

Tabunda, Ana Maria L.; Albert, Jose Ramon G.; Angeles-Agdeppa, Imelda

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## Results of an impact evaluation study on DepED's school-based feeding program

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Philippine Institute for Development Studies  
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## Results of an Impact Evaluation Study on DepED's School-Based Feeding Program

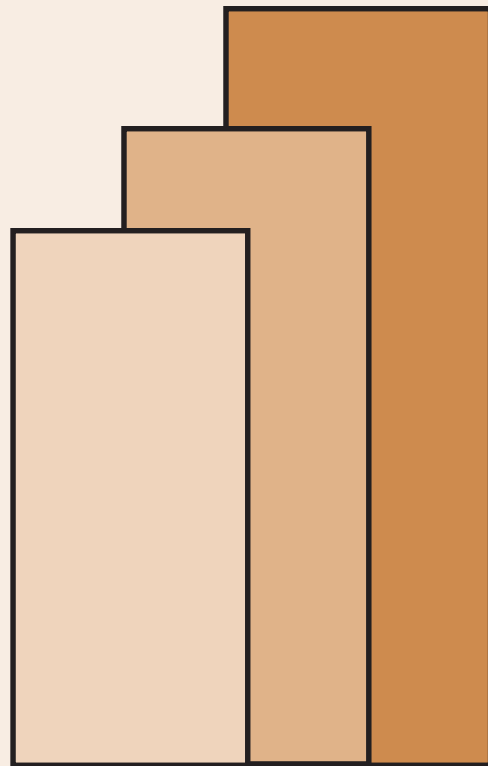
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For comments, suggestions or further inquiries please contact:

**The Research Information Staff**, Philippine Institute for Development Studies

18th Floor, Three Cyberpod Centris - North Tower, EDSA corner Quezon Avenue, 1100 Quezon City, Philippines

Telephone Numbers: (63-2) 3721291 and 3721292; E-mail: [publications@mail.pids.gov.ph](mailto:publications@mail.pids.gov.ph)

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## **RESULTS OF AN IMPACT EVALUATION STUDY ON DEPED'S SCHOOL-BASED FEEDING PROGRAM**

**Ana Maria L. Tabunda, Jose Ramon G. Albert, and Imelda Angeles-Agdeppa<sup>1</sup>**

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<sup>1</sup> The authors are, respectively, Philippine Institute for Development Studies (PIDS) econometrics/survey consultant, PIDS senior research fellow, and PIDS nutrition specialist consultant. The authors wish to thank Beverly T. Lumbea and Martin Joseph M. Raymundo of the PIDS for research assistance. Thanks also to Sonny N. Domingo, Winnie A. Gerio, Christine Ma. Grace R. Salinas, Angelica B. Maddawin, Jocelyn P. Almeda, Emma P. Cinco, Lucy Melendez, Susan Pizarro, and Merle Galvan, also of PIDS, for being part of the field data collection and encoding team. The views expressed are those of the authors and do not necessarily reflect those of PIDS or any of the study's sponsors.

## ABSTRACT

The link between malnutrition and poor health among elementary school children and absenteeism, early dropout and poor classroom performance as well as the effectiveness of school-based nutrition and health interventions in improving school performance are well-established in the literature. Thus the Department of Education has been conducting conditional food transfer programs since 1997. Its current program, the School-Based Feeding Program, as implemented in school year (SY) 2013–2014, fed 40,361 severely wasted pupils enrolled in Kindergarten to Grade Six in 814 public elementary schools in the country.

This paper presents the findings from the impact evaluation of the SY 2013–2014 implementation of the program. This is a follow-up on the process evaluation conducted by the PIDS. The study employed mixed methods research, undertaking qualitative surveys while undertaking focus group discussions. The findings indicate that, except for inaccurate measurement of nutrition status variables and improper documentation of the program in all its three phases (prefeeding, feeding, and postfeeding), the program was generally implemented well by the beneficiary schools and welcomed not only by program beneficiaries and their parents, but also by many of the school heads and teachers of the beneficiary pupils.

**Keywords:** health and nutrition, Philippines, school children, school-based feeding program, food for education program, impact evaluation

## INTRODUCTION

The link between malnutrition and poor health among elementary school children and absenteeism, early dropout and poor classroom performance as well as the effectiveness of school-based nutrition and health interventions in improving school performance are well-established in the literature (see, for example, Pollitt 1990 and Taras 2005). Thus the Department of Education (DepED) has been conducting conditional food transfer programs since 1997.

The first Food for Education (FFE) program launched by the DepED in 1997 was a breakfast feeding program intended to address short-term hunger among public school children. Short-term hunger is a period of hunger experienced by children who have inadequate breakfast and/or walk long distances to school. Through the years DepED's feeding program underwent changes in target beneficiaries, coverage, and service delivery mode and eventually shifted focus from merely addressing short-term hunger to that of addressing undernutrition among children enrolled in public elementary schools.

At present, DepED targets severely wasted pupils and, to the extent that the program budget allows, moderately wasted or wasted (W) pupils for its feeding programs. Severely wasted (SW) children are those whose weight-for-height is below minus 3 standard deviations from the median weight-for-height of reference population, while moderately wasted children have weight-for-height below minus 2 standard deviations from the median weight-for-height. DepED uses the World Health Organization (WHO) weight-for-age tables for pre-elementary school children aged 5 years old and below and the WHO Body Mass Index-for-age tables for pre-elementary, elementary and secondary students aged 6 to 19 years old in determining nutrition status.

In SY 14-15, based on the Nutritional Status (NS) report as of SY 11-12, the national government targeted *all* the 562,262 SW children enrolled in Kindergarten to Grade 6 in public schools that school year for DepED's School-Based Feeding program (SBFP), or about 3.8% of approximately 14.9 million children of the enrollment in public schools. Previously, DepED had been targeting only a fraction of the total number of SW pupils due to budget constraints for the program. In SY 13-14, for example, it targeted the feeding of only 40,361 SW pupils for which it was allocated a budget of only PHP 77.493 M. In SY 14-15, the budget for SBFP was increased by national government to approximately PHP 1.08 B, commensurate to the increase in number of beneficiaries. For SY 15-16 the budget was further increased to approximately PHP 2.27 B with the program now targeting 532,752 SW and 627,403 W pupils enrolled in Kindergarten to Grade 6 in public elementary schools. The NS Baseline Report for SY 15-16 had indicated that there were 532,752 SW and 1,312,935 W pupils enrolled in Kindergarten to Grade 6 in public elementary schools.

Meanwhile no prior evaluation of the SBFP in its current form has been undertaken by an outside party, presumably because prior to SY 14-15 the low budget of the program circumscribed its potential impact. Given the now much expanded scale of the program, however, an impact evaluation study is needed to help government implement the program more effectively and efficiently. This study presents the results of an impact evaluation study conducted on the implementation of the SBFP and its complementary activities in SY 13-14. A process evaluation study on the implementation of the SY 13-14 program had been undertaken earlier (Albert et. al. 2016).

The impact evaluation focuses on the implementation of SBFP in SY 13-14 rather than that in SY 14-15, since the SY 14-15 program covered *all* SW children enrolled in public elementary schools. A counterfactual analysis would not have been possible or would have been difficult to undertake if the study had focused on SY 14-15 program beneficiaries, as there will be no or very few non-beneficiary (NB) SW pupils to compare with the beneficiary pupils.

### Objectives

The objectives of this study are to:

1. assess the outcomes and impact of the SBFP in terms of its stated education and nutrition objectives;
2. gauge the outcomes of two complementary activities to the SBFP - the *Gulayan sa Paaralan Program* and the Essential Health Care Program (EHCP) - as these relate to its nutrition and health objectives as well as sustainability of SBFP; and

3. identify changes needed, if any, to improve the design and management of the program.

Under the GPP, beneficiary schools are to grow vegetable gardens that contain at least 50 *malunggay* trees, other vegetables as well as fruits. The *malunggay*, other vegetables, and fruits are to be used in the food to be served the children. The EHCP, on the other hand, advocates simple and cost-effective health interventions that promote cleanliness and prevent sickness among school children.

The organization of the study is as follows. A brief history of the feeding programs conducted by the DepED since 1997 is first presented, where the modifications that the feeding program had undergone to arrive at its present form are highlighted. The goals and features of the SBFP implemented in SY 13-14 are also discussed in this section. This is followed by a description of the distribution of the beneficiary schools and beneficiary pupils in SY 13-14, or the intended target population of beneficiaries based on DepED Memo No. 74 s. 2013. The limitations of the study, its methodology and a description of the samples obtained for the study are then presented, followed by the findings of the study and its conclusion and recommendations.

### **History of the DepED Feeding Program**

Food for education (FFE) programs had received renewed interest in developing countries in Asia, Africa and Latin America as a means for achieving Millennium Development Goals (MDG) and reducing hunger. School-feeding programs, in particular, emerged in many countries as a social safety net response to the 2008 global food and fuel crises (Bundy et. al. 2009). In developing countries, these programs provide undernourished children or children from the poorer or poorest families with nutritious food in exchange for school participation. Many of the programs are implemented with a view to improving both education outcomes (e.g., school participation, school retention, learning achievement or cognitive development) and nutrition outcomes (e.g., food energy consumption, anthropometry or micronutrient status).

In the Philippines, the feeding program of the DepED was first launched in 1997 to address short-term hunger among public school children. Through the years, the program underwent changes in target beneficiaries, coverage, delivery mode, and focus (i.e., from addressing short-term hunger to that of addressing undernutrition). In 2006 the program, then called the *Malusog na Simula, Yaman ng Bansa* program and also known as the Food for School (FSP) program, had families as beneficiaries; it was addressing severe hunger among families in selected geographic areas. Each beneficiary family received a kilo of rice for each day that the family's pre-school or Grade 1 child attended class or attended the Day Care Center (DCC); the rice was given to the pupil after class to ensure school attendance. DepED implemented the FSP for the beneficiaries enrolled in pre-school or Grade1 in public elementary schools, while the Department of Social Welfare and development (DSWD) took charge of rice distribution in the DCCs.

