



**Survey on the health and nutrition service
delivery and nutritional outcomes in Tacurong
City, Tagum City, and Puerto Princesa City
(FINAL REPORT)**

20 September 2021 (version 1)

6 October 2021 (version 2)

18 October 2021 (version 3)

Table of Contents

Number	Title	Page
	Executive Summary	vii
I	Introduction	1
II	Methodology	5
	Study sites	5
	Sampling design and sample size	6
	Study Participants	8
	Survey Questionnaires	9
	Data Collection	10
	Data Processing, Analysis, and Interpretation	13
	Ethical Considerations	16
III	Main Findings	17
	A. Health Facility and Health Providers	18
	B. Pregnant Adolescents	28
	C. Post-partum Women (0-5 months)	47
	D. Children 6-23 months	66
IV	Challenges Encountered in Implementing the Survey	67
V	Conclusion and Recommendations	81
	References	84
	ANNEX.1. INDICATOR AND PREVALENCE USED TO CALCULATE THE SAMPLE SIZE FOR ADULT WOMEN 0-5 MONTHS POSTPARTUM WITH LIVE BIRTH	
	ANNEX 2. PUERTO PRINCESA CITY	
	ANNEX 3. TAGUM CITY	
	ANNEX 4. TACURONG CITY	

List of Tables

Number	Title	Page
1	Sampling design to randomly select households and survey subjects	7
2	Number of calculated sample size per target group and study site	9
3	Target group by objectives of the study	10
4	Number of enumerators vis-à-vis total number of participants and dates of data collection	12
A.1	Frequency and percentage distribution of health facility workers by city	18
A.2	Frequency and percent distribution of health facility personnel by responsibilities and by city	19

Number	Title	Page
A.3	Frequency and percentage distribution of the health care workers according to health services provided to pregnant women, post-partum women, and newborn babies, by city	20
A.4	Frequency and percentage distribution of health services offered by health facilities, by micronutrient supplements, by city	22
A.5	Frequency and percent distribution of health providers, by knowledge and practices on BF initiation and age-appropriate feeding practices, by city	24
A.6	Frequency and percent distribution of health providers based on their knowledge and practices on IFA and MNP supplementation, by city	25
A.7	Frequency and percent distribution of health workers who changed their practices on health service delivery in the context of the COVID-19 pandemic, by city	27
B.1	Frequency and percent distribution of pregnant adolescents, by socio-demographic characteristics and by city	29
B.2	Frequency and percent distribution of pregnant adolescents who had any ANC visits, by practices and by city	32
B.3	Frequency and percent distribution of pregnant adolescents who had any ANC visits based on their perceived benefits the service, by city	34
B.4	Frequency and percent distribution of pregnant adolescents who had any ANC visits, by sources of information and by city	35
B.5	Frequency and percent distribution of pregnant adolescents, by IFA supplementation and by city	35
B.6	Frequency and percent distribution of pregnant adolescents according to the knowledge of IFA supplementation, by city	38
B.7	Frequency and percent distribution of pregnant adolescents who attended EBF promotion, by city	41
B.8	Frequency and percent distribution of pregnant adolescents who availed health-related counseling services and the responsible person who attended them in the health facilities, by city	43
B.9	Percent distribution of nutritionally at-risk pregnant adolescents by city	44
B.10	Frequency and percent distribution of pregnant adolescents reporting having changed their healthcare-seeking practices due to pandemic, by city	45
C.1	Mean age of post-partum women and infants, by city	47
C.2	Frequency and percentage distribution of post-partum women, by socio-demographic characteristics and by city	47

Number	Title	Page
C.3	Mean frequency of ANC visits of post-partum women, by city	48
C.4	Frequency and percentage distribution of post-partum women, by ANC services and by city	49
C.5	Frequency and percentage distribution of post-partum women, by acquisition of iron and IFA supplements and by city	50
C.6	Mean number of days of iron and/or IFA received/purchased by post-partum women, by usage and by city	51
C.7	Frequency and percentage distribution of post-partum women according to other maternal health services they accessed and by city	53
C.8	Frequency and percentage distribution of post-partum women according to most common health providers who provided them with other maternal services by city	54
C.9	Frequency and percentage distribution of post-partum women, by knowledge and awareness of anemia and by city	57
C.10	Frequency and percentage distribution of post-partum women, by awareness of iron and IFA supplements and by city	58
C.11	Frequency and percentage distribution of post-partum women, by complementary feeding practices and by city	60
C.12	Frequency and percentage distribution of post-partum women according to liquid intake and knowledge on proper feeding of infants, by city	61
C.13	Prevalence of nutritional status of post-partum women, by city	62
C.14	Frequency and percentage distribution of post-partum women, by changes in availing health services due to the pandemic and by city	63
C.15	Frequency and percentage distribution of post-partum women, by practices on coping strategies and by city	64
D.1	Summary statistics of age of children and their mother/caregiver, by city	65
D.2	Frequency and distribution of mothers/caregivers of 6-23 months old children, by educational attainment and marital status and by city	66
D.3	Frequency and percentage distribution of 6-23-month-old children, by health services availed by the mothers/caregivers and by city	67
D.4	Frequency and percentage distribution of caregivers of 6-23-month-old children, by topics during counseling and source of information and complementary feeding and by city	68
D.5	Frequency and percentage distribution of mothers/caregivers of 6-23-month-old children, by knowledge on complementary feeding practices and by city	69
D.6	Frequency and percentage distribution of mothers/caregivers of 6-23-month-old children, by information about MNP and by city	71
D.7	Summary statistics of the mean number of times of milk consumption of 6-23-month-old children, by city	74

Number	Title	Page
D.8	Frequency and percentage distribution of 6-23 months old children, by breastfeeding practices and liquids and foods consumed and by city	75
D.9	Prevalence of nutritional status of 6-23-month-old children, by city	77
D.10	Frequency and percentage distribution of mothers/caregivers of children 6-23- month-old, by changes in availing of health services and coping strategies by city	78
D.11	Frequency and percentage distributions of changes in the child feeding practices before and during the pandemic by mothers/caregivers of 6-23-month-old children	79
E.1	Challenges and deviations from the proposal implemented/methodology in conducting the survey	82

List of Figures

Number	Title	Page
1	Study Sites	6
A.1.a	Percent distribution of IFA stock status in the health facilities, by city	22
A.1.b	Percent distribution of MNP stock status in the health facilities, by city	23
B.1	Percent distribution of pregnant adolescent respondents who availed the ANC services, by city	30
B.2	Percent distribution of pregnant adolescents who did not have any ANC visits according to the factors that hindered them from availing the service, by city	32
B.3	Percent distribution of pregnant adolescent respondents, knowledge of IFA supplementation and by city	37
B.4	Percent distribution of pregnant adolescent respondents who availed other health services and the health provider who attended them, by city	40
B.5	Percent distribution of pregnant adolescents who availed health-related counseling services and the responsible person who attended them in the health facilities, by city	42
B.6	Percent distribution of nutritionally-at-risk pregnant adolescent respondents by city in comparison with NNS 2018-2019	46
C.1	Percentage of awareness on anemia and iron and IFA supplements of post-partum women, by city	56
D.1	Complementary Feeding Indicators for children 6-23 months, by city	74

Acronyms

ANC	Antenatal Care
BF	Breastfeeding
BHS	Barangay Health Station
BHW	Barangay Health Worker
BMI	Body Mass Index
BNS	Barangay Nutrition Scholar
DOH	Department of Health
EBF	Exclusive breastfeeding
ENA	Emergency Nutrition Assessment
FNRI	Food and Nutrition Research Institute
IFA	Iron folic acid
IYCF	Infant and Young Child Feeding
MAD	Minimum Acceptable Diet
MDD	Minimum Dietary Diversity
MMF	Minimum Meal Frequency
MNAO	Municipal Nutrition Action Officer
MNP	Micronutrient powder
NDHS	National Demographic and Health Survey
NI	Nutrition International
NNC	National Nutrition Council
NNS	National Nutrition Survey
OPT	Operation Timbang Plus
PSU	Primary sampling unit
SMART	Standardized Monitoring and Assessment of Relief and Transitions
SPSS	Statistical Package for Social Sciences
UPLB	University of the Philippines Los Baños
WHO-CGS	World Health Organization-Child Growth Standards
ZFF	Zuellig Family Foundation

EXECUTIVE SUMMARY

INTRODUCTION

Proper nutrition is essential during the first 1000 days of life since it is a critical period when improvements in nutrition can have the greatest impact on a child's health and nutritional status. At the national level malnutrition among children remains to be a public health problem. Seemingly, problem on malnutrition exists among pregnant women, particularly in urban areas where all forms of malnutrition are a pressing public health concern. Hence, it is necessary to address these nutrition problems since normal growth and development is vital for the first two years of life. Furthermore, maternal health should also be prioritized since it has a great implication on the developmental outcomes of a child. Hence, implementation of interventions in the first 1000 days of life is proven integral to achieving nutrition goals and supporting long term health. With this, efforts have been made by the government and private sectors to implement programs and policies. The Zuellig Family Foundation (ZFF), in partnership with Nutritional International (NI), commissioned the conduct of this survey to provide information for the ZFF-NI project entitled "Developing Governance Models on Urban Nutrition Systems for the 1st 1000 days of life in the Philippines." The general objective of this survey is to assess the health and nutrition service delivery and the nutritional outcomes in Puerto Princesa City, Tacurong City, and Tagum City.

METHODOLOGY

The study was conducted in Puerto Princesa City, Tacurong City, and Tagum City. A total of 1,530 children 0-23 months, 967 postpartum women of all ages who had a live birth in the last 0-5 months, and 141 pregnant adolescents ages 15-19 years old were included in the survey. In addition, 70 health providers such as midwives, Barangay Health Workers, and nurses working in the local health facilities, e.g., Barangay Health Station (BHS), Rural Health Unit (RHU), were also interviewed.

A two-stage sampling method based on administrative areas in Puerto Princesa City, Tacurong City, and Tagum City was done. The first-stage sampling entailed the selection of primary sampling units (PSUs), which are the barangays with at least 250 households. In a barangay with more than 500 households, segmentation was done accordingly such that one cluster is about 250 households. The second-stage sampling was applied only to 6-23 month old children. To meet the sample size for postpartum women and pregnant adolescent, house to house visits were conducted.

Pre-tested questionnaires were used to collect data for the study. These were administered using both in a paper and pencil form and tablet form using open data kit (ODK) application and has Cebuano, Hiligaynon, Tagalog, and English with Tagalog versions. All data collection and related activities were conducted with safety protocols, such as wearing the personal protective equipment of the enumerators. Each enumerator also used a monitoring form to check the temperature and occurrence of symptoms. Close coordination with the local government units was observed to facilitate the smooth process of data collection.

The data collection took more than four months which was beyond the targeted 30 days. The delay was mainly due to the observance of the COVID-19 pandemic health protocols. During data collection, each face-to-face interview took about 45 to 60 minutes to be completed. The enumerators conducted house visits for mothers of 6-23-months-old children, postpartum women, and pregnant adolescents, and health facility visits for health workers. Anthropometric measurements were obtained using the standard

techniques either in barangay health stations or during house-to-house visits if the schedule of *Operation Timbang Plus* (OPT) of local health workers coincides with the team's schedule in the area.

To ensure the high quality of the data collected, a study protocol was developed to serve as a guide to all the personnel who were involved in the study. This included the procedures on how the survey will be conducted; how to assure research quality; how to coordinate with LGU leaders, personnel, mothers, adolescent girls, and health workers; how to locate and select participants and how to interview; how to use and check the measuring instruments; how to collect the data; and how to detect errors, among others. Regular checking was done by the team leaders and project leader in terms of correctness, completeness, and consistency of information collected. The UPLB survey team was responsible for ensuring that high-quality data was being collected including direct supervision of survey teams, monitoring of the survey implementation vis-à-vis targets, and providing brief survey updates to NI and ZFF.

Upon completion of the data collection, the data were prepared for analysis. The nutritional status of the respondents was determined by the following standards: the World Health Organization-Child Growth Standards (WHO-CGS) for children, Body Mass Index (BMI) was used for postpartum women, and the weight-for-height table by the week of pregnancy for Filipinos (Magbitang et al., 1988) for pregnant adolescents. For the complementary feeding practices, the proportion of children meeting the minimum acceptable diet (MAD), minimum diversified diet (MDD), and minimum meal frequency (MMF) were computed.

Lastly, the frequency and percentage distributions were constructed to determine the distributional characteristics of the participants. Summary statistics such as mean, median, minimum, maximum, and standard deviation were also calculated to describe the distributional properties of quantitative data. All tabulations and estimations were generated using a Statistical Package for Social Sciences (SPSS) and STATA.

MAIN FINDINGS

Health Facility Personnel

Responsibilities

More than 60.0% of the health workers claimed that they have responsibilities that are related to the promotion of health and nutrition of children and pregnant women, while only a few (17.1%) mentioned having duties that include promotion of adolescent health.

Nutrition and Health Services

All health facilities offer various nutrition and health services for pregnant and postpartum women, while very few offered labor and delivery (31.4%), and newborn care services (42.9%). On the other hand, almost all the health facilities distributed micronutrient powder (MNP) to young children (97.1%) and iron or iron and folic acid (IFA) tablets to pregnant women (100.0%). Nevertheless, stock-outs of these micronutrient supplements were often experienced especially on MNP.

Knowledge and Practices on Nutrition and Health Services

Many of the health facility providers were knowledgeable and counsel pregnant mothers on age-appropriate feeding practices or AAFP; 75.% knew that AAFP can improve growth while 91.4% advised mothers that only breastmilk should be given to infants for the first 6 months. In contrast, only 70% (49 out of 70 respondents) provided messages on breastfeeding (BF) initiation among mothers. Among these 49 health workers, the 23 or 53.0% knew about the high nutrient content of the colostrum. Moreover, more than half of the respondents associated IFA with anemia prevention (52.9%) and advised pregnant

women to take it daily throughout the pregnancy (52.9%). However, while results indicate that they have good knowledge of the benefits of MNP for children (75.7% knew MNP can prevent malnutrition), proportion of the respondents who can identify each guideline and step in the food preparation with this powder ranges from 1.4% to 45.7%.

Coping Strategies

The health facility personnel experienced challenges in the delivery of nutrition and health services due to the COVID-19 pandemic. Hence, the majority of the health workers said that they had to make changes (72.9%) and innovate to ensure health and nutrition service delivery during the pandemic (60.0%). Almost half also shifted to house-to-house visits as the primary mode of service delivery (47.7%) while a few had to resort to text messaging or call to ensure constant communication with the clients (15.7%).

Pregnant Adolescents

Receipt and Utilization of ANC Services

The percentage of pregnant adolescent respondents who had any ANC visits was high (92.0%) and those who availed of the service recognized its importance for having a healthy pregnancy (75.4%). However, only 51.0% of the respondents on their first trimester were able to avail ANC. The 11 or 7.8% of the pregnant adolescent respondents were not able to have ANC visits mainly due to unawareness of its importance and benefits. Results also showed that almost all the respondents who had availed ANC visited a public health facility for ANC (94.6%) and the majority had their first visit on the first month of their pregnancy (65.3%). Most had only one ANC visit (20.0%) and were attended predominantly by a midwife (58.5%). The top services received by the respondent during their ANC visits were the provision of IFA supplementation (91.5%) and tetanus toxoid vaccine (89.2%) while screening for gestational diabetes (21.5%) and deworming (26.9%) were the least.

Receipt and Utilization of Iron and/or IFA Supplementation

About 7 out of 10 of the respondents took IFA and took micronutrient supplements once a day. The majority received these supplements were mostly from government health facilities (95.0%). The number of days that the iron or IFA supplements were received varied as well as the number of days that the supplements were consumed. Most of the pregnant adolescents (75.2%) were not able to meet the recommended intake of iron and/or IFA of 180 days. Only 5% of them were able to do so. A few continued taking the supplements beyond 180 days.

Knowledge Related to Anemia and IFA Supplementation

The majority of the respondents have already heard about anemia (66.7%) and claimed to know why iron supplementation is recommended during pregnancy (81.6%). While their knowledge about anemia varied, many of those who have heard about anemia associate it with dizziness (48.9%). Most of the respondents associated IFA consumption with better infant/mom health (50.4%) while a few associated it with anemia prevention (20.6%). The results indicate the need for nutrition education among pregnant adolescents to increase their knowledge and improve IFA supplement consumption practices.

Utilization of Other Health and Nutrition Services

The majority of the respondents had already received the tetanus toxoid vaccine (78.8%) and attended various health-related counseling sessions on topics such as exclusive breastfeeding or EBF (71.6%), nutrition (63.8%), healthy lifestyle (59.6%), and personal hygiene (54.6%). However, less than half had availed dental (42.7%) and HIV/STI/AIDS-related services from the health facilities (33.3% for counseling and 36.4% for screening services). These services were mainly provided by a midwife or a nurse.

Nutritional Status

Results revealed that 45.6% of the pregnant adolescents were nutritionally at-risk. This finding is extremely alarming as the majority of the respondents have already undergone nutrition counseling.

Coping Strategies

A third of pregnant adolescent respondents claimed to have changed their practices in availing of health services mainly due to fear of going out for check-ups (20.6%). However, they also claimed to have applied several strategies to ensure healthy pregnancy such as adequate food intake (62.4%), taking vitamins and minerals (46.8%), and personal hygiene and sanitation (36.2%).

Post-partum Women (0-5 months)

Receipt and Utilization of Health Services and Iron and IFA Supplements

Across the three cities, post-partum women visited the health facility for ANC services on average of six times throughout the entire pregnancy, which is higher than the recommended visits of at least four times. Nearly all women had their ANC visit in government health facilities (91.0%) where information on healthy eating (88.9%) was usually discussed and where majority of the iron and IFA supplements were acquired from for free. In all cities, out of the nearly 160.8 days-worth of iron/ IFA supplements received and/ or purchased, nearly 95% were consumed which is below the 180 days recommendation and but still below the 270 days full dosage.

Post-Partum Services

Across the three cities, the foremost post-partum services availed by the women were vaccination of tetanus toxoid (93.2%), promotion of exclusive breastfeeding for the first 6 months of child (93.6%), and counselling (47.7% - 75.6%). Majority of the post-partum services were received from midwives such as counselling and exclusive breastfeeding. Other health workers provide post-partum services as well.

Knowledge and Practices

Majority of the post-partum women knew about anemia (79.0%), iron and IFA supplements (87/4%), and anemia's health effect such as dizziness/nausea/vomiting (78.1%), and tiredness (53.8%). However, most women seemed to be more familiar with iron and IFA supplements than the disease itself. Most of the learned information on anemia and supplements were from doctor/ nurse/ health center worker (45.8%). More than half the mothers knew of the recommended dosage of iron and IFA supplements (56.4%) despite the high awareness. Furthermore, only few knew how to avoid experiencing problems regarding iron and IFA supplements. In terms of child feeding practices, post-partum women across the cities, claimed to ever breastfed their child (97.2%). However, less than half of the women knew at least one proper dietary habit of feeding infants (46.6%). Majority of mothers (82.3%) introduced solid food before the recommended age of 6 months, which prevents infants from reaping the full health benefits of exclusive breastfeeding.

Nutritional Status

After child birth, adequate maternal nutrition is essential for recovery and regaining strength. Across the three cities, proportion of chronic energy deficient was highest in Puerto Princesa City (10.6%). Apparently, proportion of overweight and obesity in Tacurong City (26.1%, 7.4%) and Tagum City (26.1%, 5.6%) was high but lower than the national estimate of 36.4 and 13.2, respectively.

Coping Strategies

Across the three cities, less than half (36.8%) of the postpartum women changed their practices of availing health services of post-partum women due to fear of going out (52.8%) and strict implementation of health and safety protocols (26.7%). Despite these changes and challenges, post-

partum women still ensured that mother and child will be in good health through eating adequately (78.5%), continued breastfeeding (70.1%), and good personal hygiene and clean environment (54.8%).

Children (6-23 months)

Utilization of Health Services

The most common health services for 6-23 months old children were counselling of mothers/caregiver (52.8%), child health day activities (49.0%) and growth monitoring (30.3%). Counselling of mothers/caregivers covered topics on breastfeeding and introduction of food at 6 months, which they received from skilled workers. However, less 15% of children received micronutrient powder across the three cities.

Knowledge and Practices

Some mothers/caregivers knew continued breastfeeding and complementary feeding practices for 6-11 months old. However, as the age of child increase proportion of mothers who considered important practices for 12-23 months grew as well. Across the cities, more than 80% of the mothers/caregivers who received in MNP knew about its health benefits, which were mostly heard from community health workers (98.4%). Most of the MNP received by the mothers were from public facilities (88.8%). Less than a third of the mothers gave all the MNP to their children (31.5%) and almost half even shared with other children (46.6%). Proper MNP preparations were also uncommon to the mothers/ caregivers.

Complementary Feeding Indicators

Across the three cities, at least nearly half (44.0% to 55.0%) of the children met the minimum dietary diversity score (MDD), twice higher than the national level of 20%. At least two-thirds (65.0% to 83.0%) met the minimum meal frequency (MMF) which means that somehow the child received the minimum recommended number of foods in the past 24 hours, yet this is still below the national estimate. Although minimum acceptable diet (MAD) is higher than the national estimate across the three cities (37.0% to 39.0%), low proportion indicates a suboptimal complementary feeding.

Nutritional Status

Malnutrition existed among 6-23 months old children across the cities, where underweight (11.7%) and stunting (15.5%) still remained to be a problem of public health significant. Wasting is a public health problem (8.0%) while percentage of overweight children (2.3%) were relatively low.

Coping Strategies

More than one-fourth of the mothers/caregivers reported changing their practices in availing health services due to the pandemic (29.7%), which is likely caused by their fear of going out (16.2%), self-medication (7.1%), and consumption of vitamins/ minerals supplements (7.4%). Despite these changes and challenges, mother/caregivers still ensured that they practice eating adequate food (84.6%), consumption of supplements (56.8%), and observed personal hygiene and cleanliness (52.1%). Apparently, food intake was also reduced by mothers/caregivers (18.8%) due to lack of income (77.3%), which resulted to more than half to rely on less preferred and less expensive food (55.7%).

CONCLUSION AND RECOMMENDATIONS

Across the three cities, different forms of malnutrition existed among 6-23 months old, where underweight, stunting, and wasting remain to be of public health concern. Malnutrition was also observed among women, there were nutritionally at-risk pregnant adolescents and chronic deficient post-partum women. Problems on overnutrition is also present among these women.

Pregnant women, post-partum women and mothers/caregivers received health services, particularly ANC, from health providers. Across the three cities, high percentage of women, particularly post-partum women, were aware of anemia and iron and IFA supplements. However, despite of their awareness, only few women knew the recommended dosage of IFA. Across the three cities, only Tacurong met the minimum 180 days of IFA consumption but still below from the optimum full dosage of 270 days.

In terms of feeding practices, nearly all mothers reported to have ever breastfed their children. Despite the high proportion, not all of them were aware of proper feeding practices and continued breastfeeding specifically for 6 to 11 months old. Majority of the mother also reported feeding their children before the recommended age of 6 months. However, mother's knowledge on proper feeding practices seemed to improve as the child aged. Apparently, the repercussion of having a poor maternal knowledge in terms of feeding practices was low proportion of children meeting MAD and MDD, although data were higher than the national estimate. The pandemic has also brought changes on how health providers delivered health services and how women availed these health services.

To address the findings related to malnutrition and sub-optimal feeding practices, the following recommendations are proposed. There is a need for continued support to the implementation of health and nutrition services for pregnant and post-partum women and 6-23-month-old children such as micronutrient supplementation, ANC services for pregnant adolescents/women, promotion and counseling on EBF and proper IYCF, among others. Strengthening the services offered in the health facilities is also critical to realize the program's overall goals. An adequate supply of micronutrient supplements to the health facilities must be secured to ensure that the target groups in the communities have access, particularly the MNP. Regular training of health providers is also needed to have updated knowledge on the local health and nutrition programs, especially on the micronutrient supplementation for young children. Available services must be expanded to include more labor and delivery, adolescent-focused, and newborn care services. There is also a need to promote these services to address the knowledge gaps knowledge on anemia prevention, low utilization of HIV/STI/AIDS-related services, and fear of availing health facility services due to COVID-19, especially among pregnant adolescents. Additionally, current strategies on encouraging mothers to breastfeed and/or to practice optimal complementary feeding should also be intensified amid the continuing community quarantine.

I. INTRODUCTION

The first 1000 days of life is the time spanning between conception and one's second birthday. Proper nutrition in this period is critical because it is a unique period of opportunity and a time of vulnerability (Scott, 2020). The first 1000 days are the window of opportunity because this is when improvements in nutrition can have the greatest impact in populations with poor nutrition, and it is also a vulnerable period because it is the time of rapid growth and development (Schwarzenberg et al., 2018; Martorell, 2018; Scott, 2020).

At the national level, malnutrition, especially among children, remains a significant public health problem in the Philippines. The latest survey showed that the prevalence of stunting in children 0-23 months was 21.9% and wasting 7.0% (FNRI, 2019). In addition, the prevalence of anemia among children <2 years old was 29.3%, considered as a moderate (between 20.0-39.9%) public health concern (WHO 2001).

With regards to infant and young child feeding (IYCF), the same survey revealed that 74.0% of 0-23 months old children were initiated to breastfeeding within one hour after birth and the proportion of infants less than 6 months old exclusively breastfed was 57.9%. The percentage distribution of exclusively breastfed infants under 6 months old by single age in months has shown a decreasing trend, from a high of 77.6% at 0 month to 63.7% at 2 months, and to a low 35.1% at 5 months. Also, the average duration of exclusive breastfeeding is 4.4 months (FNRI-DOST, 2019d).

Moreover, the prevalence of nutritionally at-risk women was 22.9% in 2019, an increase of about three percentage points from 20.1% in 2018 (FNRI, 2019). Between age groups, the proportion of nutritionally at-risk pregnant adolescents were higher at 28.5% than adult pregnant women at 22.3%. These nutritionally at-risk pregnant women are likely to deliver low birth weight babies. Anemia is also a mild public health problem among adult pregnant women (19.9%).

In urban areas, all forms of malnutrition are also a pressing public health concern. However, there is limited data on the delivery of health and nutrition services and the nutrition situation of children, pregnant adolescents, and post-partum women. Of the three cities included in this survey, only Puerto Princesa City was reported by DOST-FNRI to have data on the prevalence of undernutrition of children included in the national nutrition survey. In Puerto Princesa City, 16.6% of children are underweight, 26.5% are stunted, and 6.9% are wasted/thin. The prevalence of overweight children is still low at 2.5% but could be a potential nutritional problem (FNRI-DOST 2019c). Two-thirds of the 0-23 months old children were exclusively breastfed, and almost three-fourth of the children were breastfed up to two years (FNRI-DOST 2019c). As for pregnant women, 19.8% were assessed as nutritionally at-risk (FNRI-DOST 2019c). Data on the undernutrition of children in Tagum City and Tacurong City were based on the reports of the city government. In Tagum City, the prevalence of underweight, stunting, and wasting among children were 2.2%, 5.5%, and 1.6%, respectively (Tagum City Information Office, 2018). In Tacurong City, the reported prevalence of stunting among 0-59 months old was 8.6% and underweight at 5.5% (Tacurong City Government website).

The importance of good nutrition in the first 1000 days is widely recognized at all levels. In children, poor or inadequate nutrition in the first 1000 days may result in stunting and lifelong deficits in brain function (Scott, 2020), lower IQ scores, reduced school success, and more behavioral dysregulation in children (Schwarzenberg, 2018). In pregnant women, malnutrition increases the risk of gestational anemia, hypertension, miscarriages, and fetal deaths during pregnancy, pre-term delivery, and maternal mortality (Salem et al., 2016). Moreover, poor nutrition during pregnancy is associated with poor

developmental outcomes in children, including lower cognitive functioning, deficits in attention, and disruptive behavior problems (Keenan et al., 2013).

An increasing concern is the growing proportion of teenage pregnancy. Pregnancy in adolescence poses additional risks to the mother and newborn, as adolescent girls are not physically mature enough, and undernutrition further exacerbates these risks (Das et al., 2018). In addition, the nutritional issues of undernutrition and overnutrition among children and adolescents are intricately woven together in an intergenerational cycle of malnutrition. The intergenerational cycle is the path through which a low-birth-weight baby becomes a stunted child, a stunted adolescent, and a malnourished woman who, in turn, has another low-birth-weight baby. Thus, it is essential that women, particularly girls, are nourished well at all stages of growth and development because the risk of malnutrition in women spans a life course and also across generations, this is termed as intergenerational effects of malnutrition (Das et al., 2018, de Silva et al., 2019).

