2010)	Rural Community Setting	Individually Randomized Control Study, Single Level Intervention	Agricultural Practices, Micronutrient Supplementation	An individually-randomized controlled trial evaluating the impact on stunting of either daily 5-mg zinc supplementation or low-phytate corn in 6-12-month-old infants. No effect was seen. Consumption of corn was low in this age group.
Stein et al (2010)	INCAP Study	Longitudinal Study	Catch-up growth	Authors used cohort data from Brazil, Guatemala (INCAP study), India, the Philippines, and South Africa; showing that growth failure prior to 12 months was strongly associated with final adult stature, with variable evidence for catch-up growth later in childhood.
Lee et al (2010)	National Living Standards Survey	Cross-Sectional Study	Double Burden of Malnutrition, Socio-demographic Correlates	Authors used nationally representative data to describe the double burden of malnutrition (child stunting and maternal overweight); which was found to be more evident in indigenous households with low socio-economic status and in mothers of low statures.
Ramirez-Zea et al (2010)	INCAP Study	Review	Economic Productivity, Educational Attainment, NCD Risk Factors, Supplementary Feeding	This review article summarizes key findings from the INCAP Study, including the impacts of supplementary feeding on economic productivity and educational attainment and growth.
Carletto et al (2010)	Rural Community Setting	Cross-Sectional Study	Migration	Authors used a representative household survey administered in a high-migration region of Guatemala to show that migration is associated with improvements in the height-for-age and stunting status of children who remain.
Kac et al (2010)	World Health Organization	Review	Secular Trend	Summarizing World Health Organization data on malnutrition in Latin America. Highlights Guatemala, Nicaragua, Haiti, and Honduras as

				countries in the region with the worst child growth indicators, including stunting
Graff et al (2010)	INCAP Study	Longitudinal Study	Women's Health	Authors used data from the INCAP Study to assess the impact of childhood growth on subsequent fertility outcomes in adult women. Height at 2 years was positively associated with an age delay of the first pregnancy and fewer total children.
Chary et al (2011)	Rural Community Setting	Cross-Sectional Study	Behavior Change, Community Perceptions, Gender differences	Authors discussed 3 case studies of Mayan families in rural Guatemala, in which they explore the importance of male behaviors towards the growth of children with stunting.
Krebs et al (2011)	Global Network for Women's and Children's Health Research	Cross-Sectional Study	Complementary Feeding Practices	Cross-sectional complementary feeding survey of 5- to 9-month old infants and 12- to 24-month-old toddlers conducted in Guatemala, Pakistan, Democratic Republic of the Congo, and Zambia. Stunting prevalence was high in all sites, and meat consumption was associated with a reduced risk for stunting.
Krebs et al (2011)	Global Network for Women's and Children's Health Research	Study Protocol	Complementary Feeding Practices	Study protocol for a cluster randomized trial to be conducted in Guatemala, Pakistan, Democratic Republic of the Congo, and Zambia to evaluate the impact on stunting of daily meat consumption (intervention) versus fortified corn-soy blend (control).
Dewey et al (2011)	INCAP Study	Review	Economic Productivity, Educational Attainment, Intergenerational Effects, NCD Risk Factors	Review of the impact of stunting on health, educational and economic performance later in life. Includes a review of data from the INCAP study discussing consequences of stunting over a lifespan.
Fort et al (2012)	Rural Community Setting	Dissertation	Implementation Science	Examines the implementation of an innovative primary care model focused on inclusive and culturally appropriate care in a rural indigenous health district. Finds that the model improved equity in access to care, health care utilization and vaccination. Both stunting and wasting remained very high, however, the authors emphasized that multi-sectorial social programs and not just health system strengthening are needed.
Poder et al (2011)	National Living Standards Survey	Cross-Sectional Study	WASH	This study uses nationally representative data to show an important substitution effect for the poorest households receiving access to new WASH technology, where access to technology could paradoxically lead to worsening stunting by diminishing household spending on health.
Krebs et al (2012)	Global Network for Women's and Children's Health Research	Cluster Randomized Trial, Single Level Intervention	Complementary Feeding	Cluster randomized efficacy trial conducted in Guatemala, Pakistan, Democratic Republic of the Congo, and Zambia to evaluate the impact on stunting of daily meat consumption (intervention) versus fortified corn-soy blend (control), enrolling infants and toddlers from 6 to 18 months. Stunting increased over the

				course of the trial in both arms, and there was no difference in growth in the two arms. Authors mention that the negative results highlight the need for multi-level interventions.
