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**Working Paper**

## Putting prevention of childhood stunting into the forefront of the nutrition agenda: A nutrition sector review

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Putting Prevention of Childhood Stunting  
into the Forefront of the Nutrition Agenda:  
A Nutrition Sector Review

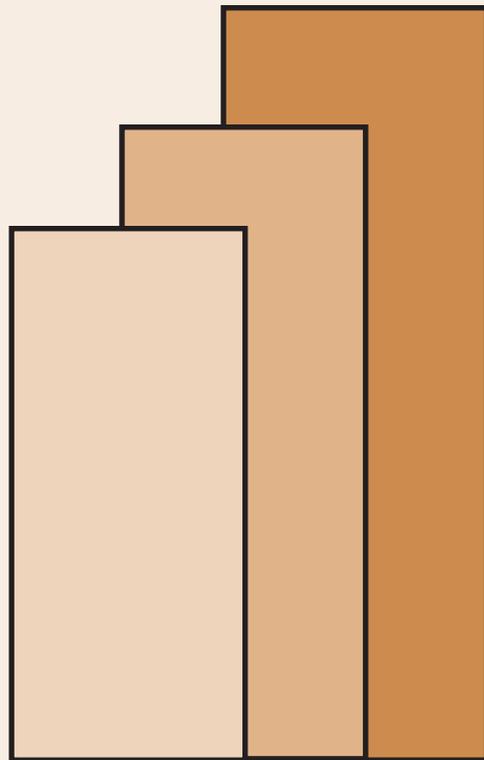
*Alejandro N. Herrin*

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Putting Prevention of Childhood Stunting into the  
Forefront of the Nutrition Agenda  
A Nutrition Sector Review

Alejandro N. Herrin

Report prepared for  
Philippine Institute for Development Studies  
April 30, 2016

# Putting Prevention of Childhood Stunting into the Forefront of the Nutrition Agenda A Nutrition Sector Review

Alejandro N. Herrin

## Abstract

In 2015, based on the latest FNRI survey, childhood stunting affected one-third (33 percent) of children under 5 years. This is equivalent to 3.78 million children in 2015. Moreover, there has been little progress in reducing stunting prevalence in the last 20 years.

The strategic importance of stunting prevention cannot be overemphasized in view of its short and long-term consequences on health, learning and economic productivity and the short period of time in which it can be effectively prevented (the first 1000 days from conception to age two years). Moreover, cost-effective interventions to address the situation are known and regularly updated

Assessments of specific nutrition projects have uncovered various implementation issues of targeting, coordination, management structures, logistics and sustainability. On the other hand, recent sector-level assessment has uncovered a number of structural issues of (a) governance: local mobilization to implement nutrition program; limited resources for nutrition; and organizational –effective coordination by NNC National Secretariat in a devolved set up.

Responding to these structural issues requires a new approach to address them. An approach suggested in the paper is to take advantage of existing opportunities offered, first, by the increasing global interest in child stunting, and second, by the existing platforms for identifying the poor and for delivering and financing health services. The paper outlines an approach for consideration and discussion.

Keywords: Childhood stunting, maternal and child care, micronutrients, health service delivery.

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# Putting Prevention of Childhood Stunting into the Forefront of the National Nutrition Agenda: A Nutrition Sector Review

Alejandro N. Herrin<sup>1</sup>  
April 30, 2016

## Introduction

Recent reviews of the Philippine nutrition situation and effectiveness of interventions highlight, among others, the slow progress in achieving the nation's goals regarding undernutrition of children and mothers and nutrition-related risks of non-communicable diseases (Save the Children 2015, Food and Nutrition Research Institute, 2015). At the international level, knowledge of the determinants, consequences and cost-effective interventions regarding various forms of malnutrition have been updated and synthesized to set the stage for the post-2015 era of sustainable development goals (SDG 2030) (e.g., UNICEF, 2013, IFPRI, 2015). Both sets of reviews are timely in providing needed perspectives in how the Philippines can move forward on the nutrition from starting with a new political administration in 2016.

This paper builds on these reviews to help provide further guidance to the formulation of a more focused and strategic nutrition agenda and a critical set of interventions that can be implemented effectively and financed adequately. This review is organized as follows. First, based on a review of how the nutrition agenda has been formulated in various official Philippine and the evolution of nutrition goals in the international community, the paper suggests that the goal of preventing childhood stunting be placed in the forefront of the national nutrition agenda.

Secondly, based on a review of various frameworks to guide understanding of the determinants and consequences of childhood stunting, the paper describes a simple framework that helps to bring together various dimensions of the childhood stunting problem: (a) the key determinants (pathogenesis) based on the interplay between dietary intake and infection; (b) the short- and long-term consequences (survival, learning, and economic productivity); (c) the short window of opportunity to prevent stunting (the first 1,000 days from conception to the first two years of the child's life); (d) the link between childhood stunting and chronic diseases; and (e) the intergenerational aspects of childhood stunting.

Thirdly, we use the framework to organize existing information on the Philippine's interrelated child and maternal nutrition situation in terms of key nutrition outcomes and coverage of nutrition and health interventions. Fourthly, we review current assessments of the implementation of the nutrition program to uncover underlying structural problems that hinder achievement of greater impacts. Fifthly, on the basis of the underlying structural problems, we propose an approach for delivering and financing nutrition interventions using existing platforms, in particular the social protection platform and the health services and financing platforms. Finally, the concluding section outlines areas for further research and analysis, including the regular estimation and publication of nutrition expenditures (nutrition accounts) as a sub-account of the National Health Accounts.

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<sup>1</sup> The author wishes to express appreciation to Corazon VC Barba for comments and guidance, and to Maria Bernardita T. Flores, Maria Lourdes A. Vega and National Nutrition Council staff for discussion of key ideas during the course of preparation of this paper.

## **Putting Childhood Stunting Prevention in the Forefront of the National Nutrition Agenda**

Malnutrition has many forms: malnutrition among infants and young children, school-age children, adolescents, and mothers; micronutrient deficiencies across all age groups; and obesity and risks of non-communicable diseases among adults. Data from the Food and Nutrition Research Institute (FNRI) and from the National Demographic Health Survey (NDHS) provide a wide range of data on nutritional status of different population groups, behavioral outcomes and coverage of nutrition and health interventions. However, because these many forms of malnutrition are often described separately, there is a need to analyze their interrelationships in order to formulate a more focused agenda with an integrated set of interventions.

This section reviews how the nutrition agenda has been formulated in the Philippines based on most recent official documents and then looks at recent developments in the international community regarding how global nutrition goals have evolved. It concludes with a suggestion of adopting a more focused and strategic nutrition agenda centered on the prevention of childhood stunting.

### *The Philippine Nutrition Agenda*

The Philippine nutrition agenda adopted by the Philippine Development Plan (PDP) 2011-2016 and its Midterm Update (NEDA, 2011; NEDA, 2014) is subsumed under the MDG Goal 1: Eradicate Extreme Poverty and Hunger, Target 1.C: Halve, between 1990 and 2015, the proportion of people who suffer from hunger. The target indicators adopted and tracked include: (a) prevalence of underweight children under 5 years of age; (b) percent of households with per capita energy less than 100% adequacy; (c) proportion of population with mean one-day energy intake less than 100% adequacy; and (d) proportion of population below national subsistence (food) threshold (PSA, MDG Watch, 2015)

The nutrition problems are discussed under the subsector “Health, Nutrition and Population” of the large “Social Development Sector”. Related goals discussed include those on maternal mortality, child mortality, and access to reproductive health. Sectoral policies and strategies include focus on population groups at risk of malnutrition (pregnant women, infants, children 1-2 years old, underweight children 0-5 years old) and LGUs with high levels of child undernutrition or risk of undernutrition. It also includes a wide range of interventions from nutrition-specific Infant Young Child Feeding (IYCF), micronutrient supplementation and fortification, to health interventions and sanitation, and to broadly specified nutrition-sensitive interventions in food production and employment.

At the Department of Health, its “National Objectives for Health 2011-2016” adopted the strategic objective of reducing the proportion of people who suffer from hunger and malnutrition (DOH, 2011). A similar set of indicators as in the PDP 2011-2016 are adopted, namely: per capita energy intake, underweight children under 5 years, and other nutrition-specific indicators including iron deficiency anemia, Vitamin A deficiency and iodine deficiency, and the proportion of children exclusively breastfed until six months. Targeting nutritionally-at-risk and vulnerable populations using the Conditional Cash Transfer (CCT) beneficiaries, the strategies include promotion of optimum infant and young child feeding practices, implementation of guidelines for the community-based management of acute malnutrition, increasing the supply and consumption of micronutrients (Vitamin A and iodine), and integration of nutrition services in the maternal continuum of care and in school and alternative school systems. (Interestingly, among the strategies include priority to pregnant and lactating mothers, but there is no target for lactating mothers, and to reduce prevalence of underweight and stunted under-5 children, but there is no target for stunting.)

At the National Nutrition Council, the overall planning for addressing nutrition problems has been more comprehensive, targeting improvements in all nutrition indicators and correspondingly adopting a wide range of interventions. This is evident in the latest PPAN 2011-2016 (NNC, 2011) and Midterm Update (NNC, 2014). The stated challenges include: (a) hunger continues to be a serious concern; (b) underweight, stunting, wasting continue to be serious nutritional problems; (c) significant improvements in micronutrient malnutrition but levels still of public health significance; (d) over-nutrition is also increasing among children and is at a high level among adults. Corresponding sets of indicators with baseline (2008) and targets (2016) for relevant population groups are adopted for hunger; underweight, stunting and wasting; vitamin A deficiency; anemia; iodine deficiency; and overweight and obesity.

Strategies and priorities for action cover eight sets of interventions including (a) a set of nutrition-specific interventions (i.e., promotion of IYCF, increasing supply and consumption of micronutrients, management of acute malnutrition, nutrition services in antenatal care, integration of nutrition services in schools); (b) a set of health interventions (management of infection and promotion of healthy lifestyle); (c) water and sanitation; and (d) a set of broad interventions related to increasing food supply, ensuring universal health insurance coverage, and managing population size, growth and distribution.

Examination of the data on nutrition outcomes reveal mixed results, namely: limited progress in preventing child malnutrition, reducing micronutrient deficiencies (except Vitamin A and anemia), and arresting the increasing incidence in risk factors for non-communicable diseases. (These will be described in detail later in Section 3.) It may be noted that the MDG child nutrition target (reduction of underweight prevalence by half) was not achieved: the baseline prevalence in 1992 was 26.5 percent, the target was to reduce this to 13.3 percent by 2015. The latest FNRI report based on the 2015 Updating Survey shows the prevalence of underweight was 21.5%. Similarly, the National Nutrition Council, in its Midterm Update of 2014 assessed that practically all of its the targets in the PPAN 2011-2016 are unlikely to be achieved by 2016.

A review of past assessments of the performance of the nutrition sector and specific interventions reveal major gaps in implementation and outstanding operational issues. Moving forward, there is a need to focus attention of the most critical nutrition problem and place this at the forefront of the overall nutrition agenda. There is also a need to narrow down the set of interventions to those that have been found to be cost-effective and those that can be delivered effectively and financed adequately. We return to a discussion of these items in later sections of this paper.

### *Global Nutrition Goals and Targets*

In 2012, the World Health Assembly endorsed a resolution on maternal, infant and young child nutrition which adopted a set of global nutrition targets (WHO 2012; 2014). These targets included a reduction in stunting and wasting in children under 5 years old, reduction in anemia in women, reduction in low birthweight, no increase in childhood overweight, and increase in the rate of exclusive breastfeeding in the first six months.

Prevention of stunting has increasingly gained international attention. The reasons for this, as summarized by Onis, et al. (2013, pp. 6-7 ) are as follows: (a) it affects a large number of children globally; (b) it has severe short-and long-term health and economic consequences (poor cognition and educational performance, low adult wages, lost productivity and, when accompanied by excessive weight gain later in childhood, increased risk of nutrition-related chronic diseases); (c) there is



international agreement on its definition and measurement and a standard that defines normal human growth which is applicable everywhere; (d) there is an agreement on a critical window – from conception to the first two years of life – within which linear growth is most sensitive to interventions related to feeding, infections and psychosocial care; (e) it is a cross-cutting problem calling for a multisector response in food and nutrition security, education, water, sanitation and hygiene (WASH), health, poverty reduction and the status of women”.

In September 2015, the United Nations General Assembly adopted a resolution: “Transforming Our Future: The 2030 Agenda for Sustainable Development” calling for the achievement of 17 Sustainable Development Goals by 2030. Nutrition falls under “Goal No. 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture.” Under this goal, the nutrition indicator is “Indicator 2.2: By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons.”

In sum, based on a better understanding of nutrition problems, the prevention of childhood stunting has become an important international concern. In 2012, the World Health Assembly adopted childhood stunting as major target for reduction from 2010 to 2025, while the UN General Assembly adopted in 2015 the Sustainable Development Agenda that included stunting prevention as an important target.

#### *Putting Childhood Stunting Prevention into the Forefront of National Nutrition Agenda*

In the Philippines, based on the results of the FNRI survey of 2015, childhood stunting affected one-third (33.4 percent) of children under 5 years. This is equivalent to 3.78 million children in 2015. Moreover, there has been little progress in reducing stunting prevalence in the last 20 years.

The strategic importance of stunting prevention cannot be overemphasized in view of its short and long-term consequences on health, learning and economic productivity and the short period of time in which it can be effectively prevented (the first 1000 days from conception to age two years). Moreover, cost-effective interventions to address the situation are known and regularly updated (Bhutta, et al. 2015; Das et al. 2016; WHO eLENA).

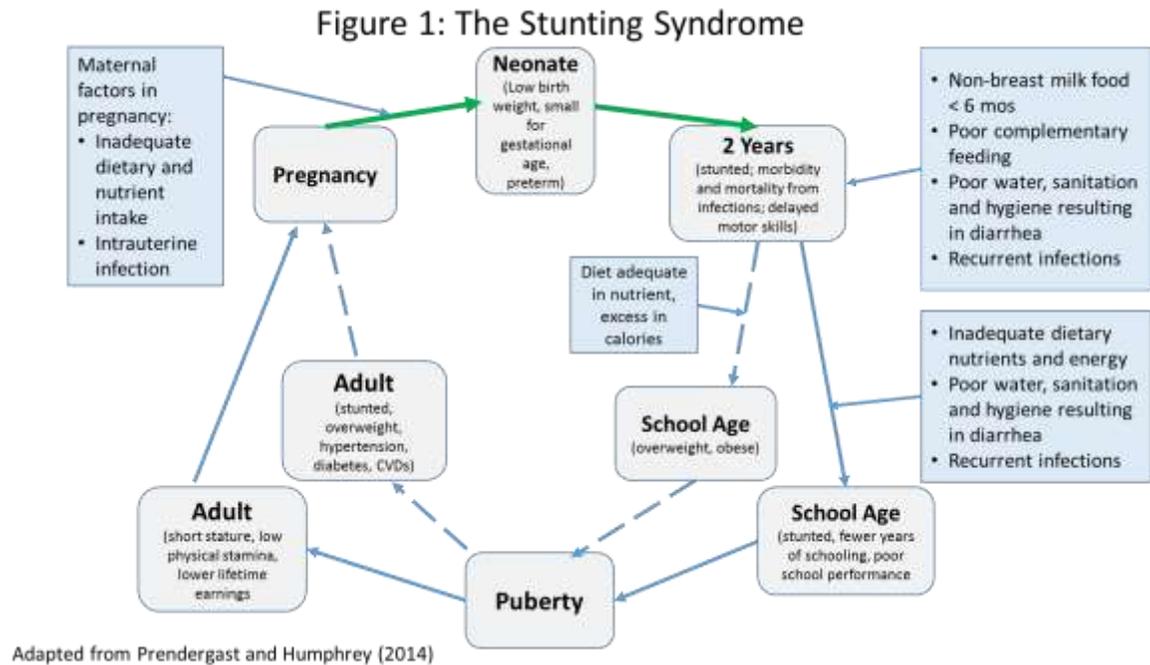
There is a need to adopt a more focused and strategic nutrition agenda with a similarly focused set of cost-effective interventions that can be effectively delivered and adequately financed. Putting stunting prevention into the forefront of the national nutrition agenda is a strategic move to produce greater impacts on health and education in the short and medium-term and on economic productivity and inclusive growth in the longer term. To guide the implementation of a program for prevention of childhood stunting, we review its proximate determinants and the known cost-effective interventions.

#### **A Framework for Childhood Stunting Prevention: The Stunting Syndrome:**

Addressing the stunting problem requires a better understanding of its determinants and consequences. There are various conceptual frameworks describing the determinants of stunting emphasizing the interplay of inadequate nutrient intake and disease against the backdrop of underlying causes: household food insecurity, inadequate care and feeding practices, unhealthy household environment and inadequate health services. These include the conceptual framework of the determinants of maternal and child undernutrition (UNICEF, 2013); conceptual framework on childhood stunting: context, causes and consequence (WHO 2013); pathways to infant and child wasting and stunting (Khara

and Dolan, 2014); potential causal pathways for long term consequences of stunting (Dewey and Begum, 2010); and stunting syndrome (Prendergast and Humphrey, 2014). However, there is a need for a more unifying framework that puts together the various pathways of the stunting condition into clearer cause-effect perspective. The same perspective of functionally linked causes and effects also serve to identify the cost-effective interventions.

For this purpose, we adopt the stunting syndrome framework suggested by Prendergast and Humphrey (2014) in which “multiple pathological changes marked by linear growth retardation increase morbidity and mortality and reduce physical, neurological development and economic capacity ... Stunting is a cyclical process because women who were themselves stunted in childhood tend to have stunted offspring, creating and intergenerational cycle of poverty and reduced human capital that is difficult to break, although potential windows of opportunity have been identified” (Prendergast and Humphrey, 2014, p. 251). A quick summary of the elements of the stunting syndrome is provided below with the aid of Figure 1 (see also discussion in Das, et al. 2016).



### *Proximate Determinants and Consequences<sup>2</sup>*

During **pregnancy**, maternal factors that affect the birth outcome include poor diet and infection. Short maternal stature, low body mass index and poor weight gain during pregnancy are associated with low birthweight and Small for Gestational Age (SGA). Studies reviewed by Prendergast and Humphrey (2014) suggest that prenatal multiple micronutrients and provision of balanced energy and protein to mothers

<sup>2</sup> Contributions to the international literature based on longitudinal studies include studies under the Cebu Longitudinal Health and Nutrition Survey (CLHNS). Description of the CLHNS and key findings are described in Adair, et al., 2011 and Borja, 2013). Specific studies on the relationships among maternal age and nutrition, birth outcomes, childhood stunting, schooling performance, and risk of cardiovascular disease are included in the list of references.

reduce SGA, while iron supplementation during pregnancy reduces low birthweight (LBW), both birth outcomes are risk factors of stunting.

From **birth to 6 months of age**, exclusive breastfeeding provides benefits in terms of reduced morbidity and mortality and improved cognition. Important factors contributing to stunting from **6 to 24 months** are the introduction of non-breast milk food before 6 months, poor complementary feeding practices, poor WASH (water, sanitation and hygiene) resulting in diarrhea, and recurrent infections.

To complete the cycle beyond the first 1,000 days are two divergent paths – one where resources are constrained, and the other where resources are more abundant. Under the resource constrained environment, inadequate dietary nutrients and energy, poor WASH resulting in diarrhea, and recurrent infections contribute to further stunting at school age and fewer years of schooling and poor school performance. As an adult, short stature and low physical stamina result in lower lifetime earnings.

On the other hand, under a more abundant resource environment, diet adequate in nutrient but with excess calories lead to overweight and increased weight-for-age relative to height-for-age at school age, and as an adult, stunted, overweight and at risk for hypertension, diabetes and cardiovascular disease.

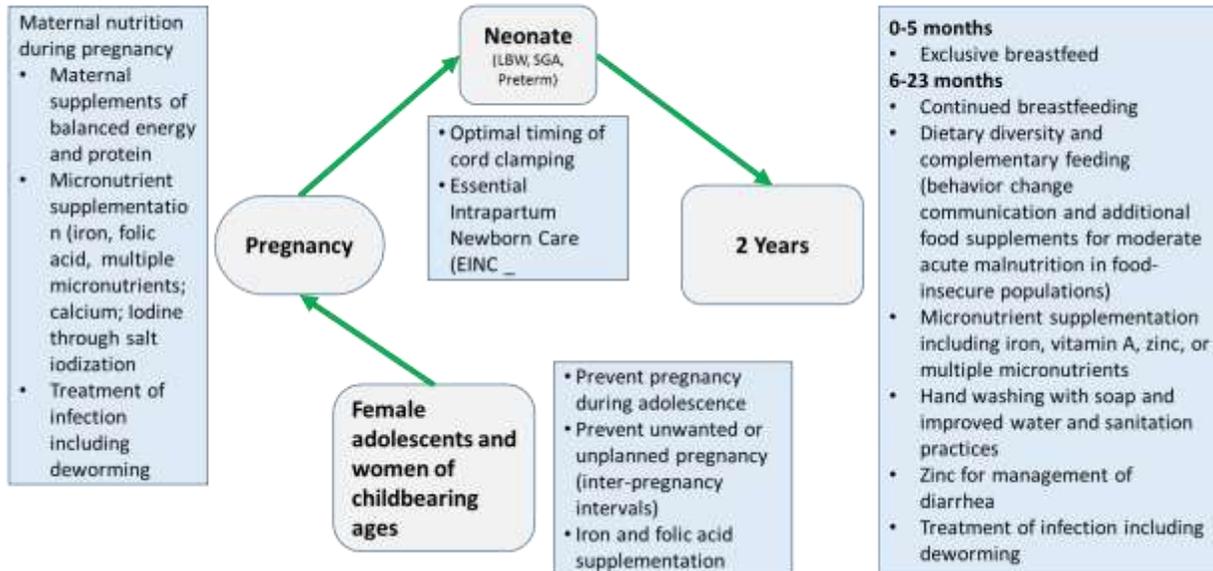
The consequences of the stunting syndrome can be looked at in the short-term in terms of mortality from infections, in particular pneumonia and diarrhea. In the medium-term stunting affect the cognitive, education and behavioral aspects of child development. In the long-term, children who become stunted between conception and 2 years of age are at greater risk of poor health and lower socio-economic attainment throughout their lifetime. Short stature translates into lack of physical stamina, and poor cognition resulting in lower economic productivity and wages.

The effects are intergenerational: low birthweight is more common among infants whose mothers were themselves stunted during early childhood. On the other hand, nutritional deprivation during fetal or infant life triggers changes in body function that result in elevated risks of hypertension, cardiovascular disease and type 2 diabetes, especially when aggravated by rapid weight gain and obesity after age 2 years.

#### *Critical Interventions during the First 1,000 Days*

Knowledge of the critically needed interventions that are demonstrated to be cost-effective have converged to a narrow set that corresponds to the determinants identified in the framework. Recent reviews of evidence regarding the effects of interventions are provided by Bhutta et al. (2013), Prendergast and Humphrey (2014), WHO Nutrition Interventions Electronic Library of Nutrition Action (eLENA), and Das et al. (2016). We summarize the results below with the aid of Figure 2.

Figure 2: Interventions: The First 1,000 Days



Sources Bhutta, et al. (2013), WHO Nutrition Interventions (eLENA), and Das et al. (2016)

During pregnancy, maternal balanced energy and protein supplementation and iron or iron-folate supplementation and multiple micronutrient supplementation reduce risk of SGA (small for gestational age) and low birth weight. Both in turn are risk factors for stunting.

At birth, delaying cord clamping allows blood flow between the placenta and neonate to continue, which may improve iron status in the infant for up to six months after birth. Early skin-to-skin care in neonates reduces prevalence of hypothermia and increase breastfeeding at 1-4 months of age and increased duration of breastfeeding.

For infants, breast milk contains all the nutrients an infant need in the first six months of life. Breastfeeding protects against diarrhea and common childhood illnesses such as pneumonia. WHO recommends initiation of breastfeeding within one hour of birth, exclusive breastfeeding of infants until six months of age and continued breastfeeding until two years of age or older. Counseling or educational interventions increase exclusive breastfeeding. However, combined individual and group counselling seemed to be better than individual or group counselling alone.

From six months to two years old is a critical period of growth during which nutrient deficiencies and illnesses contribute to undernutrition among children. Appropriate complementary feeding (the transition from exclusive breastfeeding to family foods) affects height and weight gain and stunting.

Multiple micronutrient supplementation including iron in children have significant effects on height and weight and reduction in anemia. Zinc supplementation improves height. It also reduces the risk of morbidity from childhood diarrhea and pneumonia in infants and young children. Zinc in the management of diarrhea reduces the duration of acute diarrhea and persistent diarrhea.

Vitamin A supplementation reduces the incidence of diarrhea and measles. In turn, infection is a risk factor in stunting and wasting. WASH interventions reduces diarrhea. Deworming in children (for soil

transmitted intestinal worms) reduces risk of infections that can impair nutritional status by causing internal bleeding which can lead to loss of iron and anemia; malabsorption of nutrients, diarrhea and loss of appetite, which can lead to a reduction in energy intake.

Finally, interventions exist in relation to adolescent health and nutrition before the first pregnancy and between pregnancies by providing family planning information and services to prevent early pregnancy, and closely spaced pregnancies thereafter. The aim is to reduce the risk of SGA births. Moreover, addressing micronutrient deficiencies in adolescents can help reduce preconception anemia, which has been found to be associated with poor fetal and neonatal outcomes (Borja and Adair, 2003; Bhutta et al., 2013).

## **Child and Maternal Nutrition Outcomes and Coverage of Interventions**

Data from the Food and Nutrition Research Institute (FNRI) based on the National Nutrition Surveys (NNS) and Updating Surveys and from the National Demographic and Health Survey (NDHS) are used to see how the various deficiencies described in the framework manifest themselves in the Philippine population<sup>3</sup>. The data, organized around the First 1,000 Days framework of Figure 2, reveal where the deficiencies are in both nutritional outcomes and coverage of interventions. There are summarized below based on data compiled in Annex A.

### **Outcomes**

#### *Prevalence of stunting, underweight, wasting and overweight in children<sup>4</sup>*

There was little progress in reducing the prevalence of stunting and underweight among children under 5 in the last 20 years., but wasting and overweight are slightly rising (See Figure 3, also found in Annex A). The latest FNRI survey of 2015 shows that the situation has remained the same, and that stunting may in fact have increased from 2013 survey. In 2015, the prevalence of stunting, underweight, wasting

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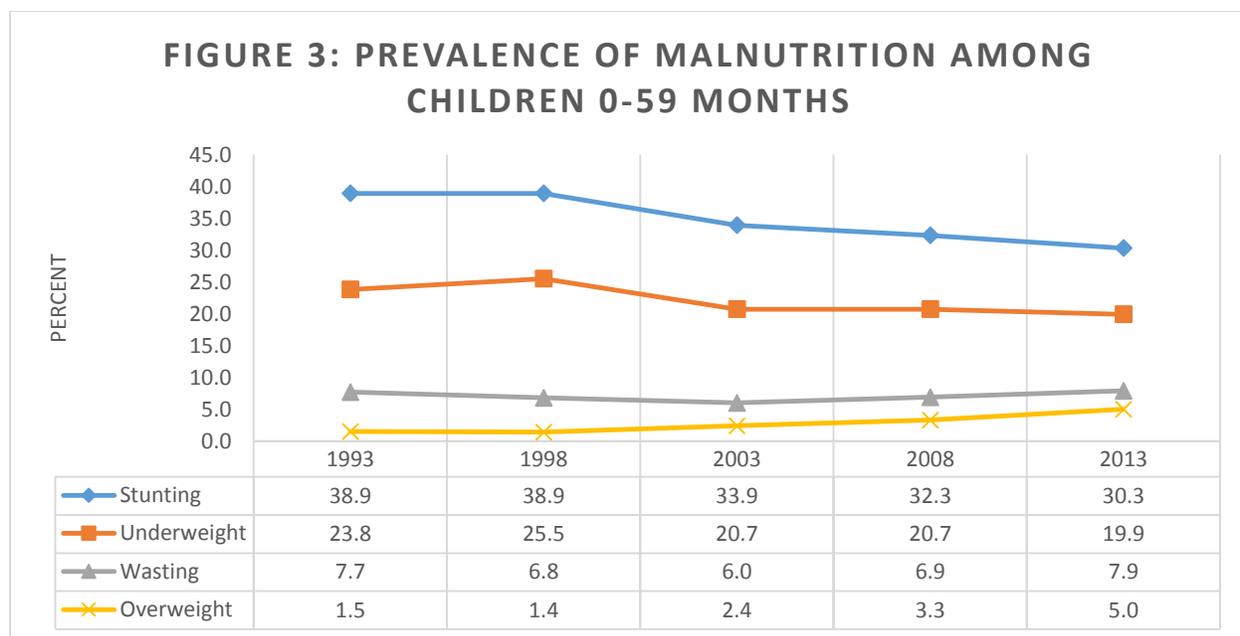
<sup>3</sup> To provide as complete a picture of the situation of mothers and their children, we use both NDHS and NNS data since some information is found only in one source and not in the other. However, we note that there are differences in the NDHS and NNS data with respect to the reference period. In general, NDHS data refer to pregnancy, delivery and postnatal care with reference to the last birth during the five years preceding the survey. In the NNS, the reference is usually 0-36 months. In the case of breastfeeding and complementary feeding in the NNS survey, the reference is with respect to children 0-23 months. The differences between the NDHS and NNS is described more fully in FNRI DOH Philippine Nutrition Facts and Figures 2013 (2015).

<sup>4</sup> Child malnutrition can manifest itself in several ways. It is most commonly assessed through measurement of a child's weight and height. **Stunting** reflects chronic undernutrition during the most critical periods of growth and development in early life. It is defined as the percentage of children aged 0-59 months whose height for age is below minus two standard deviations from the median of the WHO Child Growth Standards. **Wasting** reflects acute undernutrition. It describes a recent or current severe process leading to significant weight loss, usually a consequence of acute starvation or severe illness. It is defined as the percentage of children aged 0-59 months whose weight for height is below minus two standard deviations (from the median of the WHO Child Growth Standards). **Underweight** is a composite form of undernutrition that includes elements of stunting and wasting. It is defined as the percentage of children aged 0-59 months whose weight for age is below minus two standard deviations minus three standard deviations (severe underweight) from the median of the WHO Child Growth Standards. **Overweight** is defined as the percentage of children aged 0-59 months whose weight for height is above two standard deviations from the median of the WHO Child Growth Standards. (UNICEF, Improving Child Nutrition: The Achievable Imperative for Global Progress, 2013).

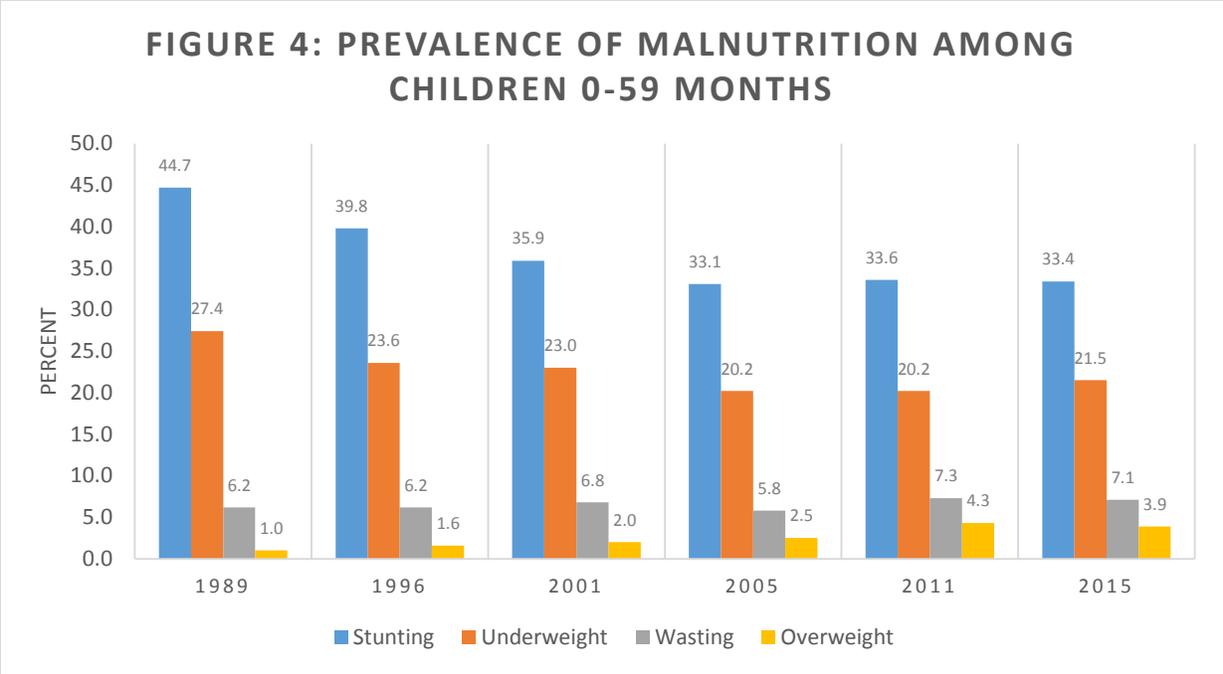
and overweight are 33.4 percent, 21.5 percent, 7.1 percent and 3.9 percent, respectively. These translated to 3.78 million children less than 5 years old in 2015. The figures for underweight, wasting and overweight are 2.44 million, 804,236 and 441,176, respectively.

Note that Figure 3 (also found in Annex A) includes data only from the NNS conducted at five-year intervals ending in 2013. Figure 4 (also found in Annex A) also include data from the Updating Surveys conducted with at least a five-year interval ending in 2015. The reason for separating out the series in five-year intervals is to highlight the fact that children observed from survey year to the next represent a different cohort of children under 5 years. Those reported in the 2013 survey are children less than 5 years in 2013. Using 2013 as the point of reference, those reported in the 2008 survey are age 5-9 years, while those reported in the 2003 survey are now age 10-14 years, those reported in the 1998 survey are now age 15-20 years, and finally, those reported in the 1993 survey are now age 20-24.

With little change in the stunting prevalence since 1993, we see more than three million surviving children under 5 years among the various age groups from under 5 years to 20-24 years in the 2013 population who have been stunted in childhood. Thus in 2013, we could expect to experience the long-term consequences on productivity of childhood stunting in 1993, and the medium-term consequences on schooling of childhood stunting back in 1998. Moreover, stunted female children in 1993 and 1998 are at higher risk of giving birth to stunted children in 2013.



