

Mitigating the Effects of Undernutrition on Schooling Performance among 10-Year-Old Children: What can be done?

Longitudinal Cohort Study on the Filipino Child
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The prevalence of undernutrition in the form of stunting and wasting or being thin among children in the age groups under 5, 5-9, and 10-19 years have remained high in the past decade as reported by the National Nutrition Surveys (NNS) (FNRI, 2016, pp. 24, 39, 50). In 2015, the prevalence of stunting among these groups of children are 33%, 31%, and 32% respectively. For wasting, the corresponding prevalence rates are 7%, 8%, and 13%. Data from the Longitudinal Cohort Study on the Filipino Child¹(Cohort Study) show similar rates for 10-year old children surveyed in 2016. The Cohort Study also found significant links between undernutrition and schooling outcomes. This Policy Note describes these findings and their policy implications.

Consequences of Undernutrition and Critical Interventions

Stunting or being short for age based on WHO child growth standards, is a marker for inadequate nutrition and repeated infections during the first 1,000 days of the child's life (WHO, 2014a, 2017). Stunting has long-term effects. Studies have shown that stunting before the age of two years is associated with lower cognitive test scores (Adair et al., 2013; Victora et al., 2008),

¹The Longitudinal Cohort Study on the Filipino Child is a collaborative undertaking of government agencies, development partners and demographic researchers aimed to examine how the lives of Filipinos are changed in the course of the implementation of the Sustainable Development Goals (SDG) agenda (OPS 2018). The research strategy is to prospectively observe a nationally representative sample of 4,952 Filipinos from age 10 through 24 (2016-2030) and collect data on significant life course milestones such as puberty, school completion, labor force entry/exit, sexual activity initiation, and marriage. Data collected at each survey round are analyzed to determine the interplay of child, household and community attributes that explain various health and socio-demographic outcomes among the cohort. Study findings will inform policy decisions, program design and service delivery efforts.

reduced educational attainment, and lower likelihood of entry into formal labor markets (Carba et al., 2009; Galasso et al., 2017), which contribute to lower earnings in adult labor (Galasso et al., 2017). The policy response to preventing stunting during the first 1,000 days are well-known (Bhutta et al., 2013; Das et al., 2016; WHO, 2014a).

Undernutrition marked by wasting or being thin based on WHO child growth standards (WHO, 2017) results from inadequate nutrition or disease in the current period. Wasting is associated with higher risk of death in childhood (Khara and Dolan, 2014). The underlying causes of wasting in childhood are also well-known as are the critical interventions, including timely treatment (WHO, 2014b).

Much of the discussion on stunting and wasting refer to early childhood, and appropriately so since prevention, particularly of stunting, is of critical importance. But what happens if such cases of undernutrition are not prevented in early childhood? The window of opportunity of the first 1,000 days for preventing stunting being closed, a key policy concern is how to mitigate adverse consequences over the life course. One such consequence is the schooling performance of children in elementary school.

The Cohort Study Findings

The Cohort Study provides information on the environment faced by children who are stunted and wasted, and what the effects are on schooling performance. While stunting has its roots in early childhood, wasting may be recent. Nonetheless, each or a combination of both conditions can have effects on current schooling performance.

Table 1 presents the characteristics of the index children in the Cohort Study in terms of nutritional status by major island group. The overall prevalence of wasting² in the study sample is 16% with prevalence being lower in Luzon than in the Visayas or Mindanao. This is slightly higher than the prevalence rates for 10-12-year-old in the previous NNS rounds of 14% in both 2013 and 2015 rounds. One possible explanation is that the study cohort is generally younger than the NNS reference age group. Thirty two percent of index children were found to be stunted with a similar pattern of lower prevalence found for Luzon. In addition, 8 % were found to be both stunted and thin.