Lee et al (2012)	National Living Standards Survey	Cross-Sectional Study	Double Burden of Malnutrition, Socio-demographic Correlates	Authors studied the relationship between a child with stunting, an overweight mother and their socioeconomic status. The results showed that the middle consumption quintile and indigenous mothers are more likely to present with a double burden of under- and over-nutrition.
Pelletier et al (2012)	Public Policy Documents	Qualitative Study	Implementation Science, Policy	Review of the implementation of nutrition policy initiatives in Bangladesh, Bolivia, Guatemala, Peru and Vietnam. Guatemala period review from 2006-2009. Conclusions include that high-level political attention to stunting is not sufficient to achieve change, it requires sustained actions from mid-level actors from ministries, policy entrepreneurs as well as investments in frontline organizational capacity.
Martorell et al (2012)	INCAP Study	Review	Intergenerational Effects	Review of the intergenerational effects of stunting, including a mention of data from the INCAP study. Authors discuss the possible mechanisms of intergenerational effects on linear growth.
Hambidge et al (2012)	Rural Community Setting	Longitudinal Study	Intergenerational Effects	Secondary analysis of data collected during the course of an individually randomized trial. Strong associations demonstrated between maternal short stature and infant stunting status and height velocities.
Martorell et al (2012)	DHS	Cross-Sectional Study	Socio-demographic Correlates	One of the first studies to use DHS datasets to examine the impact of the new WHO growth standards on prevalence estimates for stunting and wasting. Demonstrates high levels of stunting in both Guatemala and India. Self-evident demographic correlates of stunting and wasting are explored.
Sweeney et al (2013)	National Living Standards Survey	Cross-Sectional Study	Socio-demographic Correlates	Authors used nationally representative data to explore the demographic correlates of stunting using ordinal versus quantile regression. Quantile regression provides additional detail on homogeneity (indigenous children are more universally stunted than nonindigenous children) not provided by ordinal regression.
Adair et al (2013)	INCAP Study	Longitudinal Study	NCD Risk Factors	Authors examined cohort data from Brazil, Guatemala (INCAP study), India, the Philippines, and South Africa. Faster linear growth reduced risk of adult short stature and increased educational attainment, but also increased the likelihood of adult overweight and elevated blood pressure.
Doak et al (2013)	Urban Community Setting	Cross-Sectional Study	Breast Feeding Practices	Introduction of non-nutritive liquids early in infancy was associated with a higher risk for

				stunting, diarrhea, and the need for medical attention.
Prentice et al (2013)	INCAP Study	Review	Catch-up Growth	Authors re-analyzed already published cohort data from Brazil, Guatemala (INCAP study), India, the Philippines, and South Africa; demonstrating evidence for catch-up growth after two years of age and again in adolescence. They caution against interpretations of the "1000 Days Window" which neglect this evidence for substantial growth outside the window.
Chary et al (2013)	Rural Community Setting	Qualitative Study	Community Perceptions, Implementation Science	Ethnographic study exploring community and caregiver perceptions of stunting in an indigenous community. Child malnutrition is highly prevalent and therefore "normalized" with low awareness that it is a significant health problem.
FHI 360 / FANTA (2013)	Rural Community Setting	Cross-Sectional Study	Complementary Feeding Practices, Micronutrients, Supplementary Feeding	Assessment of nutrient consumption in children (12-23 mo.), pregnant women and lactating women (children under 6 mo.) to determine the best, cost-efficient food sources for those nutrients. Diet quality (rather than calories) and cost of high-quality foods were the major problems identified.
Hoddinott et al (2013)	INCAP Study	Longitudinal Study	Early Child Development, Economic Productivity, Educational Attainment	Analysis of longitudinal data on adults who participated as children in the INCAP study. Authors found that stunting as children was associated with lower educational attainment and performance on reading and nonverbal cognitive tests, earlier age at first pregnancy, higher total number of children, and increased poverty.
Stein et al (2013)	INCAP Study	Longitudinal Study	Educational Attainment, Intrauterine Environment	Authors examined cohort data from Brazil, Guatemala (INCAP Study), India, the Philippines, and South Africa; showing that prematurity and small for gestational age were associated with a risk for decreased educational attainment and adult short stature.