Source: FNRI, National Nutrition Surveys as reported in FNRI (2015)



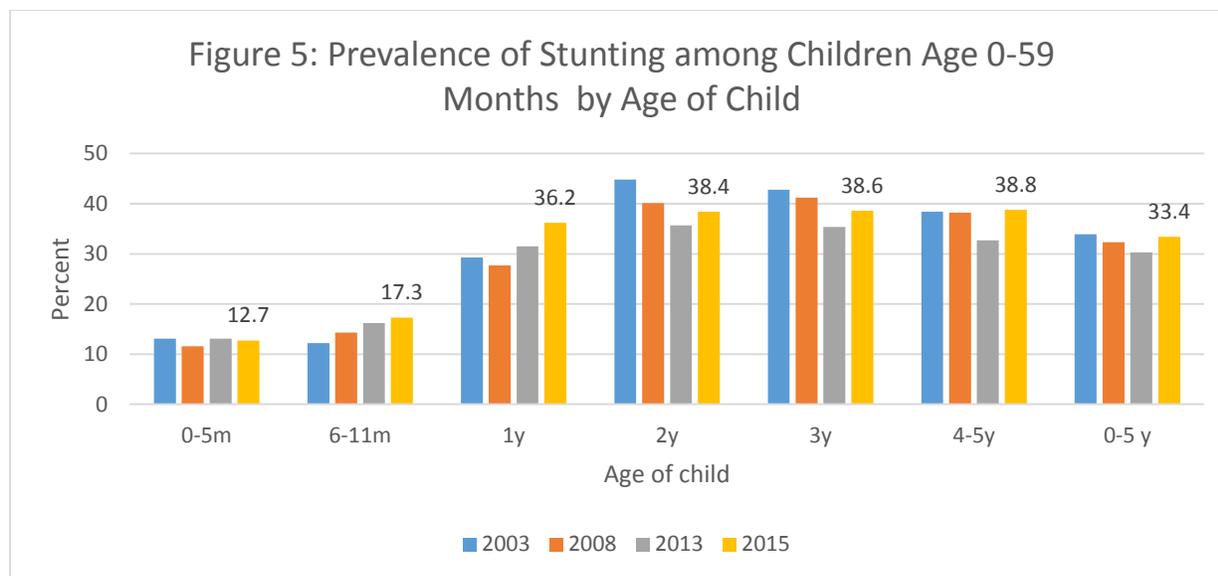
Source: FNRI, Updating Surveys as reported in FNRI (2015) and FNRI (2016)

The focus on childhood stunting in the international community represent shift in the choice of target indicator for child undernutrition from the underweight (weight-for-age) used in the MDG 2015 to stunting (height-for-age) in the WHO and SDG 2030 targets. Underweight is a composite measure which reflects two different dimensions of child undernutrition in a single measure, namely wasting (weight-for-height, which measures current nutritional status) and stunting (height-for-age, which measures long-run nutritional status). In settings where stunting is highly prevalent and wasting is rare, underweight underestimates the burden of undernutrition (Prendergast and Humphrey, 2014; Ruel, Rivera and Habicht, 1995). Indeed, if we use underweight as a measure, the 2015 prevalence of 21.5 percent translates to 2.44 million under-5 children. In contrast, using 2015 stunting prevalence, the burden of child undernutrition is 3.78 million children under-5 years.

The advantage of stunting over underweight as a goal and indicator is best described by Horton and Hoddinott (2014): “Stunting is a better goal than underweight. It is an excellent measure of the health, diet and care provided to children during the 1000 days from conception to age two. Although it is not quite as predictive of mortality as underweight, it is much more predictive of economic outcomes (cognitive scores, education and wages)”. However, they also stress the need to complement stunting data with additional information on wasting (to reflect short-term problems) and overweight/obesity.

It should be noted that while indicators of child undernutrition are typically measured and described separately, there may often in fact be the coexistence of multiple anthropometric deficits in the same child. Multiple deficits increase the risk of child mortality (McDonald, et al., 2013; Olofin et al., 2013; Khara and Dolan, 2014). Likewise, multiple micronutrient deficits can also occur in the same child and anthropometric and micronutrient deficits are likely to be also coexistent. The FNRI could include tabulations of this potential coexistence of multiple deficits in the same child in their regular nutrition reports.

In view of the known window of opportunity to effectively prevent child stunting – within the 1000 days from conception to 2 years of age (Victora, et al. 2010) – we examine stunting data by age of child under 5 years. This is done in Figure 5 (also found in Annex A; henceforth, all other figures referred to in the text will be found in Annex A). We see stunting increasing in infants age 0-5 months and 6-11 months, then to age 1 and then to age 2, beyond which stunting prevalence tend to remain at high levels. A more sensitive indicator for assessing progress towards preventing stunting is to look at the prevalence of stunting at age 2 years, since this represent the window of opportunity for prevention, beyond which the effects of stunting are irreversible. In 2015, the stunting prevalence was 38.4 percent, an upturn from 2013 from what seemed to be a downward trend from 2003 to 2013.



Source: FNRI, NNS 2003, 2008 and 2013 and Updating Survey 2015

The national average in childhood stunting hides the variation across wealth quintiles and regions. Children from poorer households have higher rates of stunting than richer households (Figure 8), while relatively higher rates of overweight children are found among richer households than poorer households (Figure 10). There is no definite pattern for wasting (Figure 9).

There is wide variation in child stunting across regions, with the three highly advanced regions of NCR, Central Luzon and CALABARZON exhibiting lower stunting prevalence, averaging around 25 percent in 2015. In contrast stunting prevalence in Bicol, MIMAROPA, Eastern Visayas, Western Visayas and SOCCSKSARGEN is around 40 percent, while ARMM had the highest stunting prevalence at 45 percent (Figures 12 and 13). Stunting prevalence is generally higher in rural than in urban areas (Figure 14).

Compared to other countries, the Philippines is 9th among 14 countries where 80 percent of world's stunted children live (UNICEF 2013). The prevalence of child malnutrition in selected countries is shown in Figure 16.

#### *Prevalence of nutritionally-at-risk pregnant and lactating women*

Maternal nutrition and health during pregnancy are important, which can affect birth outcomes. One-fourth of pregnant women were nutritionally-at-risk in 2015 with little change in the last 10 years (Figure 17). Women under 20 years have higher prevalence of nutritionally-at-risk pregnant women at



37.2 percent compared to older women. Women in the poorest quintile are more nutritionally at-risk (36.0 percent) compared to the richest women (14.4 percent) (Figure 18). Corresponding data for lactating women are shown in Figures 19 and 20.

#### *Micronutrient deficiencies in pregnant and lactating women*

Prevalence of anemia among pregnant and lactating women show substantial declines, almost by half, between 2008 to 2013 (from 43 percent to 25 percent) although the prevalence is still a public health concern (Figure 21). Younger women (less than 20 years old) tend to be more anemic than older women (30 percent vs 25 percent), while differences by wealth quintiles do not show a definite pattern (Figure 22). Similar data for lactating women are shown in Figure 23. On the other hand, the prevalence of iodine deficiency has increased between 2003 and 2013 for both pregnant (from 18.0 percent to 27.0 percent) and lactating women (from 23.7 percent to 34.3 percent) (Figure 24).

#### *Birth outcomes*

Poor nutrition and micronutrient deficiencies during pregnancy are risk factors for poor birth outcomes. Data from the NDHS show that low birth weight babies are associated with young mothers less than 20 years old and older mothers age 35-39 years (25 percent vs 20 for women 20-34 years) (Figure 25). A similar pattern is observed for preterm births. Additionally, higher preterm births are observed among first order births (Figure 26). The incidence of low birthweight in 2013 of 21.4 percent is the highest among several countries in the region. The incidence of low birthweight around the period 2009-2013 in Thailand is 11 percent, in Malaysia is 11 percent, in Singapore is 10 percent, in Indonesia is 9 percent, and in Vietnam is 5 percent (UNICEF, 2015).

#### *Micronutrient deficiencies in children*

There have been substantial declines in the prevalence of anemia among children during the past 10 years, 2003 to 2013. Although the prevalence for infants aged 6 months to less than 1 year declined from a high of 66 percent in 2003 to 40 percent in 2013, the prevalence was still considered severe. (Figure 27).

In 2013, the prevalence of anemia among children aged 6 months to 1 year are relatively high in the three lowest quintiles (from 45 percent to 49 percent) compared to the top two quintiles (from 28 percent to 32 percent). For children aged from 1 to 5 years, the prevalence is relatively low (from 10 percent to 15 percent) across quintiles except for the top quintile which had the lowest prevalence of 5 percent (Figure 29).

Vitamin A deficiency among children 6 months to 5 years has declined from 40 percent (severe) in 2003 to 15 percent (moderate) in 2008 (Figure 30). The prevalence is generally higher among children age 6-23 months than children aged 24-59 months (moderate) in the three lower quintiles (Figure 31).

Zinc deficiency among children 6-23 months as well as children 24-59 months have high (greater than 20 percent) prevalence in the bottom three quintiles and moderate in the top two quintiles (Figure 32).

## Summary

Available reports typically present data separately by condition and characteristics of children or women and, thus far, we have described them in the same way here. To get a better picture of the nutritional status of children, pregnant women and female adolescents as it relates to the stunting syndrome, we summarize key findings into Table 1 below

**Table 1: Summary of Nutritional Status of Children, Pregnant Women and Adolescents**

<b>Children Under 5 Years of Age</b>							
<b>Age of child</b>	<b>0-59 mos.</b>	<b>0-5 mos.</b>	<b>6-11 mos.</b>	<b>1 yr</b>	<b>2 yrs</b>		<b>Survey year</b>
Stunting	33.4	12.7	17.3	36.2	38.4		2015
	1-5 yrs	6 mos.-1 yr		1 yr	2 yrs		
Anemia	11.2	40.5		24.7	13.9		2013
	<b>6 mos-5 yrs</b>						
Vitamin A	15.2						2008
<b>Wealth quintile</b>	<b>Total</b>	<b>Poorest</b>	<b>Poor</b>	<b>Middle</b>	<b>Rich</b>	<b>Richest</b>	
Stunting	33.4	49.2	39.5	31.5	22.1	14.8	2015
Anemia (6 mos.-1 yr)	40.5	44.9	47.6	48.6	28.1	31.6	2013
Vitamin A deficiency							2008
6-23 mos.		21.7	16.4	19.3	17.8	8.3	
24-59 mos.		15.5	12.7	10.2	19.0	8.6	
Zinc deficiency							2008
6-23 mos.		28.2	21.8	18.0	11.4	17.8	
24-59 mos.		26.1	19.8	21.9	15.3	16.1	
<b>Pregnant women</b>							
<b>Age of woman</b>	<b>Total</b>	<b>&lt;20 yrs</b>	<b>≥20 yrs</b>				
Nutritionally at risk	24.8	37.4	22.6				2015
Anemia	24.6						2013
Iodine deficiency	27.0						2013
Vitamin A deficiency	9.5						2008
<b>Wealth quintile</b>	<b>Total</b>	<b>Poorest</b>	<b>Poorest</b>	<b>Middle</b>	<b>Rich</b>	<b>Richest</b>	
Nutritionally at risk	24.8	30.0	26.5	24.7	25.9	14.4	2015
<b>Female Adolescents age 13-19 years</b>							
<b>Age of adolescent</b>	<b>Total</b>	<b>10-12 years</b>	<b>13-15 years</b>	<b>16-19 years</b>			
Stunting	29.1	30.0	27.6	29.9			2015
Anemia	10.4	5.3					2013
Vitamin A deficiency	4.6						2008
Folate deficiency							2008
Serum folate	40.3						
Red cell folate	21.3						
<b>Wealth quintile</b>	<b>Total</b>	<b>Poorest</b>	<b>Poorest</b>	<b>Middle</b>	<b>Rich</b>	<b>Richest</b>	
Stunting (both sexes)	31.6	47.6	37.2	28.6	22.3	15.5	2013
Iodine deficiency (female)	20.0	28.2	22.5	19.1	15.4	13.1	2013

Sources: FNRI (2015) for anthropometric measures; Agdeppa (2015) for micronutrients.

For children under 5 years, in 2015, out of 100 children 33 were stunted, 7 were wasted, and 4 were overweight. In addition, 11 of those 1-5 years suffered from iron deficiency anemia and 15 of those 6 months to 5 years suffered from vitamin A deficiency.

Stunting increased from early infancy to 2 years from 13 children out of a 100 under 5 months to 38 per 100 children at 2 years old. Iron deficiency anemia is particularly high affecting 40 of 100 of infants 5 months to 1 year but declining to 14 of 100 by age 2 years.

Looking at children by wealth quintiles, we find that among children under 5 years, about half of children in the poorest households are stunted compared to only 15 of 100 among the richest households. But even in the second and middle wealth quintiles, a third of children are stunted, indicating that stunting occurs among a wider range of poor households. Similarly, among children aged 6 months to 1 year, close to half suffer from iron deficiency anemia in each of the three lowest wealth quintiles, and slightly lower only in the two top quintiles. This suggests that, as in stunting, not only are the poorest of the poor affected but even those in the middle quintiles. Vitamin A deficiency is still of public health significance among infants and young children up to 2 years old. Zinc deficiency is high especially among children in the lowest three quintiles, but is a concern even among the higher quintiles. Children who are stunted are most likely to be deficient in micronutrients.

Among pregnant women, out of a hundred pregnant women, 25 are nutritionally-at-risk (35 among women less than 20 years of age), 25 are iron deficient (anemic), 27 are iodine deficient, and 10 are deficient in vitamin A. The 25 nutritionally-at-risk are most likely to be also those deficient in micronutrients.

Among adolescents aged 13-19 years of both sexes (available reports did not distinguish by sex), 19 out of 100 are stunted, 10 have anemia, 40 are deficient in serum folate while 21 are deficient in red cell folate. By wealth quintile. Among female adolescents aged 13-19 years 28 of 100 in the poorest households are iodine deficient. The numbers decline as we move towards richer households (Figures 73 and 74).

Viewed from the perspective of the stunting syndrome depicted in Figure 1, we could imagine how the condition of pregnant women in the current period (nutritionally-at-risk especially among teenagers, and deficient in important micronutrients) increases the risk of poor birth outcomes and subsequent risk of stunting from infancy to early childhood. Moreover, non-pregnant adolescents who are undernourished and could also be at risk of early pregnancy (to be discussed later) become future mothers of stunted children. Those affected most are the poorest, but is of concern even among the middle quintiles.

### ***Coverage of Interventions***

#### *Maternal care: antenatal, birth delivery and postnatal care*

*Antenatal Care.* In 2013, based on the NDHS data, the percentage of pregnant women who go for prenatal care is high, with 84 percent having completed a minimum of 4 visits recommended by DOH (Figure 33). However, the timing of first visit is late: 32 percent have their first visit only after the first trimester (Figure 34). A similar finding is also reported in the 2013 NDHS. Teenage pregnant women and women in the lower quintiles tend to have their visit only after the first trimester of pregnancy (Figure 35).

Women in higher wealth quintiles obtain prenatal care from doctors while those in the lower quintiles rely more on midwives/nurses. In the lowest quintile, 11 percent of women did not access a skilled provider (Figure 36). Similar findings based on 2003 and 2008 NDHS data were reported by Lavado and Lagrada (2008) and Lavado et al. (2010).

Only about half of pregnant women reported that they had received information on nutrition during prenatal care (Figure 37). There is no difference among women in different quintiles in the percentage reporting that they received information on nutrition during prenatal visits. This would suggest that providing such information to all women is not common during prenatal visits. Moreover, this is lower among teenage mothers than older mothers. While a wide variety of topics are discussed, the percent of women who reported discussing a particular topic is less than half (ranging from 23 percent to 43 percent) in all of the topics except for the need to increase food intake (55 percent) (Figure 38).

The percentage of women receiving prenatal services during their visit vary by type of service - more on blood pressure measures and weighing and less on taking blood and urine samples (Figures 39 and 40). Micronutrient supplements taken during pregnancy include iron (ferrous sulfate), folic acid or iron with folic acid. Intake of multivitamins or single vitamins, however, is low (Figure 41)

*Pregnancy complications.* In addition to nutritional status of the mother during pregnancy, it is also important to look at pregnancy complications, which affect the health of the mother and the risk of poor birth outcomes. Data from the 2013 NNS show the types of pregnancy complications women experienced during pregnancy (Figure 42). The most common problem is urinary tract infection, which affected more than half of the women. Hypertension affected about 20 percent of women and anemia, about 10 percent.

*Birth Deliveries.* In 2013, based on NDHS data, 40 percent of births were delivered at home. The percentage is higher among the lower quintiles. In contrast, birth deliveries in health facilities, especially private facilities, are higher among women in the higher quintiles (Figures 43). DOH has recommended facility-based deliveries to ensure quality service and quick response to emergency obstetric care. Home deliveries occur more among older women, among higher order births, and among those that did not have any prenatal check-up (Figure 44).

More women in lower quintiles are assisted in birth delivery by traditional birth attendants while those in the higher quintiles are assisted by doctors (Figure 45). Interestingly, 30 percent of birth deliveries outside a health facility (i.e., home) are assisted by midwives in spite of DOH policy on facility-based deliveries (Figure 46).

Whether delivery is at health facility or at home, the practice of essential intrapartum newborn care (EINC) is important to promote early breastfeeding, among other benefits. Data from the NDHS 2013 show that only 64 percent of deliveries had skin contact with the mother in the first hour of birth. Those born in the facility, whose mothers had more prenatal visits, and births among mothers in the higher quintiles had higher percentages of skin contact (Figure 47). We also observe a difference between the percentage of skilled providers and the percentage of skin contact, which suggests that not all skilled providers practiced EINC.

*Postnatal Care.* Postnatal care is important to ensure that the mother is protected from any complications that may arise after birth. The postnatal check-up is also an opportunity to provide the

mother with information on how to care for herself and her child as well as counseling on nutrition, micronutrient supplementation and exclusive breastfeeding. This is to reinforce the counseling received during prenatal check-up.

On average, 20 percent of mothers do not go for postnatal check-up in the first two days after birth. This is higher among women who delivered a higher order birth (50 percent), those who delivered outside a facility (70 percent), and women in the poorest quintile (50 percent) (Figure 48). This data show postnatal care received from any provider. Data shown in Figure 49 show postnatal care from skilled provider together with the data on percent with postnatal care. The difference suggest that women go to nonskilled providers (e.g., hilot) for postnatal consultation. The reliance on nonskilled providers is higher among those who delivered outside a facility and those in the lowest quintile (Figure 49).

In sum, we see gaps in maternal care with respect to putting nutrition components firmly in place. In prenatal care, there is the problem of the quality of care women receive, particularly the nutrition component including provision of nutrition information. Although facility-based deliveries have increased overall, home deliveries by non-health providers are still high among poor women and EINC is not practiced by all providers in health facilities. Postnatal care is relatively low compared to prenatal care and postnatal care is lower among poor women. The opportunity for further counseling on health care and nutrition of both mothers and their infants is lost.

It is often suggested that there is a need to increase the nutrition-sensitivity of other sector activities, e.g., in agriculture, social protection, etc. However, based on the data above, perhaps the first sector to increase nutrition-sensitivity is the health sector. Ironically, although one can argue that nutrition is part of the health sector, in fact nutrition is not so visible in the health sector considering that health sector goals are often expressed in terms of reduction in morbidity and mortality.

### *Breastfeeding*

Early initiation of breastfeeding and exclusive breastfeeding in the first 6 months are important for the health of the child. Exclusive breastfeeding means that the child only receives breastmilk and nothing else but when necessary allows the giving of oral rehydration solution, vitamins, minerals and medicines in drops or syrups. Moreover, continued breastfeeding until 2 years of age or older is also recommended after complementary foods are introduced after six months.

Data from the FNRI surveys show an increase of mothers who initiate breastfeeding within one hour from 52 percent in 2011 to 77 percent in 2013. The increase was observed irrespective of where the child was delivered. However, early initiation of breastfeeding is still lower among those who were delivered in private health facilities (hospitals or clinics) compared to those delivered in public facilities or at home (Figure 50). Early initiation of breastfeeding was higher among children of women in the lower wealth quintiles than those in the higher quintiles (82 percent in the poorest quintile vs. 66 percent in the richest quintile) (Figure 51).

Exclusive breastfeeding has likewise increased from 30 percent in 2003 to 52 percent in 2013 (Figure 52). However, such percentage is low considering the expected benefits of exclusive breastfeeding. Moreover, such average percentage hides the fact that exclusive breastfeeding is not maintained throughout the first six months. In 2013, data on exclusive breastfeeding by age of child in months show a steady decline from 66 percent in the first month to only 22 percent in the sixth month (Figure 53).

Children among mothers in lower wealth quintiles, in rural areas and who are not working tend to be exclusively breastfed than children among other groups of women (Figure 54).

Half of the children continued breastfeeding beyond the sixth month of exclusive breastfeeding up to age 1, but the percentage declined to 18 percent by year 2. The percentage of children with continued breastfeeding either at year 1 or year 2 was higher among the lower quintiles and non-working women (Figure 55).

### *Complementary Feeding*

*Introduction of complementary food.* Equally important as breastfeeding is the child's intake of complementary foods starting at 6 months of age. Data from recent FNRI surveys show that in 2013 about 80 percent of children aged 6-8 months were introduced to complementary food (Figure 56). There is not much change from 2011. There is not much difference among various groups by mother's age, wealth quintile, rural-urban residence and working-non-working status (Figure 57).

*Feeding practices.* Figure 58 shows a profile of children of different age groups by feeding practices for both 2011 and 2013. At age 0-5 months, half of the children are exclusively breastfed, 25 percent are breastfed with complementary foods, and the rest are given formula milk with foods. At age 6-11 months, 5 percent are still exclusively breastfed, more than half (56 percent) are now provided with complementary foods with breastfeeding, and 38 percent fed with formula milk and food. At age 12-23 months, 13 percent are provided with regular family food without either breastfeeding or formula milk family.

Based on the 2011 FNRI survey, the first introductory foods given to children 0-23 months are commercially prepared foods (46 percent) and lugaw (24 percent). Rice, mashed vegetables and bread/biscuit were introduced to about 7 percent of children (Figure 59).

*Quality of complementary food.* The dietary quality and nutrient adequacy of diets of children 6-23 months is often proxied by the indicator Minimum Dietary Diversity Score (DDS), which is based on the number of food groups consumed by the child. The Minimum Dietary Diversity refers to the proportion of children 6-23 months of age who received foods from at least four food groups the previous day. The food groups are (1) grains, roots and tubers, (2) legumes and nuts, (3) dairy products (milk, yogurt, cheese), (4) flesh foods (meat, fish, poultry, and liver/organ meals), (5) eggs, (6) vitamin A-rich fruits and vegetables, and (7) other fruits and vegetables were used as reference groups (FNRI DOST, Philippine Nutrition Facts and Figures 2013)

Data from the FNRI Surveys of 2011 and 2013 show low and declining percentage of children 0-23 months meeting the Minimum Dietary Diversity (MDD). The average percentage for children 0-23 months was 16 percent in 2013, down from 22 percent in 2011. In 2013, for children aged 0-11 months, the MDD was only 5 percent, increasing to 17 percent in children aged 12-17 months and to 25 percent in children aged 18-23 months. The corresponding percentages in 2011 are 7 percent, 26 percent and 33 percent, respectively (Figure 60). In 2013, lower than the average percentages of children meeting MDD are found among those with teenage mothers and among the lowest two wealth quintiles (Figure 61).

Another indicator of the quality and nutrient adequacy of diets in children is the percentage of children with intake of iron-rich foods. Iron deficiency affects the mental and mental development of the child. As Figure 29 earlier show, iron deficiency is a major problem especially among children 6 months to 1

year affecting 45 percent of children of the poorest three quintiles. Iron-rich foods include meat, fish, poultry, organ meats like liver and kidney, cereals, vegetables and other plant productions. In 2013, 40 percent of children 6-23 months old had intake of iron-rich foods. The percentage increases with increasing age of the child from 17 percent among children aged 6-11 months, to 44 percent among children aged 12-17 months, and to 54 percent among children aged 18-23. The percentage is about the same across wealth quintiles, rural-urban residence and working-non-working status of mothers (Figure 62).

*Food Security.* Part of reason for not meeting the Minimum Dietary Diversity is the high percentage of households that are food insecure. Categories of food insecurity (with levels defined according to frequency of experience, i.e. rarely, sometimes and often) are: (1) worry about food, (2) unable to eat preferred foods, (3) eat just a few kinds of foods, (4) eat foods they really do not want to eat, (5) eat a smaller meal, (6) eat fewer meals in a day, (7) no food of any kind in the household, (8) go to sleep hungry, and (9) go a whole day and night without eating (FNRI DOST Philippine Nutrition Facts and Figures, 2013: Food Security Survey, p. 7).

Data for 2013 show the percentage of households by levels of food security (food secure, mildly insecure, moderately food insecure, and severely food insecure (Figure 63). Overall, only 34 percent of households were classified as food secure. It is generally higher among households with less than 5 members, richer households, urban household, and, ironically, those in non-agriculture sector. Only 11 percent of the poorest households were classified as food secure compared to 72 percent for the richest households. The dimensions of food insecurity and the frequency of households experiencing them are shown in Figure 64.

In summary, poor households while disadvantaged in terms of the quality of complementary foods and food security are advantaged with respect to breastfeeding practices – initiation, exclusive up to six months and continued after six months. While there is a need to maintain relatively favorable breastfeeding practices among the poor, there is also a need to improve breastfeeding practices among better off households who often deliver in private health facilities and are working.

### *Child health care*

In addition to inadequate dietary and nutrient intake, infection and disease are important factors affecting stunting. In this section we examine indicators of child health care, particularly preventive interventions such as immunization, and the management of respiratory infection and diarrhea which are common illnesses of young children.

There is high use for individual vaccines to prevent childhood diseases but only 69% are fully immunized. The low vaccination rate (Fully Immunized Child) is due to low coverage of succeeding doses of DPT, Polio and Hepa B (Figure 65). It might be noted that the percentage of fully immunized child (FIC) rose from 70 percent in 2003 to 80 percent in 2008, only to see it decline in 2013 back to 70 percent. The DOH target for FIC is 95 percent (DOH National Objectives for Health: Philippines 2011-2016 (2012). Moreover, in 2013, FIC coverage is related to wealth quintiles: it is lowest among the poorest quintiles (59 percent) and highest among the richest quintile (80 percent) (NDHS, 2013).

In 2013, the percentage of children with acute respiratory infection (ARI) was six percent (Figure 66), of which 64 percent were taken to a facility and 50 percent were treated with antibiotics. Among children who had fever (around 30 percent), about half visited a health facility for treatment (Figures 67). The

percentages seeking treatment in a facility are higher among younger children up to aged 2. Little differences are seen among higher quintile households.

About eight percent of children under 5 years were reported to have diarrhea. Children ages 6-11 years and 12-23 years have almost twice the percentage having diarrhea than younger or older children (Figure 68). Among those with diarrhea, 42 percent sought treatment (Figure 69). Interestingly, only 11 percent took zinc supplements while 25 percent took antibiotics. The use of zinc in treatment of diarrhea is part of DOH guidelines in diarrhea management.

One factor related to the incidence of diarrhea beyond six months of age is the disposal of stools. Data from the 2013 NDHS reveal low percentage of proper disposal of stools of infants. The percentage increases as the child grows and can use toilet/latrine. The percentage of children whose stools are disposed of safely are 9.1 percent for children less than 6 months, 16.2 percent for children 6-11 months, 29.8 percent for children 12-23 months, 60.2 percent for children 24-25 months, 80.8 percent for children 35-47 months, and 88.4 percent of children 48-59 months (NDHS 2013, p. 135). This pattern is consistent with the incidence of diarrhea shown earlier in Figure 68. Very often, the stool of children up to 23 months are reportedly thrown out of the garbage. The low incidence of diarrhea among those below 6 months may be associated with children who are exclusively breastfed.

Another indicator of hygiene and sanitation that could affect diarrheal rates is the practice of hand washing with soap by the mother. Data from the FNRI Survey of 2013 show uniformly high rates of mothers practicing hand washing with soap. Hand washing with soap by mothers appears to be uniformly high among wealth quintiles. The activities being referred to where hand washing is important are: before food preparation, before eating, after eating, after toilet use, before feeding the child and after attending to a child who defecated (Figure 70).

Among those with diarrhea, only 12 percent were given increased food and only 32 percent were given increased fluid. About half of children with diarrhea are given just the usual same amount of food and liquid while 39 percent are given less food than usual and 22 percent less fluids than usual (Figure 71).

Finally, eighty-five percent of children below 5 years were given vitamin A, 38 percent were given iron and 40 percent were given deworming medication as part of health care (Figure 72).

In sum, it appears variation in the incidence of infection and diarrhea are related to risk associated with age of child. Relative access to treatment do not appear to vary much by wealth quintiles. What can be noted is the quality of care in the case of diarrhea. Although more than half were provided with ORS or ORT, only 11 percent zinc as part of treatment for diarrhea. In the case of immunization, however, variations among wealth quintiles in FIC are observed.

### *Reproductive health*

We end this section with a note on *reproductive health among adolescents*, which is risk factor in birth outcomes. Based on the 2013 NDHS data, about one-fourth of women aged 18-24 years already had their first sexual intercourse before age 18 (Figure 75). Teenage pregnancy has been increasing in recent years. About 10 percent of women age 15-19 have begun child bearing (either had a child or currently pregnant) (Figure 76). One-third of women below 20 years reported having a birth that was not planned compared to 28 percent on average for all women of reproductive age (Figure 77). Moreover, only 21 percent of women 15-19 years are currently practicing a modern family planning method compared to



38 percent on average for all women of reproductive age. (NDH, 2013). Progress in this area of reproductive health has been slow.

### **Towards Achieving Better Results**

After a review of the Philippine nutrition outcomes and coverage of interventions, a question might be asked how come we did not achieve better results. For sure it was not for lack of national policies. Key areas of nutrition and nutrition-related issues such as maternal and child undernutrition, infant and young child nutrition, micronutrients, and obesity and diet-related non-communicable diseases (NCDs), are covered by Executive Orders (e.g., Milk Code), national laws (e.g., salt iodization and food fortification) and DOH administrative orders (e.g., maternal, newborn and child health and nutrition (MNCHN), IYCF, micronutrient supplementation guidelines, non-communicable diseases essential package).

#### *Abstracting key lessons from assessments*

Assessments of specific nutrition projects have uncovered various implementation issues of targeting, coordination, management structures, logistics and sustainability. These assessments include the program review of infant and young child program by UNICEF (2000); the program on ensuring food security and nutrition for children 0-24 months in the Philippines by Chiwara and Villate (2013); and targeting of food programs by Manasan and Cuenca (2007).

Recent sector-level assessment such as those of NNC in its mid-term review of the PPAN 2011-2016) and that of FNRI (2015a) uncovered a number of structural issues. Broadly, these are (a) governance: local mobilization to implement nutrition program; (b) limited resources for nutrition; and (c) organizational – effective coordination by NNC National Secretariat in a devolved set up.

Considering all major insights from both the program evaluations and sector assessments, one can put forward a number of strategic reasons for lack of significant progress in nutrition relative to its potential. First, it seems our national nutrition plan attempted to do so many things – address all the dimensions of malnutrition as described earlier in Section 2.

Secondly, while the plan rightfully placed emphasis on targeting the vulnerable and nutritionally-at-risk population – by population groups and conditions and by areas - operationally, it did not apply the means by which this priority target population will be identified and located. While the Conditional Cash Transfer (CCT) beneficiaries was mentioned as a possible platform for identifying the priority population for nutrition interventions, this has not been actually done. The service delivery interventions were implemented everywhere for the most part through the local health system.

Thirdly, and most importantly, we are faced with a fragmented delivery and financing system resulting from the devolution of key services (i.e., health and nutrition) to the Local Government Units (LGUs). We will have to deal with 81 provinces, 144 cities and 1,500 municipalities, whose local chief executives have different priorities and capacities. This makes it difficult to consolidate efforts for national impact in a sustained way. Given these daunting challenges, how do we move forward?

### *An approach to meeting the challenges*

While the general assessment by NNC and FNRI of the key factors hindering better performance of the nutrition sector are insightful, the proposed strategies and program solutions are not likely to effectively address the challenges, which are essentially structural in nature. In response to the challenges above, a broad approach suggested here is to take advantage of existing opportunities offered by, first, the increasing global interest in child stunting, and second, by the existing platforms for identifying the poor and for delivering and financing health services. Below we outline an approach for consideration and discussion.

*Adopt a more focused and strategic nutrition agenda.* The increased international interest in the prevention of childhood stunting and the national commitment of the Sustainable Development Goals (SDG 2030) that include stunting as goal provide an opportunity to craft a more focused and strategic nutrition agenda by putting stunting prevention in the forefront. First, stunting affects a large number of children – in 2015, one-third of the children aged 0-59 months representing 3.78 million children. The Philippines is 9<sup>th</sup> among 80 countries with the largest number of stunted children (UNICEF, 2013). Secondly there is international agreement on (a) the severe short-and long-term health and economic consequences of stunting (poor cognition and educational performance, low adult wages, lost productivity and, when accompanied by excessive weight gain later in childhood, increased risk of nutrition-related chronic diseases); (b) the definition and measurement and a standard that defines normal human growth which is applicable everywhere; (c) and a critical window – from conception to the first two years of life – within which linear growth is most sensitive to interventions related to feeding, infections and psychosocial care (Onis, et al. (2013, pp. 6-7)

*Use CCT as platform for identifying the poor and target them for intensified nutrition interventions.* Based on data presented thus far, it appears that most nutritionally-at-risk population are the poor as exhibited by differences among wealth quintiles. Childhood stunting and poverty rates by region show close correlation (Figures 78 and 79). Multivariate analysis on correlates of nutrition problems (undernutrition in children, pregnant and lactating women, and adult malnutrition) show wealth quintile as a consistent factor (FNRI 2015).

To focus nutrition interventions on the most at risk, we take advantage of the opportunity afforded by the Conditional Cash Transfer Program (CCT). The CCT in its current form is already a platform for identifying priority target population for health and education. It has been recognized and used as a platform by other countries to introduce nutrition goals, i.e., making social protection more nutrition-sensitive (IFPRI, 2015, Save the Children, 2015; Bassett, 2008). A review of CCT programs with health components implemented in various countries shows that “CCT have been effective in increasing the use of preventive services, improving immunization coverage, certain health outcomes and in encouraging health behaviors.” Bassett, 2008; Raganathan and Legarde, 2011). Health outcomes included nutritional status of newborns and infants and greater growth of children. Studies of the impact of CCT in the Philippines, however, show limited impact on child nutrition (Orbeta, 2014; Onishi, 2014). One possible explanation is that the supply-side intervention is lacking to support the demand-side conditionalities. The importance of supply-side interventions has been suggested to be an important part of the design for making CCT more nutrition-sensitive (World Bank, 2006; Raganathan and Legarde, 2011; Save the Children, 2015; Bassett, 2008).

The CCT platform would be the most operationally effective to identify the poor who are the most nutritionally-at-risk for various reasons. First, the CCT program currently has more than 4 million poor

beneficiaries, a large enough population to scale up cost-effective interventions targeted at the poor. The recent enumeration of DSWD expands and updates the list of CCT beneficiaries. Each family that qualified have young children below 5 years or mother is pregnant. Secondly, from a logistics standpoint, the CCT families can readily be identified and mapped by name and location. Thirdly, the CCT families are automatically covered by PhilHealth, the full premium has been paid by the national government according to law. Fourthly, there is within the CCT structure, an existing mechanism for education, communication and community support, namely the Family Development Sessions and the Parent Leaders, which are important for sustaining communication and community-level interventions. What is not available at present is a baseline data on nutrition and health conditions of the CCT population as basis for programming, and future monitoring and evaluation.