Like the current SBFP of DepED, the FSP program included complementary activities to ensure improvement in the beneficiary children's nutritional status, among them deworming and training of parents on desirable food, health and nutrition practices, sustainable food production / gardening technologies, and livelihood / self-sufficiency projects. The program had a budget of P2.93 B (Manasan and Cuenca 2007).

In 2008 the FSP targeted all pupils in Grades 1 to 3 in public elementary schools and all children in Dep-Ed supervised preschools and DCCs in the top 20 most food-poor provinces and the top 100 poorest municipalities. The program also covered all DCCs in the National Capital Region (NCR), Department of Interior and Local Government (DILG)-identified "hot spots", and DSWD-depressed areas in NCR. Each beneficiary child was given a daily ration of 1 kg of iron-fortified rice for each school day attended for a period of 120 days. The program had an on-site feeding component that provided the children with vegetable-based noodles, coco pan de sal, milk, and egg for each day of school attended. On-site feeding was added at experts' advice; it was more effective than rice distribution in

addressing child malnutrition, as the welfare benefits were directed to the child rather than dispersed among family members (Senate Economic Planning Office or SEPO 2008).

On the uptrend since 2006, the budget of the FSP program increased to PHP 3.3 B in 2008 (SEPO 2008), as the program target of 2,721,641 feeding beneficiaries had increased more than 32 times its 2004 level (84,477 beneficiaries) and more than four times its 2006 level of 609,552 beneficiaries (PIDS 2009). The program's targeting mechanism, however, proved to be inefficient, resulting in leakage rates<sup>2</sup> of 62% for the DepED component and 59% for the DSWD component. Its undercoverage rates<sup>3</sup> were also high - 80% for the DepED component and 75% for the DSWD component (Manasan and Cuenca 2007). Alternative targeting mechanisms simulated by Manasan and Cuenca (2007) on SY 2006-2007 data yielded lower leakage and undercoverage rates.

In May 2009, amidst allegations that the bidding for the noodles had been rigged in 2007 and 2009 and that the noodles were overpriced and lacked nutritive value, the DepED Secretary cancelled the procurement of P427 million worth of instant noodles and ordered a review of the entire school feeding program. In March 2012, the graft and misconduct complaints filed against the incumbent DepED Secretary and six others were dismissed by the Office of the Ombudsman. The Ombudsman reportedly found baseless the charge that the biddings were rigged to favor one bidder, and also found no evidence to hold the officials liable for misconduct and overpricing, as no proper price comparison was conducted (Salaverria 2012).

In 2011, after conducting a pilot test, the DepED launched the Breakfast Feeding Program (BFP). The BFP shifted the focus of the feeding program from that of addressing short-term hunger to one of addressing the more serious case of undernutrition or malnutrition among elementary children enrolled in public schools (DepED Order No. 80 s. 2011). The program also strove for more efficient targeting. Rather than feeding all children in a school included under the program, the BFP targeted undernourished children in Kindergarten and Grades 1 to 3. Selection of the beneficiary pupils was performed by school implementers using WHO weight-for-age and BMI-for-age tables for establishing nutrition status.

The beneficiary schools were selected by Regional Health and Nutrition Units (RHNU) based on prevalence of undernutrition among the school's pupils and the capacity of their heads or principals to manage food procurement along with the feeding program. Food procurement had been decentralized to the schools, possibly to avoid problems ensuing from centralized procurement and distribution. Thus, training on School Based Management (SBM), ability to manage, disburse and liquidate funds, and knowledge on procurement rules and regulations on the part of school heads were part of the selection criteria for beneficiary schools.

The program was renamed the SBFP in 2012 so as not limit the feeding to breakfast time. SBFP also restricted the coverage of the program to SW children in Kindergarten and Grades 1 to 6 in selected public elementary schools. In addition, a school could be selected into the program only if it had no other feeding program.

Thus by addressing the inadequacies of the programs in the past, the DepED feeding program has evolved to the current form of the SBFP. In its current form, the SBFP has retained the main features of the BFP namely, the 100-120 feeding day duration; the use of standardized recipes with *malunggay* and the 20-day cycle menu, with each meal providing the child with at least 300 additional calories; the establishment of a school-based feeding core group; involvement of volunteer parents in the preparation of meals and the feeding of children; devolved procurement and financial reporting procedures; and the prescribed complementary activities consisting of deworming of the beneficiaries prior to the start of the feeding program; waste segregation, management and composting; integration of the Essential Health Care Program in the implementation of the SBFP; and the *Gulayan sa Paaralan* Project.

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<sup>2</sup> The leakage rate is the ratio of nonpoor beneficiaries to the total number of beneficiaries.

<sup>3</sup> The undercoverage rate is the ratio of the number of poor households who do not participate in the program to the total number of poor households.

The goals of the SBFP are:

1. To rehabilitate at least 70% of the severely wasted beneficiaries to normal nutritional status at the end of 100 to 120 feeding days;
2. To ensure 85% to 100% classroom attendance of beneficiaries; and
3. To improve the children's health and nutrition values and behavior.

According to the Health and Nutrition Center (HNC) of DepED, the primary goal of the program is the nutrition goal; improved class attendance and improved health and nutrition values and behavior are secondary goals.

The SBFP's attendance target of 85% to 100% school attendance is comparable to that required in other countries, which is at least 80% to 85% school attendance. The stated number of calories (300) provided by an SBFP meal is lower, however, than the average of 876 calories per child per day offer that in-school meals in other developing countries offer (Adelman, Gilligan & Lehrer, 2008). Its number of feeding days is also lower than the 180 feeding-day-average in other developing countries (Bundy, Burbano, Grosh, Gelli, Jukes & Drake, 2009).

The SBFP also differs from in-school feeding programs in many developing countries in that it targets selected pupils as beneficiaries rather than feeds all pupils in a given school or in selected grade levels. In other developing countries, targeting individual students for school meals is infeasible or undesirable (Adelman et. al., 2008). Selective targeting is a desirable feature of a feeding program, however, as it reduces total program costs. In addition, results from well-designed impact evaluation studies of primary school-based FFE programs generally indicate that the programs have higher impacts on children with greater initial malnutrition and that the nutrition benefits are greater for programs targeting younger children (Adelman et. al., 2008).

School feeding is also one of the government's interventions to address persistent malnutrition among children. Latest reports of the Food and Nutrition Research Institute (FNRI) suggest that about one in ten children aged five and below (7.9%) are wasted, while one in five (19.9%) are underweight, and three in ten (30.7%) have stunted growths<sup>4</sup>. While the prevalence of stunting and underweight has decreased since the 1990s, the prevalence of stunting has not (See Figure 1). In addition, while malnutrition is highest among poorest families, malnutrition is prevalent across socio-economic strata (see Figure 2).

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<sup>4</sup> Aside from wasting, there are two other indicators of malnutrition: underweight, and stunted. When a child's weight is below three standard deviations from the median weight-for-age, the child is said to be severely underweight, while if the weight is lower than two standard deviations from the growth standard but higher than three standard deviations, then the child is moderately underweight. Similarly, (moderate and severe) stunting are defined in terms of child growth standards on height-for-age.



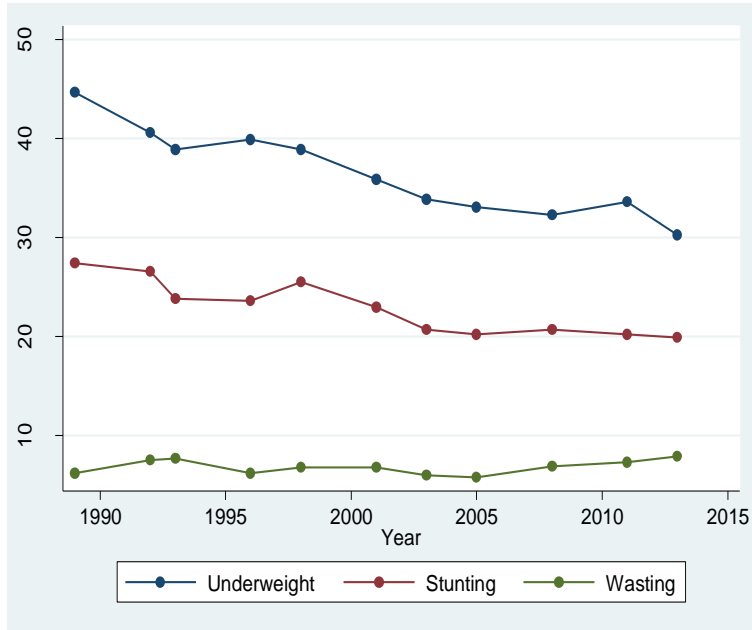


Figure 1. Prevalence of stunting, underweight, and wasting in Philippines, 1989-2013.

