



**UNIVERSITY OF INDONESIA**

**SYSTEM REVIEW ON DISTRIBUTION OF MULTIPLE  
MICRONUTRIENT POWDER PROGRAM IN PRAYA  
TENGAH, CENTRAL LOMBOK DISTRICT**

**THESIS**

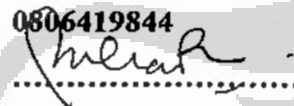
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JAKARTA  
JUNE 2010**

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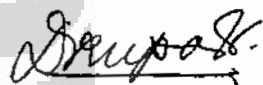
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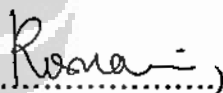
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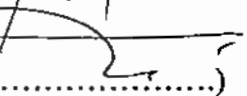
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Lastly, I offer my regards and blessing to all of those who supported me in any respect during the completion of this study.

Muharni

Jakarta, 22 June 2010

## PUBLICATION APPROVAL FOR ACADEMIC PURPOSES

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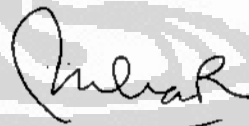
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## ABSTRAK

Name : Muharni  
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Tabur gizi, sebuah fortifikasi yang mengandung vitamin dan mineral berbentuk serbuk untuk diberikan di rumah, telah terbukti berhasil mengobati dan mencegah anemia hingga 49-91%. Di Indonesia, program tabur gizi akan dijadikan program nasional seperti halnya pada negara-negara Asia lainnya. Untuk menciptakan suatu program nasional yang efektif dan efisien, diperlukan suatu strategi sistem distribusi yang benar sehingga cakupan program yang tinggi dan merata akan tercapai dan terpelihara.

Tujuan umum penelitian ini adalah untuk mengkaji implementasi dari sistem distribusi program tabur gizi yang sedang berjalan di Praya Tengah, kabupaten Lombok Tengah. Sebuah penelitian *cross sectional* dilaksanakan dengan melakukan interview pada 240 ibu/pengasuh yang memiliki anak usia 12-59 bulan, 48 kader Posyandu dan petugas kesehatan yang bertanggung jawab atas program tabur gizi di Puskesmas, Dinas Kesehatan (Dinkes) dan UNICEF. Metode lain yang digunakan adalah interview mendalam, observasi dan telaah dokumen. Semua data di analisa secara deskriptif.

Tidak ada mekanisme sistem permintaan dari Posyandu ke Dinkes. Distribusi tabur gizi juga berjalan tanpa catatan logistik dari Dinkes hingga ke Posyandu. Posyandu sebagai saluran distribusi utama tabur gizi mudah dijangkau oleh hampir semua kader (95.8%) dan ibu/pengasuh (78.3%). Perencanaan dan manajemen di Puskesmas buruk dan kurang akan supervisi yang efektif terhadap Posyandu, maupun supervisi dari Dinkes ke Puskesmas. Pelatihan untuk kader hanya berlangsung dua kali yang berpengaruh terhadap rendahnya pengetahuan kader terlatih tentang program tabur gizi. Hanya sekitar 30.2% kader yang pernah mengikuti pelatihan program tabur gizi. Sebanyak 79.2% Posyandu telah memasukkan laporan distribusi tabur gizi ke Puskesmas. Sebagian besar Posyandu (85.4%) mengalami kelebihan persediaan tabur gizi dan sebagian besar oleh karena distribusi dari persediaan yang berlebih dari Puskesmas. Partisipasi masyarakat terutama kepala dusun tidak begitu berperan. Cakupan distribusi yang menerima 60 bungkus tabur gizi pada enam bulan terakhir hanya sekitar 37.9%.

Hampir semua komponen esensial pada sistem distribusi tabur gizi tidak berfungsi dengan baik. Setiap komponen saling berkaitan dengan komponen lainnya, sehingga malfungsi dari suatu komponen akan juga berpengaruh pada komponen lainnya, yang pada akhirnya akan berpengaruh pada rendahnya cakupan distribusi tabur gizi.

Kata kunci: tabur gizi, system kesehatan, distribusi

## ABSTRACT

Name : Muharni  
Study program : Nutrition  
Thesis title : System Review on Distribution of Multiple  
Micronutrient Powder in Praya Tengah, Central Lombok  
District

Multiple micronutrients powder (MNP), a home fortification contains of vitamins and minerals in a form of powder have been showed successful in treating and preventing anemia with a cure rate of 49-91%. Scaling-up the MNP program nationally is addressed to Asian countries including Indonesia. One of the requirements of establishing effective and efficient scale-up program is to define the proper delivery strategy or distribution system, hence high and equitable program coverage will be obtained and well maintained.

The general objective of this study was to review the implementation of existing distribution system of MNP program in relation to coverage in Praya Tengah, Central Lombok District. A cross sectional study was conducted by interviewing 240 children aged 12-59 months, 48 Posyandu cadres and health service providers responsible person for MNP program of Puskesmas, District Health Office (DHO) and UNICEF. To reveal the existing distribution system, in-depth interview, observation, record checking or document review were also executed. All data were descriptively analyzed.

There was no mechanism of requesting system from Posyandu to DHO. The frequency of distribution was inconsistent with no records of MNP logistic from DHO level to Posyandu. Posyandu as the main site of MNP distribution was accessible by most cadres (95.8%) and mother/caregivers (78.3%). Planning and management in Puskesmas was poor, with lacks of effective supervision either to Posyandu or from DHO. Training for cadres only conducted two times during the last three years, resulting in poor knowledge of trained cadre. Only 30.2% cadre were ever trained on MNP program. About 79.2% Posyandu submitted last report of MNP distribution to Puskesmas. Most Posyandu (85.4%) had experienced MNP over stocking, mostly due to over dropping by Puskesmas. Community participation on MNP distribution especially community leader was insufficient. Only 37.9% of targeted children received 60 sachets in the last six months, considered a low coverage of MNP distribution.

Almost all essential components of MNP distribution system were mostly deficient. As they interrelated to each other, any deficiency might give impact to others; consequently, coverage of MNP distribution was low.

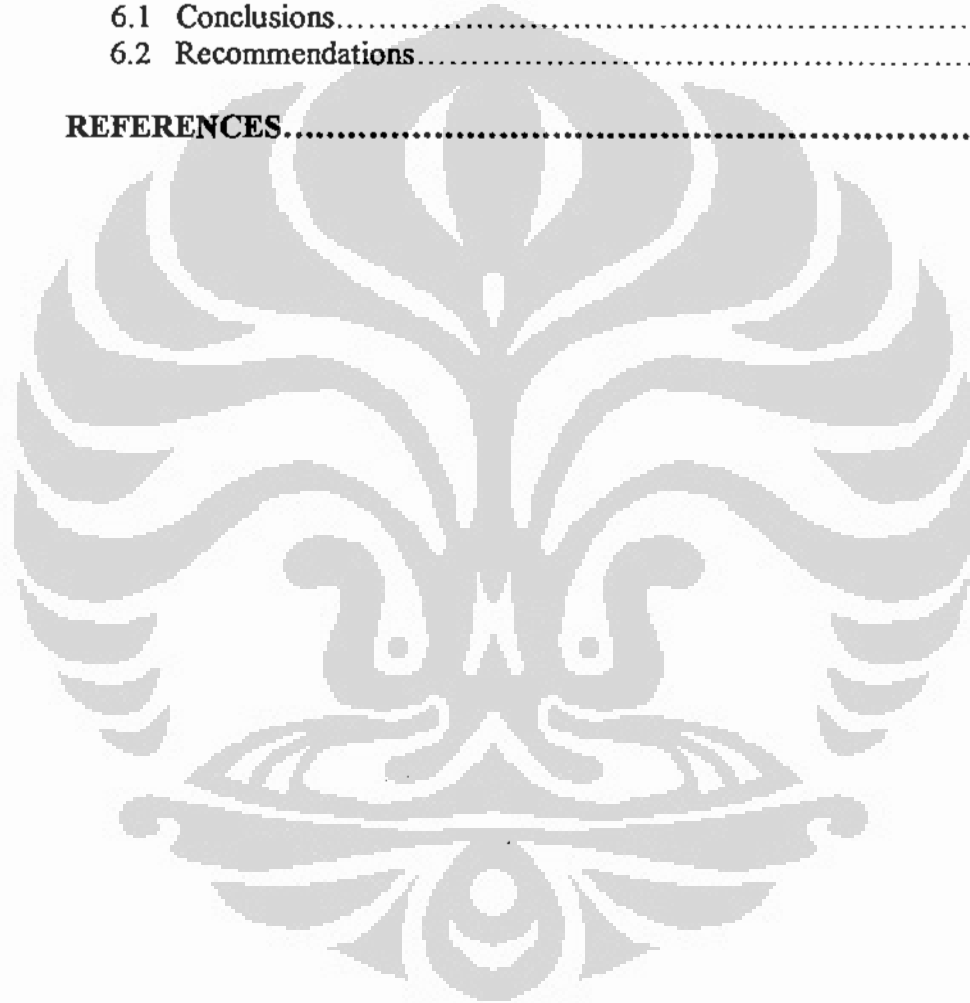
**Key words:** multiple micronutrient powder, health system review, distribution

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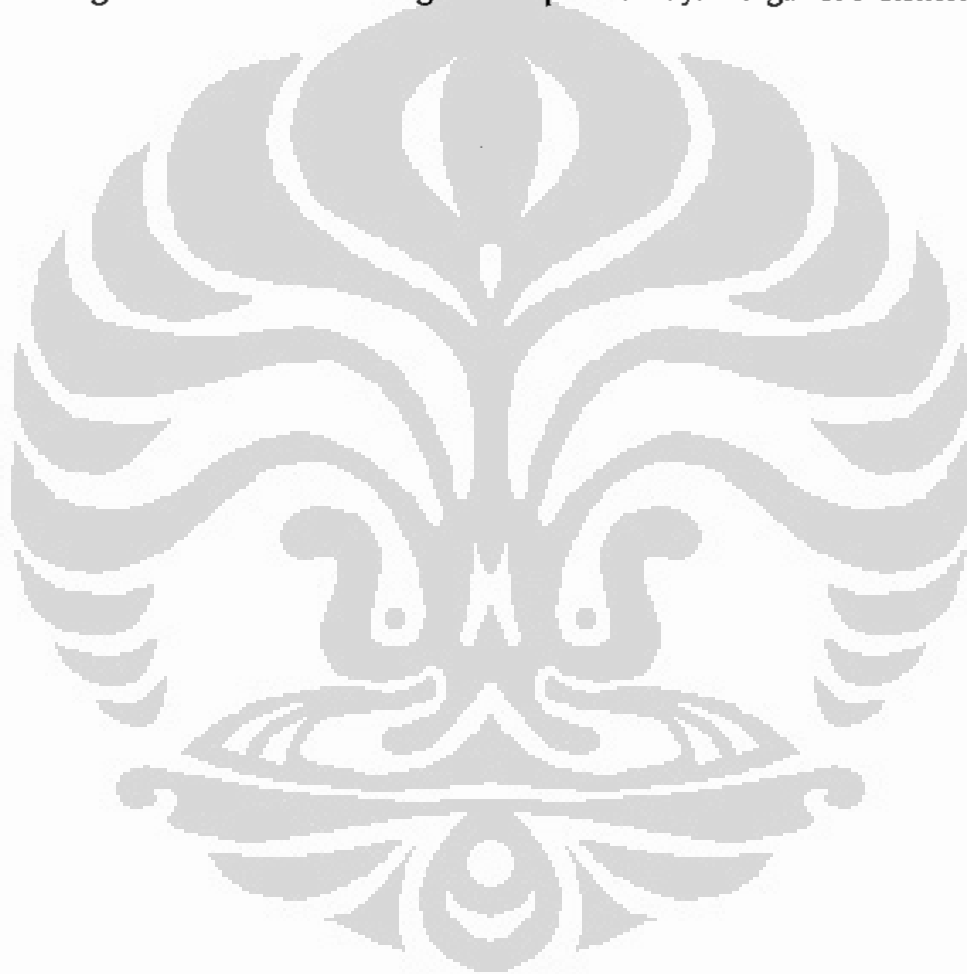


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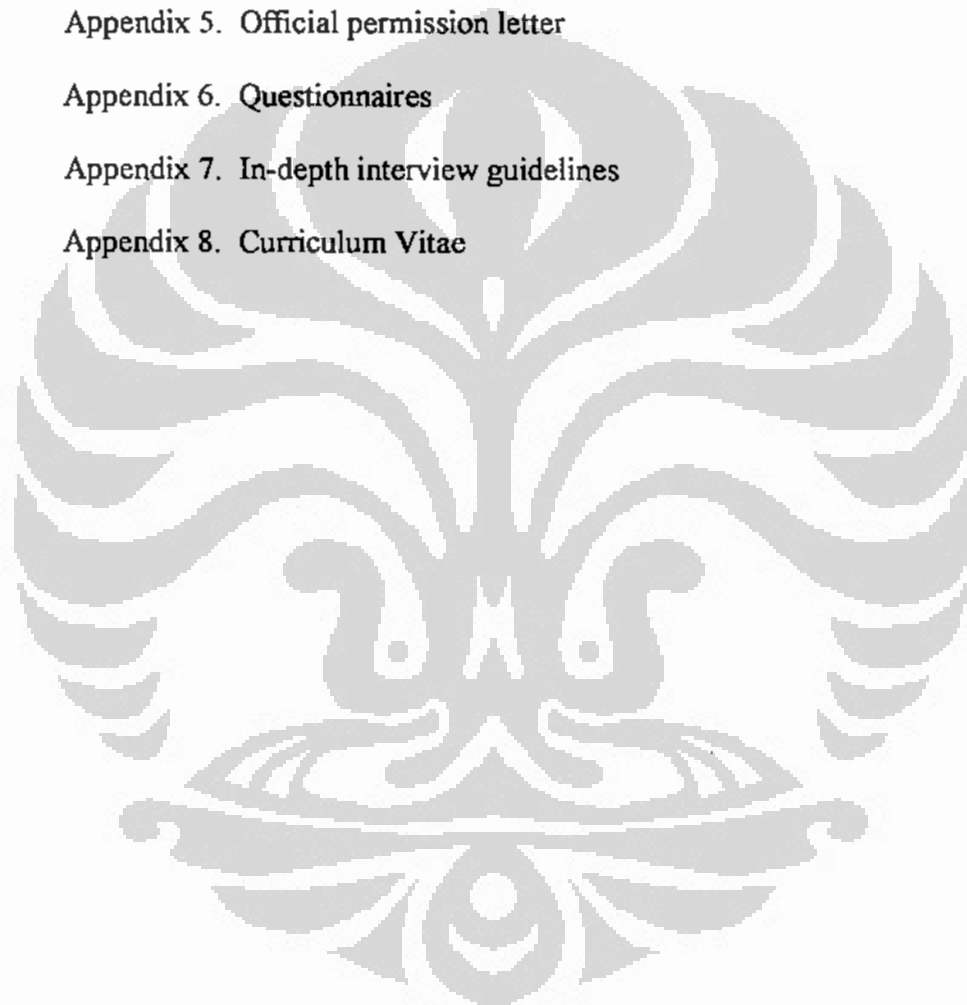
Appendix 4. Informed consent

Appendix 5. Official permission letter

Appendix 6. Questionnaires

Appendix 7. In-depth interview guidelines

Appendix 8. Curriculum Vitae



## LIST OF ABBREVIATIONS

MNP	:	Multiple Micronutrients Powder
CHANSYS	:	Community Health System Strengthening
INACG	:	International Nutritional Anemia Consultative Group
CHR-UI	:	Center for Health Research University of Indonesia (Pusat Penelitian Kesehatan Universitas Indonesia)
UNICEF	:	United Nations Children's Fund
DHO	:	District Health Office (Dinas Kesehatan/Dinkes)
Puskesmas	:	Pusat Kesehatan Masyarakat (Community Health Center)
Posyandu	:	Pos Pelayanan Terpadu (Integrated Health Post)
WHO	:	World Health Organization
WHO GMP	:	World Health Organization Good Manufacturing Practices
WFP	:	World Food Programme
HKI	:	Helen Keller International
SGHI	:	Sprinkles Global Health Initiatives
CBS	:	Central Bureau Statistic (Badan Pusat Statistik/BPS)
MOH	:	Ministry of Health (Kementrian Kesehatan/Kemkes)
SOP	:	Standard Operational Procedure

## OPERATIONAL DEFINITIONS

### COVERAGE OF MNP PROGRAM

is proportion of children aged 6-59 months who receive 60 sachets of MNP in the last six months. This measurement used representative sample from target group in a free population.

### RESOURCES FOR MNP DISTRIBUTION

is a combined score of availability of trained cadre and Puskesmas staff, availability of MNP supply, children registration book and record of MNP logistic at Posyandu and Puskesmas.

### ACCESSIBILITY OF POSYANDU

is perception of mothers/caregivers and cadre to reach Posyandu with regards to time needed and easiness.

### PLANNING AND MANAGEMENT

is a combined score of planning of MNP program, job description, area of responsibility, meetings conducted and schedule of planned activities.

### TRAINING AND SUPERVISION

is assessed by scoring several criteria regarding training attendance of cadre and Puskesmas staff, availability of SOP/guidelines and supervision at Posyandu and Puskesmas.

### FIXED SCHEDULE OF POSYANDU DAY

is the fixed time and venue of MNP distribution for at least four times in the last six months.

## NOTIFICATION OF MNP DISTRIBUTION SCHEDULE

is information given to target populaton regarding schedule of MNP distribution in terms of outreach, invitation letter, announcement by mosque and notification material such as poste and banner.

## QUALIFIED STORING SYSTEM

is indicated by availability of specific room to store MNP, cleanliness and no signs of cockroach or mouse during observation.

## ADEQUACY OF MNP IN POSYANDU

is indicated by adequate and punctuality of MNP stock for distribution at Posyandu level at least for four times in the last six months.

## KNOWLEDGE OF HUMAN RESOURCES

is a combined score of knowledge of cadre regarding benefit, content and use of MNP, requesting, delivery and storing system.

## CHAPTER 1

### INTRODUCTION

#### 1.1 Background

Anemia is the most common nutrient deficiency affecting both developing and developed countries, especially among pregnant women and young children. Almost half (47.4%) of preschool aged children of the world's population were anemic, a severe public health problem with  $\geq 40\%$  prevalence among preschool aged children in South-East Asia countries (de Benoist *et al.*, 2008). Nutrition Surveillance System (NSS) showed an anemia prevalence of 50-85% among underfive children (HKI, 2000). The National Health and Households Survey (2001) confirmed that anemia was still the main problem in Indonesia with increasing prevalence ( $>55\%$ ), particularly among children less than 24 months. This trend seems correlated with the declining quality of household food consumption, including low quality of complementary food given to young children (Jahari *et al.*, 2008).

Oral ferrous sulfate syrups have been the primary strategy to control anemia in infants and young children. However, adherence is often limited due to a combination of factors: the syrup has an unpleasant metallic aftertaste, leaves dark stains on teeth, and abdominal discomfort with high dosage (Galloway & McGuire, 1994). Furthermore, there are technical disadvantages associated with the use of liquid iron preparations such as short shelf life, high transportation costs due to the bottles' weight and difficulty in accurately dispensing the drops, especially among illiterate populations, as measuring an accurate decimal volume from a dropper is required (DeMaeyer *et al.*, 1989; Nestel & Alnwick, 1997).

A new method has been introduced to the world as an alternative to help reduce prevalence of anemia. Micronutrients powder (MNP), a home fortification contains of vitamins and minerals in a form of powder, was introduced in 1996. Randomized community-based studies on MNP involving both anemic and non-anemic children have been completed in diverse setting i.e. Ghana (Zlotkin *et al.*, 2001; Zlotkin *et al.*, 2003), Cambodia (Giovannini *et al.*, 2006), Pakistan (Sharieff *et al.*, 2006), Bangladesh (Hyder *et al.*, 2007), India (Hirve *et al.*, 2007) and Haiti



(Menon *et al.*, 2007). Several studies had been done as well in rural and urban area of Indonesia (HKI, 2006; Jahari *et al.*, 2008) also during emergencies after tsunami in Aceh (HKI, 2006; de Pee *et al.*, 2007). Overall results of those efficacy studies showed that MNP was successful in treating and preventing anemia. Cure rates of anemia ranged from 49-91%, depending on the confounding presence of other factors that also lead to anemia, such as malaria. MNP was also shown to be well tolerated by children, easy to administered and acceptable to their caregivers (SGHI, 2009).

Many Asian countries were poised to scale up the use of MNP as part of an integrated infant young child nutrition strategy including Indonesia (UNICEF, 2009). Before scaling-up the MNP program nationally, one of the requirements of establishing effective and efficient scale-up program is to define the proper delivery strategy or distribution system, hence high and equitable coverage of program will be obtained and maintained (Bryce *et al.*, 2003). Review of several programs derived from UNICEF child health data sets and other sources done in most countries, shows that global coverage for most intervention programs are below 50%. Coverage rates are fairly high for a few interventions i.e. breastfeeding and measles vaccination, but for most countries and most intervention coverage is low or very low i.e. vitamin A, oral rehydration therapy and zinc (Jones *et al.*, 2003). Although the knowledge and instruments already established, somehow, the distribution did not reach the targeted group thoroughly. Poor children were far less likely to receive the interventions than children living in families, communities, and countries with more resources (Victora *et al.*, 2003)

A study conducted in three selected low-high performance areas in Indonesia found that the average coverage of vitamin A program was still below 70%, which represent the minimal coverage expected to observe child mortality's reduction. The study highlighted difficulties in supply management such as inaccurate assessment of provision and logistic management, un-reached targets due to un-reached geographic areas, different format and calculation of reporting and recording for coverage at different level of distribution and less socialization towards vitamin A distribution (Pangaribuan *et al.*, 2007).

In regards to MNP distribution, the choice of distribution depends on the ability of existing systems to reach the intended target group with the desired frequency, the capacity of personnel to implement, communicate and monitor the distribution, and the cost and sustainability. The types of MNP distribution channel available are government fixed site, community distributed/outreach, non-government health services and special events. The selection of MNP distribution channel should be based on coverage, capacity to delivery at community level, motivation of personnel, frequency of contact and logistic and reporting capacity. The dosing schedule also one of the consideration, whether it is daily or flexible administration (UNICEF, 2009). Therefore, a study regarding distribution system of MNP program and its essential components is needed before scaling up the program nationally, hence to obtain high coverage.

### **1.3 Problem statement**

Based on baseline data of CHANSYS program, most of the mothers/caregivers (96%) have ever took their children to Posyandu, but only 62% of mothers/caregivers took their children to Posyandu routinely in the last six months (UNICEF & CHR-UI, 2007). It means that the coverage of monthly growth monitoring program in Central Lombok District still below the national target (80%). Since MNP distribution attached to monthly growth monitoring program, this low coverage may give impact to the coverage of MNP as well. To date, there are no studies regarding distribution system of MNP program.

### **1.2 Rationale and justification of the study**

Community Health Systems Strengthening (CHANSYS) program, a collaboration project between UNICEF and District Health Office of Central Lombok has been running since 2007 (UNICEF, 2007). The ongoing program in Central Lombok District uses MNP as part of a program package to improve child health. The MNP is distributed to all children aged 6-59 months in CHANSYS area. Posyandu, as a fixed site of distribution, has been used as distribution channel of MNP, and also community outreach, known as sweeping activity. Mothers/caregivers are given fifteen sachets of MNP monthly, to be given to their

children flexibly by sprinkle onto foods prepared in the home but not more than one sachet daily.

By reviewing the existing distribution system of MNP program in CHANSYS area, more information regarding distribution system in relation to coverage will be obtained hence this study will give insight to the CHANSYS's program planner, implementer and coordinator in their efforts to construct a proper guideline of MNP distribution.

#### **1.4 Research question**

How is the implementation of existing distribution system of MNP program in relation to coverage in Praya Tengah, Central Lombok District?

#### **1.5 Objectives of the study**

##### **1.5.1 General objective**

To review the implementation of existing distribution system of MNP program in relation to coverage in Praya Tengah, Central Lombok District.