There is probably little need to explicitly add to the existing conditionalities with a corresponding administrative reporting as we would not want to complicate compliance monitoring. In fact, the Philippines CCT program is cited as an example not to be followed due to what is considered as “too many conditionalities and bureaucratic processes restricting access” (Save the Children, 2015). The demand-side effect to be expected from a nutrition conditionality can come through counseling and communication when family members come into contact with the health system and with related activities in their own Family Development Sessions. To ensure that demand is translated into utilization of services and outcomes, there is a need to fill the gaps and improve the quality services that is offered by the health delivery system particularly the nutrition components in maternal and child care. There is also a need to expand services related to behavior change communication and access to food supplements with respect complementary feeding.

*Use existing platforms for delivery and financing of services.* All CCT beneficiary households are enrolled in PhilHealth with the full premium paid for by the national government. PhilHealth currently have a maternal and newborn care package where CCT members can avail of services from accredited public and private health facilities. PhilHealth also has the Primary Benefit Package where maternal and child health services can be obtained. However, delivery of these packages to the CCT families are not likely to be uniform in coverage and quality across the local health systems in view of LGUs differing priorities and capacities.

Data from a CCT evaluation show the sample areas vary in terms of the health delivery system (personnel, facilities, distance to CCT) in addition to the general economic and social environment. This means that the quality of interventions reaching families have wide variations, especially when delivered by local government health systems (even if financed from PhilHealth reimbursements). Hence the need of a mechanism to ensure a minimum set of quality interventions reaching CTT families.

An approach to providing a set of quality interventions is to first examine PhilHealth existing benefit packages with the view of coming up packages that contain as additional elements the critical interventions suggested, e.g., in Bhutta, et al. (2013) and Das et al., (2016). These packages include:

- Maternal nutrition and intrapartum care (expanded MCP) based on clinical standards plus critical nutrition components delivered in a service delivery network
- Infant and young child feeding: behavior change communication and delivery of nutrient-dense and safe food supplements
- Micronutrient supplementation in children at risk and management of childhood illnesses particularly acute respiratory infection and diarrhea (expansion of out-patient benefit package in network of health facilities). Include immunization and deworming to prevent infection.

- Reproductive health and family planning delivered in network of health facilities to optimize timing of first pregnancy among adolescents, space subsequent pregnancies, and “limit” births as desired among older women with high parity.

It is important to cost the packages correctly to include capital costs to ensure that contracted providers will invest in quality service provision.

*Financing of nutrition interventions.* In 2014, PhilHealth spent (purchased) around 83 billion pesos in benefits, which represented 14 percent of total health expenditures. Current discussions on health spending and source of financing in the context of larger health sector reforms revealed that the main reason PhilHealth cannot provide more benefits is because it has not expanded its funds by increasing premium contributions (Ayala-UPSE Economic Forum April 7, 2016; Ambisyon40 Panel Discussion, May 5, 2016). Additional financing by raising premium as well as increasing government contribution to PhilHealth can provide additional resources to fund nutrition interventions.

*Delivery of services through contracts and strategic purchasing.* With the larger fund available to PhilHealth, it can then deliver the packages of health and nutrition-related interventions by contracting public and private providers based on DOH quality standards and guidelines. In a larger health sector reform context that goes beyond solely implementing nutrition interventions, local government health systems can participate in the contracting process. They will have to compete with other providers or develop partnerships with other providers to deliver service in a network to ensure continuity of care. The LGUs themselves may need to modify governance of their public health system to encourage greater decision-making of health staff and adopt management processes and structures (e.g., enterprise or corporations) that are more efficient to compete in the market.

*How the approach addresses the challenges?* The approach suggested is expected foremost of all to address the fragmentation of the service delivery and financing system of the LGUs. A uniform level and standard of interventions shall be available to CCT beneficiaries across various areas through the contracting process. The service delivery network will expand by including the private providers, and contracts can be designed to provide incentives for providers to reach remote areas (e.g., by increasing the contract price as incentive). The current problems of coordinating with LGUs in planning, expansion of health and nutrition staff to be hired trained and supervised, and the fragmented logistics system arising from individual LGU procurements will now be transferred to contractors who will take care of inputs to deliver contracted outputs. These contractors would also develop the information system to account for services delivered, which could be used for national planning and programming. For policy, what is need is to develop capacity for rigorous impact evaluation (which can also be outsourced) and for FNRI to continue its data collection and analysis of key indicators at the national level for policy guidance.

## **Further Studies**

One of the most useful set of information on health expenditures collected and published regularly by the Philippine Statistics Authority (formerly done by the National Statistical Coordination Board) is National Health Accounts (NHA). The NHA tells us about the total health expenditure in a given year and the sources of funds. A recent system of producing such account has been introduced by the WHO/Geneva, which provides a much richer set of information than the old system that was maintained since 1991. It would be useful for the nutrition sector to have a similar type of data set, i.e., a national nutrition expenditure accounts as a sub-account of the national health accounts to track national expenditures for service delivery, planning and financing of the nutrition sector. A national nutrition

accounts was developed in 1997 under UPecon with support from ADB but that effort was not sustained (no champion to demand and use it; things might change now).

The regular CCT impact evaluation will need to be adjusted to take into account of the enhanced nutrition component of the CCT program. This includes baseline information and monitoring of nutrition status as well as coverage of interventions among the CCT beneficiaries.

The rich data regularly collected by FNRI need to be analyzed more fully for further insights into the nutrition issue. Wider access to the data through the release of public use files will facilitate participation of a larger set of researchers from various disciplines.

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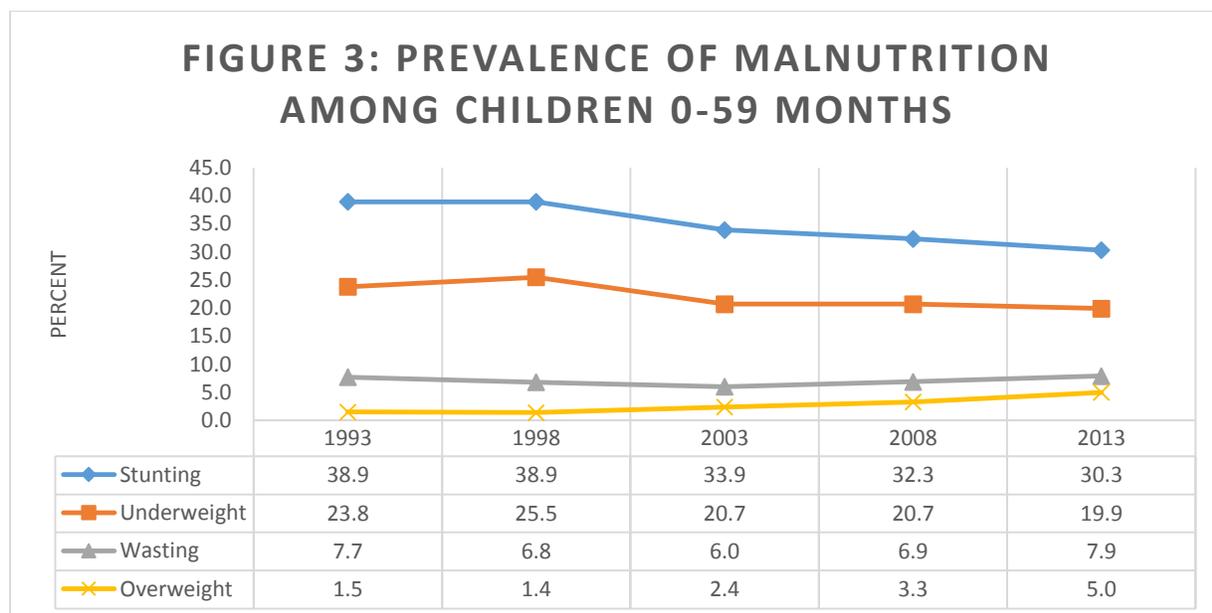
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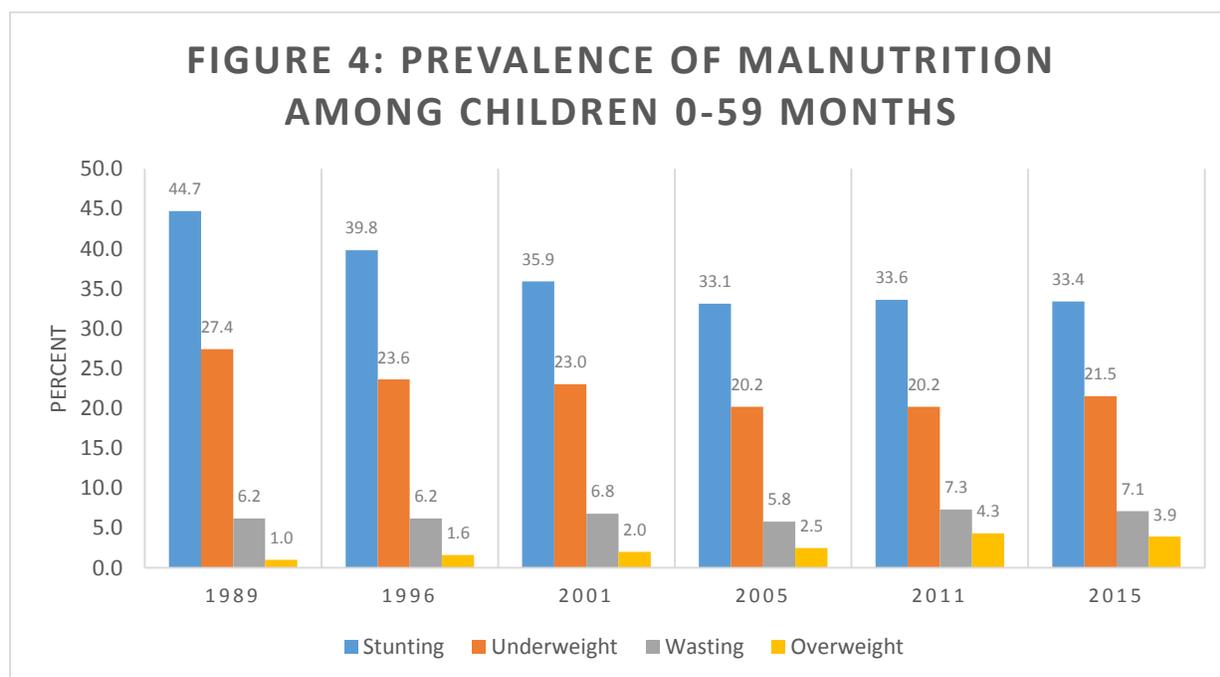
## Annex A: Child and Maternal Nutrition Outcomes and Coverage of Interventions

### Outcomes

#### Nutritional Status of Children

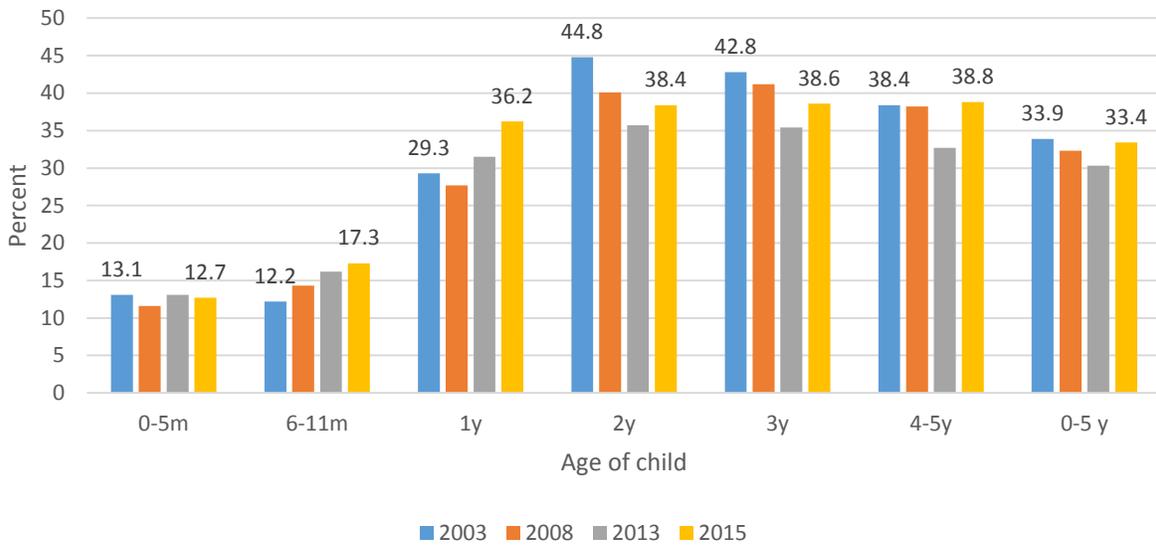


Source: FNRI, NNS various years



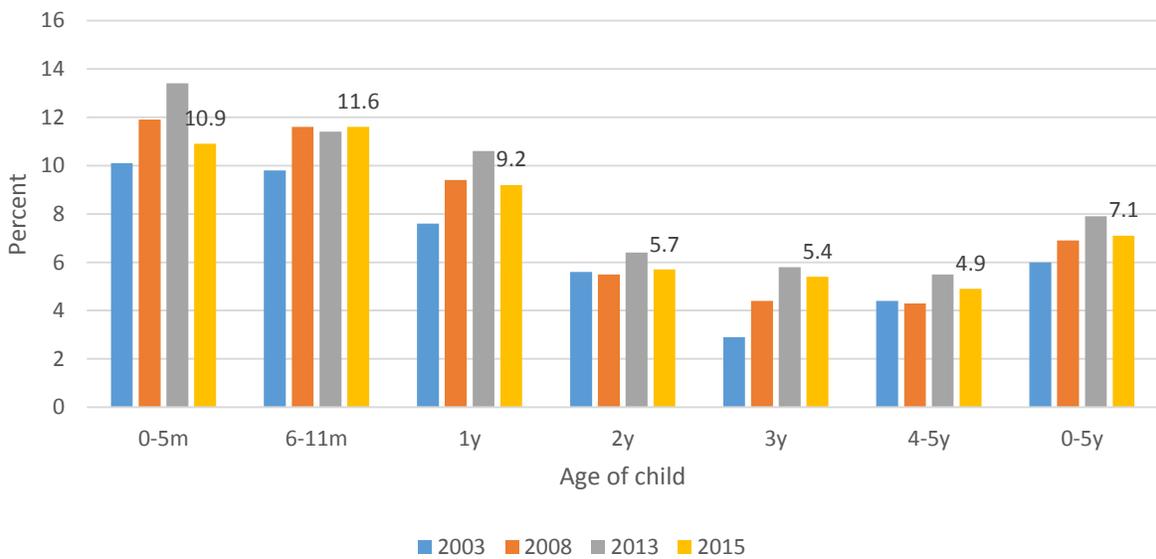
Source: FNRI, Updating Surveys, various years

Figure 5: Prevalence of Stunting among Children Age 0-59 Months by Age of Child

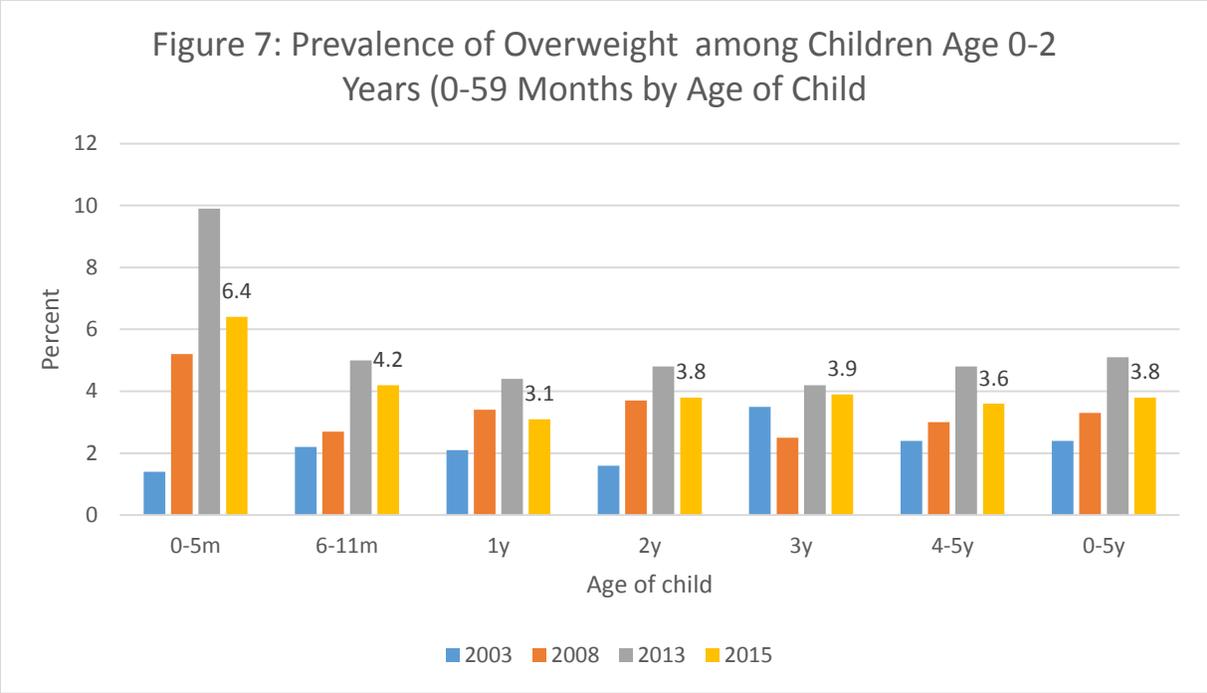


Source: FNRI, NNS 2003 and 2013 and Updating Surveys 2008 and 2015

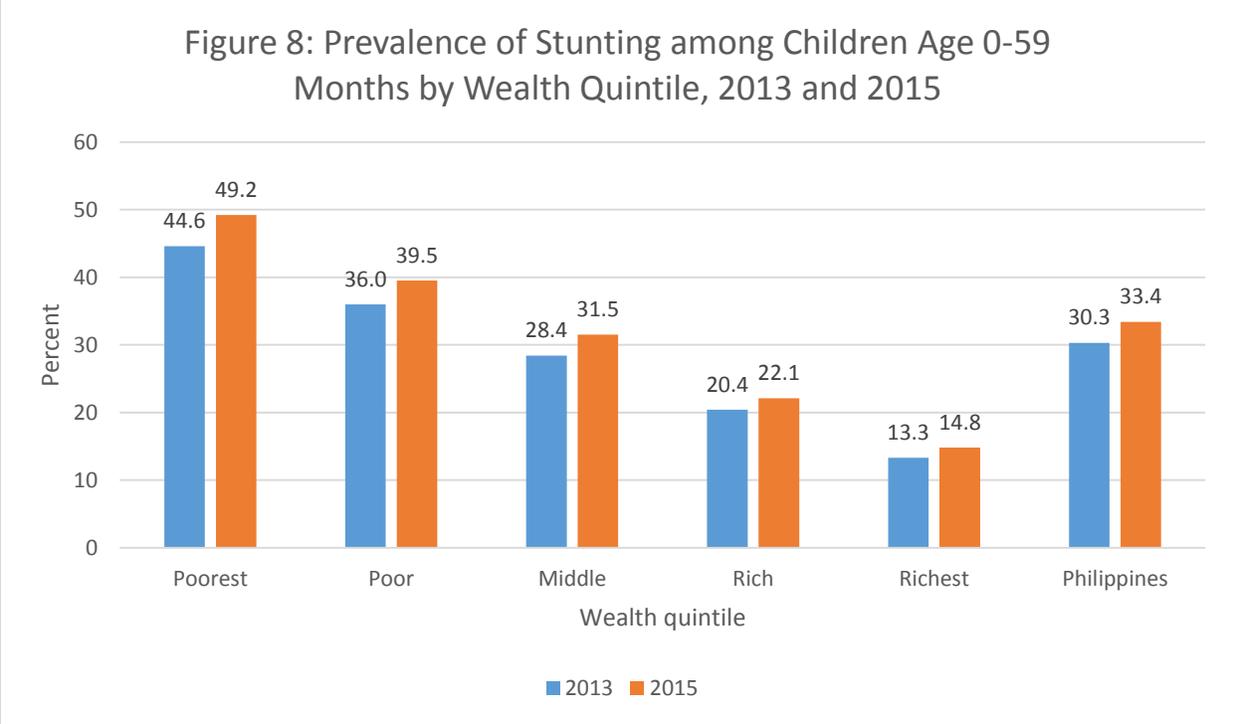
Figure 6: Prevalence of Wasting among Children Age 0-59 Months by Age of Child



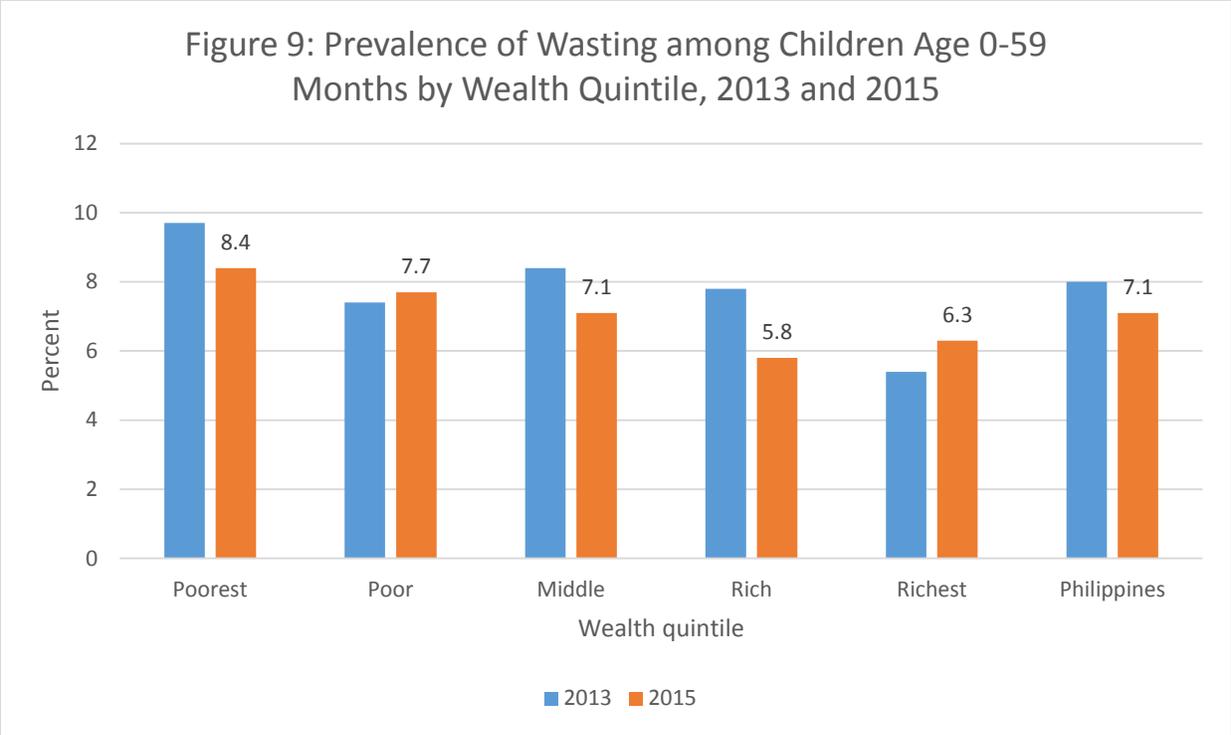
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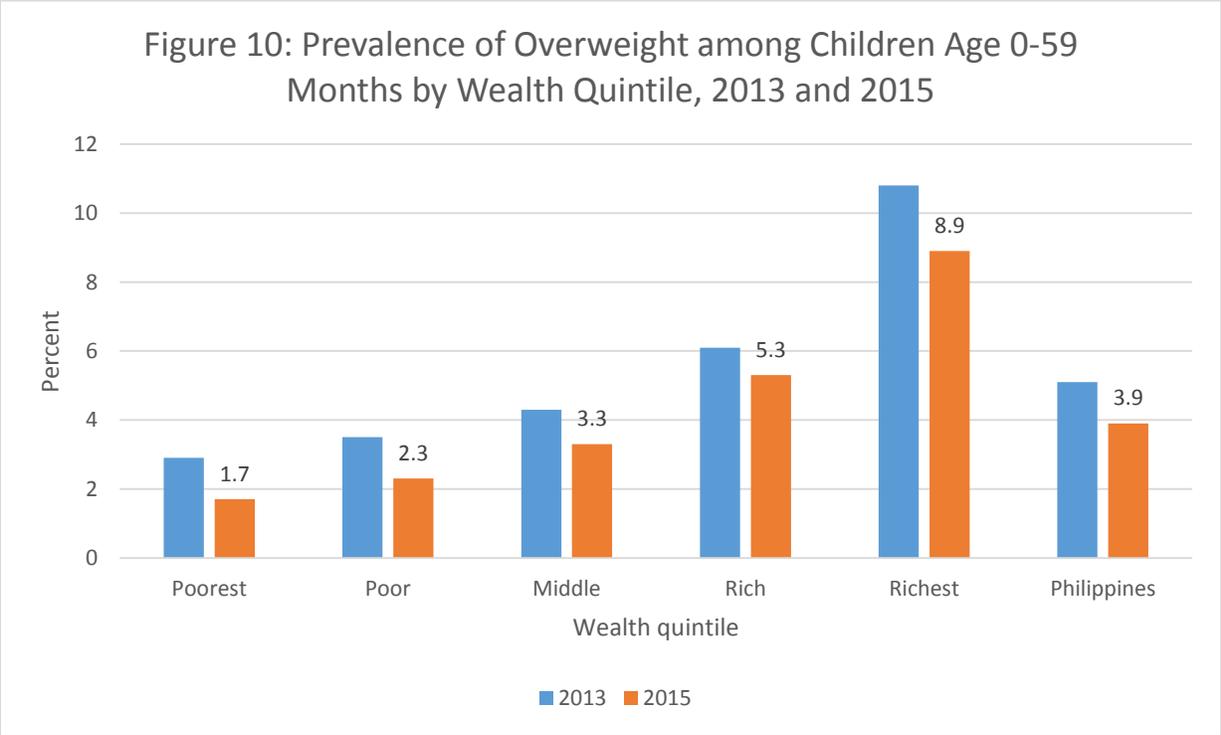
Source: FNRI, NNS 2003 and 2013 and Updating Surveys 2008 and 2015



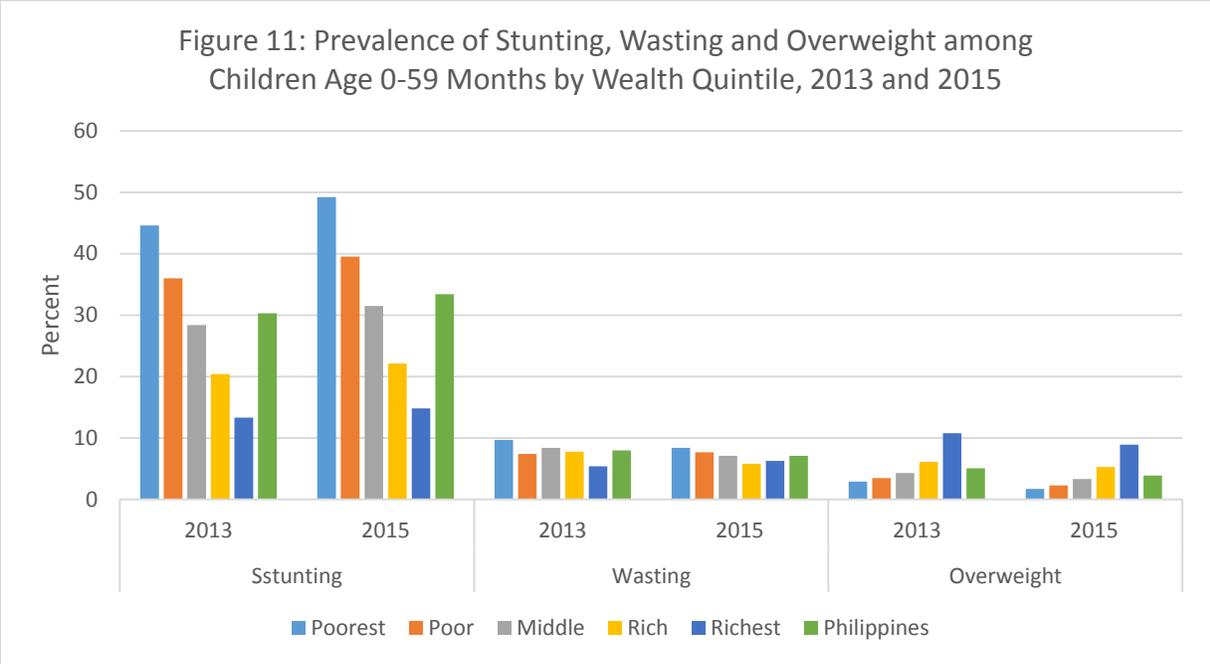
Source: FNRI, NNS 2013 and Updating Survey 2015 as reported in FNRI DOST2016 National Nutrition Summit, February 16, 2016



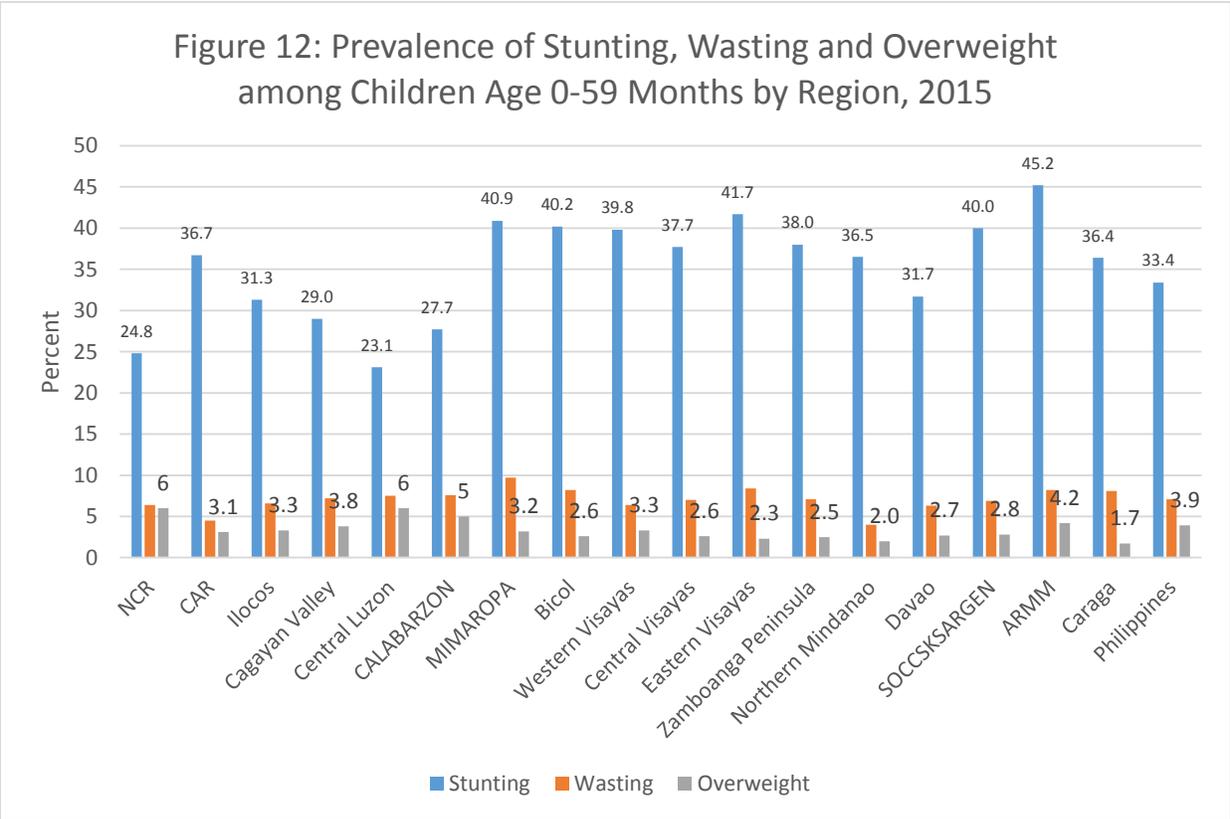
Source: FNRI, NNS 2013 and Updating Survey 2015