Source: FNRI

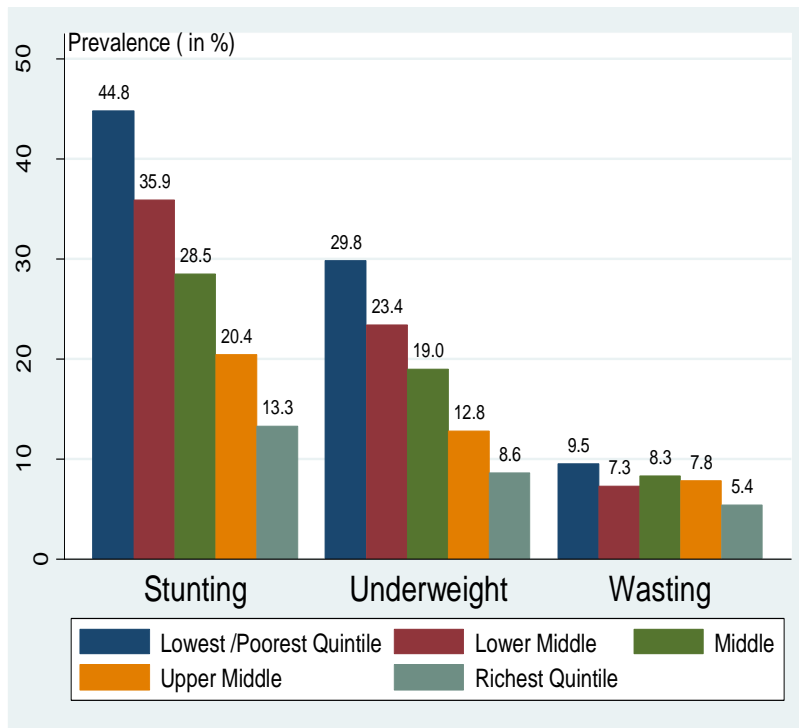


Figure 2. Prevalence of malnourished children (0 to 5 yrs old) in the Philippines by poverty status, 2013.

Source: FNRI

## Distribution of SBFP target beneficiary schools and pupils in SY 13-14

The SY 13-14 implementation of the SBFP was modest in size (number of target beneficiaries) and budget. DepED allocated P77.493 M for the school-feeding of 40,361 SW pupils in 814 schools across the country (DepED Memo No. 74 s. 2013). HNC proportionally allocated the 40,361 beneficiary pupils to the regions based on prevalence of SW children, as determined from the Nutritional Status (NS) Baseline Report of SY 2012-2013. The RHNU in turn proportionally allocated the region's quota to the divisions in the region based on prevalence. The Division offices then allocated the division's quota to the schools based on prevalence and management capability of the school head. Beneficiary pupils were then identified and selected by the SBFP core group, subject to the approval of the school head, based on the set criteria.

The distribution of program beneficiaries was uneven across regions, with four regions each having at most 600 beneficiaries, while Region IV-A had 8,893 beneficiaries. Luzon, including NCR, accounted for about 59% of beneficiary SW pupils in SY 13-14, followed by Visayas, which had about 27%. Mindanao had the least number of SW pupils, accounting for only about 14% of the beneficiaries (Table 1).

The 59% allocation for the whole of Luzon is somewhat higher than the share of Luzon in the general population. The share of Visayas, on the other hand, is larger than the area's share in the general population, while that for Mindanao is smaller than its corresponding share in the general population<sup>5</sup>. The disproportionate allocation may be due to the fact that severe wasting is likely not proportional to population size. In addition, several international and nongovernmental organizations have been undertaking feeding programs in Mindanao. The World Food Programme, in particular, has been implementing feeding programs in Mindanao, since 2006.<sup>6</sup> Given the restriction that beneficiary schools were not to have existing feeding programs, fewer schools in Mindanao qualified for inclusion under the program.

Nearly two-thirds (65.7%) of the SW pupils in SY 13-14 were enrolled in schools located in rural barangays (Table 2). Here the regions have been grouped into region-clusters to facilitate analyses. Except for the NCR-IVA cluster, SBFP beneficiaries in rural barangays in a region-cluster outnumbered those in urban barangays. Yet, nearly half of the beneficiary schools are located in first class income cities and municipalities (Table 3), an indication of weak correlation between income classification of the city/municipality in which the schools are located and prevalence of severe wasting.

The number of target beneficiary pupils in a beneficiary school was quite variable, ranging from 10 to 718 (a school in Bacoor, Cavite). No target beneficiary school in the NCR - IVA region-cluster had fewer than 20 beneficiaries. In fact, only one school in this cluster had less than 30 target beneficiaries; even schools located in rural barangays had at least 30 beneficiaries. Meanwhile, 216 schools each having fewer than 20 target beneficiary pupils accounted for less than 8% of the total number of beneficiary pupils, while 87 schools having at least 100 target beneficiary pupils each accounted for 16,212 beneficiary pupils, or about 40%.

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<sup>5</sup> In 2010, Luzon, Visayas and Mindanao accounted for 57%, 20% and 23% of the country's population, respectively.

<sup>6</sup> See [www.wfp.org/countries/philippines](http://www.wfp.org/countries/philippines).

Table 1. Distribution of beneficiary schools and beneficiary pupils in SY 13-14, by region

Region	No. of ben. schools	No. of ben. Ppupils	Percent of total number of pupils (%)
National Capital Region	6	1,000	2.5
Cordillera Region	10	523	1.3
Region I	79	2,000	5.0
Region II	64	1,249	3.1
Region III	11	1,701	4.2
Region IVA	58	8,893	22.0
Region IVB	100	3,593	8.9
Region V	122	4,730	11.7
Region VI	88	5,974	14.8
Region VII	72	3,793	9.4
Region VIII	35	1,058	2.6
Region IX	40	912	2.3
Region X	67	2,047	5.1
Region XI	27	1,305	3.2
Region XII	22	600	1.5
Caraga	9	600	1.5
ARMM	4	383	0.9
RP	814	40,361	1.0

Table 2. Distribution of SY 13-14 SBFP target beneficiary pupils, by cluster and urban / rural classification

Region-Cluster	Rural	Urban	Total
<b>N. and C. Luzon</b>			
Number	3,723	1,750	5,473
Pct of cluster, %	68	32	100
Pct of RP, %	9.2	4.3	13.5
<b>NCR and IV-A</b>			
Number	4,462	5,431	9,893
Pct of cluster, %	45.1	54.9	100
Pct of RP, %	11.1	13.5	24.6
<b>IV-B and V</b>			
Number	7,079	1,244	8,323
Pct of cluster, %	85.1	14.9	100
Pct of RP, %	17.5	3.1	20.6
<b>Visayas</b>			
Number	6,765	4,060	10,825
Pct of cluster, %	62.5	37.5	100
Pct of RP, %	16.8	10.1	26.9
<b>Mindanao</b>			
Number	4492	1355	5847
Pct of cluster, %	76.8	23.2	100
Pct of RP, %	11.1	3.4	14.5
<b>RP</b>			
Number	26,521	13,840	40,361
Pct of RP, %	65.7	34.3	100

Table 3. Number of beneficiary schools in SY 13-14 by cluster and income classification of cities / municipalities

Cluster	No. of Schools	Income Classification of City / Municipality				
		First	Second	Third	Fourth	Fifth
North/Central Luzon	164	99	15	40	10	
NCR and IVA	64	52	4	8		
IVB and V	222	122	30	38	20	12
Visayas	195	78	24	59	33	1
Mindanao	169	41	67	32	18	11
Total	814	392	140	177	81	24
Pct of total schools, %	100	48.2	17.2	21.7	10.0	2.9

## Limitations of the study

This study focuses on the SY 13-14 implementation of the SBFP, which covered only about 7% of the total number of SW pupils enrolled in the public elementary schools at the time. Thus this study will not yield insights on the problems of scale that were likely encountered or are being encountered by the SY 14-15 and SY 15-16 implementation of the SBFP, which targeted 562,262 SW pupils and 532,752 SW children and 627,403 wasted children, respectively.

The study encountered difficulties in securing the needed documentation (SBFP forms, Nutrition Status Reports, report cards) from many SBFP beneficiary and non-beneficiary schools. Some beneficiary schools could not provide the survey teams with copies of their SY 13-14 SBFP forms. In the case of some schools that did provide the forms, vital information on the age, nutrition status or grade level of the beneficiaries or the date the weights and heights were taken were missing, thereby constraining the selection of schools and beneficiary pupils into the sample and verifying the nutrition status of the children. In the case of report cards for verifying school attendance of both beneficiary and NB pupils, the sampled parent had misplaced the report card or the teacher who had a copy of the report card had been transferred to another school and did not endorse the form to her / his replacement.

To be able to proceed with some of the analyses, the study resorted to imputing for missing observations. In particular, post-feeding dates when the height and weight measurements of the sampled SBFP beneficiary pupils were taken were imputed based on available information in order to assess the nutrition status of the beneficiaries at the end of the program. The possible implication of the use of imputations on the study's findings is discussed, however.

The expanded coverage of SY14-15 also introduced a complication in that about a third of the matched NB pupils, who were not beneficiaries in SY 13-14, were, however, beneficiaries in SY 14-15. This served to reduce the sample size available for assessing for possible medium-term impacts of the feeding program.

Another limitation of this study is that the findings presented in this study are based on unweighted statistical analyses. The list of SY 13-14 SBFP beneficiary schools did not include all the schools that actually conducted feeding programs in that school year using DepED budget allocations, included some schools that did not conduct feeding programs then, and had incorrect counts of the number of SW children for many of the schools.<sup>7</sup> And since quite a number of schools could not provide the study team with copies of their nutrition status reports or SBFP forms, or provided documents with incomplete information, the actual number of SW beneficiary pupils fed in SY 13-14 could not be obtained and/or verified. Thus, survey weights could not be correctly computed even for the beneficiary schools included in the sample.

## Methodology

The study employed mixed methods research. Quantitative surveys of program beneficiary pupils and their parents and matched non-program beneficiary children and their parents were undertaken. The information from these surveys were supplemented with information obtained through structured interviews of school heads of sampled beneficiary schools as well as heads of counterpart NB schools from which the matched NB children were drawn. Leaders or members of SBFP Core Groups in sampled beneficiary schools were also interviewed as well as one teacher of each sampled beneficiary child. Focus group discussions (FGDs) were conducted in five schools to probe into program features or processes that appear to have had considerable effect on whether a school attained the program objectives or not. One of the five schools was also the subject of the process evaluation study (Albert *et al.* 2015). The participants were a mix of beneficiary parents, non-beneficiary parents, core group members, feeding coordinators, and volunteer parents.