Implementing health and nutrition interventions in the first 1000 days is quite important as much of human development is said to be completed during this period (Al-Zwaini et al., 2020). Evidence shows that interventions implemented in the first 1000 days, such as micronutrient powder supplementation, iron-folic acid supplementation, ante-natal care services, behavior change communication, can be effective. However, the full effects may be felt later in life (Schwarzenberg, 2018; FANTA, 2018). Specific to maternal nutrition interventions, delivery through antenatal care platforms of iron, folic acid, and zinc supplementation, nutrition counselling, and food supplementation successfully reduces the prevalence of low birth weight (del Silva et al., 2019).

With regards to policies, Republic Act 11148, also known as *Kalusugan at Nutrisyon ng Mag-Nanay Act or the First 1000 Law*, was signed on November 29, 2018 to ensure that quality services reach mothers and children. The law aims to scale up the national and local health and nutrition programs through a strengthened integrated strategy for maternal, neonatal, child health and nutrition in the first 1000 days. The Department of Health (DOH) and National Nutrition Council (NNC) implements an integrated package of maternal, newborn, and child health and nutrition services. These include micronutrient supplementation, behavior change communication, case management, capacity building, and provision and/or updating related policies and guidelines. In addition, non-government organizations such as the Zuellig Family Foundation (ZFF) and Nutrition International (NI) support the country's efforts to reduce malnutrition following the first 1000 days framework.

The general objective of this survey was to assess the health and nutrition service delivery and nutritional outcomes in Tacurong City, Tagum City, and Puerto Princesa City. Specifically, it aimed to:

1. Identify the nutrition and health service delivery in health facilities, e.g., rural health units, barangay health stations in the selected cities;
2. Determine the knowledge and practices on the First 1000 Days of health providers in the health facilities;
3. Assess the receipt and utilization of health services as well as supplements, including its consumption among women before, during, and after pregnancy;
4. Determine the knowledge and practices related to nutrition of women who are 0-5 months post-partum (all ages) and 15-19 years old adolescent girls who are pregnant;
5. Determine the percentage of 6-23 months old children meeting the minimum acceptable diet;
6. Estimate the prevalence of nutritionally at-risk pregnant adolescent girls;
7. Estimate the prevalence of stunting, wasting, and overweight among children 6-23 months of age; and,

8. Describe the changes in practices of mothers/caregivers and health providers in the context of the COVID-19 global pandemic.

This survey was commissioned by Zuellig Family Foundation (ZFF) in partnership with Nutritional International (NI) and is intended to provide information for the ZFF-NI project entitled “Developing Governance Models on Urban Nutrition Systems for the 1st 1000 days of life in the Philippines.” The survey results could be used to adjust project plans and implement inputs, outputs, and outcomes at the local levels. Furthermore, with available information, there will be room for future external or internal monitoring and evaluation of identified indicators to measure the success of programs. Moreover, one of the focuses of the study is among adolescent girls who are pregnant. Hence, the results will considerably add to the limited health and nutrition information on pregnancy among adolescents in the Philippines, particularly in urban areas. In addition, research result dissemination activities will be done, such as oral presentations in local and international proceedings and publication in reputable journals. Also, the lessons learned in the study could be used by different organizations and entities in implementing nutrition and health-related interventions in urban areas. Lastly, various stakeholders can use the results in implementing targeted and timely nutrition and health-related interventions.

This is a comprehensive report covering the three survey sites. The report consists of five (5) sections. The first section is the introduction that provides a brief discussion of the country's nutrition situation, and, overview and objectives of the study. The second section outlines and discusses the methodology of the study, including the study design; study participants; study sites; sampling design; sample size calculation, questionnaire development; data collection data processing, analysis and interpretation; and ethical considerations. The third section discusses the findings, presented according to the sequence of the objectives and by target group such as health facility and health providers, pregnant adolescents, post-partum women (0-5 months), and children 6-23 months. The fourth section shares the challenges encountered during the implementation of the study. Finally, the last section briefly summarizes the results and conclusions and provides recommendations for local government actions.

II. METHODOLOGY

As mentioned earlier, this survey was conducted to assess the health and nutrition service delivery and nutritional outcomes in three urban cities. The survey methodology was based on the Standardized Monitoring and Assessment of Relief and Transitions (SMART). This methodology is a standardized, simplified, cross-sectional field survey designed to aid the collection of quality, up-to-date and timely nutrition data necessary for decision-making.

Study sites

The three study sites were Puerto Princesa City, Tacurong City, and Tagum City (Figure 1). These are also the project areas of ZFF and NI.

Puerto Princesa City has 253,982 hectares that stretch to over 106 kilometers, making it the country's largest city. It has 66 barangays, the majority of which are rural settlements scattered in underdeveloped land. The estimated total population is about 211,000. The primary economic activities are tourism, agriculture, fisheries, and commerce. In 2018, the city had a 3.6% poverty incidence based on the report of the Philippine Statistics Authority (PSA). **Tagum** is also a first-class city with 23 barangays with a total estimated population of 259,444. It has a land area of 198.5 square meters, and its major economic activity is agriculture. The city also serves as the regional center for Region XI. It has the least poverty incidence among the cities and municipalities in the region, with 13.6% based on PSA's poverty statistics survey in 2015. The third area is **Tacurong City**, with an estimated population of 98,316 and a total land area of 15,340 hectares. It has 20 barangays, mostly agricultural, but some barangays adjacent to Barangay Poblacion are already becoming commercial and industrial centers. According to PSA's poverty statistics survey in 2015, Tacurong has the lowest poverty incidence among the cities and municipalities in Region XII with 16.4%.

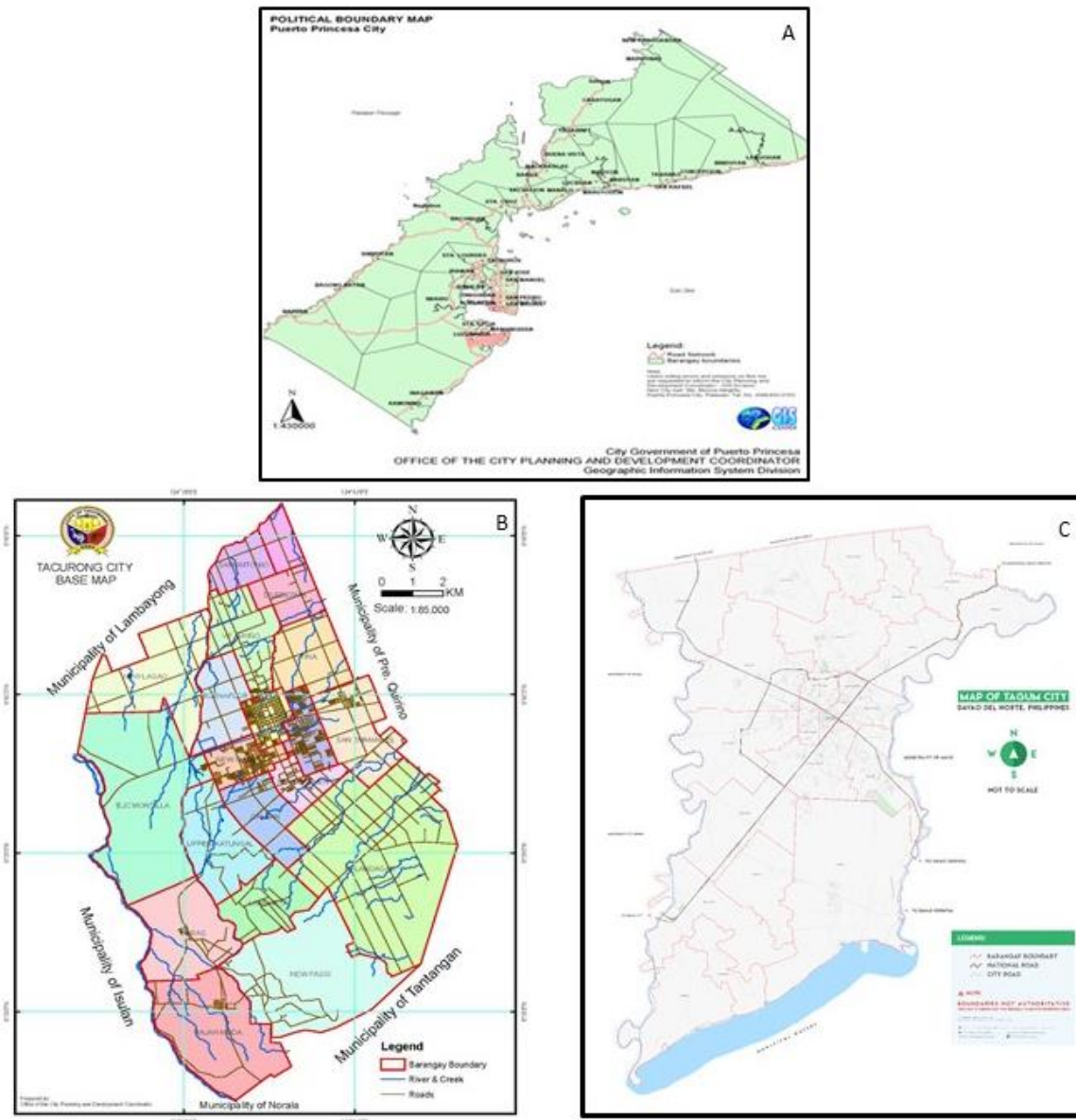


Figure 1. Study sites

Sources: A - Puerto Princesa City Tourism Department; B – Tacurong City Office of the City Planning and Development Coordinator; C - The Official Website of the City Government of Tagum.

Sampling design and sample size

The proposal was to use a two-stage sampling method based on administrative areas in Puerto Princesa City, Tacurong City, and Tagum City (Table 1). The first-stage sampling entailed the selection of primary sampling units (PSUs), which are the barangays with at least 250 households. In a barangay with more than 500 households, segmentation was done accordingly such that one cluster is about 250 households.

The second-stage sampling should have involved the selection of basic sampling units or target groups through simple random sampling using computer-generated random numbers. The most recent list of the target groups, i.e., children 6-23 months, pregnant adolescents and post-partum women provided by the local health and nutrition workers in the selected PSUs was meant to serve as the sampling frame for the random selection of participants. However, the list of pregnant adolescents was not available and the

list of the two other target groups provided by the local health officials had to be updated by the research team.

The planned second-stage sampling was applied only to 6-23 month old children. The number of postpartum women (0-5 months) included in the updated list was lower than the calculated sample size (Table 2) which precluded random sampling from the list. Aside from including all postpartum women included in the list, house-to-house visits were conducted in the entire village even if houses are far from each other particularly in Puerto Princesa City. Eligible pregnant adolescents were likewise recruited through the house-to-house visits.

Table 1. Proposed sampling design to randomly select barangays and survey subjects

Stage of Sampling	Sampling	Procedure
1 st stage sampling	Selection of barangays with at least 250 households using simple random sampling	1. List all barangays with their total number of households. 2. Identify PSUs according to criteria. 3. Random selection of PSUs using Emergency Nutrition Assessment (ENA) software.
2 nd stage sampling	Selection of sampling units using simple random sampling	List of sampling units per PSU • children 6-23 months • post-partum women

The formula used to estimate the sample size for the survey target participants, namely, postpartum women (0-5 months, all ages, with live birth) and children 6-23 months, is shown below:

$$\frac{Z_{\alpha/2}^2}{d^2} P(1-P) \times \frac{1}{\text{Response Rate}} \times DEFF$$

where P is the proportion of identified indicator for each domain, Q is computed as $1-P$, d is the margin of error, Z is the standard normal variate based on a level of confidence $(1-\alpha)$, and $DEFF$ is the design effect to compensate with the complexity of the sampling design.

The following assumptions were used to calculate the sample size. In addition, precision, homogeneity of clusters (design effect), local demographic information, and non-respondent rates were estimated per the SMART recommended approach.

1. The design effect used in the computation of sample size was 1.5 based on the terms of reference. While the design effect should depend on the study's location, 1.5 is used in all cities since the sampling procedures implemented were the same in all areas.
2. Non-respondent rate of 10% was used according to the local refusal rates to reach the desired number of respondents, assuming some are lost due to refusal, inaccessibility, security reasons, absentees, among others.
3. Desired Precision/Margin of Error. Based on the prevalence of several indicators, 5% was used in the computation of sample size for women postpartum and children 6-23 months.
4. The sample size for each target group was calculated using available prevalence (p) or coverage estimates of indicators in the region from the national nutrition survey (NNS) and national demographic and health surveys (NDHS). Refer to Annex 1.
5. The indicators used to get the expected prevalence in calculating the sample size for women 0-5 months postpartum (all ages, with live birth) were: a) iron-folic acid supplementation; b) antenatal care by skilled health provider; c) initiation of breastfeeding within 1 hour of delivery, and d) exclusive breastfeeding for the first five months.

6. The 2019 NNS national prevalence for underweight, stunted, and wasted children and the prevalence of minimum acceptable diet (MAD) were used to calculate the sample for children 6-23 months. The indicator of % of stunted children 6-23 months provided the highest number of samples of 1,530.
7. Using the ENA software, a total of 30 clusters were selected with four reserved clusters per area. If a health facility was found in the community (barangay), a rural health midwife (RHM) or a Barangay Nutrition Scholar (BNS), or a BHW from each of these villages were interviewed.

Survey participants

Table 2 shows the target sample size per target group, study site, percent coverage of data collection, and minimum sample size requirement without adjustment for non-response. A total of 1,530 children 0-23 months, 967 postpartum women of all ages who had a live birth in the last 0-5 months, and 141 pregnant adolescents ages 15-19 years old who are currently pregnant were included in the survey. Only the target sample size for children 6-23 months was achieved. For the 6-23-month-old children, their mothers/caregivers served as the respondents.

Despite the team's best efforts to meet the sample size requirement by doing house-to-house visits within the entire village, the number of postpartum women and pregnant adolescents included in the study is much less than the requirement. There were clusters that did not have pregnant adolescents and postpartum women. To document this observation, in each cluster or village visited, the team requested for a signed certification from the local health and nutrition workers regarding the low number of eligible individuals in these two target groups who were found and subsequently interviewed in the village.

Table 2. Number of calculated sample size per target group and study site

City	Cluster No.*	Target Sample Size						Number of Completed Interviews					
		Children 6-23 months	Minimum sample size requirement without adjustment for non-response	Post-partum Women	Minimum sample size requirement without adjustment for non-response	Pregnant Adolescent	Minimum sample size requirement without adjustment for non-response	Children 6-23 months		Postpartum Women*		Pregnant Adolescent*	
								n	%	n	%	n	%
Puerto Princesa	34	510	459	630	567	540	486	500	98.0	340	54.0	32	5.9
Tacurong	34	510	459	660	594	540	486	516	101.2	352	53.3	34	6.3
Tagum	34	510	459	600	540	540	486	514	100.8	275	44.8	75	13.9

* Actual number of eligible participants found in sampled clusters and villages; included the four reserved clusters

In addition, the target number of health facilities is one for every community found in clusters. As mentioned, one RHM, BNS, or BHW was interviewed in a health facility found in every community (barangay) in the clusters. A total of 70 health providers were interviewed for the study. The health providers were interviewed to gain information on the nutrition and health services offered in the health facilities. The health providers interviewed were selected based convenience (i.e., the health providers available at the time of visit). It is assumed that all health providers were knowledgeable of the nutrition and health services offered in their respective facilities.

Survey questionnaires

Four (4) questionnaires from NI were adapted to the local Philippine context and used in this survey. These were for: 1) postpartum women; 2) infants and children 6-23 months of age; 3) pregnant adolescents; and 4) facility personnel and health providers. Table 3 presents the questionnaire vis-à-vis the target group and objectives of the survey. The questionnaires in paper and pencil form and tablet form using open data kit (ODK) application were pretested in a community that was not selected as a study site in Puerto Princesa City and Tagum City. While the questionnaires were translated to Cebuano,

Hiligaynon, and Tagalog, only the English and Tagalog versions were used in Open Data Kit (ODK). The ODK is a free and open-source software used for collecting and submitting data using tablets or Android mobile devices.

Table 3. Target group by objectives of the study

Objective	Target group	Questionnaire
Objectives # 1. Identify the nutrition and health service delivery in health facilities in the selected cities.	Health providers who work with pregnant and postpartum women on the delivery of antenatal care (ANC), Iron Folic Acid (IFA), and Micronutrient Powder (MNP) supplementation and age-appropriate Infant and Young Child Feeding (IYCF) practices	Health Facility
Objective #2: To determine the knowledge and practices on the first 1000 days of health providers in the health facilities.		
Objectives # 3. To assess receipt and utilization of health services as well as supplements, including its consumption among women before, during, and after pregnancy.	- Adolescent girls who are pregnant 0-5 months postpartum women	- Pregnant Adolescents 0-5 months postpartum women
Objective # 4: To determine the knowledge and practices related to nutrition of women who are 0-5 months postpartum (all ages) and adolescent girls who are pregnant.		
Objective #5: Determine the % of 6-23 months old children meeting the minimum acceptable diet.	Children 6-23 months	Infant and Young Child Nutrition (IYCN)
Objective #6: To estimate the prevalence of nutritionally at-risk pregnant women.	Adolescent girls who are pregnant	Pregnant Adolescents
Objective #7: To estimate the prevalence of stunting, wasting, and overweight among children 6-23 months of age.	Children aged 6-23 months	IYCN
Objective # 8: To explain the changes in practices of mothers/caregivers and health providers in the context of the COVID-19 global pandemic.	- Facility workers - Adolescent girls who are pregnant 0-5 months postpartum Women - Children aged 6-23 months	All four questionnaires

Data collection

Village representatives such as the BNS or BHW were tapped to provide support in conducting the survey since they have extensive knowledge on the layout of the village and know the head of each household in the village as well as the women who gave birth in the previous year. All data collection and related activities were conducted with safety protocols, such as wearing personal protective equipment by the enumerators. Each enumerator also used a monitoring form to check their temperature and the occurrence of symptoms. In addition, close coordination with the respective city government was observed to facilitate the smooth data collection process.

1. Hiring and training of enumerators

Local enumerators were hired to minimize language and context barriers. The UPLB survey team interviewed all applicants via Zoom or messenger. All those with prior work experience related to conducting a survey were given priority. They were also asked if they were willing to conduct face-to-face interviews and anthropometric measurements. A total of 23 enumerators and two team leaders were hired (Table 4). The team leader and enumerators in Tagum City were also the teams who collected data in Tacurong City. Two research teams were organized, and each group had at least 10-15 enumerators.

The training of local enumerators was conducted to equip them with the knowledge and skills on how to do a face-to-face interview, standardize the procedures of data collection, and familiarize themselves with the four questionnaires. The survey team conducted the training via Zoom as travel to the study sites was not yet allowed. The enumerators and team leaders were gathered in a hotel to ensure a stable internet connection throughout the training. Roleplay exercises were used to practice the questionnaires' administration, and adequate time was allocated to the digital data collection process. The enumerators practiced encoding of answers in the ODK application using an android tablet.

Moreover, the participants were trained on proper anthropometric measurement techniques, particularly weighing and measurement of length and height of 6-23-month-old children and mothers. Standardization exercises were done for weight, length, and height measurements. Pre-and post-tests were also implemented to assess the acquisition of knowledge. Prior to hiring and commencing the survey, observations of at least two interviews to assess and provide feedback to each enumerator on their interview practices were also done.

2. Schedule of data collection

The data collection per city was undertaken for more than 30 days, beyond the target number of days. This was attributed to the observance of the COVID-19 pandemic health protocols. In Puerto Princesa City, data collection was stopped for almost two weeks as per the city government's order due to the rising covid-19 cases. Tacurong City required a 14-day quarantine for the enumerators before the data collection, while in Tagum City, quarantine was imposed before and after the data collection.

Table 4. Number of enumerators vis-à-vis total number of participants and dates of data collection

City	Number of Enumerators	Date of Data Collection	Remarks
Puerto Princesa	13	24 Sep – 28 Oct 9 Nov – 4 Dec 2020	Stopped on 29 Oct – 8 Nov
Tacurong	10	8-21 Nov 23 Nov - 20 Dec	14-day quarantine before the data collection
Tagum	10	24 Sept – 28 Oct 2020 16 Jan – 7 Feb 2021	7-14 days quarantine before and after the data collection

3. Face-to-face interview

Each face-to-face interview took about 45 to 60 minutes to be completed. The enumerators conducted house visits for mothers of 6-23-months-old children, postpartum women, and pregnant adolescents and health facility visits for health workers. The questionnaires used were updated based on NI-Canada consultation even after the training of enumerators.

4. Anthropometric measurements

Standard anthropometric measurement techniques were followed by the enumerators. Measurements were obtained either in barangay health stations or respondents' residence where it was more conducive to place the measuring equipment on flat surfaces. Whenever the *Operation Timbang Plus* (OPT) schedule of local health workers coincided with the team's schedule in the area, the latter joined the health workers. The recumbent length of children 6-23-months-old was measured using an infantometer by two enumerators.

The height of mothers and pregnant adolescents was measured using a microtoise. Measurements were done twice then average of the two measurements was used. But if the difference between the two measurements is 0.3 cm and above, a third measurement was done. Among children, height was measured after checking if they were wearing shoes or have hair decorations, hair bands, and other objects that might obstruct measurement. Measurements were rounded to the nearest 0.1 cm.

Weight was measured using the digital weighing scale. Each area was assigned a measurer who took weight among children, adolescent girls and post-partum women. Measurement was taken in the participant's home or a designated venue such as the local health center. Specific to weighing children, the mothers/caregivers were asked to remove the child's heavy clothing or diaper. Weight was measured to the nearest 0.1 kg. Measurements were done twice, but if the difference between the two measurements was 0.2 kg and above, a third measurement was necessary. The average of the two weight measurements was used. The mothers/caregivers were informed of the results of the anthropometric assessment. Participants who were found to be malnourished were endorsed to the Barangay Nutrition Committee. Also, a list was forwarded and endorsed to the Municipal Nutrition Action Officer (MNAO).

5. Quality control

A survey protocol was developed to serve as a guide to all the involved personnel in the study. This included the procedures on how the survey will be conducted; how to assure research quality; how to coordinate with LGU leaders, personnel, mothers, adolescent girls, and health workers; how to locate and select participants and how to interview; how to use and check the measuring instruments; how to collect the data; and how to detect errors, among others. The data were collected accordingly as stipulated in the proposal and protocol.

Regular checking (weekly) was done by the team leaders and project leader in terms of correctness, completeness, and consistency of data collected. The UPLB survey team was responsible for ensuring that high-quality data was collected, including direct supervision of survey teams per city, monitoring the survey implementation vis-à-vis targets, and providing brief survey updates to NI and ZFF.

The team leaders also documented their activities. The team leaders were provided with logbooks to document their daily activities, the detailed procedures or steps undertaken, the people they met and talked to, the arrangements made, the documents used, problems encountered, solution(s) tried, and accomplishments. Several forms were also used to document the visited and interviewed participants, including their contact information, supplies, and travel expenses of the enumerators and participants.

Data processing, analysis, and interpretation

The data collected via ODK were checked regularly (weekly) by the team leaders. Data were uploaded by the enumerators at the end of each day's data collection to the Cloud server or on the following 1-2 days when the service connection was available. In Tagum City, the data was encoded in ODK after the data collection using paper and pencil was completed. These data were externally monitored and

checked throughout the survey implementation period. Upon completion of data collection, the datasets from each of the survey teams were consolidated and analyzed as one single dataset to obtain prevalence estimates representing all NI-intervention areas in the country.

The nutritional status of children was determined using the World Health Organization-Child Growth Standards (WHO-CGS), which are listed below. Descriptive statistics were used, including computing for a percentage of children with a low length/height-for-age (stunting), reflecting the cumulative effects of undernutrition and infections since and even before birth (WHO, 2010). The percentage of children who have low weight-for-age (underweight) can reflect 'wasting' (i.e., low weight-for-length/height), indicating acute weight loss, 'stunting,' or both. When children were assessed to be undernourished, their parents/guardians were referred to the appropriate health personnel for immediate intervention.

Underweight (low weight-for-age): weight for age < -2 SD

Stunting (low length/height-for-age): height for age < -2 SD

Wasting (low weight-for-length): weight for height < -2 SD

The nutritional status of postpartum women was determined using Body Mass Index (BMI). It is defined as a person's weight in kilograms divided by the square of the person's height in meters (kg/m^2). BMI was developed as a risk indicator of disease; thus, as BMI increases, so does the risk for some diseases such as high blood pressure, cardiovascular diseases.

Classification	Cut-off points
Chronic Energy Deficiency	< 18.5
Normal	18.5 to 24.99
Overweight	25.0 to 29.99
Obesity	≥ 30

The nutritional status of pregnant adolescents was evaluated using the weight-for-height table by the week of pregnancy for Filipinos. It is used as a risk indicator for screening mothers at risk of delivering low birthweight babies (Magbitang et al., 1988). In the calculation, the pre-pregnant weight equals the standard reference for the woman's height.

Classification	Cut-off points
Nutritionally at-risk	$< \text{P}95$
Not nutritionally at-risk	$\geq \text{P}95$

For the complementary feeding practices, the **minimum acceptable diet (MAD)** was computed. The MAD is the proportion of children 6-23 months meeting both the minimum dietary diversity and the minimum meal frequency to ensure both dietary and nutrient adequacy (WHO, 2010).

Breastfed children 6–23 months of age who had at least the minimum dietary diversity and the minimum meal frequency during the previous day
Breastfed children 6–23 months of age
Non-breastfed children 6–23 months of age who received at least 2 milk feedings and had at least the minimum dietary diversity not including milk feeds and the minimum meal frequency during the previous day
Non-breastfed children 6–23 months of age

The **minimum meal frequency (MMF)** is the proportion of breastfed and non-breastfed children 6-23 months who received solid, semi-solid, or soft foods consumed at the minimum number of times per day.

The minimum number of times are: 2x for breastfed infants 6-8 months old; 3x for breastfed children 9-23 months old; and 4x for non-breastfed children 6-23 months old (WHO, 2010).

Breastfed children 6–23 months of age who received solid, semi-solid or soft foods
the minimum number of times or more during the previous day

Breastfed children 6–23 months of age

Non-breastfed children 6–23 months of age who received solid, semi-solid or soft foods or
milk feeds the minimum number of times or more during the previous day

Non-breastfed children 6–23 months of age

On the other hand, **minimum dietary diversity** (MDD) is the consumption of four or more food groups from the seven food groups for higher dietary quality and to meet daily energy and nutrient requirements of the seven recommended food groups, namely: grains, roots, and tubers; legumes and nuts; dairy products; flesh foods (meat, fish, poultry). Based on WHO (2010), the formula is:

Children 6–23 months of age who received foods from ≥ 4 food groups during the previous day

Children 6–23 months of age

Lastly, the frequency and percentage distributions of variables were analyzed to determine the distributional characteristics of the participants in Puerto Princesa City, Tacurong City, and Tagum City. Summary statistics such as mean, median, minimum, maximum, and standard deviation were also calculated to describe the distributional properties of quantitative data. In addition, the proportion of children with their nutritional status was estimated, and a 95% confidence interval was constructed. All tabulations and estimations were generated using a Statistical Package for Social Sciences (SPSS) and STATA.

Ethical considerations

Ethical clearance for the survey was provided by the University of the East Ramon Magsaysay Memorial Medical Center UERM 0785/E/2020/013 in August 2020. Informed consent was obtained from respondents of legal age (i.e., women 18-45 years). Additional assent was obtained for the 6-23-months old children and adolescent girls as they were not yet of legal age. Before asking each respondent to sign the informed consent form, the enumerators explained the survey's objectives and benefits. The enumerators also emphasized that the participants could refuse to answer questions at any point during the survey. The enumerators also explained to the participants that they would not be exposed to physical or biological hazards and that the interview would not have topics that could cause psychological distress to them.