Jiménez-Morán et al (2013)	Rural Community Setting	Review	Micronutrient Supplementation	Systematic review of randomized clinical trials of zinc supplementation conducted in Brazil, Cuba, Peru, Ecuador, and Guatemala. No trial showed a significant impact on linear growth or stunting.
Addo et al (2013)	INCAP Study	Cross-sectional Study	Intergenerational Effects	Authors examined cohort data from Brazil, Guatemala (INCAP study), India, the Philippines, and South Africa; showing strong associations between maternal height and stunting in offspring.
Bergard et al (2013)	Global Network for Women's and Children's Health Research	Longitudinal Study	Intrauterine Environment	Authors examined predictors of stunting in the first 6 months of life in the Western Highlands of Guatemala. The strongest predictor was newborn length, emphasizing the role of the intrauterine environment and the need for maternal interventions for stunting.

Bogin (2013)	Urban Community Setting, Rural Community Setting	Review	Secular trend	Review article discuss secular trends in height within populations. Uses the case of the Maya population in three locations (rural Guatemala; Merida, Mexico; and the United States) to examine rapid changes in height in these different contexts.
Reurings et al (2013)	Urban Community Setting	Cross-Sectional Study	Socio-demographic Correlates	Describes stunting prevalence in an urban convenience sample, with a high proportion of indigenous Maya subjects. The usual demographic correlates of stunting are described.
Paciorek et al (2013)	DHS	Cross-Sectional Study	Socio-demographic Correlates	Using a large series of representative national datasets including DHS and others to examine the urban-rural gap in child growth. Urban children were generally taller and heavier. The urban to rural gap was widest in Guatemala, Burundi, and Niger.
Newman et al (2014)	Global Network for Women's and Children's Health Research	Cluster Randomized Trial, Single Level Intervention	Complementary Feeding Practices	An implementation science evaluation of a negative cluster randomized controlled trial in Guatemala, Pakistan, Democratic Republic of the Congo, and Zambia, that measured the impact on stunting of daily meat consumption (intervention) versus fortified corn-soy blend (control). A key finding was that recall of complementary feeding messages was associated with improved height-for-age independent of study arm.
Davis et al (2014)	Rural Community Setting	Qualitative Study	Breast Feeding Practices, Complementary Feeding Practices, Implementation Science, Supplementary Feeding,	This qualitative study documents implementation barriers to community-based supplementary feeding for stunting, including misunderstandings related to messaging around exclusive breastfeeding and sharing of supplements among family members.
Lundeen et al (2014)	INCAP Study	Longitudinal Study	Catch-up Growth	Examines cohort data from Brazil, Guatemala (INCAP Study), India, the Philippines, and South Africa. Authors explored differences in height deficit versus height-for-age Z-score after the first two years of life, showing that Z-scores improved but height deficit continues to worsen into adulthood.
Brown et al (2014)	Rural Community Setting	Cross-Sectional Study	Complementary Feeding Practices	A mixed methods study exploring infant feeding in highly stunted indigenous communities. Findings included limited awareness of stunting, low consumption of locally grown foods and increasing processed food consumption, and overall low diet diversity and meal frequency.
Frojo et al (2014)	Rural Community Setting	Cross-Sectional Study	Complementary Feeding Practices, Intergenerational Effects	Case control study showing that maternal short stature strongly predicted infant stunting. Adequate complementary feeding practices positively modified this association, whereas adequate maternal nutritional status had a minimal effect.

Ramirez-Zea et al (2014)	DHS	Cross-Sectional Study	Double Burden of Malnutrition	Authors used several cross-sectional DHS survey sets to examine trends in the double burden of malnutrition (stunted child, overweight mother), finding a decrease over time in the rate of stunting, but increase in mothers' overweight and obesity. The double burden of malnutrition was more common in indigenous than nonindigenous households.
Behrman et al (2014)	INCAP Study	Longitudinal Study	Early Child Development, Educational Attainment	Analysis of previously collected data on adult verbal and nonverbal cognitive skills obtained from adult subjects who participated in the INCAP Study. Data show that pre-school experiences (including supplementary feeding) had an important impact on some cognitive skills independent of school attainment, emphasizing the role of early childhood interventions, some of which have direct benefit unmediated by later school enrollment.