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<sup>7</sup> Inaccuracy of the counts is unavoidable, since DepED has to allocate the total budget for the program based on the latest consolidated NS report, which usually takes at least a year to consolidate.

The results of the FGDs demonstrate the positive benefits of the SBFP among the beneficiary pupils. In particular, the beneficiary parents observed the following among their children: increased weight, less frequency of sickness, better school attendance, improved eating habits and table manners. The parents, especially those who came from poor households, expressed gratitude for the program as it became a way to relieve them from their families' tight budget. With the SBFP, they were assured that their children would get to eat a complete meal in school. Some of the volunteer parents also cited that the program fostered a sense of camaraderie among them. However, in other instances, the participants mentioned that there was a lack of volunteer parents. All of the participants also mentioned that the budget for the program was insufficient and should be augmented. Most of the participants, particularly the non-beneficiary parents recommended to extend the implementation of the SBFP to cover even the wasted pupils.

In particular, a two-stage stratified random sample of 1,151 SY 13-14 beneficiary pupils was obtained as follows<sup>8</sup>. The first stage consisted of randomly selecting 44 beneficiary schools using DepED Memo No. 74 s. 2013, which contains the list of beneficiary schools for SY 13-14 and the corresponding number of SW children in each of these schools, as sampling frame. The second stage consisted of sampling the beneficiary pupils from the list of children fed based on the SY 13-14 SBFP forms, copies of which were to be obtained from the school heads of the sampled schools.

For purpose of first-stage sampling, the beneficiary schools were stratified based on cross-classification of the five region-clusters (N. and C. Luzon, NCR and IV-A, IV-B and V, Visayas and Mindanao) and grouping based on number of beneficiary children in a school (less than 20, 20 to 29, 30 to 99, at least 100 beneficiary children). The intention behind grouping the schools according to number of beneficiaries is to ensure that schools with few beneficiaries as well as those with many beneficiaries will be included in the sample, since successful implementation of the feeding program in a given school could depend on the number of pupils being fed. However, only schools which had at least 20 beneficiary students in SY 13-14 were considered for inclusion in the study to allow for: (1) possible reduction in the number of SW children in the school at the time the measurements were taken for the SY 12-13 NS Baseline report and at the time when the feeding was actually conducted in SY 13-14; (2) relocation of some of the SY 13-14 SW beneficiary pupils by the time the survey was undertaken in February to March 2015; (3) the usual "not-at-home" and "cannot be located" calls that occur in any survey of pre-listed respondents; and (4) greater likelihood of finding NB SW pupils to match the sampled SW beneficiary pupils. For if the number of SW pupils in a given beneficiary school is small, the likelihood of locating matching SW pupils in nearby NB schools can be expected to be small as well.

The target number of SW beneficiary pupils were 15, 25 and 35 for sampled schools that had fed 20 to 29, 30 to 99 and at least 100 pupils, respectively. The number of schools to be drawn from the cross-classified strata was in proportion to the number of SW beneficiaries in these strata based on the DepED memo.

Once a beneficiary school was selected for inclusion in the sample, the survey field work teams were to interview the school head as well as request, among other things, for: (1) copies of the SY 13-14 nutrition status reports and the SBFP forms and the addresses of the beneficiary children, which were to serve as the sampling frame for the selection of the beneficiary pupils; (2) the list of SBFP core group (CG) members or feeding coordinator(s) who were in charge of the feeding so that a CG leader / member could be selected for interview; (3) the list of teachers of the beneficiary pupils; and the list of volunteer parents who assisted the SBFP CG members in feeding the children.

The study sought to match each randomly selected beneficiary pupil with a SW pupil of the same gender and age (in years) who was enrolled in a public elementary school, preferably in the same municipality, that was not a SBFP beneficiary in SY 13-14. A counterpart NB school in the vicinity of and belonging to the same school division as well as urban/rural classification of each beneficiary school was identified prior to conduct of fieldwork for the purpose of

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<sup>8</sup> The initial target sample size for pupil beneficiaries was 1,210.

selecting SW wasted children for matching. Severely wasted beneficiary and NB pupils were to be randomly selected using systematic sampling of each school's list of SW beneficiary pupils ordered by grade level. In the case of beneficiary schools, only SW pupils who completed the feeding program were to be included in the list.

The study verified the nutrition status of both beneficiary and NB children sampled using data recorded in SBFP forms, nutrition status reports and other documents provided by the schools to the survey teams. This was to ensure correct appreciation of the nutrition status outcome of the program.

To help explain improvement in nutrition status of SW beneficiary children, logistic regression variables were performed using various possible explanatory variables, among them:

household characteristics

family size; number of working/employed family members; access to safe water and sanitary toilet; highest educational attainment of the child's parent/guardian; highest educational attainment of any member in the HH; residence in rural or urban barangay; having a home garden

access of household to financial assistance / help

whether the HH was a Conditional Cash Transfer (CCT) beneficiary in SY 13-14 or a CCT beneficiary at the time of the survey

whether overseas Filipino worker (OFW) - relative(s) send financial assistance to the family

nutrition in the household

adequacy of food and number and type of meals usually eaten by family, food groups eaten by the family

characteristics of the child

gender, age, BMI, whether a repeat of SBFP beneficiary in SY 13-14, whether a repeat beneficiary at the time of the survey, whether the child became ill for at least three days in SY 13-14

aspects of SBFP implementation in SY 13-14

whether child was dewormed, perceived adequacy of food served, whether child brought home of SBFP food, whether child usually did not finish SBFP food

interaction variables

Matched pairs of beneficiary and NB children were also compared on nutrition status.

## THE SAMPLES

The field work for the survey was conducted from February 16 to March 27, 2015. As expected, discrepancies in number of SW pupils as reflected in the DepED memo and the actual number of SW pupils by the time feeding was implemented led to post stratification of schools. In some cases, based on the submitted SBFP forms, the schools fed both SW and some moderately wasted children to reach the allocated number of children to be fed. In addition, some schools that were included in the initial sample drawn did not conduct feeding in SY 13-14, while some schools not listed in the DepED memo conducted SBFP feeding possibly as replacements of schools listed that did not. As a result, 12 of the 44 beneficiary schools included in the original sample, had to be replaced for the following reasons:

1. Three schools did not implement the SBFP in SY 13-14 although these were listed in the DepED memorandum – two are in Solana, Cagayan and one in Victorias City, Negros Occidental.
2. One school in Daraga, Albay did not complete the SBFP in SY 13-14.
3. Five schools had fewer SW beneficiaries than the target number to be randomly drawn from them because of a drop in the number of SW pupils by the time of the feeding. The locations of these schools and /the change in number of SW beneficiaries are shown in Table 4 to show how large the reduction in number of children actually fed could be.

Table 4. Location of schools in original sample with reduced number of children fed

Location of school	Number of SW children with budget allocation based on DepED Memo No. 74, s. 2013	Number of children fed based on SBFP forms
Baguio City	103	11
Labrador, Pangasinan	36	12
Gasan, Marinduque	33	19
Victorias City, Negros Occidental	101	24
Dipolog City, Zamboanga del Norte	31	7

4. The three schools drawn in Compostela Valley had to be replaced because all public elementary schools in this province received, in the aftermath of typhoon Pablo, funding for school-based feeding in SY 13-14, leaving no NB school in the province from which to draw matching SW NB children for the counterfactual sample.

The replacement schools were obtained from the same urban / rural category as the initially sampled schools to be replaced. But of the 12 replacement schools, only five schools could be obtained from the same school division as the original sample. The schools in Compostela Valley had to be replaced with schools in Lanao del Norte and Misamis Oriental, as the field teams were already deployed when it was learned that selecting counterpart NB schools located in Compostela Valley was not feasible.

Schools were not replaced if the number of SW pupils fed exceeded the target sample size of SW beneficiary pupils for that school even if the change in number of SW beneficiaries caused a change in stratum classification. Some schools were retained in the sample even if the target sample size of beneficiary pupils could not be achieved if no school in the municipality would yield the target sample size. For some schools the target sample size for beneficiary pupils could not be achieved because the addresses of the children could not be located or because the children's families had relocated to an unknown address or to too distant a municipality.

Table A.1 in Annex A gives the list of the 44 beneficiary schools that were included in the sample, the target number of beneficiary SW pupils, and the number of SW beneficiary children who were interviewed.

Identifying only one counterpart NB school for each selected beneficiary schools for the purpose of selecting SW wasted children for matching proved insufficient. NB schools were encouraged by DepED to conduct feeding programs using canteen funds and other fund sources. A number of NB schools did so. As for the NB schools that did undertake feeding programs, some did not have SW pupils, or did not have enough SW pupils, or enough SW pupils that matched the sampled beneficiaries. Thus additional NB schools had to be located. When the original NB school identified did not have enough matching SW pupils, the SW pupils of several NB schools with SW pupils were pooled to come up with the required number to match to the sampled pupils of a given beneficiary school. While some beneficiary schools required only one counterpart NB school, two schools needed as many as six or seven counterpart schools to obtain the required number of matched SW NB pupils. Thus, the field survey teams approached a great many more than the 117 NB schools from which the matching SW NB pupils were eventually selected. The list of NB schools from which the matched SW NB children were selected is shown in Table A.2.

Because of the difficulty of locating matching SW NB pupils, some of the NB schools no longer matched the beneficiary school in terms of urban / rural stratification (8% of 119 cases) or school division (39% of 119 cases). In



the case of Dipolog City North District, all the public elementary schools in that district implemented SBFP in SY 13-14, leaving no school to serve as counterpart NB school. The counterpart NB schools were selected from other districts in the province. Many of the barangays in Matungao District, Lanao del Norte on the other hand, were on red alert during the period for field work on account of the SAF 44 tragedy. Hence the NB schools had to be taken from another school district.