III. MAIN FINDINGS

The results are presented by the target group and by the objective of the study across the three cities. Section A describes the responsibilities, nutrition, and health services offered by, and knowledge and practices on these services of the health facility personnel. It also describes the coping strategies they had adopted to ensure delivery of nutrition and health services amid the pandemic. On the other hand, Section B describes the receipt and utilization of ANC, iron or iron and folic acid (IFA) supplementation, and other health and nutrition services offered in the health facilities, knowledge related to anemia and IFA supplementation, nutritional status, and the coping strategies adopted by the pregnant adolescent respondents to ensure a healthy pregnancy. Moreover, Section C describes receipt and utilization of health services and iron and IFA supplements of post-partum women, and availment of post-partum services. It also describes their nutrition status and knowledge and practices on anemia and supplements, and appropriate feeding practices for infants. This section describes the coping strategies of post-partum women when it comes to availment of health services and feeding practices during the pandemic. Lastly, Section D describes the utilization of services, knowledge and practices of mothers/ caregivers with 6-23 months old children. This section also describes the nutritional status of children, complementary feeding indicators, and coping strategies on availment of health services and feeding practices of mothers/ caregivers during the pandemic.

A. HEALTH FACILITY AND HEALTH PROVIDERS

A.1 HEALTH FACILITY PERSONNEL RESPONSIBILITIES

Across the three cities, a total number of 70 health facility personnel or health providers were included in the survey as mentioned in the methodology section. Health providers, also referred to as health service providers or health facility workers, are people engaged in actions whose primary intent is to enhance health (WHO, 2006). They play a critical role in improving access and providing quality health and nutrition services. The health facility personnel are people engaged in actions whose primary intent is to enhance health (WHO, 2006).

In this survey, they are midwives, nurses, doctors or community health workers/volunteers. They work in government health facilities such as the rural health units/centers or barangay health stations. Across the three cities, a total of 70 health providers were included in the survey (Table A.1) and Puerto Princesa City had the highest number of participants (30). Majority of the respondents in the in the three cities were Rural Health Midwives. Few respondents in Tacurong were nurses.

Table A.1. Frequency and percentage distribution of health facility workers by city

Types of health facility workers	Puerto Princesa City (n=30)		Tacurong City (n=21)		Tagum City (n=19)		Total (n=70)	
	n	%	n	%	n	%	n	%
Community Health Worker/Volunteer	10	33.3	4	19.0	6	31.6	20	
Rural Health Midwife	20	66.7	15	71.4	13	68.4	48	
Nurse	-	-	2	9.5	-	-	2	

The health facility personnel have various responsibilities related to the promotion of health and nutrition of children and pregnant women including adolescents (Table A.2). One responsibility which most of the health providers mentioned is the distribution of micronutrient supplements, i.e., for MNP and iron-folic acid (IFA). Another responsibility identified was counseling which is provided to all target groups, e.g., IYCN for mothers/caregivers of children (24.3%), pregnant women (24.3%). The health facility personnel in Puerto Princesa City seem to have a fewer range of responsibilities compared to those in the other two cities. This is probably due to the prioritization which limited the health and nutrition services provided due to the pandemic.

The majority (55.7%) of the health personnel also manage the supplies stocks and inventory. Based on the DOH revised policy on micronutrient supplementation (DOH AO 2010-0010), the RHUs and BHSs are responsible for delivering and distributing the supplements, recording and monitoring, and training of health staff and community volunteers. The BHWs and other volunteers may give the supplements if they are trained. At the time of the survey though, information on training of the health care workers was not asked.

Table A.2. Frequency and percent distribution of health facility personnel, by responsibilities and by city

Responsibilities of health facility personnel*	Puerto Princesa City		Tacurong City		Tagum City		Total	
	(n=30)		(n=21)		(n=19)		(n=70)	
	n	%	n	%	n	%	n	%
Children								
MNP distribution/issue/dispensing	29	96.7	11	52.4	8	42.1	48	68.6
IYCN counseling	0	0.0	11	52.4	6	31.6	17	24.3
Zinc/ORS distribution	0	0.0	4	19.0	4	21.1	8	11.4

Diarrhea treatment	0	0.0	6	28.6	1	5.3	7	10.0
Pregnant adolescents								
Counseling adolescents	0	0.0	7	33.3	5	26.3	12	17.1
IFA distribution/issue/dispensing	0	0.0	2	9.5	2	10.5	4	5.7
Pregnant Women								
IFA distribution/issue/dispensing	30	100.0	9	42.9	6	31.6	45	64.3
Pregnancy counseling	0	0.0	12	57.1	5	26.3	17	24.3
Management of inventory/stocks	28	93.3	7	33.3	4	21.1	39	55.7

*Multiple responses

A.2. NUTRITION AND HEALTH SERVICE DELIVERY IN HEALTH FACILITIES

Table A.3 summarizes the health services for pregnant women, post-partum women, and newborn babies practiced by the health personnel. Note that these results do not necessarily mean that the health personnel are in the position to provide these services (e.g., practice of active labor during the 3rd stage, monitoring vital signs & progress of labor using partograph). These results are summarized based on the claims of the respondents. ANC services, pre-natal in particular, were the most common services. ANC services are important to prepare pregnant women for delivery and detection and management of risk conditions associated with pregnancy and childbirth. Understandably, the less common services provided by the respondent health workers were related to labor and delivery and post-partum since approximately 28% of them were community workers and are not tasked to deliver such services. In contrast, the fewer common services were related to labor and delivery and post-partum. Specific to areas, Puerto Princesa City did not have services on deworming, malaria prophylaxis, labor and delivery of pregnant women, and services for newborn babies such as newborn screening and immediate drying of newborn babies. Tacurong City also did not offer the same services for newborn babies. This may be due to the limited birthing facilities in the two cities.

Table A.3. Frequency and percentage distribution of the health care workers according to the services they provided to pregnant adolescents, post-partum women, and newborn babies, by city

Services	Puerto Princesa City (n=30)		Tacurong City (n=21)		Tagum City (n=19)		Total (n=70)	
	n	%	n	%	n	%	n	%
Before and during pregnancy/ANC								
Antenatal care for pregnant women	30	100.0	21	100.0	18	94.7	69	98.6
Tetanus toxoid immunization	30	100.0	21	100.0	19	100.0	70	100.0
Blood pressure monitoring	30	100.0	21	100.0	19	100.0	70	100.0
Counselling services for pregnant women	30	100.0	21	100.0	19	100.0	70	100.0
Height and weight monitoring of pregnant women	30	100.0	21	100.0	18	94.7	69	98.6
Blood testing and screening	30	100.0	2	9.5	14	73.7	46	65.7
Oral health services	30	100.0	7	33.3	10	52.6	47	67.1
Identification of early signs and symptoms of complications	29	96.7	8	38.1	10	52.6	47	67.1

Services	Puerto Princesa City (n=30)		Tacurong City (n=21)		Tagum City (n=19)		Total (n=70)	
	n	%	n	%	n	%	n	%
Home visits and follow up	30	100.0	20	95.2	18	94.7	68	97.1
Birth planning services	29	96.7	21	100.0	17	89.5	67	95.7
Deworming services	0	0.0	20	95.2	17	89.5	37	52.9
Malaria prophylaxis	0	0.0	1	4.8	12	63.2	13	18.6
Labor and delivery								
Practice of active management during 3 rd stage of labor	0	0.0	20	95.2	2	10.5	22	31.4
Monitoring vital signs and progress of labor using partograph	0	0.0	3	14.3	8	42.1	11	15.7
Designated area for premature birth care	0	0.0	0	0.0	0	0.0	0	0.0
Delivery services for pregnant women (birthing facilities)	0	0.0	0	0.0	4	21.0	4	5.7
Post-partum								
Promote exclusive breastfeeding	30	100.0	21	100.0	19	100.0	70	100.0
Post-partum check-up	29	96.7	20	95.2	14	73.7	63	90.0
Counseling to post-partum women	29	96.7	19	90.5	19	100.0	67	95.7
IFA supplementation after delivery	29	96.7	18	85.7	16	84.2	63	90.0
Vitamin A to post-partum women	3	10.0	18	85.7	15	78.9	36	51.4
Immediate nursing care to post-partum women	0	0.0	0	0.0	3	15.8	3	4.3
Newborn and infant care								
Weighing of newborn babies	0	0.0	5	23.8	12	63.2	17	24.3
Newborn screening	0	0.0	0	0.0	15	78.9	15	21.4
Immediate drying of newborn babies	0	0.0	0	0.0	3	15.8	3	4.3
Follow up check-up of newborn babies	1	3.3	15	71.4	14	73.7	30	42.9

*Multiple responses

A.3. DELIVERY OF IFA AND MNP SUPPLEMENTS

Most of the health facilities distributed micronutrient powder (MNP) to young children and iron or iron and folic acid (IFA) tablets to pregnant women (Table A.4). It seems there is a recognition of the importance of these supplements. The MNP has an important role in ensuring adequate micronutrient intake and reducing anaemia in young children (Siekman et al., 2017). Likewise, IFA is an important micronutrient for physiological function, growth, and development and maintenance of life for the mother and her fetus during pregnancy and in later life (Sendeku et al., 2020).

Table A.4. Frequency and percentage distribution offered by health facilities, by micronutrient supplements, and by city

Services	Puerto Princesa City (n=30)		Tacurong City (n=21)		Tagum City (n=19)		Total (n=70)	
	n	%	n	%	n	%	n	%
1. Iron or iron and folic acid tablets for pregnant women	30	100.0	21	100.0	19	100.0	70	100.0
2. Micronutrient Powders (MNP) for young children	28	93.3	21	100.0	19	100.0	68	97.1

Stocks of IFA were seen by enumerators in many health facilities in all cities (Figure A.1.a). It is important to have regular and adequate stocks of IFA and MNP in the health facilities so that both children and pregnant women who need them would have continuous access. Stocks of MNP were also noted in the three cities but a fewer number of health facilities (Figure A.1.b). Stock-outs of IFA and MNP were experienced in the past 3 and 12 months by all cities. Tacurong City had the highest percentage of health facilities that experienced IFA stock out in the last 3 months (57.1%) and the last 12 months (61.9%). Puerto Princesa City had no MNP stocks at the time of the survey.

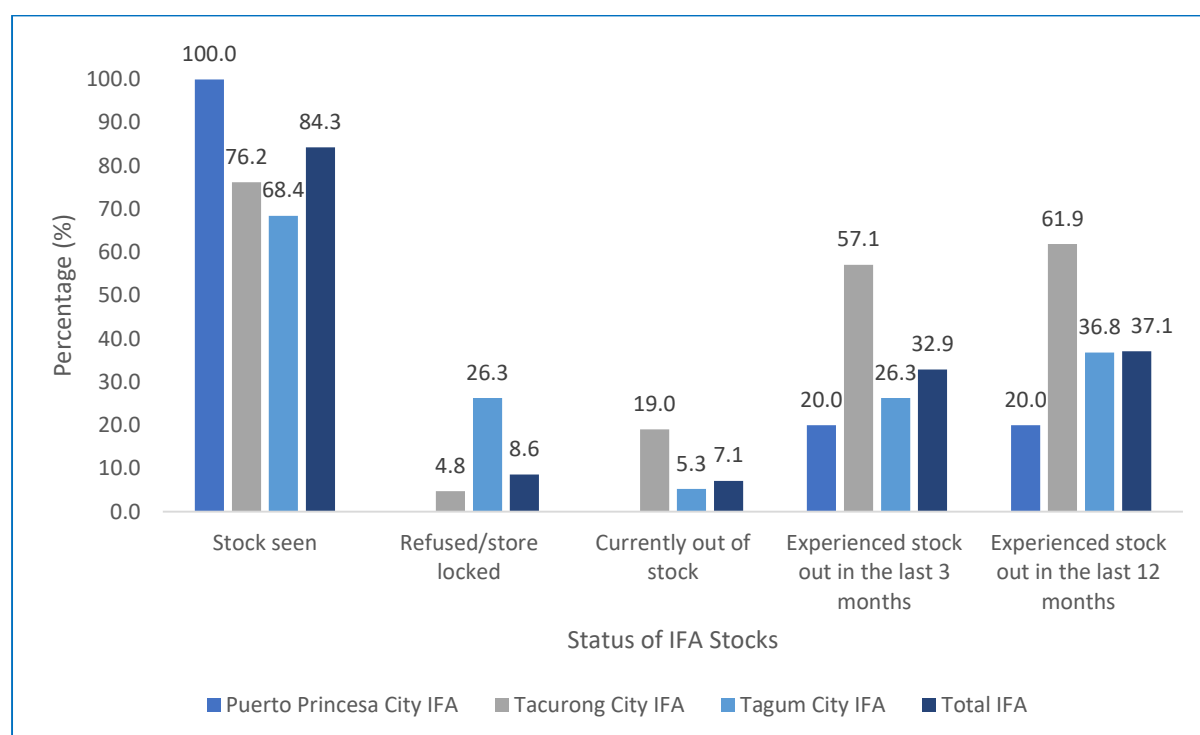


Figure A.1.a. Percent distribution of IFA stock status in the health facilities, by city

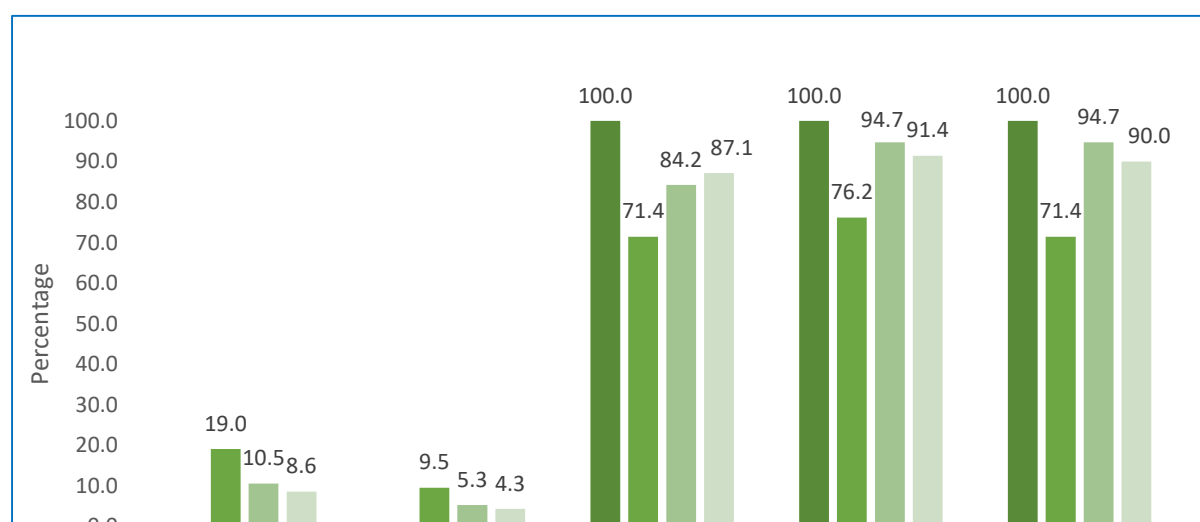


Figure A.1.b. Percent distribution of MNP stock status in the health facilities, by city

A.4. KNOWLEDGE AND PRACTICES ON AGE-APPROPRIATE FEEDING PRACTICES AND BREASTFEEDING INITIATION

The health providers' knowledge on age-appropriate feeding practices (AAFP) and breastfeeding (BF) initiation is presented in Table A.5. Note that there were items that had low response, i.e., benefits of timely initiation of BF in Tacurong City (n=4) and Tagum City (n=9). Low response could be due to difficulty in understanding of what colostrum is which is one of benefits gained by infants when they are breastfed. The AAFP *improves growth and prevents malnutrition* were the most common claims of health workers on its benefits while *exclusive breastfeeding (EBF) in the first 6 months of life* was the most common message provided to the mothers followed by the *introduction of complementary feeding at 6 months*. On the other hand, all health providers who provided messages on *timely initiation of BF* to pregnant women in Puerto Princesa knew that *BF should be initiated within 1 hour after delivery*. In Tacurong City, only four out of 21 health providers interviewed provided messages on the initiation of BF to pregnant women. The percentages in Tagum City are relatively higher than Tacurong City but lower than Puerto Princesa City. The most common answer of health workers on the benefits of timely initiation of BF was the *high nutrient contents of colostrum*. This information was learned from a series of training conducted by the government.

Table A.5. Frequency and percent distribution of health providers, by knowledge and practices on BF initiation and age-appropriate feeding practices, by city

Knowledge & Practices of health providers on BF and AAFP*	Puerto Princesa City		Tacurong City		Tagum City		Total	
	n	%	n	%	n	%	n	%
Benefits of Timely Initiation of BF	n=30		n=4**		n=9**		n=49	
Colostrum is high in nutrients	17	57.0	2	50.0	4	44.0	23	53.0
Colostrum contains antibodies	8	27.0	1	25.0	0	0.0	9	21.0
Starts milk production/breastfeeding	5	17.0	1	25.0	4	44.0	10	23.0
Best nutrition at birth	1	3.0	0	0.0	1	11.0	2	5.0
Benefits of AAFP	n=30		n=21		n=19		n=70	
Improves growth	28	93.3	11	52.4	14	73.7	53	75.7
Prevents malnutrition	27	90.0	16	76.2	10	52.6	53	75.7
Prevents micro- and macro-nutrient deficiency	25	83.3	8	38.1	10	52.6	43	61.4
Prevents infection	25	83.3	6	28.6	5	26.3	36	51.4
Prevents anemia	26	86.7	1	4.8	8	42.1	35	50.0
Provides correct nutrients	25	83.3	4	19.0	1	5.3	30	42.9

Knowledge & Practices of health providers on BF and AAFP*	Puerto Princesa City		Tacurong City		Tagum City		Total	
	n	%	n	%	n	%	n	%
Messages on AAFP provided by health workers to mothers	n=30		n=21		n=19		n=70	
Give only breastmilk for the first 6 months	30	100.0	18	85.7	16	84.2	64	91.4
Commence giving food/other liquids at 6 months	29	96.7	14	66.7	13	68.4	56	80.0
Start with soft/ semi-soft foods	29	96.7	7	33.3	12	63.2	48	68.6
Start with one food at a time	29	96.7	8	38.1	9	47.4	46	65.7
Continue BF to two years of age	29	96.7	8	38.1	9	47.4	46	65.7
Provide a variety of foods	29	96.7	7	33.3	9	47.4	45	64.3
Provide foods that have the right consistency	28	93.3	6	28.6	7	36.8	41	58.6
Include meats, dairy, vegetables, fruits, legumes (not just grains/ cereals)	28	93.3	5	23.8	7	36.8	40	57.1
No water or teas before 6 months of age	29	96.7	1	4.8	3	15.8	33	47.1
Add some fat to increase weight gain	28	93.3	0	0.0	1	5.3	29	41.4
Continue feeding and BF during illnesses	28	93.3	0	0.0	1	5.3	29	41.4
Provided messages on initiation of BF to pregnant women	30	100.0	4	19.0	9	47.4	43	61.4

*Multiple responses

** Eligible respondents

A.5. KNOWLEDGE AND PRACTICES ON IFA AND MNP SUPPLEMENTATION

The health providers were also asked about their knowledge and practices related to IFA and MNP supplementation (Table A.6). The most common benefit of IFA consumption cited by health workers was that it *prevents/reduces/treats anemia* followed by *prevention of iron deficiency*, while the most common message they mentioned to mothers was to *take IFA daily throughout pregnancy*. On the other hand, the top three benefits of MNP identified by the health workers were the following: *it prevents malnutrition*, *it prevents micro and macronutrient deficiencies*, and *it improves growth*. However, only a few of the health workers were able to identify the guidelines and steps in the food preparation with MNP for children, particularly for the following: *If possible, choose foods that contain meat or vitamin C* (No. 8); *1 sachet a day*; *1 sachet a day for 30 days* (No. 13); *Pour on cold rice, use on alternate days at the very least if baby refuses to eat* (No. 14); and *Alternate in giving to a child* (No. 15). These results highlight the need for further training of the health workers on using the micronutrient deficiency intervention programs, particularly on the use of MNP for the preparation of food for young children.

Table A.6. Frequency and percent distribution of health providers based on their knowledge and practices on IFA and MNP supplementation, by city

Knowledge & Practices of Health Providers on IFA and MNP Supplementation*	Puerto Princesa City		Tacurong City		Tagum City		Total	
	(n=30)		(n=21)		(n=19)		(n=70)	
	n	%	n	%	n	%	n	%
Benefits of consuming IFA during pregnancy								

Knowledge & Practices of Health Providers on IFA and MNP Supplementation*	Puerto Princesa City		Tacurong City		Tagum City		Total	
	(n=30)		(n=21)		(n=19)		(n=70)	
	n	%	n	%	n	%	n	%
Prevent/reduce/treat anemia	20	66.7	11	52.4	6	31.6	37	52.9
Prevents iron deficiency	10	33.3	8	38.1	9	47.4	27	38.6
Others (e.g., reduces risk of preterm birth, growth of fetus, reduce clinical symptoms of anemia)	0	0.0	2	9.5	4	21.1	6	8.6
IFA related messages provided by health workers to pregnant mothers								
Take daily throughout pregnancy	21	70.0	9	42.9	7	36.8	37	52.9
Start early in pregnancy	9	30.0	3	14.3	9	47.4	21	30.0
Others (e.g., encourage eating of fruits, vegetables, legumes, needs follow up)	0	0.0	9	42.9	3	15.8	12	17.1
Benefits of MNP for young children								
Prevent malnutrition	27	90.0	16	76.2	10	52.6	53	75.7
Prevent micro and macronutrient deficiencies	25	83.3	8	38.1	10	52.6	43	61.4
Improve growth	18	60.0	11	52.4	14	73.7	43	61.4
Prevent infection	25	83.3	6	28.6	5	26.3	36	51.4
Prevent anemia	26	86.7	1	4.8	8	42.1	35	50.0
Food Preparation with MNP								
1. Wash hands	10	33.3	3	14.3	8	42.1	21	30.0
2. Shake sachet before opening	6	20.0	5	23.8	2	10.5	13	18.6
3. Open sachet and pour entire contents over the child's food	9	30.0	14	66.7	9	47.4	32	45.7
4. Put child's food portion in a separate dish	3	10.0	2	9.5	4	21.1	9	12.9
5. Avoid adding to hot foods	11	36.7	9	42.9	9	47.4	29	41.4
6. Do not premix the sachet into the entire food pot (for the entire family)	4	13.3	1	4.8	6	31.6	11	15.7
7. Add sachet just before feeding to child	7	23.3	7	33.3	5	26.3	19	27.1
8. If possible, choose foods that contain meat or vitamin C	1	3.3	0	0.0	1	5.3	2	2.9
9. If possible, avoid adding to foods with lots of fiber (whole grains/ legumes)	10	33.3	9	42.9	9	47.4	28	40.0
10. Add to flavorful foods (so the flavor is not a problem)	3	10.0	2	9.5	2	10.5	7	10.0
11. Add to just a small portion of the food (minimum the child would usually eat)	10	33.3	5	23.8	5	26.3	20	28.6
12. Mix with solid or semi-solid foods (avoid liquids)	10	33.3	8	38.1	11	57.9	29	41.4
13. One sachet a day for 30 days	0	0.0	0	0.0	2	10.5	2	2.9
14. Pour on cold rice, use on alternate days at the very least if baby refuses to eat	0	0.0	1	4.8	0	0.0	1	1.4
15. Alternate in giving to child	0	0.0	1	4.8	0	0.0	1	1.4

*Multiple responses

A.6. CHALLENGES AND COPING STRATEGIES TO PROVIDE HEALTH AND NUTRITION SERVICES DURING THE COVID-19 PANDEMIC

Some challenges were experienced by the health facility personnel. In Puerto Princesa City, the distribution of IFA supplements was delayed, and anthropometric measurements were suspended. In Tacurong City, all health services were stopped during the first lockdown. Eventually, the services were continued but with some changes such as conducting limited house-to-house visits, use of text messages, or calling patients. In Tagum City, the health care protocols such as wearing face masks and face shields as well as following strict social distancing were also implemented.

Coping strategies were implemented by the health facility personnel to adjust to the COVID-19 pandemic and to ensure the delivery of services. About 73% of health facilities reported changing the ways of delivering health services. A lower percentage of health facilities (60%) implemented innovative actions as a strategy as a coping strategy and to ensure service delivery to the target groups. For example, instead of the pregnant women and children going to health facilities, the health facility personnel conducted house-to-house visits. In addition, text messaging or calling target groups was done to ensure communication with the target groups except in Puerto Princesa City. But this was not commonly done as less than 20% of the health facilities implemented this strategy (Table A.7).

Table A.7. Frequency and percent distribution of health workers who changed their practices on health service delivery in the context of the COVID-19 pandemic, by city

Changes in the practices of health providers	Puerto Princesa City		Tacurong City		Tagum City		Total	
	(n=30)		(n=21)		(n=19)		(n=70)	
	n	%	n	%	n	%	n	%
Had changes in the delivery of health services	30	100.0	10	47.6	11	57.9	51	72.9
Implemented innovative actions to ensure service delivery during the pandemic	24	80.0	9	42.9	9	47.4	42	60.0
Changed mode of service delivery to house-to-house visits	24	80.0	5	23.8	4	21.1	33	47.1
Ensured constant communication with clients via text messaging or call	0	0.0	6	28.6	5	26.3	11	15.7

B. PREGNANT ADOLESCENTS

The survey was conducted among 141 pregnant adolescents (Table B.1). The PSA (2020) estimates that the population of adolescent girls is 10.3 million (10-19 years old). At a young age, many Filipino adolescents are becoming pregnant while simultaneously undergoing physical, cognitive, and psychosocial changes in their body. They become responsible of taking care of their baby while they themselves are still maturing. Teenage pregnancy is an increasing problem and is considered a public health burden in the country (Ticzon et al., 2020).

Tagum City had the highest number of pregnant adolescents. In terms of age, a lower proportion of pregnant adolescents were noted among younger adolescents (14-16 years old) than older ones (17-19 years old). On a per age group basis, the highest proportion of pregnant adolescents was among the 16 years old in Puerto Princesa City (25%), 17 years old in Tacurong City (26.7%), and 18 years old in Tagum City (31%). At the national level, the teenage pregnancy rate was 9% in 2017 based on the NDHS survey. The Philippines has 47 annual births per 1,000 women aged 15-19, higher than the average adolescent birth rates of 44 globally and 33.5 in the ASEAN region (World Bank Group, 2019).

The respondents were in various months of pregnancy during the survey, from the first to the third trimester. Most of them were separated from their partners and have reached some secondary education. This is unfortunate since not being able to complete education is one of the significant non-health risks that beset pregnant adolescents (Natividad, 2013). When a teenager bears a child, more likely she is separated from her partner (73.8%) and she could be at risk of not finishing her education and of limiting her chances of realizing her full potential by being burdened with childcare.

Pregnancy among adolescents is associated with several potential problems such as high health risk, unsafe abortion, inadequate or lack of prenatal care, and sexually transmitted disease from unprotected sex (DOH, 2014). Moreover, they are more likely not to be able to complete their secondary or tertiary education, which in turn would affect their economic productivity in the future. The cost of loss of opportunities and foregone earning is estimated at Php 33 billion per year (UNFPA, 2020). Based on the NDHS (PSA and ICF, 2018), adolescents with some primary education and those from the poorest households are more likely to have begun childbearing than those with higher education levels and those from the wealthiest households. Relative to the area, there are more pregnant adolescents in rural areas (10%) than in urban areas (7%).