##### **1.5.2 Specific objective**

1. To assess the components of MNP distribution namely: service input, service distribution, management and organization, support system, community participation, service output, service outcome and impact.
2. To assess component functionality of MNP distribution system.
3. To assess the relationships among all components of MNP distribution system.

## 1.6 Conceptual model of the study

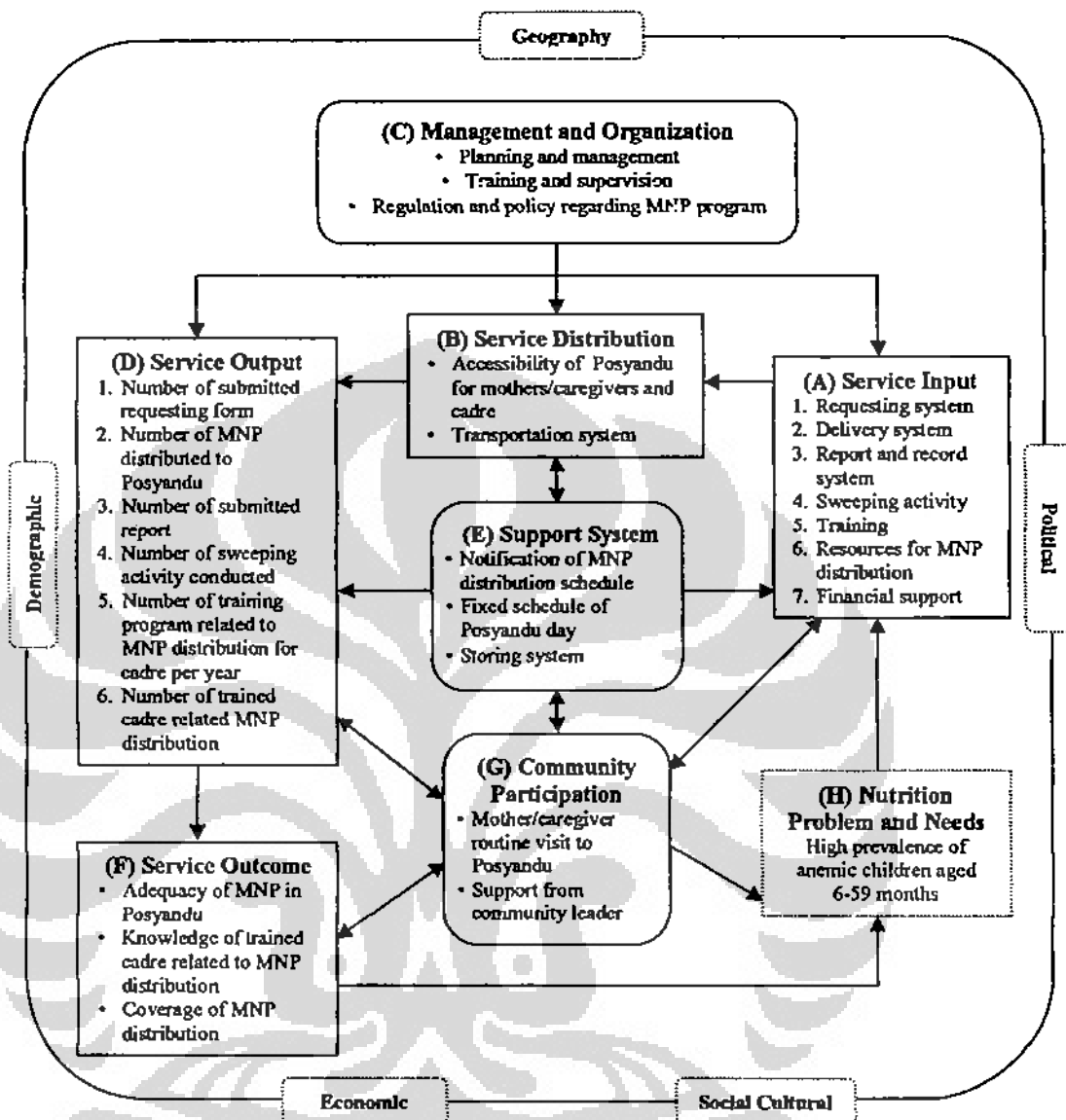


Figure 1.1 Conceptual model of the study

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Multiple Micronutrient Powder (MNP)

INACG/WHO/UNICEF recommend to provide daily iron supplementation to all infants with normal birth weight in the first year of life starting at 6 months of age in regions where the prevalence of anemia is below 40% and where iron fortified complementary foods are not widely used. In areas where the prevalence of anemia is at least 40% or above, it is recommended to continue supplementation until 24 months of age. However, few options exist for supplementing iron to infants and young children (Stoltzfus & Dreyfuss, 1998).

In the last decade, various significant efforts have been made to develop alternative ways of providing iron to young children and reproductive age women. Numerous new and innovative products with proven impact are increasingly available to deliver iron and other essential vitamins and minerals to young children ranging from multiple micronutrient powders (e.g. *Sprinkles*, *Vitashakti*, *Anuka*, *MixMe*), spreads (e.g. *Nutributter*), and crushable tablets (e.g. *Foodlet*). Of the various products recently developed, multiple micronutrient powders (MNP) are particularly attractive due to the fact that they are advanced in terms of research, and acceptability of use in field settings (UNICEF, 2009).

MNP is known as “home fortification” or “point-of-use” fortification (de Pee et al, 2008). MNP is iron (ferrous fumarate) which is encapsulated within a thin lipid layer to prevent the iron from interacting with food, thereby limiting changes to the taste, color, or texture of the food. The manner of giving MNP are instructed to add the entire contents of one sachet daily to any semi-solid food prepared for their infant or young child in the household, immediately before serving. Other essential micronutrients including zinc, iodine, vitamins C, D and A, and folic acid may be added to MNP sachets (Zlotkin & Tondeur, 2007).

Ideally, the use of MNP should start at the age of 6 months and, at a minimum, distribution should be repeated every 6 months until a child reaches 24 months inclusively (4 distributions between 6-24 months). In routine programs,

the priority target is 6-24 months age group as this is the period of rapid growth and development and highest nutrient requirements. If resources are available, the provision of MNP could be extended to children 6-59 months (UNICEF, 2009).

As MNP containing multiple micronutrients required by young children, the benefit of MNP allow them to fulfil their micronutrients requirement. One of the greatest benefits of the MNP concept is that it can be easily incorporated into currently recommended complementary feeding practices for infants after 6 months of age (Zlotkin & Tondeur, 2007). Gibson et al found that in many developing countries, poor weaning practices are common, such as prolonged exclusive breastfeeding, delayed introduction of semi-solid foods, and feeding of poor quality complementary foods with low iron content and bioavailability (Gibson *et al.*, 1998). Therefore, MNP can also contribute to healthy weaning practices through the concurrent promotion of appropriate feeding practices, since MNP can only be used with complementary foods.

#### **Efficacy study of MNP**

Several studies of MNP had been conducted mostly in developing countries such as Asian and African countries (Giovannini *et al.*, 2006; Hirve *et al.*, 2007; Hyder *et al.*, 2007; Menon *et al.*, 2007). Initial study conducted by Zlotkin et al on anemic 6-18 months children with hemoglobin concentration of 70-99 g/L at rural Ghana, comparing MNP and iron drops, showed that 58% of children who received MNP and 56% of the iron drops group went from an anemic to a non-anemic state (Hb>100 g/L) in 2 months. In conclusion the use of MNP and iron drops result similar rate of successful treatment on anemia without side effect although the study took place during wet season when malaria transmission is high (Zlotkin *et al.*, 2001). Further study, after 12 months post intervention of 6 months given MNP, 77.1% of the children remained non-anemic (Zlotkin *et al.*, 2003). The bioavailability of microencapsulated iron in MNP using a dual-stable-isotope study found adequately absorbed by anemic infants (Tondeur *et al.*, 2004) and non-anemic infants as well (Liyanage & Zlotkin, 2002).

Experience from urban slums Jakarta and rural Sukabumi Indonesia done by HKI after six months of MNP intervention to 6-30 months old children indicated that anemia decreased significantly from 24.7% to 14.6% in urban slums Jakarta and from 36% to 16% in Sukabumi (HKI, 2006). Another study in North Jakarta also found that the proportion of anemic children decreased from 62.3% to 24.7% (Jahari *et al.*, 2008).

## 2.2 MNP distribution

### Phases of MNP distribution

There are typically three potential stages of MNP on a program development in a country. A typical scenario in a country evolves a 'start-up' phase which includes one or more demonstration projects followed by scale-up which involves widespread free public distribution for a large group of social beneficiaries. This stage may be followed by distribution through social marketing mechanisms or through market based channels targeting specific socio-economic population groups, but not the poorest, which require a developed private sector and a significant consumer market (UNICEF, 2009).

It is not necessary and nor it is the role of public health organizations to build social or commercial markets. However, if a public distribution system builds awareness and demand for MNP, the private/social market may enter if they perceive an opportunity for profit. As a result, the burden of the public health system will be reduced, enabling the public health system to focus on meeting the universal rights of poor and hard to reach children for nutrition security (UNICEF, 2009).

Planning of program to scale up MNP is multi-dimensional, including the intervention with continued improvement and integration; supply, distribution and financing; and behavior change, operational engagement and motivation, of which all are coordinated and managed through a central unit (UNICEF, 2009).

## **Distribution strategies**

The public health distribution channel should be selected on the basis of considerations such as coverage, capacity to deliver at community level, motivation of personnel, frequency of contact and logistics and reporting capacity. The choice of distribution strategy should also consider the dosing schedule, for example if the chosen dosing schedule is daily for two months followed by a four month 'break', a bi-annual distribution strategy could be chosen. However, if the dosing schedule is flexible through the period of a child's age between 6-24 months, distribution through a routine service with frequent contact with the child and caretaker might be more appropriate (UNICEF, 2009).

## **Supplies**

- Accessing adequate, high quality supplies of MNPs in a timely manner was identified as the most common constraint by countries in either planning or implementing the program
- Adoption and adherence to a standard formulation would facilitate large scale production, timely delivery of orders and the lowest possible price.
- MNP can be produced by food manufacturers and/or pharmaceutical manufacturers. An important requirement is that manufacturers must possess a valid manufacturing license and comply with standard requirements (such as HACCP, Codex Alimentarius, ISO 22000:2005 or WHO GMP).
- Certificate of analysis for each batch of manufactured MNP issued by the manufacturer confirms product compliance with the specification and further analytical testing of the product by the national authorities is redundant.
- Centralized procurement offers certain advantages in the form of expertise - in particular establishing product specifications and assessing compliance of manufacturers with quality requirements -, cost savings and better lead times due to higher volumes.
- Supply from local manufacturers may be preferable for countries that envisage large scale up of the use of MNP since large and regular orders



could be generated. UNICEF is able to provide capacity building support for local manufacturers, which in most cases entails support for in mixing and packaging.

- Country specific layout of the packaging is available from global suppliers, but entails longer lead time and increased costs. The WFP strategy of using a generic sachet with a minimum instruction packaged in country-specific boxes presents a good option.
- Program planners and national regulatory authorities should ensure that government ownership is retained over logos, product names, and branded images, for products distributed through public health services.
- Procurement forecasting tools can facilitate accurate planning and assessment of the MNP supplies needed (UNICEF, 2009).

#### **Storage condition**

MNP storage conditions after distribution for optimal shelf-life (24 months) should be set on temperature below 30°C and relative humidity below 60%. But in practice in many countries, those conditions are difficult to achieve therefore storage conditions before distribution are critical. The final product of MNP should remain in favorable ambient conditions - storage in cool and dry place - as long as possible before final transport for distribution. When conditions are no longer favorable, the product should be used within a relatively short period of time (de Pee *et al.*, 2008).

### **2.3 Determinant factors of program coverage**

A review of coverage in child survival intervention found that in the 42 countries with 90% of child deaths worldwide in 2000, 63% could have been prevented through full implementation of a few known and effective interventions. Levels of coverage with these interventions were still unacceptably low in most low-income and middle-income countries. Worse still, coverage for some interventions, such as immunizations and attended delivery, are stagnant or even falling in several of the poorest countries. Meaning that the intervention needed to achieve millennium development goal of reducing child mortality by

two-thirds on 2015 are not available, because they are not being delivered to mothers and children who need them (Jones *et al.*, 2003). Hence, the need of tailored delivery strategies to the stage of health-system development is essential to every country (Bryce *et al.*, 2003)

Availability and accessibility of a program will highly influence the program coverage. A program should be available and accessible in terms of distribution and supply. Without adequate stock and reachable site of distribution, the program would not be accessible to the target group. A study regarding iron supplementation for pregnant women in Jeneponto, Sulawesi found that among those who received prenatal care, only 72.1% obtained iron tablets (49 out of 68). Of the 49 women who received iron tablets, only 6 women received more than 60 tablets. It showed that inadequate stock of iron tablets on the day of distribution resulted in the inaccessibility of iron tablets (Thorand *et al.*, 1994). Another study in Southeast Sulawesi found that there were some of the target groups who lived in very remote areas such as forests, who did not receive vitamin A capsules, and therefore suffered from chronic vitamin A deficiency (Pangaribuan *et al.*, 2007).

A flexible delivery mechanism also contributes to the program coverage. A study in Bangladesh found that flexible administration of MNP sachets for over four months was found preferable to daily and also gave a positive impact in regard to adherence, acceptability and hematological responses (Ip *et al.*, 2009). Flexible delivery mechanisms respond to the uneven geographical distribution of the population and coverage of the national health system. A vitamin A program in Nigeria adopted three approaches of capsule distribution. First, the fixed strategy, in which supplement distribution took place in existing health facilities (fixed posts). Second approach was the advanced strategy, in which supplement distribution took place in health posts created for the occasion (advanced posts) in rural areas located within 5 to 10 km from a fixed post. Third, the mobile strategy, in which supplementation was implemented by mobile distribution teams in populations located more than 10 km from a fixed or advanced health post, and distribution may take place in a centrally located site or door-to-door. This last strategy has been known as sweeping activity (Aguayo *et al.*, 2005).

If a program use fixed strategy for drugs or supplement distribution, the first task is to enable target group to come to health facilities so they can received the supplement. One of the ways is by giving them social marketing of the program. It is well known that social marketing is an essential component of program successfulness. Socialization of health program will increase awareness of target group to utilize the program. Simple socialization can be done by using socialization material such as poster and banner. Notification to target group by health worker will let them aware of program availability. This kind of strategy should involve community participation to establish community empowerment of a health program. Study in North Jakarta used fun vehicle for children (odong-odong) to be put poster on them socializing MNP to mothers and underfive children. This strategy gave high impact to successfulness of the program itself (Jahari *et al.*, 2008).

Requesting and delivering system will influence stock management which in turn also influences program coverage. Problems are often found that incorrect estimation of requesting stock and poor timeliness of requesting and delivering system. Study in three selected low-high performance vitamin A supplementation in Indonesia (Lampung, West Kalimantan and Southeast Sulawesi) revealed that there were some difficulties in supply management such as inaccurate assessment of supplement needs, poor practices in inventory and stock rotation. In those areas, vitamin A capsules were partly fulfilled by provincial health office, however, the coordination between province and district was not appropriately managed. This study also found poor practices of recording vitamin A distribution on different site of distribution i.e. health clinics and kindergarten which in turn influencing the report of logistic and coverage (Pangaribuan *et al.*, 2007).

Training and supervision are also one of the factors influencing coverage of program. Training and supervision tools are developed at central level and adapted at district level to the specific needs and realities of the districts (Aguayo *et al.*, 2005). A randomized control trial in Zimbabwe was conducted to evaluate the impact of supervision and effectiveness of training program - including stock management and rational drug use - to adherence of standard treatment guidelines

and stock management protocols. The study found that overall stock management and adherence to standard treatment guidelines was improved than those in the control and comparison group. The study also showed that supervision had a positive effect on improving performance and demonstrated that pharmacy technicians with limited clinical skills can be trained to improve their performance (Trap *et al.*, 2001). A review on human resource management interventions to improve performance of health workers in low and medium income countries found that training increased knowledge and skills, improved motivation and feeling of being obliged to change (Dieleman *et al.*, 2009).

Community health workers are more likely to develop knowledge and skills if the training is interactive, provides time to share stories, and offers a chance to practice skills. Strategies used in training must be culturally appropriate. The key training issues for them are assessing training needs, developing training objectives, selecting training content, designing and delivery of training, selecting appropriate training methodologies, identifying trainers, planning logistics, developing a graduation plan, evaluating training programs, and planning for ongoing education (NTC & CDC, 1998).

Poor coverage is clearly a result of weaknesses in both the provision of and demand for services, and a consequence of malfunctioning health systems. Public-health programs that are planned, implemented, and assessed well, tackling a few diseases, can make a difference. Understanding the reasons for our inability to increase coverage, especially among the poorest people, is a first step towards recouping why we have failed and not moving towards universal coverage (Bryce *et al.*, 2003). For instance, vitamin A coverage of children aged 6-59 months received two doses in Nigeria were maintained above 80% annually for three years (1999-2002). One of the key features of this successful program was district-level planning and implementation with oversight and coordination from central level. Each district took the lead in planning and implementation of the district plan of action customizes with district-level condition and involving community participation as well (Aguayo *et al.*, 2005).

**CHAPTER 3**  
**METHODOLOGY**

**3.1 Variables Indicators Matrix (VIM)**

Table 3.1 Variable Indicators Matrix (VIM) of the study

No	Variables	Indicators	Method	References
A	Service input	Availability of requesting system	Interview cadre Document review	(Pangaribuan <i>et al.</i> , 2007)
		Availability of delivery system	Interview cadre Document review	(Pangaribuan <i>et al.</i> , 2007)
		Availability of report and record system	Interview cadre, Puskesmas staff, in-depth interview nutrition staff at DHO Document review	(Kielmann <i>et al.</i> , 1991)
		Availability of sweeping activity	Interview cadre Document review	(Pangaribuan <i>et al.</i> , 2007)
		Availability of training program on MNP distribution (reporting, stocking etc)	Interview cadre	(Harmiko, 2007)
		Score of resources for MNP distribution	Interview cadre Document review	(Harmiko, 2007)
		Availability of financial support	Interview cadre	(Harmiko, 2007)
B	Service distribution	Accessibility of MNP for mothers/caregivers and cadre	Interview mother/caregiver and cadre	(Harmiko, 2007)
		Availability of transportation system	Interview cadre and mother/caregiver	(Kielmann <i>et al.</i> , 1991)
C	Management and organization	Score of planning & management	Interview Puskesmas staff, In-depth interview head of Puskesmas nutrition staff at DHO, head of DHO and responsible person from UNICEF Document review	(Kielmann <i>et al.</i> , 1991)

		Score of training and supervision	Interview cadre, In-depth interview Puskesmas staff, head of Puskesmas nutrition staff at DHO and head of DHO Document review	(Kielmann <i>et al.</i> , 1991)
		Availability of regulation and policy regarding MNP	In-depth interview head of Puskesmas, nutrition staff at DHO head of DHO and responsible person from UNICEF Document review	(Harmiko, 2007)
D	Service output	Number of submitted requesting report	Document review	(Pangaribuan <i>et al.</i> , 2007)
		Number of MNP distributed to Posyandu	Record checking on logistic book of MNP	(Pangaribuan <i>et al.</i> , 2007)
		Number of submitted report	Document review	(Pangaribuan <i>et al.</i> , 2007)
		Number of sweeping activity conducted	Interview mother/caregiver	(Harmiko, 2007)
		Number of training program related to MNP distribution	Interview Puskesmas staff Document review	(Sumarna, 2001)
		Number of trained cadre related to MNP distribution	Interview cadre	(Harmiko, 2007)
E	Support system	Availability of notification on MNP distribution schedule	Interview mother/caregiver	(Pangaribuan <i>et al.</i> , 2007)
		Availability of fixed schedule on MNP distribution	Record checking on register book of MNP distribution	(Pangaribuan <i>et al.</i> , 2007)
		Availability of qualified storing system	Observation of storage room	(de Pee <i>et al.</i> , 2008)
F	Service outcome	Adequacy of MNP at Posyandu	Interview cadre Document review	
		Knowledge score of trained cadre related to MNP distribution	Interview cadre,	(Kielmann <i>et al.</i> , 1991)
		Coverage of MNP (%)	Interview mother/caregiver	(Pangaribuan <i>et al.</i> , 2007)
G	Community participation	Mother/caregiver routine visit to Posyandu	Interview mother/caregiver	(MOH, 2008)
		Support from community leader	Interview cadre	(Harmiko, 2007)

### 3.2 Study design

The study was designed as a cross sectional study.

### 3.3 Study population

Central Lombok District is located on 116°05' - 116°24' east longitude and 8°24' - 8°57' south latitude. The district border to the north is West Lombok and East Lombok District, to the east is East Lombok District, to the south is Indonesian Ocean, and to the west is West Lombok District. Total area is 1.208,39 km<sup>2</sup> (120.839 ha). The northern area is mountainous, several sub-district lies on the lower side of Rinjani Mountain and has lower temperature. The central area is lower ground while the southern area is hilly. As tropical area, Central Lombok has two seasons, dry and rainy seasons. The rainfall record ranges between 11 – 233.64 mm and 1 – 22 rainy days (CBS, 2009).

Central Lombok District consists of 12 sub-districts and 124 villages. Total population was 844.105 people of which 92.055 were underfive children. The sex ratio was 87:100, meaning that among 100 females there were 87 males. The population density was 699/km<sup>2</sup> in which Praya sub-District is the densest. Total family member in average was 4 persons (CBS, 2009). The percentage of family living below the poverty line ranged between 47% in the sub-district of Praya and Jonggat to greater than 65% in Praya Timur (UNICEF, 2007). Approximately 57.8% of job seekers had graduated from primary school and only 17.0% graduated from university (CBS, 2009).

Indonesia Basic Health Research showed that the prevalence of stunting of underfive children in Central Lombok district was above (45.1%) the national prevalence. On the other hand, prevalence of undernourished and wasting of underfive children were below the national prevalence, 18.2% and 9% respectively (MOH, 2008). Baseline data of CHANSYS program indicated that malaria symptoms and worm infestation among children in Central Lombok district were 22% and 23%, respectively (UNICEF & CHR-UI, 2007).

### 3.4 Study site

CHANSYS program applied to several sub-districts in Central Lombok district in sequent. Initiation phase of CHANSYS program started with four sub-districts, namely Pujut, Kopang, Praya Tengah, and Pringgarata in August 2007. Furthermore, the second phase in 2009, another two sub-districts added: Praya Timur and Batukliang Utara. One of the programs on CHANSYS was giving MNP to children age 6-59 months old.

The selection criteria for the first four sub-districts were the incidence of severe-acute malnutrition (SAM), poverty, nutrition staff available in the Puskesmas and presence of community groups to support outreach. This study, purposively selected one sub-district, Praya Tengah, from total scoring of several criteria regarding distribution of MNP among the first phase of CHANSYS program. The selection criteria of this sub-district were the nearest distance from central district to sub-district, less population density, small area of sub-district, highest number of Posyandu Mandiri, smallest number of underfive children per Posyandu (CBS, 2009). These criteria were selected to obtain the possible best practice of MNP program available in Lombok Tengah.

### 3.5 Subject of the study

In regards to the objectives of this study, two sample populations were selected:

1. Selected Posyandu as service provider of MNP program, supervised by two Puskesmas (Batunyala and Pengadang) in Praya Tengah sub-district and one DHO. A cadre responsible for MNP program was selected representing each Posyandu, Puskesmas staff and nutrition staff at DHO who was responsible for MNP program. Head of Puskesmas, head of DHO and responsible person from UNICEF were also included as respondents.
2. 12-59 months old children as targeted group of MNP program. Mothers/caregivers with children aged 12-59 months taken from free population were interviewed.