Paz et al (2014)	Rural Community Setting	Cross-Sectional Study	Implementation Science, Policy	The second of six annual assessments that aim to monitor the actions, interventions and advancements in public policy and service delivery in line with the 1000 Days Framework and national plans to reduce stunting. Describes deficits in infrastructure, service delivery, and knowledge, action, and practices observed in site visits with both healthcare providers and community members.
Lakkam et al (2014)	Rural Community Setting	Longitudinal Study	Supplementary Feeding	Statistical modelling of attenuation of growth deficits in an observational, longitudinal supplementary feeding cohort; showing that targeting of supplementary feeding to 6-12 months old would most efficiently reduce the severity of stunting and underweight.
Solomons et al (2015)	Urban Community Setting	Cross-Sectional Study	Intergenerational Effect, Intrauterine Environment	A cross sectional study of a convenience sample of newborns, showing significant prevalence of stunting at birth, emphasizing the role of the intrauterine environment.
Tumilowicz et al (2015)	DHS	Cross-Sectional Study	Complementary Feeding Practices, Gender	Mixed methods study which noted in ethnographic interviews that mothers perceived that male infants were hungrier and more difficult to satisfy when feeding, coupled with a difference in height-for-age in favor of girls. A similar gendered pattern for stunting was observed in the DHS data set only for indigenous children.
Godinez et al (2015)	University Thesis	Cross-Sectional Study	Complementary Feeding Practices, Socio-demographic Correlates	Descriptive cross-sectional study showing the prevalence of stunting and other nutritional disorders in two rural communities and demonstrating the relationship between complementary feeding practices and malnutrition.
Thompson et al (2015)	Rural Community Setting	Cross-Sectional Study	Early Child Development	Study assessing the psychometric properties of the Rapid Neurodevelopmental Assessment and Bayley Scales of Infant and Toddler Development, Third Edition tools in a population of infants from rural Guatemala.

				Stunting infants had lower scores than non-stunted infants.
Poder et al (2015)	National Living Standards Survey	Cross-Sectional Study	Economic Productivity, Socio-demographic Correlates	Authors used nationally representative data to examine the transmission channels for income inequality's effect on stunting, showing that household income positively and maternal education negatively affect child growth. Household income has a less positive effect on child growth when a parent is indigenous or in rural areas, highlighting the role of discrimination and lack of access.
Fall et al (2015)	INCAP Study	Longitudinal Study	Intergenerational Effects	Authors examined cohort data from Brazil, Guatemala (INCAP study), India, the Philippines, and South Africa, showing associations between younger maternal age and stunting. Older maternal age was found protective for stunting.
Chomat et al (2015)	Rural Community Setting	Longitudinal Study	Socio-demographic Correlates	Descriptive analysis of a cohort of mother-infant dyads followed from the prenatal to postnatal period describing infant health and nutritional/stunting status, as well as sociodemographic correlates and psychosocial stressors.
Restrepo-Méndez et al (2015)	DHS	Cross-Sectional Study	Socio-demographic Correlates	Analysis of regional data from serial representative population surveys, showing inequalities in stunting and other child health outcomes by wealth status. Inequalities were most pronounced in Bolivia, Guatemala, Haiti, Nicaragua, and Peru.
Griffen et al (2015)	INCAP Study	Longitudinal Study	Supplementary Feeding	Authors compared data from the original INCAP Study intervention trial with data obtained on migrant Guatemalan children in the United States; they concluded that calories exert a significant but small impact on height attainment and that other factors must be at play given that caloric intake explains only a small percentage of the variation in height between the two populations.
Muros et al (2016)	Urban Community Setting, Rural Community Setting	Cross-Sectional Study	Double Burden of Malnutrition, Socio-demographic Correlates	Descriptive cross-sectional study that demonstrates a high prevalence of the double burden of malnutrition in school-age children. In the urban sample, the prevalence of obesity was higher and stunting lower than in the rural sample.
Puentes et al (2016)	INCAP Study	Longitudinal Study	Supplementary Feeding	Authors reexamined growth and diet composition data from the original INCAP Study supplementation trial, showing that protein consumption was strongly correlated with linear growth and weight increase whereas other macronutrients were not.