Given the difficulties encountered in the field, only 1, 107 NB children were found for matching with the randomly selected SW beneficiary children.

Table 5 lists the number of respondents interviewed for the study by category of respondent. Some of the SW beneficiary children interviewed are siblings as are some of the NB children. Hence the number of parents interviewed is lower than the number of children interviewees for both beneficiaries and non-beneficiaries.<sup>9</sup>

Table 5. Number of respondents interviewed by respondent category

Respondent category	Number of respondents interviewed
Beneficiary pupil	1,151
Parent of beneficiary pupil	1,081
School Head of beneficiary school	44
Teacher of beneficiary pupil	582
SBFP Core Group leader / member or feeding coordinator	44
Non-beneficiary pupil	1,107
Parent of non-beneficiary pupil	1,069
School head of non-beneficiary school	117

### Profile of the sampled beneficiary schools

Of the 44 sampled beneficiary schools, 30 schools or 68% are located in rural barangays. Yet, nearly half of the schools are located in first-class-income cities or municipalities.

Majority of the beneficiary schools (68%) implemented the SBFP for the first time in SY 13-14, while 11 schools or a quarter of them implemented it in SY 12-13 as well.<sup>10</sup> Two schools implemented the program in SY 11-12 and SY 13-14, while one school implemented it during each of the three school years.

Of the 14 schools that had implemented the program prior to SY 13-14, 11 had repeat beneficiary pupils, i.e., pupils who were included in the program in both SY 11-12 or SY 12-13 and SY 13-14. While the number of repeat beneficiary pupils ranges from 1 to 28 for nine of these schools, Prenza ES and *Paaralang Elementarya ng Sapangan*, both in Batangas, had 100 and 134 repeat beneficiaries, respectively. DepED Order No. 87, s. 2012 lists 235 and 93 SW beneficiaries in SY 12-13 for Prenza ES and *Paaralang Elementarya ng Sapangan*, respectively. Meanwhile DepED Memo No. 74, s. 2013 records 182 and 293 SW beneficiaries in SY 13-14 for these two schools, respectively.

<sup>9</sup> Siblings were included in the sample to increase the attained sample and to improve the chances of getting a match through the increased pool of beneficiary and NB pupils. But only one sibling is used in the regression models fitted.

<sup>10</sup> Based on DepED Order No. 87, s. 2012 and DepED Memo No. 74, s. 2013, only seven schools are repeat beneficiaries.

When asked for the reason for the incidence of repeat beneficiary pupils, school heads of four schools, including *Paaralang Elementarya ng Sapangan*, said that the children did not attain normal nutrition status at the end of the previous SBFP. The other three schools, which had from 3 to 10 repeat beneficiaries, are located in Pangasinan, Pampanga and Albay.

Six other school heads, including that of Prenza ES, said that their repeat beneficiary pupils attained normal nutrition status at the end of the previous SBFP but reverted to SW or W status at the start of SY 13-14. School heads of three other schools in Batangas, along with a school in Cavite and one in Western Samar, cited this reason as well.

Most of the sampled beneficiary schools (40 out of 44) conducted the feeding program for 120 days. Only four schools conducted the feeding for 100 days. All of the SBFP core group leaders / members or feeding coordinators said that they used the *malunggay* recipes given by DepED. Only three of these feeding program implementers said that not many of the children liked many of the *malunggay* recipes they had served.

Twelve school heads said that they fed wasted pupils, not just SW pupils, in SY 13-14. A total of 144 children were reportedly fed by 11 of these schools. The school head of the twelfth said that there was “no exact number” of these W pupils; perhaps the number of W pupils varied from day to day depending on the amount of excess food in a feeding day.

All but five schools had a school vegetable garden based on field inspection reports of the survey teams, and all but two schools implemented the EHCP.

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### **Profile of the sampled beneficiary families**

Majority (67%) of the 1,081 families of the sampled beneficiary children reside in rural barangays. The average family size of the beneficiary families is six, with actual size ranging from two to 16 members. Most of these families (96%) eat at least three meals a day. Majority (65%) have access to safe water supply (i.e., own-use or shared faucet / community water system or own-use or shared tubed / piped well). The rest source their water from dug wells (10%), natural bodies of water like spring, stream, river, etc. (11%), and peddlers (15%).

Nearly half of the beneficiary families (48%) were CCT beneficiaries both in SY 13-14 and at the time of the interview. About 15% say that they have OFW relatives who send them money.

About 74% of the parents / guardians interviewed said that their families planted or had their own vegetable gardens. About 87% say that their child had been eating *malunggay* even before the SY 13-14 SBFP. About 8% were not eating either *malunggay* or other vegetables before the feeding program.

### **Profile of the sampled beneficiary pupils**

Male pupils (56%) slightly outnumber female beneficiary pupils in the sample. The ages of the children at about the time of the *survey period* ranged from four to 19 years (Table 6), with mean and median age of about 10 years, respectively. About a third of the children were at most 8 years old.

Based on their parents' responses, more than a third (38%) of the children were repeat beneficiaries by the time of the SY 13-14 implementation, and about the same percentage (36%) were beneficiaries of the SY 14-15 implementation. Meanwhile 157 pupils, or approximately 14%, were SBFP beneficiaries for three consecutive school years: SY 12-13, SY 13-14 and SY 14-15.

These three-time beneficiaries did not differ in age and gender profile from the entire group of sampled SW beneficiary children. More than half (56%) of them are male, and their ages range from five to 17 years, with mean and median age of about 10 years, respectively. About a third of these children were also at most 8 years old.

A logistic regression model (pseudo  $R^2=0.05$ ) indicates that these three-time beneficiaries tend to be from the provinces of Batangas, Rizal, Sorsogon, Negros Oriental, and Misamis Oriental. While the fit of the model is not good, indicating that other explanatory variables are needed to explain the phenomenon of three-time-repetition in the SBFP, the three-time beneficiaries constitute from 21% to 28% of the total number of SW beneficiaries in four of these five provinces; the exception is Sorsogon (Table 7).

A better fitting logistic regression model for explaining the repeat-beneficiary phenomenon is obtained when dummy variables are used for specific beneficiary schools (pseudo  $R^2=0.13$  and model passes the Pearson goodness-of-fit test) and an interaction variable for rural residence and family size as explanatory variables. Twelve (12) schools are flagged by the model as being more likely to have thrice-repeating beneficiaries than other schools. The estimated odds ratio for the interaction variable is 1.09, indicating that even in a school with a sizeable percentage of repeat SW beneficiaries, SW children from large rural families are more likely to be repeat beneficiaries.

Table 6. Age distribution of sample SW beneficiary children as of survey period

Age	Frequency	Percent (%)
4	1	0.1
5	8	0.7
6	41	3.6
7	158	13.7
8	173	15.0
9	150	13.0
10	161	14.0
11	114	9.9
12	121	10.5
13	127	11.0
14	59	5.1
15	22	1.9
16	11	1.0
17	3	0.3
18	1	0.1
19	1	0.1
<b>TOTAL</b>	<b>1,151</b>	<b>100</b>

Table 7. Percent of thrice-repeating beneficiary pupils to total number of beneficiary pupils, by province

Region-cluster / province	Percent (%)	Region-cluster / province	Percent (%)
<b>N. and C. Luzon</b>		<b>Visayas</b>	
Benguet	0	Iloilo	20.0
Pangasinan	0	Negros Occidental	15.3
Cagayan	0	Cebu	2.9
Pampanga	4.3	Negros Oriental	28.0
		Western Samar	16.4
<b>NCR-IVA</b>		<b>Mindanao</b>	
Caloocan City	0	Zamboanga del Norte	4.0
Rizal	22.9	Lanao del Norte	24.4
Cavite	11.4	Misamis Oriental	21.1
Batangas	24.5		
<b>IV-B and V</b>			
Marinduque	0		
Oriental Mindoro	0		
Palawan	12.1		
Albay	10.0		
Sorsogon	16.7		

## MAIN FINDINGS

### Inconsistencies in recorded and verified nutrition status

As in the process evaluation study conducted on the SY 13-14 implementation of the SBFP (Albert et. al. 2015), the study uncovered inconsistencies in the verbal descriptors for nutrition status (e.g., severely wasted, wasted, normal, etc.) recorded in the SBFP forms and nutrition status reports and the verified nutrition status computed from the birthdates and weight and height measurements also recorded therein. All of the beneficiary children included in the sample were recorded to be severely underweight (SU) or SW pupils<sup>11</sup>. Use of the weight standards for children 5 years old and below (DepED Memo No. 241, s.2010) and BMI standards for children 6 years old and over (DepED Memo No. 165, s. 2010) yields only 494 SW pupils, constituting 43% of the total sample of 1,151 beneficiary children (Fig. 3)<sup>12</sup>. Majority of the 147 pupils verified to be wasted may not even be considered to be borderline SW, as 60% of the 35 children below 6 years of age exceeded the cutoff for SU by 0.5 to 1.6 kg, while 64% of the 112 verified wasted children 6 years old and over exceeded the cutoff for SW by 0.51 to 0.95 kg/m<sup>2</sup>. These are large discrepancies given that the WHO weight cutoff for a given age in years and months can exceed the cutoff for the previous age category (i.e., for the same age in years but one month younger) by as little as 0.1 unit.

In the case of the NB pupils, the nutrition status of even fewer pupils could be verified based on information recorded in the documents provided to the survey teams – 626 pupils or 57% of the total sample of NB pupils as compared to the 66% figure for beneficiary pupils (Figs. 3 and 4). Some 383 pupils, or only 35% were verified to be SW.