### 3.6 Sample size

#### a. Posyandu

In this study, number of Posyandu to be included in the study was calculated using formula for sample survey with simple random sampling (Lwanga & Lemeshow, 1991). Since no data available on proportion of active Posyandu, highest number of Posyandu was obtained from assuming proportion of active Posyandu was 50%.

$$n = \frac{z^2_{1-\alpha/2} P(1-P)N}{d^2(N-1) + z^2_{1-\alpha/2} P(1-P)}$$

Notes:

$n$  = the calculated sample size of Posyandu = 48

$P$  = anticipated population proportion of active Posyandu = 50%

$d$  = absolute precision required = 10%

$N$  = population size of Posyandu = 93

$z_{1-\alpha/2}$  = z-score at 95% confidence level

About 48 Posyandu were randomly selected from all 93 Posyandu existed in Praya Tengah sub-district using simple random sampling.

#### b. Children aged 12-59 months

The sample size of 12-59 months old children was calculated using formula to estimate a population proportion of MNP coverage with specified absolute precision (Lwanga & Lemeshow, 1991). Since no data available on MNP coverage, highest number of children aged 12-59 months was obtained from assuming proportion of MNP coverage was 50%.

$$n = \frac{z^2_{1-\alpha/2} P(1-P)}{d^2}$$

Notes:

$n$  = the calculated sample size of children = 97

$P$  = anticipated population proportion of MNP coverage = 50%

$d$  = absolute precision required = 10%

$z_{1-\alpha/2}$  = z-score at 95% confidence level

After considering design effect (DEFF) of 2 and 15% non-response cases, total sample needed was 224 underfive children.

### 3.7 Sampling methods

Central Lombok district purposively selected based on area of CHANSYS program. Praya Tengah sub-district, one out of four CHANSYS sub-district, purposively selected based on the nearest distance from central district to sub-district, less population density, small area of sub-district, highest number of Posyandu Mandiri, smallest number of underfive children per Posyandu. Forty-eight clusters of Posyandu were randomly selected. Sampling unit was children aged 12-59 months of the respective Posyandus. The targeted children obtained from free population by mapping the area of Posyandu into four quadrants. One child was selected without randomization from each of quadrants including the center area. Hence, five children aged 12-59 months were obtained from each Posyandu. Total sample collected was 240 children aged 12-59 months

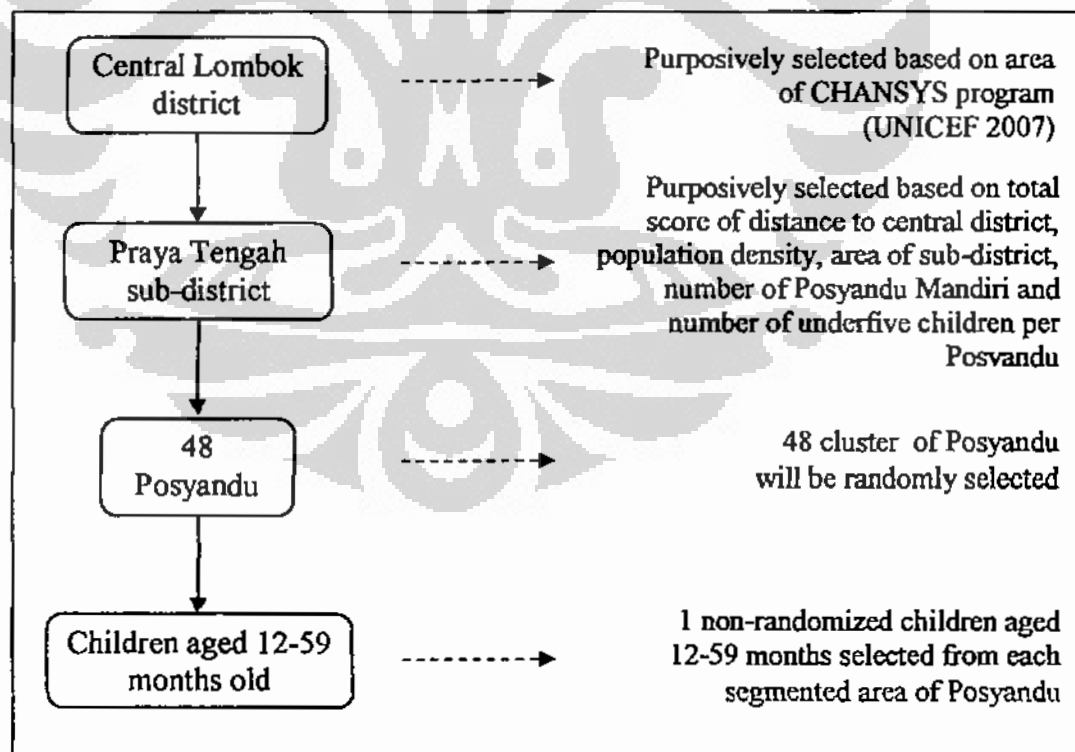


Figure 3.1 Sampling procedure

### 3.9 Data collection procedures

Several methods were used to collect data, including interview using structured questionnaire, in-depth interview, observation using check list questionnaire and record checking/document review (secondary data review). Interview with caregiver and cadre was conducted by local trained interviewers, personally and in a convenient situation (inside or outside the house) for each selected subject. The questionnaires were pre-tested prior the actual data collection. Observation on storage was performed by one observer to avoid interpersonal bias. The in-depth interview and secondary data were obtained from responsible person of MNP program from UNICEF, district health office, Puskesmas and Posyandu.

### 3.10 Methods of assessment

Description of assessment described in detail is as follows:

- a. **Service input.** The implementation of MNP distribution system required a service input available both in Posyandu and Puskesmas. The assessments:
  - Interview to assess the availability of requesting, delivery, report and record system and sweeping activity. This data was supported by document review on MNP distribution registration book, record of requesting and sweeping activity in the last six months.
  - Interview to assess the availability of financial support and training program on MNP distribution included: benefit, reporting, storing, delivery and requesting for cadre and nutrition staff at Puskesmas in the last three years.
  - Interview and document review to assess the availability of resources including human resources, supply of MNP and records at Posyandu and Puskesmas in the last six months using scoring system. If a resource is available then score one would be granted on each resource. A score of 50% or more may suggest resources are in place. The resources for MNP distribution at Posyandu are:

Table 3.2 Potential score for resources of MNP distribution at Posyandu

No.	Resources	Score
1.	Trained cadre	1
2.	Supply of MNP	1
3.	Children registration book	1
4.	Record of MNP logistic	1
	Total	4

The resources for MNP distribution at Puskesmas are:

Table 3.3 Potential score for resources of MNP distribution at Puskesmas

No.	Resources	Score
1.	Trained nutrition staff	1
2.	Supply of MNP	1
3.	Record of MNP request to DHO	1
4.	Record of MNP delivery to Posyandu	1
5.	Record of MNP logistic	1
	Total	5

- b. Service distribution.** Interview with cadre and mother/caregiver to determine the accessibility of Posyandu or place for MNP distribution with regards to time needed and easiness to reach it was conducted. Information on transportation system was also obtained during the interview.

Accessibility was determined based on:

- Physically accessible by walking less than 20 minutes.
- Psychologically accessible by perceived easiness to access Posyandu or place of MNP distribution.

The criteria of accessibility are as follows:

- Good, both of above criteria are mentioned.
- Moderate, only one of above criteria are mentioned.
- Less, none of above criteria is mentioned.

- c. Management and organization.** Essential indicators include in this variable were:

- Interview and document review to assess planning and management of MNP program in Puskesmas using scores with criteria below (Table 3.4). If a resource is available then score one would be granted on each

resources. A score of less than 50% indicated poor job organization and planning capability.

Table 3.4 Potential score for planning and management criteria

No.	Criteria	Score
1.	District health planning regarding MNP program was available	1
2.	Local planning regarding MNP program was available	1
3.	Job description on MNP distribution was available	
4.	Arcas of responsibility were clearly defined within the health team	1
5.	Meetings to discuss schedules and problems performed	1
6.	Schedule of planned activities was available	1
	Total	6

- Interview to assess training and supervision activity for cadre and Puskesmas staff responsible for MNP distribution using scoring system. Score 50% or more suggests adequate training and supervision. Criteria for training and supervision consist of:

Table 3.5 Potential score for training and supervision at Posyandu

No.	Resources	Score
1.	Attended any training on MNP distribution-related topic in the last three years	1
2.	Other cadre attended training on MNP distribution-related topic in the last three years	1
3.	Posyandu has any SOP/guideline of MNP distribution	1
4.	Puskesmas supervised your work at Posyandu	1
5.	Visit by Puskesmas staff to Posyandu in the last 6 months	1
	Total	5

Table 3.6 Potential score of training and supervision at Puskesmas

No.	Resources	Score
1.	Attended any training on MNP distribution-related topic in the last three years	1
2.	Other Puskesmas staff attended training on MNP distribution-related topic in the last three years	1
3.	Puskesmas has any SOP/guideline of MNP distribution	1
4.	Puskesmas has any supervisor (from DHO) supervised your work	1
5.	Visit by DHO staff to Puskesmas in the last six months	1
	Total	5

- Regulation and policy regarding MNP program was assessed through in-depth interview with head of Puskesmas and head of DHO.

d. **Service output.** The output of MNP distribution system consisted of:

- Document review to assess number of submitted requesting report in the last six months.
- Record check to assess number of MNP distributed to Posyandu from Puskesmas on logistic book in the last six months.
- Document review on number of submitted report of MNP distribution in the last six months.
- Interview mother/caregiver to assess number of sweeping performed by cadre. Ratio of number of sweeping activity conducted to number of obligatory sweeping activity was determined.
- Interview the nutrition staff at Puskesmas responsible for MNP distribution and document review on number of training program related to MNP distribution conducted in the last three years
- Interview cadre responsible for MNP distribution to assess number of trained cadre in the last three years .

e. **Support system.** This variable consisted of several indicators:

- Interview with mother/caregiver to assess availability of notification of MNP distribution schedule.
- Record checking on registration book about information on fixed schedule (time and venue) on Posyandu day in the last six months. Availability of fixed schedule suggests if there were fixed time and venue of MNP distribution for four times or more.
- Observation on storage room of MNP at Posyandu to assess quality of storing. Three aspects of qualified storage were availability of specific room to store MNP, cleanliness and no signs of cockroach or mouse during observation. If all of these aspects were fulfilled, it may suggest as qualified storing system.

f. **Service outcome.** The indicators of service outcome consisted of:

- Interview cadre and supported by document review to assess adequacy of MNP in Posyandu in the last six months. Two aspects of this indicator

were adequacy of MNP stock for distribution and timely supply arrival before distribution day at Posyandu. If both criteria were fulfilled at least for four months, it suggests adequacy of MNP in Posyandu.

- Interview cadre to assess knowledge of trained cadre related to MNP benefit for underfive, use of MNP, requesting, delivery and storing of MNP using scoring system. The criteria of cadre's knowledge were classified as follows:
  - Good: score of correct answer >70%
  - Moderate: score of correct answer 50-70%
  - Poor: score of correct answer <50%
- Coverage of MNP was calculated in percentage. Mothers/caregivers were asked whether they had received 60 sachets of MNP either from Posyandu or sweeping activity in the last six months.

**g. Community participation.** Information on mother/caregiver routine visit to Posyandu in the last six months was assessed by interviewing mother/caregiver. At least four times visit was considered as routine visit to Posyandu. Support from community leader on MNP program was assessed by interviewing cadre.

### 3.10 Data analysis

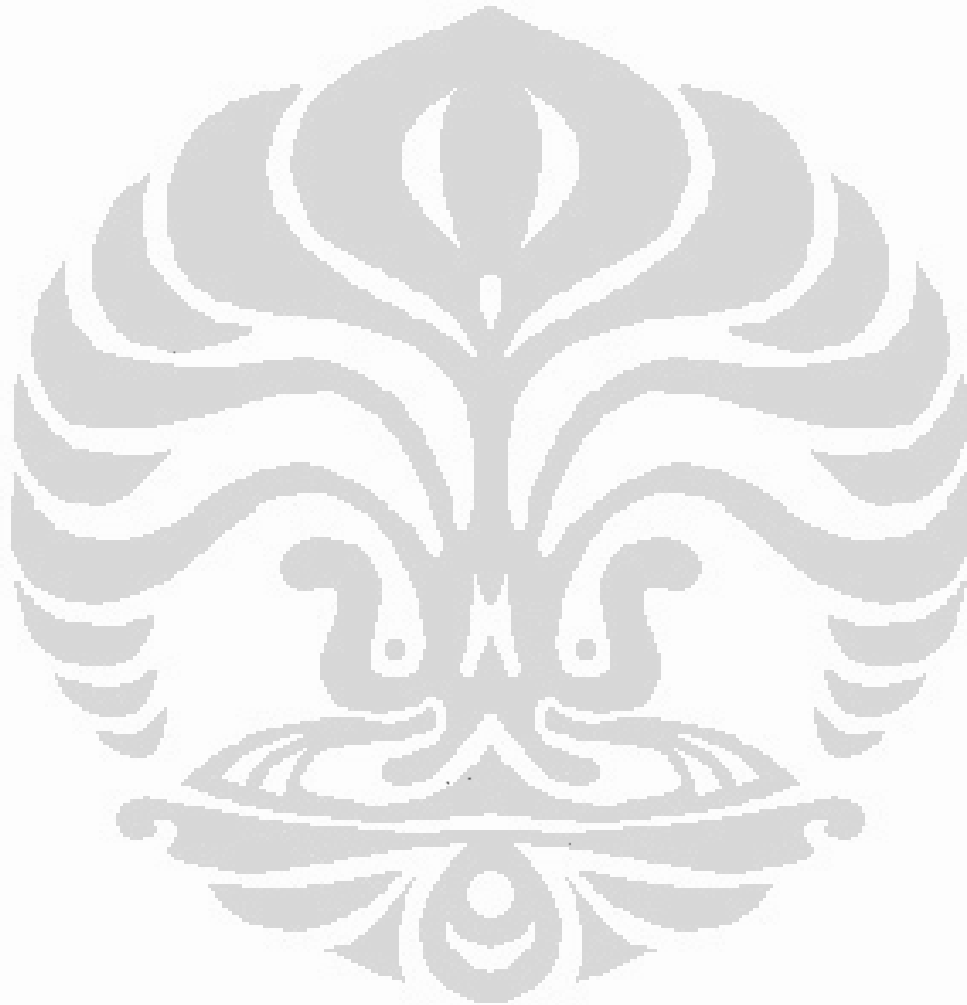
After data collection, all of data were cleaning. All variables obtained from interview using structured questionnaires were analyzed using descriptive statistic by SPSS version 16.0. Data on in-depth interview and observation were summarized based on defined theme and then descriptively analyzed.

### 3.11 Ethical consideration

The protocol of the study obtained an ethical clearance from the Ethical Committee of the Medical Faculty, University of Indonesia. Permission to conduct the study was obtained from the local government offices.

The interviewers gave explanation on the research purpose, procedure and ensure confidentiality to all respondents. All data was obtained with the least

burden on the respondent's side. The respondents had the rights to refuse or quit at any time. Before conducting interview, the respondents signed a written consent.





## CHAPTER 4

### RESULTS

#### 4.1 General Characteristic

Praya Tengah sub-district had two Puskesmas namely Batunyala and Pengadang. Table 4.1 shows characteristics of those Puskesmas under study.

Table 4.1 Characteristics of Puskesmas under study in Praya Tengah sub-district

Characteristic	Batunyala	Pengadang	Total
Number of village under supervision	5	5	10
Number of Posyandu under supervision	54	50	104
Total population	31,686	33,169	64,855
Number of cadre	109	126	235
Number of active cadre, <i>n</i> (%)	95 (87)	114 (91)	209 (89)
Number of trained cadre, <i>n</i> (%)	35 (32)	36 (29)	71 (30)
Number of underfive children	3359	4504	7863
Ratio Posyandu : underfive children	1:62	1:90	1:75

The peripheral health facilities studied included two Puskesmas covering 104 Posyandu, 5 Pustu and 7 Polindes. There were 5 nutrition staffs of the two Puskesmas responsible for nutrition program giving ratio to inhabitants of 7.7 per 100.000 and ratio to underfive children of 1:1573.

Most caregivers (93.8%) of underfive children were their mothers. Others caregivers were grandmother, aunty, father and foster mother. Median age of the caregivers was 29 with a range of 17 to 50 years. Main educational level of the father and mother (42.8% and 44.6% respectively) were illiterate or graduated from elementary school. The main occupation of father was laborer (24.3%) and others occupation of father were private employee, mechanic and craftsmen. Almost half of mothers were housewives (43.8%) and other occupations of mother were craftsmen and private employee.

Table 4.2 Characteristic of socio-economic status of household in Praya Tengah sub-district

Characteristic	Total
Family size <sup>1</sup> , median (min, max)	4 (2,10)
Underfive children in the household <sup>1</sup> , n(%)	
1 underfive	216 (90)
>1 underfive	24 (10)
Father educational level <sup>2</sup> , n(%)	
Never or <3 years of schooling	39 (16.5)
Elementary school	62 (26.3)
Junior high school	56 (23.7)
Senior high school	59 (25)
University	20 (8.5)
Mother educational level <sup>1</sup> , n(%)	
Never or <3 years of schooling	24 (10)
Elementary school	83 (34.6)
Junior high school	59 (24.6)
Senior high school	62 (25.8)
University	12 (5)
Father's occupation <sup>3</sup> , n(%)	
Farmer/fisherman/breeder (land/boat/husbandry owner)	50 (21.5)
Farmer/fisherman (not land/boat husbandry owner)	28 (12)
Government employee	24 (10.3)
Entrepreneur	10 (4.3)
Laborer	58 (24.8)
Migrant worker	40 (17.1)
Unemployed	3 (1.3)
Driver/ojek/cidomo	11 (4.7)
Others	10 (4.3)
Mother's occupation <sup>1</sup> , n(%)	
Housewife	105 (43.8)
Farmer/fisherman/breeder (land/boat/husbandry owner)	39 (16.2)
Farmer/fisherman (not land/boat husbandry owner)	23 (9.6)
Government employee	18 (7.5)
Entrepreneur	16 (6.7)
Laborer	22 (9.1)
Migrant worker	8 (3.3)
Others	9 (3.7)

<sup>1</sup>n=240

<sup>2</sup>n=236

<sup>3</sup>n=234

Most (95.8%) cadres were women, graduated from senior high school (41.7%), while 39.6% cadres were housewife and other occupations were district honorer, entrepreneur, driver and craftsmen. Most (88.9%) cadres at Posyandu were active. More than half of cadres (60.4%) have been cadre for  $\geq 10$  years, ranged from 1 to 29 years.

Table 4.3 Characteristics of cadre in Praya Tengah sub-district

Characteristic	Total, n=48
Sex, <i>n</i> (%)	
Men	2 (4.2)
Women	46 (95.8)
Educational level, <i>n</i> (%)	
<3 years of schooling	1 (2.1)
Elementary school	9 (18.8)
Junior high school	15 (31.2)
Senior high school	20 (41.7)
University	3 (6.2)
Occupation, <i>n</i> (%)	
Housewife	19 (39.6)
Farmer/ breeder (land/ husbandry owner)	6 (12.5)
Farmer/breeder (not land/ husbandry owner)	10 (21.1)
Private employee	6 (12.5)
Others	7 (14.6)
Age of cadre, <i>mean</i> ± <i>SD</i>	33.21 ± 6.1
Duration of being cadre, <i>median</i> ( <i>min</i> , <i>max</i> )	10 (1,29)

#### 4.2 Service input

Initially, MNP would be distributed every six months concurrently with vitamin A distribution. However, in the study area, the practice was that mothers/caregivers only visited Posyandu if their children would get something in addition to routine weighing. This practice particularly occurred with children above 12 months, who had completed immunization. Therefore, the Puskesmas staff and cadre decided to distribute MNP monthly, during Posyandu activity. They asked mother to return empty sachets of MNP before getting new one, aiming to increase children's attendance on Posyandu day. However, it only happened for the first four months. Afterwards, due to direction by DHO in order to achieve high coverage of MNP, they distributed MNP bimonthly as one box of MNP consisted of 30 sachets, sufficient for two months supply. During the last distribution in August 2009, 60 MNP sachets were distributed for four months, to similarize vitamin A distribution months of February and August, as the highest Posyandu attendance.

There were no requesting system from cadre to Puskesmas staff available, neither from Puskesmas staff to DHO. Requesting system only occurred from DHO to UNICEF. Based on in-depth interview to nutrition staff at DHO, DHO

determined targeted children (6-59 months old) based on report of Puskesmas on growth monitoring program and sometimes using projection data. The last request for delivery in August 2009 was made more than one year in advance (June 2008).

MNP distribution was attached to monthly growth monitoring program in Posyandu. The MNP stock was delivered to Posyandu on the day of distribution by Puskesmas staff. There were no record of logistic available at Posyandu, Puskesmas nor DHO. Although 83.3% cadres conducting sweeping activity, however, there were no records available as well.

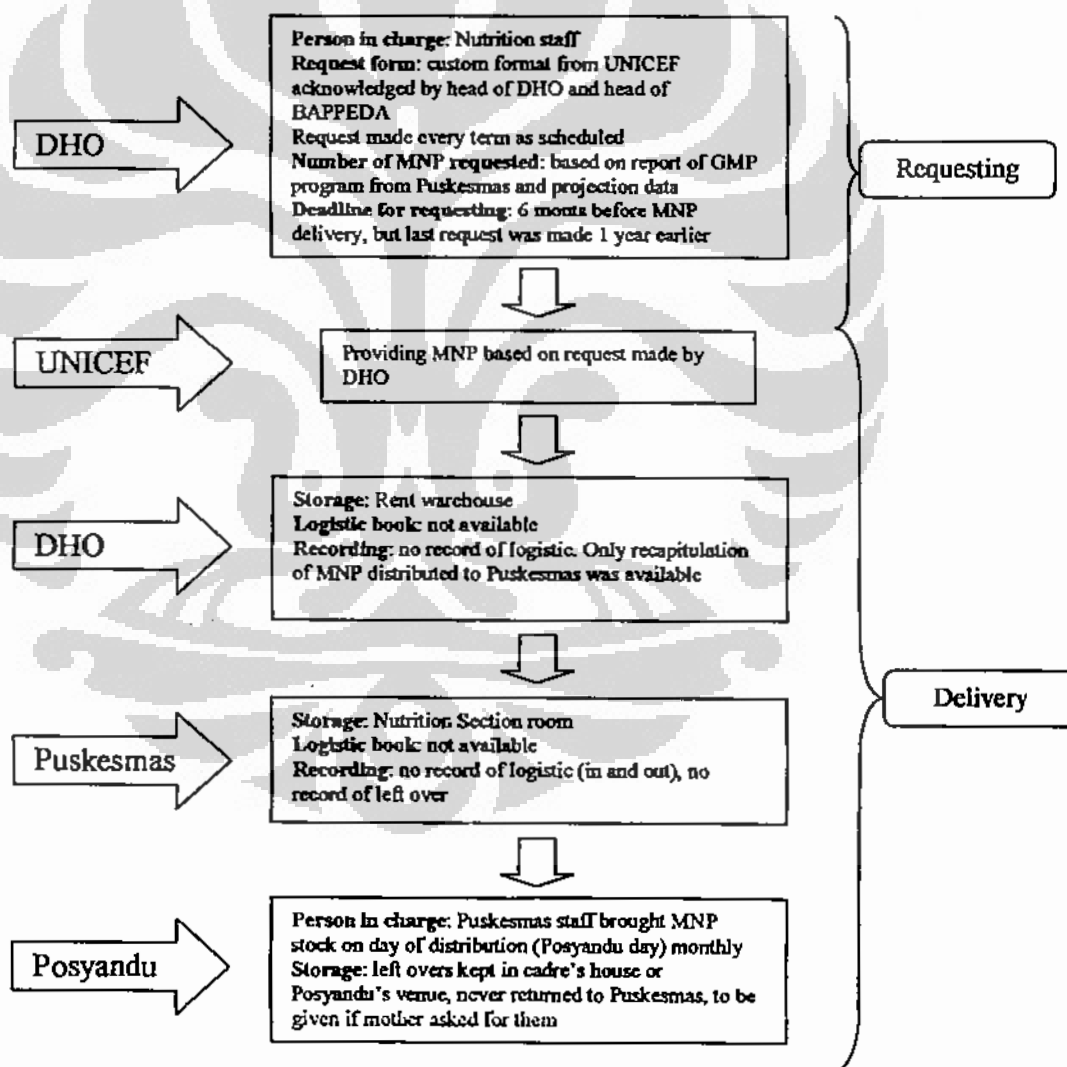


Figure 4.1 Flow of existing MNP distribution in Praya Tengah sub-district

There were only two times of cadre's training for MNP: in 2007 and 2009. Every Puskesmas organized half day training for five villages, using lecture and practice, but no evaluation.