Li et al (2016)	Rural Community Setting	Cross-Sectional Study	Breast Feeding Practices, Micronutrients	Examined the concentration of key minerals and trace elements in breast milk and used principal components analysis to show that higher concentrations of several elements and minerals in breast milk were positively

				associated with improved growth, including height-for-age.
Jensen et al (2016)	Rural Community Setting	Cluster Randomized Trial, Multiple Level Intervention	Complementary Feeding Practices, Behavior change, Supplemental Feeding	Mixed methods evaluation of a multi-level intervention which included food supplementation and behavior change interventions around a healthy diet. In intervention clusters, households consumed more diverse foods (including both foods considered in and not considered in the food ration) emphasizing the role of the behavior change component.
Doak et al (2016)	Urban Community Setting	Cross-Sectional Study	Double Burden of Malnutrition	Cross-sectional study of an urban population, examining the double burden of malnutrition (obese mother, stunted child), finding 17% mother-child pairs to be dual burden.
King et al (2016)	Rural Community Setting	Case Study	Medical Disorders	A case study discussing a stunted child in rural Guatemala with a delayed diagnosis of an inborn error of metabolism, emphasizing the need to maintain a medical differential diagnosis for growth failure even in high stunting prevalence settings.
Davis et al (2016)	National Living Standards Survey	Cross-Sectional Study	Migration	Uses a nationally representative data set to show that an out-migrating father is associated with lower height-for-age for his children left behind and that remittances have no impact on height.
Pulgar et al (2016)	Public Policy Documents	Qualitative study	Policy, Implementation Science	Analysis of the Food Insecurity and Malnutrition in Guatemala Project that aimed to evaluate food security and nutrition policies to advocate for effective policies, primarily motivated by recurrent national interest in stunting. Main conclusions were a need to strengthen national research efforts around outcomes, update technical recommendations based on newly available nutritional and food security data, and strengthen private and university sector collaborations with government.
Varela et al (2016)	Universidad del Valle de Guatemala Longitudinal Study	Review	Secular trend, Socio-demographic Correlates	Review article describing the existence of the Universidad del Valle de Guatemala Longitudinal Study and Guatemalan immigrant cohorts. No data is presented.
Nagata et al (2016)	Rural Community Setting	Longitudinal Study	Socio-demographic Correlates	Study of a prospective cohort of Guatemalan children followed from birth to age 2 to determine predictors, finding that household size, number of children <5 years old, and diarrhea predicted stunting.
Jiménez et al (2016)	Rural Community Setting	Qualitative study	Complementary Feeding Practices	Qualitative interviews with families in high-stunting municipalities prioritized by the government program "Pacto Hambre Cero", finding that lack of access to health and sanitation infrastructure, lack of economic opportunities and access to health education, and cultural differences influence stunting.
Palacios et al (2017)	Urban Community Setting	Single Level Intervention	Complementary Feeding Practices,	Quasi-experimental study (pre- and post-analysis) showing improvements in linear

			Infection-Nutrition Interaction, Micronutrient Supplementation	growth among children supplemented with a fortified cereal product. Improvements were also seen in anemia, and upper respiratory infections but not diarrhea.
Lee et al (2017)	National Living Standards Survey	Cross-Sectional Study	Double Burden of Malnutrition	Use of a nationally representative data set to examine the double burden of malnutrition (obese mother, stunting child); finding that urban indigenous households were more likely to have the double burden. Overall overweight women were less likely to have stunted children, but short and overweight mothers had more stunted children.
Soto-Méndez et al (2017)	Urban Community Setting	Cross-Sectional Study	Infection-Nutrition Interaction	Reports high levels of fecal calprotectin in preschool Guatemalan children, but these are not correlated with stunting or other growth indicators.
Liu et al (2017)	INCAP Study	Longitudinal Study	Intrauterine environment, Educational Attainment	Authors examined cohort data from Brazil, Guatemala (INCAP study), India, the Philippines, and South Africa, showing that access to prenatal care positively impacted linear growth and educational attainment.
Monroy-Valle et al (2017)	Rural Community Setting	Cross-Sectional Study	Micronutrients	Cross-sectional survey of indigenous children from the Western Highlands in Guatemala who are stunted, finding low dietary zinc intake and high rates of diarrhea.
Estrada et al (2017)	DHS	Cross-sectional Study	Socio-demographic Correlates	Basic sociodemographic analysis of 2014 DHS survey data from Guatemala, showing that stunting is correlated with poverty, maternal education, informal employment, chronic illnesses in the family, and lack of access to sanitation and health infrastructure.