²In the Cohort study, wasting or being thin is based on body mass index (BMI) rather than weight. The mean age of the cohort is 10.4. For children of pubertal age, weight-for-age does not distinguish between height and body mass because of the ongoing growth spurt. Using weight-for-age may erroneously classify children who are simply tall as overweight. We use the 2007 WHO Reference Standards (<https://www.who.int/growthref/en/>) for BMI-for-age categories in this study: Severely thin:<-3SD, Thin:<-2SD, Not Thin (Overweight: >+1SD to +2SD, Obese: >+2SD)

Table 1. Prevalence of Undernourished Index Children by Nutritional Status and Island Group¹

Variables	Luzon	Visayas	Mindanao	ALL
Below normal BMI-for-age categories ^{a,b}				
Severely Thin	3.7	3.9	4.2	3.9
Thin	10.7	11.2	12.9	11.4
Stunted ^{a,b}	25.7	36.0	36.7	30.7
Both stunted and thin ^{a,b}	5.9	7.1	8.4	6.9

¹ Classified using the 2007 WHO Reference Standards (n=4925); Height-for age cut-off: Stunted = <-2SD; BMI-for-age cut-offs: Thin: <-2SD, Severely thin: <-3SD

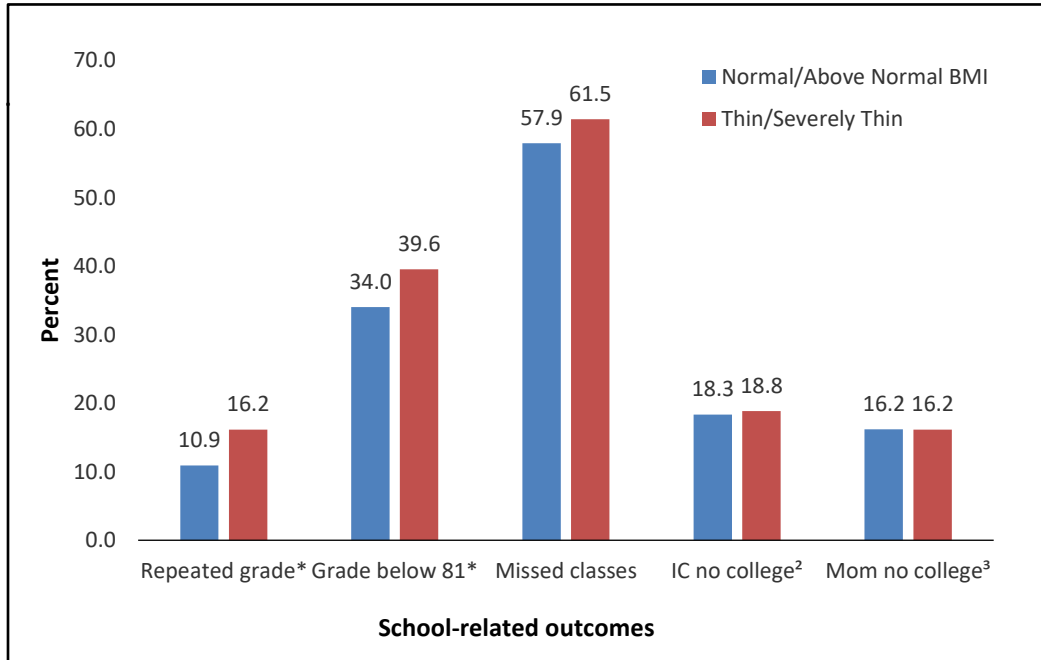
^aSignificantly different at p<0.05 between Luzon and Visayas; ^b Luzon and Mindanao

Certain background characteristics were found to be significantly associated with either undernutrition status. Both being thin or stunted is positively associated with households who are poor (proxied by being a beneficiary household of the conditional cash transfer program or Pantawid Pamilyang Pilipino Program (4Ps)). Being stunted is positively associated with larger household sizes, and households located in Visayas, Mindanao or in geographically isolated and disadvantaged areas (GIDA). Negatively associated with stunting is the mother's education (lower risk if with at least a high school education) and environment with lower risk of infection (proxied by the frequency of handwashing with soap and access to a sanitary toilet). There are no significant differences in both stunting or being thin between boys and girls at this age.

Undernutrition is significantly associated with poorer school-related outcomes. Figure 1 shows that being thin/severely thin is associated with greater prevalence of grade repetition and grades below 81 compared to those who are not thin. Figure 2 shows that being stunted leads to a greater prevalence (compared to non-stunted children) of repeating grades, obtaining grades below 81, missing classes (about 67% reported being absent because of sickness), index children not aspiring for college education and mothers not aspiring for college education for their children.