UNICEF provided financial support for procurement of MNP, communication material, training for nutrition staff and cadre, socialization and supervision, without any operational financial support to distribute MNP.

Table 4.4 Availability of resources of MNP distribution at Posyandu in Praya Tengah sub-district

Availability	Total, n=48
Minimally 2 trained cadre, <i>n</i> (%)	24 (50)
Supply of MNP, <i>n</i> (%)	48 (100)
Children registration book, <i>n</i> (%)	37 (77.1)
Record of MNP logistic, <i>n</i> (%)	0 (0)
Total score of resources at Posyandu, <i>median (min, max)</i>	50 (25,75)

Despite both Puskesmas had all their nutrition staff trained, only 50% of Posyandu had minimally two trained cadre on MNP, but 6 Posyandu (12.5%) had no trained cadre. Since there was no requesting mechanism from Puskesmas staff to DHO, obviously there was no record of MNP request nor record of MNP delivery to Posyandu and MNP logistic in both Puskesmas. The last supply of MNP to Puskesmas was delivered in August 2009 which also had to be delivered during the same month to Posyandu.

#### 4.3 Service distribution

Most (78.3%) mother/caregiver had good accessibility to reach Posyandu and only small proportion had less accessibility to Posyandu (Table 4.5).

Table 4.5 Mother/caregiver's accessibility to Posyandu in Praya Tengah sub-district

Variables	Total, n=240
Easiness to reach Posyandu, n(%)	
Easy to reach	212 (88.3)
Not easy to reach	28 (11.7)
Walking distance to Posyandu, n(%)	
≤20 minutes	197 (82.1)
>20 minutes	43 (17.9)
Accessibility criteria, n(%)	
Good	188 (78.3)
Moderate	33 (13.8)
Less	19 (7.9)

Walking distance to Posyandu ranged between 1-60 minutes. Most (91.67%) mother/caregiver went to Posyandu by foot and only 8.3% of mother/caregiver utilized different vehicles to reach Posyandu: 85% by motorcycle, 10% by *angkot* and 5% by *cidomo*. The cost every visit to Posyandu ranged between IDR 0-2000.

Table 4.6 Cadre's accessibility to Posyandu in Praya Tengah sub-district

Variables	Total, n=48
Easiness to reach Posyandu, n(%)	
Easy to reach	46 (95.8)
Not easy to reach	2 (4.2)
Walking distance to Posyandu, n(%)	
≤20 minutes	48 (100)
Accessibility criteria, n(%)	
Good	46 (95.8)
Moderate	2 (4.2)

Almost all cadres could reach Posyandu easily. Walking distance to Posyandu ranged between 0-20 minutes. About 85.4% cadre walked to Posyandu and 14.6% utilized motorcycle to reach Posyandu. The cost of every visit to Posyandu ranged between IDR 0-2000. Cost for cadre to reach Puskesmas was ranged between IDR 2000-15000.

#### 4.4 Management and organization

Based on in-depth interview with nutrition staff and head of Puskesmas, MNP program was a top down program and no local planning ever made at

Puskesmas level. It was attached to nutrition section program, therefore nutrition staff responsible for MNP distribution without specific job description and areas of responsibility. Meetings to discuss schedule and problem were held irregularly. Puskesmas obliged to every planned activities made by DHO. Puskesmas only determined schedule of MNP distribution which was attached to monthly Posyandu day. Average score for planning and management at Puskesmas was 50%.

Table 4.7 Training and supervision of MNP distribution at Posyandu in Praya Tengah sub-district

Availability	Total, n=48
Cadre coordinator attended training on MNP distribution in the last three years, <i>n</i> (%)	42 (87.5)
Other cadre attended training on MNP distribution in the last three years, <i>n</i> (%)	24 (50)
Availability of SOP/guideline of MNP distribution, <i>n</i> (%)	0 (0)
Supervisor from Puskesmas on MNP distribution, <i>n</i> (%)	48 (100)
Supervision in the last six months, <i>n</i> (%)	48 (100)
Total score of training and supervision at Posyandu, median ( <i>min, max</i> )	62.5 (40,80)

Head of DHO explained that there were no specific regulation and policy ever made since the initiation of the MNP program. This program was attached to nutrition section program. MNP distribution was set to use Posyandu as channel of delivery and supervision also attached to growth monitoring program. Based on in-depth interview with UNICEF responsible person, this program was intended to advocating local government to use MNP as part of infant young child feeding practices using local existing health system delivery and avoiding dependency.

#### 4.5 Service output

Since there was no mechanism of requesting system from Posyandu to Puskesmas and also to DHO, there were no requesting reports available ever. Due to poor recording system on MNP distribution, data on the number of MNP distributed to Posyandu was not available. Puskesmas staff just brought some boxes of MNP on the day of delivery at Posyandu.

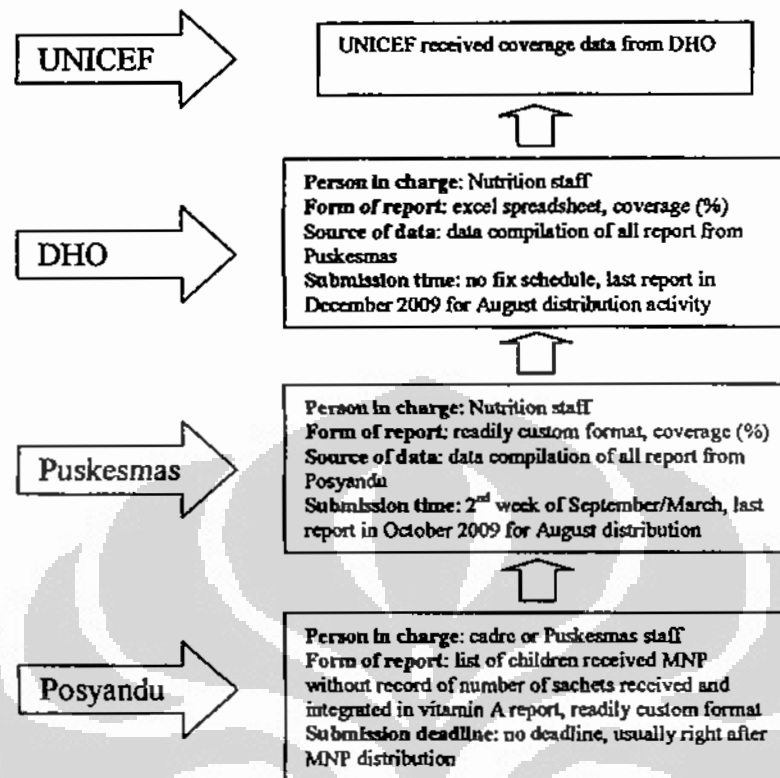


Figure 4.2 Flow of existing MNP report in Praya Tengah sub-district

About 79.2% of Posyandu submitted report to Puskesmas of last MNP distribution in August 2009. Most reports were made by cadre and some by Puskesmas staff. Only 11 children were actually given MNP at home through sweeping activity among 231 eligible children, with a ratio of 1:21 (one had been swept among 21 underfive children)

Since initiation of the program, two trainings for cadre on MNP were conducted. First training was conducted in 2007 and the last one was in 2009, with only two cadres from each Posyandu attended. During the first training, 83.3% of cadre's coordinator attended the training and only 56.3% of them attended the second one. About 87.5% of Posyandu had at least one trained cadre and 54.2% of Posyandu had their cadre coordinator attended both training. About half of the Posyandu (50%) had minimally two trained cadre at least attended one training on MNP program. In total, only 30.2% cadre ever underwent training on MNP program.



#### 4.6 Support system

Almost all mother/caregiver acknowledged MNP distribution. The channel of information received mostly from announcement by mosque as shown in Table 4.8.

Table 4.8 Acknowledgement of MNP distribution to mother's in Praya Tengah sub-district

Variables	Total
Mother's acknowledgement of MNP distribution <sup>1</sup> , n(%)	232 (96.7)
Channel of MNP distribution's information <sup>2</sup> , n(%)	
Announcement from the mosque	191 (82.3)
Home visit by cadre	109 (47)
Others	14 (6)

<sup>1</sup>n=240

<sup>2</sup>n=232

About 83.3% of Posyandu had fixed schedule of monthly Posyandu day. There were no specific place to store MNP stock at Posyandu and Puskesmas. Half of Posyandu had poor storing system. In both Puskesmas, there were piles of left over stock that had not been distributed yet.

#### 4.7 Service outcome

Most (85.4%) Posyandu had experienced an over stock of MNP. The main reason of over stocking was overload dropping from Puskesmas (70.7%), mother didn't want to receive MNP (19.5%) and mother didn't come to Posyandu (9.8%). Only one Posyandu experienced lack of MNP stock due to lack of dropping on the day of distribution from Puskesmas.

Table 4.9 Knowledge of trained cadre in Praya Tengah sub-district

Variables	Total
At least attending one training <sup>1</sup> , n(%)	
Poor (correct answer <50%)	34 (82.9)
Moderate (correct answer 50-70%)	7 (17.1)
Attending the last training on <sup>2</sup> , n(%)	
Poor (correct answer <50%)	23 (85.2)
Moderate (correct answer 50-70%)	4 (14.8)

<sup>1</sup>n=41

<sup>2</sup>n=27

In the last six months, distribution of MNP only occurred in August 2009 when the children were given 60 sachets for 4 months. During December 2009 - January 2010, MNP was only given for mother/caregiver who asked for it.

Table 4.10 Distribution of MNP coverage in the last 6 months in Praya Tengah sub-district

MNP received in the last 6 months	Total
MNP received in the last 6 months <sup>1</sup> , n(%)	
0	25 (10.8)
<60 sachets	98 (42.2)
60 sachets	88 (37.9)
>60 sachets	21 (8.9)
MNP received on August 2009 <sup>1</sup> , n(%)	
0	91 (39.2)
<60 sachets	92 (39.6)
60 sachets	47 (20.3)
>60 sachets	2 (0.8)
Main reason for irregular received of MNP <sup>2</sup> , n(%)	
Child dislike MNP	95 (41.1)
No stock available at Posyandu	85 (36.8)
Irregular visit to Posyandu	15 (6.5)
Posyandu too far away	8 (3.5)
Mother disliked MNP to be given to her child	6 (2.6)
Others	21(9)

<sup>1</sup>n=232

<sup>2</sup>n=231

#### 4.8 Community participation

About 77.1% of mother/caregiver visited Posyandu  $\geq 4$  times in the last six months. Reason for never or less visiting to Posyandu was displayed in Table 4.10. Other reasons were mother/caregiver went out of the village on the day of distribution, mother/caregiver's sickness and children were afraid to the weighing activity.

Table 4.11 Posyandu utilization in Praya Tengah sub-district

Variables	Total
Posyandu visit in the last 6 months <sup>1</sup> , <i>n</i> (%)	
Never go to Posyandu	3 (1.2)
< 4 times	52 (21.7)
≥ 4 times	185 (77.1)
Main reason for never and visiting Posyandu <4 times <sup>2</sup> , <i>n</i> (%)	
Mother/caregiver was busy working	16 (29.1)
No benefit for the child	13 (23.6)
Posyandu is too far	9 (16.4)
Child was sick	7 (12.7)
Other	10 (18.2)

<sup>1</sup>*n*=240<sup>2</sup>*n*=55

Most support by head of sub-village about MNP program was by giving information on MNP distribution schedule, however, about one-third of sub-village head did not support the MNP program at all.

Table 4.12 Types of support on MNP program from head of sub-village in Praya Tengah sub-district

Variables	Total, <i>n</i> =48
Informing MNP distribution schedule, <i>n</i> (%)	23 (47.9)
Providing place for MNP distribution, <i>n</i> (%)	19 (37.9)
Attending MNP distribution, <i>n</i> (%)	11 (22.9)
None, <i>n</i> (%)	18 (37.5)

## CHAPTER 5

### DISCUSSIONS

There were several efficacy studies on MNP had been conducted in different areas in Indonesia such as in urban slums Jakarta, rural Sukabumi (HKI, 2006) and North Jakarta (Jahari *et al.*, 2008). Findings in those studies showed a consistent result of improving anemia prevalence on underfive children after giving MNP for several months. However, we still need to evaluate MNP program in a community setting; hence, a public health effectiveness of MNP program is needed. To date, this is the first study evaluating public health effectiveness of MNP program in a community setting.

MNP program was part of CHANSYS project which consist of several intervention package of improving health of underfive children and strengthening service delivery system. Since there were limited study regarding MNP distribution program, this study would only focused on MNP distribution by reviewing essential system component of distribution of MNP program.

This study took underfive children as sample based on quadrants without random selection among available underfive children in each quadrant. It means that those samples probably may not represent the area. When we compare some characteristics of mother/caregiver between CHANSYS baseline survey (UNICEF & CHR-UI, 2007) and this study: mean age of mother was 27 years vs. 29 years, mother's education of illiteracy and elementary school graduate was 56% vs. 44.6%, mother's as housewife was 76% vs. 43.8%, and Posyandu's routine visit was 62% vs. 77%. Besides mother's occupation as housewife, others important characteristics were quite comparable, considering that this study purposively selected the best practice of MNP program in Lombok Tengah.

MNP was distributed free of charge to all children age 6-59 months old. The choice of distribution strategy was utilizing Posyandu as already established at every sub-village. This choice was in line with the intention of the project by strengthening existing system and not establishing any parallel system (UNICEF, 2007). However, the choice of distribution strategy was based on agreement

between local government (DHO) and UNICEF without involving Puskesmas staff or cadres in the decision making process. Since a number of programs are attached to Posyandu of which needs good involvement of cadres and other respective personnel, this kind of agreement needs to be revisited. Poor recording of MNP logistic resulted in overstock of MNP at Posyandu as a result of no specific job description and areas of responsibility of nutrition staff responsible for MNP distribution observed in this study would be a consequence of one sided agreement like this kind.

Although Posyandu had good accessibility for cadre and mother since most of Posyandu located in the center of sub-village, however, not all of mother/caregiver acknowledged about MNP distribution. This might occur since most mother/caregiver obtained the information through announcement from the mosque which might not cover all member of the community. Besides, there were about 22.9% mothers/caregivers did not routinely visit Posyandu in the last six months, mostly due to busy doing household tasks and working. These showed that Posyandu alone as channel of MNP distribution would have not been enough. Various channel of MNP distribution might be needed to distribute MNP to the community, such example exist in Nigeria where three different strategies of delivery mechanism of vitamin A supplementation program implemented flexibly: fixed post, advanced post and mobile strategy, responding to the uneven geographical condition to have a successful program of vitamin A distribution (Aguayo *et al.*, 2005).

This study observed that sweeping activity, similarly as mobile strategy in Nigeria, was not seriously implemented as only one child out of 21 was swept. MNP was delivered from Puskesmas to Posyandu on the day of distribution and to be given to mother/caregiver who attended Posyandu. If they were not shown up, cadre was supposed to conduct sweeping activity; however, not all Posyandu confirmed the expected sweeping activity – it was rarely implemented. Sometimes cadres asked the neighbors to pass MNP to mother/caregiver who didn't visit Posyandu. Similar practice occurred in vitamin A distribution program in several areas of Indonesia (Pangaribuan *et al.*, 2007). This problem

should be addressed accordingly: could it be a lack of cadre's commitment, unavailability of incentive for sweeping activity or cadre's heavy workload.

The inconsistency of MNP delivery was due to unavailability of SOP or guideline and improper program planning, a result of a top-down program and unavailability of local planning ever made by Puskesmas. Furthermore, the socialization of the program was conducted one month prior to first distribution which considered as a very short time.

The irregularity of MNP distribution during the last six months was due to miss-communication between interns of UNICEF. Although the request made by DHO already included MNP needs for one year, however, UNICEF was only able to provide half of MNP needs sufficient for less than six months. Since this program required huge number of MNP, proper planning and management of logistic are needed. DHO agreed to receive this shortage of stock as DHO experienced some difficulties to distribute MNP due to low acceptance of MNP resulting in abundant of leftovers up to Posyandu level.

There was no requesting system especially for MNP ever made by Posyandu up to DHO. No survey conducted especially to get the list of MNP targeted children. DHO only used list of underfive children based on Puskesmas report on growth monitoring program which might be not updated regularly. DHO requested MNP needs based on the report and projection data. This practice might have given inaccurate assessment of MNP needs, hence inaccurate supply from UNICEF as it found that most Posyandu experienced over-stock of MNP. Furthermore, last request of DHO to UNICEF was made more than one year prior to MNP distribution schedule. This could contribute to even more inaccuracy data of MNP needs. DHO and Puskesmas should strengthen their task of getting an appropriate data on population of underfive children.

UNICEF set the deadline for request at least six months in advanced to give them enough time to provide the MNP stocks. This practice was better than the vitamin A supplementation program in West Kalimantan province, where there was no deadline of vitamin A capsules request to MOH, and usually the request was submitted one month before delivery. However, unlike in this MNP

program, the mechanism of vitamin A request from Posyandu up to DHO was available (Pangaribuan *et al.*, 2007).

Besides inaccuracy assessment of MNP needs, the fact that some of mother/caregiver did not want to take MNP might also lead to abundant leftovers of MNP. Unavailability records of MNP logistic available at DHO up to Posyandu would also have contributed to over-stock of MNP. Poor record of MNP logistic allowed poor information on quantities of MNP at different distribution levels. Puskesmas staff continuously delivered MNP without monitoring the leftovers at Posyandu. Those might be the causes of most Posyandu experienced over-stock of MNP.

The availability of MNP storing system observed in this study was very poor. Most Posyandu in this study kept MNP stocks in no specific room with high humidity, and possible contamination of cockroach and mouse, as it recognized in many circumstances in which MNP storage was in those improper condition. If it happened, the products should have been produced suitable with their best shelf life under prevailing condition, adapt packaging and advice customers and users on the expected shelf life (de Pee *et al.*, 2008). Therefore, supplier of MNP should put this condition into consideration.

Puskesmas staff only delivered MNP stock to Posyandu monthly without performing any other tasks such as monitoring and supervision of MNP distribution. Therefore, cadre rarely received feedback on MNP program due to no specific report of Puskesmas supervision. Similar condition of supervision from DHO to Puskesmas also occurred: no records of supervision available as well as at DHO. Based on interview with Puskesmas staff, low acceptance of MNP was already known since first semester of MNP distribution. Puskesmas already sent this information to DHO but there was no feedback given to overcome the problem. More than one year after the start of MNP program, DHO and UNICEF conducted a survey to find out more about the low acceptance of MNP. Afterwards, several facilitators were selected to assist MNP distribution on every village. Unfortunately, this effort was initiated only several months before the last MNP distribution, and furthermore no results were reported.

This study observed lack and ineffective supervision with regards to feed back given to overcome the existing problem. Nutrition staff of Puskesmas claimed that their workload were too much since most Puskesmas programs attached to nutrition section, whereby only 2-3 nutrition staff available in each Puskesmas, considering one Puskesmas should supervised 25 Posyandu. This fact resulted in limited and ineffective supervision to Posyandu. Similarly, some cadres also mentioned about their extra responsibilities of running this additional MNP program in Posyandu and claimed no incentives since the previous year. A study on public funding in health at district level in Indonesia after decentralization observed that allocation for health center only less than a quarter of public funds for health (Heywood & Harahap, 2009). As UNICEF intention to have the MNP program to be embedded to the local existing health system, the local health authority should have been able to address this problem. Propose funding allocation for distribution of MNP as well as additional staffs of nutrition section at Puskemas are necessary for the success of MNP program.

Training on MNP program was very limited. Since the initiation of the program, there were only two trainings for cadres, with no refreshers training in between and only half of cadre's coordinator attended the second training. Review among several countries in South Asia revealed that continuous training was found to be an essential prerequisite for an effective community health workers program (UNICEF, 2004). Limited qualified training for cadres and low participation of cadres to attend training might be the causes of poor knowledge of cadres regarding MNP program especially the importance of accurate data on targeted children. Poor knowledge would also probably due to in-continuity and irregularity of training. Continuous and qualified training would improve knowledge, motivation and skill of cadres in delivering program for community (Bhattacharyya *et al.*, 2001).

This study also revealed that there were lack of community participation especially participation by head of sub-villages. Their contribution to the program was mostly by only informing Posyandu day which actually at the same time scheduled for MNP distribution, despite efforts to socialize the program started by inviting sub-village heads and implementing regulation for them to became cadre



in their Posyandu. Posyandu has a concept of community ownership aiming for the welfare of the community. Therefore, coordination among stakeholders should be an integrated efforts amongst all of them, with the sub-village head as the focal person (Indonesia, 2006).

Report of MNP distribution at Posyandu was using custom format from DHO and integrated with vitamin A and deworming tablet report. Cadre reported only list of children received MNP with no information about number of MNP sachets received by each child. Inconsistent data on number of children received MNP from Posyandu up to DHO was also observed. These conditions might have given impact on inaccuracy of coverage calculation.

This study revealed that the coverage of MNP distribution was low (<50%). However, report from DHO stated that coverage of MNP distribution was  $\geq 90\%$ . This discrepancy might be due to inaccuracy and inconsistency of data on targeted children at DHO, since cadres only reported those who attended Posyandu, excluding other targeted children who did not attend Posyandu. Report from Posyandu were used by Puskesmas and furthermore to DHO as the source of their report. Consequently, over reporting would have been produced. It was also found that Puskesmas had reported high coverage of MNP distribution and no leftovers. However, by observation, it was found that there were still several boxes of MNP leftovers in Puskesmas and abundant stocks at Posyandu.

The low coverage was a result of low sweeping activity, poor recording and reporting system, ineffective supervision, lack of qualified training for cadres, unavailability of request mechanism low level, financial support for operational of MNP distribution and lack of community participation. All essential components of MNP distribution system were mostly deficient. Since all of them were interrelated to each other, any deficiency of only one those components might give influence to others; hence, coverage of MNP distribution as an outcome of the system was low. This was in agreement with findings of vitamin A distribution study in three provinces of Indonesia, in which improper functioning on its several essential components influencing the low coverage as well (Pangaribuan *et al.*, 2007). This low coverage might also influenced by the low acceptance of MNP itself as most mothers/caregivers mentioned their child dislike

MNP due to organoleptic changes on food sprinkled MNP and some cadres also confirmed this fact, hence, mother/caregiver refused to receive MNP. This fact might be the consequences of improper practice of MNP use. However, this study were not exploring on practice of MNP use among mother/caregiver.

Effective program should be based on sound information about the setting and consideration to create demand among different stakeholders, namely politicians, health care providers and parents, to enhance program uptake and at the end for the betterment of child nutrition (WHO & UNICEF, 2008). The need of proper local program planning is highly required to achieve the goal of the program. This study also shows how important it is to highly recognize a study on program delivery to the success of a new health program to be scaled-up.

It is obvious, that at least in Praya Tengah sub-district, MNP delivery was not working properly, meaning that MNP did not reach targeted underfive children.

## CHAPTER 6

### CONCLUSIONS AND RECOMMENDATIONS

#### 6.1. Conclusions

1. Most of all essential components of MNP distribution system were mostly deficient. Deficiencies were due to poor planning and management, no requesting mechanism from Posyandu to DHO, poor record system and resources at Posyandu and Puskesmas, no financial support for MNP distribution, ineffective supervisions, inadequate training for cadre and lack of support from community leader.
2. Since all of the sub-systems were interrelated to each other, any deficiency might give effect to others, and consequently, coverage of MNP distribution was low.

#### 6.2. Recommendations

1. Provision of comprehensive formative research regarding local health system especially capacity of resources before running a future MNP program.
2. Provision of proper local program planning and management of MNP program accustomed to the available health care delivery service capacity.
3. Provision of complete SOP and guidelines for MNP distribution prior to program implementation.
4. Requirement to develop mutual agreements among stakeholders of a sharing planned MNP distribution activities.
5. A study to recognize other possible channel for MNP distribution.
6. Increasing awareness of study in program delivery is highly recommended.