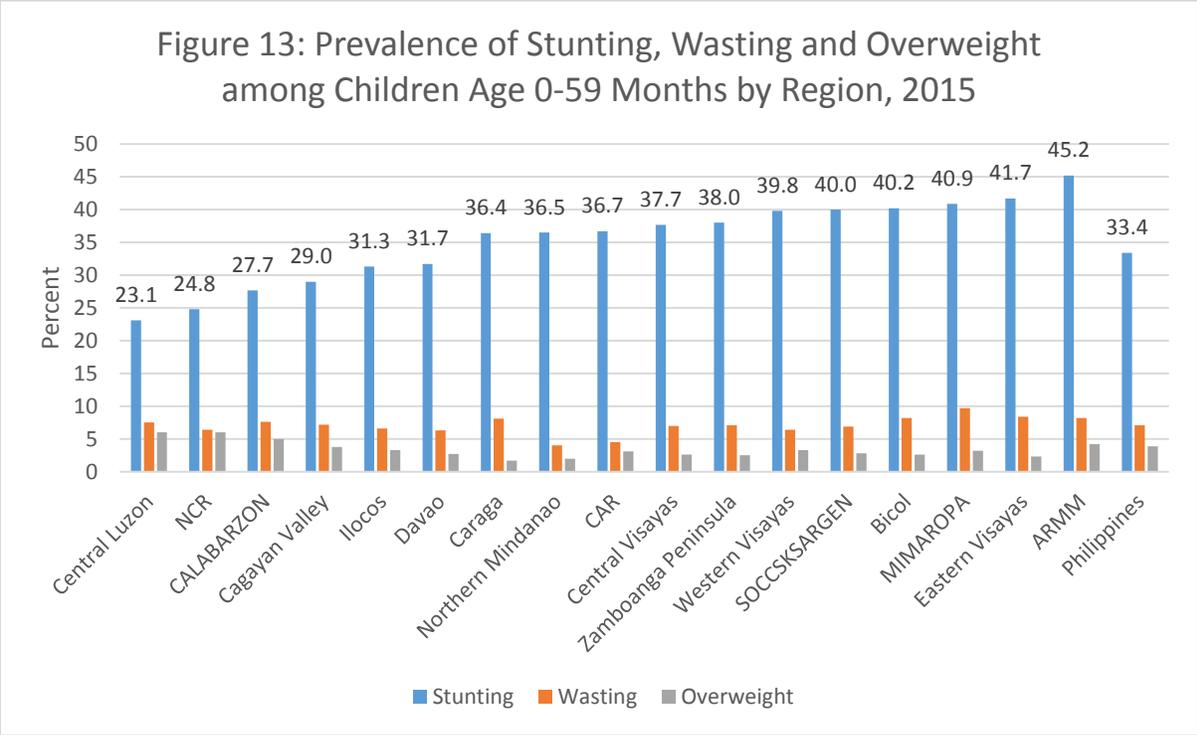
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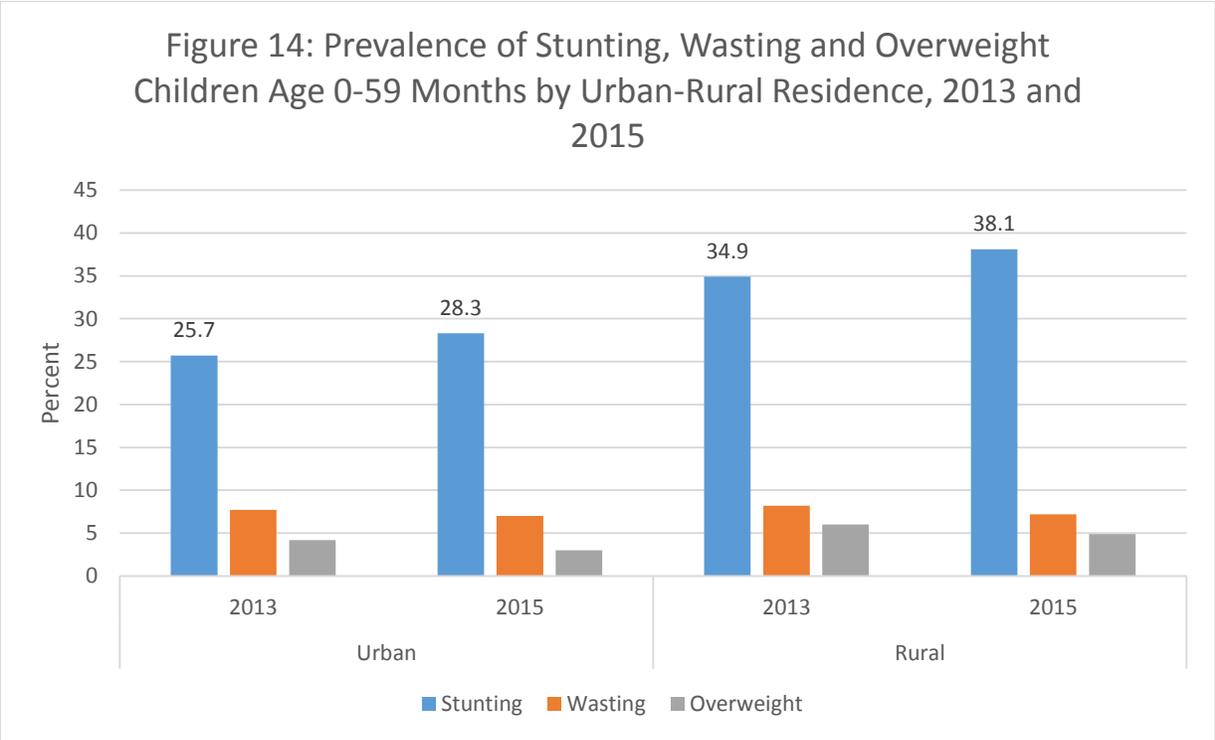
Source: FNRI, NNS 2013 and Updating Survey 2015



Source: FNRI, Updating Survey 2015

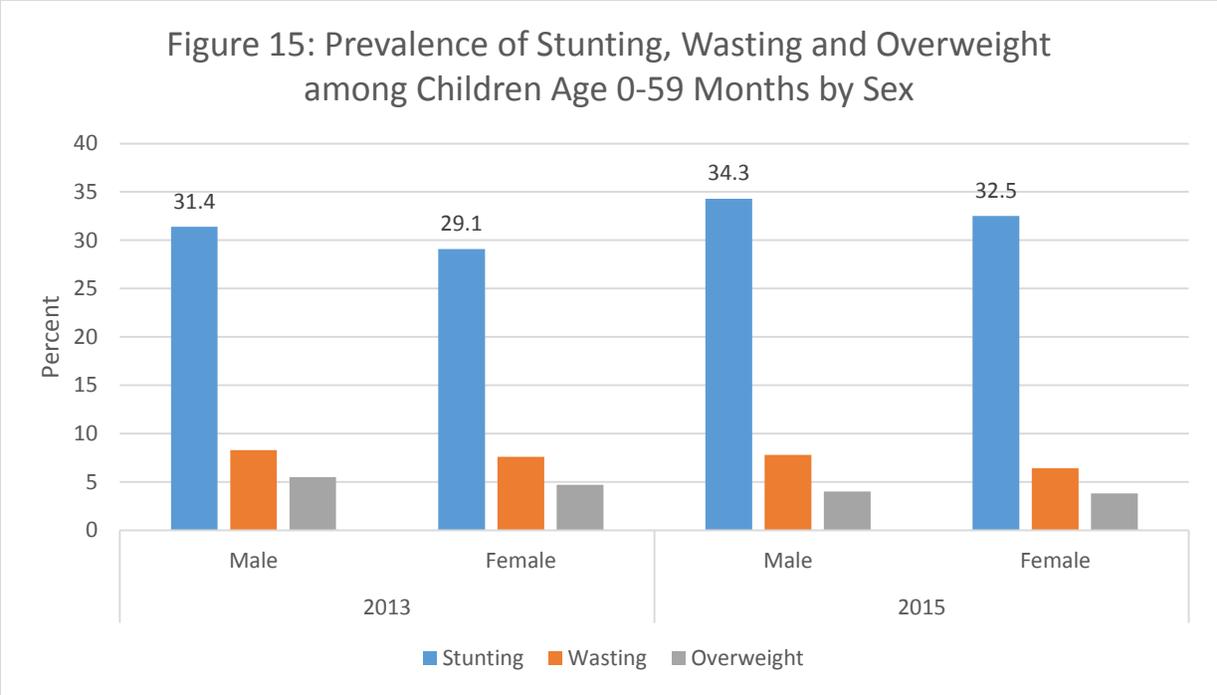


Source: FNRI, Updating Survey 2015

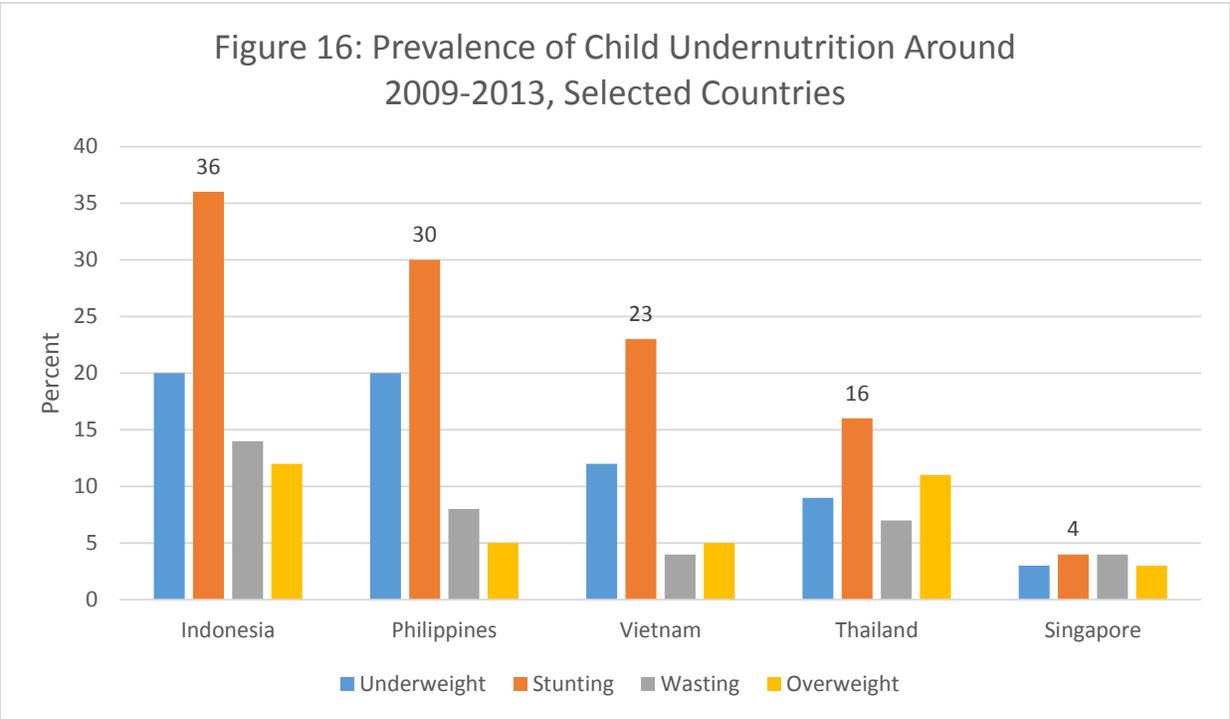


Source: FNRI, NNS 2013 and Updating Survey 2015



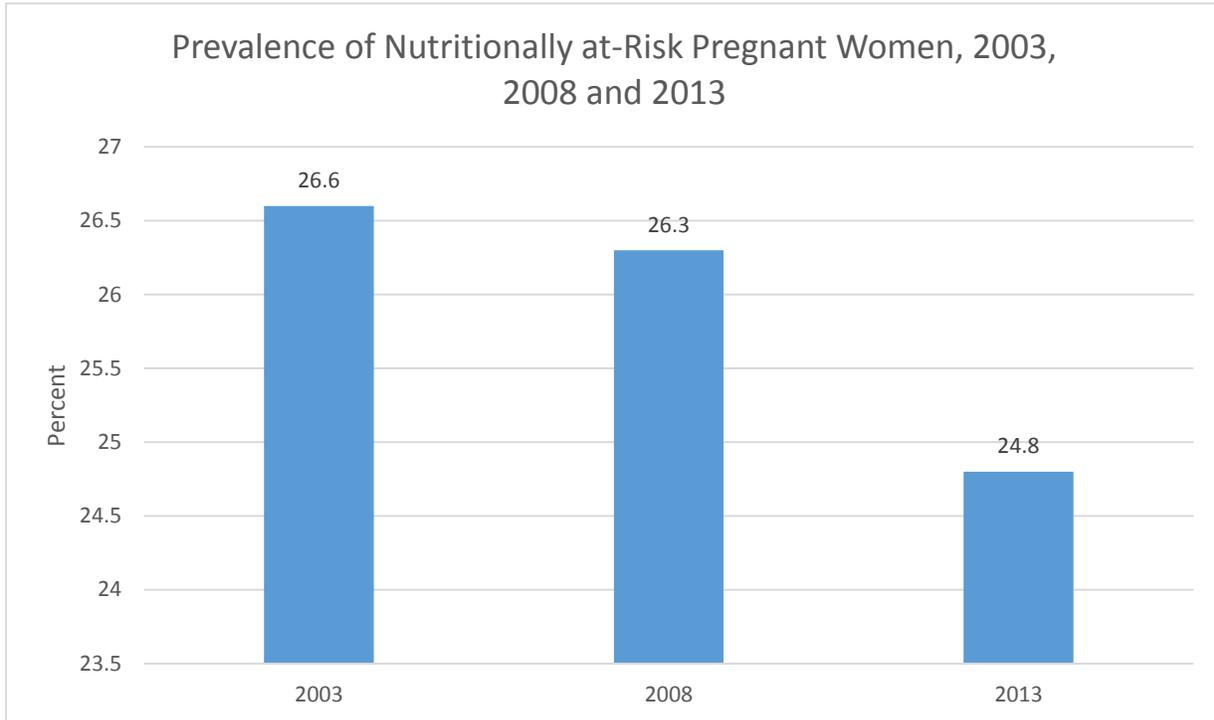


Source: FNRI, NNS 2013 and Updating Survey 2015

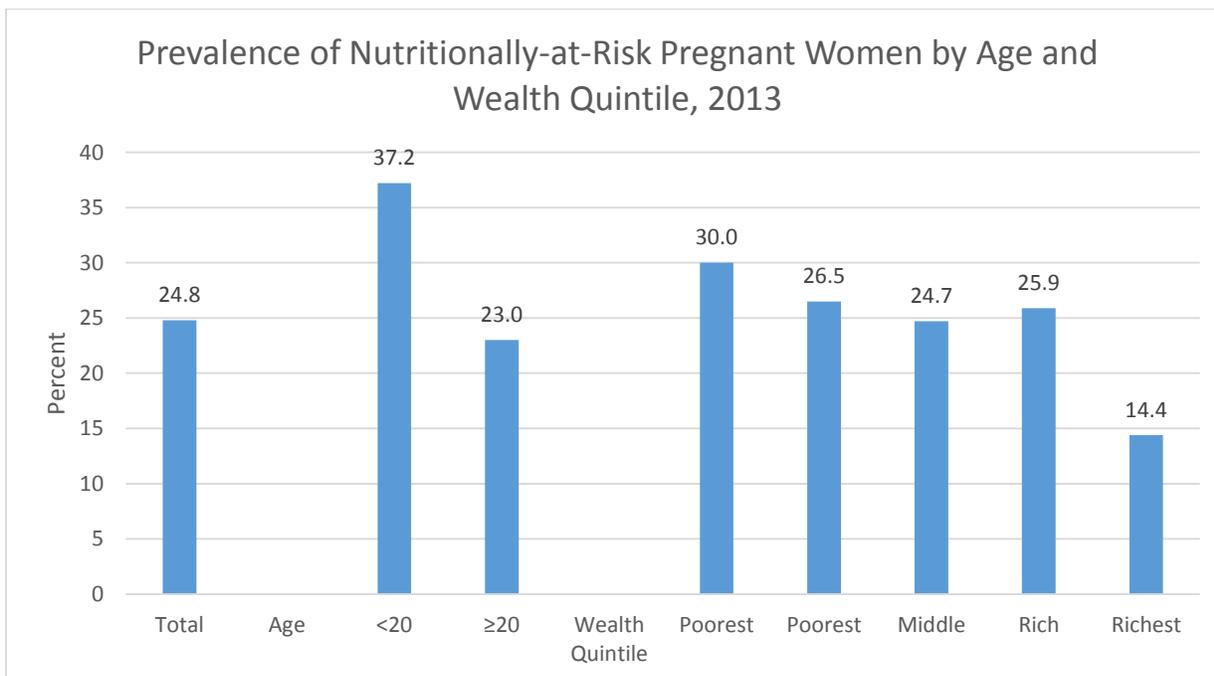


Source: UNICEF, State of the World's Children 2015

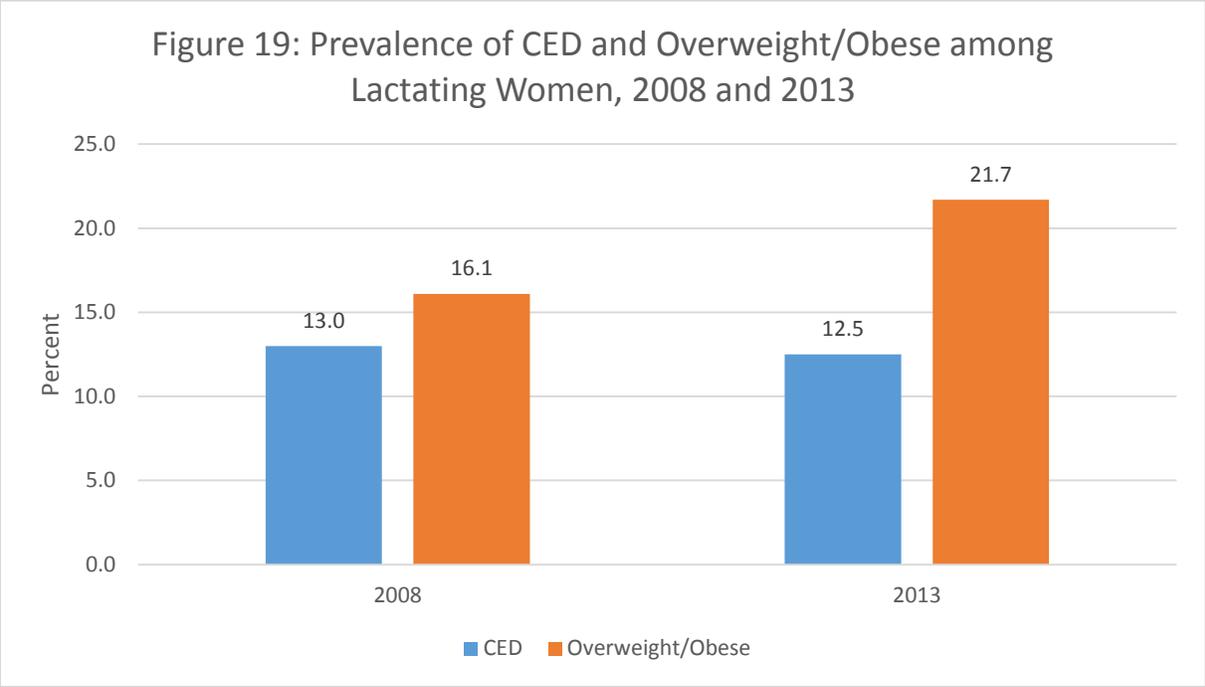
## Nutritional Status of Pregnant and Lactating Women



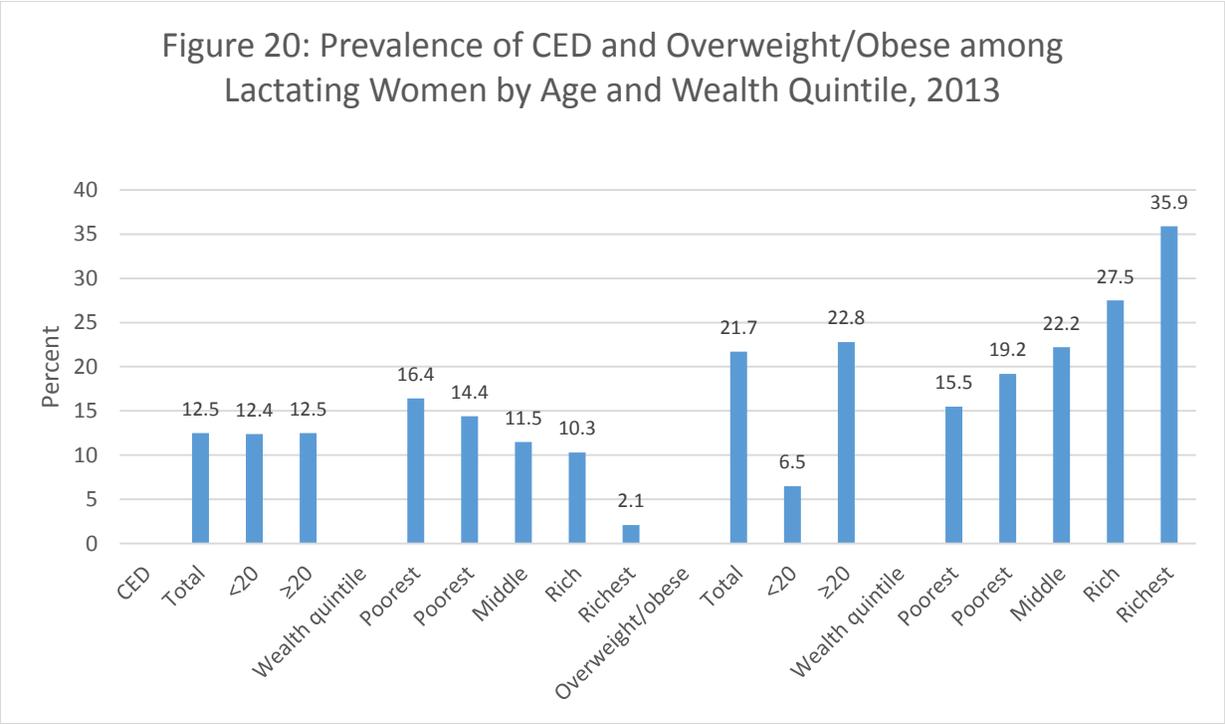
Source: FNRI NNS 2013 presentation and FNRI Philippine Nutrition Facts and Figures 2013 (2015)



Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)

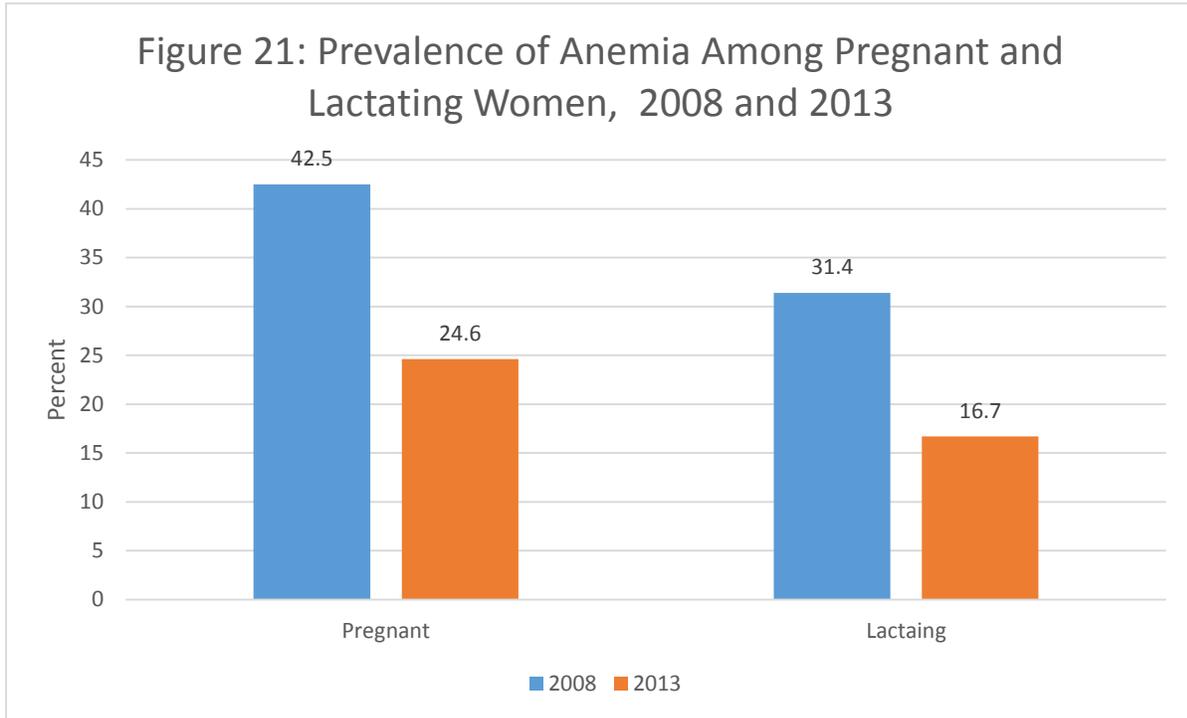


Source: FNRI Philippine Nutrition Facts and Figures 2013 (2015)

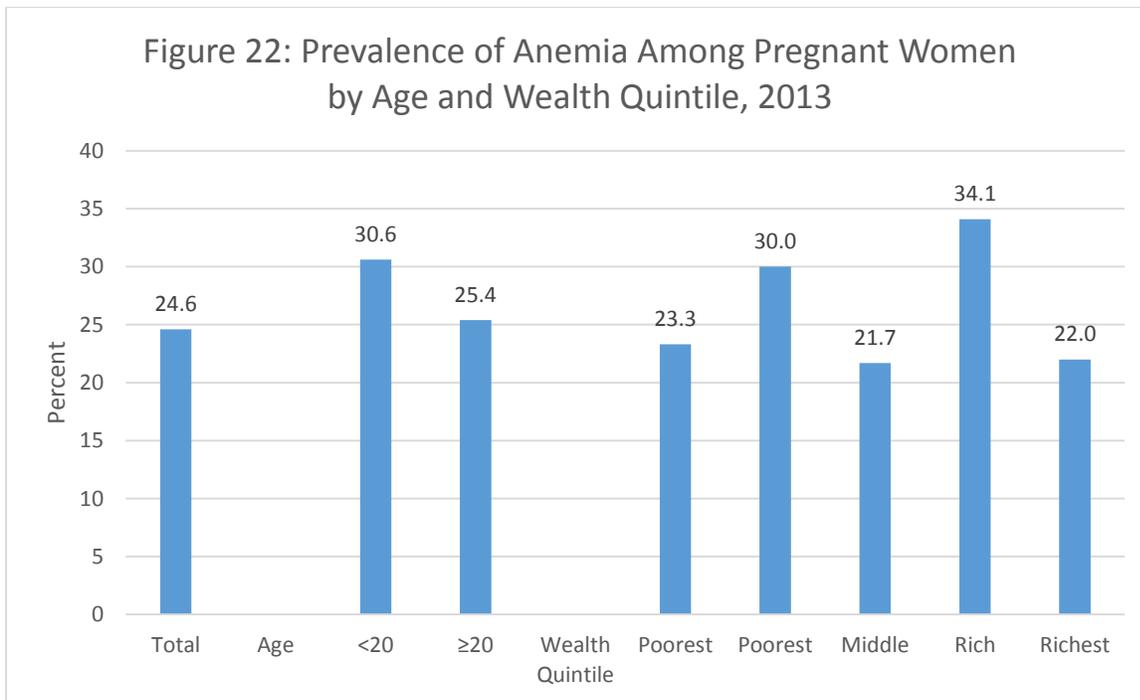


Source: FNRI Philippine Nutrition Facts and Figures 2013 (2015)

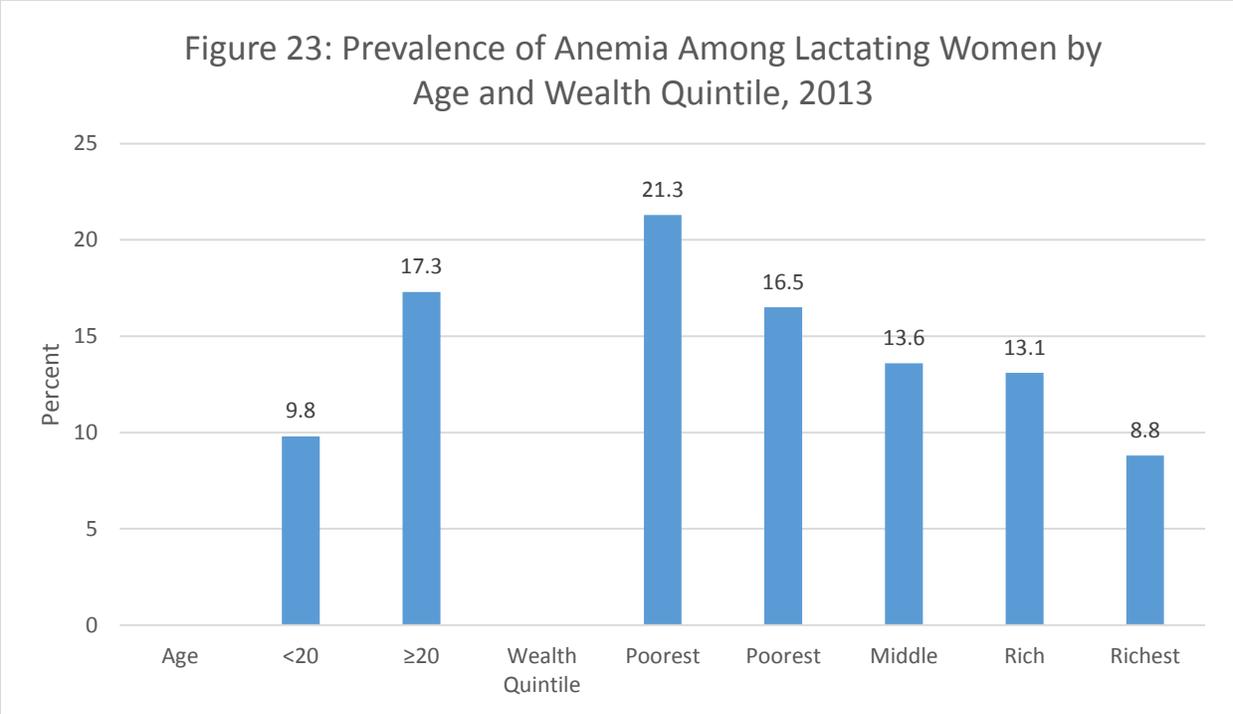
## Micronutrient Deficiencies: Pregnant and Lactating Women



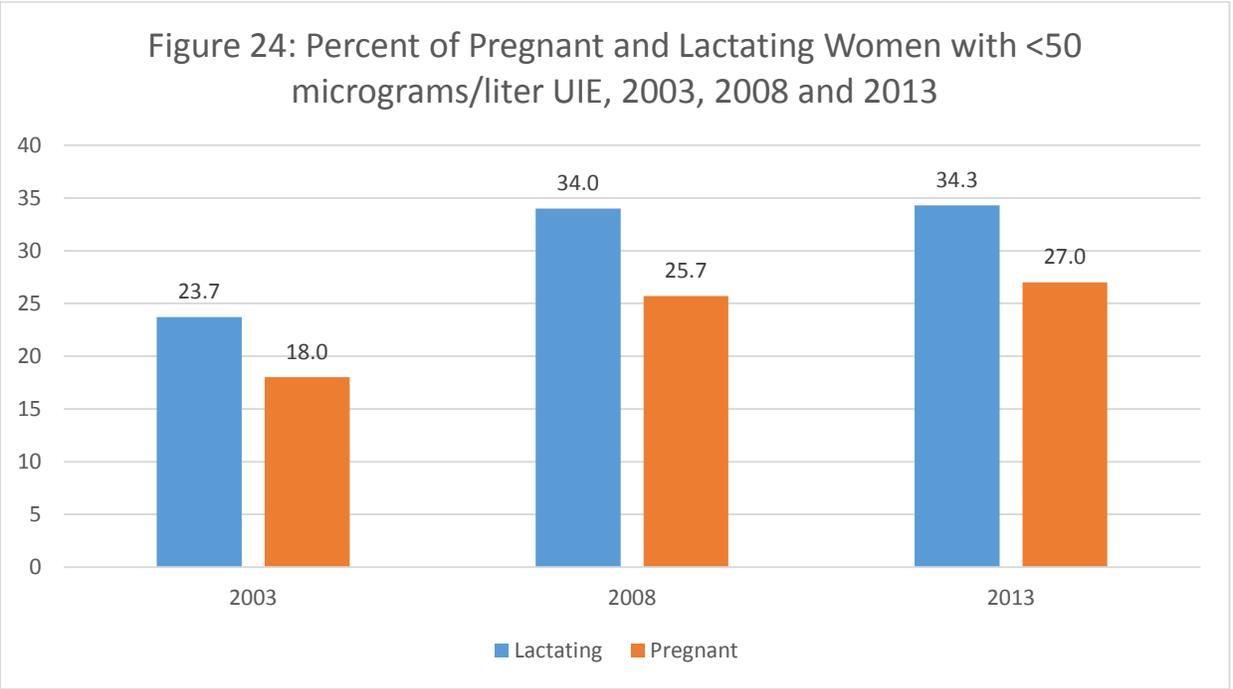
Sources: FNRI (2010) and Agdeppa (2015)



Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)

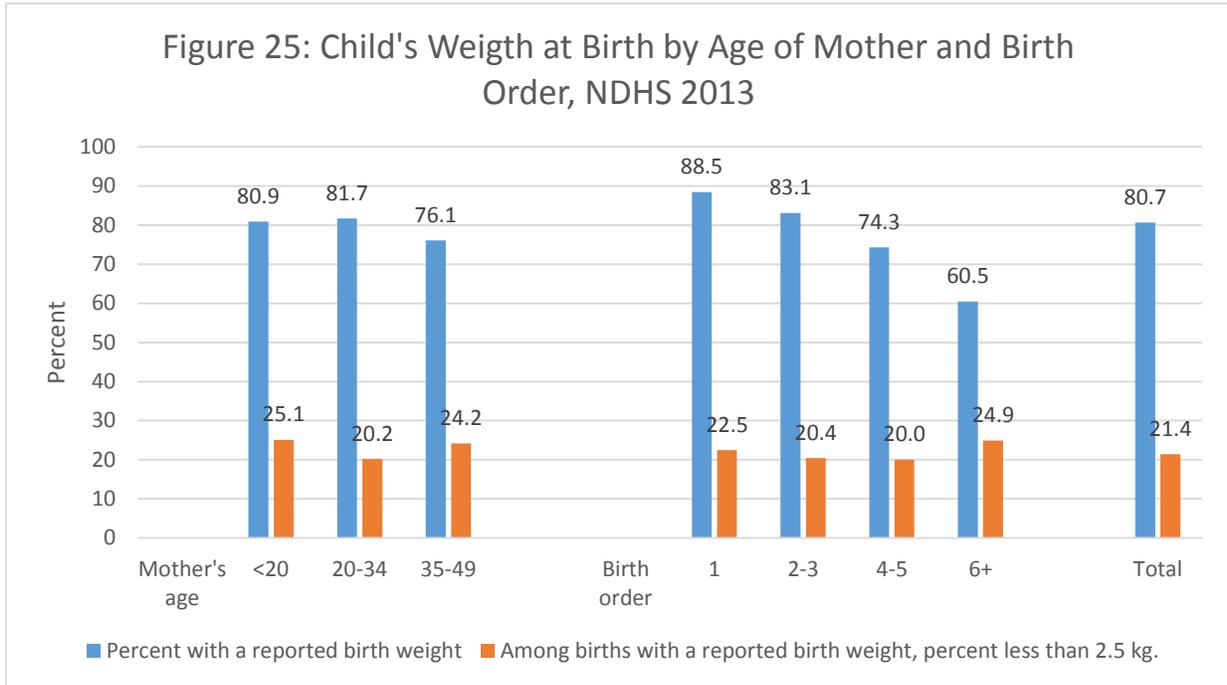


Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)