The analysis further shows that being both stunted and thin leads to greater negative school outcomes compared to not being stunted and thin, as shown in Figure 3. The pathways through which stunting and other forms of undernutrition increase the risk of poor school performance and human capital in general have been examined in various local and international studies (Adair et al., 2013; Carba et al., 2009; Martorell et al., 2010; Stewart et al., 2013).

Figure 1. Schooling-related outcomes and being thin¹



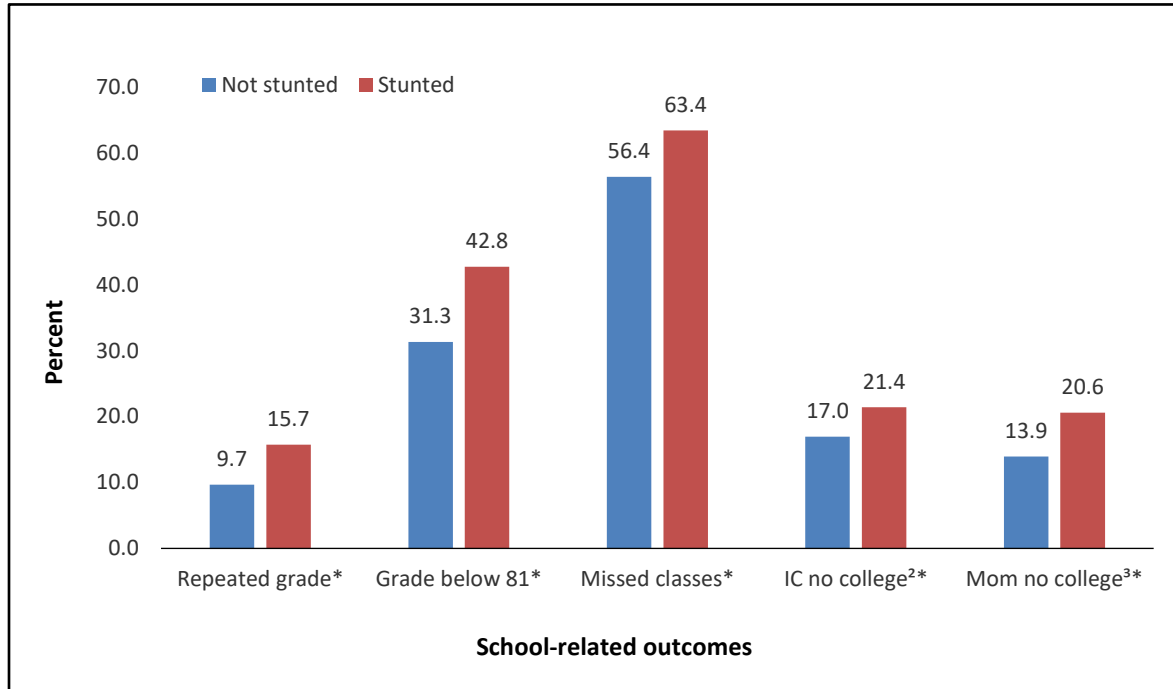
¹Predicted rates adjusted for relevant child, household and community characteristics. Excluded in graph: being in school since

about 98% were in school. BMI-for-age cut-offs: Thin/Severely thin:<-2SD; Normal/Above normal BMI: \geq -2SD

² IC does not aspire for nor believe he/she can attain college education

³ Mother/caregiver does not aspire for college education for IC nor believes IC can attain such level