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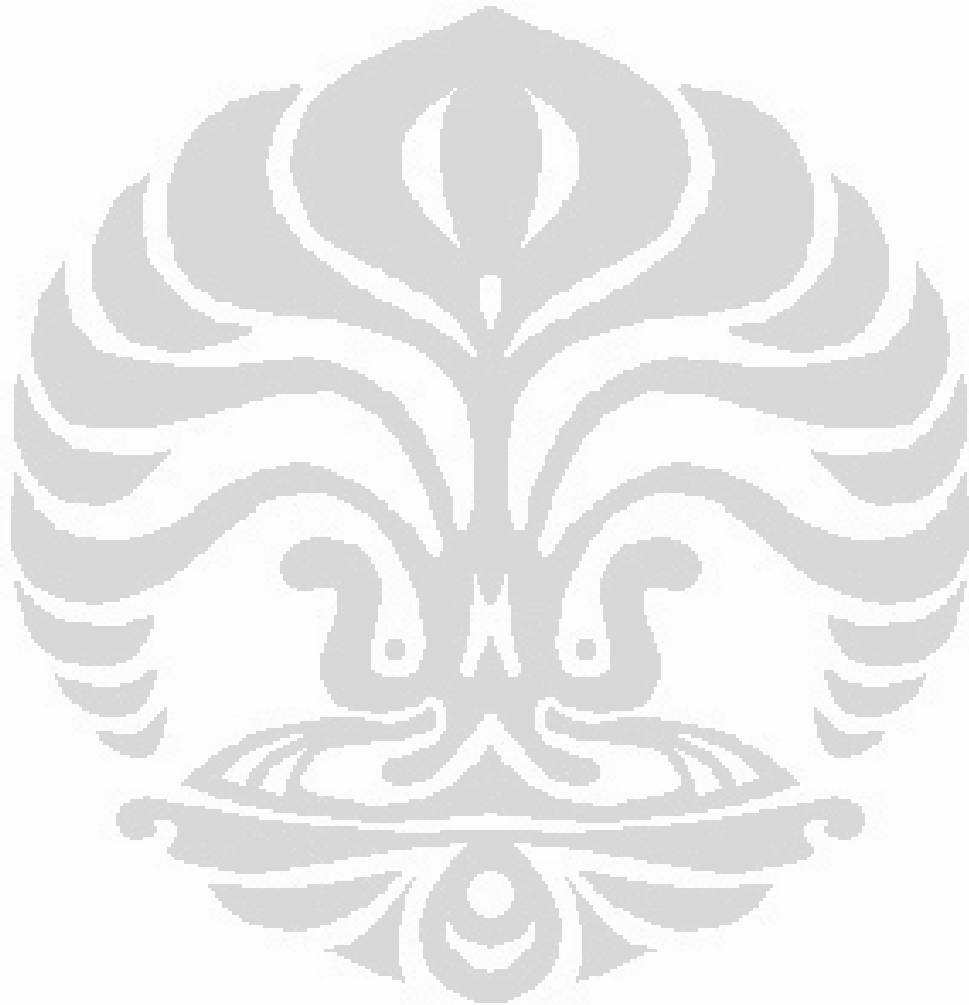
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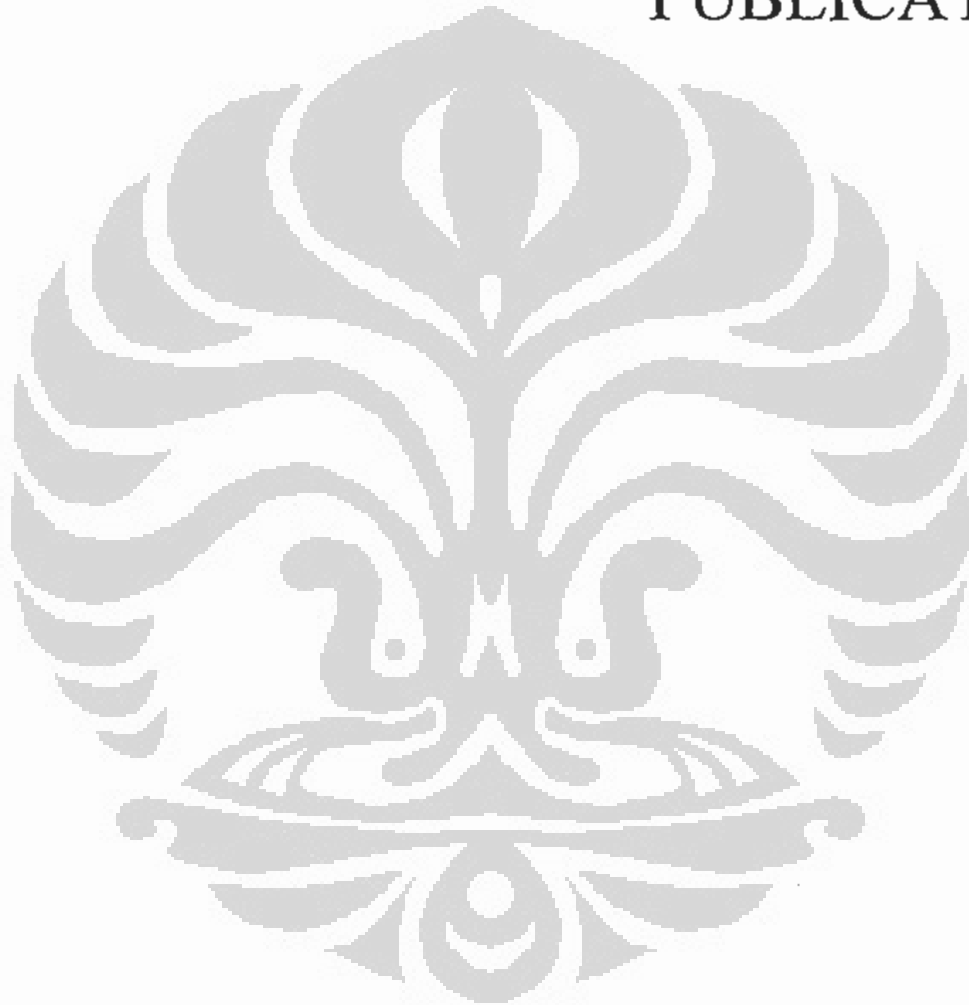
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# APPENDICES





APPENDIX 1  
MANUSCRIPT FOR  
PUBLICATION



1 **MANUSCRIPT FOR PUBLICATION**

2  
3 **To be submitted to: Public Health Nutrition**

4  
5  
6 **SYSTEM REVIEW ON DISTRIBUTION OF**  
7 **MULTIPLE MICRONUTRIENT POWDER PROGRAM IN**  
8 **PRAYA TENGAH, CENTRAL LOMBOK DISTRICT**

9  
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11  
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1 **Abstract**

2 ***Objective***

3 To review the implementation of existing distribution system of Multiple  
4 Micronutrient Powder (MNP) program in relation to coverage in Praya Tengah,  
5 Central Lombok District.

6 ***Design***

7 Health System Analysis (HSA) was used to review each essential component of  
8 MNP distribution. Methods were in-depth interview health care provider of MNP  
9 program, document review, observation and interviewing cadre and  
10 mother/caregiver with targeted children (12-59 months old children).

11 ***Setting***

12 Praya Tengah sub-district, Central Lombok District, Indonesia.

13 ***Subjects***

14 A total of 240 randomly selected underfive children (12-59 months old), 48 cadres  
15 responsible for MNP program, 2 nutrition staff responsible for MNP program and  
16 1 head of health center, one nutrition staff at district health office (DHO) and head  
17 of DHO also a representative person of UNICEF.

18 ***Results***

19 There was no mechanism of requesting system from Posyandu to District Health  
20 Office (DHO). Score of resources in Posyandu was 50%, with no records of MNP  
21 logistic and only half Posyandu had minimally two trained cadres. Posyandu as  
22 main site of MNP distribution was accessible by mostly cadre (95.8%) and  
23 mother/caregiver (78.3%). Average score of planning and management in  
24 Puskesmas was 50% and lack of effective supervision. Training for cadres only  
25 conducted two times since the last three years yielding poor knowledge of trained  
26 cadre. Only 30.2% cadre ever trained on MNP program. About 79.2% Posyandu  
27 submitted last report of MNP distribution on Posyandu. Most of Posyandu  
28 (85.4%) had experienced of over stocking MNP and mostly due to over dropping  
29 from Puskesmas. Community participation on MNP distribution especially  
30 community leader was not sufficient. The coverage of MNP distribution in the  
31 last six months was only 37.9%.

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1 **Conclusions**

2 Almost all of essential components of MNP distribution system were mostly  
3 deficient. Since all of them were influenced to each other, any deficiency might  
4 give effect to others; hence, coverage of MNP distribution was low.

5 **Keywords: multiple micronutrient powder, health system review,**  
6 **distribution**

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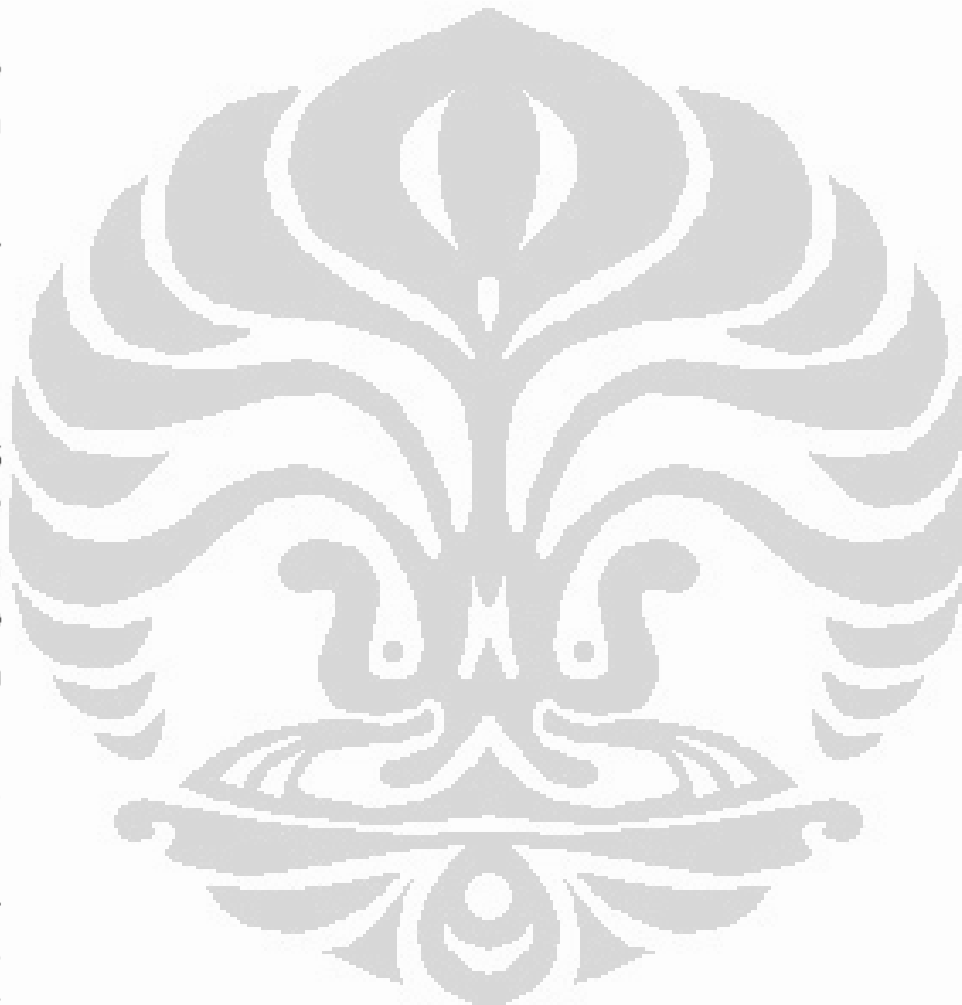
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## 1 INTRODUCTION

2 Anemia is the most common nutrient deficiency affecting both developing  
3 and developed countries, especially among pregnant women and young children.  
4 The National Health and Households Survey (2001) confirmed that anemia was  
5 still the main problem in Indonesia with increasing prevalence (>55%),  
6 particularly among children less than 24 months.

7 A new method has been introduced to the world as an alternative to help  
8 reduce prevalence of anemia. Micronutrients powder (MNP), a home fortification  
9 contains of vitamins and minerals in a form of powder, was introduced in 1996.  
10 Randomized community-based studies on MNP involving both anemic and non-  
11 anemic children have been completed in diverse setting i.e. Ghana [1-2],  
12 Cambodia [3], Pakistan [4], Bangladesh [5], India [6] and Haiti [7].

13 Many Asian countries were poised to scale up the use of MNP as part of  
14 an integrated infant young child nutrition strategy including Indonesia [8]. Before  
15 scaling-up the MNP program nationally, one of the requirements of establishing  
16 effective and efficient scale-up program is to define the proper delivery strategy or  
17 distribution system, hence high and equitable coverage of program will be  
18 obtained and maintained [9].

19 Community Health Systems Strengthening (CHANSYS) program, a  
20 collaboration project between UNICEF and District Health Office of Central  
21 Lombok has been running since 2007 [10]. The ongoing program in Central  
22 Lombok District uses MNP as part of a program package to improve child health.  
23 The MNP are distributed to all of the children aged 6-59 months in CHANSYS  
24 area. Posyandu, as a fixed site of distribution, has been used as distribution  
25 channel of MNP, and community outreach, known as sweeping activity.  
26 Mothers/caregivers are given fifteen sachets of MNP monthly, to be given to their  
27 children flexibly by sprinkled onto foods prepared in the home but not more than  
28 one sachet daily.

29 By reviewing the existing distribution system of MNP program in  
30 CHANSYS area, more information regarding distribution system in relation to  
31 coverage will be obtained hence this study will give insight to the CHANSYS's

1 program planner, implementer and coordinator in their efforts to construct a  
2 proper guideline of MNP distribution.

3 This study aimed to review the implementation of existing distribution  
4 system of MNP program in relation to coverage in Praya Tengah, Central Lombok  
5 District.

## 6 **METHODS**

### 7 **Study design and site**

8 This cross sectional study was conducted in all villages (10) of Praya  
9 Tengah sub-district from February to March 2010. The study was conducted in  
10 one among four sub-district of CHANSYS area in Central Lombok. The selection  
11 criteria of this sub-district are the nearest distance from central district to sub-  
12 district, less population density, small area of sub-district, highest number of  
13 Posyandu Mandiri, smallest number of underfive children per Posyandu.

### 14 **Subjects**

15 There were two Puskesmas existed in Praya Tengah sub-district. About 48  
16 Posyandu were randomly selected out of 93 Posyandu under supervision the two  
17 Puskesmas. In this study, cadre coordinator of each Posyandu, nutrition staff at  
18 Puskesmas responsible for MNP program, head of Puskesmas, head of nutrition  
19 section at DHO, head of DHO and UNICEF's representative person responsible  
20 for MNP program.

21 To determine the coverage of MNP distribution in this area, a sample size  
22 of 240 underfive children (12-59 months old) was needed considering design  
23 effect and 10% non-response cases [11]. The underfive children was randomly  
24 selected using one stage cluster sampling procedure; 48 clusters of Posyandu were  
25 selected randomly. The targeted children obtained from free population by  
26 mapping the area of Posyandu into four quadrants. On each quadrant including  
27 the center area, one child was selected without randomization. Hence, five  
28 children aged 12-59 were obtained per Posyandu. Coverage of MNP was  
29 measured as proportion of children aged 6-59 months who receive 60 sachets of  
30 MNP in the last six months by interviewing mother/caregiver.

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## 1 **Methods of assessment**

2 Health System Analysis (HSA) was used as management of tools to  
3 review the existing MNP distribution system. If one of the essential components is  
4 lacking, the whole system will not function properly since each components are  
5 interrelated to another. Figure 1 shows MNP distribution as a health system with  
6 its essential components.

7 Data collection was using several methods including interview using  
8 structured questionnaire, in-depth interview, observation using check list  
9 questionnaire and record checking/document review (secondary data review).  
10 The interview with mother and cadre conducted by local trained interviewers,  
11 personally and in convenient situation (inside or outside the house) for each  
12 selected subject. The questionnaires were pre-tested prior the actual data  
13 collection. Observation on storage was conducted by one observer to avoid inter-  
14 personal bias. The in-depth interview and secondary data obtained from  
15 responsible person of MNP program from district health office, Puskesmas and  
16 Posyandu.

17 The method used as described below:

- 18 a. *Service input.* The implementation of MNP distribution system required a  
19 service input available both in Posyandu and Puskesmas which including:
- 20 ▪ Availability of requesting, delivery, report and record system and  
21 sweeping activity will assess through interview. This data would also  
22 supported by document review on MNP distribution registration book,  
23 record of requesting and sweeping activity in the last six months.
  - 24 ▪ Availability of financial support and training program related to MNP  
25 distribution (reporting, stocking, requesting etc) in the last three years for  
26 cadre and nutrition staff at Puskesmas obtained by interview.
  - 27 ▪ Data on availability of resources including trained cadre, supply of MNP,  
28 children registration book and record of MNP logistic Posyandu and  
29 Puskesmas assessed through interview and document review in the last six  
30 months. A score 50% or more may at least for six months suggest  
31 resources are in place.

1 **b. Service distribution.** To determine the accessibility of Posyandu or place for  
2 MNP distribution in regard to time needed and easiness to reach it, interview  
3 with mother/caregiver and cadre will be conducted. Interview with cadre and  
4 mother/caregiver were conducted to obtain information on transportation  
5 system.

6 Accessibility determined based on:

- 7 • Physically accessible by walking time less than 20 minutes.
- 8 • Psychologically accessible by perceive easiness to access Posyandu or  
9 place for MNP distribution.

10 The criteria of accessibility as follows:

- 11 • Good, both of above criteria are mentioned.
- 12 • Moderate, only one of above criteria are mentioned.
- 13 • Less, none of above criteria is mentioned.

14 **c. Management and organization.** Essential indicators include in this variable  
15 were:

- 16 ▪ Potential score of planning and management of MNP program in  
17 Puskesmas obtained from questions on planning from DHO, local  
18 planning at Puskesmas, job description, meetings and schedule of planned  
19 activities. A score of less than 50% define poor job organization and  
20 planning capability.
- 21 ▪ Data on training and supervision obtained by interviewing cadre and  
22 Puskesmas staff responsible for MNP distribution. Several criteria were  
23 scored by dividing assessed score by potential score and multiply by  
24 100%. Adequate training and supervision suggest if score 50% or more.
- 25 ▪ Regulation and policy regarding MNP program assessed through in-depth  
26 interview with head of Puskesmas and head of DHO.

27 **d. Service output.** The output of MNP distribution system consists of:

- 28 ▪ Number of submitted requesting report obtained by reviewing the existing  
29 requesting document in the last six months.
- 30 ▪ Number of MNP distributed to Posyandu from Puskesmas assessed by  
31 record checking on logistic book of MNP distribution in the last six  
32 months.



- 1       ▪ Number of submitted report of MNP distribution in the last six months  
2       obtained by document review.
- 3       ▪ Data on number of sweeping performed by cadre assessed by asking  
4       mother/caregiver whether they to be visited when their children did not  
5       attend MNP distribution at Posyandu. Ratio of number of sweeping  
6       activity conducted to number of sweeping activity had to be conducted  
7       was calculated.
- 8       ▪ Number of training program related to MNP distribution conducted in the  
9       last three years will be obtained from nutrition staff at Puskesmas  
10      responsible for MNP distribution and also supported by document review
- 11      ▪ Number of trained cadre in the last three years obtained from interview  
12      cadre responsible for MNP distribution.
- 13    e. *Support system.* This variable consists of several indicators:
- 14      ▪ Availability of notification of MNP distribution schedule assessed through  
15      interview with mother/caregiver.
- 16      ▪ Information on fixed schedule (time and venue) on Posyandu day in the  
17      last six months obtained by record checking on registration book of MNP  
18      distribution. Availability of fixed schedule would suggest if there were  
19      fixed time and venue of MNP distribution for four times or more.
- 20      ▪ Information on storing system will be obtained by observation on storage  
21      room at Posyandu. Three aspects of qualified storage were availability of  
22      specific room to store MNP, cleanliness and no signs pest; cockroach or  
23      mouse during observation. If all of these aspects were fulfilled, it may  
24      suggest as qualified storing system.
- 25    f. *Service outcome.* The indicators of service outcome consisted of:
- 26      ▪ Adequacy of MNP in Posyandu in the last six months obtained by  
27      document review and interview cadre. Two aspects of this indicator were  
28      adequacy of MNP stock for distribution and supply arrival timely before  
29      distribution day on Posyandu. If both criteria were fulfilled at least for  
30      four months may suggest adequacy of MNP in Posyandu.
- 31      ▪ Knowledge of trained cadre related to MNP benefit for underfive, use of  
32      MNP, requesting, delivery and storing of MNP. This knowledge assessed

1 by interviewing cadre. Scoring system were applied by dividing correct  
2 answer to total questions multiply by 100%. The criteria of cadre's  
3 knowledge were classified as:

4 o Good: score of correct answer >70%

5 o Moderate: score of correct answer 50-70%

6 o Poor: score of correct answer <50%

7 ■ Coverage of MNP was calculated in percentage. Mothers/caregivers were  
8 asked whether they had received 60 sachets of MNP either from Posyandu  
9 or sweeping activity in the last six months.

10 g. *Community participation.* Information on mother/caregiver routine visit to  
11 Posyandu in the last six months will assess through interview  
12 mother/caregiver. At least four times visit may consider as routine visit to  
13 Posyandu. Support from community leader on MNP program assessed by  
14 interviewing cadre.

#### 15 **Data analysis**

16 After data collection, all of data were cleaning. All variables obtained  
17 from interview using structured questionnaires were analyzed using descriptive  
18 statistic by SPSS version 16.0. Data on in-depth interview and observation were  
19 summarized based on defined theme and then descriptively analyzed.

#### 20 **Ethical consideration**

21 The protocol of the study obtained an ethical clearance from the Ethical  
22 Committee of the Medical Faculty, University of Indonesia. Permission to  
23 conduct the study was obtained from the local government offices.

24 The interviewers gave explanation on the research purpose, procedure and ensure  
25 confidentiality to all respondents. All of data collection was obtained with the  
26 least burden on the respondent's side. The respondents had the rights to refuse or  
27 quit at any time. Before conducting interview, the respondents signed a written  
28 consent.

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## 1 RESULTS

### 2 Baseline characteristics

3 Praya Tengah sub-district had two Puskesmas namely Batunyala and  
4 Pengadang. Table 1 will show characteristics of those Puskesmas under study.  
5 The peripheral health facilities studied included two Puskesmas covering 104  
6 Posyandu, 5 Pustu and 7 Polindes. There were 5 nutrition staffs from the two  
7 Puskesmas responsible for nutrition program giving ratio to inhabitants at 7.7 per  
8 100.000 and ratio to underfive children at 1:1573.

9 Most caregivers (93.8%) of underfive children were their mothers. Others  
10 caregivers were grandmother, aunty, father and foster mother. Median age of the  
11 caregivers was 29 (ranged from 17 to 50 years). Most of the father and mother  
12 (26.3% and 34.6% respectively) had educational level on elementary school  
13 graduate. The main occupation of father was laborer (24.3%) and others  
14 occupation of father were private employee, mechanic and craftsmen. Most of  
15 mother was housewife (43.8%) and others occupation of mother were craftsmen  
16 and private employee (Table 2).

17 Most cadres were women (95.8%), graduated from senior high school  
18 (41.7%) while 39.6% cadres were housewife and others occupation were district  
19 honorer, entrepreneur, driver and craftsmen. Most cadres on Posyandu (88.9%)  
20 were active. More than half of cadres (60.4%) had being cadre for  $\geq 10$  years  
21 (ranged from 1 to 29 years). Detailed information shows in Table 3.