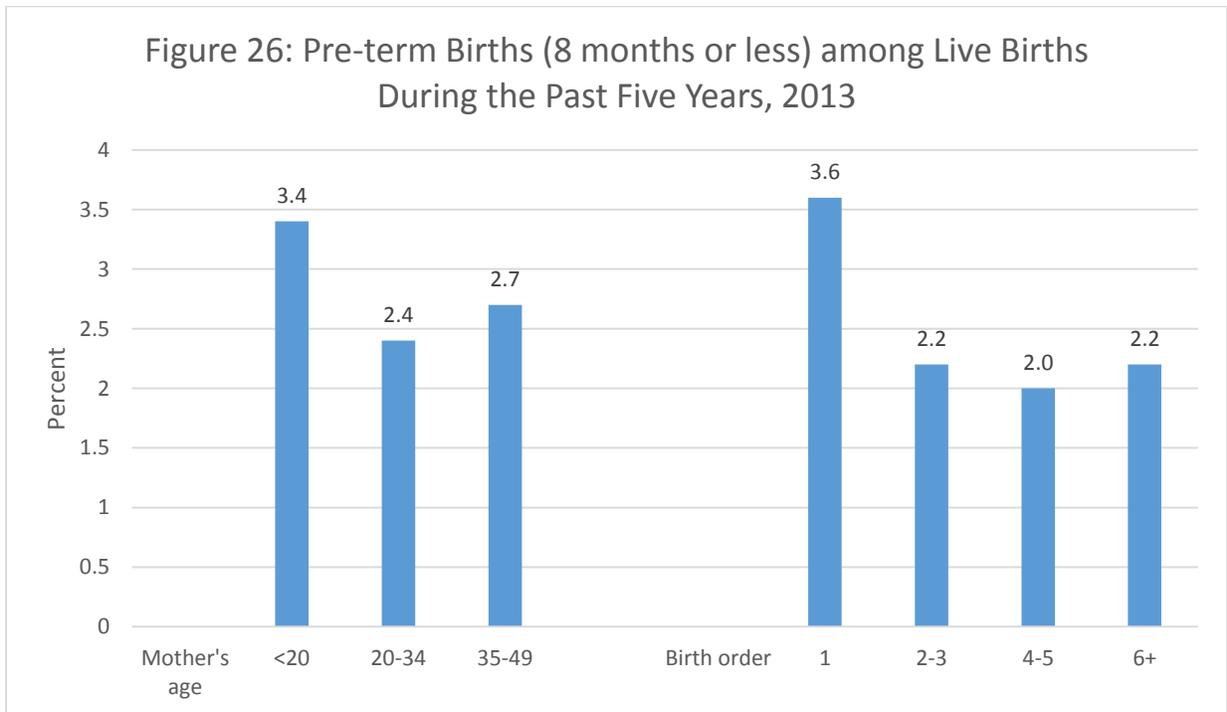


Source: Agdeppa (2015)

## Birth Outcomes

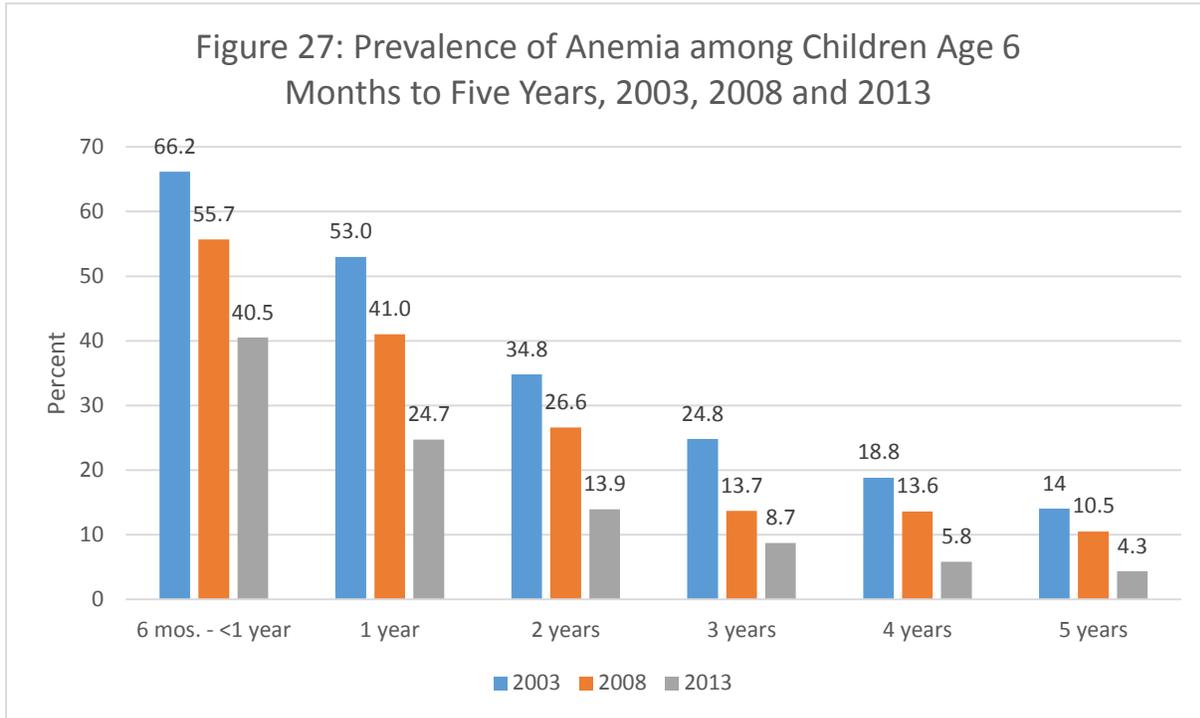


Source: NDHS 2013

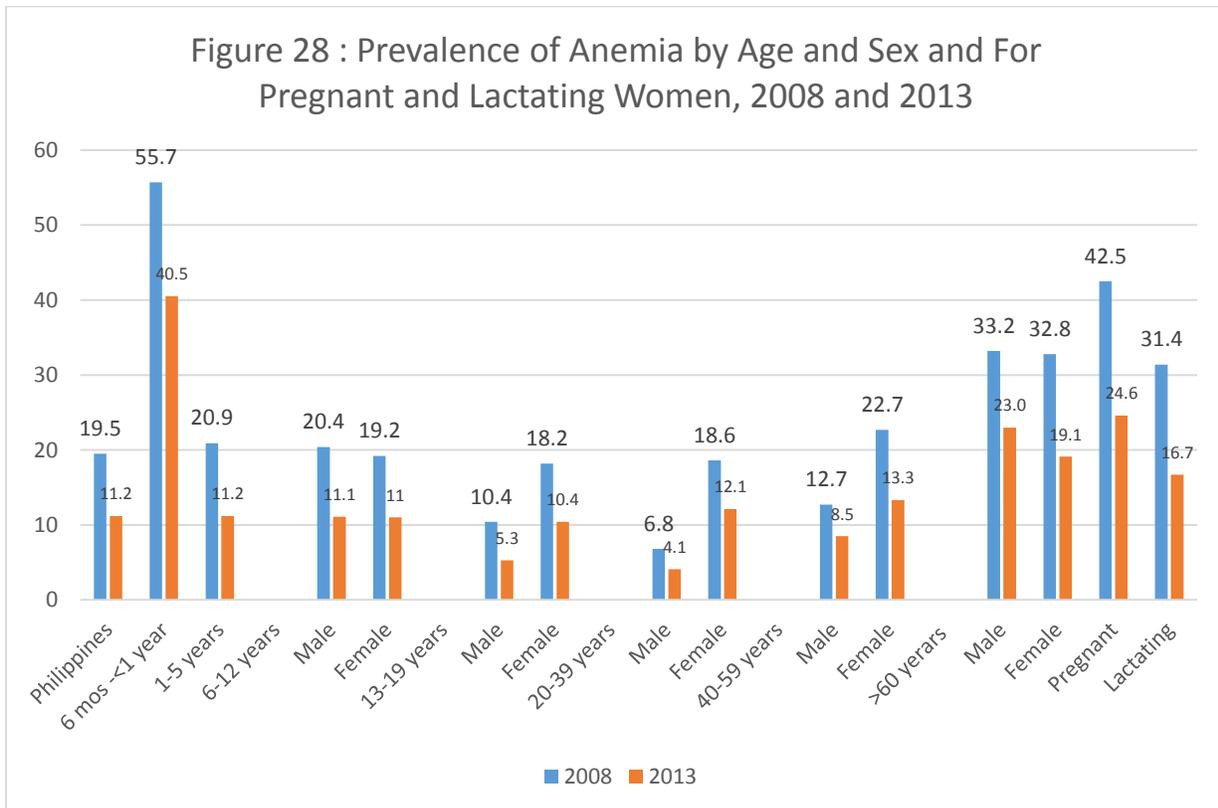


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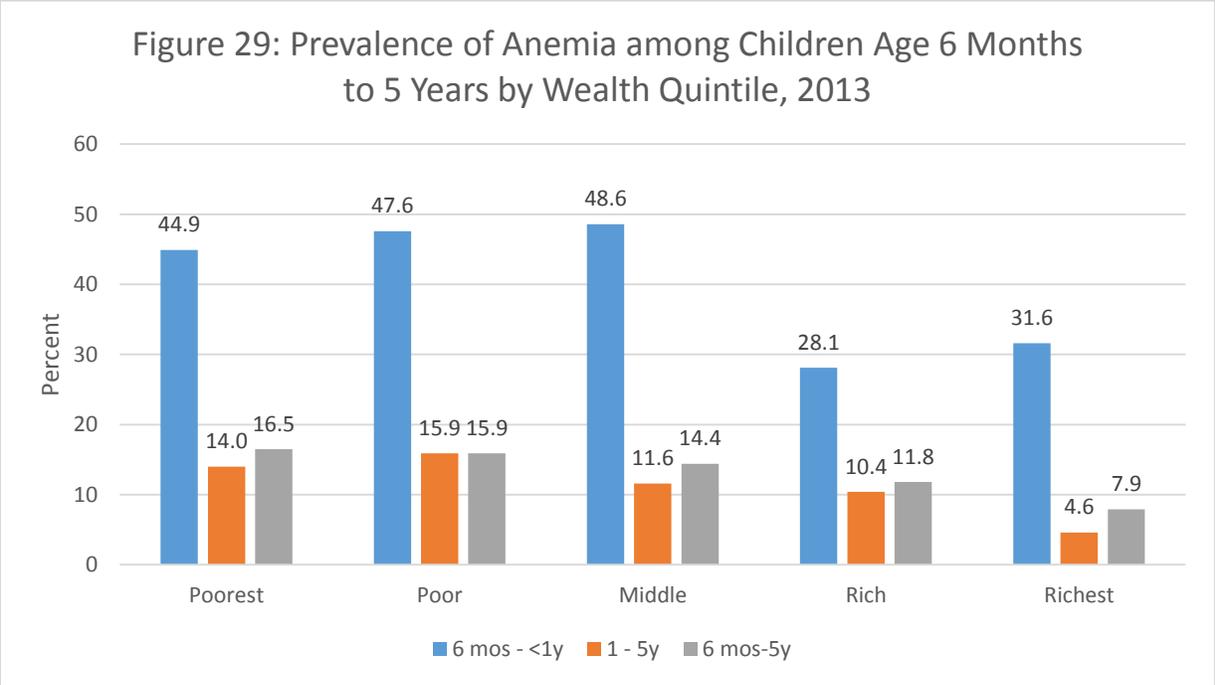
## Micronutrient Deficiencies among Children



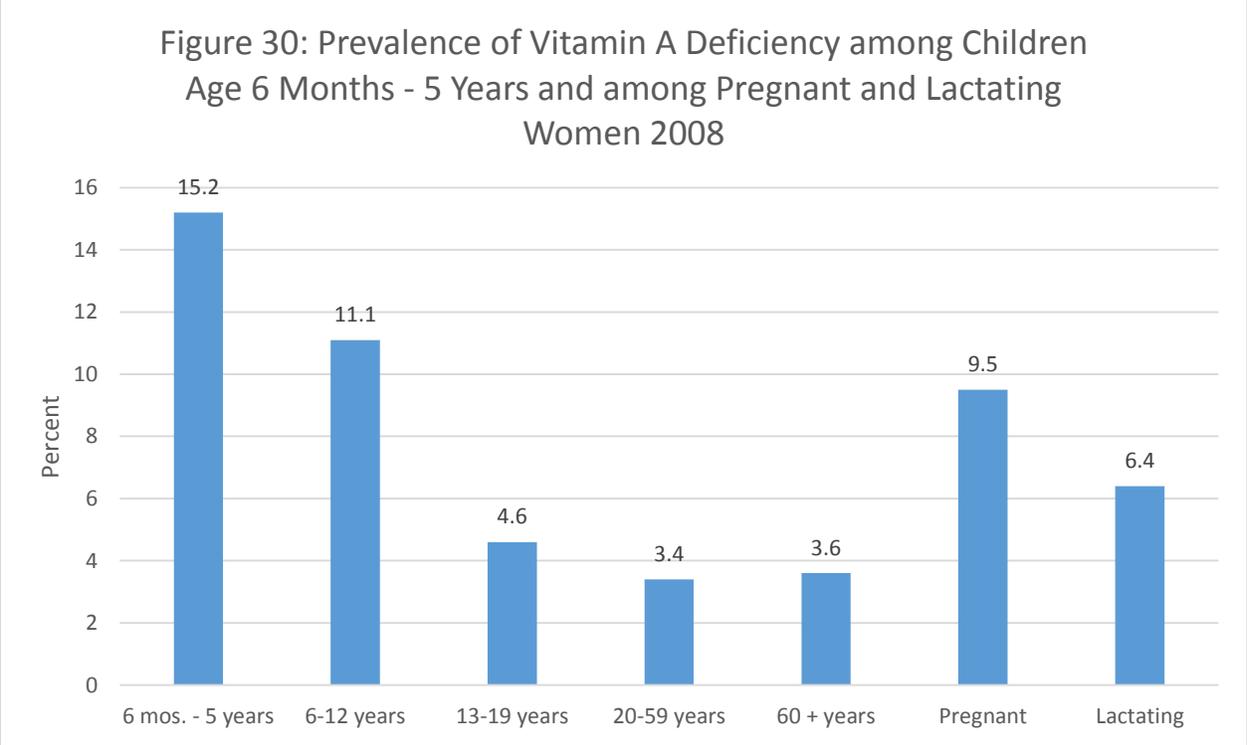
Source; Agdeppa (2015)



Source; FNRI (2010) and Agdeppa (2015)

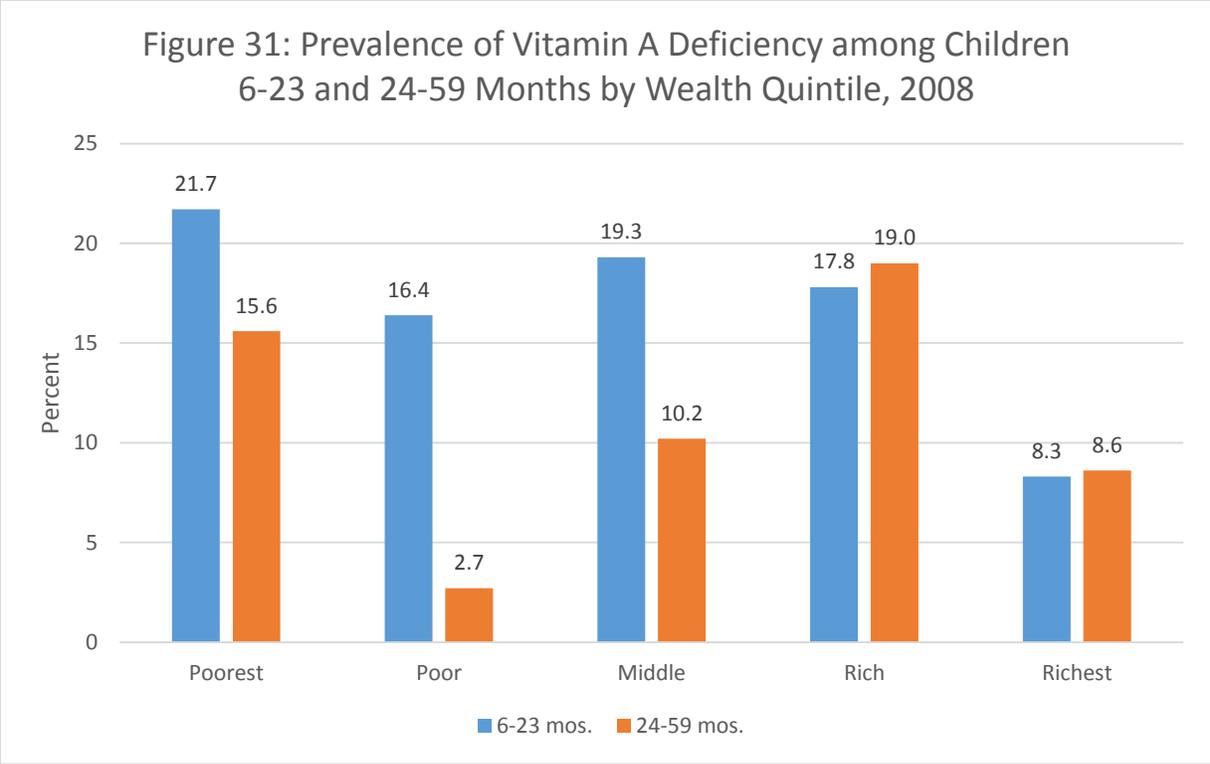


Source: Agdeppa (2015)

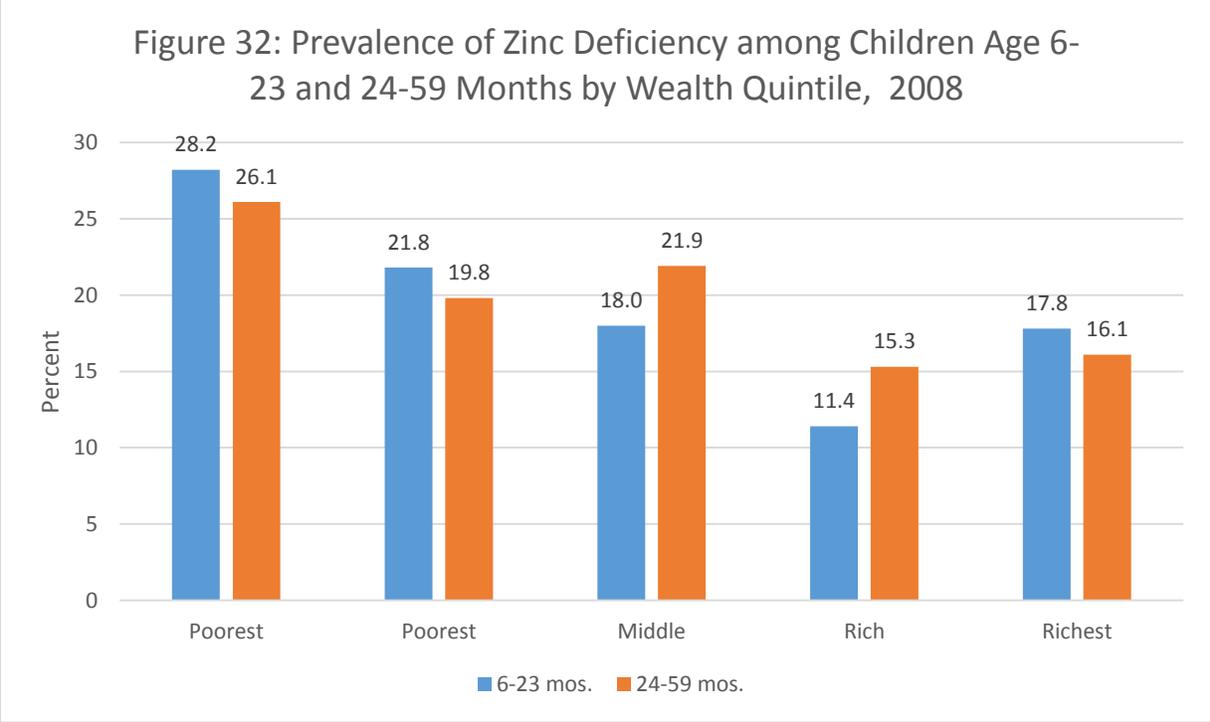


Source; Agdeppa (2015)





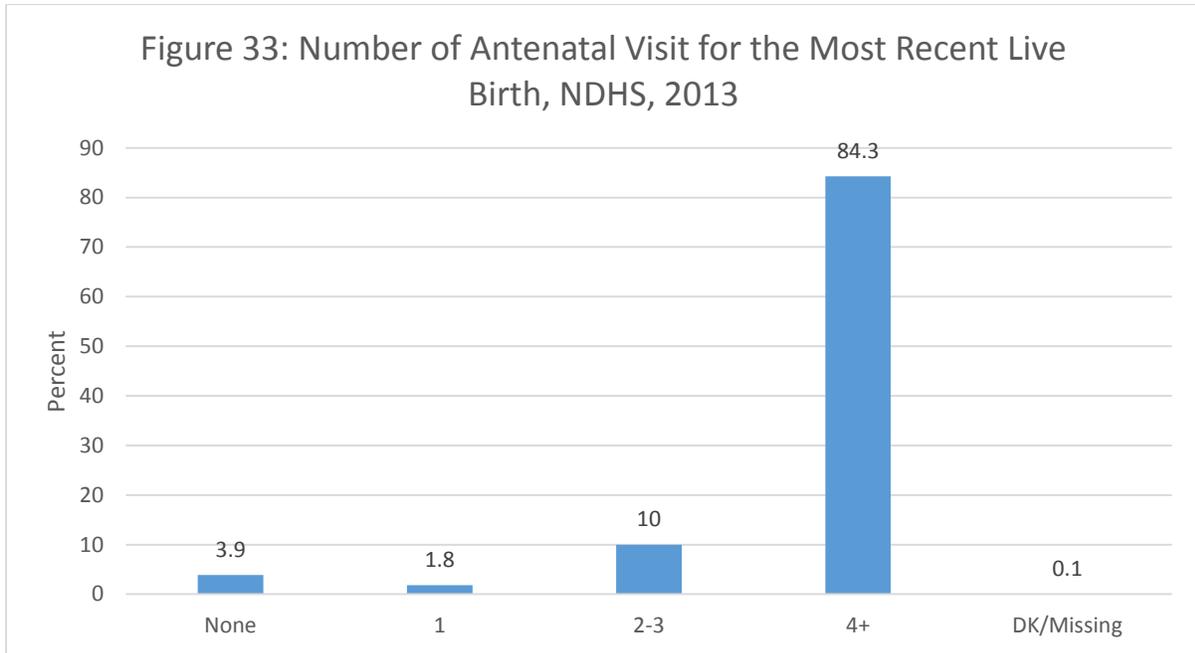
Source; Agdeppa (2015)



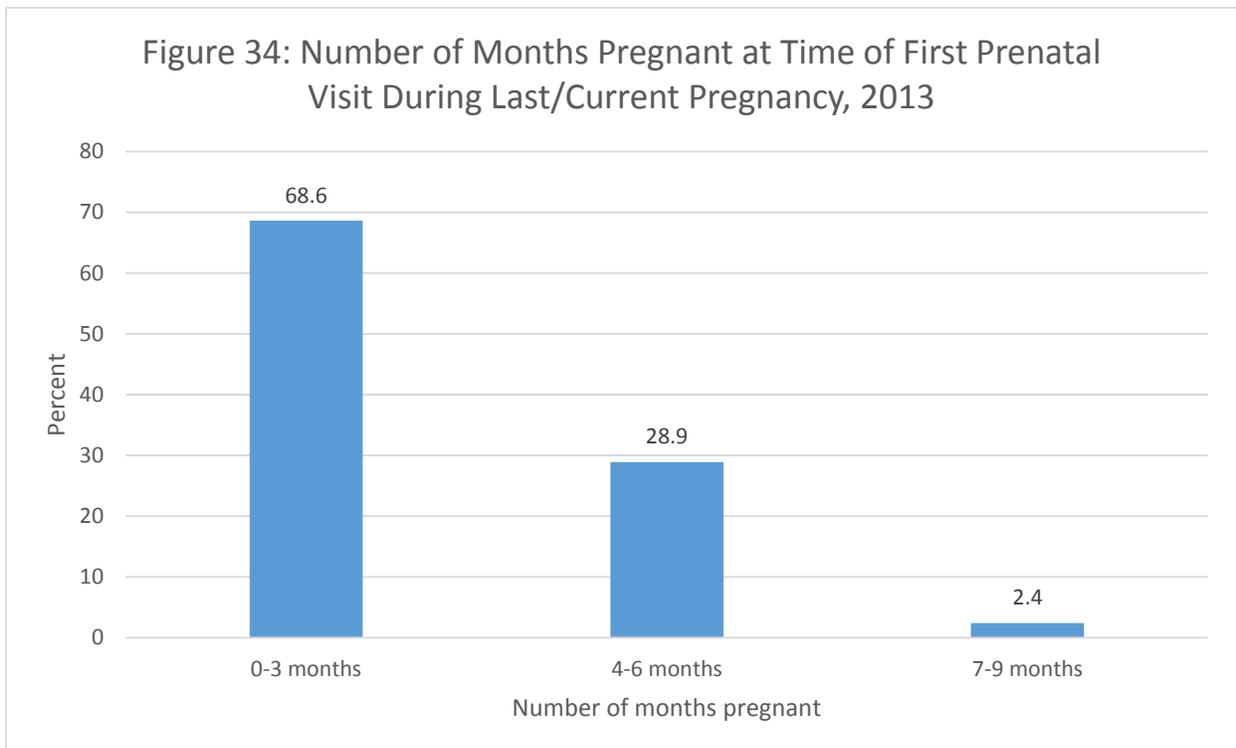
Source; Agdeppa (2015)

## Interventions

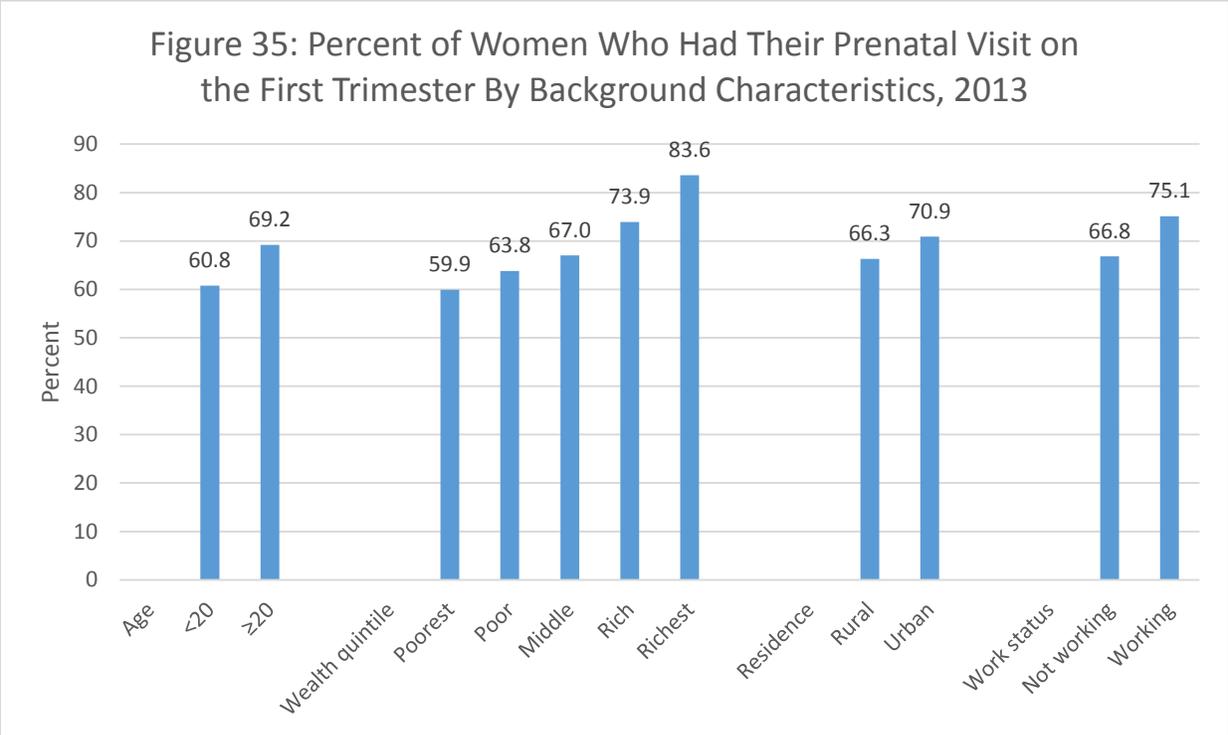
### Antenatal Care



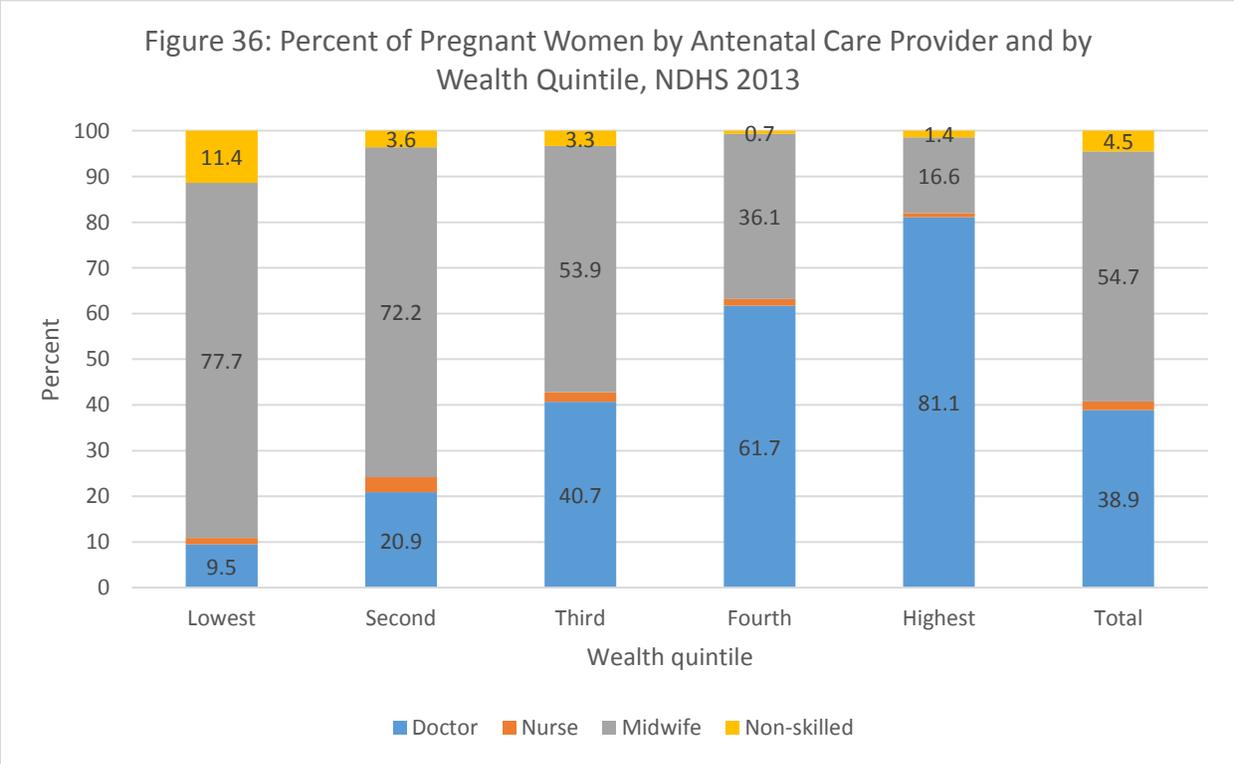
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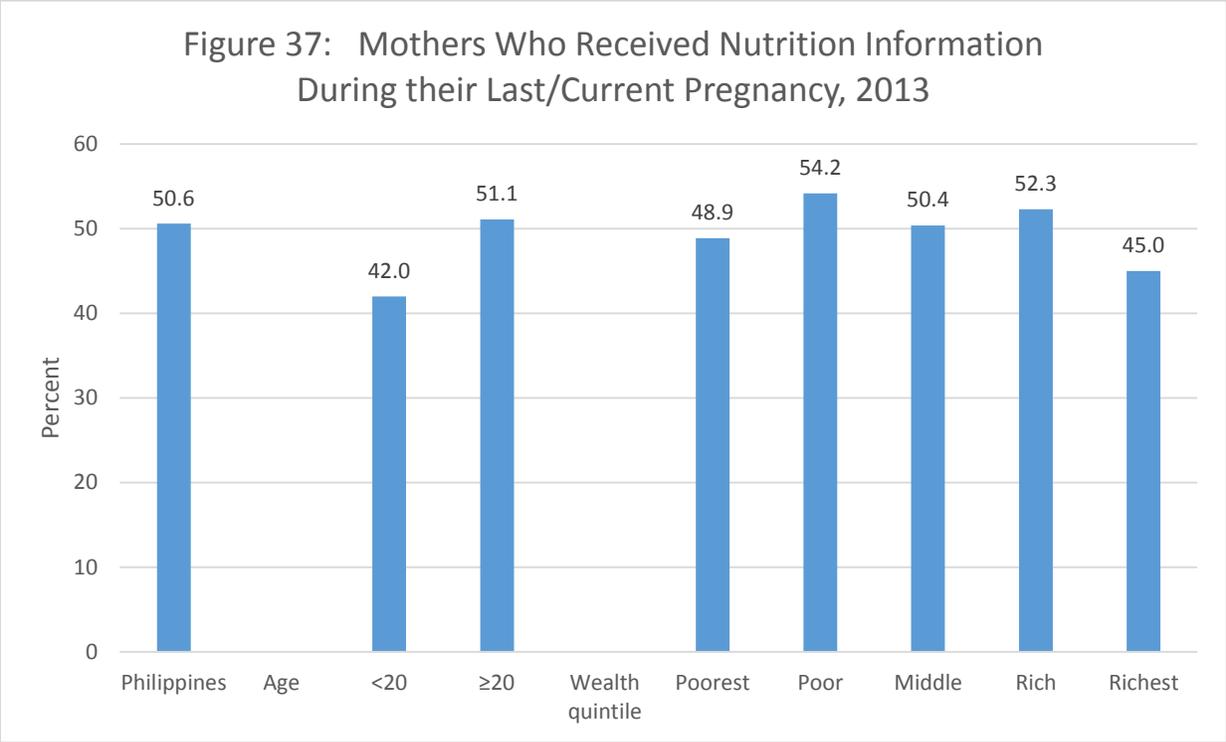
Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)



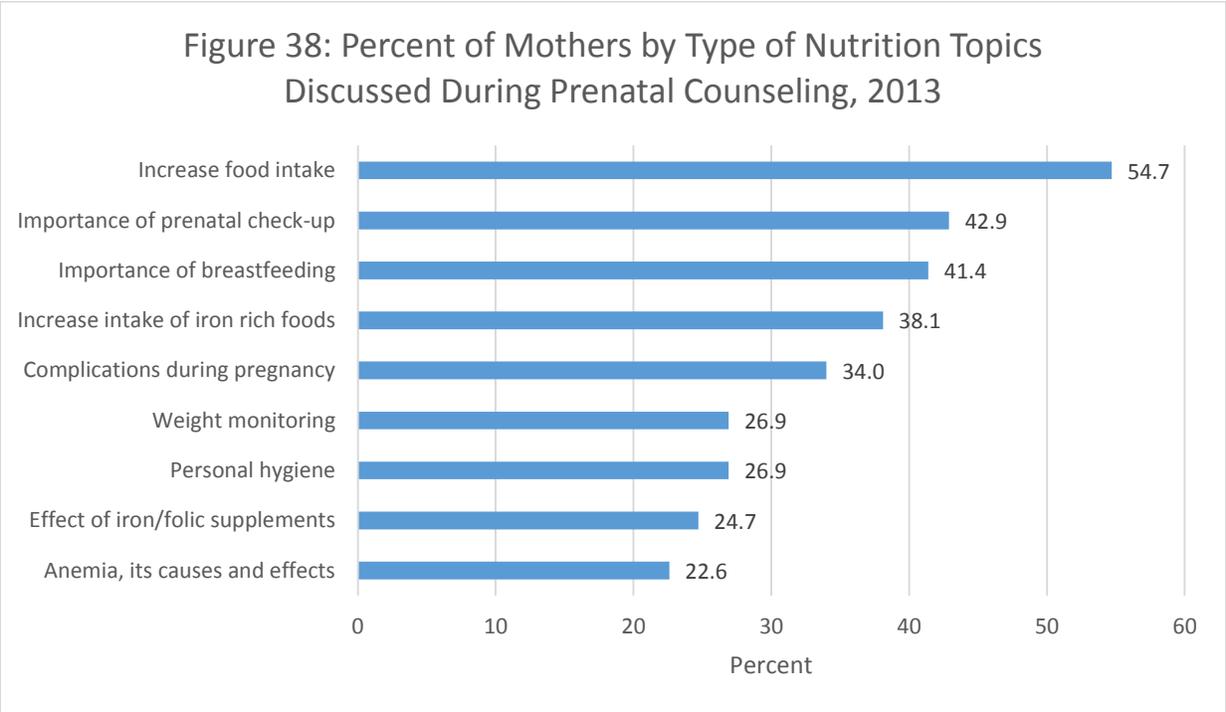
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Source: NDHS 2013