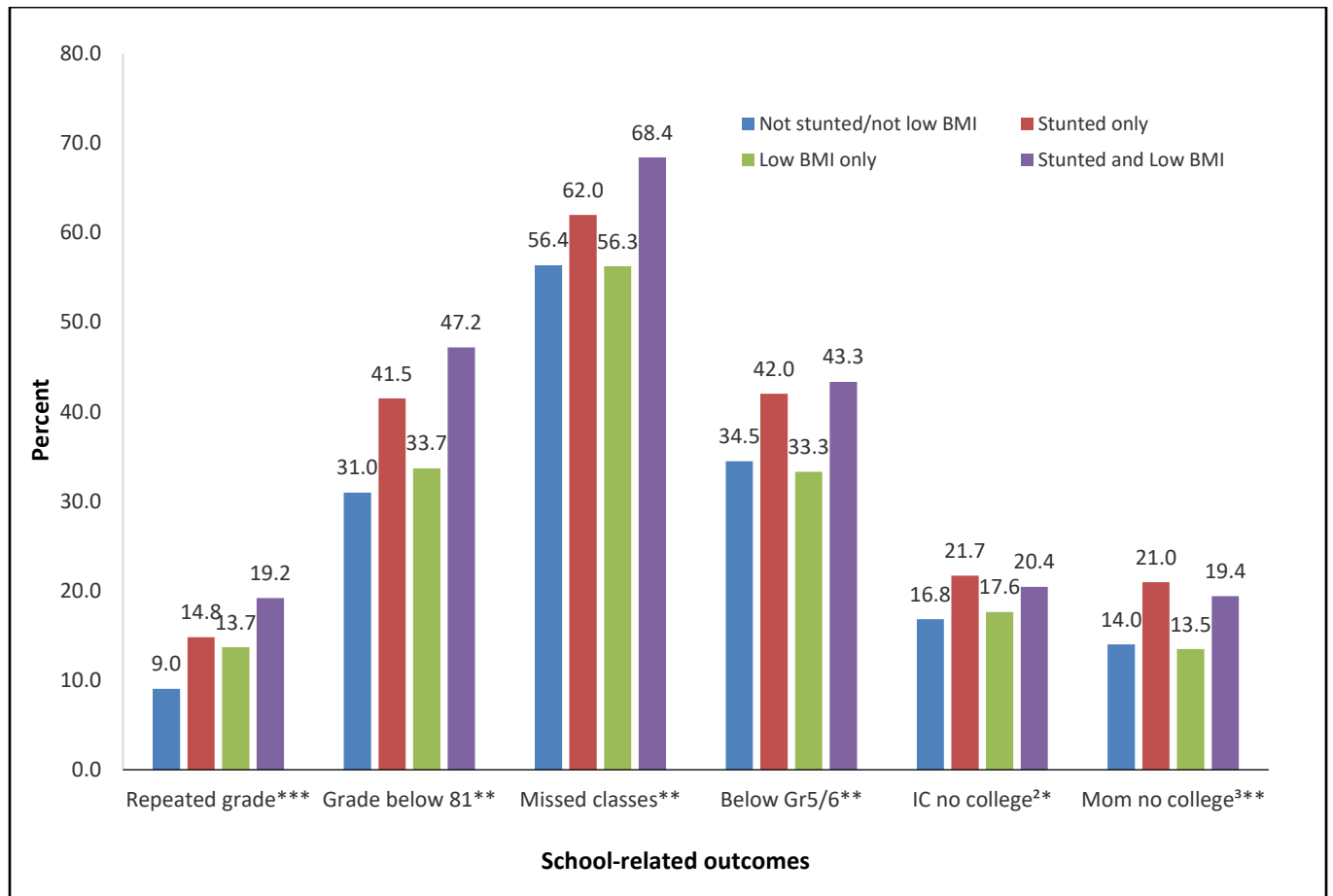
Figure 2. Schooling-related outcomes and being stunted¹



¹Predicted rates adjusted for relevant child, household and community characteristics. Excluded in graph: being in school since about 98% were in school. Height-for age cut-off: Stunted= <-2SD

² IC does not aspire for nor believe he/she can attain college education

³ Mother/caregiver does not aspire for college education for IC nor believes IC can attain such level

Figure 3. School related outcomes and forms of undernutrition¹

¹Predicted rates adjusted for relevant child, household and community characteristics. Excluded in graph: being in school since about 98% were in school. Height-for age cut-off: Stunted= <-2SD; BMI-for-age cut-offs: Low BMI:<-2SD; Not low BMI: \geq -2SD

² IC does not aspire for nor believe he/she can attain college education

³ Mother/caregiver does not aspire for college education for IC nor believes IC can attain such level