Barnhart et al (2018)	INCAP Study	Cluster Randomized Trial, Single Level Intervention	Intergenerational Effects, Supplementary Feeding	Comparison of the intergenerational effects on birth length of two groups of children born to mothers that participated in the INCAP Study. Children born to mothers that received the supplement were taller independent of birth weight and socioeconomic status, however this effect was attenuated after adjustment for maternal height.
Luna-González et al (2018)	Rural Community Setting	Cross-Sectional Study	Agricultural Practices, Complementary Feeding Practices	A mixed methods study examining agricultural and animal species richness, finding that higher agrobiodiversity was correlated with better diet diversity and diet quality. However, it was not correlated with improved growth parameters in children.
Voth-Gaeddert et al (2018)	Rural Community Setting	Cross-Sectional Study	Agricultural Practices, Infection-Nutrition Interaction	Authors studied a Maya community to investigate exposure to aflatoxins and its relationship with environmental enteric dysfunction and linear growth failure, the results confirm the tight association among those variables.
Martinez et al (2018)	Rural Community Setting	Individually Randomized Trial, Multiple level intervention	Behavior Change, Complementary Feeding Practices	Authors report results of a multilevel behavior change and supplementary feeding intervention for caregivers and stunted infants, showing improvements in diet diversity and minimum acceptable diet but not growth.

Martinez et al (2018)	Rural Community Setting	Individually Randomized Trial, Multiple level intervention	Behavior Change, Complementary Feeding Practices, Early Child Development	Authors report developmental outcomes from a multilevel behavior change and supplementary feeding intervention for caregivers and stunted infants, showing marked improvements in developmental scores in both intervention and control arms using the Bayley Scales of Infant Development.
Solomons et al (2018)	Urban Community Setting	Review	Breast Feeding Practices, Complementary Feeding Practices, Micronutrient Supplementation, Micronutrients	Review article mostly summarizing prior work by the authors, focused on identifying micronutrient deficiencies, deficiencies in breastfeeding and complementary feeding practices as they relate to stunting.
Oney et al (2018)	Rural Community Setting	Cluster Randomized Trial, Multiple Level Intervention	Complementary Feeding Practices, Supplemental Feeding, Behavior change	Reports primary growth outcomes from a multilevel cluster randomized trial which included food supplementation, behavior change, and micronutrient or supplemental feeding for infants. Food rations were full size or reduced size. Full sized family rations in combination with either micronutrient or supplementary fortified foods for children were most effective at reducing stunting, and effects were sustained through 2 years.
Flood et al (2018)	Rural Community Setting	Perspective	Gender	This perspective piece describes the adverse effects of Guatemala's focus on child stunting through 1000 Days initiatives on the rights and needs of adolescent girls and adolescent mothers.
Ng et al (2018)	INCAP Study	Longitudinal Study	NCD Risk Factors	Authors reanalyzed data from the INCAP Study, showing that any child growth disorder (stunting, underweight or wasting) increased the risk of impaired glucose tolerance and dyslipidemia in adults. These patterns were not shown for BMI and blood pressure.
Ford et al (2018)	INCAP Study	Longitudinal Study	NCD Risk Factors, Supplementary Feeding	Authors presented follow-up data on adults who participated in the INCAP Study; finding that supplementary feeding early in life reduced the risk of diabetes but increased the risk for obesity, hypertension, and dyslipidemia.
Voth-Gaeddert et al (2018)	Food For Peace USAID Needs Assessment	Cross-Sectional Study	Socio-demographic Correlates, Infection-Nutrition interaction, Intrauterine environment, WASH	Authors analyzed cross-sectional survey data from a USAID needs assessment using structural equation modelling, finding that water treatment and source, prenatal healthcare, and child diarrhea were correlated with stunting.
Wren-Atilola et al (2019)	Rural Community Setting	Cross-Sectional Study	Breast Feeding Practices, Infection-Nutrition Interaction	Authors studied how the mother's health impacts childhood anthropometry during the first 6 months of life; finding a higher risk of stunting in the presence of subclinical mastitis, and smaller head circumference if the mother had a diagnosis of intestinal parasitic infection or had not provided exclusive breastfeeding.

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