<sup>11</sup> Children aged five years and below and whose weights fall below the WHO weight cutoffs are referred to as severely underweight (SU) or underweight (U) rather than SW or wasted. For convenience in report writing, the terms SW and W are also used to refer to SU and U children, respectively.

<sup>12</sup> Fig. 3 does not reflect the one child verified to be overweight, based on recorded data, prior to feeding.

It appears that lack of standard measuring protocols and/or measuring equipment in the schools, which was observed by the study team even during the process evaluation phase of the research, has resulted in inaccurate weight and height measurements, and hence in misclassified nutrition status of many children. School heads are tasked by DepED Memo No. 241, s. 2010 to provide the tools to be used for height and weight measurements. Per the memo, the ideal tool is the calibrated beam balance scale with a height scale. But not all schools have been able to procure the desired equipment.

Another source of error in the assessment of the children's nutrition status are the inconsistencies in the birthdates and ages of the children as recorded in the copies of the SBFP forms and nutrition status reports that were made available to the survey teams. There may have also been errors in the computation of the BMI of the children aged 6 years and over.

#### **Insufficient documentation of post-feeding measurement**

Complete information on the post-feeding measurements taken of the SY 13-14 SBFP children is even more scant than that on the pre-feeding measurements. Dates when the measurements were taken are essential to establishing the ages of the children, down to months, for purposes of establishing nutrition status. But there is no data on post-feeding date in the case of 749 beneficiary children, or 65% of the total sample. Only 16 out of the 44 schools had provided documents which reflected this date.

To determine the post-feeding nutrition status of more children, missing post-feeding dates were imputed by using the latest post-feeding date recorded for children belonging to the same school, or using the date of the last feeding day mentioned by the School Head during his/her interview. The latter recourse seems reasonable, since in the case of 11 out of the 16 schools that submitted documents that reflected post-feeding dates, the recorded dates were within 15 days of the date of the last feeding day mentioned by the school head. If it may be assumed that the actual post-feeding dates for those with missing observations likewise fall within such a 15-day period, then the post-feeding ages of some of the children would be underestimated by at most one month.

Fig. 3. Verification of pre-feed nutrition status of SY 13-14 SBFP beneficiary pupils

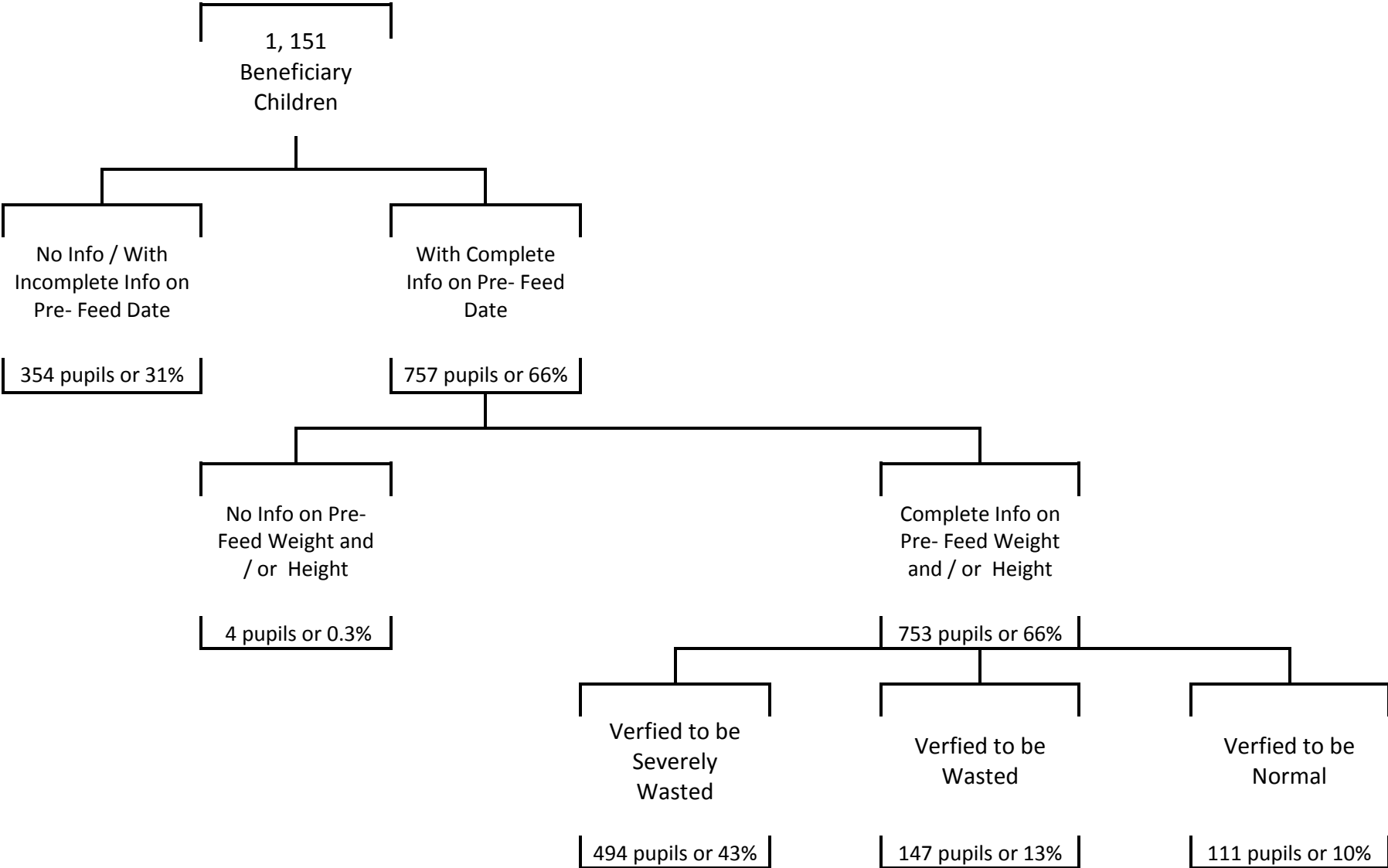
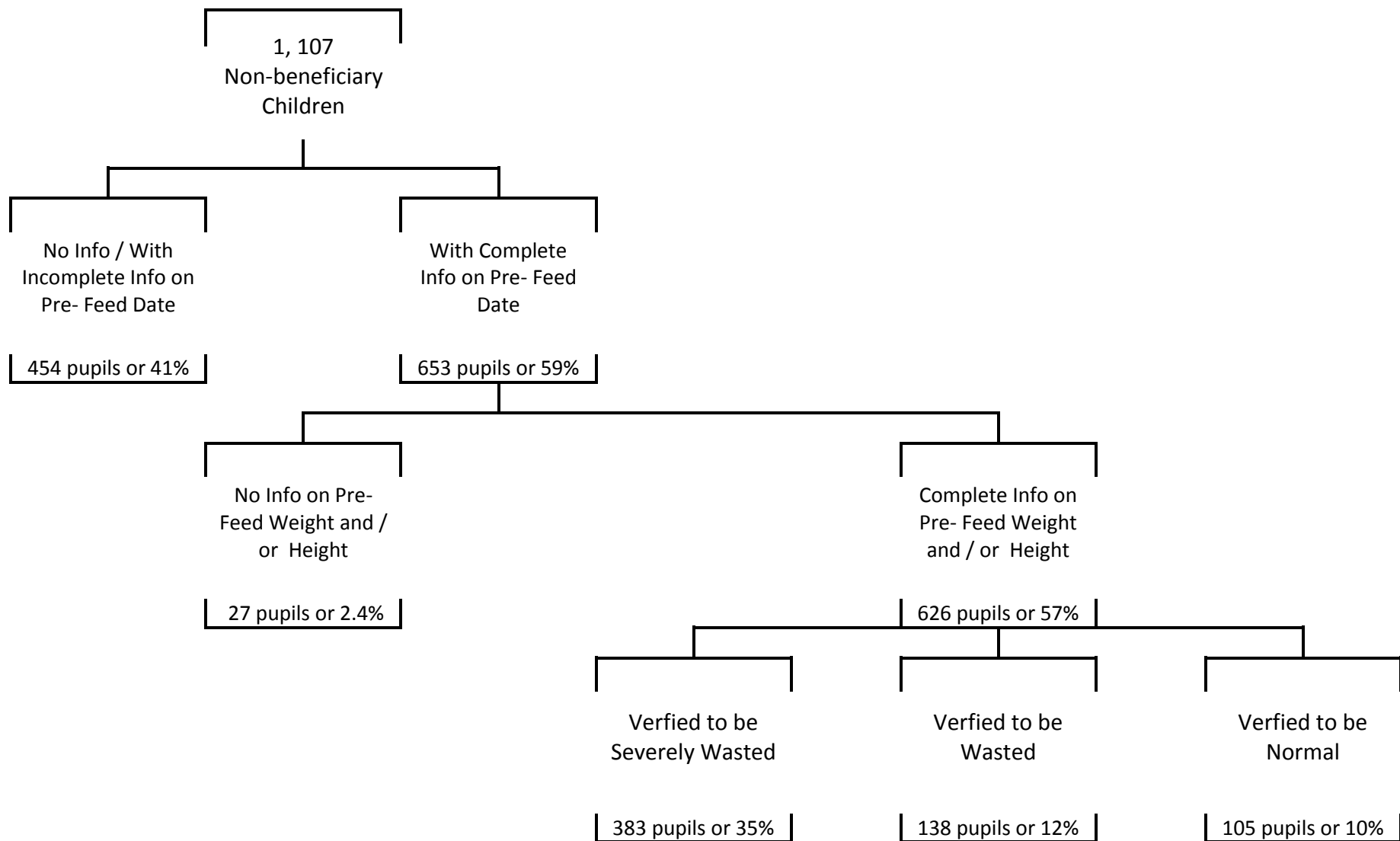


Fig. 4. Verification of nutrition status of SY 13-14 non-beneficiary pupils



Ignoring observations with inconsistent recorded heights (i.e., post-feeding height is lower than pre-feeding height) and observations with missing post-feeding weight / height measurements leaves 464 beneficiary children, or about 40% of the original sample, whose pre- and post-feeding nutrition status could be verified (Table 8). Of these children with verifiable post-feeding nutrition status, only 287 or about 25% of the original sample are verified to have been severely wasted prior to the SY 13-14 feeding program.