### 22 Essential components of MNP distribution system

23 Complete essential components shows on Figure 1.

#### 24 a. Service input

25 Initially, MNP would be distributed every six months concurrently with  
26 vitamin A distribution. However, in the study area, the practice was that  
27 mothers/caregivers only visited Posyandu if their children would get something in  
28 addition to routine weighing. This practice particularly occurred with children  
29 above 12 months, who had completed immunization. Therefore, the Puskesmas  
30 staff and cadre decided to distribute MNP monthly during Posyandu activity.  
31 They asked mother to return empty sachets of MNP before getting new one,  
32 aiming to increase children's attendance on Posyandu day. However, it only

1 happened for the first four months. Afterwards, due to direction by DHO in order  
2 to achieve high coverage of MNP, they distributed MNP bimonthly as one box of  
3 MNP consisted of 30 sachets, sufficient for two months supply. During the last  
4 distribution in August 2009, 60 MNP sachets were distributed for four months, to  
5 similar vitamin A distribution months of February and August, as the highest  
6 Posyandu attendance.

7         There was no requesting system from cadre to Puskesmas staff available  
8 and also from Puskesmas staff to DHO. Requesting system only occurred from  
9 DHO to UNICEF. Based on in-depth interview to nutrition staff at DHO, DHO  
10 determined targeted children (6-59 months old) based on report of Puskesmas on  
11 growth monitoring program and sometimes using projection data. The last  
12 request for delivery in August 2009 was made more than one year in advance  
13 (June 2008).

14 MNP distribution was attached to monthly growth monitoring program in  
15 Posyandu. The MNP stock was delivered to Posyandu on the day of distribution  
16 by Puskesmas staff. There were no record of logistic available at Posyandu,  
17 Puskesmas and nor DHO. Although 83.3% cadres conducting sweeping activity,  
18 however, there were no records available as well.

19         There was only two times cadre's training for MNP: in 2007 and 2009.  
20 Every Puskesmas organized half day training to five villages, using lecture and  
21 practice, but no evaluation. UNICEF provided financial support for procurement  
22 of MNP, communication material, training for nutrition staff and cadre,  
23 socialization and supervision, however, no operational financial support to  
24 distribute MNP

25         Despite both Puskesmas had all their nutrition staff trained, only 50% of  
26 Posyandu had minimally two trained cadre on MNP but 6 Posyandu (12.5%) had  
27 none trained cadre. Since there was no requesting mechanism from Puskesmas  
28 staff to DHO, obviously there was no record of MNP request nor record of MNP  
29 delivery to Posyandu and MNP logistic in both Puskesmas. The last supply of  
30 MNP to Puskesmas was delivered in August 2009 which also had to be delivered  
31 in the same month to Posyandu.

32 **b. Service distribution**

1 Most mother/caregiver (78.3%) had good accessibility to reach Posyandu  
2 and only small proportion had less accessibility to Posyandu. Walking distance to  
3 Posyandu ranged between 1-60 minutes. Most mother/caregiver went to  
4 Posyandu by foot (91.67%) and only 8.3% of mother/caregiver utilized different  
5 vehicles to reach Posyandu: 85% by motorcycle, 10% by angkot and 5% by  
6 cidomo. The cost every visit to Posyandu ranged between IDR 0-2000.

7 Almost all cadres could reach Posyandu easily. Walking distance to  
8 Posyandu ranged between 0-20 minutes. About 85.4% cadre walked to Posyandu  
9 and 14.6% utilized motorcycle to reach Posyandu. The cost of every visit to  
10 Posyandu ranged between IDR 0-2000. Cost for cadre to reach Puskesmas was  
11 ranged between IDR 2000-15000.

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#### 14 **c. Management and organization**

15 Based on in-depth interview to nutrition staff and head of Puskesmas,  
16 MNP program was a top down program and no local planning ever made at  
17 Puskesmas level. It was attached to nutrition section program, therefore nutrition  
18 staff responsible for MNP distribution and no specific job description and areas of  
19 responsibility were determined. Meetings to discuss schedule and problem were  
20 held irregularly. Puskesmas obliged to every planned activities made by DHO.  
21 Puskesmas only determined schedule of MNP distribution which attached to  
22 monthly Posyandu day. Average score for planning and management at  
23 Puskesmas was 50%.

24 Head of DHO explained that there were no specific regulation and policy  
25 ever made since the initiation of the program. This program was attached to  
26 nutrition section program. MNP distribution was using Posyandu as channel of  
27 delivery and supervision also attached to growth monitoring program. Based on  
28 in-depth interview with UNICEF responsible person, this program was intended  
29 to advocating local government to use MNP as part of infant young child feeding  
30 practices using the local existing health system delivery and to avoiding  
31 dependency.

32

1 **d. Service output**

2 Since there was no mechanism of requesting system from Posyandu to  
3 Puskesmas and also to DHO, there were no requesting reports available ever. Due  
4 to poor record system on MNP distribution, number of MNP distributed to  
5 Posyandu was not available. Puskesmas staff just brought some boxes of MNP on  
6 the day of delivery to Posyandu.

7 About 79.2% of Posyandu submitted report of last MNP distribution on  
8 August 2009. Most reports were made by cadre but some of them were made by  
9 Puskesmas staff. Only 11 children were actually given MNP at home (sweeping  
10 activity) among 231 eligible children, with a ratio of 1:21 (one had been swept  
11 among 21 underfive children)

12 Since initiation of the program, two training for cadre on MNP were  
13 conducted. First training conducted in 2007 and the last one was in 2009, with  
14 only two cadres from each Posyandu attended. During the first training, 83.3% of  
15 cadre's coordinator attended the training and only 56.3% of them attended the  
16 second one. About 87.5% of Posyandu had at least one trained cadre and 54.2%  
17 of Posyandu had their cadre coordinator attended both training. About half of the  
18 Posyandu (50%) had minimally two trained cadre at least attended one training on  
19 MNP program. Only 30.2% cadre ever trained on MNP program.

20 **e. Support system**

21 Almost all mother/caregiver acknowledged MNP distribution. The channel  
22 of information received mostly from announcement by mosque. About 83.3%  
23 Posyandu had fixed schedule of monthly Posyandu day. There were no specific  
24 place to store MNP stock at Posyandu and Puskesmas. There were 24 (50%)  
25 Posyandu had poor storing system. In both Puskesmas, there were left over stock  
26 that had not been distributed yet.

27 **f. Service outcome**

28 Most Posyandu (85.4%) had experienced over stocking of MNP and only  
29 one Posyandu ever experience lack of MNP stock on the day of MNP distribution.  
30 The main reason of over stocking was overload dropping from Puskesmas  
31 (70.7%), mother didn't want to take MNP (19.5%) and mother didn't come to  
32 Posyandu (9.8%). The reason for lack of MNP stock was due to lack of dropping

1 from Puskesmas. In the last six months the distribution of MNP only occurred in  
2 August 2009. The children were given 60 sachets for 4 months. During the last  
3 two months (December 2009 - January 2010), MNP was only given for  
4 mother/caregiver who asked for it (Table 3).

#### 5 **g. Community participation**

6 About 77.1% of mother/caregiver visited Posyandu  $\geq 4$  times in the last six  
7 months. Reason for never or less visiting to Posyandu was displayed in Table  
8 4.10; due to busy working (29.1%) and others reason were went out of the village  
9 on the day of distribution, sickness and children were afraid to the weighing  
10 activity. Almost half of head of sub-village (47.9%) supported MNP distribution  
11 by giving information of MNP distribution schedule monthly. Others support  
12 were providing place for MNP distribution and attending MNP distribution.

## 15 **DISCUSSION**

16 There were several efficacy studies on MNP had been conducted on different  
17 areas in Indonesia such as in urban slums Jakarta, rural Sukabumi [12] and North  
18 Jakarta [13]. Findings in those studies showed a consistent result of improving  
19 anemia prevalence on underfive children after giving MNP for several months.  
20 However, we still need to evaluate MNP program in a community setting; hence,  
21 a public health effectiveness of MNP program is needed. To date, this is the first  
22 study evaluating public health effectiveness of MNP program in a community  
23 setting.

24 MNP program was part of CHANSYS project which consist of several  
25 intervention package of improving health of underfive children and strengthening  
26 service delivery system. Since there were limited study regarding MNP  
27 distribution program, this study would only focused on MNP distribution by  
28 reviewing essential system component of distribution of MNP program.

29 This study took underfive children as sample based on quadrants without  
30 random selection among available underfive children in each quadrant. It means  
31 that those samples probably may not represent the area. When we compare some  
32 characteristics of mother/caregiver between CHANSYS baseline survey [14] and

1 this study: mean of mother's age was 27 years vs. 29 years, mother's education of  
2 illiteracy and elementary school graduate was 56% vs. 44.6%, mother's as  
3 housewife was 76% vs. 43.8%, and Posyandu's routine visit was 62% vs. 77%.  
4 Besides mother's occupation as housewife, others important characteristics were  
5 quite comparable, considering that this study purposively selected the best  
6 practice of MNP program in Lombok Tengah.

7 MNP was distributed free of charge to all children age 6-59 months old.  
8 The choice of distribution strategy was utilizing Posyandu as already established  
9 at every sub-village. This choice was in line with the intention of the project by  
10 strengthening existing system and not establishing any parallel system [10].  
11 However, the choice of distribution strategy was based on agreement between  
12 local government (DHO) and UNICEF without involving Puskesmas staff or  
13 cadres in the decision making process. Since a number of programs are attached  
14 to Posyandu of which needs good involvement of cadres and other respective  
15 personnel, this kind of agreement needs to be revisited. Poor recording of MNP  
16 logistic resulted in overstock of MNP at Posyandu as a result of no specific job  
17 description and areas of responsibility of nutrition staff responsible for MNP  
18 distribution observed in this study, would be a consequence of one sided  
19 agreement like this kind.

20 Although Posyandu had good accessibility for cadre and mother since  
21 most of Posyandu located in the center of sub-village, however, not all of  
22 mother/caregiver acknowledged about MNP distribution. This might occur since  
23 most mother/caregiver obtained the information through announcement from the  
24 mosque which might not cover all member of the community. Besides, there were  
25 about 22.9% mothers/caregivers did not routinely visit Posyandu in the last six  
26 months, mostly due to busy doing household tasks and working. These showed  
27 that Posyandu alone as channel of MNP distribution would have not been enough.  
28 Various channel of MNP distribution might be needed to distribute MNP to the  
29 community, such example exist in Nigeria where three different strategies of  
30 delivery mechanism of vitamin A supplementation program implemented flexibly:  
31 fixed post, advanced post and mobile strategy, responding to the uneven



1 geographical condition to have a successful program of vitamin A distribution  
2 [15].

3 This study observed that sweeping activity, similarly as mobile strategy in  
4 Nigeria, was not seriously implemented. MNP was delivered from Puskesmas to  
5 Posyandu on the day of distribution and to be given to mother/caregiver who  
6 attended Posyandu. If they were not shown up, cadre was supposed to conduct  
7 sweeping activity; however, not all Posyandu confirmed the expected sweeping  
8 activity – it was rarely implemented. Sometimes cadres asked the neighbors to  
9 pass MNP to mother/caregiver who didn't visit Posyandu. Similar practice  
10 occurred in vitamin A distribution program in several areas of Indonesia [16].  
11 This problem should be addressed accordingly: could it be a lack of cadre's  
12 commitment, unavailability of incentive for sweeping activity or cadre's heavy  
13 workload.

14 The inconsistency of MNP delivery was due to unavailability of SOP or  
15 guideline and improper program planning, a result of a top-down program and  
16 unavailability of local planning ever made by Puskesmas. Furthermore, the  
17 socialization of the program was conducted one month prior to first distribution  
18 which considered as a very short time.

19 The irregularity of MNP distribution during the last six months was due to  
20 miss-communication between interns of UNICEF. Although the request made by  
21 DHO already included MNP needs for one year, however, UNICEF was only able  
22 to provide half of MNP needs sufficient for less than six months. Since this  
23 program required huge number of MNP, proper planning and management of  
24 logistic are needed. DHO agreed to receive this shortage of stock as DHO  
25 experienced some difficulties to distribute MNP due to low acceptance of MNP  
26 resulting in abundant of leftovers up to Posyandu level.

27 There was no requesting system especially for MNP ever made by  
28 Posyandu up to DHO. No survey conducted especially to get the list of MNP  
29 targeted children. DHO only used list of underfive children based on Puskesmas  
30 report on growth monitoring program which might be not updated regularly.  
31 DHO requested MNP needs based on the report and projection data. This practice  
32 might have given inaccurate assessment of MNP needs, hence inaccurate supply

1 from UNICEF as it found that most Posyandu experienced over-stock of MNP.  
2 Furthermore, last request of DHO to UNICEF was made more than one year prior  
3 to MNP distribution schedule. This could contribute to even more inaccuracy data  
4 of MNP needs. DHO and Puskesmas should strengthen their task of getting an  
5 appropriate data on population of underfive children.

6 UNICEF set the deadline for request at least six months in advanced to  
7 give them enough time to provide the MNP stocks. This practice was better than  
8 the vitamin A supplementation program in West Kalimantan province, where  
9 there was no deadline of vitamin A capsules request to MOH and usually the  
10 request was submitted one month before delivery. However, unlike in this MNP  
11 program, the mechanism of vitamin A request from Posyandu up to DHO was  
12 available [16].

13 Besides inaccuracy assessment of MNP needs, the fact that some of  
14 mother/caregiver did not want to take MNP might also lead to abundant leftovers  
15 of MNP. Unavailability records of MNP logistic available at DHO up to  
16 Posyandu would also have contributed to over-stock of MNP. Poor record of  
17 MNP logistic allowed poor information on quantities of MNP at different  
18 distribution levels. Puskesmas staff continuously delivered MNP without  
19 monitoring the leftovers at Posyandu. Those might be the causes of most  
20 Posyandu experienced over-stock of MNP.

21 The availability of MNP storing system observed in this study was very  
22 poor. Most Posyandu in this study kept MNP stocks in no specific room with  
23 high humidity, and possible contamination of cockroach and mouse, as it  
24 recognized in many circumstances in which MNP storage is possible in those  
25 improper condition. If it happened, the products should have been produced  
26 suitable with their best shelf life under prevailing condition, adapt packaging and  
27 advice customers and users on the expected shelf life [17]. Therefore, supplier of  
28 MNP should put this condition into consideration.

29 Puskesmas staff only delivered MNP stock to Posyandu monthly without  
30 performing any other tasks such as monitoring and supervision of MNP  
31 distribution. Therefore, cadre rarely received feedback on MNP program, due to  
32 no specific report of Puskesmas supervision. Similar condition of supervision

1 from DHO to Puskesmas also occurred: no records of supervision available as  
2 well as at DHO. Based on interview with Puskemas staff, low acceptance of  
3 MNP was already known since first semester of MNP distribution. Puskesmas  
4 already sent this information to DHO but there was no feedback given to  
5 overcome the problem. More than one year after, DHO and UNICEF conducted  
6 survey to find out more about the low acceptance of MNP. Afterwards, several  
7 facilitators were selected to assist MNP distribution on every village.  
8 Unfortunately, this effort was initiated only several months before the last MNP  
9 distributed.

10 This study observed lack and ineffective supervision with regards to feed  
11 back given to overcome the existing problem. Nutrition staff of Puskesmas  
12 claimed that their workload were too much since most Puskesmas programs  
13 attached to nutrition section, whereby only 2-3 nutrition staff available in each  
14 Puskesmas, considering one Puskesmas should supervised 25 Posyandu. This fact  
15 resulted in limited and ineffective supervision to Posyandu. Similarly, some  
16 cadres also mentioned about their extra responsibilities of running this additional  
17 MNP program in Posyandu and claimed no incentives since the previous year. A  
18 study on public funding in health at district level in Indonesia after  
19 decentralization observed that allocation for health center only less than a quarter  
20 of public funds for health [18]. As UNICEF intention to have the MNP program  
21 to be embedded to the local existing health system, the local health authority  
22 should have been able to address this problem. Propose funding allocation for  
23 distribution of MNP as well as additional staffs of nutrition section at Puskemas  
24 are necessary for the success of MNP program.

25 Training on MNP program was very limited. Since the initiation of the  
26 program, there were only two trainings for cadres, with no refreshers training in  
27 between and only half of cadre's coordinator attended the second training.  
28 Review among several countries in South Asia revealed that continuous training  
29 was found to be an essential prerequisite for an effective community health  
30 workers program [19]. Limited qualified training for cadres and low participation  
31 of cadres to attend training might be the causes of poor knowledge of cadres  
32 regarding MNP program especially the importance of accurate data on targeted

1 children. Poor knowledge would also probably due to in-continuity and  
2 irregularity of training. Continuous and qualified training would improve  
3 knowledge, motivation and skill of cadres in delivering program for community  
4 [20].

5 This study also revealed that there were lack of community participation  
6 especially participation by head of sub-villages. Their contribution to the program  
7 was mostly by only informing Posyandu day which actually at the same time  
8 scheduled for MNP distribution, despite efforts to socialize the program started by  
9 inviting sub-village heads and implementing regulation for them to became cadre  
10 in their Posyandu. Posyandu has a concept of community ownership aiming for  
11 the welfare of the community. Therefore, coordination among stakeholders  
12 should be an integrated efforts amongst all of them, with the sub-village head as  
13 the focal person [21].

14 Report of MNP distribution at Posyandu was using custom format from  
15 DHO and integrated with vitamin A and deworming tablet report. Cadre reported  
16 only list of children received MNP with no information about number of MNP  
17 sachets received by each child. Inconsistent data on number of children received  
18 MNP from Posyandu up to DHO was also observed. These conditions might have  
19 given impact on inaccuracy of coverage calculation.

20 This study revealed that the coverage of MNP distribution was low  
21 (<50%). However, report from DHO stated that coverage of MNP distribution  
22 was  $\geq 90\%$ . This discrepancy might be due to inaccuracy and inconsistency of  
23 data on targeted children at DHO, since cadres only reported those who attended  
24 Posyandu, excluding other targeted children who did not attend Posyandu. Report  
25 from Posyandu were used by Puskesmas and furthermore to DHO as the source of  
26 their report. Consequently, over reporting would have been produced. It was also  
27 found that Puskesmas had reported high coverage of MNP distribution and no  
28 leftovers. However, by observation, it was found that there were still several  
29 boxes of MNP leftovers in Puskesmas and abundant stocks at Posyandu.

30 The low coverage was a result of low sweeping activity, poor recording  
31 and reporting system, ineffective supervision, lack of qualified training for cadres,  
32 unavailability of request mechanism low level, financial support for operational of

1 MNP distribution and lack of community participation. All of essential  
2 components of MNP distribution system were mostly deficient. Since all of them  
3 were interrelated to each other, any deficiency of those components might give  
4 influence to others; hence, coverage of MNP distribution as an outcome of the  
5 system was low. This was in agreement with findings of vitamin A distribution  
6 study in three provinces of Indonesia, in which improper functioning on its  
7 several essential components influencing the low coverage as well [16]. This low  
8 coverage might also influenced by the low acceptance of MNP itself as most  
9 mothers/caregivers mentioned their child dislike MNP due to organoleptic  
10 changes on food sprinkled MNP and some cadres also confirmed this fact, hence,  
11 mother/caregiver refused to receive MNP. This fact might be the consequences of  
12 improper practice of MNP use. However, this study were not exploring on  
13 practice of MNP use among mother/caregiver.

14       Effective program should be based on sound information about the setting  
15 and consideration to create demand among different stakeholders, namely  
16 politicians, health care providers and parents, to enhance program uptake and at  
17 the end for the betterment of child nutrition [22]. The need of proper local  
18 program planning is highly required to achieve the goal of the program. This  
19 study also shows how important it is to highly recognize a study on program  
20 delivery to the success of a new health program to be scaled-up.

21       It is obvious, that at least in Praya Tengah sub-district, MNP delivery was  
22 not working properly, meaning that MNP did not reach targeted underfive  
23 children.

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## 25 **CONCLUSIONS AND RECCOMENDATIONS**

26       Most of all essential components of MNP distribution system were mostly  
27 deficient. Deficiencies were due to poor planning and management, no requesting  
28 mechanism from Posyandu to DHO, poor record system and resources at  
29 Posyandu and Puskesmas, no financial support for MNP distribution, ineffective  
30 supervisions, inadequate training for cadre and lack of support from community  
31 leader. Since all of the sub-systems were interrelated to each other, any

1 deficiency might give effect to others, and consequently, coverage of MNP  
2 distribution was low.

3           Recommendations to be addressed are provision comprehensive study  
4 regarding local health system especially capacity of resources before running a  
5 future MNP program, provision of proper local program planning and  
6 management of MNP program accustomed to the available health care delivery  
7 service capacity, provision of complete SOP and guidelines for MNP distribution  
8 prior to program implementation, requirement to develop mutual agreements  
9 among stakeholders of a sharing planned MNP distribution activities, a study to  
10 recognize other possible channel for MNP distribution and increasing awareness  
11 of study in program delivery is highly recommended.