Significantly different at $p < 0.05$ *** in all categories ** between not stunted/low BMI and stunted only and stunted/lowBMI

*between not stunted/low BMI and stunted only

Policy Action

Stunting. The Cohort Study and NNS point to the continued prevalence of stunting for 10-year-old children and a need for reiterating policy interventions that are targeted at much younger stages of the child's life course where these are most appropriate. Interventions during the crucial first 1,000 days from conception to 24 months of age, when the child's growth path is particularly sensitive to nutrition and other shocks, are highly important. For the current cohort of stunted 10-year-olds, a policy focus would be to mitigate the persistent adverse effect of

stunting at this stage of the life course, this time focusing on the effects on cognitive ability and the resulting lowered education outcomes.

The Department of Education (DepEd) undertakes both delivery and regulatory functions for basic education and would, therefore, be the principal locus of such interventions. As primary school participation reaches or exceeds 90% (98% in the Cohort Study), interventions implemented in this setting would have considerable coverage.

The DepEd Order 15, s. 2018 (DepEd, 2018a) requires a baseline nutritional status assessment that includes identifying stunted learners for the first time (and only for kindergarteners) in SY 2018-2019. Assessing for stunting addresses an important information gap. For instance, a sample report from DepEd Region VII shows results for wasted and severely wasted learners only. With DepEd Order 15, interventions can be targeted to include stunted learners as well.

DepEd has existing programs for slow learners. It currently implements remedial classes on top of regular classes in classroom interventions (DepEd, 2018b). The program implements summer classes to “provide opportunities for remediation through tutorial or coaching of learners with learning gaps or subject area deficiency.” DepEd’s Special Education Program (DepEd, 2017) includes a category for learners classified as having “difficulty remembering, concentrating, paying attention and understanding based on manifestation.” Appropriate programs for slow learners due to stunting have yet to be designed.

As there is at present no program to address stunted learners distinct from children with other disadvantages, i.e., children with disabilities, it is recommended that DepEd consider establishing such a distinct program. Addressing the cognitive limitations attributed to stunting may require a different approach than that caused by disability. This could be an expansion of the current Special Education Program or other programs or remediation. DepEd should take the lead in exploring alternative options, testing them out prior to scaling up. The implementation of DepEd circular No. 15 S 2018 that assesses school children’s nutritional status should screen for stunting to identify children who could be enrolled in such special programs.

Wasting/Being Thin. DepEd implements a School Based Feeding Program (SBFP), which currently targets all severely wasted and wasted learners from Grade 1-6 and stunted kindergarten students in priority areas identified in the Philippine Plan of Action for Nutrition (DepEd, 2018b). Instituted in 2012 as a replacement of the Food for School Program (FSP), it replaced the previous program’s emphasis on addressing short-term hunger to that of lessening the problem of undernutrition. After 2012, the program targeted severely wasted students from Kindergarten to Grade 6 at a minimum, accommodating wasted students as the budget allowed. Starting in 2017, the program targeted all severely wasted and wasted students nationwide, until finally including stunted kindergarten students in 2018.

Stunting and Wasting/Being Thin. The Cohort Study’s results show that 10-year old children who are both stunted and wasted/thin are the most disadvantaged in the area of schooling performance. DepEd’s nutritional status screening should also include a mechanism prioritizing

assistance among such children since their needs are both acute (their current nutrient requirements are not met) and long-term (stunting).

Albert et al., (2016) conducted an impact evaluation of the SBFP to determine, among others, if the nutrition goal was being met. The study found that only 62% of severely wasted beneficiaries attained normal status. The study, however, pointed to the importance of external factors such as initial nutritional status and family feeding practices that were beyond the control of the program. Further, whatever gains obtained from the program were not sustained. After 12 months, only less than half of improved severely wasted children retained normal status. These indicate a need for a lengthened feeding period as well other interventions addressing external factors.