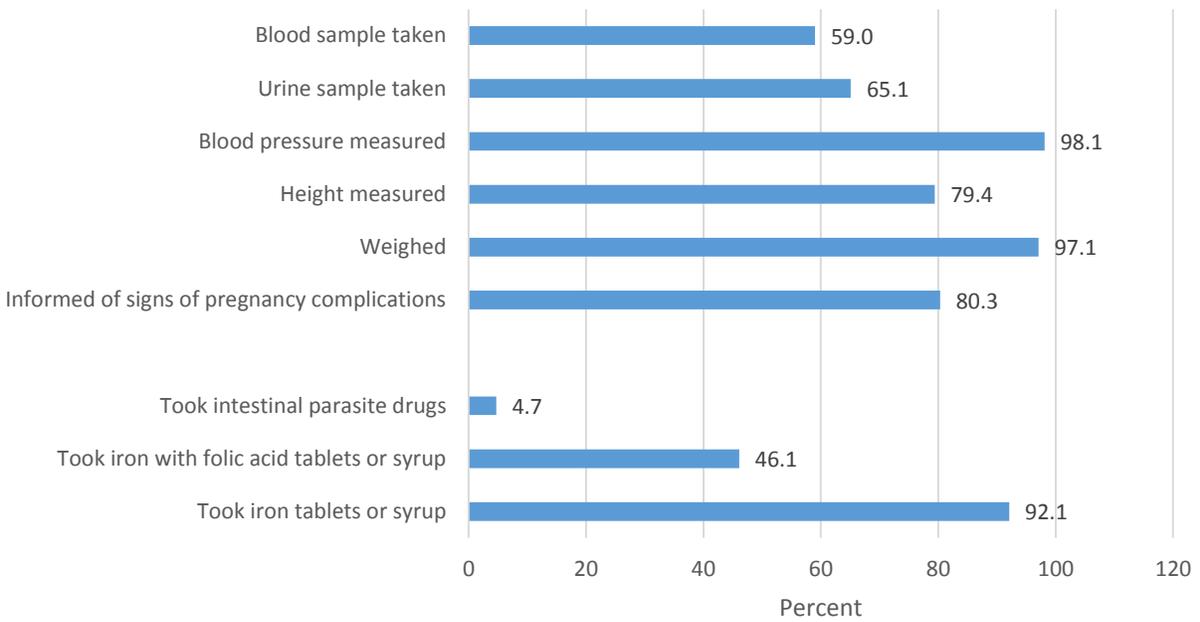


Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)



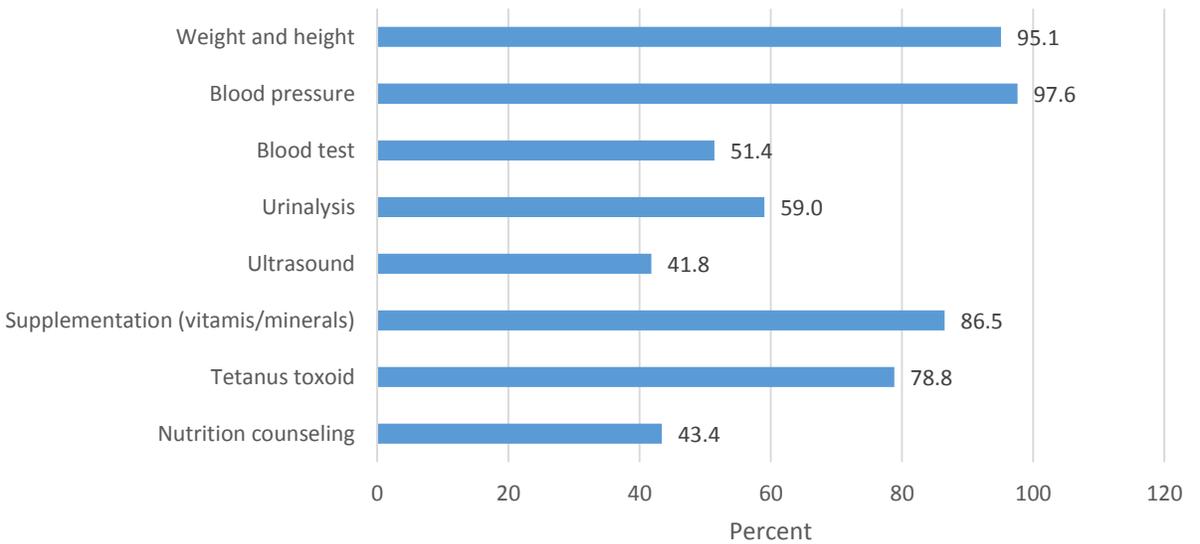
Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)

Figure 39: Components of Antenatal Care for Most Recent Live Birth During the Past Five Years Preceding the Survey, NDHS 2013



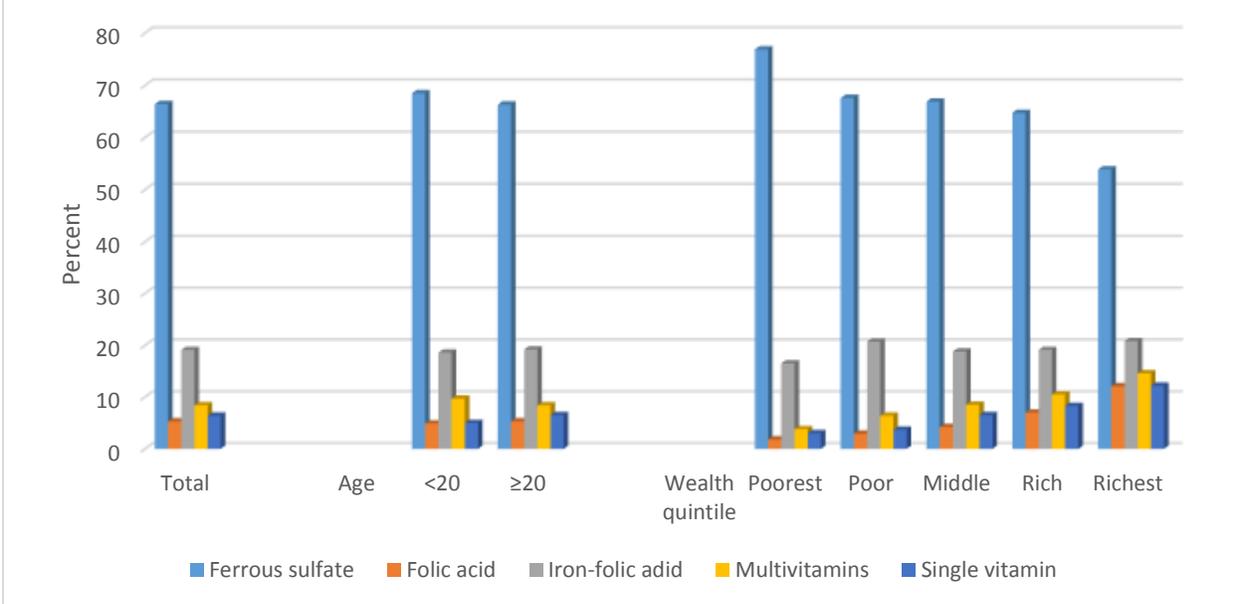
Source: NDHS 2013

Figure 40 Services Received During Prenatal Visits, 2013



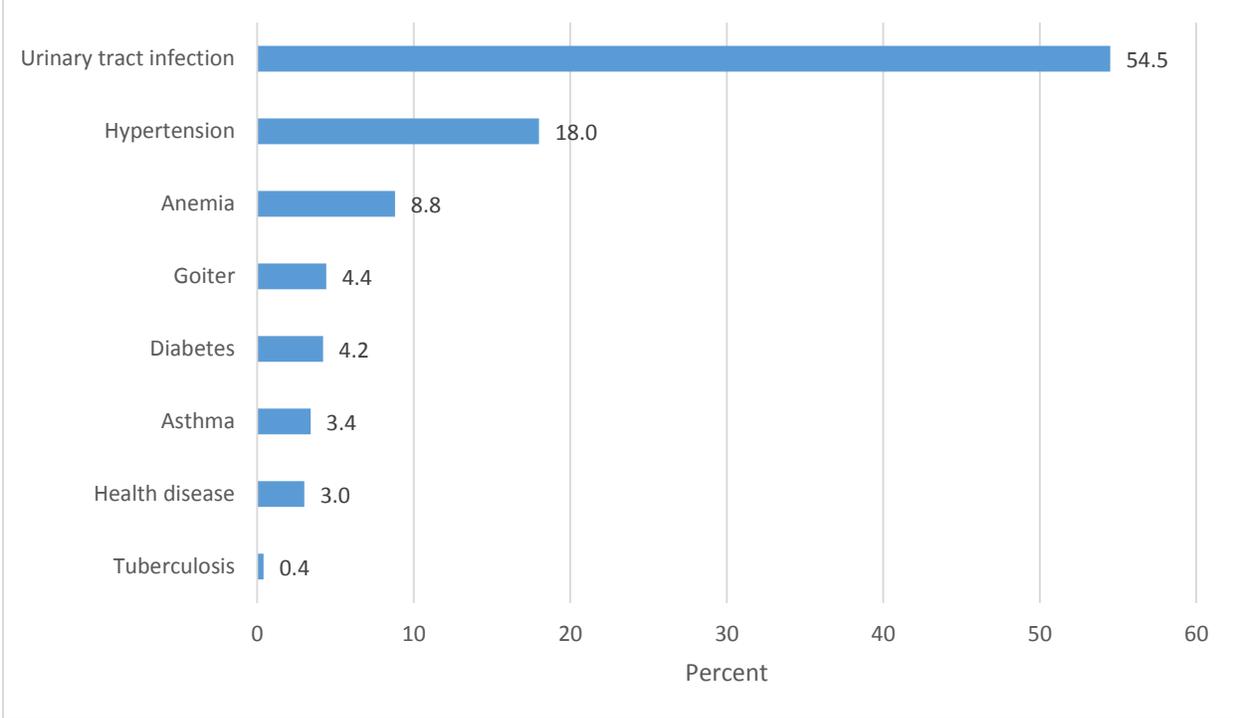
Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)

Figure 41: Supplements Taken During Pregnancy by Type of Supplement By Age and Wealth Quintile, 2013



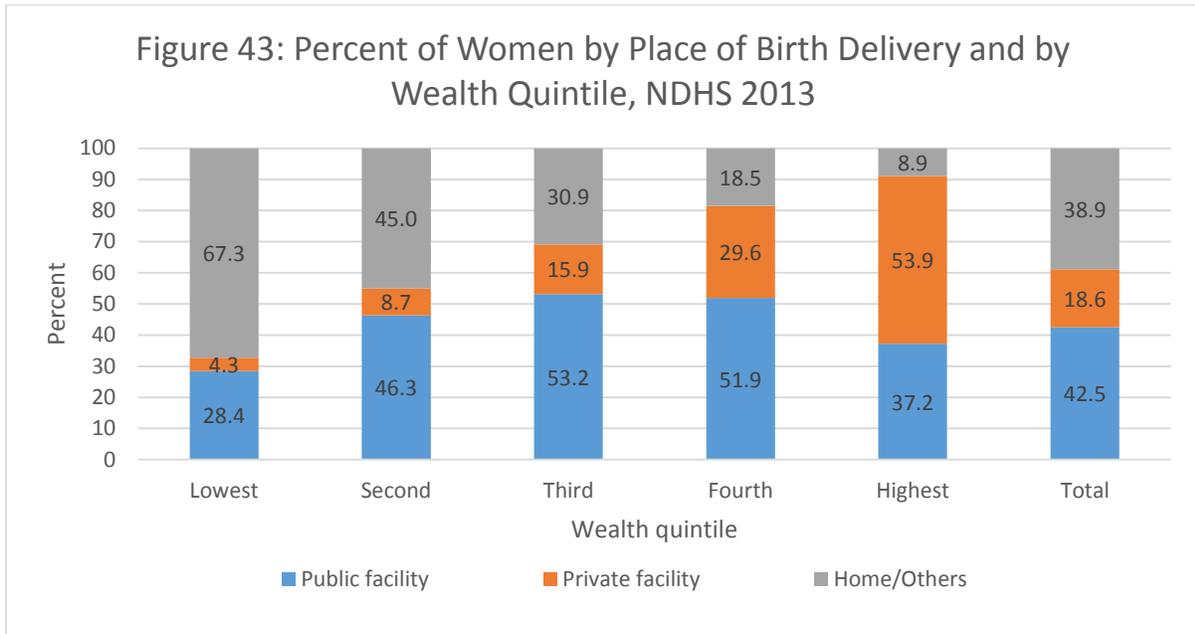
Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)

Figure 42: Percent of Mothers by Type of Pregnancy Complications Experienced During Last/Current Pregnancy, 2013

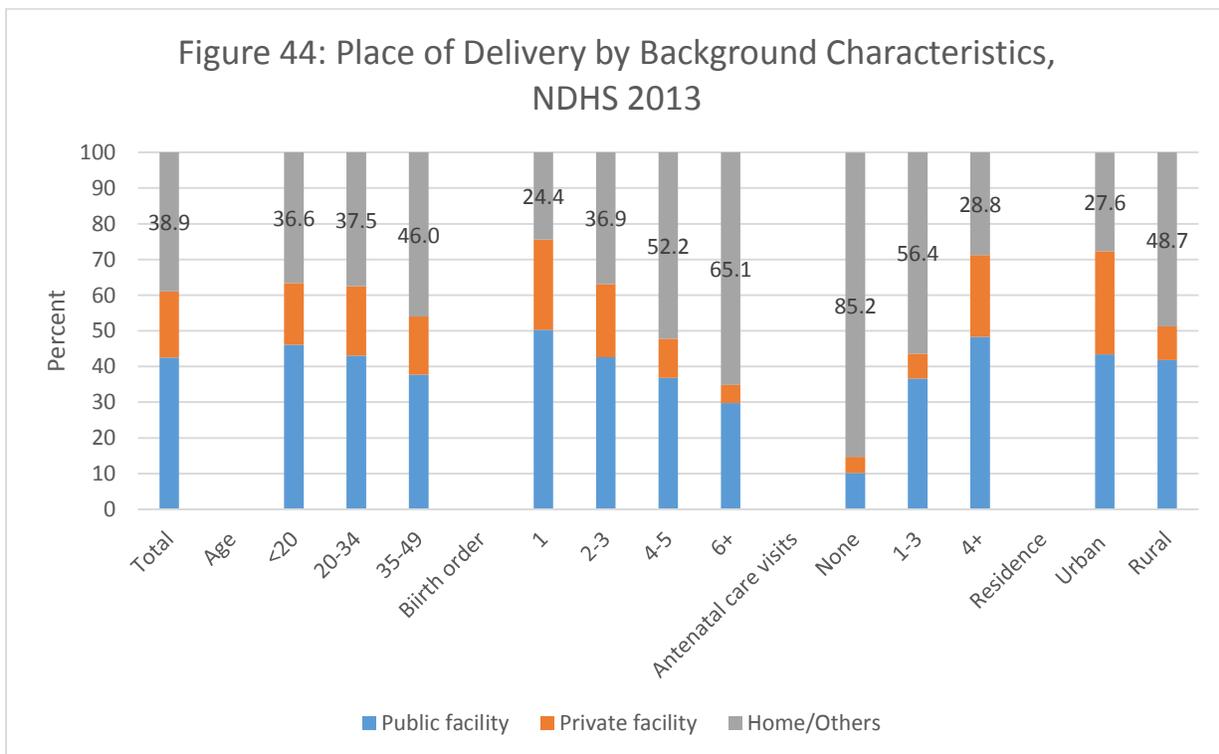


Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)

## Birth Delivery

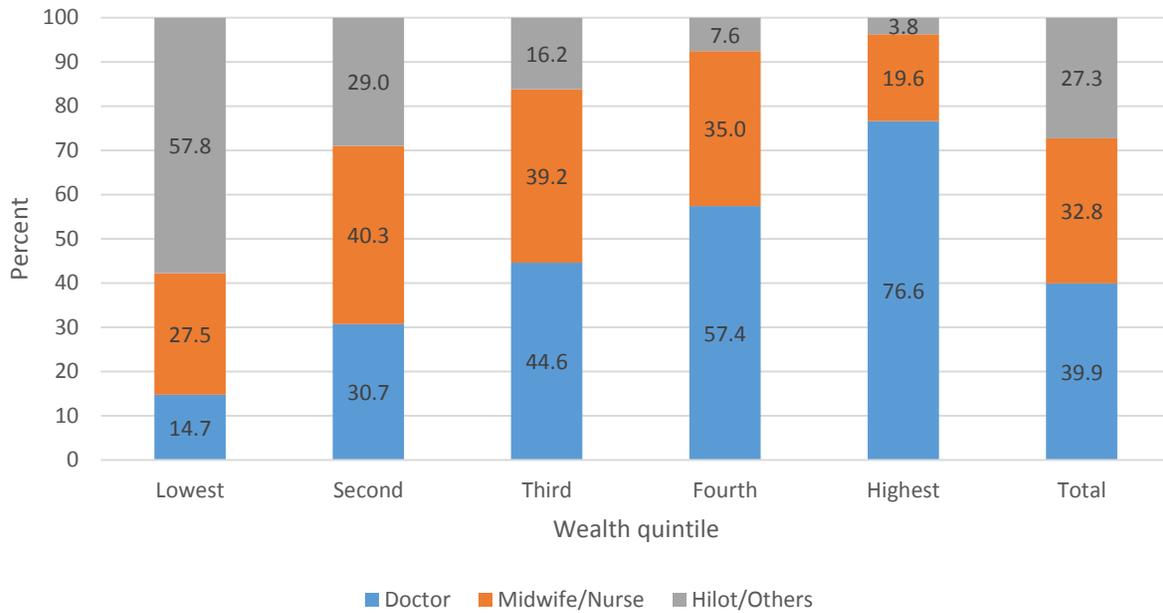


Source: NDHS 2013



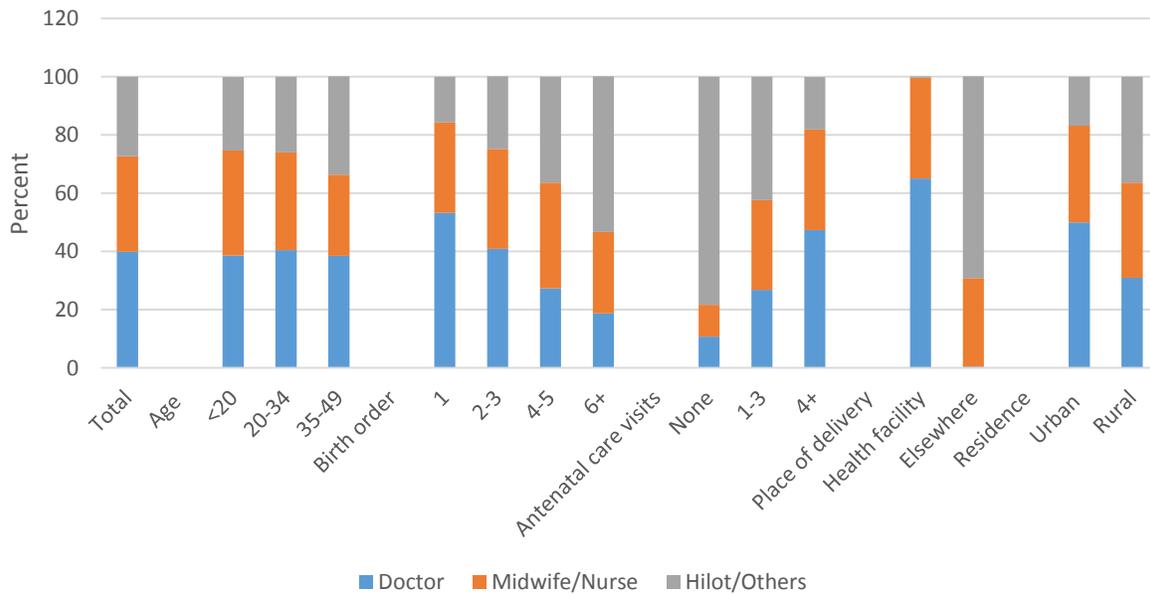
Source: NDHS 2013

Figure 45: Person Providing Assistance During Delivery by Wealth Quintile, NDHS 2013



Source: NDHS 2013

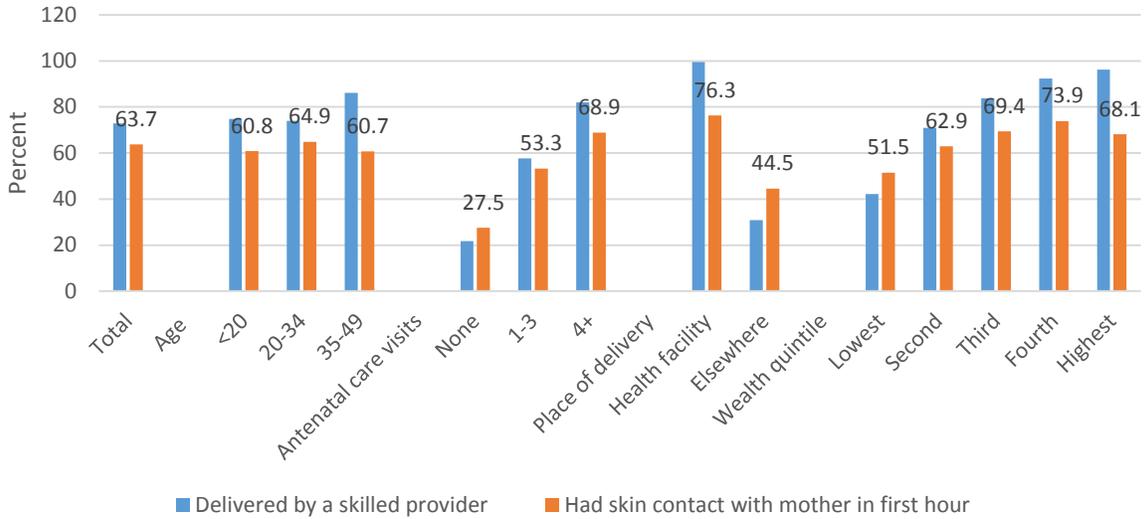
Figure 46: Person Providing Assistance During Delivery by Background Characteristics, NDHS 2013



Source: NDHS 2013



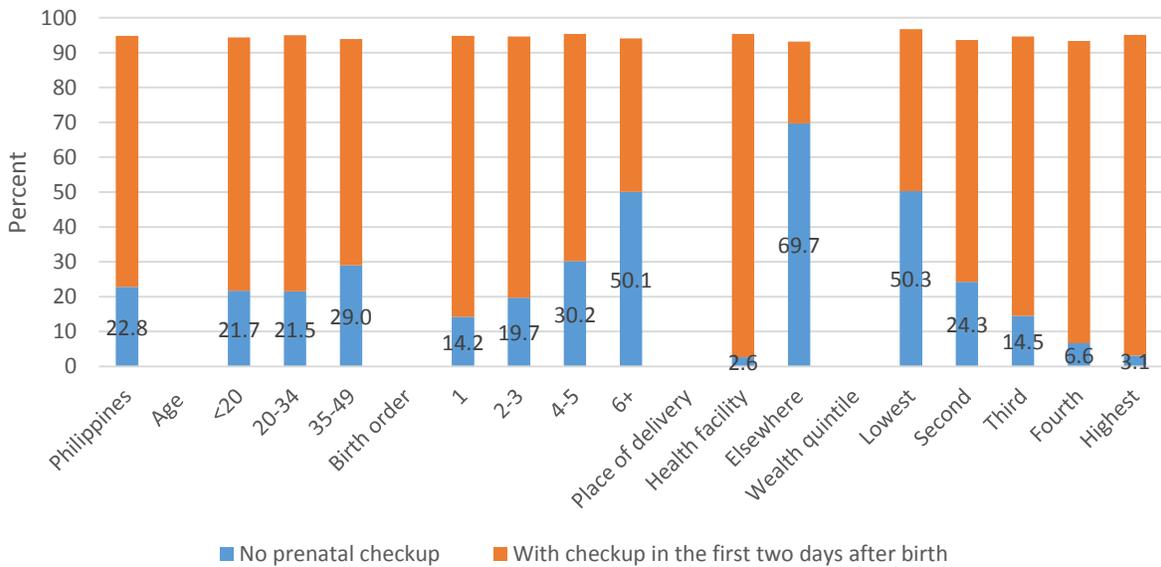
Figure 47: Percent of Births Delivered by Skilled Provider and Births that Had Skin Contact with the Mother in the First Hour, NDHS 2013



Source: NDHA 2013

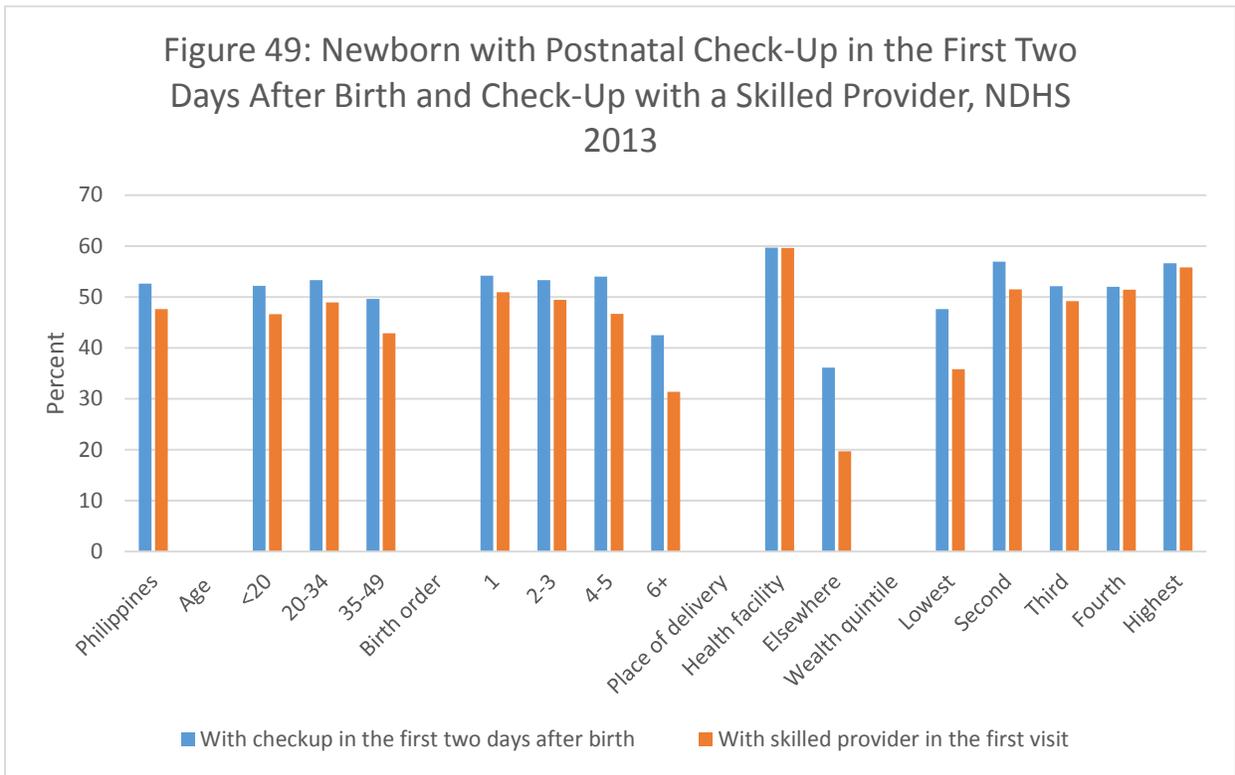
Postnatal Care

Figure 48: Percent of Mothers with Postnatal Check-Up in the First Two Days after Birth, NDHS 2013



Source: NDHS 2013 (Excludes those who had postnatal two days after birth)

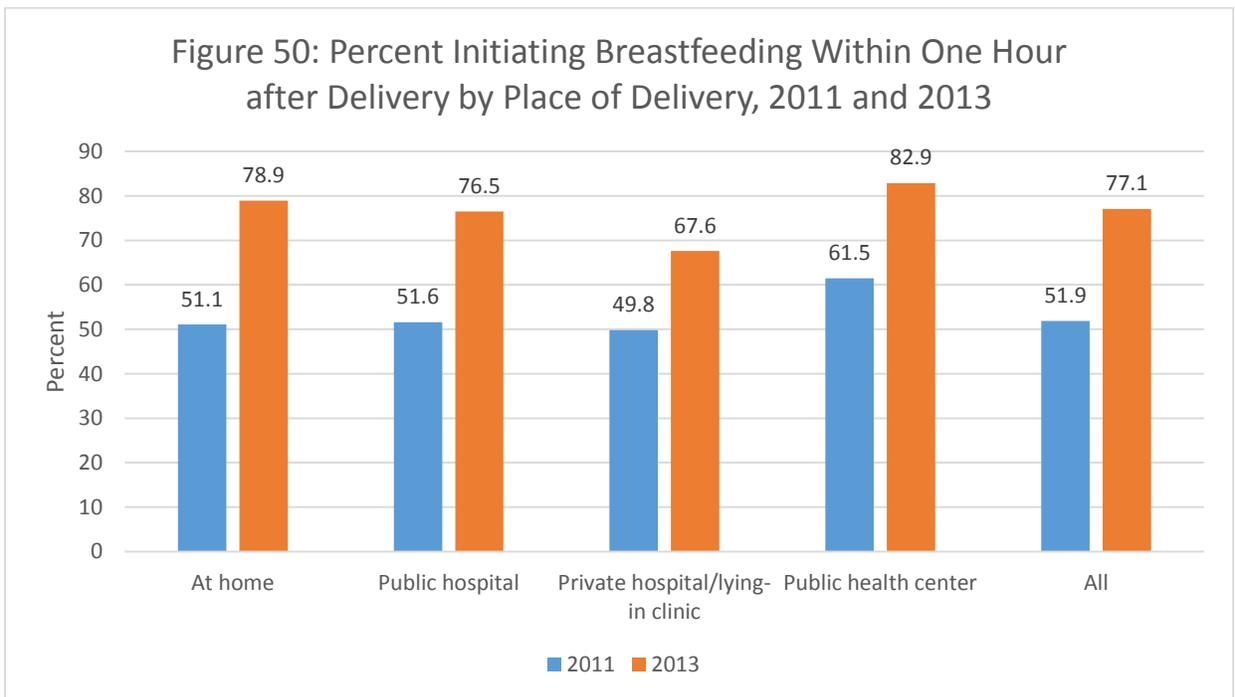
Figure 49: Newborn with Postnatal Check-Up in the First Two Days After Birth and Check-Up with a Skilled Provider, NDHS 2013



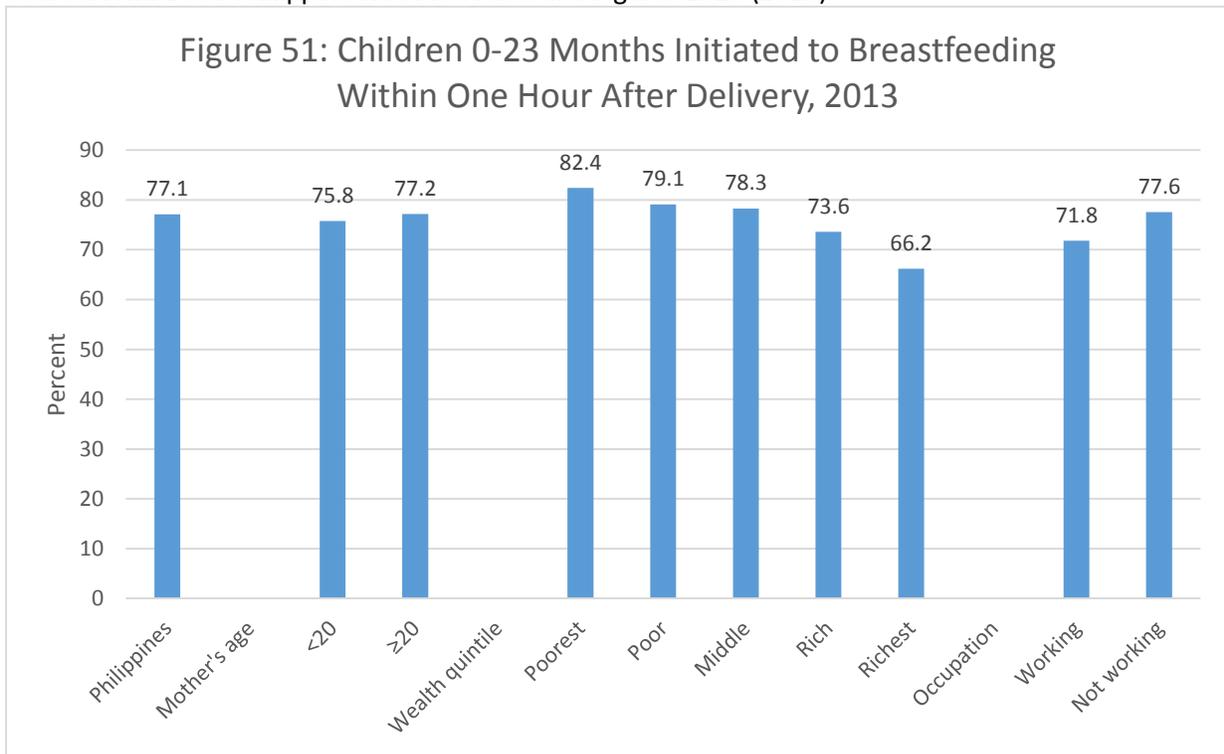
Source: NDHS 2013

### Breastfeeding

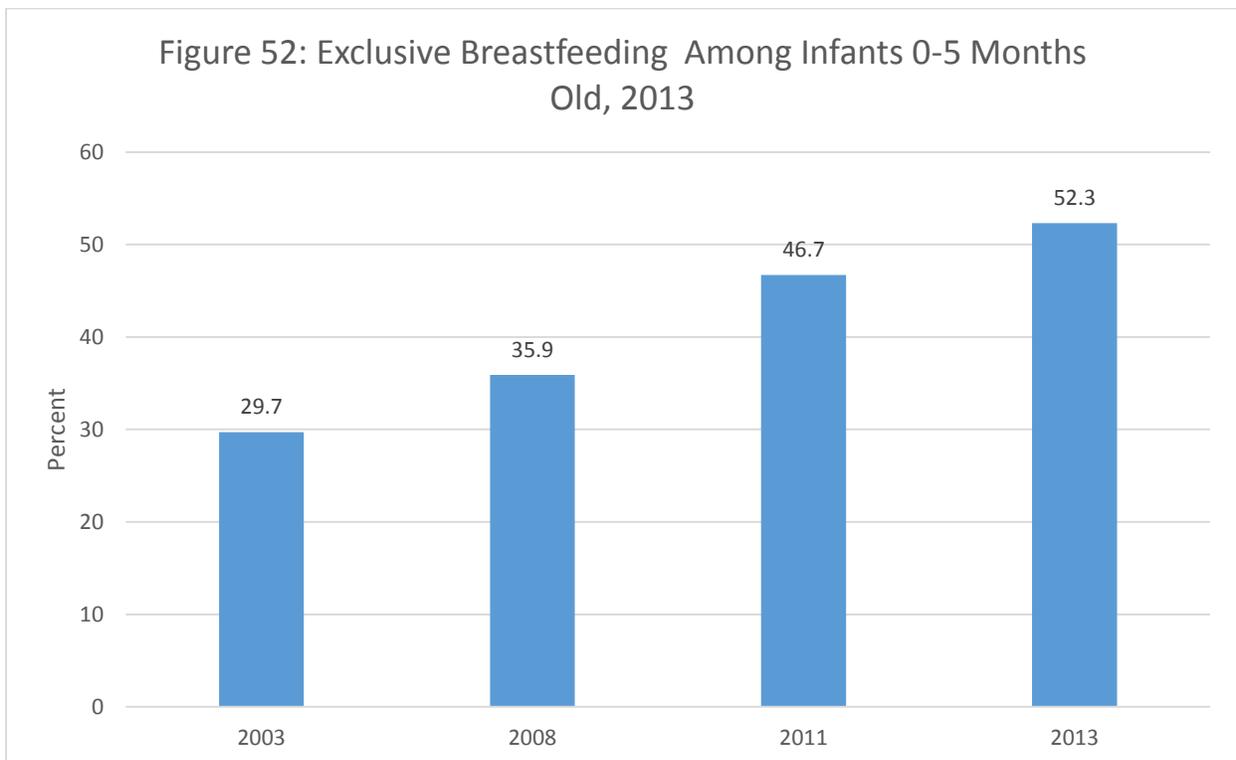
Figure 50: Percent Initiating Breastfeeding Within One Hour after Delivery by Place of Delivery, 2011 and 2013