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1 Table 1. Characteristics of Puskesmas under study in Praya Tengah sub-district

Characteristic	Batunyala	Pengadang	Total
Number of village under supervision	5	5	10
Number of Posyandu under supervision	54	50	104
Total population	31,686	33,169	64,855
Number of cadre	109	126	235
Number of active cadre, <i>n</i> (%)	95 (87)	114 (91)	209 (89)
Number of trained cadre, <i>n</i> (%)	35 (32)	36 (29)	71 (30)
Number of underfive children	3359	4504	7863
Ratio Posyandu : underfive children	1:62	1:90	1:75

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1 Table 2. Characteristic of socio-economic status of household in Praya Tengah  
 2 sub-district

Characteristic	Total
Family size <sup>1</sup> , median (min,max)	4 (2,10)
Underfive children in the household <sup>1</sup> , n(%)	
1 underfive	216 (90)
>1 underfive	24 (10)
Father educational level <sup>2</sup> , n(%)	
Never or <3 years of schooling	39 (16.5)
Elementary school	62 (26.3)
Junior high school	56 (23.7)
Senior high school	59 (25)
University	20 (8.5)
Mother educational level <sup>1</sup> , n(%)	
Never or <3 years of schooling	24 (10)
Elementary school	83 (34.6)
Junior high school	59 (24.6)
Senior high school	62 (25.8)
University	12 (5)
Father's occupation <sup>3</sup> , n(%)	
Farmer/fisherman/breeder (land/boat/husbandry owner)	50 (21.5)
Farmer/fisherman (not land/boat husbandry owner)	28 (12)
Government employee	24 (10.3)
Entrepreneur	10 (4.3)
Laborer	58 (24.8)
Migrant worker	40 (17.1)
Unemployed	3 (1.3)
Driver/ojck/cidomo	11 (4.7)
Others	10 (4.3)
Mother's occupation <sup>1</sup> , n(%)	
Housewife	105 (43.8)
Farmer/fisherman/breeder (land/boat/husbandry owner)	39 (16.2)
Farmer/fisherman (not land/boat husbandry owner)	23 (9.6)
Government employee	18 (7.5)
Entrepreneur	16 (6.7)
Laborer	22 (9.1)
Migrant worker	8 (3.3)
Others	9 (3.7)

3 <sup>1</sup>n=240

4 <sup>2</sup>n=236

5 <sup>3</sup>n=234

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1 Table 3. Characteristics of cadre in Praya Tengah sub-district

Characteristic	Total, n=48
<b>Sex, n(%)</b>	
Men	2 (4.2)
Women	46 (95.8)
<b>Educational level, n(%)</b>	
<3 years of schooling	1 (2.1)
Elementary school	9 (18.8)
Junior high school	15 (31.2)
Senior high school	20 (41.7)
University	3 (6.2)
<b>Occupation, n(%)</b>	
Housewife	19 (39.6)
Farmer/ breeder (land/husbandry owner)	6 (12.5)
Farmer/breeder (not land/husbandry owner)	10 (21)
Private employee	6 (12.5)
Others	7 (14.6)
Age of cadre, <i>median (min,max)</i>	32 (22,45)
Duration of being cadre, <i>median (min, max)</i>	10 (1,29)

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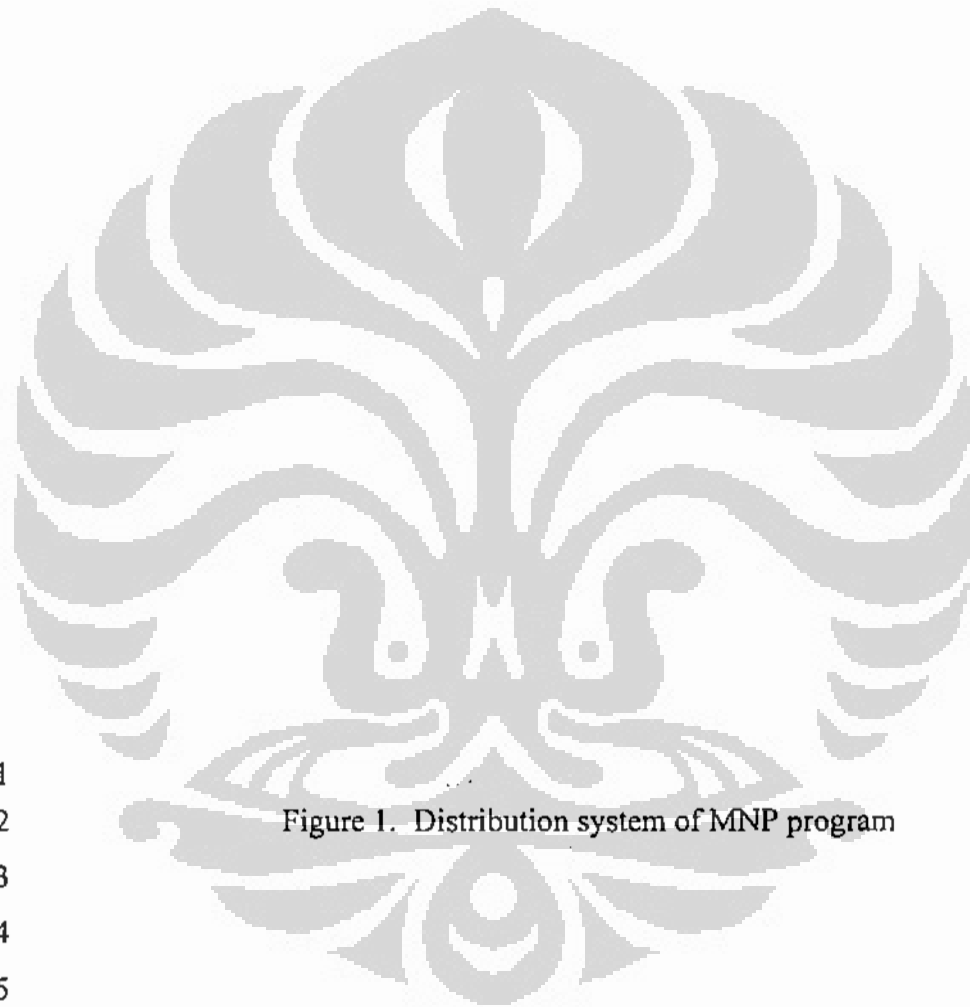
1 Table 4. Distribution of MNP coverage in the last 6 months in Praya Tengah  
 2 sub-district

	MNP received in the last 6 months	Total
MNP received in the last 6 months <sup>1</sup> , n(%)		
0		25 (10.8)
<60 sachets		98 (42.2)
60 sachets		88 (37.9)
>60 sachets		21 (8.9)
MNP received on August 2009 <sup>1</sup> , n(%)		
0		91 (39.2)
<60 sachets		92 (39.6)
60 sachets		47 (20.3)
>60 sachets		2 (0.8)
Main reason for irregular received of MNP <sup>2</sup> , n(%)		
Child dislike MNP		95 (41.1)
No stock available at Posyandu		85 (36.8)
Irregular visit to Posyandu		15 (6.5)
Posyandu too far away		8 (3.5)
Mother disliked MNP to be given to her child		6 (2.6)
Others		21 (9)

3 <sup>1</sup>n=232

4 <sup>2</sup>n=231

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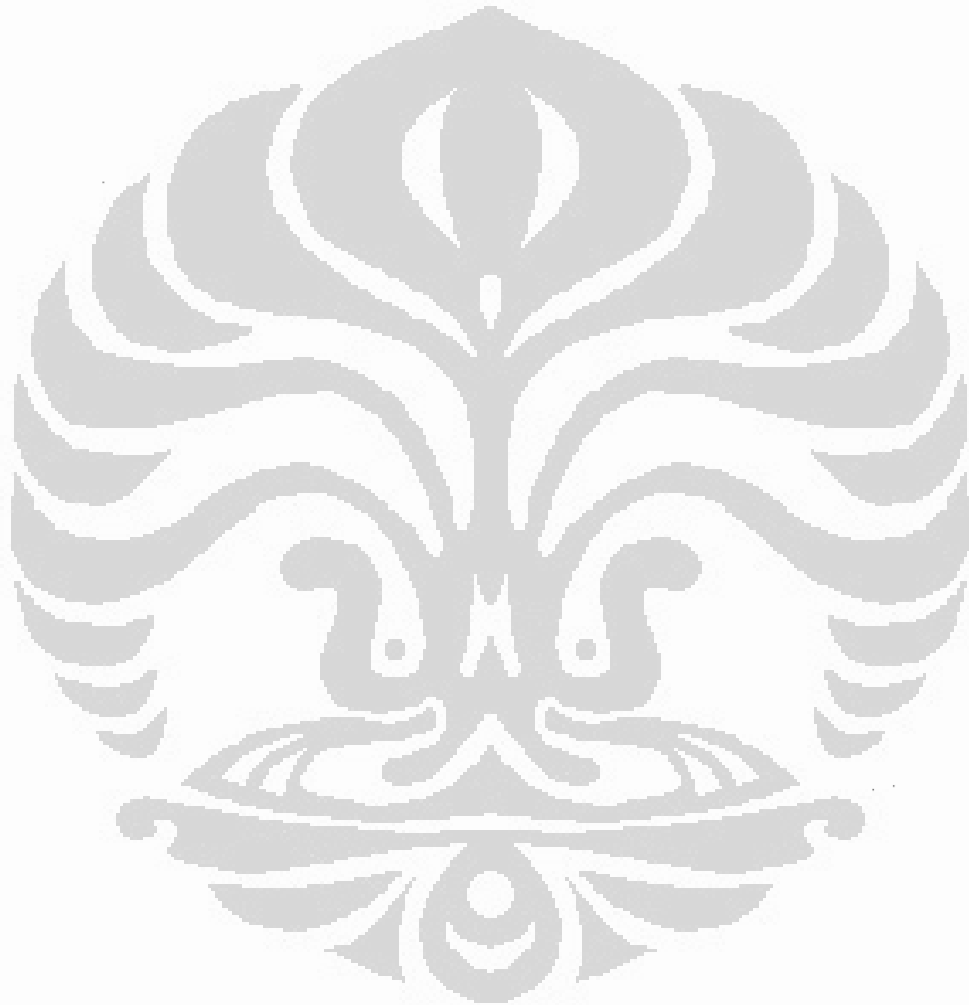


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Figure 1. Distribution system of MNP program

# APPENDIX 2

## GUIDELINES FOR AUTHORS



## Directions to Contributors

### Public Health Nutrition

(Revised April 2010)

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The submission must include a statement reporting any conflicts of interest, all sources of funding and the contribution of each author to the manuscript. The International Committee of Medical Journal Editors (ICMJE) guidelines state that 'Conflict of interest exists when an author (or the author's institution) has financial or personal relationships that inappropriately influence (bias) his or her actions (such relationships are also known as dual commitments, competing interests, or competing loyalties)'; for further detail, see [http://www.icmje.org/ethical\\_4conflicts.html](http://www.icmje.org/ethical_4conflicts.html). If there are no conflicts of interest this must be stated. If the work was funded, please state "This work was supported by (for example) The Medical Research Council [grant number xxx (if applicable)]". If the research was not funded by any specific project grant, state "This research received no specific grant from any funding agency in the public, commercial or not-for-profit sectors." The author will be asked to provide this information during the submission process and should not include it as part of the manuscript. This enables double-blind reviewing. If accepted, the paragraph will then be published as part of the manuscript.

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When substantial revisions are required to manuscripts, authors are given the opportunity to do this once only, the need for any further changes should at most reflect only minor issues. If a paper requiring revision is not resubmitted within 3 months, it may, on resubmission, be deemed a new paper and the date of receipt altered accordingly.

*Public Health Nutrition* publishes the following: Full Papers, Short Communications, Review Articles, Letters to the Editors, Commentaries, Debate and Opinion Papers and Editorials.

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Short Communications. Papers submitted as Short Communications should consist of about 2000 words and will be fast tracked through the system.

Review Articles. Please contact the Editorial Office with any queries regarding the submission of potential review articles.

Letters to the Editor/Debate and Opinion Papers. Letters are invited that discuss, criticise or develop themes put forward in papers published in the *Public Health Nutrition* or that deal with matters relevant to it. They should not be used as a means of publishing new work. Acceptance will be at the discretion of the Editorial Board, and editorial changes may be required. Wherever possible, letters from responding authors will be included in the same issue.

Form of full papers submitted for publication. A typical paper should be no more than 4000 words long. This word count does not include the heading, references, tables, graphs and acknowledgements. The onus of preparing a paper in a form suitable for sending to press lies with the author. Authors are advised to consult a current issue in order to make themselves familiar with the *Public Health Nutrition* as to typographical and other conventions, layout of tables etc. Authors are encouraged to consult the latest guidelines produced by the ICMJE, which contains a lot of useful generic information about preparing scientific papers <http://www.icmje.org/> and also the CONSORT guidelines for reporting results of randomised trials <http://www.consort-statement.org/>. The journal endorses the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement, a guideline to help authors report a systematic review and meta-analysis <http://prisma-statement.org> (see *British Medical Journal* (2009) 339, b2535). A systematic review or meta-analysis of randomised trials and other evaluation studies should follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (<http://prisma-statement.org>).

Plagiarism: Text taken directly or closely paraphrased from earlier published work that has not been acknowledged or referenced will be considered plagiarism. Submitted manuscripts in which such text is identified will be withdrawn from the editorial process.

Authors are invited to nominate up to four potential referees who may then be asked by the Editorial Board to help review the work.

Typescripts should be prepared with 1.5 line spacing and wide margins (2 cm), the preferred font being Times New Roman size 12. At the ends of lines words should not be hyphenated unless hyphens are to be printed. Page and line numbering are required.

Spelling should generally be that of the *Concise Oxford Dictionary* (1995), 9th ed. Oxford: Clarendon Press. Papers should normally be divided into the following parts:

(a) *Title page*: authors' names should be given without titles or degrees and one forename may be given in full. The name and address of the institution where the work was performed should be given, as well as the main address for each author.

The name and address of the author to whom correspondence should be sent should be clearly stated, together with telephone and fax numbers and email address. Other authors should be linked to their address using superscript Arabic numerals.

The title page should also contain a shortened version of the paper's title, not exceeding forty-five letters and spaces in length, suitable for use as a running title in the published paper.

Authors are asked to supply three or four key words or phrases on the title page of the typescript.

The title page should be submitted online as a separate cover letter. This enables double-blind reviewing.

(b) *Abstract*: each paper must open with a structured abstract of not more than 250 words. The abstract should consist of the following headings: Objective, Design, Setting, Subjects, Results, Conclusions. All the headings should be used, and there should be a separate paragraph for each one. The abstract should be intelligible without reference to text or figures.

(c) *Introduction*: it is not necessary to introduce a paper with a full account of the relevant literature, but the introduction should indicate briefly the nature of the question asked and the reasons for asking it.

(d) *Experimental methods*: methods should appear after the introduction.

(e) *Results*: these should be given as concisely as possible, using figures or tables as appropriate.

(f) *Discussion*: while it is generally desirable that the presentation of the results and the discussion of their significance should be presented separately, there may be occasions when combining these sections may be beneficial. Authors may also find that additional or alternative sections such as 'conclusions' may be useful.

(g) *Acknowledgments*: these should be given in a single paragraph after the discussion and should include information on source of funding, declaration of any conflicts of interest and a brief statement of the contribution(s) of each author, as specified above. The author will be asked to provide this information during the submission process and should not include it as part of the manuscript. This enables double-blind reviewing.

(h) *References*: these should be given in the text using the Vancouver system. They should be numbered consecutively in the order in which they first appear in the text using superscript Arabic numerals in parentheses, e.g. 'The conceptual difficulty of this approach has recently been highlighted<sup>(1,2-4)</sup>'. If a reference is cited more than once the same number should be used each time. References cited only in tables and figure legends and not in the text should be numbered in sequence from the last number used in the text and in the order of mention of the individual tables and figures in the text. At the end of the paper, on a page(s) separate from the text, references should be listed in numerical order. When an article has more than three authors only the names of the first three authors should be given followed by 'et al.'. The issue number should be omitted if there is continuous pagination throughout a volume. Names and initials of authors of unpublished work should be given in the text as 'unpublished results' and not included in the References. Titles of journals should appear in their abbreviated form using the NCBI LinkOut page <http://www.ncbi.nlm.nih.gov/projects/linkout/journals/jourlists.fcgi?typid=1&type=journals&operation=Show>. References to books and monographs should include the town of publication and the number of the edition to which reference is made. Thus:

1. Setchell KD, Faughnan MS, Avades T *et al.* (2003) Comparing the pharmacokinetics of daidzein and genistein with the use of <sup>13</sup>C-labeled tracers in premenopausal women. *Am J Clin Nutr* 77, 411-419.
2. Barker DJ, Winter PD, Osmond C *et al.* (1989) Weight in infancy and death from ischaemic heart disease. *Lancet* ii, 577-580.
3. Forchielli ML & Walker WA (2005) The role of gut-associated lymphoid tissues and mucosal defence. *Br J Nutr* 93, Suppl. 1, S41-S48.
4. Bradbury J, Thomason JM, Jepson NJA *et al.* (2003) A nutrition education intervention to increase the fruit and vegetable intake of denture wearers. *Proc Nutr Soc* 62, 86A.
5. Fröhbeek G, Gómez-Ambrosi J, Muruzabal FJ *et al.* (2001) The adipocyte: a model for integration of endocrine and metabolic signaling in energy metabolism regulation. *Am J Physiol Endocrinol Metab* 280, E827-E847.
6. Han KK, Soares JM Jr, Haidar MA *et al.* (2002) Benefits of soy isoflavone therapeutic regimen on menopausal symptoms. *Obst Gynecol* 99, 389-394.
7. Uhl M, Kassie F, Rabot S *et al.* (2004) Effect of common Brassica vegetables (Brussels sprouts and red cabbage) on the development of preneoplastic lesions induced by 2-amino-3-methylimidazo[4,5-f]quinoline (IQ) in liver and colon of Fischer 344 rats. *J Chromatogr* 802B, 225-230.
8. Hall WL, Vafeiandou K, Hallund J *et al.* (2005) Soy isoflavone enriched foods and inflammatory biomarkers of cardiovascular risk in postmenopausal women: interactions with genotype and equal production. *Am J Clin Nutr* (In the Press).
9. Skurk T, Herder C, Kraft I *et al.* (2004) Production and release of macrophage migration inhibitory factor from human adipocytes. *Endocrinology* (Epublication ahead of print version).
10. Skurk T, Herder C, Kraft I *et al.* (2005) Production and release of macrophage migration inhibitory factor from human adipocytes. *Endocrinology* 146, 1006-1011; Epublication 2 December 2004.
11. Bradbury J (2002) Dietary intervention in edentulous patients. PhD Thesis, University of Newcastle.
12. Ailhaud G & Hauner H (2004) Development of white adipose tissue. In *Handbook of Obesity. Etiology and Pathophysiology*, 2nd ed., pp. 481-514 [GA Bray and C Bouchard, editors]. New York: Marcel Dekker.
13. Bruinsma J (editor) (2003) *World Agriculture towards 2015/2030: An FAO Perspective*. London: Earthscan Publications.
14. Grinari JM & Bauman DE (1999) Biosynthesis of conjugated linoleic acid and its incorporation into meat and milk in ruminants. In *Advances in Conjugated Linoleic Acid Research*, vol. 1, pp. 180-200 [MP Yurawecz, MM Mossoba, JKG Kramer, MW Pariza and GJ Nelson, editors]. Champaign, IL: AOCS Press.
15. Henderson L, Gregory J, Irving K *et al.* (2004) *National Diet and Nutrition Survey: Adults Aged 19 to 64 Years*. vol. 2: Energy, Protein, Fat and Carbohydrate Intake. London: The Stationery Office.



16. International Agency for Research on Cancer (2004) *Cruciferous Vegetables, Isothiocyanates and Indoles*. IARC Handbooks of Cancer Prevention no. 9 [H Vainio and F Bianchini, editors]. Lyon, France: IARC Press.
17. Linder MC (1996) Copper. In *Present Knowledge in Nutrition*, 7th ed., pp. 307–319 [EE Zeigler and LJ Filer Jr, editors]. Washington, DC: ILSI Press.
18. World Health Organization (2003) *Diet, Nutrition and the Prevention of Chronic Diseases. Joint WHO/FAO Expert Consultation. WHO Technical Report Series no. 916*. Geneva: WHO.
19. Keiding L (1997) *Astma, Allergi og Anden Overfølsomhed i Danmark – Og Udviklingen 1987–1991 (Asthma, Allergy and Other Hypersensitivities in Denmark, 1987–1991)*. Copenhagen, Denmark: Dansk Institut for Klinisk Epidemiologi.

References to material available on websites should include the full Internet address, and the date of the version cited. Thus:

20. Department of Health (1997) Committee on Toxicity of Chemicals in Food Consumer Products and the Environment. Statement on vitamin B<sub>6</sub> (pyridoxine) toxicity. <http://www.open.gov.uk/doh/het/B6.htm>
21. Kramer MS & Kakuma R (2002) *The Optimal Duration of Exclusive Breastfeeding: A Systematic Review*. Rome: WHO, available at [http://www.who.int/nut/documents/optimal\\_duration\\_of\\_exc\\_bffeeding\\_review\\_eng.pdf](http://www.who.int/nut/documents/optimal_duration_of_exc_bffeeding_review_eng.pdf)
22. Hooper L, Thompson RL, Harrison RA et al. (2004) Omega 3 fatty acids for prevention and treatment of cardiovascular disease. *Cochrane Database of Systematic Reviews*, issue 4, CD003177. <http://www.mrw.interscience.wiley.com/cochrane/cdsystrev/articles/CD003177/frame.html>
23. Nationmaster (2005) HIV AIDS – Adult prevalence rate. [http://www.nationmaster.com/graph-T/hea\\_hiv\\_aid\\_adu\\_pre\\_rat](http://www.nationmaster.com/graph-T/hea_hiv_aid_adu_pre_rat) (accessed June 2005).

**Mathematical modelling of nutritional processes.** Papers in which mathematical modelling of nutritional processes forms the principal element will be considered for publication provided: (a) they are based on sound biological and mathematical principles; (b) they advance nutritional concepts or identify new avenues likely to lead to such advances; (c) assumptions used in their construction are fully described and supported by appropriate argument; (d) they are described in such a way that the nutritional purpose is clearly apparent; (e) the contribution of the model to the design of future experimentation is clearly defined.

**Units.** Results should be presented in metric units according to the International System of Units (see Quantities, Units, and Symbols (1971) London: The Royal Society, and Metric Units, Conversion Factors and Nomenclature in Nutritional and Food Sciences (1972) London: The Royal Society – as reproduced in *Proceedings of the Nutrition Society* (1972) 31, 239–247). SI units should be used throughout the paper. The author will be asked to convert any values that are given in any other form. The only exception is where there is a unique way of expressing a particular variable that is in widespread use. Energy values must be given in Joules (MJ or kJ) using the conversion factor 1 kcal = 4.184 kJ. If required by the author, the value in kcal can be given afterwards in parentheses. Temperature is given in degrees Celsius (°C). Vitamins should be given as mg or µg, not as IU.

For substances of known molecular mass (Da) or relative molecular mass, e.g. glucose, urea, Ca, Na, Fe, K, P, values should be expressed as mol/l; for substances of indeterminate molecular mass (Da) or relative molecular mass, e.g. phospholipids, proteins, and for trace elements, e.g. Cu, Zn, then g/l should be used.

Time. The 24 h clock should be used, e.g. 15.00 hours.

Units are: year, month, week, d, h, min, s, kg, g, mg, µg, litre, ml, µl, fl. To avoid misunderstandings, the word litre should be used in full, except in terms like g/l. Radioactivity should be given in becquerels (Bq or GBq) not in Ci. 1 MBq = 27.03 µCi (1Bq = 1 disintegration/s).

**Statistical treatment of results.** Data from individual replicates should not be given for large experiments, but may be given for small studies. The methods of statistical analysis used should be described, and references to statistical analysis packages included in the text, thus: Statistical Analysis Systems statistical software package version 6.11 (SAS Institute, Cary, NC, USA). Information such as analysis of variance tables should be given in the paper only if they are relevant to the discussion. A statement of the number of replicates, their average value and some appropriate measure of variability is usually sufficient.

Comparisons between means can be made by using either confidence intervals (CI) or significance tests. The most appropriate of such measures is usually the standard error of a difference between means (SED), or the standard errors of the means (SE or SEM) when these vary between means. The standard deviation (SD) is more useful only when there is specific interest in the variability of individual values. The degrees of freedom (df) associated with SED, SEM or SD should also be stated. The number of decimal places quoted should be sufficient but not excessive. Note that pH is an exponential number, as are the log<sub>10</sub> values often quoted for microbial numbers. Statistics should be carried out on the scalar rather than the exponential values.

If comparisons between means are made using CI, the format for presentation is, e.g. 'difference between means 0.73 (95 % CI 0.314, 1.36) g'. If significance tests are used, a statement that the difference between the means for two groups of values is (or is not) statistically significant should include the level of significance attained, preferably as an explicit *P* value (e.g. *P*=0.016 or *P*=0.32) rather than as a range (e.g. *P*<0.05 or *P*>0.05). It should be stated whether the significance levels quoted are one-sided or two-sided. Where a multiple comparison procedure is used, a description or explicit reference should be given. Where appropriate, a superscript notation may be used in tables to denote levels of significance; similar superscripts should denote lack of a significant difference.

Where the method of analysis is unusual, or if the experimental design is at all complex, further details (e.g. experimental plan, raw data, confirmation of assumptions, analysis of variance tables, etc.) should be included.

**Figures.** In curves presenting experimental results the determined points should be clearly shown, the symbols used being, in order of preference, ○, ●, △, ▲, □, ■, ×, +. Curves and symbols should not extend beyond the experimental points. Scale-marks on the axes should be on the inner side of each axis and should extend beyond the last experimental point. Ensure that lines and symbols used in graphs and shading used in histograms are large enough to be easily identified when the figure is reduced to fit the printed page.

Figures and diagrams can be prepared using most applications but please do not use the following: cdx, chm, jnb or PDF. All figures should be numbered and legends should be provided. Each figure, with its legend, should be comprehensible without reference to the text and should include definitions of abbreviations. Latin names for unusual species should be included unless they

have already been specified in the text. Each figure will be positioned near the point in the text at which it is first introduced unless instructed otherwise.

Refer to a recent copy of the journal for examples of figures.

**Plates.** The size of photomicrographs may have to be altered in printing; in order to avoid mistakes the magnification should be shown by scale on the photograph itself. The scale with the appropriate unit together with any lettering should be drawn by the author, preferably using appropriate software.

**Tables.** Tables should carry headings describing their content and should be comprehensible without reference to the text. Tables should not be subdivided by ruled lines. The dimensions of the values, e.g. mg/kg, should be given at the top of each column. Separate columns should be used for measures of variance (SD, SE etc.), the  $\pm$  sign should not be used. The number of decimal places used should be standardized; for whole numbers 1.0, 2.0 etc. should be used. Shortened forms of the words weight (wt) height (ht) and experiment (Expt) may be used to save space in tables, but only Expt (when referring to a specified experiment, e.g. Expt 1) is acceptable in the heading.