The scale of the SBFP is projected to increase even more with the passage of Republic Act 11037 or the “Masustansiyang Pagkain Para sa Batang Pilipino Act.” The latter expands the mandate of the SBFP to include stunted children from Grades 1-6. This expanded scale will likely strain budgets given existing stunting rates. Ironically, the 2019 budget for the SBFP suffered from a reduction despite the increased scale (DepEd, 2018c). DepEd would need to explore ways to supplement its limited resources with those from external partners such as other government units identified in RA 11037 and non-government actors. The latter (civil society, businesses, etc.) operate on different budget considerations from government actors who may share the same constraints.

DepEd will also need to review the nutrient content of school meals. The current FNRI recommendation is to provide 25% of daily nutrient requirement. World Food Program recommends providing 1/2 of daily nutrient requirement considering the possibility that these children would not have sufficient nutrients available at home (WFP, DOST-FNRI and UNICEF, 2018).

Moving Forward

While preventing stunting during the critical period of the first 1,000 days needs to be given highest priority, there is a need to consider addressing the effects of stunting among those who are already stunted. This is particularly the case of school children in primary education. Of immediate concern is how to mitigate the learning disadvantage caused by stunting. There is a need to explore alternative ways to address deficiencies in schooling performance related to stunting. While schooling outcomes fall mainly under the responsibility of DepEd, soliciting support from various sectors and coordinating with other agencies to combat undernutrition among school children is essential. For instance, the Department of Social Welfare and Development, which oversees the 4Ps, could incorporate a strong message on the adverse consequences of undernutrition on schooling in Family Development Sessions that 4Ps beneficiaries are required to attend. The Department of Agriculture could provide support to home gardening initiatives of the parents of schoolchildren as well as of the school, to boost their food supply needs given the increasing SBFP challenges. It is recommended that DepEd take the

lead in undertaking such exploration, and to take such task as part of its overall agenda for improving education outcomes for all.

References

- Adair, L. et.al (2013). Associations of Linear Growth and Relative Weight Gain During Early Life with Adult Health and Human Capital in Countries of Low and Middle Income: Findings from Five Birth Cohort Studies. *Lancet* 382: 525-34. Retrieved from: [http://dx.doi.org/10.1016/S0140-6736\(13\)60103-8](http://dx.doi.org/10.1016/S0140-6736(13)60103-8).
- Albert, J.R. et.al. (2016). What is the Impact of DepED's School-Based Feeding Program? Philippine Institute for Development Studies Policy Note No. 2016-10. Retrieved from: <https://dirp3.pids.gov.ph/websitecms/CDN/PUBLICATIONS/pidspn1610.pdf>.
- Bhutta, Z. A., et al. (2013). Evidence-based Interventions for Improvement of Maternal and Child Nutrition: What Can Be Done and at What Cost? *The Lancet* 382(9890):452–77.
- Carba, D.B., Tan, V.L., & Adair, L.S. (2009) Early Childhood Length-for-age is Associated with the Work Status of Filipino Young Adults. *Economics & Human Biology*, 7(1):7-17.
- Das, J.K. et al. (2016). Infant and Young Child Growth. In Black, R.E., R. Laxminarayan, M. Temmerman, and N. Walker (2016). *Reproductive, Maternal, Newborn, and Child Health. Disease Control Priorities (3rd Ed)*. Washington, DC: The World Bank.
- Department of Education. (2018a). DO 15, S. 2018 – Supplemental Guidelines on The Implementation of School-Based Feeding Program for Fiscal Year 2018. Retrieved from: <http://www.deped.gov.ph/2018/03/28/do-15-s-2018-supplemental-guidelines-on-the-implementation-of-school-based-feeding-program-for-fiscal-year-2018/>.
- Department of Education. (2018b). DO 13, S. 2018 – Implementing Guidelines on The Conduct of Remedial and Advancement Classes During Summer for the K to 12 Basic Education Program. Retrieved from: <http://www.deped.gov.ph/2018/03/23/do-13-s-2018-implementing-guidelines-on-the-conduct-of-remedial-and-advancement-classes-during-summer-for-the-k-to-12-basic-education-program/>.
- Department of Education (DepEd). (2018c). DepEd Highlights Accomplishments, Sets Direction for 2019. Retrieved from: <http://www.deped.gov.ph/2018/08/08/deped-highlights-accomplishments-sets-direction-for-2019/>.
- Department of Science and Technology-Food and Nutrition Research Institute (DOST-FNRI). (2016). The Philippine Nutrition Facts and Figures 2015: 2015 Updating of the Nutritional

Status of Filipino Children and Other Population Groups Anthropometric Survey.