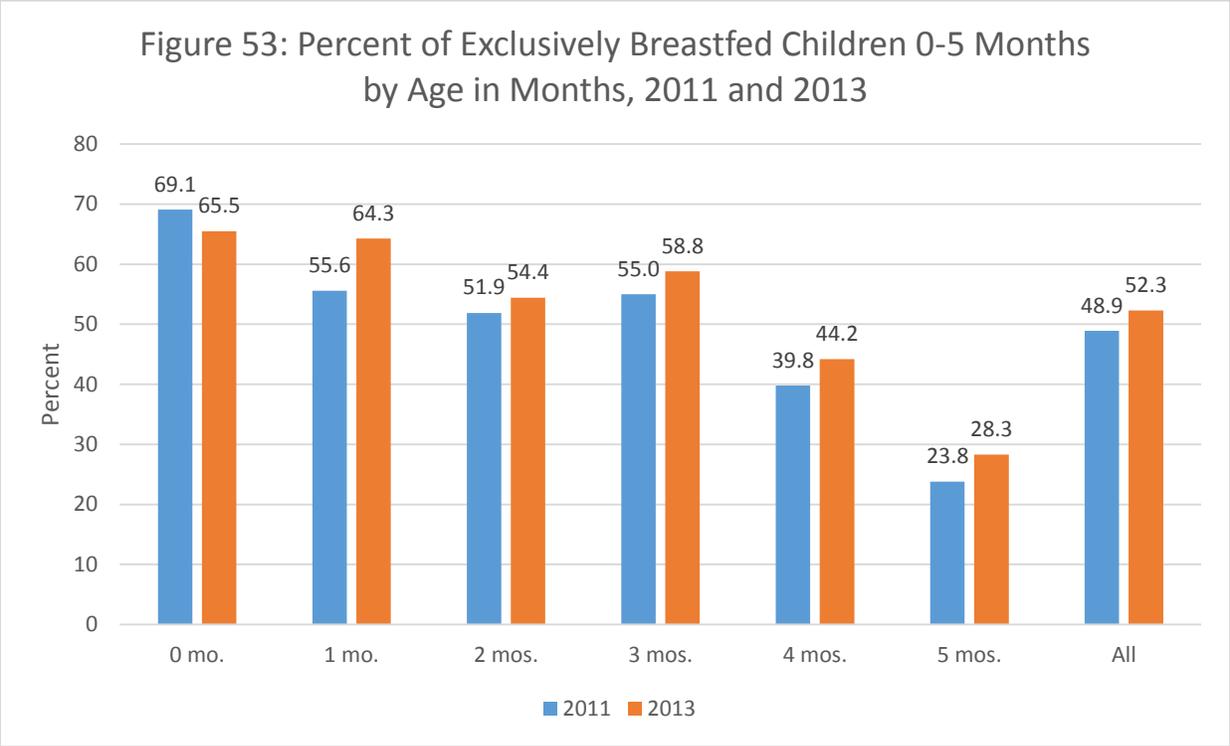
Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)



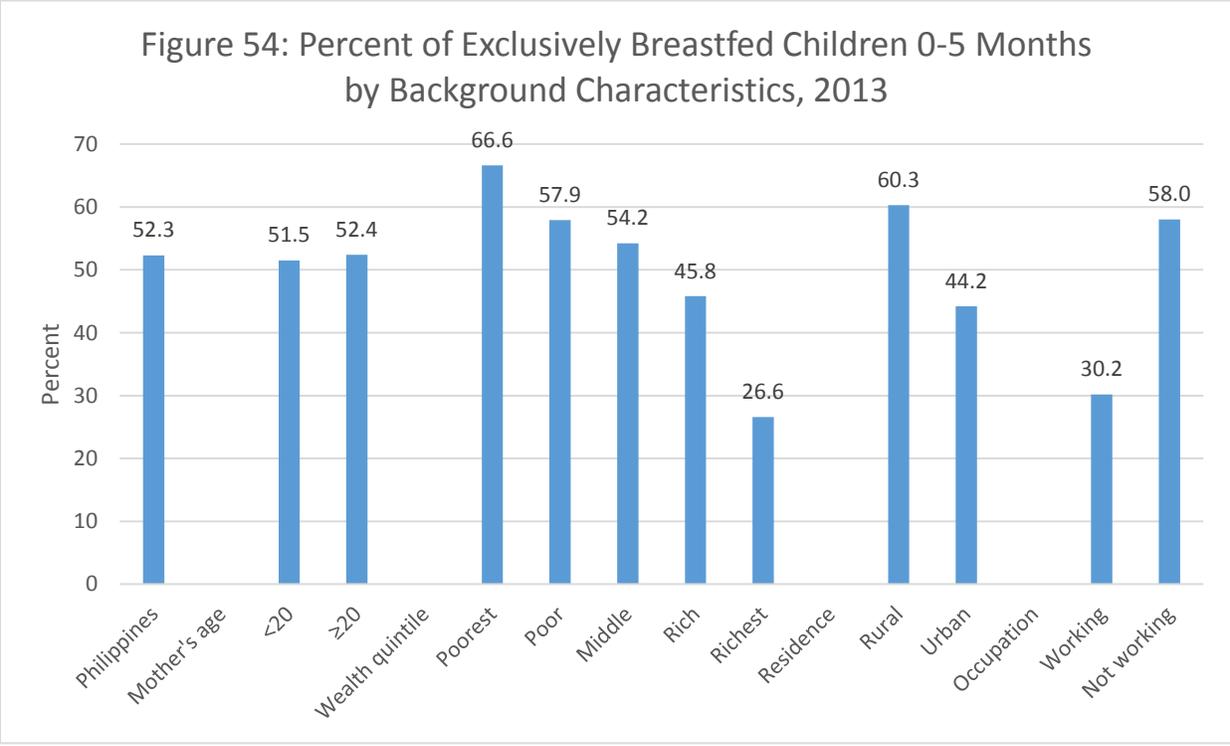
Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)



Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)

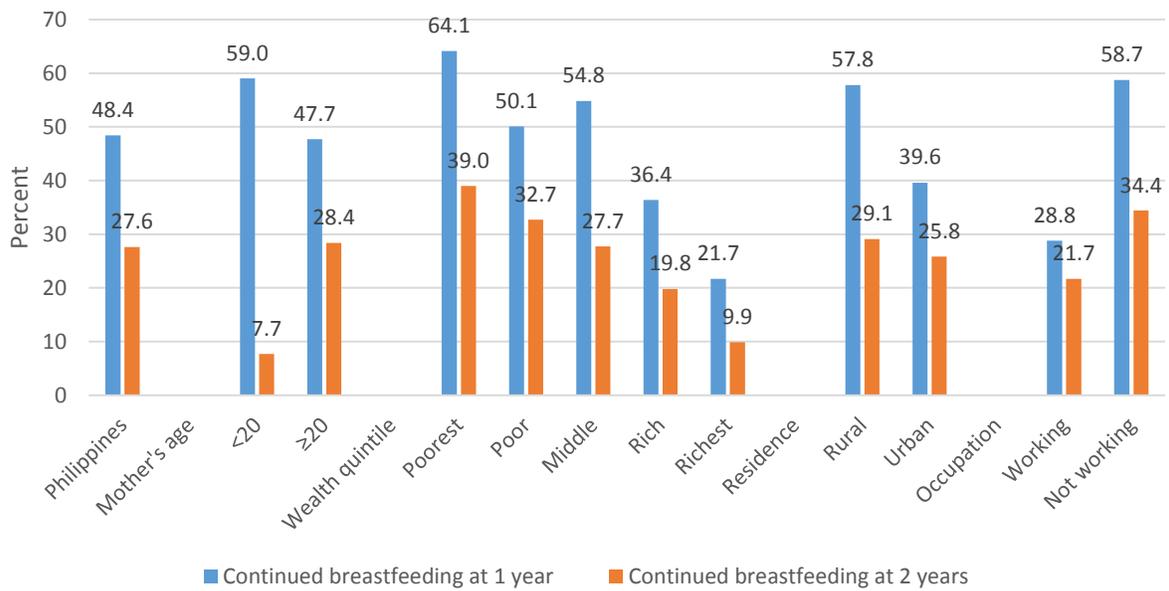


Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)



Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)

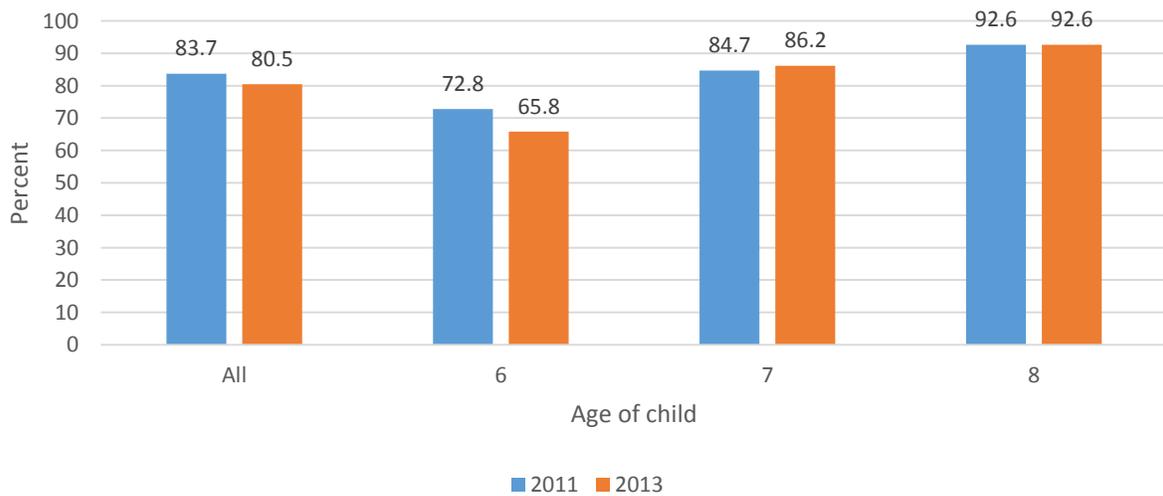
Figure 55: Percent of Children with Continued Breastfeeding, 2013



Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)

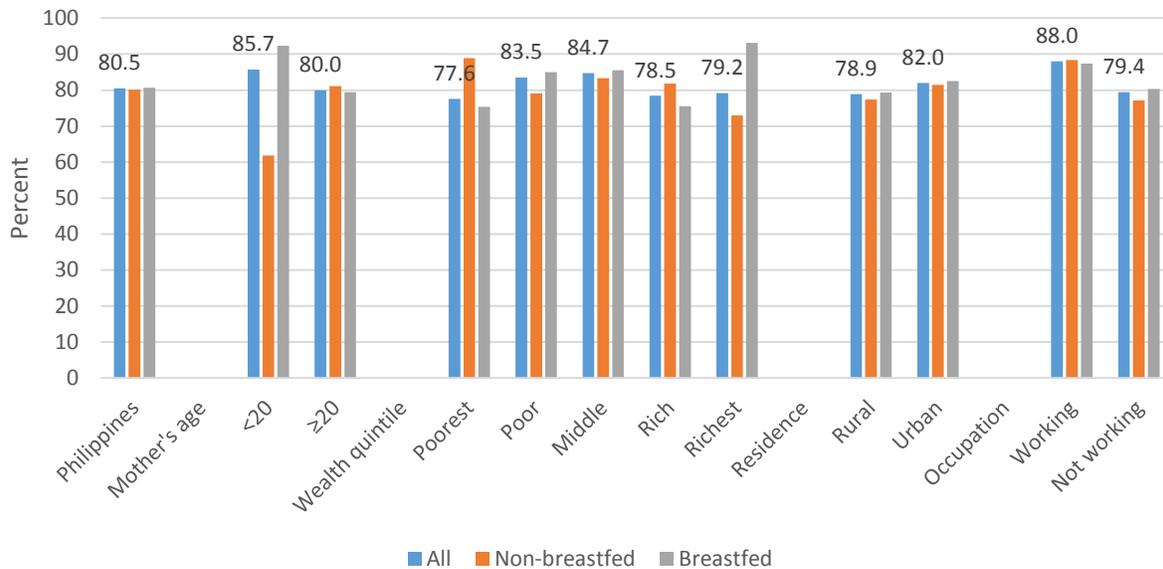
### Complementary feeding

Figure 56: Percent of Children 6-8 Months Old Introduced to Complementary Foods, 2011 and 2013



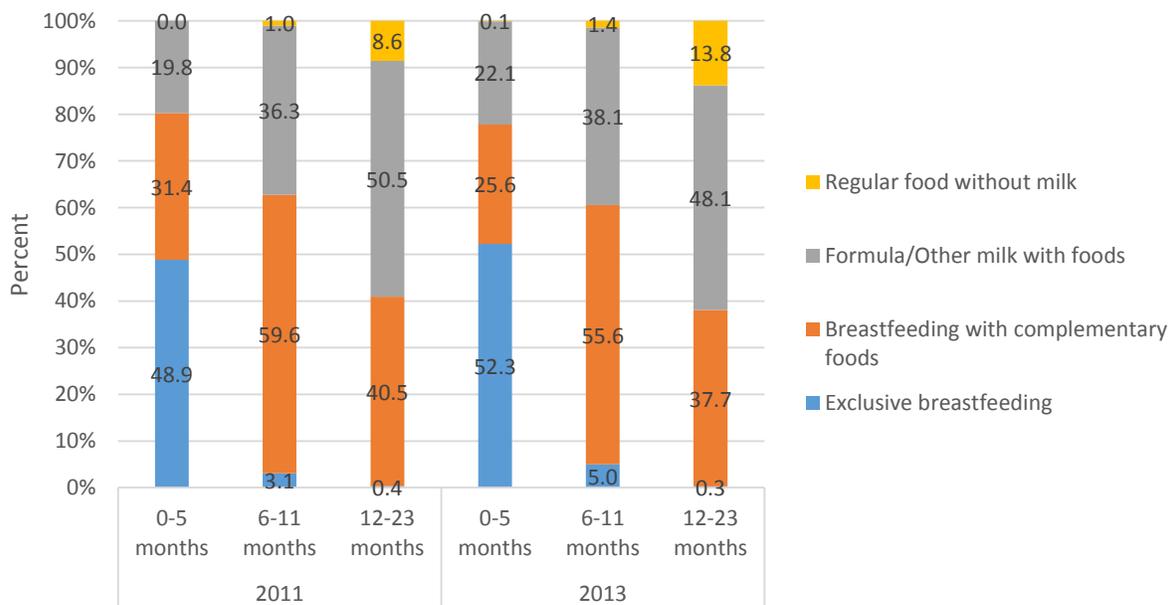
Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)

Figure 57: Percent of Children Aged 6-8 Months Introduced to Complementary Foods by Background Characteristics, 2013



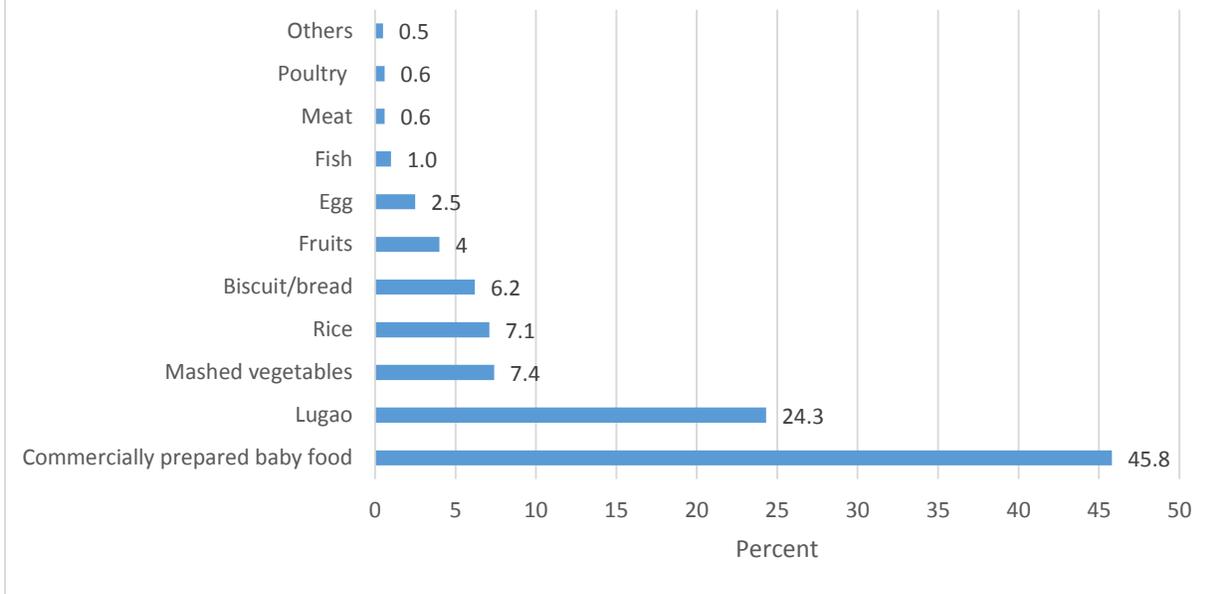
Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)

Figure 58: Current Feeding Practice of Children 0-23 Months Old by Age Group, 2011 and 2013



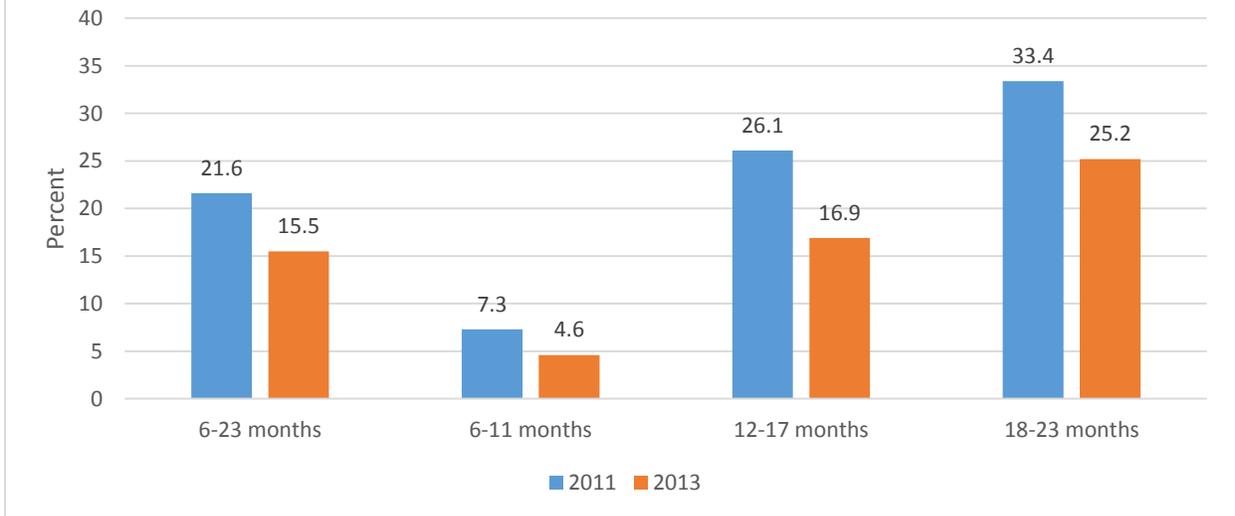
Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)

Figure 59: First Introductory Foods Given to Children 0-23 Months Old, 2011



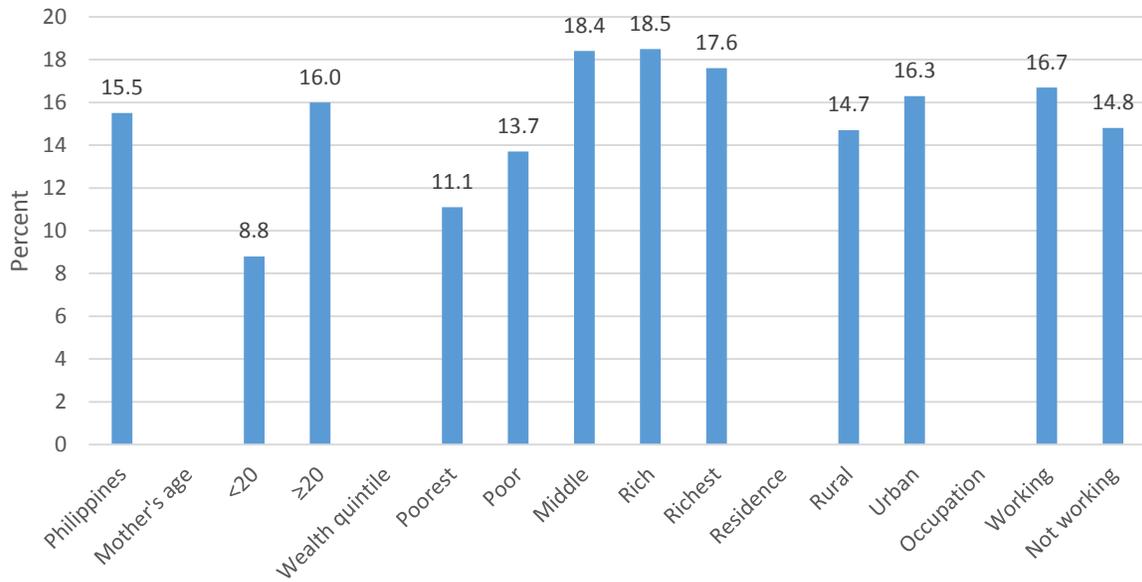
Source: FNRI Updating Survey 2011 (2012)

Figure 60: Percent of Children Meeting the Minimum Dietary Diversity by Age of Child, 2011 and 2013



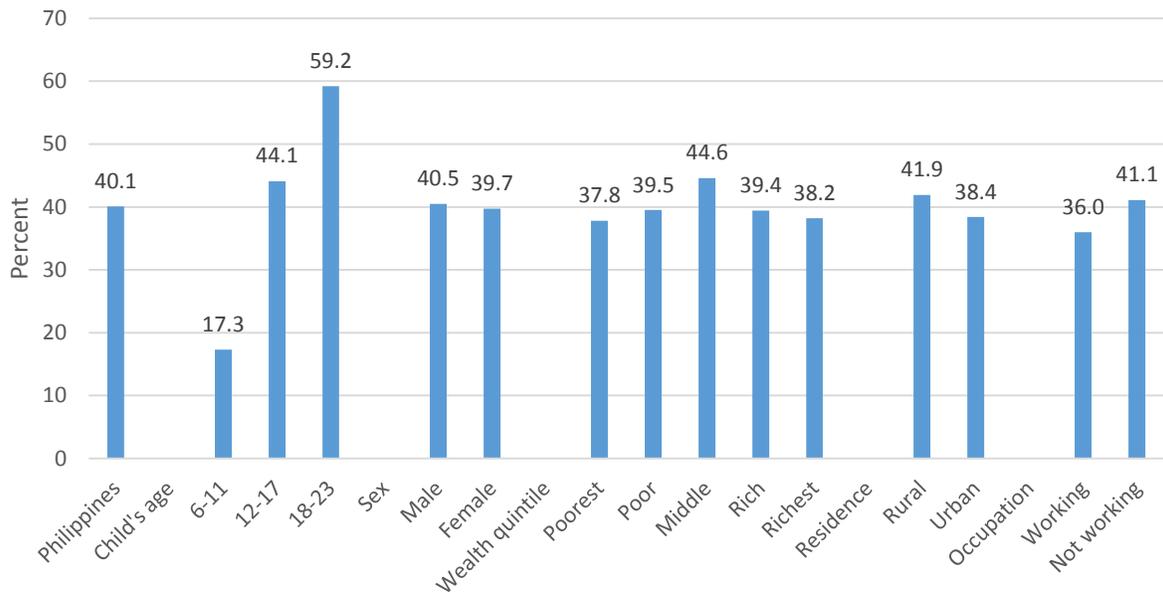
Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)

Figure 61: Percent of Children 6-23 Months Old Meeting Minimum Dietary Diversity by Background Characteristics, 2013



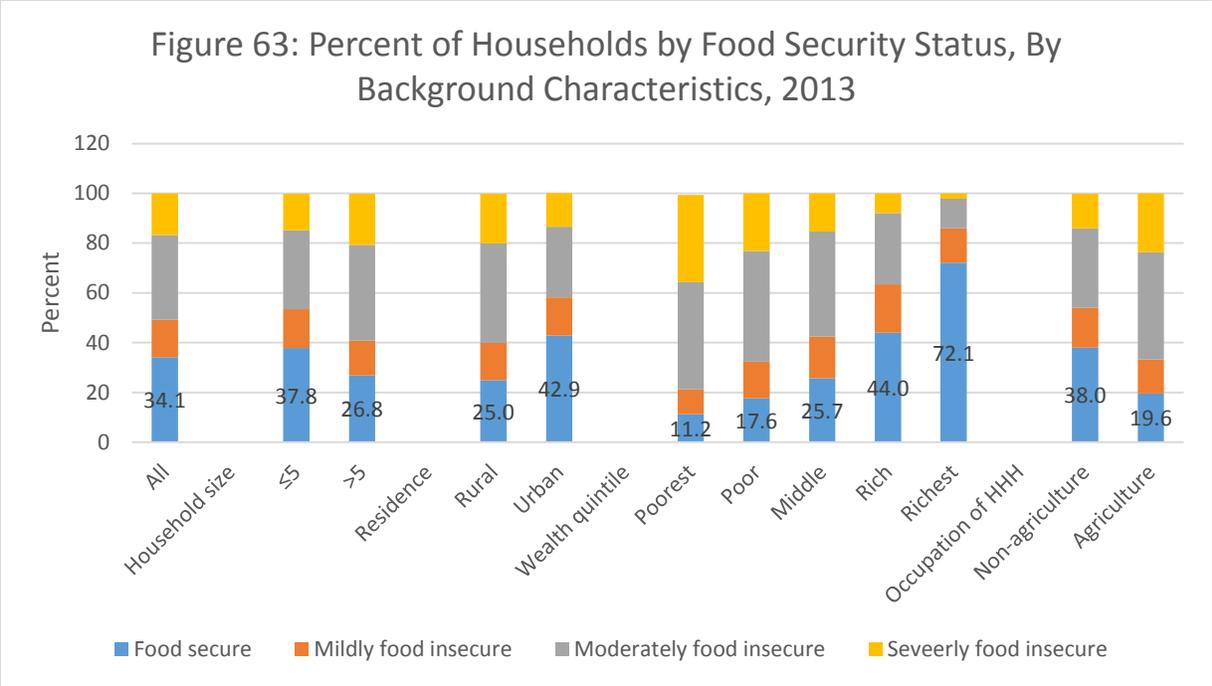
Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)

Figure 62: Percent of Children Age 6-23 Months with Intake of Iron-Rich Foods by Background Characteristics, 2013

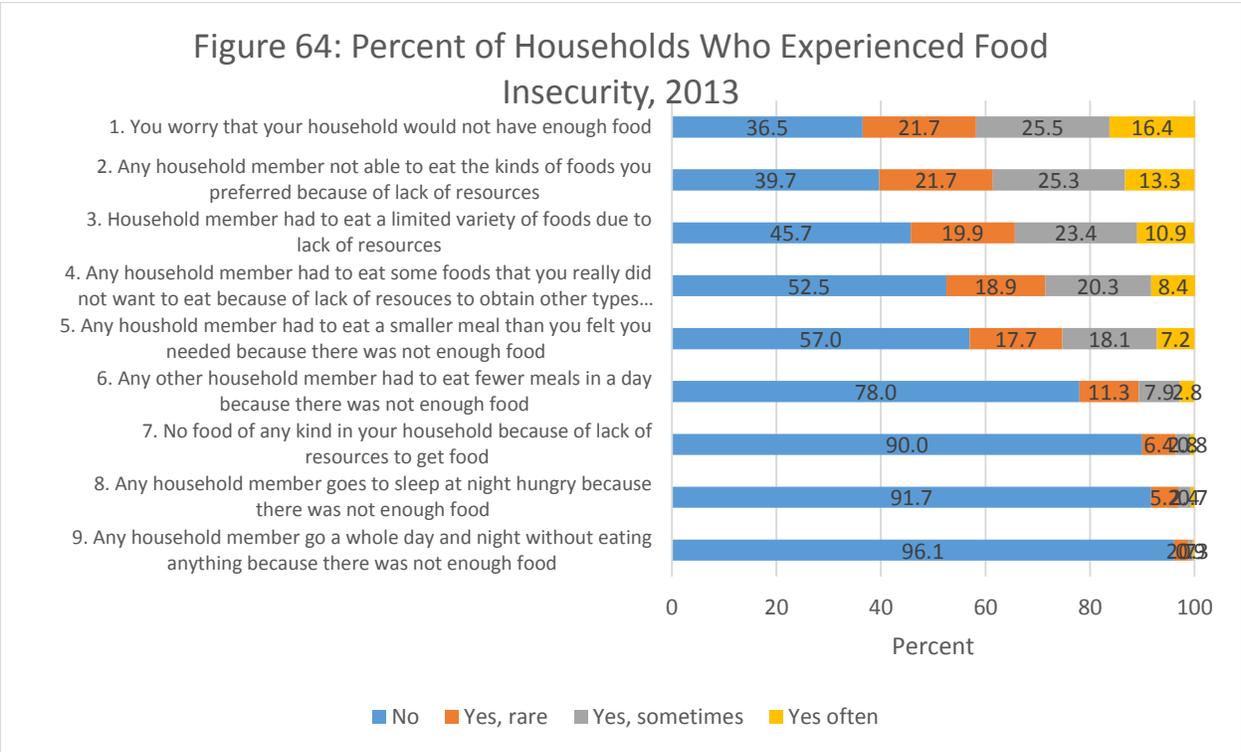


Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)



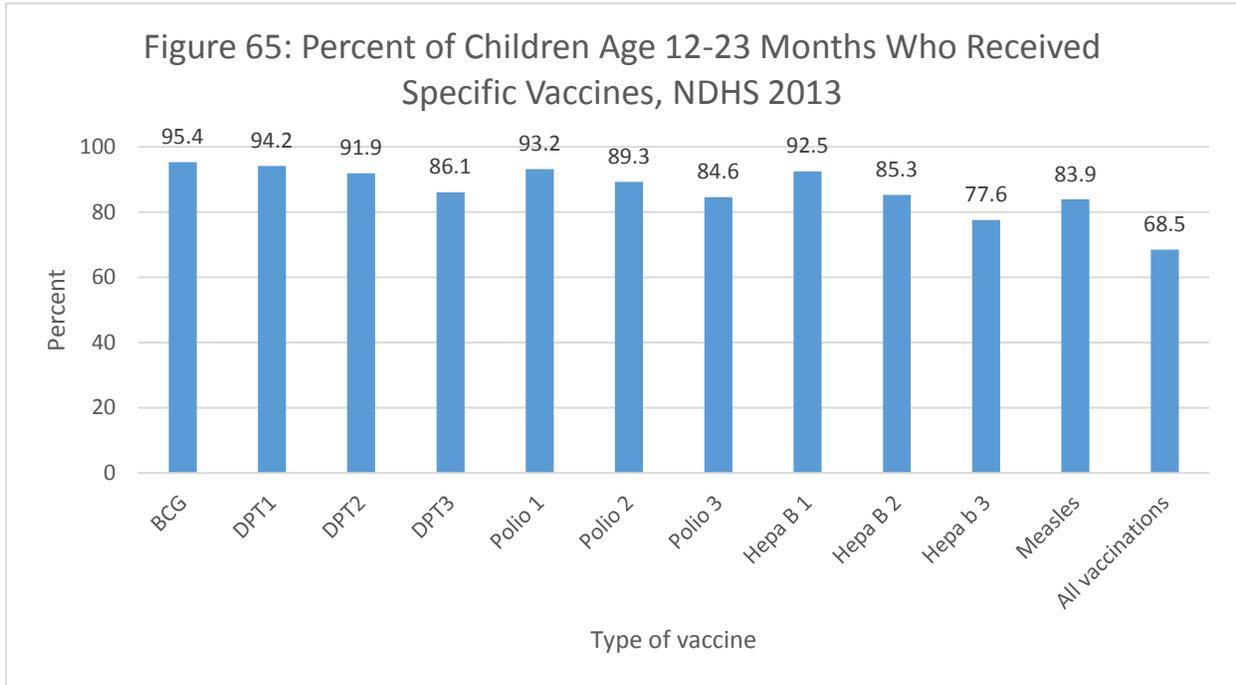


Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)