Table B.1. Frequency and percent distribution of pregnant adolescents, by socio-demographic characteristics and by city

Characteristics of pregnant adolescents	Puerto Princesa City (n=32)		Tacurong City (n=34)		Tagum City (n=75)		Total (n=141)	
	n	%	n	%	n	%	n	%
Age (years)								
14	1	3.1	0	0.0	0	0.0	1	0.7
15	2	6.3	6	17.6	3	4.0	11	7.8
16	8	25.0	6	17.6	14	18.7	28	19.9
17	7	21.9	9	26.5	16	21.3	32	22.7
18	7	21.9	8	23.5	23	30.7	38	27.0
19	7	21.9	5	14.7	19	25.3	31	22.0
Educational attainment								
Some primary	0	0.0	6	17.6	5	6.7	11	7.8
Completed primary	3	9.4	0	0.0	5	6.7	8	5.7
Some secondary	18	56.3	23	67.6	51	68.0	92	65.2
Completed secondary	9	28.1	3	8.8	12	16.0	24	17.0
Some tertiary	1	3.1	2	5.9	2	2.7	5	3.5
Technical/vocational	1	3.1	0	0.0	0	0.0	1	0.7
Current marital status								
Single, no partner	7	21.9	6	17.6	10	13.3	23	16.3
Cohabiting	3	9.4	5	14.7	6	8.0	14	9.9
Separated	22	68.8	23	67.6	59	78.7	104	73.8
Trimester of pregnancy								
First	6	18.8	5	14.7	6	8.0	17	12.1
Second	12	37.5	16	47.1	27	36.0	55	39.0
Third	14	43.8	13	38.2	42	56.0	69	48.9

B.1. RECEIPT AND UTILIZATION OF ANC SERVICES BY PREGNANT ADOLESCENTS

This portion highlights the practices of pregnant adolescents particularly in the receipt and utilization of health services such as ANC and IFA supplements. Figure B.1 shows that the overall percentage of pregnant adolescents who had any ANC visits was high, particularly among the participants who were in their third trimester. This is consistent with the 2015 FNRI National Nutrition Survey wherein, more than 90% of mothers less than 20 years old had at least one prenatal visit. The results also revealed that most of those who had not availed of ANC services were those in their first trimester, especially those who live in Tagum City. There is a tendency for adolescents to hide their pregnancy in the early months.

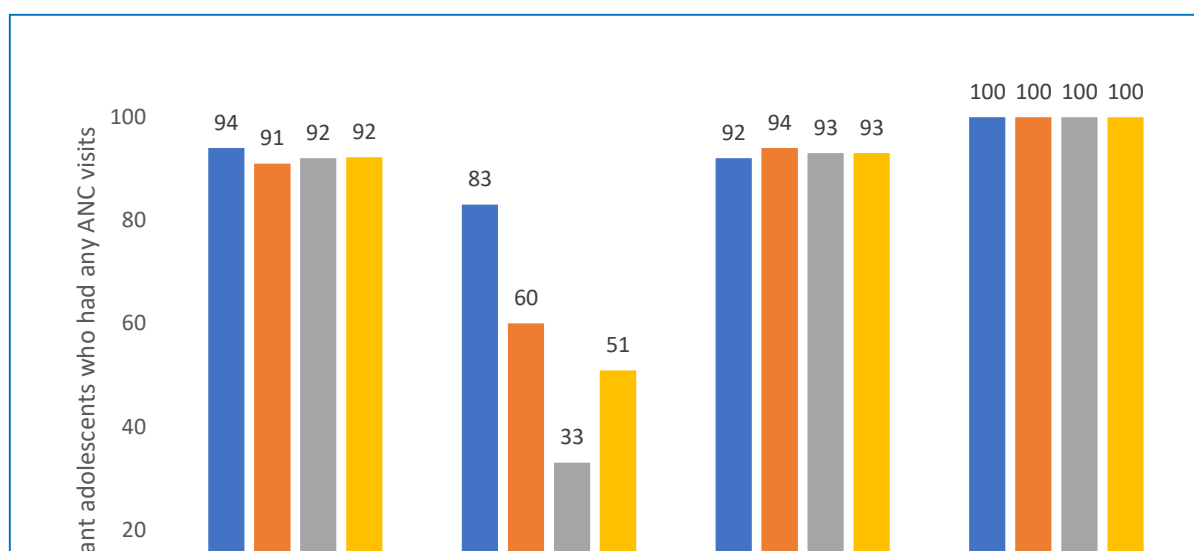


Figure B.1. Percent distribution of pregnant adolescents who availed the ANC services by trimester and by city

On the other hand, 11 out of 141 (7.8%) pregnant adolescent did not avail of any ANC services and they were asked about the hindering factors in availing of such services. All of them claimed that they were unaware of ANC's importance and benefits (Figure B.2). Some of them also said that it is because the local health center does not have the complete facility and equipment for ANC.

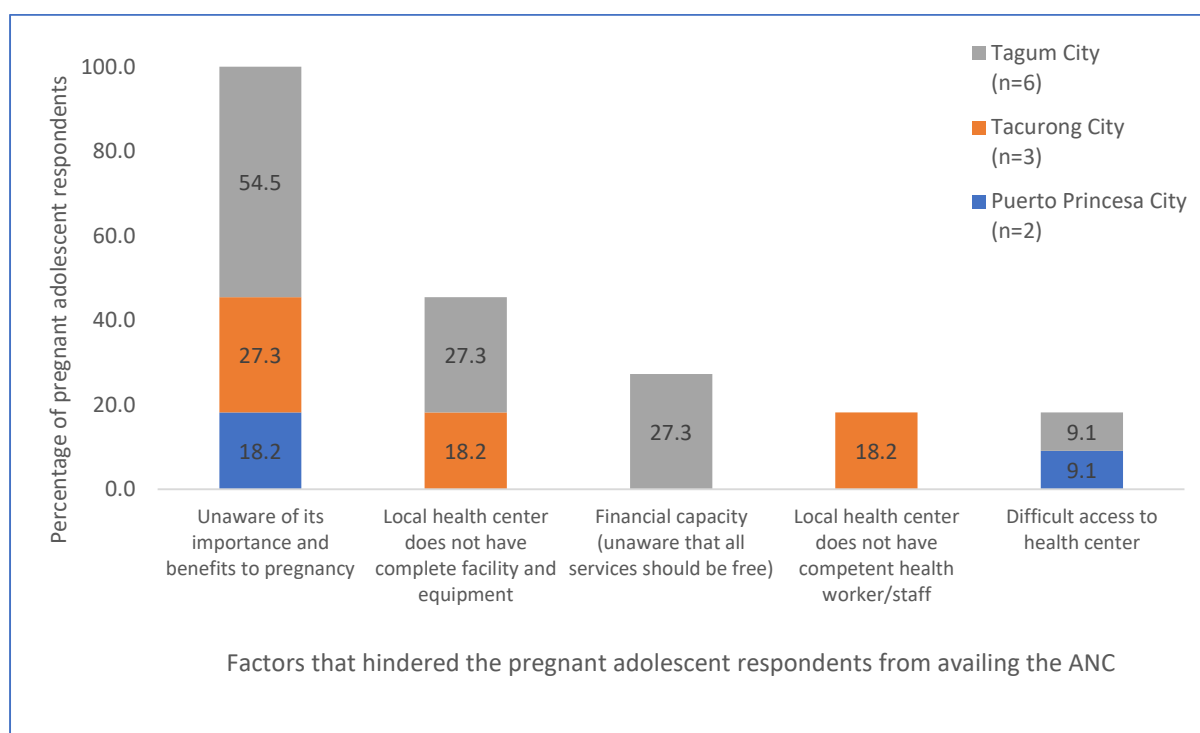


Figure B.2. Percent distribution of pregnant adolescents who did not have any ANC visits according to the factors that hindered them from availing the service, by city

Table B.2 presents the information on practices of the pregnant adolescent who had already visited a health facility to avail of ANC services. The month of the first ANC visit varied with the first month of pregnancy as the earliest and the 6th month as the oldest. Most of the respondents were able to avail of ANC during the first trimester, particularly in the third month of pregnancy (31.5%). The majority (65.3%) of the pregnant adolescents who availed of ANC did so during the first semester, particularly in the third month of pregnancy (31.5%). In addition, of the 141 pregnant adolescents (including those who did not avail of ANC visits), 68.1% failed to follow the recommendation of at least 4 visits.

Across cities, the majority had their ANC visits in government health facilities (94.6%). The highest number of visits observed among pregnant adolescents was 7 times which is higher than the recommended ANC visit of four (FNRI, 2015). However, less than 10% of pregnant adolescents have 7 or more ANC visits. Across all cities, the participants received ANC services mostly from the midwives (58.5%).

Meanwhile, the three most common services received by pregnant adolescents were IFA supplementation, tetanus toxoid immunization, and information dissemination through counseling and group activities helping the mothers and baby achieve a healthy pregnancy. This is consistent with the earlier findings on the services offered to pregnant women by the health facility providers. The findings in this survey are also consistent with that of the National Nutrition Survey (FNRI, 2015) where more than 90% of mothers were provided with weight monitoring and micronutrient supplementation (FNRI, 2016).

Table B.2. Frequency and percent distribution of pregnant adolescents who had any ANC visits, by practices and by city

ANC Practices*	Puerto Princesa City (n=30)		Tacurong City (n=31)		Tagum City (n=69)		Total (n=130)	
	n	%	n	%	n	%	n	%
The month of the first ANC visit							65.4	
1	4	13.3	6	19.4	6	8.7	16	12.3
2	8	26.7	8	25.8	12	17.4	28	21.5
3	5	16.7	11	35.5	25	36.2	41	31.5
4	6	20.0	5	16.1	14	20.3	25	19.2
5	4	13.3	0	0.0	6	8.7	10	7.7
6	3	10.0	1	3.2	4	5.8	8	6.2
Do not know	0	0.0	0	0.0	2	2.9	2	1.5
ANC Facility visited								
Private	1	3.3	0	0.0	5	7.2	6	4.6
Public	29	96.7	31	100.0	63	91.3	123	94.6
Do not know	0	0.0	0	0.0	1	1.4	1	0.8
Number of ANC visits								
1	11	36.7	4	12.9	11	15.9	26	20.0
2	5	16.7	5	16.1	11	15.9	21	16.2
3	3	10.0	7	22.6	12	17.4	22	16.9
4	4	13.3	3	9.7	7	10.1	14	10.8
5	4	13.3	6	19.4	14	20.3	24	18.5
6	2	6.7	2	6.5	9	13.0	13	10.0
7 or more	0	0.0	4	12.9	5	7.2	9	6.9
Do not know	1	3.3	0	0.0	0	0.0	1	0.8
Provided assistance during ANC visit*								
Midwife	23	76.7	28	90.3	25	36.2	76	58.5
Nurse	0	0.0	1	3.2	44	63.8	45	34.6
BHW	18	60.0	3	9.7	1	1.4	22	16.9
Doctor	1	3.3	0	0.0	3	4.3	4	3.1
CH Volunteer	3	10.0	0	0.0	1	1.4	4	3.1
Services received from health facility*								

ANC Practices*	Puerto Princesa City (n=30)		Tacurong City (n=31)		Tagum City (n=69)		Total (n=130)	
	n	%	n	%	n	%	n	%
Complete blood count/Hb/Hc	12	40.0	23	74.2	39	56.5	74	56.9
Screening for gestational diabetes	5	16.7	14	45.2	9	13.0	28	21.5
IFA supplements	24	80.0	30	96.8	65	94.2	119	91.5
Deworming	0	0.0	11	35.5	24	34.8	35	26.9
Weight and height measurement	13	43.3	22	71.0	27	39.1	62	47.7
Tetanus toxoid immunization	23	76.7	31	100.0	62	89.9	116	89.2
Information dissemination	15	50.0	23	74.2	52	75.4	90	69.2
Do not know	0	0.0	0	0.0	1	1.4	1	0.8

*Multiple responses

The majority of the pregnant adolescents recognized the importance of availing of ANC services to have a healthy pregnancy (75.4%). However, only a few associates it with the detection and management of pregnancy-related complications, treatment of underlying or concurrent illnesses, and prevention of maternal/infant mortality (Table B.3).

Table B.3. Frequency and percent distribution of pregnant adolescents who had any ANC visits based on their perceived benefits the service, by city

Benefits of ANC Visits*	Puerto Princesa City (n=30)		Tacurong City (n=31)		Tagum City (n=69)		Total (n=130)	
	n	%	n	%	n	%	n	%
Identification and surveillance of the pregnant woman and her expected child	22	73.3	17	54.8	39	56.5	78	60.0
Recognition and treatment of underlying or concurrent illness	14	46.7	2	6.5	14	20.3	30	23.1
Recognition and management of pregnancy-related complications	7	23.3	4	12.9	11	15.9	22	16.9
Receipt of services for preventive measures	15	50.0	10	32.3	16	23.2	41	31.5
Advice and support to the woman and her family for developing healthy home behavior	12	40.0	5	16.1	16	23.2	33	25.4
Help the mother and baby have a healthy pregnancy	19	63.3	21	67.7	58	84.1	98	75.4
Help prevent maternal/infant mortality	11	36.7	3	9.7	16	23.2	30	23.1

*Multiple responses

Among the pregnant adolescents, the top source of information on ANC services is the doctor/nurse/midwife across all cities (Table B.4). While very few mentioned social media as a source of information, there is a need to examine more closely the use of the internet and social media. The internet and social media, and new information technologies have become platforms for interaction and knowledge sharing especially among young people (UNFPA, 2020). The online platforms can be an opportunity to promote ANC services and improvement in the help-seeking behavior of adolescents.

Table B.4. Frequency and percent distribution of pregnant adolescents who had any ANC visits, by sources of information and by city

Sources of information on ANC Visits*	Puerto Princesa City (n=30)		Tacurong City (n=31)		Tagum City (n=69)		Total (n=130)	
	n	%	n	%	n	%	n	%
Doctor/nurse/Midwife	16	53.3	14	45.2	47	68.1	77	59.2
Community health worker	14	46.7	7	22.6	25	36.2	46	35.4
Teacher or other at school	7	23.3	4	12.9	15	21.7	26	20.0
Others	-	-	-	-	3	4.3	3	2.3

*Multiple responses

B.2. RECEIPT AND UTILIZATION OF IRON AND/OR IFA SUPPLEMENTS BY PREGNANT ADOLESCENTS

The respondents were asked about their consumption of micronutrient supplements during their current pregnancy (Table B.5). Results show that the majority took vitamins and/or minerals across all cities, particularly the IFA supplements (67.5%), and that most of them took these supplements once a day (71.4%). The DOH recommends daily IFA supplements containing 60 mg of elemental iron with 0.4 mg folic acid for at least 180 days and for up to three months postpartum. The percentage of pregnant adolescents who took iron and/or IFA supplements according to the recommendation of 180 days is only 5%. This is similar to the results of Fielder et al. (2014) where only 19% of women were able to meet the recommended intake. Table B.5 also shows that majority received iron or IFA supplements free of charge (94.2%) and got them mostly from a government health facility (95.0%).

Table B.5. Frequency and percent distribution of pregnant adolescents, by IFA supplementation practices and by city

Micronutrient Supplement Intake Practices	Puerto Princesa City (n=32)		Tacurong City (n=34)		Tagum City (n=75)		Total (n=141)	
	n	%	n	%	n	%	n	%
Taking vitamin and/or mineral supplement	29	90.6	30	88.2	67	89.3	126	89.4
Type of vitamin and/or mineral supplement is taken anytime during pregnancy*								
Iron/ferrous sulphate only	15	51.7	16	53.3	16	23.9	47	37.3
Iron and folic acid	21	72.4	15	50	49	73.1	85	67.5
Multivitamins without IFA	11	37.9	0	0.0	7	10.4	18	14.3
Vitamin C	4	13.8	3	10.0	5	7.5	12	9.5
Others (i.e., Provita)	0	0.0	8	26.7	13	19.4	21	16.7
Frequency of taking vitamin and/or mineral supplements during present pregnancy								
Once a day	23	79.3	24	80.0	43	64.2	90	71.4
Twice a day	3	10.3	5	16.7	22	32.8	30	23.8
Once a week	3	10.3	1	3.3	0	0.0	4	3.2
Every other day	0	0.0	0	0.0	1	1.5	1	0.8
Do not know/ cannot remember	0	0	0.0	0.0	1	1.5	1	0.8
Receive or purchase iron or IFA supplements	26	89.7	28	93.3	66	98.5	120	95.2
Received supplements for free	24	92.3	27	96.4	62	93.9	113	94.2
Paid for supplements	0	0	0.0	0.0	2	3.0	2	1.7
Both free and paid	2	7.7	1	3.6	2	3.0	5	4.2
Source of supplements								0.0
Public sector/government health facility	24	92.3	28	100	62	93.9	114	95.0
Private sector health facility	2	7.7	0.0	0.0	2	3.0	4	3.3
Non-medical/traditional care	0	0.0	0.0	0.0	1	1.5	1	0.8
Others	0	0.0	0.0	0.0	1	1.5	1	0.8
Number of days received/purchased supplements from the time pregnancy was known								
1-30	15	57.7	2	7.1	7	10.6	24	20
31-60	2	7.7	6	21.4	8	12.1	14	11.7
61-120	6	23.1	8	28.6	27	40.9	41	34.2
121-180	2	7.7	3	10.7	13	19.7	18	15.0

Micronutrient Supplement Intake Practices	Puerto Princesa City (n=32)		Tacurong City (n=34)		Tagum City (n=75)		Total (n=141)	
	n	%	n	%	n	%	n	%
>181	1	3.8	9	32.1	11	16.7	21	17.5
Number of days iron and/or IFA supplements consumed over the whole pregnancy								
Less than 180	27	84.4	24	70.6	55	73.3	106	75.2
180	0	0.0	0	0.0	7	9.3	7	5.0
More than 180	2	6.3	5	14.7	5	6.7	12	8.5

B.3. KNOWLEDGE RELATED TO ANEMIA AND IRON-FOLIC ACID SUPPLEMENTATION

Across the three cities, more than 50% of pregnant adolescents have already heard about anemia. The majority of them also know why iron supplementation is recommended during pregnancy (Figure B.3). In a study among Filipino pregnant women (18-45 years old), lower percentages were noted on their knowledge level, i.e., 45.9% had knowledge about signs and symptoms of anemia, 45.3% had knowledge of the benefits associated with IFA, and 15.4% had knowledge about side effects associated with IFA. The percentages are much lower than the results in this survey though among post-partum women

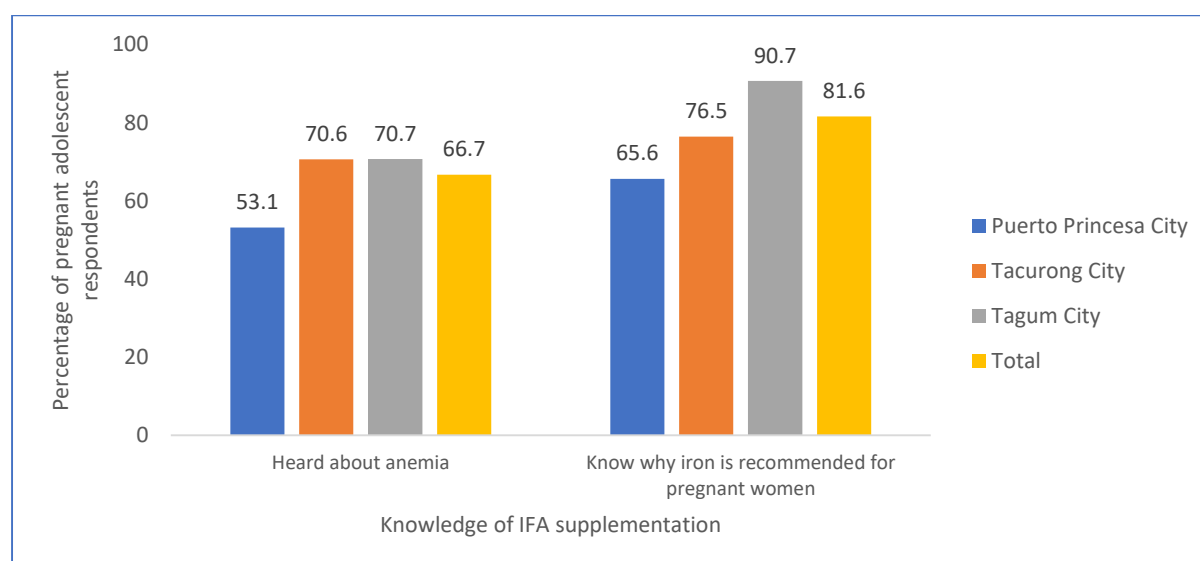


Figure B.3. Percent distribution of pregnant adolescent respondents, by knowledge of IFA supplementation and by city

Table B.6 shows the pregnant adolescents' knowledge of anemia and IFA supplements. While their knowledge about anemia varied, many of those who have heard about anemia associated it with dizziness and feeling tired, and paleness. Most of the respondents also claimed to know the reason why IFA is being recommended during pregnancy. However, very few can associate IFA supplement consumption with anemia prevention.

The majority of the respondents have heard about iron or IFA supplementation from health professionals. There is no information regarding the source of information IFA among Filipino adolescents. However, in other countries, the health posts and health centers were the preferred health facilities for iron

supplementation to adolescent girls who were not attending schools while the school was the preferred facility for iron supplementation of student adolescent girls (Mulugeta et al., 2015).

The respondents also claimed to be aware of ways to improve intake of IFA supplement and avoid any barriers to its intake. Among these are drinking more water and fluids as well as taking IFA with food. These results indicate the need for nutrition education among pregnant adolescents to increase their knowledge and improve IFA supplement consumption practices.

Table B.6. Frequency and percent distribution of pregnant adolescents according to the knowledge of IFA supplementation, by city

Knowledge on IFA supplementation	Puerto Princesa City (n=32)		Tacurong City (n=34)		Tagum City (n=75)		Total (n=141)	
	n	%	n	%	n	%	n	%
Knowledge about anemia*								
Dizziness	14	43.8	14	41.2	41	54.7	69	48.9
Tired/ fatigue/ can't work very long	14	43.8	8	23.5	32	42.7	54	38.3
Pale conjunctiva/palms of hands/feet and finger/toenails	4	12.5	11	32.4	12	16.0	27	19.1
Can't seem to breath well/get enough breath	8	25.0	2	5.9	7	9.3	17	12.1
Others	6	18.8	1	2.9	6	8.0	13	9.2
Reasons why IFA is recommended for pregnant women*								
Better/ more blood / better general health for infant / mom	16	50.0	11	32.4	44	58.7	71	50.4
More energy	15	46.9	3	8.8	17	22.7	35	24.8
Growth of baby: improve growth or birth weight/reduce the chance of low birth weight	3	9.4	13	38.2	18	24.0	34	24.1
Reduce/prevent/avoid/treat anemia	6	18.8	4	11.8	19	25.3	29	20.6
Prevent birth defects	4	12.5	5	14.7	19	25.3	28	19.9
Reduce/prevent/treat clinical symptoms: tiredness/weakness, dizziness, shortness of breath, pale skin	7	21.9	1	2.9	19	25.3	27	19.1
Others	2	6.3	15	44.1	22	29.3	39	27.7
Sources or heard messages about iron or IFA supplements*								
Health Professionals (including doctors, nurses, midwives)	14	43.8	22	64.7	50	66.7	86	61.0
Community health worker	10	31.3	5	14.7	21	28.0	36	25.5
Non-health professionals (including friends, relative, birth companion, TBA, teachers at schools)	4	12.5	4	11.8	19	25.3	27	19.1
Media (i.e., TV, radio, leaflet, posters)	0	0.0	2	5.9	1	1.3	3	2.1
Think that IFA is beneficial to pregnant women	21	65.6	23	67.6	26	34.7	70	49.6
Heard of ways that IFA should be taken or aware of things a woman might do to make it easier to take IFA and avoid any barriers	18	56.3	25	73.5	44	58.7	87	61.7
Ways to take IFA to avoid problems and consume the recommended dose*								

Knowledge on IFA supplementation	Puerto Princesa City (n=32)		Tacurong City (n=34)		Tagum City (n=75)		Total (n=141)	
	n	%	n	%	n	%	n	%
Drink lots of water/fluid	4	12.5	7	20.6	22	29.3	33	23.4
Take IFA with food	9	28.1	11	32.4	12	16.0	32	22.7
Consume high fiber foods	12	37.5	3	8.8	16	21.3	31	22.0
Take it every day throughout pregnancy	0	0.0	7	20.6	10	13.3	17	12.1
Dark stool color is normal/not bad	4	12.5	3	8.8	8	10.7	15	10.6
Take IFA at same every day	2	6.3	3	8.8	7	9.3	12	8.5
Others	12	37.5	3	8.8	11	14.7	26	18.4
Source of information about taking IFA to avoid problems and consume the recommended dose*								
Doctor/nurse/health center worker	12	37.5	13	38.2	30	40.0	55	39.0
Community health worker	6	18.8	6	17.6	11	14.7	23	16.3
Other health professional	2	6.3	0	0.0	9	12.0	11	7.8
Relative/friend	5	15.6	2	5.9	11	14.7	18	12.8

*Multiple responses

The utilization of other services by the respondents is summarized in Figure B.4. The majority of the pregnant adolescents were given tetanus toxoid vaccination and these were mostly administered by midwives. However, less than half availed dental and HIV/STI/AIDS screening services from health facilities across all cities and were mostly provided by dentists and midwives and nurses, respectively. Note that these results does not necessarily mean that the health personnel are in the position to provide these services (e.g., oral health services provided by midwives). The results are summarized based on the claims of the respondents.

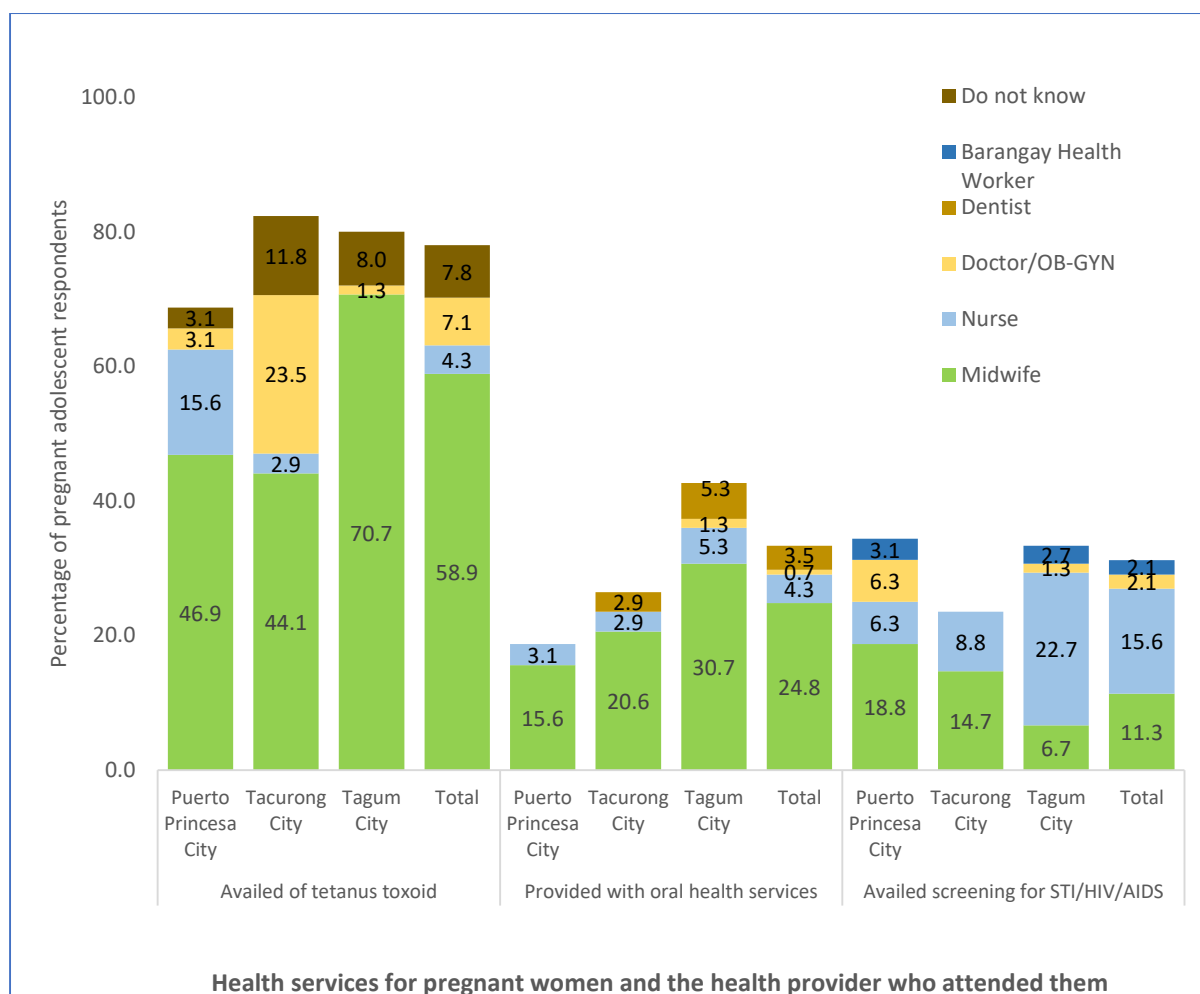


Figure B.4. Percent distribution of pregnant adolescent respondents who availed other health services and the health provider who attended them, by city

Moreover, the majority of the respondents have also attended EBF promotion sessions for pregnant women (Table B.7). The top two health workers who promoted EBF to the respondents were the midwives and nurses. In Puerto Princesa City and Tacurong City, most of the respondents received the information from midwives but in Tagum City, it was from the nurses. This activity is important to promote and increase the EBF rates in this group, as a study showed that adolescents are much less likely to breastfeed their babies compared to any other population group (Davies-Morris et al., 2014).