Retrieved from:

http://enutrition.fnri.dost.gov.ph/site/preview.php?xx=%20uploads/2015_ANTHROPOMETRIC_SURVEY.pdf.

Galasso, E. et al. (2017). The Economic Costs of Stunting and How to Reduce Them. World Bank Policy Research Note 17-05. Development Economics, World Bank Group. Retrieved from: <http://www.worldbank.org/en/research/brief/policy-research-note-no5-the-economic-costs-of-stunting-and-how-to-reduce-them>.

Khara T, Dolan C. (2014). Technical Briefing Paper: Associations Between Wasting and Stunting, Policy, Programming and Research Implications. Oxford: Emergency Nutrition Network; 2014 (<http://www.enonline.net/waststuntreview2014>, accessed 13 October 2014).

Martorell, R., Horta, B.L., Adair, L.S., Stein, A.D., Richter, L., Fall, C.H. Consortium for Health Orientated Research in Transitional Societies Group. (2010) Weight gain in the first two years of life is an important predictor of schooling outcomes in pooled analyses from five birth cohorts from low- and middle- income countries. *The Journal of Nutrition*, 140, 348-54.

Republic Act No. 11037. (2018). An Act Institutionalizing a National Feeding Program for Undernourished Children in Public Day Care, Kindergarten, and Elementary Schools to Combat Hunger and Undernutrition Among Filipino Children and Appropriating Funds Therefor. Retrieved from: <https://www.officialgazette.gov.ph/downloads/2018/06jun/20180620-RA-11037-RRD.pdf>.

Stewart, C.P., Lanotti, L., Dewey, K.G., Michaelsen, K.F. & Onyango, A.W. (2013) Contextualizing complementary feeding in a broader framework for stunting prevention. *Maternal and Child Nutrition*, 8 (Suppl 2), 27-45

USC-Office of Population Studies Foundation, Inc. (OPS). (2018). Longitudinal Cohort Study on the Filipino Child. Baseline Survey Technical Report. OPS Report Series No. 2. Retrieved from https://www.opsusc.org/paper_series.php

Victora, C. et al. (2008). Maternal and Child Undernutrition: Consequences for Adult Health and Human Capital. *Lancet* 371: 340-357. DOI:10.1016/S0140-6736(07)61692-4.

World Bank. (2012). What Matters Most for School Health and School Feeding: A Framework Paper. SABER Working Paper Series No. 3. Retrieved from:

<https://documents.worldbank.org/en/publication/documents-reports/documentdetail/197681468331747243/what-matters-most-for-school-health-and-school-feeding-a-framework-paper>.

World Health Organization (WHO). (2014a). Global Nutrition Targets 2025: Stunting Policy Brief (WHO/NMH/NHD/14.3). Geneva: World Health Organization; 2014.
https://apps.who.int/iris/bitstream/handle/10665/149019/WHO_NMH_NHD_14.3_eng.pdf?ua=1.

World Health Organization (WHO). (2014b). United Nations Children's Fund, and World Food Program (WFP)/UNICEF/WFP. Global Nutrition Targets 2025: Wasting Policy Brief (WHO/NMH/NHD/14.8). Geneva: World Health Organization; 2014.
https://apps.who.int/iris/bitstream/handle/10665/149023/WHO_NMH_NHD_14.8_eng.pdf?ua=1.

World Health Organization (WHO). (2017). Guideline: Assessing and Managing Children at Primary Health-care Facilities to Prevent Overweight and Obesity in the Context of the Double Burden of Malnutrition. Updates for the Integrated Management of Childhood Illness (IMCI) Geneva: World Health Organization; 2017. License: CC BY-NC-SA 3.0 IGO.

World Food Program, (WFP), Department of Science and Technology (DOST)-Food and Nutrition Research Institute (FNRI) and United Nations Children's Fund (UNICEF). (2018). Fill the Nutrient Gap: Philippines.