Table 8. Status of information on pre-feeding and post-feeding nutrition status variables, number of children, row percentage and cell percentage

Status of information on pre-feeding nutrition variables	Status of information on post-feeding nutrition variables			Total
	With complete information &		With incomplete information	
	Consistent heights	Inconsistent heights		
Incomplete	180	34	184	398
	45.2	8.5	46.2	100
	15.6	3.0	16.0	34.6
Complete	<b>464</b>	75	214	753
	61.6	10.0	28.4	100
	40.3	6.5	18.6	65.4
Total	644	109	398	1,151
	56.0	9.5	34.6	100
	56.0	9.5	34.6	100

#### Attainment of SBFP nutrition goal

Of the 287 children verified to be SW prior to the feeding program, about 62% attained at least normal nutrition status at the end of the feeding program (Table 9). Interestingly 62% of the parents interviewed, or the same figure, said that his/her child attained normal weight for height at the end of the SBFP, 19% said that their child did not, while the remaining 19% could not recall if their child or child did not attain normal weight or BMI at the end of the feeding program.

This 62% figure is short of the stated nutrition goal of the SY 13-14 SBFP wherein at least 70% of the beneficiaries are to attain normal nutrition status by the end of the feeding program. The study's findings indicate, however, that attainment of the nutrition goal depends not only on how well the SBFP was implemented but also on the circumstances and characteristics of the children's families and the children themselves.

Inasmuch as the SY 15-16 SBFP also includes moderately wasted pupils as beneficiaries, it is worth noting that about 70% of the children verified to be wasted prior to the start of the feeding program attained normal status at the end of the feeding program (Table 9). Moreover, 10% of the children verified to have been normal prior to feeding had regressed to wasted or SW status by the end of the feeding program.

These figures suggest that the basis for the 70% figure in the SBFP nutrition goal for SW children may have to be reviewed in light of the fact that 10% of normal and 30% of wasted children can regress to wasted or SW status, possibly due to a severe illness or growth spurt. About 18% of the sampled beneficiaries are reported to have suffered in SY 13-14 severe illness lasting at least three days.



Note that the percentages for improved nutrition status reflected in Table 9 could be slightly lower if the actual post-feeding dates of all these 464 children were available. The effect of using the last day of the feeding program is to underestimate the month component of the ages of some of the children, thereby possibly overstating the improvement in nutrition status for some of the children.

Table 9. Change in nutrition status of beneficiary children with verified pre- and post-feeding nutrition status, number of children and row percentage

Verified pre-feeding nutrition status	Verified post-feeding nutrition status				Total
	Severely Wasted	Wasted	Normal	Overweight	
Severely Wasted	49 17.1	59 20.6	178 <b>62.0</b>	1 0.4	287 100
Wasted	5 5.2	24 24.7	68 70.1	0 0	97 100
Normal	3 3.8	5 6.3	71 89.9	0 0	79 100
Overweight	0 0	1 100	0 0	0 0	1 100
Total	57 12.3	89 19.2	317 68.3	1 0.2	464 100

Height and weight measurements of all beneficiary and NB children interviewed were taken during the survey period. Among the beneficiary pupils whose height measurements during the survey period were not inconsistent with those taken prior to the feeding program, 624 had verified nutrition status information for both the pre-feeding period and the survey period. Of the 397 SW children for which information was available, 46% had normal nutrition status as of the survey period, or at least 12 months after their SY 13-14 feeding program (Table 10).

Table 10. Change in nutrition status of beneficiary children with consistently measured heights during pre-feeding and survey periods, number of children and row percentage

Verified pre-feeding nutrition status	Verified survey period nutrition status			Total
	Severely Wasted	Wasted	Normal	
Severely Wasted	89 22.4	125 31.5	183 46.1	397 100
Wasted	23 17.7	44 33.9	63 48.5	130 100
Normal	15 15.6	24 25	57 59.4	96 100
Overweight	0 0	0 0	1 100	1 100
Total	127 20.4	193 30.9	304 48.7	624 100

Of the 179 SW beneficiary pupils whose nutrition status had improved to normal at the end of the feeding program and who had consistent height measurements for the pre-feeding and survey periods, about the same percentage (48%) remained normal by the time of the survey (Table 11). This indicates that some of the children that had achieved normal BMI or weights at the end of the feeding period had regressed to W or SW a year or more later.

Table 11. Change in nutrition status of beneficiary children with consistently measured heights during pre-feeding and post-feeding and during pre-feeding and survey periods, number of children and row percentage

Verified pre-feeding nutrition status	Verified survey period nutrition status			Total
	Severely Wasted	Wasted	Normal	
Severely Wasted	44 24.6	49 27.4	86 48	179 100
Wasted	8 12.3	22 33.9	35 53.9	65 100
Normal	8 11.3	20 28.2	43 60.6	71 100
Total	60 19.1	91 28.9	164 52.1	315 100

It would thus seem that while about 60% of SW beneficiaries attained normal nutrition status at the end of the feeding program, only half or less than half of SW beneficiaries remain normal a year or more after the feeding program.

### Factors associated with improvement in nutrition status

Results of a logistic regression performed to help explain improvement in nutrition status of SW beneficiary children to at least normal status show the interplay between household characteristics and program implementation in the attainment of the nutrition goal (Table 12). In this model the educational attainment of the child's parent/guardian and the water system indicator may be serving as proxy variables for the financial or welfare status of the child's family.

Table 12. Estimated odds ratios for model with improvement from SW to normal status as dependent variable, n=265

Variable	Estimated odds ratio	P-value
HH is in rural barangay in N. and C. Luzon	2.3	0.001
Child's parent / guardian has college units	2.9	0.025
HH has access to own-use / shared faucet / community water system	2.0	0.028
Indicator variable for insufficient food at times during SBFP feedings	0.5	0.030
Child in a rural family brought home some of the SBFP food	0.4	0.015

The results indicate that SW children residing in rural barangays in Northern and Central Luzon, with at least one parent or guardian having college units, and whose family has access to safe water supply are more likely to improve to normal, while children whose parents said that the SBFP food served in their child's school was at times inadequate and SW children residing in rural barangays who bring home some of the food are less likely to improve to normal nutrition status.

Nearly 9% of the 1,151 sampled beneficiary pupils reside in rural barangays in Northern Luzon or Central Luzon. Meanwhile only 71, or about 6% of the beneficiary parents / guardians interviewed, have college units, while about 5% have at least a college degree. Most of the parents / guardians have either at best an elementary degree (40%) or a high school degree (44%).

Seventy-two (72) parents, or 6% of those interviewed, said that the SBFP food provided the children was sometimes insufficient. When asked what the school did to address the lack of food, 29% said that the feeding implementers adjusted / decreased the food portions so that all the children could eat. About 10% said that the school had food cooked again. The other responses were cited by at most 5% of these parents.

Meanwhile, about 24% of sampled beneficiary pupils in both urban and rural areas were reported by their parents to have brought home food to share with family members.

The fit of the model explaining improvement of SW children to at least normal status is low; the pseudo  $R^2$  is only 0.06 even as the model clears the Pearson goodness-of-fit test. A better-fitting model is obtained to help explain improvement from SW status to W status or better (Table 13). This model suggests, additionally, that improvement in nutrition status depends on the severity of the wasting, with the borderline SW cases having a greater chance of improving. Older SW children are also less likely to improve than their younger counterparts.

The model also surfaces the effect of the nutritional adequacy, or rather the lack of it, of the typical meals at home. A SW child whose family's usual meal consists of rice or corn and vegetables only is about a fifth as likely to improve. This was the typical meal of about half (51%) of the sampled beneficiaries' families.

Table 13. Estimated odds ratios for model with improvement from SW to W status or better as dependent variable, n=265

Variable	Estimated odds ratio	P-value
HH has access to own-use / shared faucet / community water system	3.5	0.002
Usual family meal consists of rice/corn and vegetables	0.4	0.046
BMI of child prior to feeding	2.0	0.003
Age of child at time of feeding (pre-feeding age)	0.7	0.08

The model for explaining improvement of the SW children to moderately wasted status or better has better fit. It has a pseudo  $R^2$  of 0.24 and passes the Pearson goodness-of-fit test.

As for explaining SBFP-fed SW children's ability to maintain normal nutrition status until the time of the survey, the models tried point only to geographic location and the educational attainment of the child's parent/guardian (Table 14). The model has a pseudo  $R^2$  of 0.05 and has good fit based on the Pearson goodness-of-fit test.

Table 14. Estimated odds ratios for model with improvement from SW to normal status as dependent variable, n=265

Variable	Estimated odds ratio	P-value
HH is in rural barangay in N. and C. Luzon	4.9	0.000
Child's parent / guardian has college units	2.4	0.030

In all the models considered, it is seen that the family's being a CCT beneficiary or having an OFW relative who helps the family, or the child's being a repeat SBFP beneficiary prior to SY13-14 in the case of the model for post-feeding improvement, or the child's being a SBFP beneficiary in SY 14-15 in the case of the model for maintained improved nutrition status, is not significantly associated with nutrition status improvement, based on the available data. It is possible that these interventions are bringing the neediest, in nutrition terms, of the needy at par with the latter.