Table B.7. Frequency and percent distribution of pregnant adolescents who attended EBF promotion, by city

EBF Promotion	Puerto Princesa City (n=32)		Tacurong City (n=34)		Tagum City (n=75)		Total (n=141)	
	n	%	n	%	n	%	n	%
Attended EBF promotion	22	68.8	23	67.6	56	74.7	101	71.6
The person who promoted EBF*								

Midwife	16	72.7	18	78.3	18	32.1	52	51.5
Nurse	1	4.5	2	8.7	32	57.1	35	34.7
Doctor	3	13.6	1	4.3	2	3.6	6	5.9
Others (including BHW, nutritionists, parents/relatives)	2	9.1	2	8.7	4	7.1	8	7.9

* % among those who attended EBF promotion

Aside from EBF promotion, the pregnant adolescents also availed various health-related counseling services (Figure B.5). Counseling by health workers is an important component of the ANC services for pregnant adolescents as it would help them make informed decisions and improve their prospects in the future (Bluestein and Starling 1994). More than 50% of the respondents were able to attend a counseling session on family planning, nutrition, personal hygiene, and healthy lifestyle while otherwise was observed in other counseling topics, especially on counseling on STI/HIV/AIDS.

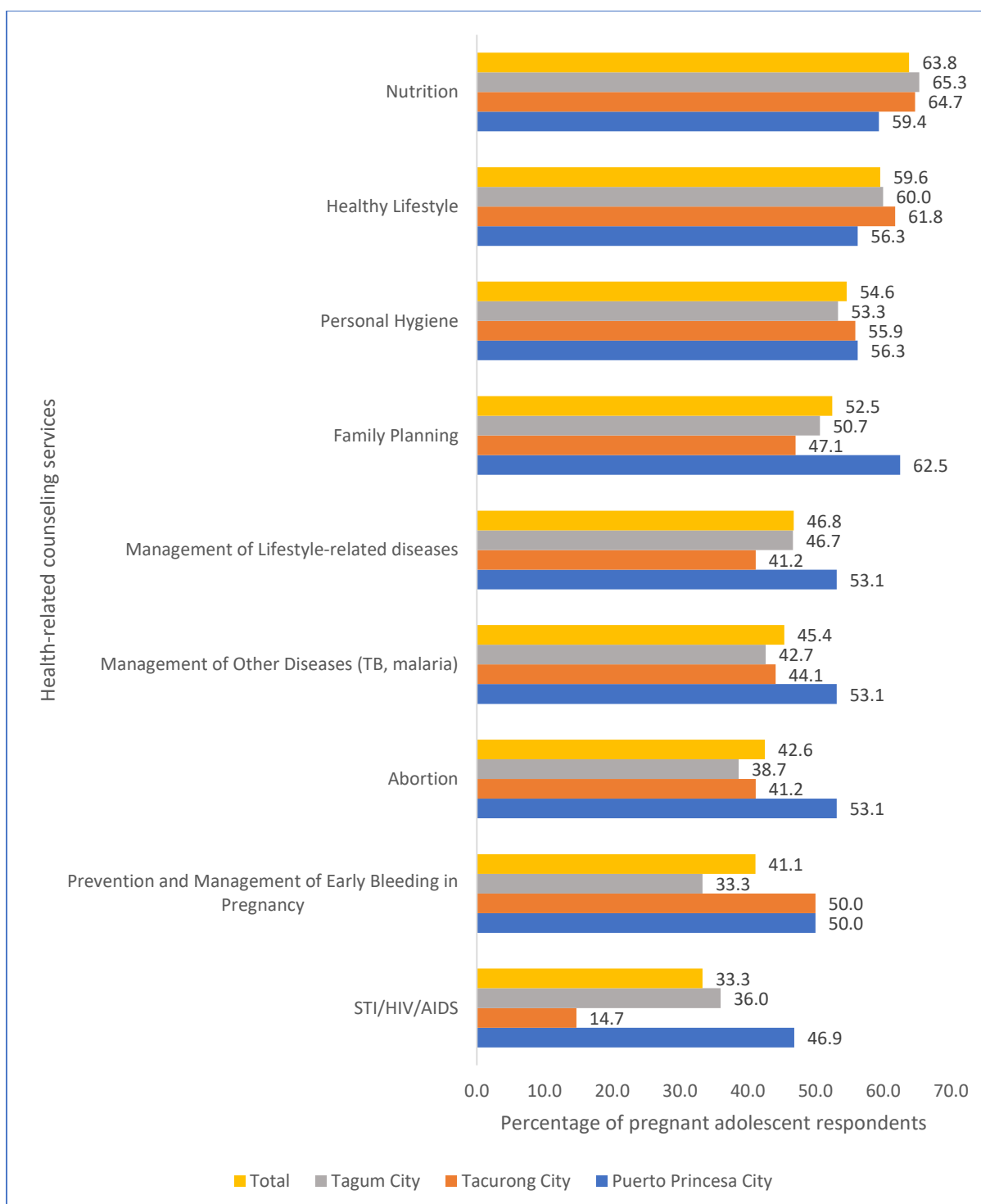


Figure B.5. Percent distribution of pregnant adolescents who availed health-related counseling services and the responsible person who attended them in the health facilities, by city

The results revealed that these counseling services are mainly provided by midwives and nurses although other health providers such as doctors, and BHW among others also conduct them. The messages on STI/HIV/AIDS are included because certain adolescent groups may be at high risk for acquiring HIV and STIs and to provide correct information and improve their knowledge on contraceptive use and appropriateness of contraception (DOH, 2014). However, access to sexual and reproductive health services by adolescents is hindered by legal obstacles, social, cultural restrictions in the country (Melgar

et al., 2018). Hence, the results highlight the need for public health intervention to promote health-related counseling services, particularly among pregnant adolescents (Table B.8).

Table B.8. Frequency and percent distribution of pregnant adolescents who availed health-related counseling services and the responsible person who attended them in the health facilities, by city

Responsible for counseling	Puerto Princesa City (n=32)		Tacurong City (n=34)		Tagum City (n=75)		Total (n=141)	
	n	%	n	%	n	%	n	%
Family planning								
Midwife	17	53.1	12	35.3	10	13.3	39	27.7
Nurse	0	0.0	2	5.9	22	29.3	24	17.0
Others	3	9.4	2	5.9	6	8.0	11	7.8
STI/HIV/AIDS								
Midwife	11	34.4	0	0.0	3	4.0	14	9.9
Nurse	1	3.1	5	14.7	21	28.0	27	19.1
Others	3	9.4	0	0.0	3	4.0	6	4.3
Nutrition								
Midwife	14	43.8	17	50.0	3	4.0	34	24.1
Nurse	0	0.0	1	2.9	35	46.7	36	25.5
Others	5	15.6	3	8.8	11	14.7	19	13.5
Personal hygiene*								
Midwife	13	40.6	13	38.2	6	8.0	32	22.7
Nurse	0	0.0	4	11.8	27	36.0	31	22.0
Others	5	15.6	2	5.9	8	10.7	15	10.6
Consequences of abortion*								
Midwife	14	43.8	13	38.2	7	9.3	34	24.1
Nurse	1	3.1	1	2.9	21	28.0	23	16.3
Others	2	6.3	0	0.0	2	2.7	4	2.8
Healthy lifestyle*								
Midwife	15	46.9	15	44.1	6	8.0	36	25.5
Nurse	1	3.1	3	8.8	32	42.7	36	25.5
Others	2	6.3	3	8.8	7	9.3	12	8.5
Management of other diseases*								
Midwife	12	37.5	10	29.4	2	2.7	24	17.0
Nurse	1	3.1	3	8.8	26	34.7	30	21.3
Others	5	15.6	2	5.9	5	6.7	12	8.5
Lifestyle-related diseases*								
Midwife	12	37.5	11	32.4	6	8.0	29	20.6
Nurse	1	3.1	1	2.9	24	32.0	26	18.4
Others	5	15.6	2	5.9	6	8.0	13	9.2
Prevention and management of early bleeding in pregnancy*								
Midwife	11	34.4	13	38.2	7	9.3	31	22.0
Nurse	3	9.4	1	2.9	19	25.3	23	16.3
Others	3	9.4	3	8.8	2	2.7	8	5.7

*Multiple responses

B.4. PREVALENCE OF NUTRITIONALLY AT-RISK PREGNANT ADOLESCENTS

The nutritional status of pregnant adolescent respondents is presented in Table B.9. Using the weight-for-height table by month of pregnancy for Filipinos (Magbitang et al. 1988), the results revealed that 45.6% of pregnant adolescents were nutritionally at-risk in all cities. Puerto Princesa City had the highest proportion of nutritionally at-risk adolescents at 50.0% while Tacurong City had the lowest at 43.7%. The prevalence of nutritionally at-risk pregnant adolescents in the three cities is higher than the national prevalence of 32.6% for pregnant women less than 20 years old. A possible factor that could explain this situation is the low percentage of pregnant adolescents meeting the recommended 4 ANC visits. In other studies, inadequate family support, birth intervals, workload, food security, and dietary intake were identified as factors that could explain the high prevalence of nutritionally at-risk pregnant adolescents (Belete et al. 2016; Muze et al. 2020; Zewdie et al. 2021). The factors contributing to the prevalence of nutritionally at-risk pregnant adolescents could be explored in future studies.

Table B.9. Percent distribution of nutritionally-at-risk pregnant adolescents, by city

Areas	Puerto Princesa City		Tacurong City		Tagum City		Total	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Nutritionally at risk	50.0	31.6-68.3	43.7	26.1-61.3	44.6	32.3-56.9	45.6	36.8-54.4

B.5. CHANGES IN PRACTICES OF PREGNANT ADOLESCENTS IN THE CONTEXT OF COVID-19 PANDEMIC

The changes in the nutrition practices of the respondents during the pandemic were also investigated in this survey. The findings show that less than half of the pregnant adolescents changed their practices in availing of health services due to the current pandemic. The proportion across the three cities does not vary much as can be seen in Table B.10. The most common reasons cited by the respondents were fear of going out for check-ups and that they prefer to self-medicate.

Table B.10. Frequency and percent distribution of pregnant adolescents reporting having changed their healthcare-seeking practices due to pandemic, by city

	Puerto Princesa City (n=32)		Tacurong City (n=34)		Tagum City (n=75)		Total (n=141)	
	n	%	n	%	n	%	n	%
Changes in the practices of availing of health services due to the pandemic	11	34.4	12	35.3	21	28.0	44	31.2
Reasons for changes in practices of availing health services*								
Scared to go out	7	21.9	7	20.6	15	20.0	29	20.6
Self-medication	0	0.0	5	14.7	10	13.3	15	10.6
The health center is closed	4	12.5	0	0.0	0	0.0	4	2.8
No services	3	9.4	0	0.0	0	0.0	3	2.1

*Multiple responses

Moreover, the pregnant adolescent were asked the question ‘what coping strategies did you do to ensure that your child has enough to eat?.’ As shown in Figure B.6, across the three cities, the top three strategies mentioned were adequate food intake (62.4%), taking vitamins and minerals (46.8%), and practicing personal hygiene and sanitation (36.2%). About 18% pregnant adolescents answered ‘continued breastfeeding’ as another coping strategy. Note that it is possible that the respondents were referring either to their current status, i.e., breastfeeding while pregnant or in general context. Breastfeeding or expressing breastmilk while pregnant is a possibility because of rapid repeat pregnancy. The DOH (2017) reported that teenage mothers tend to have another pregnancy soon after the index pregnancy. However, the observance of proper nutrition is quite important in this situation for both the mothers and babies’ health (Academy of Nutrition and Dietetics, 2021). Also, this is one area where further research can be done among pregnant adolescents.

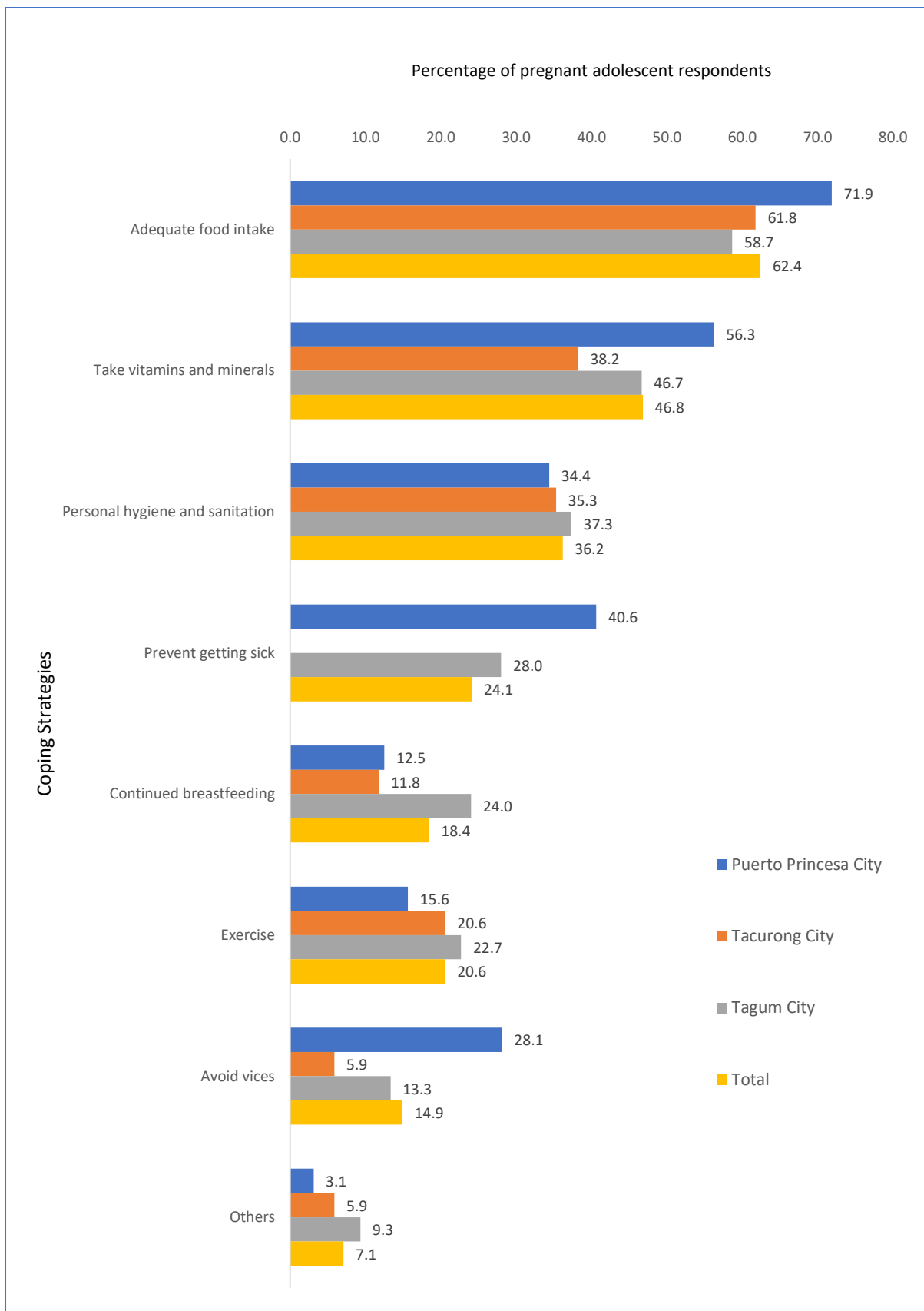


Figure B.6. Percent distribution of the coping strategies the pregnant adolescent claimed to have adopted to ensure mother and child remains healthy, by city

C. POST-PARTUM WOMEN (0-5 MONTHS)

The survey was conducted among 967 post-partum women, with a mean age of 26.7 across all cities. The mean age of their infants was 2.6 months (Table C.1). During the post-partum period, women and newborns require support and careful monitoring after birth as most maternal and infant deaths occur in the first six weeks after delivery (WHO website, accessed September 20, 2021). Moreover, this period is considered as the most neglected phase in the provision of quality maternal and newborn care.

Table C.1. Mean age of post-partum women and infants, by city

	Puerto Princesa City (n=340)	Tacurong City (n=352)	Tagum City (n=275)	Total (n=967)
Mean age of post-partum women	26.8	26.9	26.2	26.7
Mean age in months of infants	2.3	2.7	3.0	2.6

In terms of education, very few women reported having no education across the three cities. Most women reported having at least some secondary education, with 63% reporting completing secondary school (31.3%) or tertiary education (14.8%). More than half of the respondents reported cohabitating with a partner to whom they were not married, while 46.5% reported being married.

Table C.2. Frequency and percentage distribution of post-partum women, by socio-demographic characteristics and by city

Socio-demographic Characteristics	Puerto Princesa City (n=339)		Tacurong City (n=352)		Tagum City (n=275)		Total (n=966)	
	n	%	n	%	n	%	n	%
Educational attainment								
No education	2	0.6	1	0.3	0	0.0	3	0.3
Some primary	13	3.8	13	3.7	7	2.5	33	3.4
Completed primary	12	3.5	15	4.3	17	6.2	44	4.6
Some secondary	88	25.9	58	16.5	66	24.0	212	21.9
Completed secondary	102	30.0	121	34.4	80	29.1	303	31.3
Some Tertiary	62	18.2	52	14.8	49	17.8	163	16.9
Completed Tertiary	44	12.9	72	20.5	27	9.8	143	14.8
Post-graduate	1	0.3	0	0	2	0.7	3	0.3
Technical/Vocational	14	4.1	20	5.7	26	9.5	60	6.2
Others	1	0.3	0	0.0	0	0.0	1	0.1
Marital Status								
Single, no partner	21	6.2	15	4.3	17	6.2	53	5.5
Single, non-regular partner	3	0.9	0	0.0	0	0.0	3	0.3
Single with regular partner	19	5.6	1	0.3	6	2.2	26	2.7
Married	124	36.6	170	48.3	155	56.6	449	46.5
Cohabiting	170	50.1	164	46.6	89	32.5	423	43.8
Widowed	0	0.0	1	0.3	5	1.8	6	0.6
Divorced/separated	2	0.6	1	0.3	2	0.7	5	0.5

C.1. RECEIPT AND UTILIZATION OF ANC SERVICES BY POST-PARTUM WOMEN

As recalled by post-partum women, on average, visits to the health facility for ANC services were 6 times throughout the pregnancy. However, during the first trimester, ANC visits of post-partum women was done only once. On the second and trimester, the mean number of visits increased to 2 times across the three cities (Table C.3).

Table C.3 Mean frequency of ANC visits of post-partum women, by city

Mean ANC visits	Puerto Princesa City	Tacurong City	Tagum City	Total
------------------------	-------------------------------------	--------------------------	-----------------------	--------------

Mean frequency of ANC visits	5	6	6	6
Mean frequency of ANC visit during the first trimester	1	1	1	1
Mean frequency of ANC visit during the second trimester	2	2	2	2
Mean frequency of ANC visit during the third trimester	2	3	2	2
Months pregnant for first antenatal care visit	3.38	3.18	3.34	3.28

Nearly all women reported having conducted at least one antenatal care visit. Most post-partum women received antenatal care from public sector or government health facilities and only few received it from private sector health facilities. They also reported receiving information on nutrition during their antenatal visits, particularly on healthy eating. Across the three cities, almost two-third of the post-partum women received counseling from nurses or trained midwives. Others which were also responsible for this service were doctors, community health workers, and nutritionists. Three-fourth of the counseling on healthy eating was done through one-on-one session while only few answered both one-on-one and group discussions. The counseling was usually conducted at a health facility during the ANC, while some were in the community (Table C.4).

Table C.4. Frequency and percentage distribution of post-partum women, by ANC services and by city

ANC Practices	Puerto Princesa City		Tacurong City		Tagum City		Total	
	n	%	n	%	n	%	n	%
Had ANC visit	332	97.9	352	100.0	273	99.6	957	99.2
Health facility where antenatal care was received	n=332		n=353		n=273		n=957	
Public sector/government health facility	294	88.6	327	92.9	250	91.6	871	91.0
Private sector health facility	38	11.4	25	7.1	23	8.4	86	9.0
Information on healthy eating were discussed during ANC visit	294	86.5	320	90.9	246	89.5	860	88.9
Top 3 Health workers responsible for healthy eating counseling	n=294		n=327		n=250		n=871	
Doctor/clinical officer	37	12.5	29	9.0	24	9.8	90	10.5
Nurse/trained midwife	107	36.4	261	81.6	165	67.1	533	62.0
Community health worker	71	24.1	9	2.8	28	11.4	108	12.6
Type of counseling on healthy eating done by the health worker to the pregnant mother	n=294		n=327		n=250		n=871	
One on one	249	84.7	273	85.3	227	92.3	749	87.1
Group session	45	15.3	46	14.4	18	7.3	109	12.7
Both one to one and group sessions	0	0.0	1	0.3	1	0.4	2	0.2
Location of counseling sessions	n=294		n=327		n=250		n=871	
At a health facility during ANC	278	94.6	314	98.1	243	98.8	835	97.1
At a health facility but not during ANC	11	3.7	2	0.6	0	0.0	13	1.5
In your own home	1	0.3	4	1.3	2	0.8	7	0.8
In the community	4	1.4	0	0.0	1	0.4	5	0.6

C.2 RECEIPT AND UTILIZATION OF IRON AND/OR IFA SUPPLEMENTS BY POST- PARTUM WOMEN

Almost all post-partum women received and/or purchased iron and/or IFA supplements across the three cities (Table C.5). Of this percentage, about 80% received the supplements without paying for them. The supplements came mostly from the government health facility (87.8%). The percentage of post-partum women who took iron and/or IFA according to the recommended 180 days or 6 months during pregnancy was low at 11.4%. This percentage is similar to the results of a rapid initial assessment of the distribution and consumption of IFA through antenatal care in the country where only 19% had taken the recommended 180 IFA tablets (Fielder et al., 2014). As per the revised policy (DOH AO 2010-0010), pregnant women should consume 1 tablet once a day for 6 months or 180 days during the pregnancy period. Iron and/or IFA supplementation is also included in RA 11148 or An Act Scaling Up the National and Local Health and Nutrition Programs Through A Strengthened Integrated Strategy for Maternal, Neonatal, Child Health and Nutrition in the First One Thousand (1000) Days of Life, Appropriating Funds Therefore, and for Other Purposes.

Table C.5. Frequency and percentage distribution of post-partum women by acquisition of iron and/or IFA supplements and by city

Acquisition and intake of iron/IFA supplements	Puerto Princesa City (n=340)		Tacurong City (n=352)		Tagum City (n=275)		Total (n=967)	
	n	%	n	%	n	%	n	%

Received and/or purchased iron and/or IFA supplements	329	96.8	352	100.0	273	99.3	954	98.7
Manner of acquiring iron and/or IFA supplements								
Received for free	256	77.8	277	78.7	212	77.7	745	78.1
Paid for supplements	42	12.8	27	7.7	31	11.4	100	10.5
Both free and paid	30	9.1	48	13.6	30	11.0	108	11.3
Source of acquiring supplements								
Public sector/government health facility	280	85.1	320	90.9	239	87.5	839	87.9
Private sector health facility	43	13.1	22	6.3	29	10.6	94	9.9
Non-medical/traditional care	0	0.0	5	1.4	1	0.4	6	0.6
Both public and private	3	0.9	1	0.3	0	0.0	4	0.4
Pharmacy	3	0.9	4	1.1	4	1.5	11	1.2
Number of days iron and/or IFA supplements consumed over the whole pregnancy								
Less than 180	261	76.8	118	33.5	114	41.5	493	51.0
180	24	7.1	49	13.9	37	13.5	110	11.4
More than 180	39	11.5	185	52.6	121	44.0	345	35.7
No response	16	4.7	0	0.0	3	1.1	19	2.0

Across the cities, the mean number of days that post-partum women recalled having received/purchased iron and/or IFA supplements during their pregnancy was 161 days (Table C.6). A lower mean number of days of consumption of the supplements was also noted at 152 days. This indicates that at the time when the post-partum women were pregnant, they did not meet the recommended 180 days of supplementation. On a per city basis, the post-partum women in Puerto Princesa City had the lowest mean number of days of having received and/or purchased the supplements (101 days) and consumed the supplements (95 days). In all cities, it can be observed that as the pregnancy progressed, the mean number of receiving and/or purchasing and consuming the supplements is increasing.

Table C.6. Mean number of days of iron and/or IFA received/purchased by post-partum women, by usage and by city

Usage of iron and/or IFA supplements	Mean number of days			
	Puerto Princesa City	Tacurong City	Tagum City	Total
Mean number of days of iron and/or IFA supplements received/ purchased on the whole pregnancy	100.9	191.1	193.2	160.8
Mean Number of days of iron and/or IFA supplements received/purchased on the:				
First trimester	24.9	32.7	38.4	31.8
Second trimester	48.0	77.5	77.4	67.6
Third trimester	40.3	83.7	78.03	67.6
Mean number days of consumption of iron and/or IFA supplements on the whole pregnancy	94.8	184.7	178.0	152.3
Number of days of consumption of iron and/or IFA supplements on the:				
First trimester	23.8	30.7	30.8	28.5
Second trimester	42.7	75.8	74.8	64.5
Third trimester	36.5	79.9	77.0	64.6

C.3 SERVICES RECEIVED BY POST-PARTUM WOMEN

The top three most accessed other services of post-partum women were vaccination of tetanus toxoid, counselling, and promotion of exclusive breastfeeding for the first six months. Almost all of the post-partum women were vaccinated with tetanus toxoid immunization. On average, nearly one third of mothers across the three cities were provided with oral health services at the local facilities. Availment of oral health services were reported highest in the Tagum City and lowest in Puerto Princesa City. For other health services, more than half of women in Puerto Princesa were provided with STI/HIV/AIDS screening services while, a quarter of pregnant women in Tacurong City were provided the same service (Table C.7).

Post-partum women also received counseling of various topics during their pregnancy. More than three-fourth of the mothers received counselling services on nutrition. The post-partum women also reported receiving counselling about 1) family planning specifically the modern methods of lactation amenorrhea and surgical procedures like bilateral tubal ligation (BTL), no-scalpel vasectomy (NSV), and management of complications due to contraception instructed by midwives, 2) counselling about personal hygiene provided by midwives, and 3) counselling on healthy lifestyle through smoking cessation, healthy diet, regular exercise, and moderate alcohol intake by midwives. In addition, more than half of the women in each city were provided counselling on 1) prevention and management of early bleeding in pregnancy by midwives, 2) management of lifestyle-related diseases such as diabetes, cardiovascular diseases, renal diseases, and 3) management of also other diseases such as tuberculosis, malaria. Also, about half provided the mothers with counselling on consequences of abortion. All cities also promoted exclusive breastfeeding (Table C.7).

Some services were availed of by high percentage of postpartum women such as vaccination of tetanus toxoid (93.2%) and counseling on family planning, nutrition (73.5%), and personal hygiene (73.5%). In the NDHS (2017) survey results, a high percentage (80%) of mothers aged 15-49 received a postnatal check within two days of delivery, while a lower percentage (9%) did not have a postnatal check within 41 days of delivery. Moreover, 86% newborns receive a postnatal check within two days of birth.