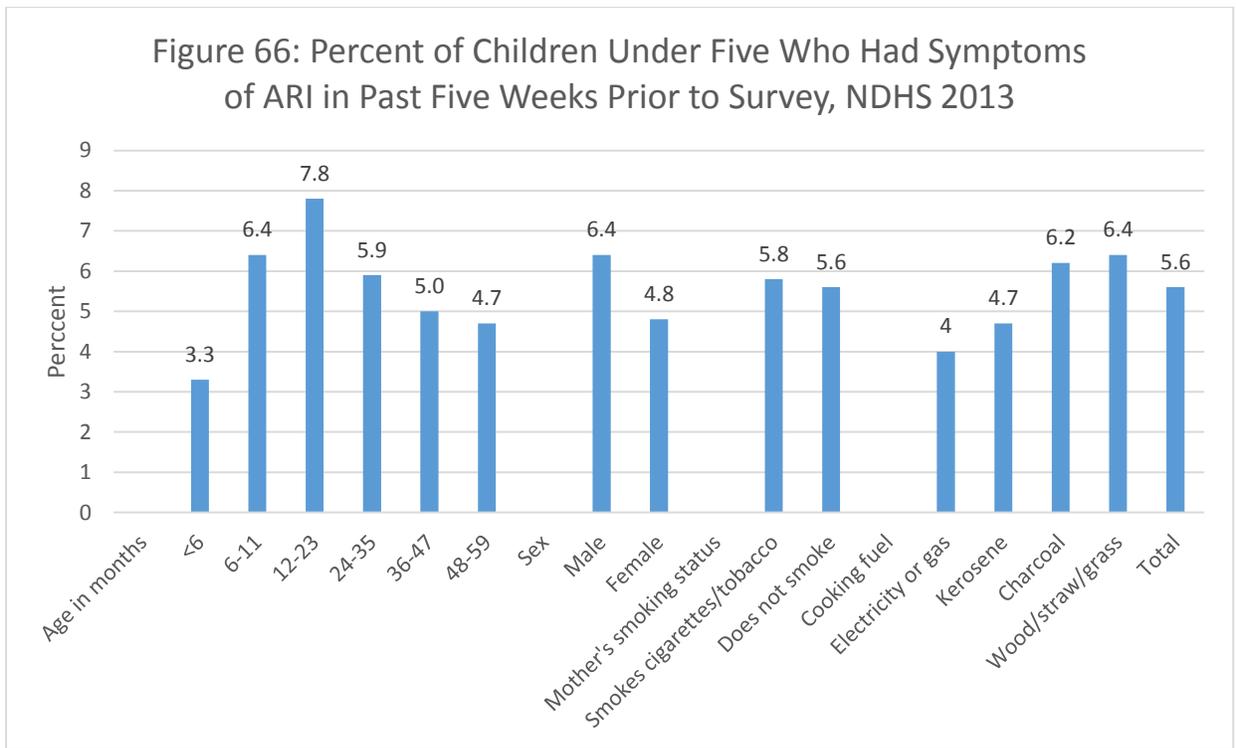


Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)

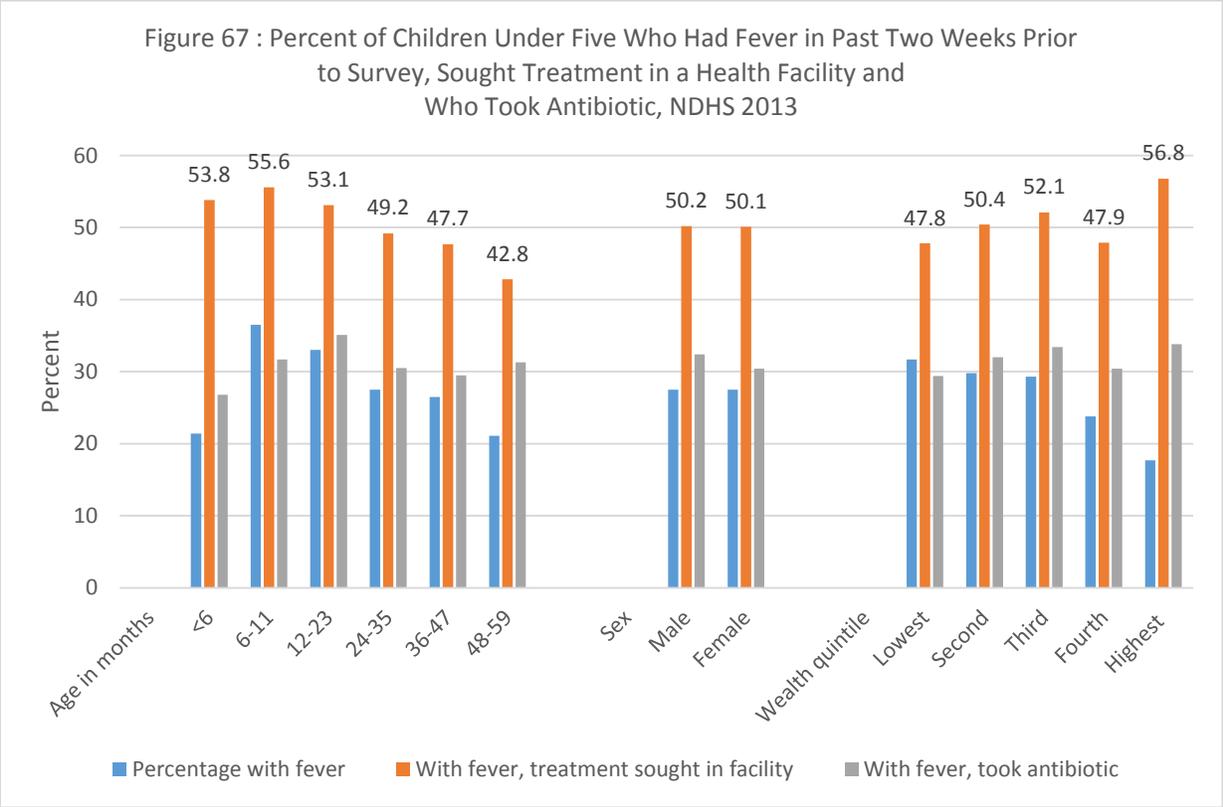
## Child Health Care



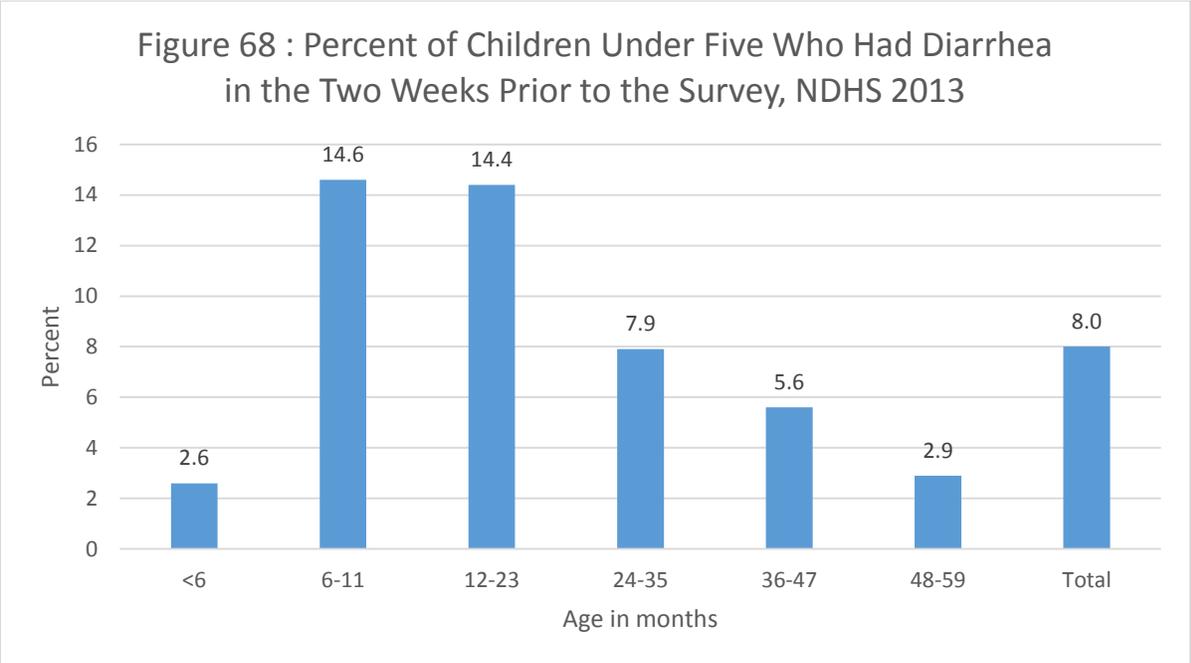
Source: NDHS 2013 (Note: FIC in 2003 and 2008 NDHS are 69.8% and 79.5%, respectively)



Source: NDHS 2013

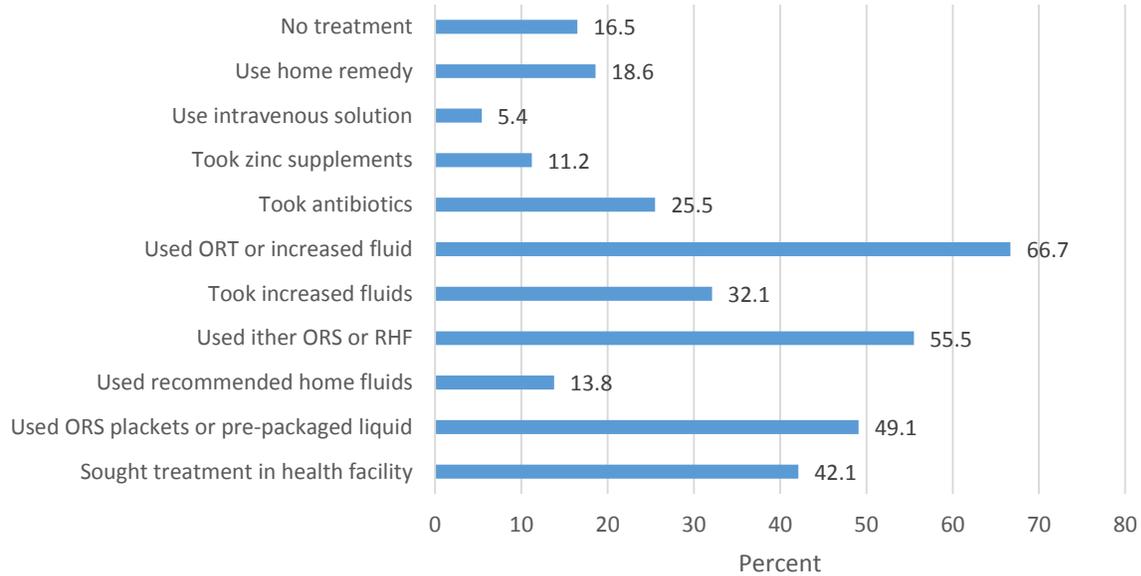


Source: NDHS 2013



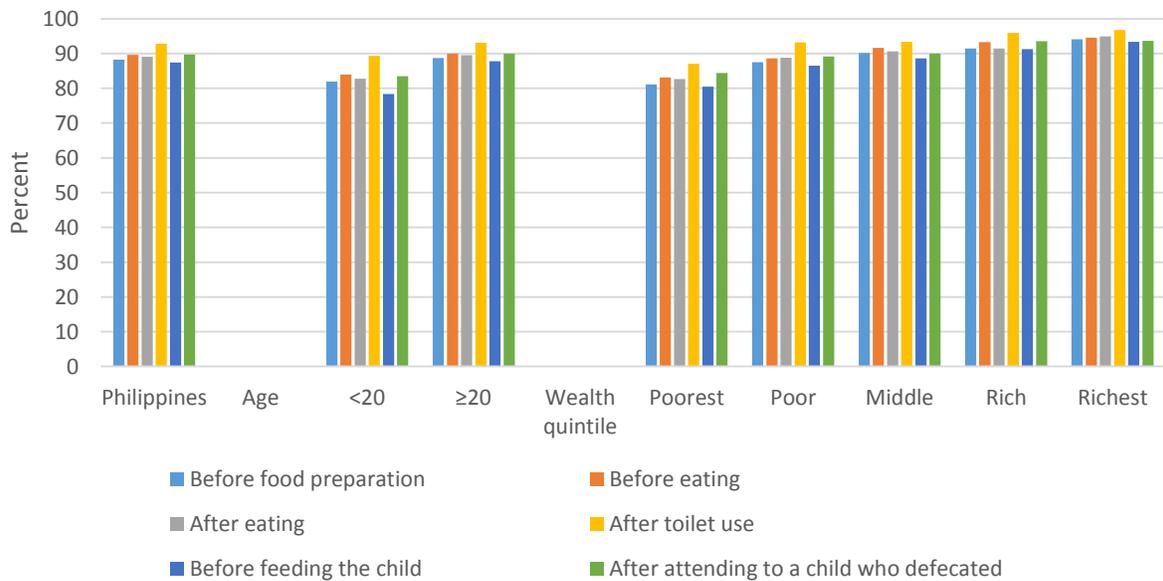
Source: NDHS 2013

Figure 69: Percent of Children Under Five Who Had Diarrhea in the Two Weeks Prior to the Survey, by Type of Treatment, NDHS 2013



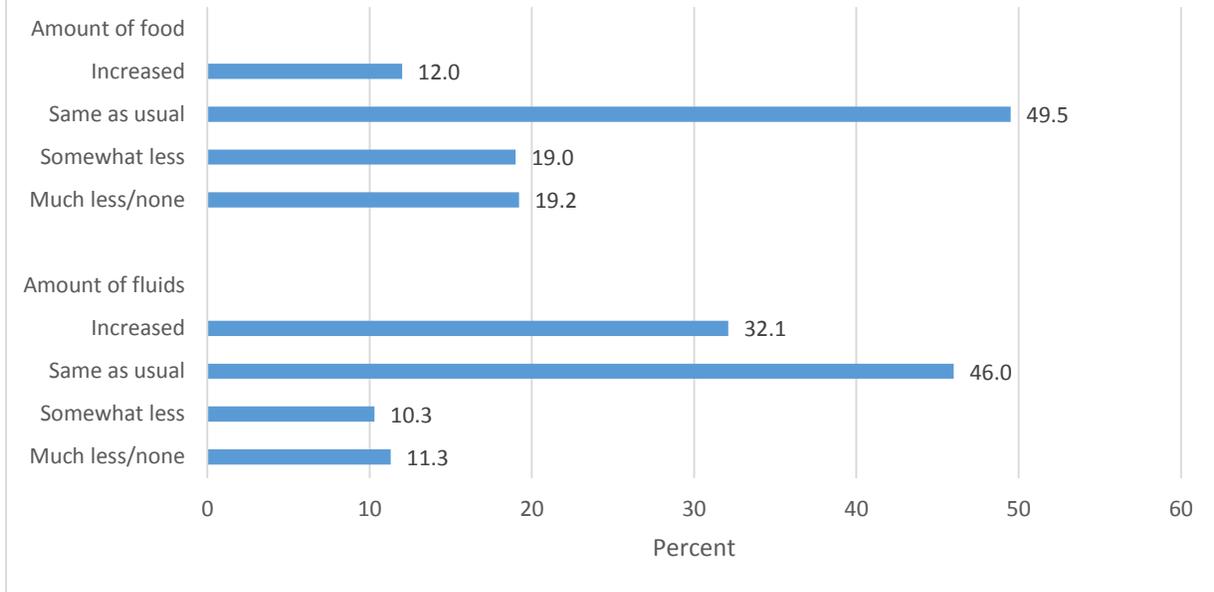
Source: NDHS 2013

Figure 70: Percent of Mothers Who Always Practice Hand Wasing with Soap, 2013



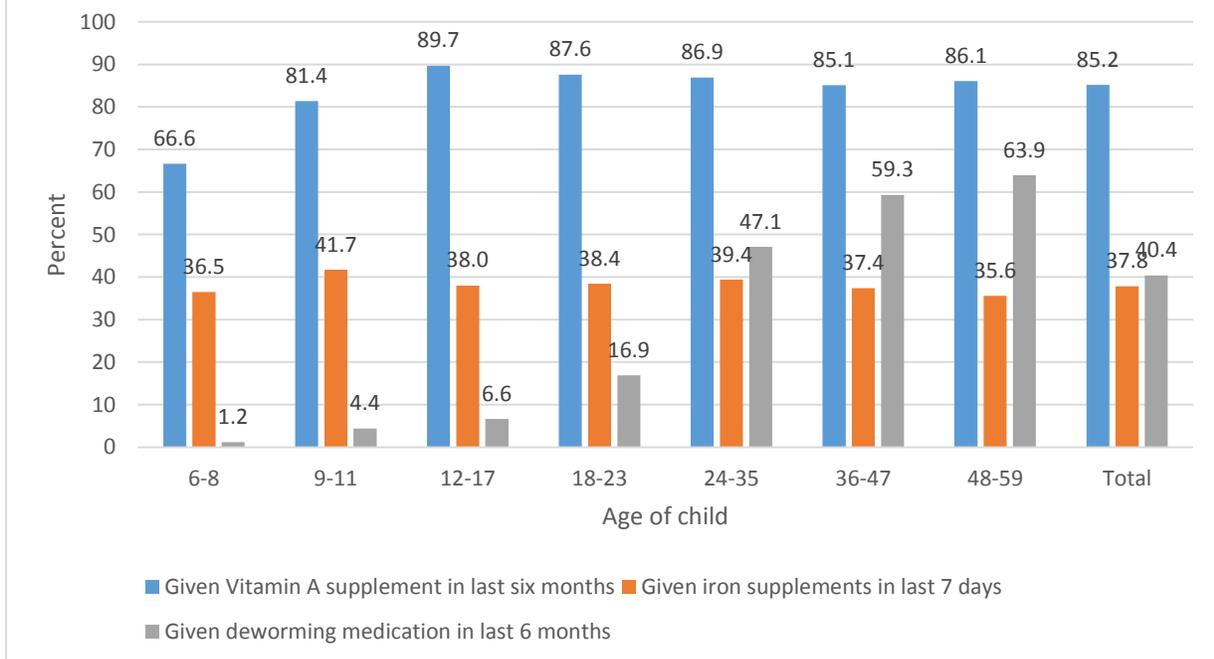
Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)

Figure 71: Feeding Practices During Diarrhea for Children Under Five, NDHS 2013



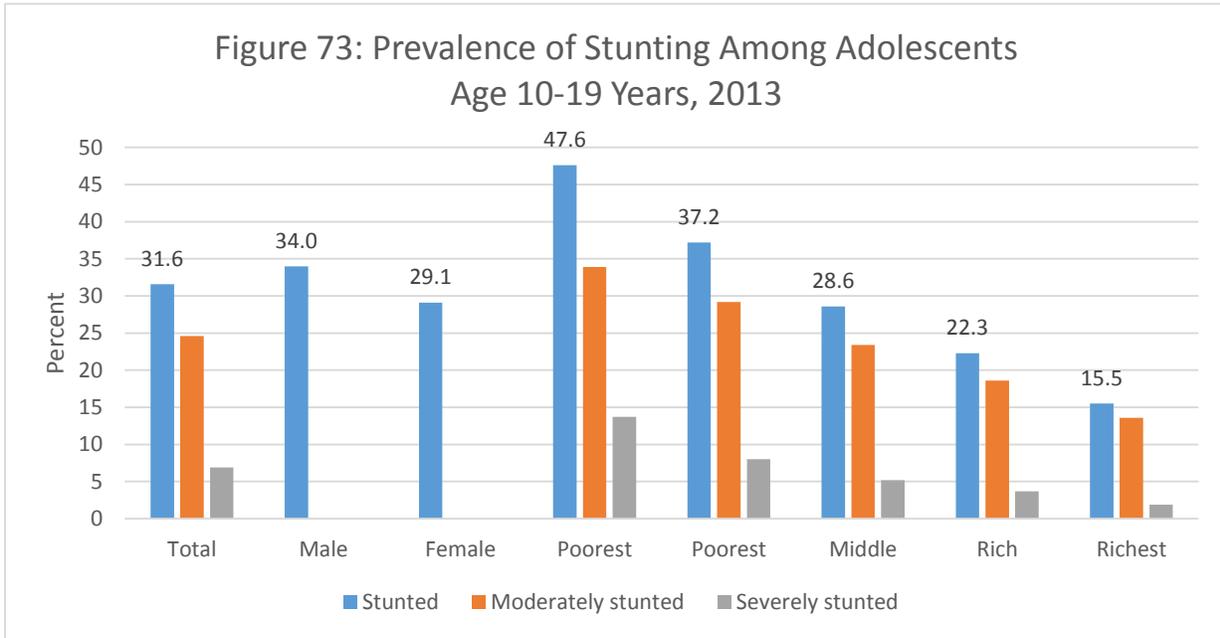
Source: NDHS 2013

Figure 72: Micronutrient Intake and Deworming Medication among Children 6-59 Months, NDHS 2013

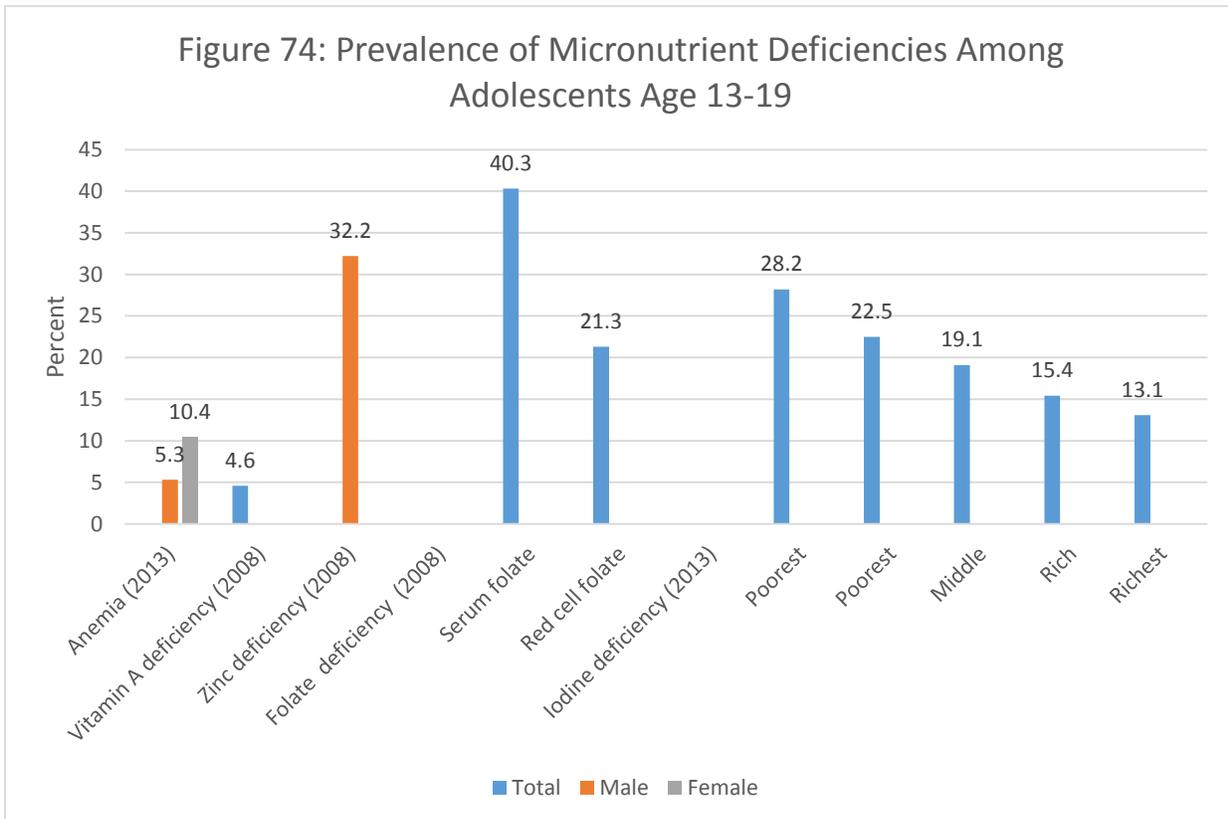


Source: NDHS 2013

**Adolescent Reproductive Health**



Source: FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)



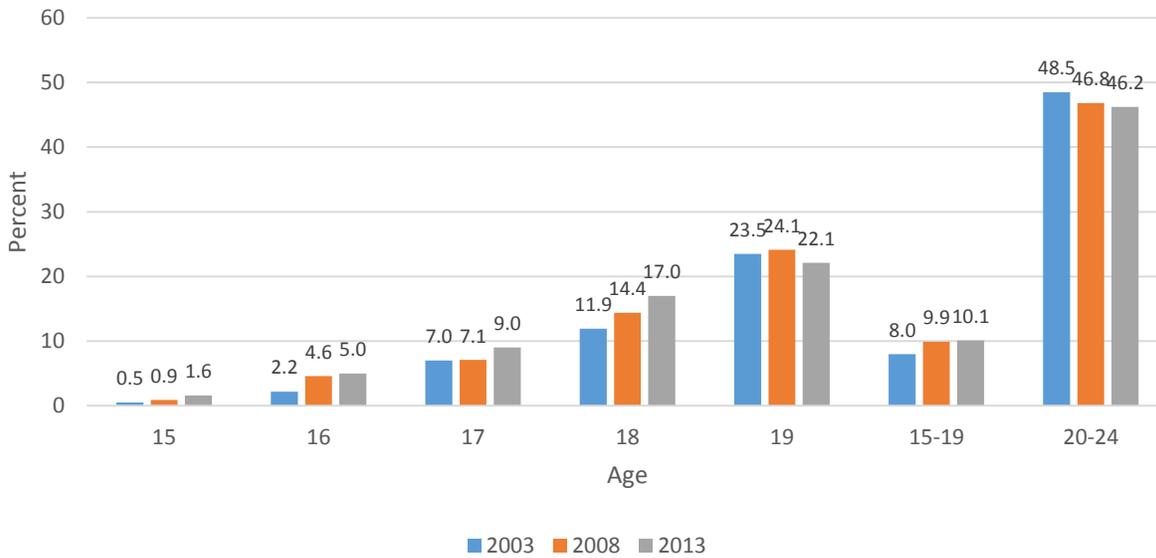
Source: Agdeppa (2015)

Figure 75: Age at First Sexual Intercourse Among Young Women by Wealth Quintile, NDHS 2013



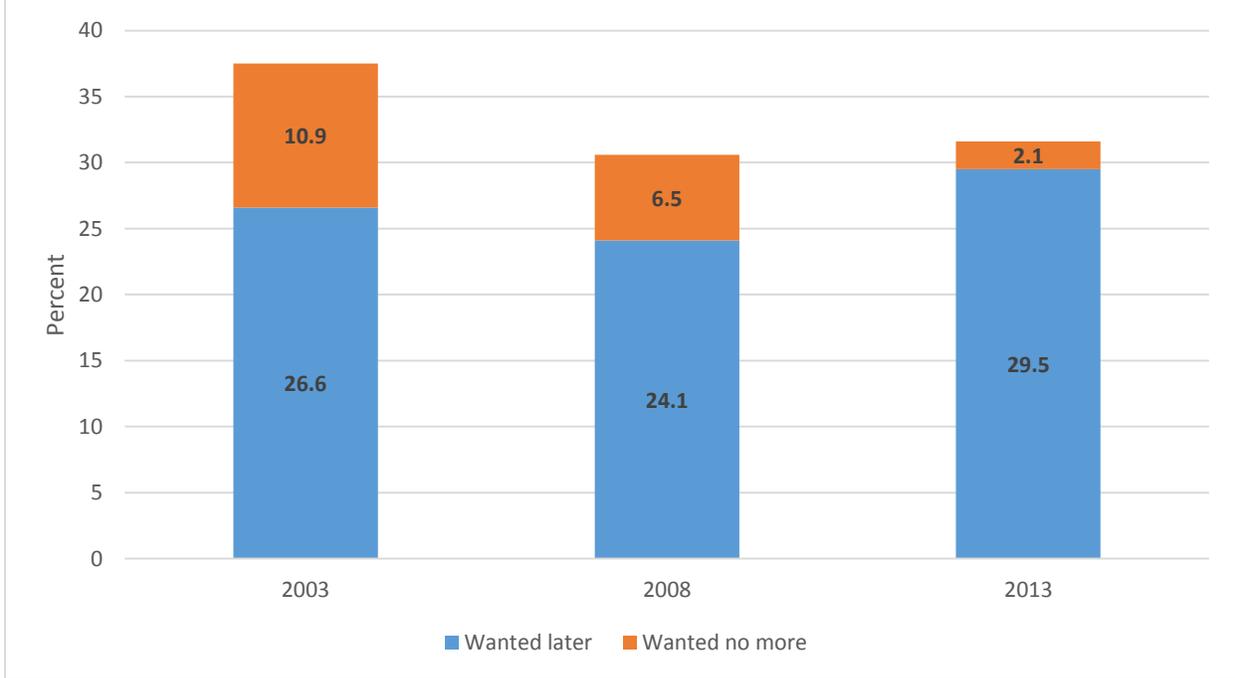
Source: NDHS 2013

Figure 76: Percent of Women Who Have Begun Childbearing by Age, 2003, 2008 and 2013



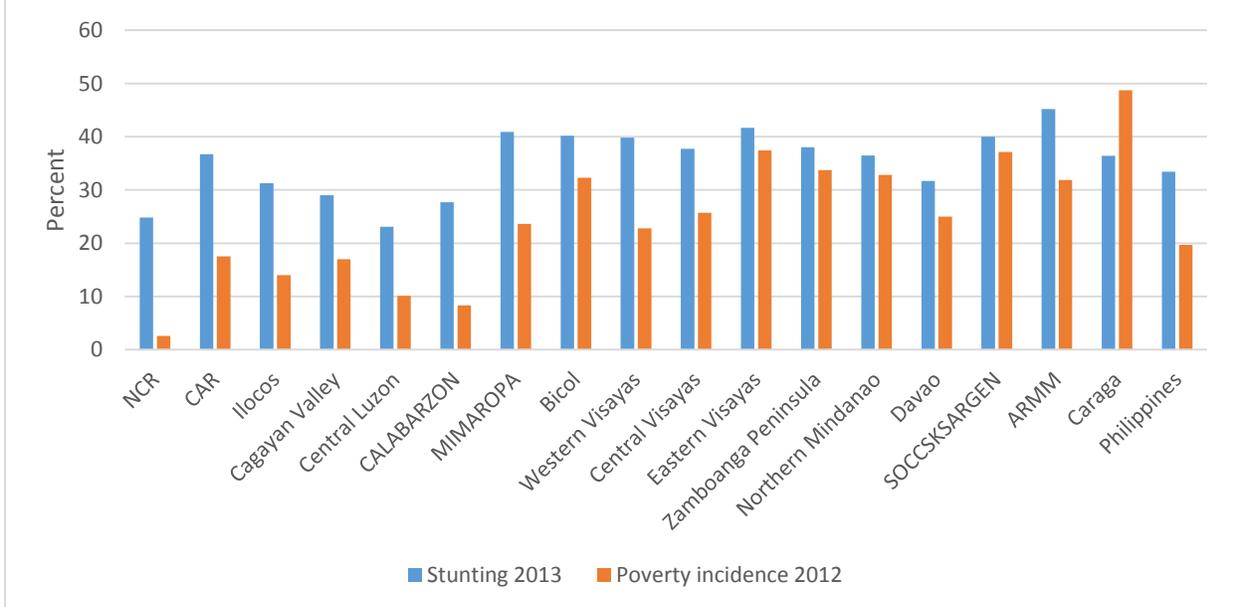
Source: NHDS 2013

Figure 77: Percent of Women Less than 20 Years of Age by Planning Status of Birth



Sources: NDHS 2003, 2008 and 2013

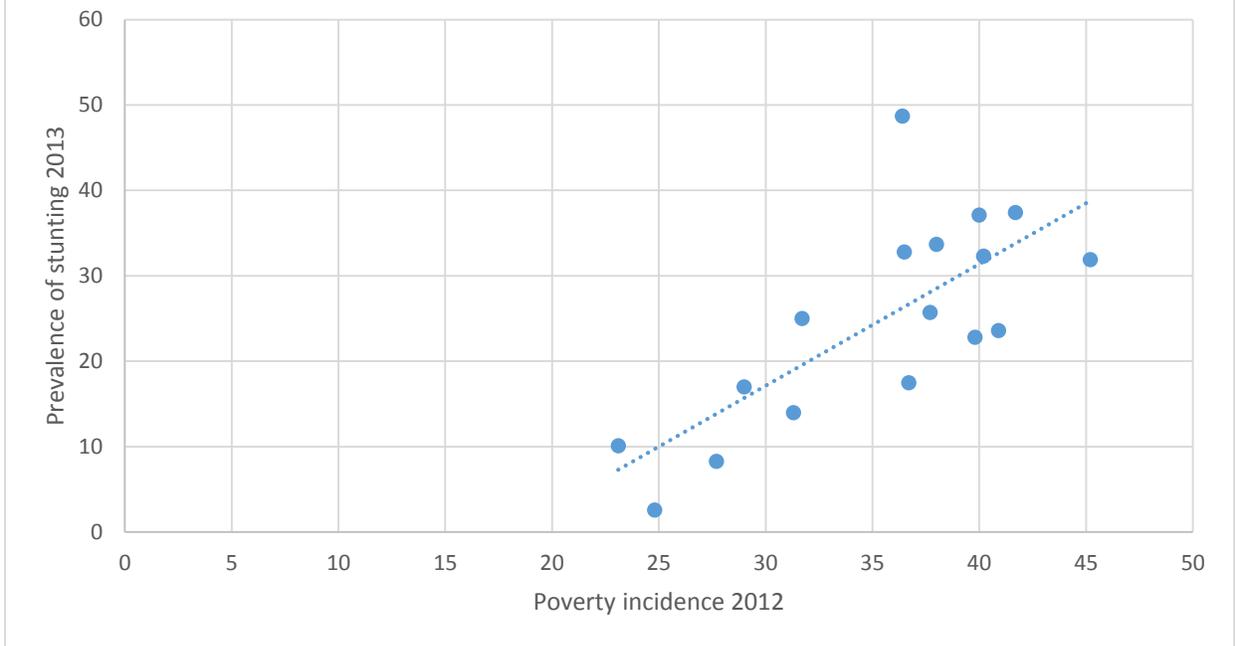
Figure 78: Prevalence of Stunting and Poverty Incidence by Region



Source: PSA data on poverty incidence and FNRI DOST Philippine Nutrition Facts and Figures 2013 (2015)



Figure 79: Prevalence of Stunting and Poverty Incidence by Region



Source: Figure 77