### **Improvement in nutrition status of the SY 13-14 Non-beneficiary pupils**

As shown in Fig. 4 earlier, the available information allowed for verification of the nutrition status of 626 NB children, 383 of whom were verified to be severely wasted. All but one NB pupil had height and weight for the survey period, but consistent height measurements between the period when the initial heights were taken and the survey period were found for only 692 NB pupils, or about 63% of the NB sample. An overall comparison of the nutrition status of the sampled beneficiary and NB pupils during the survey period (Tables 11 and 15) show that slightly more SBFP-fed SW pupils attained and maintained normal nutrition status or better compared to their NB counterparts (48% vs 42%) . A similar result is found for wasted pupils, with percentage improvement to normal nutrition status among the SBFP-fed wasted pupils exceeding that for their NB counterparts by nearly 8 percentage points (53.9% vs 46.1%).

Table 15. Change in nutrition status of non-beneficiary children with consistently measured heights during initial measurement and the survey period, number of children and row percentage

Verified initial nutrition status	Verified survey period nutrition status					Total
	Severely Wasted	Wasted	Normal	Overweight	Obese	
Severely Wasted	93 30	86 27.7	128 41.3	2 0.65	1 0.32	310 100
Wasted	27 23.5	35 30.4	53 46.1	0 0	0 0	115 100
Normal	12 13.5	15 16.9	62 69.7	0 0	0 0	89 100
Total	132 25.7	136 26.5	243 47.3	2 0.39	1 0.19	514 100

Because there were 44 fewer SW NB pupils interviewed than SW beneficiary pupils and because of incorrect field-matching, only 1,018 child-pairs were available for evaluation for strict matching. But because of incorrectly recorded and/or missing information on measurement dates, ages, height and/or weight measurements, and nutrition status, strict-matching based on gender, age in years and nutrition status could be obtained for only 43 pairs where both beneficiary and NB children had consistently measured height measurements at the pre-feeding initial stage and the time of the survey period (Table 16).

Table 16. Number and percentage of child pairs that are matched on indicated variables and with consistently recorded height measurements

Variable	Number	Percentage (%)
Gender	225	22.1
Age (in years)	86	8.4
Nutrition status	131	12.9
Gender and age	79	7.8
Gender and nutrition status	121	11.9
Age and nutrition status	47	4.6
Gender, age and nutrition status	43	4.2

Table 16 shows that age is the variable which was the most difficult to match, followed by verified nutrition status. The information on both these variables were obtained from SBFP forms or nutrition status reports.

While there are only 43 pairs of strictly matched observations, the data suggest that the SBFP SW and wasted beneficiary pupils were more likely to maintain normal nutrition status. None of the SW and wasted SY 13-14 NB pupils attained normal attrition status (Tables 17a and 17b). The results indicate that, while fewer SBFP SW beneficiary pupils were severely wasted by the time of the survey period, more NB pupils were normal by then. Results of the Wilcoxon signed-rank test indicate that the distribution of the normal status of SBFP beneficiary pupils and NB pupils do not differ significantly ( $p$ -value=0.82).

Table 17a. Change in nutrition status of 43 strictly-matched beneficiary children with consistently measured heights during pre-feeding and survey periods, number and row percentage

Verified pre-feeding nutrition status	Verified survey period nutrition			Total
	Severely Wasted	Wasted	Normal	
Severely Wasted	11 29.7	14 37.8	12 32.4	37 100
Wasted	0 0	1 25	3 75	4 100
Normal	0 0	1 50	1 50	2 100
Total	11 25.6	16 37.2	16 37.2	43 100

Table 17b. Change in nutrition status of 43 strictly-matched non-beneficiary children with consistently measured heights during pre-feeding and survey periods, number and row percentage

Verified pre-feeding nutrition status	Verified survey period nutrition			Total
	Severely Wasted	Wasted	Normal	
Severely Wasted	13 35.1	7 18.9	17 46	37 100
Wasted	0 0	1 25	3 75	4 100
Normal	1 50	1 50	0 0	2 100
Total	14 32.6	9 20.9	20 46.5	43 100

If only the SBFP SW children who attained normal nutrition status at the end of the feeding period are considered, 40% of the 30 such children remained normal until the survey period. The figure is comparable to the corresponding figure for the SY 13-14 NB SW children (46%). Thus it appears that the gains in nutrition status from SBFP can be lost more than 12 months after the feeding if no subsequent interventions are made.

### Attainment of SBFP attendance goal

Of the 198 SBFP pupil beneficiaries verified to be SW prior to feeding and who had school attendance data, only six children, or about 3%, attended school for less than 85% of total school days. The median percentage attendance for the SW children is 97.5%. School attendance of NB pupils, however, is comparable, with 95% of these pupils attending 85% of total school days.

### Assessment of the GPP and EHCP

Nearly all the beneficiary schools implemented the GPP and the EHCP. Some parents mentioned that when the school their child was enrolled in sometimes lacked food, the feeding implementers added vegetables from the school garden to make up for the lack.

The children were taught the importance of good grooming, of washing hands before and after meals, of brushing their teeth and of good nutrition. Nearly all of the children say that they continue to wash their hands before and after eating both at school and at home. But only 69% of the field interviewers found the children to be well-groomed at the time of the interview.

Table 18. Summary of Children’s Responses for EHCP

Activity	Yes	Column Percent (%)	No	Column Percent (%)	Can't Recall	Column Percent (%)
Whether teacher/s taught the importance of wearing clean clothes	1,111	96.52	39	3.39	1	0.09
Whether teacher/s taught the importance of proper haircut	1,092	94.87	57	4.95	2	0.17
Whether teacher/s taught the importance of having short and clean nails	1,122	97.48	27	2.35	2	0.17
Whether teacher/s taught the importance of washing hands	1,140	99.04	11	0.96		
Whether teacher/s taught the importance of brushing	1,119	97.22	31	2.69	1	0.09
Whether teacher/s taught the importance of nutrition from foods	1,120	97.31	30	2.61	1	0.09
Whether child washes hands before and after eating in school	1,100	95.57	51	4.43		
Whether child washes hands before and after eating at home	1,105	96	46	4		

### Attentiveness and sociability of SBFP beneficiary pupils

Based on the teacher’s responses, most of the SBFP children enrolled in their classes improved in attentiveness during the feeding program (96%) as well as after (95%). The children also reportedly became more sociable during the feeding (97%), a development that was sustained after the feeding (96%). Improvement in class attendance was also reported by teachers for 94% of the beneficiary pupils; 92% of the children sustained good attendance.

## **School heads' and teachers' suggestions for improving implementation of the SBFP**

To improve the implementation of the SBFP, about a fifth of the school heads suggested an increase in budget allocation, while about 10% suggested that the program be continued every year in their school in order to sustain the gains obtained. Both these concerns have been addressed in the implementation of the SBFP for SY 14-15 and SY 15-16, although the increase in budget allocation is mainly for administration of the program rather than increase in food budget.

Among 485 teachers who gave comments on the program and/or suggestions to improve the program, about 34% suggested that the program be continued, while 8% suggested that the program be expanded to include all SW pupils, wasted pupils as well, or all pupils. Only 6% mentioned the need for additional budget.

## **SUMMARY, CONCLUSION AND RECOMMENDATIONS**

Improper documentation of date of the activity being undertaken (e.g., pre-feeding measurement, post-feeding measurement, nutrition status measurement), birthdates, ages, and weight and height measurements constrain proper assessment and evaluation of the SBFP feeding program, as it renders proper evaluation of the nutrition status of beneficiary and NB pupils difficult. This constrains the analysis of the impact of the program to a much smaller sample than originally attended.

Based on the available data, it appears that the SY 13-14 SBFP program was generally implemented well, with majority of the school heads, teachers and parents expressing appreciation for the program and with sizeable percentages of the heads and teachers expressing a desire to see the program continued, and if possible, expanded.

It appears, too, that the program falls short of its nutrition status goal; only 62% of SBFP SY 13-14 SW beneficiaries attain normal status at the end of the feeding program as against the target of 70%. The results of the study indicate, however, that various factors beyond the control of program implementers, specifically characteristics and practices of beneficiary families or parents/guardians and the children themselves (age and severity of wasting at start of feeding program, in particular), affect the nutrition outcome. Problems in program implementation constitute only one component.

It is also seen that the nutritional gains of the program are not sustained in the case of many of the SW beneficiaries 12 months or more after the feeding program, suggesting the need to continue the feeding of majority of SW beneficiaries beyond one 100-120 day-feeding cycle, while simultaneously introducing government interventions (not necessarily DepEd -administered) other than feeding programs to address the capacity of disadvantaged families to provide for the nutritional needs of their members.

The program also generally helps improve attentiveness and sociability of beneficiary pupils. Thus if sustained over several feeding cycles, and complemented with other education programs (e.g., improvement of instruction), it could help eventually toward improved classroom performance.

Based on the study's findings, the study team recommends that all schools be provided with the recommended weighing and height-measurement scales, rather than leaving the procurement of such to the resourcefulness of the school heads. All schools need to be provided with these equipment, since non-beneficiary schools also need to submit accurate nutrition status reports, which serve as the basis for determining which schools will be implementing the feeding program.

We also suggest that school heads, school nurses and class advisers, if not all teachers, be trained on the proper use of such scales and on the importance of proper documentation of the pre-feeding, feeding, and post-feeding phases of the program to help in proper selection of beneficiary schools and beneficiary pupils, and in monitoring and evaluating program outcomes.



Given that the administration component of the budget has been increased we also recommend an increase in the food budget allocation and suggest that inflation-adjusted increases be considered as warranted. We also suggest that the DepED review its basis for the 70% figure for its nutrition target, which has since been increased to 80% in the SY15-16 implementation, possibly because wasted children were included in the coverage of the program. But the results of this study indicate that only about 70% of wasted beneficiaries attain normal nutrition status at the end of the program.

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