Table C.7. Frequency and percentage distribution of post-partum women according to other maternal health services they accessed and by city

Other services received by post-partum women	Puerto Princesa City (n=340)		Tacurong City (n=352)		Tagum City (n=275)		Total (n=967)	
	n	%	n	%	n	%	n	%
Vaccination with tetanus toxoid immunization	314	92.4	331	94.0	256	93.1	901	93.2
Provision of oral health services	59	17.4	125	35.5	119	43.3	303	31.3
Provision of STI/HIV/AIDs screening services	188	55.3	93	26.4	113	41.1	394	40.7
Provision of counseling services on the following:*								
Family planning	273	80.3	257	73.0	201	73.1	731	75.6
STI/HIV/AIDS	227	66.8	117	33.2	117	42.5	461	47.7
Nutrition	275	80.9	267	75.9	200	72.7	742	76.7
Personal hygiene	269	79.1	259	73.6	183	66.5	711	73.5
Consequences of abortion	239	70.3	149	42.3	105	38.2	493	51.0
Healthy lifestyle	263	77.4	275	78.1	178	64.7	716	74.0
Management of lifestyle-related diseases	246	72.4	194	55.1	117	42.5	557	57.6
Management of other diseases (e.g., tuberculosis, malaria)	244	71.8	180	51.1	127	46.2	551	57.0
Prevention and management of early bleeding in pregnancy	246	72.4	191	54.3	126	45.8	563	58.2
Promotion of exclusive breastfeeding for the first 6 month of child	310	91.2	337	95.7	258	93.8	905	93.6

*Multiple responses

Across the three cities, the midwives and nurses were the most recognized health workers that provides services to post-partum women. The midwives' duties ranged from administration of tetanus toxoid vaccine to counseling and promoting exclusive breastfeeding. Although, in other cities, health workers such as dentist still catered to post-partum women in oral health services. Still, other health workers such as doctors, nurses, Barangay Health Worker, and nutritionist are responsible for other services (Table C.8).

Table C.8. Frequency and percentage distribution of post-partum women according to most common health providers who provided them with other maternal services by city

Health providers	Puerto Princesa City		Tacurong City		Tagum City		Total	
	n	%	n	%	n	%	%	n
Administered the tetanus toxoid vaccine	n=314		n=331		n=256		n=901	
Midwife	273	86.9	287	86.7	47	18.4	607	67.4
Nurse	4	1.3	37	11.2	197	76.9	238	26.4
Provided oral health services	n=59		n=125		n=119		n=303	
Dentist	0	0.0	88	70.4	45	37.8	133	43.9
Midwife	40	67.8	22	17.6	13	10.9	75	24.8

Health providers	Puerto Princesa City		Tacurong City		Tagum City		Total	
	n	%	n	%	n	%	%	n
Nurse	1	1.7	6	4.8	38	31.9	45	14.9
Doctor	16	27.1	8	6.4	19	16.0	43	14.2
Provided STI/HIV/AIDS screening services	n=188		n=93		n=113		n=394	
Midwife	119	63.3	47	50.5	15	13.3	181	45.9
Nurse	10	5.3	35	37.6	80	70.8	125	31.7
Provided counseling on Family Planning	n=273		n=257		n=201		n=731	
Midwife	191	70.0	222	86.4	35	17.4	448	61.3
Nurse	3	1.1	22	8.6	128	63.7	153	20.9
Barangay Health Worker	67	24.5	4	1.6	24	11.9	95	13.0
Provided counseling on STI/HIV/AIDS	n=227		n=117		n=117		n=461	
Midwife	154	67.8	71	60.7	4	3.4	229	49.7
Nurse	11	4.8	36	30.8	94	80.3	141	30.6
Provided counseling on Nutrition	n=275		n=267		n=200		n=742	
Midwife	168	61.1	200	74.9	24	12.0	392	52.8
Barangay Health Worker	84	30.5	28	10.5	43	21.5	155	20.9
Nurse	2	0.7	25	9.4	113	56.5	140	18.9
Provided counseling on Personal Hygiene	n=269		n=259		n=183		n=711	
Midwife	157	58.4	189	73.0	15	8.2	361	50.8
Nurse	3	1.1	51	19.7	124	67.8	178	25.0
Barangay Health Worker	75	27.9	4	1.5	26	14.2	105	14.8
Provided counseling on Consequences of Abortion	n=239		n=149		n=105		n=493	
Midwife	166	69.5	131	87.9	21	20.0	318	64.5
Nurse	6	2.5	7	4.7	69	65.7	82	16.6
Provided counseling on Healthy Lifestyle	n=263		n=275		n=178		n=716	
Midwife	161	61.2	202	73.5	22	12.4	385	53.8
Barangay Health Worker	77	29.3	16	5.8	34	19.1	127	17.7
Nurse	6	2.3	38	13.8	105	59.0	149	20.8
Provided counseling on Management of lifestyle-related diseases	n=246		n=194		n=117		n=557	
Midwife	153	62.2	139	71.6	13	11.1	305	54.8
Barangay Health Worker	67	27.2	23	11.9	19	16.2	109	19.6
Nurse	4	1.6	20	10.3	75	64.1	99	17.8
Provided counseling on Management of other diseases (tuberculosis, malaria, anemia)	n=244		n=180		n=127		n=551	
Midwife	156	63.9	123	68.3	16	12.6	295	53.5
Barangay Health Worker	68	27.9	24	13.3	22	17.3	114	20.7
Nurse	2	0.8	21	11.7	78	61.4	101	18.3
Provided counseling on Prevention and management of early bleeding in pregnancy	n=246		n=191		n=126		n=563	
Midwife	167	67.9	147	77.0	25	19.8	339	60.2
Nurse	5	2.0	10	5.2	78	61.9	93	16.5

Health providers	Puerto Princesa City		Tacurong City		Tagum City		Total	
	n	%	n	%	n	%	%	n
Barangay Health Worker	48	19.5	22	11.5	13	10.3	83	14.7
Responsible for promoting exclusive breastfeeding	n=310		n=337		n=258		n=905	
Midwife	184	59.4	265	78.6	61	23.6	510	56.4
Nurse	4	1.3	16	4.7	127	49.2	147	16.2
Doctor/OB-GYN	43	13.9	40	11.9	32	12.4	113	12.5
Barangay Health Worker	61	19.7	10	3.0	31	12.0	95	10.5

C.4. KNOWLEDGE AND PRACTICES RELATED TO ANEMIA AND IRON-FOLIC ACID SUPPLEMENTATION BY POST-PARTUM WOMEN

Across the cities, majority of post-partum women (79%) knew what anemia is. Likewise, more than 85% of post-partum women knew about iron and IFA supplementation (Figure C.1). IFA supplementation is recommended by the DOH among post-partum women.

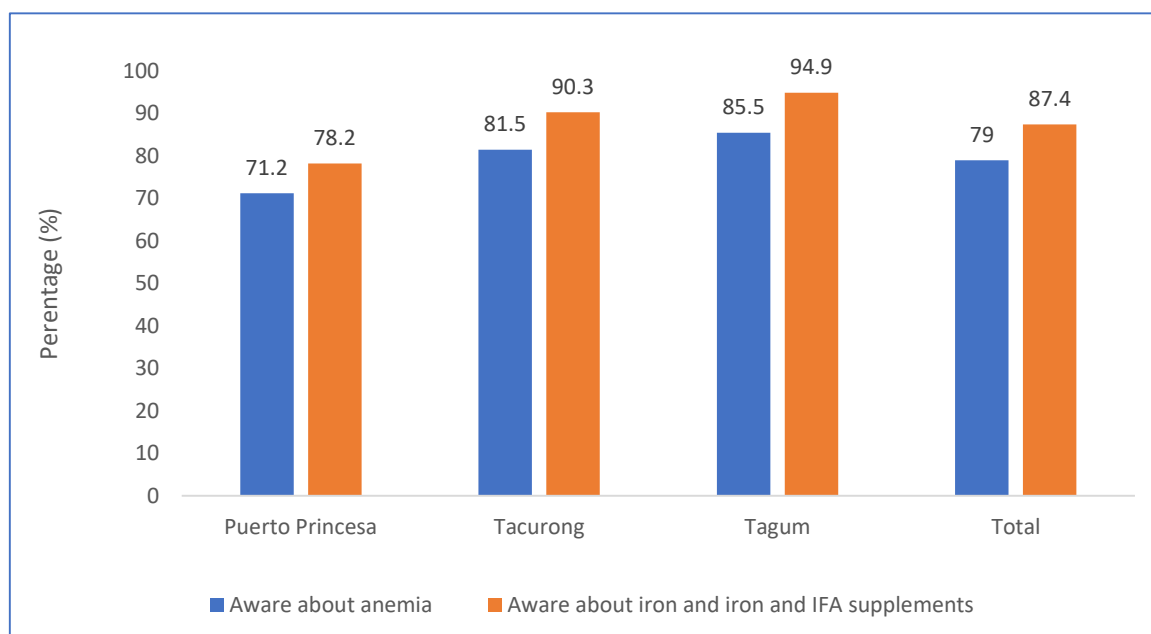


Figure C.1. Percentage of awareness on anemia and iron and IFA supplements of post-partum women, by city

About 80% of post-partum women answered that anemia causes dizziness/nausea/vomiting, followed by 54% who reported that anemia could cause tiredness. The other effects of anemia known by the post-partum women are listed in Table C.9. Only few answered that it delays child development. Information about anemia in women were mostly learned from doctor/nurse/health center workers (Table C.9).

Table C.9. Frequency and percentage distribution of post-partum women, by knowledge and awareness of anemia and by city

Knowledge on anemia	Puerto Princesa City		Tacurong City		Tagum City		Total	
	n	%	n	%	n	%	n	%
Information on the effect in women's health of anemia*								
Causes dizziness/nausea/ vomiting	186	76.9	228	79.4	183	77.9	597	78.1
Causes tiredness	204	84.3	107	37.3	100	42.6	411	53.8
Signs include pale conjunctiva/palms of hands/feet and finger/ toenails	70	28.9	99	34.5	79	33.6	248	32.5
Causes shortness of breath	119	49.2	20	7.0	31	13.2	170	22.3
Less able to fight infection	104	43.0	8	2.8	21	8.9	133	17.4
Low blood	1	0.4	96	33.4	41	17.4	138	18.1
Causes lack of concentration	59	24.4	14	4.9	22	9.4	95	12.4
Delay child development	29	12.0	2	0.7	5	2.1	36	4.7
Do not know	0	0.0	2	0.7	7	3.0	9	1.2
Others	0	0.0	19	6.4	9	3.8	28	3.6
Source of information about anemia*								
Doctor/Nurse/Health center worker	150	62.0	77	26.8	123	52.3	350	45.8
Community health worker	103	42.6	62	21.6	85	36.2	250	32.7
Relative/Friend/Mother/Neighbor	60	24.8	99	33.4	81	34.5	241	31.4
Other health professional	13	5.4	37	12.9	7	3.0	57	7.5
Teacher or other at school	9	3.7	19	6.6	20	8.5	48	6.3
TV	11	4.5	18	6.3	19	8.1	48	6.3
Personal experience	0	0.0	25	8.7	17	7.2	42	5.5
Internet/Website	6	2.5	8	2.8	16	6.8	30	3.9
Leaflet or poster PM	4	1.7	3	1.0	2	0.9	9	1.2
Do not know	0	0.0	2	0.7	5	2.1	7	0.9
Others	4	1.6	12	4.0	7	3.0	23	3.0

*Multiple response

Across the cities, almost all were aware of iron and IFA supplements, particularly in Tagum City. More than half of the women reported that they were aware of the other effects of iron and IFA supplementation in preventing and reducing iron deficiency and symptoms of anemia. Also, half of the women across the cities reported that they were aware of the recommended dosage of iron and IFA supplements. Dosage awareness is reportedly highest in Tacurong City. Currently, the recommended dosage for iron and folic acid supplements is 30-60 mg and 400 ug/ 0.4 mg per day. Iron and IFA supplementation is necessary to promote good maternal and child health during pregnancy (Table C.10). Awareness on ways to avoid problems regarding iron IFA supplementation across the cities varied. More than a quarter of the women knew that supplements should be taken with, food while 20% stated that in taking supplements, one should drink lots of water and should be taken daily as part of daily routine. Few were aware that supplements taken with high fiber foods, coffee or tea consumption should be lessened, and dark stools are normal. Only 1.9% of mothers know that supplements should be taken early in pregnancy. Others replied that supplements should be taken twice/thrice a day, supplements should be taken once before and after meals or before bedtime, candy can be taken after supplement intake, one should refrain from eating salty foods and supplements should not be consumed with other colored beverages. Many of this information was learned from doctor/nurse/health center workers while only few learned these from print and news media (Table C.10).

Table C.10. Frequency and percentage distribution of post-partum women, by awareness of iron and IFA supplements and by city

Knowledge and awareness of iron and IFA supplements	Puerto Princesa City (n=266)		Tacurong City (n=318)		Tagum City (n=261)		Total (n=845)	
	n	%	n	%	n	%	n	%
Information on the effects of iron and IFA supplementation*								
Prevents and reduces iron deficiency	227	85.3	124	39.0	151	57.9	502	59.4
Prevents and reduces symptoms of anemia: tiredness, dizziness, shortness of breath, pale skin	236	88.7	112	35.2	137	52.5	485	57.4
Helps to prevent health defects	110	41.4	80	25.2	96	36.8	286	33.8
Helps to prevent infection	135	50.8	52	16.4	37	14.2	223	26.4
Reduces chance of low birth weight and prematurity	65	24.4	58	18.2	41	15.7	164	19.4
Do not know	1	0.4	3	0.9	4	1.5	8	0.9
Others	0	0.0	99	31.0	37	14.2	136	16.1
Source of information about iron and IFA supplementation*								
Doctor/Nurse/Health center worker	187	55.0	139	39.5	176	64.0	502	51.9
Community health worker	131	38.5	78	22.2	107	38.9	316	32.7
Other health professional	16	4.7	106	30.1	9	3.3	131	13.5
Relative/Friend/ Neighbor	32	9.4	19	5.4	39	14.2	90	9.3
Internet/Website	4	1.2	5	1.4	16	5.8	24	2.5
TV	5	1.5	6	1.7	13	4.7	24	2.5
Teacher or other at school	2	0.6	2	0.6	10	3.6	14	1.4
Others	4	1.2	23	6.7	17	6.2	44	4.4
Knew the recommended dosage of iron and IFA supplements	135	39.7	260	73.9	150	54.5	545	56.4
Ways how to avoid problems regarding iron and IFA supplementation*								
Take supplements with food	121	35.6	106	30.1	60	21.8	287	29.7
Take supplements at same time every day as part of daily routine	10	2.9	148	42.0	44	16.0	202	20.9
Drink lots of water/fluid	64	18.8	65	18.5	65	23.6	194	20.1
Consume high fiber foods	76	22.4	30	8.5	37	13.5	143	14.8
Avoid or reduce coffee/tea consumption	16	4.7	7	2.0	24	8.7	47	4.9
Take once at night/before bed	0	0.0	24	6.9	8	2.9	32	3.3
Dark stool color is normal	6	1.8	5	1.4	10	3.6	21	2.2
Involve family in reminding to take supplements or knowing of supplements benefits	8	2.4	10	2.8	3	1.1	21	2.2
Eating salty food	0	0.0	1	0.3	0	0.0	1	0.1
Other information cited pertaining to frequency and timing of intake:								
Start supplements early in pregnancy	5	1.5	5	1.4	8	2.9	18	1.9
Take once after meals	0	0.0	13	3.7	0	0.0	13	1.3
Do not know	0	0.0	0	0.0	2	0.7	2	0.2
Others	0	0.0	22	6.3	26	9.5	48	4.8

Knowledge and awareness of iron and IFA supplements	Puerto Princesa City (n=266)		Tacurong City (n=318)		Tagum City (n=261)		Total (n=845)	
	n	%	n	%	n	%	n	%
Source of information on recommended dosage of iron and iron and IFA*								
Doctor/Nurse/Health center worker	99	29.1	127	36.2	87	32.2	313	32.3
Community health worker	54	15.9	44	12.6	30	11.1	128	13.2
Other health professional	5	1.5	106	30.1	5	1.8	116	12.0
Relative/Friend	18	5.3	12	3.4	23	8.4	53	5.5
Do not know	0	0.0	0	0.0	1	0.4	1	0.1
Others	4	1.2	3	0.9	48	17.8	55	5.6

*Multiple response

C.5. KNOWLEDGE AND PRACTICES RELATED TO BREASTFEEDING AND COMPLEMENTARY FEEDING

Across the three cities, almost all women ever breastfed their baby (97.2%) and majority had breastfed in the past 24 hours (87.0%) (Table C.11). Ever breastfeeding of 0-5 months old children were reported highest in Tacurong City and Tagum City. In the last 24 hours, more babies were breastfed in Puerto Princesa City (88.2%) compared to the other two cities. About 33% post-partum women practiced the giving of food and liquid other than breastmilk to their babies on a regular basis and a much lower percentage (4.9%) of the babies have eaten for the last 24 hours. This means that postpartum women were introducing complementary foods to babies who were less than 6 months old. As per DOH and WHO recommendation, complementary foods should be introduced at six months. Early introduction of complementary foods may replace breastmilk and stop breastfeeding altogether (Rao et al., 2011; Alzaheb, 2016) and exposes the infants' contaminated foods and fluids, leading to infants becoming malnourished (Kronborg et al., 2014). A higher percentage in these two indicators should be a cause of concern as it would mean that more mothers are starting to feed their babies earlier than 6 months. Among the three cities, Tacurong City has the highest percentage of respondents practicing early giving of liquids and foods which is nearing 50%.

Table C.11. Frequency and percentage distribution of post-partum women, by breastfeeding and complementary feeding practices and by city

Breastfeeding and complementary feeding practices	Puerto Princesa City (n=340)		Tacurong City (n=352)		Tagum City (n=275)		Total (n=967)	
	n	%	n	%	n	%	n	%
Child has ever been breastfed by the mother	323	95.0	346	98.3	271	98.5	940	97.2
Child has been breastfed by the mother at any time of the day in the last 24 hours	300	88.2	305	86.6	236	85.8	841	87.0
Child has started eating or drinking something other than breastmilk on a regular basis	76	22.4	149	42.3	95	34.5	320	33.1
Child had eaten any solid or semi-solid food for the last 24 hours	12	3.5	8	2.3	27	9.8	47	4.9

In terms of complementary feeding practices, more than a quarter of mothers reported that their children started consuming food other than breastmilk as early as 0-month-old. Across the three cities, 82.3 % of the children had started consuming semi-solid or solid food before 6 months of age (Table C.12). Apparently, early introduction of food before the recommended age of 6 months is perceived by respondents as having far more risks than benefits. Early introduction of complementary food may have temporary effect on growth velocity; however, it prevents the infant to achieve the full benefits of exclusive breastfeeding such as lowered risks of gastrointestinal infection and reduced risks of other infections. Hence, increased awareness on proper complementary feeding practices must be promoted across the three cities in order for mothers to make right and safe choices for their children (Table C.12).

Nearly half (46.6%) of the women knew to give breastmilk to their children. A quarter of women (25.3%) knew that if the mother is not able to breastfeed, infant formula milk can be provided. However, few of the women knew that water or other foods can be contaminated and that infant should avoid cow's milk until at least 6-12 months. Less than 20% of the women have knowledge on other proper dietary habits such as continued breastfeeding even when sick, mixed feeding, giving of infant formulas and commercial foods, vitamins, and sanitization of feeding bottles (Table C.12)

Table C.12. Frequency and percentage distribution of post-partum women according to liquid intake and knowledge on proper feeding of infants and by city

Liquid Intake and knowledge on proper feeding	Puerto Princesa City		Tacurong City		Tagum City		Total	
	n	%	n	%	n	%	n	%
Liquid intake of the child in the last 24 hours	n=75		n=149		n=94		n=318	
Infant formula	47	61.8	112	75.2	64	67.4	223	69.7
Plain water	18	23.7	17	11.4	11	11.6	46	14.4
Any other water-based liquids	0	0.0	16	10.7	6	6.3	22	6.9
Thin porridge, or soup thickened with flour	2	2.6	3	2.0	9	9.5	14	4.4
Milk, such as tinned, powdered, or fresh animal milk	8	10.5	0	0.0	2	2.1	10	3.1
Do not know	0	0.0	1	0.7	2	2.1	3	0.9
Age (in months) when baby first started consuming food other than breastmilk	n=76		n=149		n=95		n=320	
0	18	23.7	56	37.6	19	20.0	93	29.1
1	14	18.4	34	22.8	15	15.8	63	19.7
2	4	5.3	20	13.4	11	11.6	35	10.9
3	10	13.2	8	5.4	10	10.5	28	8.8
4	5	6.6	3	2.0	12	12.6	20	6.3
5	8	10.5	4	2.7	12	12.6	24	7.5
Do not know	17	22.4	24	16.1	16	16.8	57	17.8
Knowledge on proper dietary habits of feeding infants	n=75		n=138		n=87		n=300	
Only give breastmilk	36	47.4	76	51.0	37	38.9	149	46.6
If not able to breastfeed, provide infant formula	29	38.2	30	20.1	22	23.2	81	25.3
Water or other foods can be contaminated and so could be harmful	2	2.6	2	1.3	3	3.2	7	2.2
Avoid cow's milk until at least 6-12 months	0	0.0	1	0.7	0	0.0	1	0.3
Others	8	10.5	29	19.4	25	26.7	62	19.4

C.6 NUTRITIONAL STATUS OF POST-PARTUM WOMEN

Postpartum women need good nutrition for the body to recover and regain strength from the changes that occurred during pregnancy and labor and delivery. Having a normal nutritional status at this stage benefits and supports the recovery of the postpartum mother/women physical and psychologically (NNC, 2020). Less than 10% of post-partum women were suffering from chronic energy deficient. In contrast, about 32% of them were overweight and obese. Across cities, Puerto Princesa City had the highest percentage of post-partum women who were chronic energy deficient (10.6%). On the other hand, Tacurong City and Tagum City had the highest proportion of women who were overweight and obese in all the cities. However, indicatively, percentages of overweight and obese post-partum women across the three cities were lower than the national data for female adult, which is 36.4% and 13.2%, respectively (FNRI-DOST, 2019).

Overweight and obesity among post-partum women can be a potential public health problem in the three cities if not prevented. Postpartum obesity has been associated with increased risk of developing gestational diabetes, metabolic syndrome, prenatal morbidity and increased risk of obesity in the offspring through adolescence which without intervention, leads to adulthood obesity (Leddy et al., 2008; Keen and Potts, 2011). In another study, the chances for a child of having an over caloric intake was significantly higher among children from overweight mothers than those with mothers who have normal BMI (Tellez-Tojo et al., 2019). Breastfeeding offers some protection against early rapid weight gain as infant demand for feeding is matched to milk production of mother which lowers overfeeding and lowers risk for later obesity.

Table C.13. Prevalence of nutritional status of post-partum women, by city

Classification	Puerto Princesa City		Tacurong City		Tagum City		Total	
	%	95% CI	%	95% CI	%	95% CI	%	95% CI
Chronic energy deficiency	10.6	7.5-14.2	8.2	5.3-11.1	7.1	4.0-10.2	8.8	7.0-10.6
Normal	62.8	57.6-68.0	58.2	53.0-63.4	56.3	50.4-62.3	59.3	56.1-62.4
Overweight	21.1	16.7-25.5	26.1	21.5-30.7	32.3	26.6-37.9	26.1	23.3-28.9
Obese	5.0	2.7-7.5	7.4	4.6-10.1	4.1	1.7-6.5	5.6	4.2-7.1

*ENNS, 2019- Female adults (20—59 years old), no available data for post-partum women

C.7. CHANGES IN PRACTICES OF POST-PARTUM WOMEN IN THE CONTEXT OF COVID-19 PANDEMIC

On average, about 40% of post-partum women changed their practices in availing health services. Less than half of the respondents in Tacurong City observed that there had been changes in the practices of availing health services due to health services while only a quarter of respondents from Puerto Princesa City answered that pandemic has affected the health services. (Table C.14).

Table C.14. Frequency and percentage distribution of post-partum women, by changes in availing health services due to the pandemic and by city

Changes in practices of post-partum women	Puerto Princesa City		Tacurong City		Tagum City		Total	
	n	%	n	%	n	%	n	%
Changes in the practices of availing health services due to pandemic	n=340		n=352		n=275		n=967	
	80	23.5	162	46.0	114	41.5	356	36.8
Reasons for changes in practices of availing health services*	n=80		n=162		n=114		n=356	
Scared to go out	57	71.3	59	36.4	72	63.2	188	52.8
Strict implementation of health and safety protocols	6	7.5	53	32.7	36	31.6	95	26.7
Self-medication	11	13.8	28	17.3	30	26.3	69	19.4

Changes in practices of post-partum women	Puerto Princesa City		Tacurong City		Tagum City		Total	
	n	%	n	%	n	%	n	%
Take vitamins and mineral supplements	14	17.5	28	17.3	28	24.6	70	19.7
Health center was closed	31	38.8	2	1.2	10	8.8	43	12.1
No services provided	35	43.8	1	0.6	3	2.6	39	11.0
Limited entry in the health center/lack of means to go to the health center	0	0.0	22	13.6	8	7.0	30	8.4
Do not know	2	2.5	2	1.2	16	14.0	20	5.6
Mode of delivery, i.e., house to house visits	0	0.0	16	9.9	3	2.6	19	5.3
Improved delivery of health-related services	0	0.0	5	3.1	1	0.9	6	1.7
Delay in services	0	0.0	2	1.2	0	0.0	2	0.6
Lack of resources in the health center, e.g., personnel and supplies	1	1.3	1	0.6	0	0.0	2	0.6
No change	21	26.3	0	0.0	0	0.0	21	5.9

*Multiple responses

Due to the pandemic, the post-partum women also implemented some strategies to ensure good health. Many post-partum women reported eating adequately in attaining good health. To ensure good health of infants, about the 70% responded that proper breastfeeding practices can help. More than half answered that it is important to keep the environment clean. Half of the respondents responded that they practice vitamin and mineral supplementation. Few answered that they did exercise activities and refrained from their vices. Others specified that they practiced proper hand washing, had enough sleep/rest, wore face masks/face shields, observed social distancing, and drank water (Table C.15).

Table C.15. Frequency and percentage distribution of post-partum women, by practices on coping strategies and by city

Coping strategies*	Puerto Princesa City (n=340)		Tacurong City (n=352)		Tagum City (n=275)		Total (n=967)	
	n	%	n	%	n	%	n	%
Eat adequately	319	93.8	244	69.3	196	71.3	759	78.5
Continued breastfeeding	305	89.7	208	59.1	165	60	678	70.1
Personal hygiene and clean environment	226	66.5	188	53.4	116	42.2	530	54.8
Taking vitamins and minerals	214	62.9	161	45.7	112	40.7	487	50.4
Avoid getting sick	192	56.5	28	8.0	56	20.4	276	28.5
Exercise	53	15.6	25	7.1	39	14.2	117	12.1
Avoid vices	52	15.3	6	1.7	29	10.5	87	9.0
Eat nutritious food	0	0.0	38	10.9	12	3.5	50	5.2
Enough sleep/rest	0	0.0	17	4.9	4	1.2	21	2.2
Others	1	0.3	20	5.7	7	2.1	28	2.8
Compliance to minimum health and safety protocols:								
Stay at home	0	0.0	14	4	5	1.5	19	2.0
Wash hands & sanitize	0	0.0	11	3.1	2	0.6	13	1.3
Wear face mask/PPE	0	0.0	6	1.7	1	0.3	7	0.7
Practice social distancing	0	0.0	2	0.6	2	0.6	4	0.4

Others	0	0.0	33	9.4	10	3.0	43	4.4
No change	0	0.0	0	0.0	1	0.3	1	0.1
Do not know	0	0.0	0	0.0	6	2.2	6	0.6

*Multiple responses

D. CHILDREN 6-23 MONTHS

In the first two years of life, good nutrition is important as it is a time of rapid growth, development and activity. Moreover, correct feeding is critical due to its role in lowering morbidity and mortality, reducing the risk of chronic disease throughout their life span, and promoting regular mental and physical development (WHO, 2021). In this survey, the mean age in months of children was 13.8 months across all cities (Table D.1). On the other hand, the mean age of the mothers/caregivers of the 6-23-months-old children was 28.3 years.

Table D.1. Summary statistics of age of children and their mother/caregiver, by city

	Puerto Princesa City	Tacurong City	Tagum City	Total
Mean age of children (in months)				
Mean	13.6	13.9	13.8	13.8
Std. Deviation	5.1	5.1	5.1	5.1
Mean age of mothers/caregivers				
Mean	28.3	28.2	28.5	28.3
Std. Deviation	8.2	7.1	7.9	7.9

Table D.2 shows that more than two-third of the mothers/caregivers completed secondary education and a lower percentage completed tertiary education. A little half of them were single with regular partner and 40% with non-regular partner.

Table D.2. Frequency and distribution of mothers/caregivers of 6-23 months old children, by educational attainment and marital status and by city

Education and marital status of mothers/caregivers	Puerto Princesa City (n=500)		Tacurong City (n=516)		Tagum City (n=514)		Total (n=1530)	
	n	%	n	%	n	%	n	%
Educational attainment								
No schooling but can read any language	1	0.2	1	0.2	0	0.0	2	0.1
Some primary	32	6.4	17	3.3	12	2.3	64	4.2
Completed primary	29	5.8	24	4.6	38	7.4	96	6.3
Some secondary	117	23.4	94	18.2	114	22.2	337	22.0

Education and marital status of mothers/caregivers	Puerto Princesa City (n=500)		Tacurong City (n=516)		Tagum City (n=514)		Total (n=1530)	
	n	%	n	%	n	%	n	%
Completed secondary	155	31.0	185	35.8	190	37.0	525	34.3
Some Tertiary	92	18.4	75	14.5	57	11.1	225	14.7
Completed Tertiary	54	10.8	90	17.4	53	10.3	179	11.7
Postgraduate	1	0.2	29	5.6	1	0.2	3	0.2
Technical/Vocational	19	3.8	1	0.2	49	9.5	99	6.5
Marital status								
Single, no partner	35	7.0	25	4.8	30	5.8	95	6.2
Single, non-regular partner	192	38.4	259	50.1	197	38.3	617	40.3
Single with regular partner/cohabiting	270	54.0	230	44.5	276	53.7	802	52.4
Married	3	0.6	3	0.6	11	2.1	18	1.2

D.1 UTILIZATION OF HEALTH SERVICES FOR 6-23 MONTHS OLD CHILDREN

Mothers/caregivers of children 6-23-month-old reported that they have received and availed of several health services foremost of which is counselling of their mothers/caregivers, attendance to Child Health Day activities, and growth monitoring. In Tagum City and Tacurong City, there was a high proportion of mothers/caregivers who participated in Child Health Day activities. About 14% of the children received MNP (Table D.3). In addition, across the three cities, children received MNP for an average of 2.5 months during the last 12 months. Puerto Princesa City children having received the MNP for an average of 3.9 months, Tacurong City children 1.8 months, and Tagum City 2.1 months.

Table D.3. Frequency and percentage distribution of 6-23-month-old children, by health services availed by the mothers/caregivers and by city

Health services availed*	Puerto Princesa City (n=500)		Tacurong City (n=516)		Tagum City (n=514)		Total (n=1530)	
	n	%	n	%	n	%	N	%
Received counselling	239	47.8	266	51.6	302	58.8	811	53.0
Child health day	151	30.2	301	58.4	298	58.0	711	46.5
Growth monitoring to check weight or length/height	224	44.8	128	24.8	111	21.6	487	31.8
Vaccination clinic	149	29.8	118	22.8	107	20.9	389	25.4
Vitamin A supplementation	98	19.6	111	21.5	123	23.9	332	21.7
Malnutrition screening, e.g., MUAC	49	9.8	12	2.3	21	4.1	95	6.2
Community information session on child health and nutrition	27	5.4	18	3.5	25	4.9	75	4.9
Received MNP	49	9.8	109	21.1	52	10.1	181	11.8

*Multiple responses

The topics discussed during counselling of mothers/caregivers of 6-23-month-old children were almost about breastfeeding except for starting solid foods at 6 months. The sources of the information on complementary feeding were mostly community health workers followed by the health facility workers, and relative/friend. A low percentage was noted for midwives as source of information (Table D.4).

Table D.4. Frequency and percentage distribution of caregivers of 6-23-month-old children, by topics during counseling and source of information and complementary feeding and by city

Counseling topics and source of information	Puerto Princesa City (n= 239)		Tacurong City (n=303)		Tagum City (n=365)		Total (n=811)	
	n	%	n	%	n	%	n	%
Topic discussed during counseling*								
Start breastfeeding immediately after birth	223	93.3	77	25.5	104	39.4	466	57.5
Avoiding any feeding prior to commencing breastfeeding	64	26.8	18	6.0	45	16.9	153	18.9
Exclusive breastfeeding for the first six months of life	93	38.9	111	36.7	84	31.8	286	35.3
Continue to breastfeed to two years	114	47.7	98	32.2	86	32.5	309	38.1
Start solid foods at 6 months	102	42.7	141	46.5	101	38.1	333	41.1
Source of information on complementary feeding*								
Community health worker	104	43.5	106	34.9	132	49.7	365	45.0
Doctor/Nurse/Health Center worker	119	49.8	105	34.5	104	39.1	344	42.4
Relative/Friend	77	32.2	59	19.5	107	40.4	276	34.0
Other health professional (Nurses, Midwife)	0	0.0	6	1.9	0	0.0	68	8.4
Others/ Teacher or other at school	5	2.1	21	6.8	11	4.0	29	3.6

*Multiple response

D.2. KNOWLEDGE ON COMPLEMENTARY FEEDING BY MOTHERS/CAREGIVERS OF 6-23 MONTHS OLD CHILDREN WHO RECEIVED COUNSELING

Less than 20% of mothers/caregivers knew feeding practices for 6-11-month-old children. Among mothers/caregivers of 12-23 months, a higher proportion of them knew some feeding practices such as continue breastfeeding, giving of fruits and vegetables, and introduce foods that are nutritious (Table D.5). Despite the low awareness of mothers on continued breastfeeding at 6-11 months, the national data shows that more than half of 0-23 months infants were continued breastfed at 1 year (FNRI-DOST, 2019). Seemingly, better knowledge on continued breastfeeding at 12-23 months does not necessarily equate to higher percentage of continued breastfeeding at 2 years. In terms of introduction of foods at 6-11 months only few of the mothers knew of the important feeding practice, however it increases as the child grows (Ariyo et al., 2021).

Table D.5. Frequency and percentage distribution of mothers/caregivers of 6-23-month-old children with counseling, by knowledge on complementary feeding practices and by city

Knowledge on complementary Feeding	Puerto Princesa City (n=239)		Tacurong City (n=303)		Tagum City (N=265)		Total (n=811)	
	n	%	n	%	n	%	n	%
Considered as important feeding practices for 6-11 months*								
Start giving colorful fruits and vegetables	8	3.3	107	35.2	59	22.2	139	17.2
Introduce foods that are very nutritious	4	1.7	42	13.9	29	10.9	64	7.9
Start other foods one at a time	8	3.3	9	3.0	32	11.9	59	7.3
Feed foods with a consistency appropriate for age (soft, not too dilute)	4	1.7	53	17.6	17	6.3	52	6.4
Continue to breastfeed	10	4.2	17	5.6	21	7.9	50	6.2

Knowledge on complementary Feeding	Puerto Princesa City (n=239)		Tacurong City (n=303)		Tagum City (N=265)		Total (n=811)	
	n	%	n	%	n	%	n	%
Start giving animal source foods, including meats	8	3.3	38	12.7	5	2.0	32	3.9
Give foods that are thick (avoid watery foods)	1	0.4	5	1.5	1	0.3	5	0.6
Feed with a spoon or cup/avoid using a bottle	1	0.4	5	1.5	1	0.3	5	0.6
When sick, continue to breastfeed and offer additional fluids	2	0.8	0	0.0	0	0.0	2	0.3
If not able to breastfeed, provide infant formula	1	0.4	0	0.0	0	0.0	2	0.2
Considered as important practices for 12-23 months*								
Continue to breastfeed	163	68.2	86	28.5	89	33.4	371	45.7
Start giving colorful fruits and vegetables	87	36.4	148	48.7	137	51.6	368	45.4
Introduce foods that are very nutritious	64	26.8	93	30.6	90	33.8	247	30.4
Start other foods one at a time	89	37.3	65	21.4	60	22.8	227	28.0
Feed foods with a consistency appropriate for age (soft, not too dilute)	39	16.3	84	27.7	54	20.5	163	20.1
Start giving animal source foods, including meats	48	20.1	144	47.5	12	4.7	140	17.3
Feed with a spoon or cup/avoid using a bottle	26	10.9	6	1.9	16	6.0	58	7.2
Give foods that are thick (avoid watery foods)	14	5.8	7	2.3	18	6.9	47	5.8
If not able to breastfeed, provide infant formula	28	11.7	5	1.5	4	1.6	44	5.4
When sick, continue to breastfeed and offer additional fluids	26	10.9	1	0.4	7	2.6	44	5.4
Treat diarrhea with ORS	3	1.2	6	2.0	0	0.0	6	0.8
Treat diarrhea with zinc	3	1.2	0	0.0	0	0.0	4	0.5

*Multiple responses

D.3 KNOWLEDGE AND PRACTICES ON MNP BY MOTHERS/CAREGIVERS OF 6-23 MONTHS OLD CHILDREN

Table D.6 shows that only 181 of the 1,530 (19%) of mothers/caregivers of 6-23 months old children received varied messages on MNP. The top three messages are as follows: MNP improves growth (84.8%), MNP completes the nutrients that the child might be missing (81.8%) and prevents anemia (62.0%). In Puerto Princesa City, all mothers/caregivers received information that MNP improves growth of children

Across the three cities, most information on MNP was sourced by the mothers/caregivers from public health facilities. Almost all information on MNP were relayed by community health worker, followed by doctor/nurse/health center worker. Almost one-third of the mothers/caregivers gave all of the MNP they have received for their children. A few did not give all and even did not give the MNP to their child. Almost half of the mothers/caregivers shared the MNP with their other children.

There were various preparation activities for MNP such as washing hands, mixing with solid or semi-solid foods, and poring the entire MNP to a child's food. Despite the awareness of mothers/caregivers on MNP, it did not translate to a high proportion of children receiving all MNP allotted for them and only few of the mothers knew proper MNPs preparation. This finding is similar to a study conducted by Gordoncillo et al. (2017), where awareness on MNPs does not necessarily equate to knowledge and deviations were also observed on proper fortification of food using MNP. Hence, it is recommended to complement awareness with knowledge on MNP through counselling and initiation of support groups.

Table D.6. Frequency and percentage distribution of mothers/caregivers of 6-23-month-old children, by information about MNP and by city

Knowledge and Practices on MNP	Puerto Princesa City		Tacurong City		Tagum City		Total	
	n	%	n	%	n	%	n	%
Messages about MNP*	n=49		n=109		n=52		n=181	
Improves growth	49	100.0	83	76.2	40	77.0	153	84.8
Completes the nutrition that may be missing in the child's diet	48	98.0	85	78.0	36	69.2	148	81.8
Prevents iron deficiency or anemia	45	91.8	50	45.9	24	46.2	112	62.0
Child is healthier with it	13	27.3	46	42.3	31	59.6	78	43.3
Prevents illness	18	36.7	31	28.4	11	21.2	52	28.7
Have a good appetite on foods and energetic	5	9.8	1	0.9	2	3.9	9	5.1
Give vitamins for the child	1	2.3	2	1.8	4	7.6	7	4.1
Friend or family member recommended it	4	7.9	1	0.9	0	0.0	5	3.0
Gives nutrients to the child	0	0.0	1	0.9	1	1.9	1	0.8
Source of information on MNP*	n=49		n=109		n=52		n=181	
Doctor/Nurse/Health Center worker	36	73.5	67	61.4	30	57.7	116	64.3
Community health worker	49	100	103	94.5	52	100.0	178	98.4
Other health professional	0	0.0	23	21.0	1	1.9	12	6.8
Teacher or other at school	2	4.0	0	0.0	5	9.6	9	4.9
Relative/Friend	3	6.0	8	7.4	13	25.0	24	13.3
TV	0	0.0	0	0.0	3	5.8	4	2.1
Radio	0	0.0	0	0.0	1	1.9	1	0.7
Source of MNP by facility*	n=52		n=109		n=60		n=221	
Public Facility (Government Hospital, Health Centre)	41	83.7	104	95.4	46	88.5	191	88.8
Private Facility (Faith Based Hospital, Private Clinic)	2	4.0	3	2.8	2	3.9	7	3.6
Number of MNP given to child	n=47		n=103		n=51		n=225	
All of them	16	32.7	26	23.8	19	36.6	57	31.5
Almost all of them	10	20.5	31	28.4	5	9.6	34	18.9
Not all but more than half	12	24.5	31	28.4	12	23.0	46	25.2
Less than half	9	18.3	9	8.3	10	19.3	28	15.7
None of them	0	0.0	6	5.5	5	9.6	9	5.1
Ever shared the MNP received with other children	18	36.7	64	58.7	24	46.2	84	46.6
How MNP is prepared*	n=500		n=516		n=514		n=1530	
Wash hands	179	35.8	71	13.7	59	11.5	337	22.0
Put child's food portion in a separate dish	68	13.6	67	13	55	10.7	188	12.3
Open sachet and pour entire contents over child's food	42	8.4	95	18.4	47	9.1	158	10.3
Avoid adding to hot foods	8	1.6	23	4.4	36	7.0	66	4.3
Mix with solid or semi-solid foods (avoid liquids)	19	3.8	30	5.8	38	7.4	86	5.6

Knowledge and Practices on MNP	Puerto Princesa City		Tacurong City		Tagum City		Total	
	n	%	n	%	n	%	n	%
Do not premix the sachet into entire food pot (for entire family)	3	0.6	2	0.4	6	1.2	12	0.8
Add sachet just before feeding to child	3	0.6	5	1.0	5	1.0	12	0.8
Add to just a small portion of the food (minimum the child would usually eat)	4	0.8	10	1.9	4	0.8	14	0.9

*Multiple responses

D.4 PROPORTION OF 6-23-MONTH-OLD CHILDREN MEETING THE MINIMUM ACCEPTABLE DIET

As mentioned in the methodology, the minimum acceptable diet (MAD) is a composite indicator of minimum dietary diversity (MDD) and minimum meal frequency (MMF). MDD indicates the proportion of children who received food from at least four of the seven food groups, namely: 1) grains, roots and tubers, 2) legumes and nuts, 3) dairy products, 4) flesh foods, 5) eggs, 6) vitamin A-rich fruits and vegetables and 7) other fruits and vegetables based on intake the previous day.

The proportion of children 6-23-month-old who consumed four or more food groups from the seven food groups was only 48%. This means there are more than 50% of children who are not meeting the MDD. However, the MDD in the three areas are higher than the national level of 20% (FNRI, 2019). In a study on MDD of Filipino 6-23-month-old children, a low MDD was found to be associated with underweight and wasting/thinness but not with stunting (Guirindola et al., 2016).

The proportion of children 6-23-month-old with minimum meal frequency (MMF) was higher at 74.6% for all cities, with Tagum City having the highest proportion (83%). Meeting the MMF means that the child received complementary foods the minimum recommended number of times in the past 24 hours. For a breastfed child, the frequency should be at least two times for 6-8 month, and at least three times for 9-23 months of age.

The proportion of children 6–23-month-old who met the minimum acceptable diet was 38% for all cities. This proportion is higher than the national level which is 10.0% (FNRI, 2019). Still, even with the higher proportion, the young children meeting the MAD was low, indicating that complementary feeding remains suboptimal and therefore should be improved (Figure D.1).

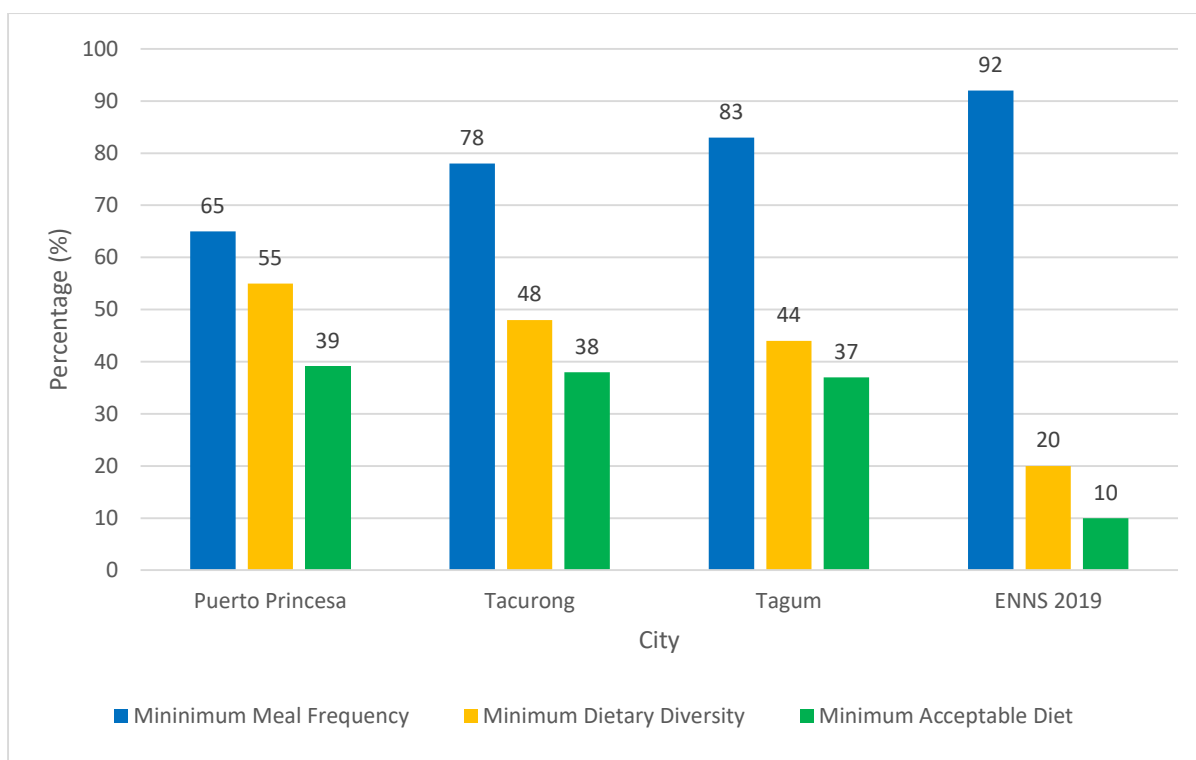


Figure D.1. Complementary Feeding Indicators for children 6-23 months, in comparison with NNS 2019, by city

In the past 24 hours, the mean number of times that infants consumed milk formula was 3.6 times across the cities with Tacurong City having the highest mean (Table D.6). Similarly, the mean number of times the infants consumed tinned, powdered and fresh milk was 3.0 times. A lower mean number of times infants consumed solid or semi-solid food at 1.2 times.

Table D.7. Summary statistics of the mean number of times of milk consumption of 6-23-month-old children, by city

Mean number of times	Puerto Princesa City	Tacurong City	Tagum City	Total
Number of times yesterday the infant consumed infant formula				
Mean	3.3	4.1	3.9	3.6
Std. Deviation	2.4	1.9	2.2	2.3
Number of times yesterday the infant consumed milk (tinned, powdered, fresh animal milk)				
Mean	2.9	3.3	3	3
Std. Deviation	1.8	2.3	1.9	1.8
Number of times yesterday the eat solid or semi-solid food				
Mean	1.1	1.3	1.35	1.2
Std. Deviation	0.5	0.5	0.7	0.7

Based on the responses of the mothers/caregivers, 90% and more of the 6-23 months old children were 'ever breastfed' but a lower proportion were 'breastfed yesterday' (Table D.8). Various types of liquids were given to children with the highest proportion reported for water, clear broth, and tinned, powdered or fresh milk. It is disconcerting to note that coffee, tea, and soda are being given to young children. Children also consumed foods such as fish, eggs, and animal meat, which are good sources of protein.

Insects and snails are given to 6-23 months old children by a low percentage of mothers/caregivers (1.9%). While edible insects can contribute essential nutrients necessary to augment dietary quality and diversity, it is not a common practice among Filipino mothers. Edible insects are usually farmed as an alternative source of protein (FAO, 2014). Studies conducted in African countries using edible insects, e.g., crickets and palm weevil larvae, grasshoppers, mayfly and termites, as complementary food are available but not in the country (Parker et al., 2020; Agfemable et al., 2020; Kinyuru, et al., 2018). This is one area which can be explored in the Philippines as possible alternative sources of nutrients particularly protein.

Table D.8. Frequency and percentage distribution of 6-23 months old children, by breastfeeding practices and liquids and foods consumed and by city

Breastfeeding practices and liquids and foods consumed	Puerto Princesa City (n=500)		Tacurong City (n=516)		Tagum City (n=514)		Total (n=1530)	
	n	%	n	%	n	%	n	%
Ever breastfed	452	90.4	484	93.8	491	95.5	1424	93.1
If breastfed (yesterday)	366	73.2	320	62.1	320	62.3	1022	66.8
Liquids taken (yesterday)								
Plain water	492	98.4	512	99.2	512	99.6	1515	99.0
Infant formula	172	34.4	124	24.0	96	18.7	399	26.1
Milk such as tinned, powdered, or fresh animal milk	183	36.6	200	38.7	217	42.2	601	39.3
Juice or juice drinks made at home or purchased	95	19.0	119	23.0	96	18.7	298	19.5
Clear broth	200	40.0	415	80.5	385	74.9	936	61.2
Sour milk or yogurt	88	17.6	84	16.2	62	12.1	0	0.0
Am/Thin porridge, or soup thickened with some sort of flour	169	33.8	188	36.4	189	36.8	231	15.1
Tea or coffee with milk	45	9.0	11	2.1	25	4.9	543	35.5
Choco-milk	6	1.2	84	16.2	48	9.3	109	7.1
Sweet drinks/iced-tea	2	0.4	3	0.6	3	0.6	24	1.6
Soda	3	0.6	58	11.2	26	5.0	257	16.8
Vitamins & medicine	0	0.0	2	0.4	0	0.0	6	0.4
Solid, semi-solid, or soft-foods eaten (yesterday)								
Liver, kidney, heart, and organ meats	79	15.8	17	3.3	30	5.8	147	9.6
Beef, pork, chicken	168	33.6	155	30.0	144	28.0	470	30.7
Egg	273	54.6	240	46.6	226	44.0	747	48.8
Fish, shellfish, seafood	313	62.6	263	50.9	240	46.7	826	54.0
Cheese, yogurt, and other milk products	102	20.4	63	12.2	50	9.7	223	14.6
Snail, insects	22	4.4	1	0.2	0	0.0	29	1.9
Oil, fat, butter, or food made of these	34	6.8	62	12.0	35	6.8	118	7.7
Cheese, yogurt, or other milk products	83	16.6	71	13.7	71	13.8	230	15.0
Any oil, fats, or butter, or foods made with any of these	27	5.4	75	14.5	65	12.6	151	9.9

Breastfeeding practices and liquids and foods consumed	Puerto Princesa City (n=500)		Tacurong City (n=516)		Tagum City (n=514)		Total (n=1530)	
	n	%	n	%	n	%	n	%
Any sugary foods such as chocolates, sweets, candies, pastries, cakes or sweet biscuits	339	67.8	298	57.8	262	51.0	904	59.1
Condiments for flavour, such as chilies, spices, herbs, or fish powder	6	1.2	7	1.4	23	4.5	40	2.6
Others	1	0.2	15	2.9	48	9.3	69	4.5

*Multiple responses

D.5. NUTRITIONAL SITUATION OF 6-23-MONTH-OLD CHILDREN

Various forms of malnutrition among children 6-23 months old children existed across the three cities. More than 10% of the children were underweight and stunted. Wasting is observed among 8.0% of the children whereas prevalence of overweight was below 3% (Table D.10). Comparing these values with the national prevalence, both the prevalence rates of underweight and stunting in the three cities were lower than the national prevalence rates among Filipino children <2 years old of 15.0% and 25.5%, respectively (FNRI, 2018). The prevalence rates of wasting in the Tacurong City (9.1%) and Tagum City (8.9%) were higher than the national prevalence of 7.4%.

If the prevalence rates are compared with the WHO cut-off values for public health significance, all cities have 'medium' problem of public health significance for underweight (10-19%); 'low' problem for stunting (<20%), and 'poor' for wasting (5-9%). Wasting was lowest in Puerto Princesa City at 6% but still falls under 'poor' public health problem. Thus, there is a need to examine the situation as it might worsen given the covid19 pandemic. Wasting in children under five years old could happen because of acute food shortages or disease. Moreover, while there were more children suffering from undernutrition, there were children who were overweight though at a much lower percentage (2.2%) but this could be a potential nutritional problem (FNRI-DOST 2019c). Thus, the promotion of healthy diets at this time would also be helpful to prevent the occurrence of malnutrition.

Table D.9. Prevalence of nutritional status of 6-23 months old children, by city

Nutritional Status	Puerto Princesa City		Tacurong City		Tagum City		Total	
	n (%)	(95% CI)	n (%)	(95% CI)	n (%)	(95% CI)	n (%)	(95% CI)
Underweight	55		67		57		179	
	(11.0)	8.2-13.7	(13.0)	10.0-15.8	(11.1)	8.3-13.8	(11.7)	10.1-13.3
Stunted	85		85		68		238	
	(17.0)	13.7-20.2	(16.4)	13.2-19.6	(13.2)	10.3-16.1	(15.5)	13.7-17.4
Wasting	30		47		46		123	
	(6.0)	3.9-8.0	(9.1)	6.6-11.5	(8.9)	6.4-11.4	8.0	6.7-9.4
Overweight	12		10		12		362	
	(2.4)	1.0-3.7	(1.9)	0.7-3.1	(2.3)	1.0-3.6	(2.2)	1.5-3.0

Cut-off values for public health significance (WHO.2010. NLIS Country Profile Indicators Interpretation Guide.)

- Underweight: < 10% Low prevalence; 10-19% Medium prevalence; 20-29% High prevalence; ≥ 30% Very high prevalence

- *Stunting*: < 20% Low prevalence; 20-29% Medium prevalence; 30-39% High prevalence; ≥40%: Very high prevalence
- *Wasting*: < 5% Acceptable; 5-9% Poor; 10-14% Serious; ≥ 15% Critical

D.6. CHANGES IN PRACTICES OF MOTHERS/CAREGIVERS OF 6-23-MONTH-OLD CHILDREN IN THE CONTEXT OF COVID-19 PANDEMIC

About one-third of mothers/caregivers of 6–23-month-old children reported changing their practices in availing health services due to the covid-19 pandemic, with the highest percentage in Tacurong City (42.9%). Mothers/caregivers did not avail health services as they were scared to go out (16.2%). Instead, a few mothers/caregivers resorted to self-medication (7.1%) and taking of vitamins and minerals (7.4%). Majority of the mothers/caregivers in all areas ensured that they practice eating adequate food with Puerto Princesa City with the highest percentage. Mothers/caregivers also continued breastfeeding and observed personal hygiene and cleanliness (Table D.10).

Table D.10. Frequency and percentage distribution of mothers/caregivers of children 6-23- month-old, by changes in availing of health services and coping strategies by city

Changes in practices and coping strategies in availing health services	Puerto Princesa City (n=500)		Tacurong City (n=516)		Tagum City (n=514)		Total (n=1530)	
	n	%	n	%	n	%	n	%
Changed in the caregiver's practices in availing health services	87	17.4	221	42.9	189	36.8	454	29.7
Changes in practices of availing health services*								
Center is closed	44	8.8	2	0.4	11	2.1	70	4.6
Services were stopped	33	6.6	2	0.4	6	1.2	50	3.3
Scared to go out	48	9.6	113	21.9	106	20.6	248	16.2
Practiced self-medication	13	2.6	64	12.4	49	9.5	109	7.1
Take vitamins and minerals	12	2.4	67	13.0	52	10.1	113	7.4
Coping strategies to ensure that you and your child remain healthy*								
Adequate food intake	455	91.0	423	82.0	407	79.2	1294	84.6
Continued breastfeeding	354	70.8	184	35.6	187	36.4	774	50.6
Avoid getting sick	235	47.0	43	8.3	97	18.9	442	28.9
Personal hygiene and environmental cleanliness	310	62.0	268	52.0	217	42.2	797	52.1
Taking of vitamins and minerals	317	63.4	288	55.9	260	50.6	869	56.8
Exercise	95	19.0	43	8.3	42	8.2	194	12.7
Avoiding vices	105	21.0	5	1.0	39	7.6	185	12.1

*Multiple responses

Less than 20% of the mothers/caregivers changed their feeding practices during the pandemic (Table D.11). Food intake was reduced by mothers/caregivers in the three cities and the free food packs became a source of food for children and the family. Common to all cities were coping strategies to ensure availability of food and these include consuming less preferred and less expensive foods, purchasing food on credit, limiting the portion sizes, and reducing the number of meals in a day. These coping strategies can eventually have a negative impact on the child's nutritional status particularly if this will continue for a long period of time.

Table D.11. Frequency and percentage distributions of changes in the child feeding practices before and during the pandemic by mothers/caregivers of 6-23-month-old children

Changes in feeding practices and coping strategies	Puerto Princesa City (n=500)		Tacurong City (n=516)		Tagum City (n=514)		Total (n=1530)	
	n	%	n	%	n	%	n	%
Changed child feeding practices due to pandemic	73	14.6	92	17.8	120	23.3	288	18.8
Changes in the feeding practices*								
Less food intake due to lack of income	452	90.4	326	63.1	377	73.3	1183	77.3
More food intake than usual since there is relief food packages given to HH	151	30.2	79	15.3	103	20.0	64	4.2
Limited food choices in the market	254	50.7	117	22.7	107	20.8	89	5.8
Food source is mainly from "ayuda"	96	19.1	34	6.6	56	10.8	37	2.4
Coping strategies*								
Rely on less preferred and less expensive foods	235	47.0	321	62.3	318	61.9	852	55.7
Grow food from a friend or relative	93	18.6	93	18.0	48	9.3	223	14.6
Purchase food on credit	93	18.6	378	73.3	137	26.7	249	16.3
Gather local foods	26	5.2	95	18.4	100	19.5	203	13.3
Consume seed stock held for next season	28	5.6	15	2.9	10	1.9	55	3.6
Send children to eat with neighbors	5	1.0	1	0.2	1	0.2	8	0.5
Limit portion size at mealtimes	24	4.8	38	7.4	48	9.3	109	7.1
Reduce number of meals eaten in a day	21	4.2	31	6.0	33	6.4	83	5.4
Restrict consumption by adults in order for smaller children to eat	52	10.4	23	4.4	12	2.3	92	6.0
Others	38	7.6	148	28.6	117	22.8	266	17.4

*Multiple responses

IV. CHALLENGES ENCOUNTERED IN IMPLEMENTING THE SURVEY

Various challenges, i.e., sample size, questionnaires, budget, and administrative processes, were encountered by the research team mostly in the training and data collection phase of the survey.

The sample size calculated for pregnant adolescents and post-partum women was higher compared with the number found in the area. While the survey team used the census of the two target groups prepared by the community health and nutrition workers, some participants were no longer eligible to be part of the study. Others had already transferred to other areas permanently or temporarily. The survey team even strategized to update the census by doing house-to-house in the clusters not yet covered by the community census but the output was still below the expectations. In addition, for 6-23 months old children, under targeting was experienced; hence, it was necessary for the team to return in the survey sites considering the rising COVID-19 cases and the logistical challenges the data collection entailed.

Even after the training of local enumerators had been conducted, comments and updates on the questionnaires were received from NI-Canada. Consequently, additional days were needed in translating the updated questionnaire. Moreover, pen and paper were used initially in the interviews as it took some time before the four questionnaires were updated in ODK, tested and ready for use. Pre-testing was also redone so that the enumerators would be familiar with the updated questionnaires.

The duration of the data collection was prolonged and delayed due to the changing rules on community quarantine of the national and local government units, i.e., from general community quarantine (GCQ) to enhanced community quarantine (ECQ) and vice-versa which had implications on the mobility of the survey teams and budgetary requirements. Member of the teams had to be quarantined before data collection or when arriving in the survey site. Moreover, the teams cannot go to the communities during the ECQ. Consequently, additional cost for transportation was incurred since the survey participants were fetched from their homes and sent back after the interview.

A particular challenge encountered was conducting the anthropometric measurements. The local enumerators had to be very careful as this involved face to face encounter with the children and mothers/caregivers. Consequently, this has lengthened data collection and required additional health workers to assist. Likewise, adjustments in logistical arrangements had to be done to consider the vulnerabilities of the target participants, i.e., pregnant adolescents and post-partum women. In terms of the number of interviews to be completed, local enumerators were initially tasked to interview 6-10 participants per day. Instead, the local enumerators were instructed to finish interviews of target participants located in one cluster per day to minimize the number of times of going back to the community.

The budget for salary of local enumerators was planned at monthly rate which was discussed with them during interview. However, since the duration of data collection was extended due to lockdown and with the implementation of the quarantine procedures and travel protocols, the staff expected salary according to the days that they are still part of the project until its completion. It was difficult to do the balancing act of sticking to the budget while being humane to the staff given the risks they faced every day in doing the rigorous process of face-to-face data collection during the pandemic.

With regards to monitoring the data collection, since the UPLB team could not be in the area to supervise the data collection, all instructions and monitoring were done remotely. There were times when miscommunication or misunderstanding happened. Despite the training of the enumerators, supervision (onsite, physical)) of the local team leader, and checking of the completed questionnaires, low response was still noted in some of the questions.

In terms of the financial processes, documentation and compliance of requirements for reimbursements or liquidation of cash advance had to be strictly complied with. The physical documents for receipts and proof of payment are needed at UPLBFI and courier services were not that efficient due to the pandemic. While cash advance is allowed, the window period for liquidating the cash advance was too short before all documents are received, hence personal money was used first so that the local team could implement the activities without the worry of when will the budget arrives. Table E.1 presents a summary of the challenges and deviations from the proposal implemented in conducting the survey.

Table E.1. Challenges and deviations from the proposal implemented/methodology in conducting the survey

Challenges/Deviation from proposal	Remarks
Questionnaires used were updated based on NI-Canada consultation even after the training of enumerators.	Delayed data collection due to: • Translation of questionnaires • Pre-testing of questionnaires • Updating of questionnaires in ODK including testing to be ready for use
Based on pre-testing the enumerators in all areas only used the English-Tagalog version. It was also the one encoded in ODK.	While the questionnaires were translated from English to Tagalog, Hiligaynon, and Cebuano, results or pre-testing showed that the English-Tagalog translation could suffice. It will also be a challenge if ODK will have 3 databases of different dialects.
Sample size calculated was higher compared to what is actually found in the area.	Certification from each cluster/village on the number of actual target group found in the area From random sampling to purposive sampling as recommended by consultants particularly among adolescent pregnant women.
Sample size for facility is one for every health facility found in cluster or villages	The unit of analysis is health facility and not health workers.
Expenses on salary and transportation exceeded	This is brought about by the deviations in the implementation of activities such as hiring of daily transportation and accounting for days of quarantine.

V. CONCLUSION AND RECOMMENDATIONS

Conclusion

There were varied health services continuously being provided by the health workers of the three cities. Due to the covid19 pandemic, local health services were stopped for a while and then resumed following health protocols. Adjustments in delivering health services were done by the health workers such as house to house visits for counseling, distribution of MNP and IFA supplements, and growth monitoring.

Pregnant adolescents, post-partum women, and mothers of 6-23-month-old children availed of health services during the survey period. Post-partum women and pregnant adolescents availed of the ANC services including the iron or IFA supplementation. However, the delivery services were not fully offered to pregnant women due to the pandemic. Still, innovative actions were implemented to ensure safe service delivery during the pandemic and changes in the mode of services delivery were also observed among health workers.

Some pregnant adolescents, post-partum women, and mothers of 6-23-month-old children possessed some knowledge on infant and young child feeding practices such as exclusive breastfeeding, complementary feeding, anemia, benefits of IFA and MNP supplementation. Suboptimal feeding practices were noted as indicated by the low MDD and MAD of the 6-23-month-old children.

In terms of malnutrition, children 0-23 months old children are suffering from various types of malnutrition across the three cities; however, the prevalence rates did not reach the cut off points of high public health significance. Nevertheless, the malnutrition problem has to be addressed in the three areas. There were also about 45% of pregnant adolescents who were found to be nutritionally at-risk. Among post-partum women, the overweight and obesity seems to be the more nutritional concern than chronic energy deficiency based on the prevalence rates across the three cities.

Recommendations

Continuous provision of the available health facility services

All of these findings prompt a need for continued support to the implementation of health and nutrition services for pregnant and post-partum women and 6-23-month-old children such as micronutrient supplementation, ANC services for pregnant adolescents/women, promotion, and counseling on EBF and proper IYCF, among others. It is imperative that messages on WASH and food safety (e.g., handwashing and water use; use of proper storage conditions for complementary foods; use and cleaning of utensils for feeding and food preparation) be emphasized during these counseling sessions. Moreover, a comprehensive and sustainable nutrition program that addresses all forms of malnutrition in children and girls/women and applies a multi-disciplinary and multi-stakeholder holistic approach to support effective local nutrition plans and programs is needed.

Strengthening the capacity of the health facilities in providing needed nutrition and health services

An adequate supply of micronutrient supplements to the health facilities must be secured to ensure that the target groups in the communities have access, particularly the MNP. Regular training of health providers is also needed to have updated knowledge on the local health and nutrition programs, especially on the micronutrient supplementation for young children. Available services must be expanded to include more labor and delivery, adolescent-focused, and newborn care services. There is also a need to promote these services to address the knowledge gaps knowledge on anemia prevention, low utilization of HIV/STI/AIDS-related services, and fear of availing health facility services due to COVID-19, especially among pregnant adolescents. Additionally, current strategies on encouraging mothers to

breastfeed and/or to practice optimal complementary feeding should also be intensified amid the continuing community quarantine.

Promote involvement and utilization of the local nutrition and health services among the communities

Health services in the facilities and other local health programs would not be effective if these are not utilized by the target participants. Hence, the active involvement of mothers and fathers in the development and implementation of local nutrition plans and programs must be encouraged. Incentives can be put in place to attract parents to participate in health and nutrition programs. Moreover, the establishment of home gardens as an integral part of the local nutrition programs should also be promoted. The products or harvests from the home gardens can be used as another source of the food supply of the household.

Strengthening the local nutrition and health services through policy and intervention programs

The findings of this study may also have policy and/or programming implications particularly on ANC service delivery, micronutrient deficiency prevention among children, and EBF promotion services for pregnant adolescents of the health facilities. Generally, those who did not avail of ANC services were not aware of its benefits. There was also a prolonged lack of MNP stocks in the health facilities, and EBF promotion was commonly done by a midwife, not BHW. Perhaps, the strategies in the implementation and delivery of these services must be reviewed and altered to address the gaps in these areas.

Studies on early introduction of food to infants

Lastly, it was observed that there were mothers who introduced food to their infants early in this study. It would have been interesting to know and understand why such IYCF is practiced and the factors that influenced this behavior. Perhaps, this may be explored in future studies including the edible insects.

References:

- Agbemaflle, I., Hadzi, D., Amagloh, F. K., Zotor, F. B., & Reddy, M. B. (2020). Nutritional, Microbial, and Sensory Evaluation of Complementary Foods Made from Blends of Orange-Fleshed Sweet Potato and Edible Insects. *Foods (Basel, Switzerland)*, 9(9), 1225. <https://doi.org/10.3390/foods9091225>
- Alzaheb R. A. (2016). Factors Associated with the Early Introduction of Complementary Feeding in Saudi Arabia. *International journal of environmental research and public health*, 13(7), 702. <https://doi.org/10.3390/ijerph13070702>
- Al-Zwaini, I.J., Al-Ani, Z. R., and Hurley, W. (2020). Introductory Chapter: Impact of First 1000 Days Nutrition on Child Development and General Health. DOI: 10.5772/intechopen.93642. <https://www.intechopen.com/books/infant-feeding-breast-versus-formula/introductory-chapter-impact-of-first-1000-days-nutrition-on-child-development-and-general-health>, March 14, 2021.
- Academy of Nutrition and Dietetics. Promoting Nutrition for Pregnant and Breastfeeding Women. Accessed from <https://www.eatrightpro.org/practice/practice-resources/international-nutrition-pilot-project/promoting-nutrition-for-pregnant-and-breast-feeding-women>, October 17, 2021.
- Ariyo, O., Aderibigbe, O. R., Ojo, T. J., Sturm, B., & Hensel, O. (2021). Determinants of appropriate complementary feeding practices among women with children aged 6-23 months in Iseyin, Nigeria. *Scientific African*, 13, e00848.
- Belete, Y.M., Negga, B., & Firehiwot, M. (2016). Under Nutrition and Associated Factors among Adolescent Pregnant Women in Shashemenne District, West Arsi Zone, Ethiopia: A Communitybased Study. *Journal of Nutrition and Food Sciences*, 6, 1-7.
- Bluestein, D., & Starling, M. E. (1994). Helping pregnant teenagers. *The Western journal of medicine*, 161(2), 140-143.
- Capanzana, M. V., Aguila, D. V., Javier, C. A., Mendoza, T. S., & Santos-Abalos, V. M. (2015). Adolescent Pregnancy and the First 1000 Days (the Philippine Situation). *Asia Pacific Journal of Clinical Nutrition*, 24(4), 759-766. <https://doi.org/10.6133/apjcn.2015.24.4.07>
- Das J, K, Lassi Z, S, Hoodbhoy Z, Salam R, A. (2008) Nutrition for the Next Generation: Older Children and Adolescents. *Ann Nutr Metab* 2018;72(suppl 3):56-64. doi: 10.1159/000487385
- Davies-Morris, B., McHugh, J., and Walters, K. (n.d.) The effects of breastfeeding and the importance of teen education. Accessed from <https://digitalcommons.calpoly.edu/cgi/viewcontent.cgi?article=1050&context=psycdsp>, February 27, 2021
- [DOST-FNRI] Department of Science and Technology - Food and Nutrition Research Institute. (2016). Philippine Nutrition Facts and Figures 2015: Maternal Health and Nutrition and Infant and Young Child Feeding Surveys. FNRI Bldg., DOST Compound, Gen. Santos Avenue, Bicutan, Taguig City, Metro Manila, Philippines.

[DOH] Department of Health. (2014). The Philippine Clinical Standards Manual on Family Planning. Manila, Philippines.

[DOH]. Department of Health (n.d.) First 1,000 Days Law- the best Christmas gift of Duterte administration to Filipino mothers and their children: Joint Press Release. Accessed from <https://doh.gov.ph/node/16268#:~:text=President%20Rodrigo%20Duterte%20signed%20Republic,first%201%2C000%20days%20of%20life>, March 14, 2021.

[DOH] Department of Health. (2017). Program for Young Parents Implementing Guidelines. <https://doh.gov.ph/sites/default/files/basic-page/Program%20for%20Young%20Parents%20Implementing%20Guidelines.pdf>

[FAO] Food and Agriculture Organization (n.d.) Insects for Food and Feed: Livelihood Opportunities. Retrieved from <http://www.fao.org/edible-insects/84624/en/>. Accessed 13 September 2021

Fiedler, Jack, D'Agostino, Alexis, and Sununtnasuk, Celeste. 2014. Nutrition Technical Brief: A Rapid Initial Assessment of the Distribution and Consumption of Iron–Folic Acid Tablets through Antenatal Care in the Philippines. Arlington, VA: USAID/Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) Project. Available online: <https://www.spring-nutrition.org/publications/briefs/iron-folic-acid-assessment-philippines> (accessed on 6 October 2021).

[FNRI] Food and Nutrition Research Institute.(2019). ENNS Provincial Dissemination. Expanded National Nutrition Survey:2019 Results. PowerPoint Presentation. Accessed from <http://enutrition.fnri.dost.gov.ph/site/uploads/2019%20ENNS%20Provincial%20Dissemination%20-%20Puerto%20Princesa.pdf>, March 14, 2021

Food and Nutrition Technical Assistance III Project (FANTA). (2018). Strengthening the Evidence Base for Nutrition Interventions during the “1,000 Days”: FANTA Research Explores How to Optimize the Prevention of Malnutrition. Washington, DC:FHI 360/FANTA.

[FNRI-DOST] Food and Nutrition Research Institute- Department of Science and Technology. (2019a). Expanded National Nutrition Survey: 2019 Results: Sultan Kudarat. Retrieved from http://enutrition.fnri.dost.gov.ph/site/uploads/2018_ENNS_Provincial_Dissemination_Sultan_Kudarat.pdf Accessed 26 August 2021

[FNRI DOST] Food and Nutrition Research Institute- Department of Science and Technology. (2019b). Expanded National Nutrition Survey: 2019 Results: Davao del Norte. Retrieved from <http://enutrition.fnri.dost.gov.ph/site/uploads/2019%20ENNS%20Provincial%20Dissemination%20-%20Davao%20del%20Norte.pdf> Accessed 25 August 2021

[FNRI DOST] Food and Nutrition Research Institute- Department of Science and Technology. (2019c). Expanded National Nutrition Survey: 2019 Results: Puerto Princesa City. Retrieved from <http://enutrition.fnri.dost.gov.ph/site/uploads/2019%20ENNS%20Provincial%20Dissemination%20-%20Puerto%20Princesa.pdf>. Accessed 26 August 2021

[FNRI DOST] Food and Nutrition Research Institute- Department of Science and Technology. (2019d). Retrieved from

<http://enutrition.fnri.dost.gov.ph/site/uploads/2019%20ENNS%20Results%20Dissemination%20Nutritional%20Status%20and%20Feeding%20%20Practices%20of%20Children%20Under%202.pdf> Accessed 1 September 2021

- Gordoncillo, N. P., Talavera, M. T. M., Barba, C. V., & Quimbo, M. A. T. (2017). Knowledge and Use of Complementary Food Fortification with Multiple Micronutrient Powders in Selected Communities in the Philippines. *Malaysian Journal of Nutrition*, 23(2).
- Keen, V.B. and Potts, C.S. (2011). Postpartum Obesity: The Root Problem of Childhood Obesity? Forum on Public Policy. Accessed from <https://files.eric.ed.gov/fulltext/EJ944213.pdf>, October 17, 2021.
- Keenan, K., Bartlett, T.Q., Nijland, M., Rodriguez, J.S., Nathanielsz, P.W., and Zürcher, N.R. (2013). Poor nutrition during pregnancy and lactation negatively affects neurodevelopment of the offspring: evidence from a translational primate model, *The American Journal of Clinical Nutrition*, Volume 98, Issue 2, August 2013, Pages 396–402, <https://doi.org/10.3945/ajcn.112.040352>
- Kinyuru, J., Nyangena, D., Kamau, E., Mmari, M. (2018). The Role of Edible Insects in Diets and Nutrition in East Africa. In book: *Edible Insects in Sustainable Food Systems*. (Abstract)
- Kronborg H., Foverskov E., Vaeth M. (2014) Predictors for early introduction of solid food among Danish mothers and infants: An observational study. *BMC Pediatr.* 14:702. doi: 10.1186/1471-2431-14-243.
- Leddy, M. A., Power, M. L., & Schulkin, J. (2008). The impact of maternal obesity on maternal and fetal health. *Reviews in obstetrics & gynecology*, 1(4), 170–178.
- Mak, T. N., Angeles-Agdeppa, I., Lenighan, Y. M., Capanzana, M. V., & Montoliu, I. (2019). Diet Diversity and Micronutrient Adequacy among Filipino School-Age Children. *Nutrients*, 11(9), 2197. <https://doi.org/10.3390/nu11092197>
- Melgar, J.L.D., Melgar, A.R., Festin, M.P.R. et al. (2018) Assessment of country policies affecting reproductive health for adolescents in the Philippines. *Reprod Health* 15, 205 (2018). <https://doi.org/10.1186/s12978-018-0638-9>
- Montgomery K. S. (2003). Improving nutrition in pregnant adolescents: recommendations for clinical practitioners. *The Journal of perinatal education*, 12(2), 22–30. <https://doi.org/10.1624/105812403X106801>
- Mulugeta, A., Tessema, M., Hsellasie, K., Seid, O., Kidane, G., and Kebede, A. (2015). Examining Means of Reaching Adolescent Girls for Iron Supplementation in Tigray, Northern Ethiopia. *Nutrients* 2015, 7, 9033–9045; doi:10.3390/nu7115449
- Muze, M., Yesse, M., Kedir, S. et al. Prevalence and associated factors of undernutrition among pregnant women visiting ANC clinics in Silte zone, Southern Ethiopia. *BMC Pregnancy Childbirth* 20, 707 (2020). <https://doi.org/10.1186/s12884-020-03404-x>

- Natividad, J. (2013). Teenage pregnancy in the Philippines: Trends, Correlates and Data Sources. *JAFES. Pediatrics* Feb 2018, 141 (2) e20173716; DOI: 10.1542/peds.2017-3716
- NNC. (2020). Lactation and Postpartum Care. Accessed from <https://nnc.gov.ph/regional-offices/luzon/region-ii-cagayan-valley/3785-lactation-and-postpartum-care-nutrition-for-lactating-women>, September 16, 2021.
- Parker, M.E., Zobrist, S., Lutterodt, H.E. *et al.* Evaluating the nutritional content of an insect-fortified food for the child complementary diet in Ghana. *BMC Nutr* 6, 7 (2020). <https://doi.org/10.1186/s40795-020-0331-6>
- Philippine Statistics Authority. (2019). Full Year 2018 Official Poverty Statistics. Retrieved from https://psa.gov.ph/sites/default/files/2018%20Full%20Year%20Poverty%20Statistics_pt.pdf. Accessed 26 August 2021
- Philippine Statistics Authority. (2016). Municipal and City Level Small Area Poverty Estimates; 2009, 2012, and 2015. https://psa.gov.ph/sites/default/files/City%20and%20Municipal-level%20Small%20Area%20Poverty%20Estimates_%202009%2C%202012%20and%202015_0.xlsx. Accessed 26 August 2021
- Philippine Statistics Authority (PSA). (2017). National Demographic and Health Survey 2017. Retrieved from: https://psa.gov.ph/sites/default/files/PHILIPPINE%20NATIONAL%20DEMOGRAPHIC%20AND%20HEALTH%20SURVEY%202017_new.pdf.
- Puerto Princesa City Tourism Department. 2015. Location and Land Area. <https://tourism.puertoprincesa.ph/?q=basic-page/location-and-land-area>. Accessed 25 August 2021
- Rao S., Swathi P., Unnikrishnan B., Hegde A. (2011). Study of complementary feeding practices among mothers of children aged six months to two years—A study from coastal south India. *Aus. Med. J.* 4:252–257. doi: 10.4066/AMJ.2011.607.
- Téllez-Rojo, M. M., Trejo-Valdivia, B., Roberts, E., Muñoz-Rocha, T. V., Bautista-Arredondo, L. F., Peterson, K. E., & Cantoral, A. (2019). Influence of post-partum BMI change on childhood obesity and energy intake. *PloS one*, 14(12), e0224830. <https://doi.org/10.1371/journal.pone.0224830>
- Salem, S., Eshra, D., and Saleem, N. (2016). Effect of malnutrition during pregnancy on pregnancy outcomes. *Journal of Nursing & Care*. ISSN: 2167-1168
- Sendeku, F.W., Azeze, G.G. & Fenta, S.L. (2020). Adherence to iron-folic acid supplementation among pregnant women in Ethiopia: a systematic review and meta-analysis. *BMC Pregnancy Childbirth* 20, 138). <https://doi.org/10.1186/s12884-020-2835-0>
- Siekman, K, Bégin, F, Situma, R, Kupka, R. (2017). The potential role of micronutrient powders to improve complementary feeding practices. *Matern Child Nutr.* 13(S2):e12464. <https://doi.org/10.1111/mcn.12464>

- Schwarzenberg, J., Georgieff, M.K., and COMMITTEE ON NUTRITION. (n.d.) Advocacy for Improving Nutrition in the First 1000 Days to Support Childhood Development and Adult Health
- Ticzon, V.M.F.T., Llanto, E.A., and Nancho, R.M.H. (2020). The Nutritional Status of Filipino Pregnant Adolescents 14 to 19 Years Old in a Tertiary Hospital. *Acta Medica Philippina*, 54:3, 251-263.
- The Official Website of the City Government of Tagum. 2017. Tagum City Administrative Map. <https://tagumcity.gov.ph/tagum-city-administrative-map/>. Accessed 25 August 2021.
- The Official Website of the City Government of Tacurong. (2016). New City Profile. Retrieved from <https://tacurong.gov.ph/tacurong-city-profile/>. Accessed 25 August 2021
- UNFPA. (2020) Eliminating Teenage Pregnancy in the Philippines. January 2020. Retrieved from https://philippines.unfpa.org/sites/default/files/pub-pdf/UNFPA_Policy_Brief_Teenage_Pregnancy_%282020-01-24%29.pdf.
- [UNSCN] United Nations System Standing Committee on Nutrition. (2010). 6th Report on the world nutrition situation. Chapter 3: Maternal Nutrition and the Intergenerational Cycle of Growth Failure. Retrieved from https://www.unscn.org/files/Publications/RWNS6/report/SCN_report.pdf. Accessed 31 August 2021
- [WHO] World Health Organization. (2006). Health Workers: Chapter 1 A Global Profile. In the World Health Report. Geneva, Switzerland.
- WHO. (2010). Indicators for assessing infant and young child feeding practices part 2: measurement. Geneva, Switzerland.
- WHO. 2021. Infant and young child feeding. Accessed from <https://www.who.int/news-room/fact-sheets/detail/infant-and-young-child-feeding>, October 17, 2021.
- World Bank Group. (2019). Adolescent fertility rate (births per 1,000 women ages 15-19). Retrieved from: <https://data.worldbank.org/indicator/SP.ADO.TFRT>.
- Zewdie S, Fage SG, Tura AK, Weldegebreal F. Undernutrition among Pregnant Women in Rural Communities in Southern Ethiopia. *Int J Womens Health*. 2021;13:73-79 <https://doi.org/10.2147/IJWH.S285132>

Annex 1. Indicator and prevalence used to calculate the sample size for adult women 0-5 months postpartum with live birth

Indicator	Puerto Princesa City, Palawan Province (Region IV-B)	Tacurong City, Sultan Kudarat Province (Region 12)	Tagum City, Davao del Norte Province (Region 11)	Total
a. iron-folic acid supplementation				
% of women 0-5 months post-partum with a live birth who consumed at least 90 iron-folic acid supplements during pregnancy	14.8 ^a	11.7 ^a	14.7 ^a	
<i>Margin of Error=5%; level of confidence=95%; Non-response rate=10%; and design effect=1.5</i>				
Target Sample Size	352	288	350	
No. of PSUs	30	30	30	
No. of Women per PSU	12	10	12	
Final Sample Size	360	300	360	1,020
a. Antenatal care by skilled health provider				
Percent of women 0-5 months post-partum with a live birth who have received ANC by skilled health provider at least 4 times during pregnancy	92.9 ^b	91.6 ^b	92.8 ^b	
<i>Margin of Error=5%; level of confidence=95%; Non-response rate=10%; and design effect=1.5</i>				
Target Sample Size	184	215	186	
No. of PSUs	30	30	30	

Indicator	Puerto Princesa City, Palawan Province (Region IV-B)	Tacurong City, Sultan Kudarat Province (Region 12)	Tagum City, Davao del Norte Province (Region 11)	Total
No. of Women per PSU	7	8	7	
Final Sample Size	210	240	210	660
c. Initiation of breastfeeding within 1 hour of delivery				
Percent of children initiated with breastfeeding within 1 hour of delivery	72.9 ^a	81.9 ^a	88.9 ^a	
<i>Margin of Error=5%; level of confidence=95%; Non-response rate=10%; and design effect=1.5</i>				
Target Sample Size	551	413	275	
No. of PSUs	30	30	30	
No. of Women per PSU	19	14	10	
Final Sample Size	570	420	300	1,290
d. Exclusive breastfeeding for the first 5 months				
Percent of children who were exclusively breastfed for the first 5 months				29% ^c
<i>Margin of Error=5%; level of confidence=95%; Non-response rate=10%; and design effect=1.5</i>				
Target Sample Size				574
No. of PSUs				30
No. of Women per PSU				19
Final Sample Size				574 per area
Total Sample Size				1,722

Note: ^a - Data is based on regional/national data from 8th National Nutrition Survey. Food and Nutrition Research Institute. 2013

^b - Data is based on regional not specific city and women who had a live birth in the 2 years preceding the survey not 0-5 months postpartum. National Demographic and Health Survey 2017

^c - Data is based on national data from 2018 National Nutrition Survey, Food and Nutrition Research Institute. 2019