Footnotes are given in the following order: (1) abbreviations, (2) superscript letters, (3) symbols. Abbreviations are given in the format: RS, resistant starch. Abbreviations appear in the footnote in the order that they appear in the table (reading from left to right across the table, then down each column). Abbreviations in tables must be defined in footnotes. Symbols for footnotes should be used in the sequence: \*†§||, then \*\* etc. (omit \* or †, or both, from the sequence if they are used to indicate levels of significance).

For indicating statistical significance, superscript letters or symbols may be used. Superscript letters are useful where comparisons are within a row or column and the level of significance is uniform, e.g. <sup>a,b,c</sup>Mean values within a column with unlike superscript letters were significantly different ( $P < 0.05$ ). Symbols are useful for indicating significant differences between rows or columns, especially where different levels of significance are found, e.g. 'Mean values were significantly different from those of the control group: \* $P < 0.05$ , \*\* $P < 0.01$ , \*\*\* $P < 0.001$ '. The symbols used for  $P$  values in the tables must be consistent.

Tables should be placed at the end of the text. Each table will be positioned near the point in the text at which it is first introduced unless instructed otherwise.

Please refer to a recent copy of the journal for examples of tables.

**Chemical formulas.** These should be written as far as possible on a single horizontal line. With inorganic substances, formulas may be used from first mention. With salts, it must be stated whether or not the anhydrous material is used, e.g. anhydrous  $\text{CuSO}_4$ , or which of the different crystalline forms is meant, e.g.  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ ,  $\text{CuSO}_4 \cdot \text{H}_2\text{O}$ .

**Descriptions of solutions, compositions and concentrations.** Solutions of common acids, bases and salts should be defined in terms of molarity (M), e.g. 0.1 M- $\text{NaH}_2\text{PO}_4$ . Compositions expressed as mass per unit mass (w/w) should have values expressed as ng,  $\mu\text{g}$ , mg or g per kg; similarly for concentrations expressed as mass per unit volume (w/v), the denominator being the litre. If concentrations or compositions are expressed as a percentage, the basis for the composition should be specified (e.g. % (w/w) or % (w/v) etc.). The common measurements used in nutritional studies, e.g. digestibility, biological value and net protein utilization, should be expressed as decimals rather than as percentages, so that amounts of available nutrients can be obtained from analytical results by direct multiplication. See *Metric Units, Conversion Factors and Nomenclature in Nutritional and Food Sciences*. London: The Royal Society, 1972 (para. 8).

**Nomenclature of vitamins.** Most of the names for vitamins and related compounds that are accepted by the Editors are those recommended by the IUNS Committee on Nomenclature. See *Nutrition Abstracts and Reviews* (1978) 48A, 831-835.

Acceptable name	Other names*
<b>Vitamin A</b>	
Retinol	Vitamin A <sub>1</sub>
Retinaldehyde, retinal	Retinene
Retinoic acid (all-trans or 13-cis)	Vitamin A <sub>1</sub> acid
3-Dehydroretinol	Vitamin A <sub>2</sub>
<b>Vitamin D</b>	
Ergocalciferol, ercalciol	Vitamin D <sub>2</sub> , calciferol
Cholecalciferol, calciol	Vitamin D <sub>3</sub>
<b>Vitamin E</b>	
$\alpha$ -, $\beta$ - and $\gamma$ -tocopherols plus tocotrienols	
<b>Vitamin K</b>	
Phylloquinone	Vitamin K <sub>1</sub>
Menaquinone-n (MK-n)†	Vitamin K <sub>2</sub>
Menadione	Vitamin K <sub>3</sub> , menaquinone, menaphthone
<b>Vitamin B<sub>1</sub></b>	
Thiamin	Aneurin(c), thiamine
<b>Vitamin B<sub>2</sub></b>	
Riboflavin	Vitamin G, riboflavine, lactoflavin
<b>Niacin</b>	
Nicotinamide	Vitamin PP
Nicotinic acid	

<i>Folic Acid</i>	
Pteroyl(mono)glutamic acid	Folacin, vitamin B <sub>9</sub> or M
<i>Vitamin B<sub>6</sub></i>	
Pyridoxine	Pyridoxol
Pyridoxal	
Pyridoxamine	
<i>Vitamin B<sub>12</sub></i>	
Cyanocobalamin	
Hydroxocobalamin	Vitamin B <sub>12a</sub> or B <sub>12b</sub>
Aquocobalamin	
Methylcobalamin	
Adenosylcobalamin	
<i>Inositol</i>	
Myo-inositol	Meso-inositol
<i>Choline</i>	
<i>Pantothenic acid</i>	
<i>Biotin</i>	Vitamin H
<i>Vitamin C</i>	
Ascorbic acid	
Dehydroascorbic acid	

\*Including some names that are still in use elsewhere, but are not used by *Public Health Nutrition*.

†Details of the nomenclature for these and other naturally-occurring quinones should follow the Tentative Rules of the IUPAC-IUB Commission on Biochemical Nomenclature (see *European Journal of Biochemistry* (1975) 53, 15-18).

*Generic descriptors.* The terms *vitamin A*, *vitamin C* and *vitamin D* may still be used where appropriate, for example in phrases such as 'vitamin A deficiency', 'vitamin D activity'.

*Vitamin E.* The term *vitamin E* should be used as the descriptor for all tocot and tocotrienol derivatives exhibiting qualitatively the biological activity of  $\alpha$ -tocopherol. The term *tocopherols* should be used as the generic descriptor for all methyl tocotols. Thus, the term *tocopherol* is not synonymous with the term *vitamin E*.

*Vitamin K.* The term *vitamin K* should be used as the generic descriptor for 2-methyl-1,4-naphthoquinone (menaphthone) and all derivatives exhibiting qualitatively the biological activity of phyloquinone (phytylmenaquinone).

*Niacin.* The term *niacin* should be used as the generic descriptor for pyridine 3-carboxylic acid and derivatives exhibiting qualitatively the biological activity of nicotinamide.

*Vitamin B<sub>6</sub>.* The term *vitamin B<sub>6</sub>* should be used as the generic descriptor for all 2-methylpyridine derivatives exhibiting qualitatively the biological activity of pyridoxine.

*Folate.* Due to the wide range of C-substituted, unsubstituted, oxidized, reduced and mono- or polyglutamyl side-chain derivatives of pteroylmonoglutamic acid that exist in nature, it is not possible to provide a complete list. Authors are encouraged to use either the generic name or the correct scientific name(s) of the derivative(s), as appropriate for each circumstance.

*Vitamin B<sub>12</sub>.* The term *vitamin B<sub>12</sub>* should be used as the generic descriptor for all corrinoids exhibiting qualitatively the biological activity of cyanocobalamin. The term *corrinoids* should be used as the generic descriptor for all compounds containing the corrin nucleus and thus chemically related to cyanocobalamin. The term *corrinoid* is not synonymous with the term *vitamin B<sub>12</sub>*.

*Vitamin C.* The terms *ascorbic acid* and *dehydroascorbic acid* will normally be taken as referring to the naturally-occurring L-forms. If the subject matter includes other optical isomers, authors are encouraged to include the L- or D- prefixes, as appropriate. The same is true for all those vitamins which can exist in both natural and alternative isomeric forms.

*Amounts of vitamins and summation.* Weight units are acceptable for the amounts of vitamins in foods and diets. For concentrations in biological tissues, SI units should be used; however, the authors may, if they wish, also include other units, such as weights or international units, in parentheses.

See *Metric Units, Conversion Factors and Nomenclature in Nutritional and Food Sciences* (1972) paras 8 and 14-20. London: The Royal Society.

*Nomenclature of fatty acids and lipids.* In the description of results obtained for the analysis of fatty acids by conventional GLC, the shorthand designation proposed by Farquhar JW, Insull W, Rosen P, Stoffel W & Ahrens EH (*Nutrition Reviews* (1959), 17, Suppl.) for individual fatty acids should be used in the text, tables and figures. Thus, 18 : 1 should be used to represent a fatty acid with eighteen carbon atoms and one double bond; if the position and configuration of the double bond is unknown. The shorthand designation should also be used in the abstract. If the positions and configurations of the double bonds are known, and these are important to the discussion, then a fatty acid such as linoleic acid may be referred to as *cis-9,cis-12-18 : 2* (positions of double bonds related to the carboxyl carbon atom 1). However, to illustrate the metabolic relationship between different unsaturated fatty acid families, it is sometimes more helpful to number the double bonds in relation to the terminal methyl carbon atom, *n*. The preferred nomenclature is then: 18 : 3*n*-3 and 18 : 3*n*-6 for  $\alpha$ -linolenic and  $\gamma$ -linolenic acids respectively; 18 : 2*n*-6 and 20 : 4*n*-6 for linoleic and arachidonic acids respectively and 18 : 1*n*-9 for oleic acid. Positional isomers such as  $\alpha$ - and  $\gamma$ -linolenic acid should always be clearly distinguished. It is assumed that the double bonds are methylene-interrupted and are of the *cis*-configuration (see Holman RT in *Progress in the Chemistry of Fats and Other Lipids* (1966) vol. 9, part 1, p. 3. Oxford: Pergamon Press). Groups of fatty acids that have a common chain length but vary in their double bond content or double bond position should be referred to, for example, as C<sub>20</sub> fatty acids or C<sub>20</sub> PUFA. The modern nomenclature for glycerol esters should be used, i.e. triacylglycerol, diacylglycerol, monoacylglycerol not triglyceride, diglyceride, monoglyceride. The form of fatty acids used in diets should be clearly stated, i.e. whether ethyl esters, natural or refined fats or oils. The composition of the fatty acids in the dietary fat and tissue fats should be stated clearly, expressed as mol/100 mol or g/100 g total fatty acids.

*Nomenclature of micro-organisms.* The correct name of the organism, conforming with international rules of nomenclature, should be used: if desired, synonyms may be added in parentheses when the name is first mentioned. Names of bacteria should conform to

the current Bacteriological Code and the opinions issued by the International Committee on Systematic Bacteriology. Names of algae and fungi must conform to the current International Code of Botanical Nomenclature. Names of protozoa should conform to the current International Code of Zoological Nomenclature.

**Nomenclature of plants.** For plant species where a common name is used that may not be universally intelligible, the Latin name in italics should follow the first mention of the common name. The cultivar should be given where appropriate.

**Other nomenclature, symbols and abbreviations.** Authors should consult recent issues of *Public Health Nutrition* for guidance. The IUPAC rules on chemical nomenclature should be followed, and the Recommendations of the IUPAC-IUB Commission on Biochemical Nomenclature (see *Biochemical Journal* (1978) 169, 11–14). The symbols and abbreviations, other than units, are essentially those listed in *British Standard 5775* (1979–1982), *Specifications for Quantities, Units and Symbols*, parts 0–13. Day should be abbreviated to d, for example 7 d, except for ‘each day’, ‘7th day’ and ‘day 1’.

Elements and simple chemicals (e.g. Fe and CO<sub>2</sub>) can be referred to by their chemical symbol (with the exception of arsenic and iodine, which should be written in full) or formula from the first mention in the text; the title, text and table headings, and figure legends can be taken as exceptions. Well-known abbreviations for chemical substances may be used without explanation, thus: RNA for ribonucleic acid and DNA for deoxyribonucleic acid. Other substances that are mentioned frequently (five or more times) may also be abbreviated, the abbreviation being placed in parentheses at the first mention, thus: lipoprotein lipase (LPL), after that, LPL, and an alphabetical list of abbreviations used should be included. Only accepted abbreviations may be used in the title and text headings. If an author’s initials are mentioned in the text, they should be distinguished from other abbreviations by the use of stops, e.g. ‘one of us (P. J. H.)...’. For UK counties the official names given in the *Concise Oxford Dictionary* (1995) should be used and for states of the USA two-letter abbreviations should be used, e.g. MA (not Mass.) and IL (not Ill.). Terms such as ‘bioavailability’ or ‘available’ may be used providing that the use of the term is adequately defined.

Spectrophotometric terms and symbols are those proposed in *IUPAC Manual of Symbols and Terminology for Physicochemical Quantities and Units* (1979) London: Butterworths. The attention of authors is particularly drawn to the following symbols: m (milli, 10<sup>3</sup>), μ (micro, 10<sup>6</sup>), n (nano, 10<sup>9</sup>) and p (pico, 10<sup>12</sup>). Note also that ml (millilitre) should be used instead of cc, μm (micrometre) instead of μ (micron) and μg (microgram) instead of γ.

Numbers. Numerals should be used with units, for example, 10 g, 7 d, 4 years (except when beginning a sentence, thus: ‘Four years ago...’); otherwise, words (except when 100 or more), thus: one man, ten ewes, ninety-nine flasks, three times (but with decimal, 2.5 times), 100 patients, 120 cows, 136 samples.

**Abbreviations.** The following abbreviations are accepted without definition by *Public Health Nutrition*:

ADP (GDP)	adenosine (guanosine) 5'-diphosphate
AIDS	acquired immune deficiency syndrome
AMP (GMP)	adenosine (guanosine) 5'-monophosphate
ANCOVA	analysis of covariance
ANOVA	analysis of variance
apo	apolipoprotein
ATP (GTP)	adenosine (guanosine) 5'-triphosphate
BMI	body mass index
BMR	basal metabolic rate
bp	base pair
BSE	bovine spongiform encephalopathy
CHD	coronary heart disease
CI	confidence interval
CJD	Creutzfeldt-Jacob disease
CoA and acyl-CoA	co-enzyme A and its acyl derivatives
CV	coefficient of variation
CVD	cardiovascular disease
Df	degrees of freedom
DHA	docosahexaenoic acid
DM	dry matter
DNA	deoxyribonucleic acid
dpm	disintegrations per minute
EDTA	ethylenediaminetetra-acetic acid
ELISA	enzyme-linked immunosorbent assay
EPA	eicosapentaenoic acid
Expt	experiment (for specified experiment, e.g. Expt 1)
FAD	flavin-adenine dinucleotide
FAO	Food and Agriculture Organization (except when used as an author)
FFQ	food-frequency questionnaire
FMN	flavin mononucleotide
GC	gas chromatography
GLC	gas-liquid chromatography
GLUT	glucose transporter
GM	genetically modified
Hb	haemoglobin
HDL	high-density lipoprotein
HEPES	4-(2-hydroxyethyl)-1-piperazine-ethanesulfonic acid
HIV	human immunodeficiency virus

HPLC	high-performance liquid chromatography
Ig	immunoglobulin
IHD	ischaemic heart disease
IL	interleukin
IR	infra red
kb	kilobases
$K_m$	Michaelis constant
LDL	low-density lipoprotein
MHC	major histocompatibility complex
MRI	magnetic resonance imaging
MS	mass spectrometry
MUFA	monounsaturated fatty acids
NAD <sup>+</sup> , NADH	oxidized and reduced nicotinamide-adenine dinucleotide
NADP <sup>+</sup> , NADPH	oxidized and reduced nicotinamide-adenine dinucleotide phosphate
NEFA	non-esterified fatty acids
NF- $\kappa$ B	nuclear factor kappa B
NMR	nuclear magnetic resonance
NS	not significant
NSP	non-starch polysaccharide
OR	odds ratio
PAGE	polyacrylamide gel electrophoresis
PBS	phosphate-buffered saline
PCR	polymerase chain reaction
PG	prostaglandin
PPAR	peroxisome proliferator-activated receptor
PUFA	polyunsaturated fatty acids
RDA	recommended dietary allowance
RER	respiratory exchange ratio
RIA	radioimmunoassay
RMR	resting metabolic rate
RNA, mRNA etc.	ribonucleic acid, messenger RNA etc.
rpm	revolutions per minute
RT	reverse transcriptase
SCFA	short-chain fatty acids
SDS	sodium dodecyl sulphate
sed	standard error of the difference between means
SFA	saturated fatty acids
SNP	single nucleotide polymorphism
TAG	triacylglycerol
TCA	trichloroacetic acid
TLC	thin-layer chromatography
TNF	tumour necrosis factor
UN	United Nations (except when used as an author)
UNICEF	United Nations International Children's Emergency Fund
UV	ultra violet
VLDL	very-low-density lipoprotein
$V_{O_2}$	O <sub>2</sub> consumption
$V_{O_{2max}}$	maximum O <sub>2</sub> consumption
WHO	World Health Organization (except when used as an author)

Use of three-letter versions of amino acids in tables: Leu, His, etc.  
CTP, UTP, GTP, ITP, as we already use ATP, AMP etc.

**Disallowed words and phrases.** The following are disallowed by *Public Health Nutrition*:  
deuterium or tritium (use <sup>2</sup>H and <sup>3</sup>H)  
c.a. or around (use approximately or about)  
canola (use rapeseed)  
ether (use diethyl ether)  
free fatty acids (use NEFA)  
isocalorific/calorie (use isoenergetic/energy)  
quantitate (use quantify)  
unpublished data or observations (use unpublished results)

**Ethics of human experimentation.** The notice of contributors is drawn to the guidelines in the World Medical Association (2000) Declaration of Helsinki: Ethical Principles for Medical Research Involving Human Subjects, with notes of clarification of 2002 and 2004 <http://www.wma.net/e/policy/b3.htm>, the *Guidelines on the Practice of Ethics Committees Involved in Medical Research Involving Human Subjects* (3rd ed., 1996; London: The Royal College of Physicians) and the *Guidelines for the Ethical Conduct of Medical Research Involving Children*, revised in 2000 by the Royal College of Paediatrics and Child Health: Ethics Advisory Committee (*Arch Dis Child* (2000) 82, 177–182). A paper describing any experimental work on human subjects should include a statement that ethical approval has been obtained.

**Animal experimentation.** The Editors will not accept papers reporting work carried out using inhumane procedures. Authors should indicate that their experiments have been approved by the appropriate local or national ethics committee for animal experiments.

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## SUBMISSION PROCESS

*Public Health Nutrition* now operates an on-line submission and reviewing system (eJournalPress). Authors should submit to the following address: <http://phn.msubmit.net/>. If any difficulties are encountered please contact the Publications Office immediately ([phn@nutsoe.org.uk](mailto:phn@nutsoe.org.uk)).

The manuscript submission process is broken into a series of four screens that gather detailed information about your manuscript and allow you to upload the appropriate text and figure/table files. The sequence of screens is as follows:

1. A form requesting author details, manuscript title, abstract, and associated information and the file quantities. Although there is the option of saving your information and returning to complete your submission at a later date we strongly advise you to submit your paper in one session if possible.
2. A screen asking for the actual file locations (via an open file dialogue). After completing this screen, your files will be uploaded to our server.
3. A completion screen that will provide you with a specific manuscript number for your manuscript. You may be asked to select the order in which your uploaded files should be presented.
4. An approval screen that will allow you to verify that your manuscript has been uploaded and converted to PDF correctly. Each converted file must be approved individually to complete your online submission. If the conversion is not correct, you can replace or delete your manuscript files as necessary. After you have reviewed the converted files, you will need to click on "Approve Manuscript". This link will have a red arrow ➔ next to it.

Throughout the system, red arrows ➔ reflect pending action items that you should address.

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- Full Postal Address for Corresponding Author only
- Institutions
- Country
- Work Fax Number for Corresponding Author only (including international dialling code)
- Email addresses

In addition we require full manuscript details:

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- Abstract (you may copy and paste this from your manuscript)
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- Ideally manuscript files should have the tables/figures given at the end of the article.
- For illustrations, preferred software packages are Adobe Illustrator, Adobe Photoshop, Aldus Freehand, Chemdraw or CorelDraw. Preferred formats are TIFF or JPEG, if a TIFF file is not possible save as an EPS or a windows metafile. Figures should be submitted as separate files, not as part of the main body of the manuscript.

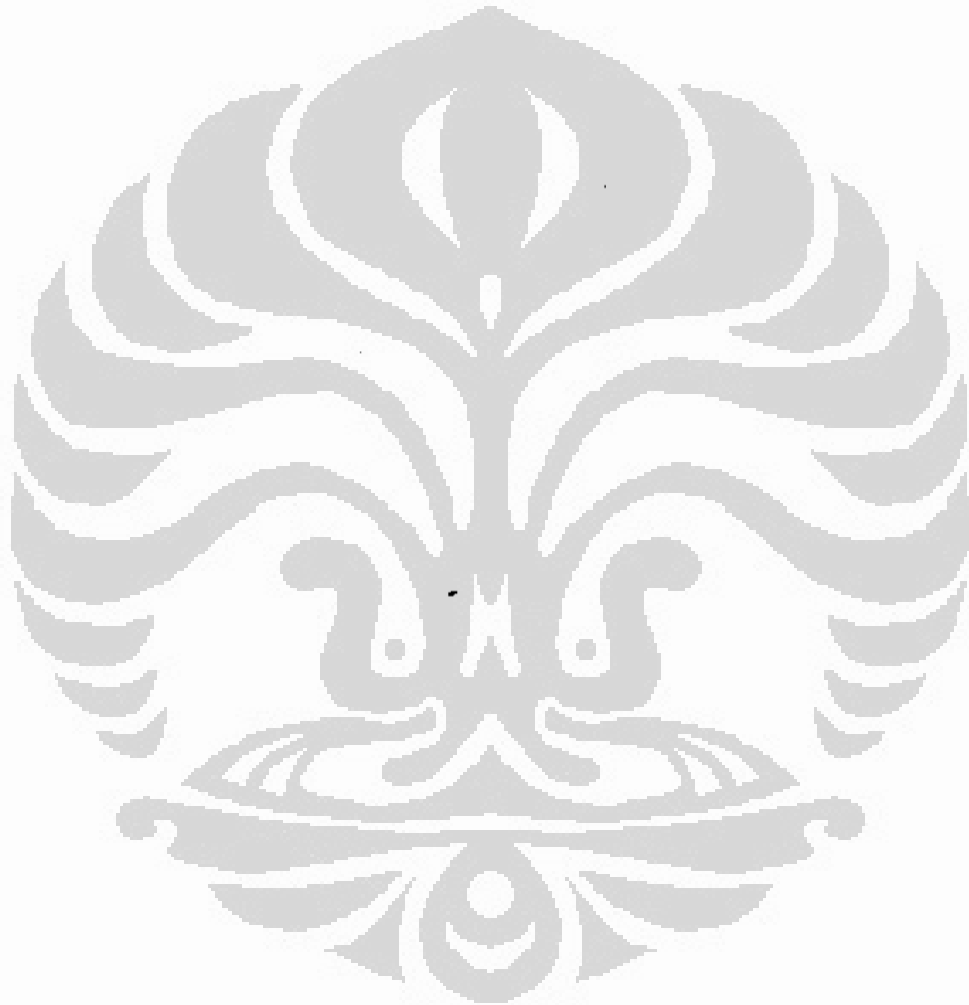
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APPENDIX 3  
ETHICAL CLEARANCE







# UNIVERSITAS INDONESIA FAKULTAS KEDOKTERAN

Jalan Salemba Raya No. 6, Jakarta Pusat

Pos Box 1358 Jakarta 10430

Kampus Salemba Telp. 31930371, 31930373, 3922977, 3927360, 3912477, 3153236, Fax. : 31930372, 3157288, e-mail : office@fk.ui

NOMOR **67** IPT02.FK/ETIK/2010

## KETERANGAN LOLOS KAJI ETIK

### ETHICAL -- CLEARANCE

Panitia Tetap Penilai Etik Penelitian, Fakultas Kedokteran Universitas Indonesia dalam upaya melindungi hak asasi dan kesejahteraan subyek penelitian kedokteran, telah mengkaji dengan teliti protokol berjudul:

*The Committee of The Medical research Ethics of the Faculty of Medicine, University of Indonesia, with regards of the Protection of human rights and welfare in medical research, has carefully reviewed the proposal entitled:*

**"System Review on Distribution of Multiple Micronutrients Powder in Praya Tengah, Central Lombok Distric (Kajian pada Sistem Distribusi Program Tabur Gizi di Kecamatan Praya Tengah, Kabupaten Lombok Tengah, Provinsi Nusa Tenggara Barat)".**

**Peneliti Utama** : Muharni, SP  
*Name of the principal investigator*

**Nama Institusi** : Seameco-Tropmed UI

dan telah menyetujui protocol tersebut di atas. *valuasi and approved the above mentioned proposal.*



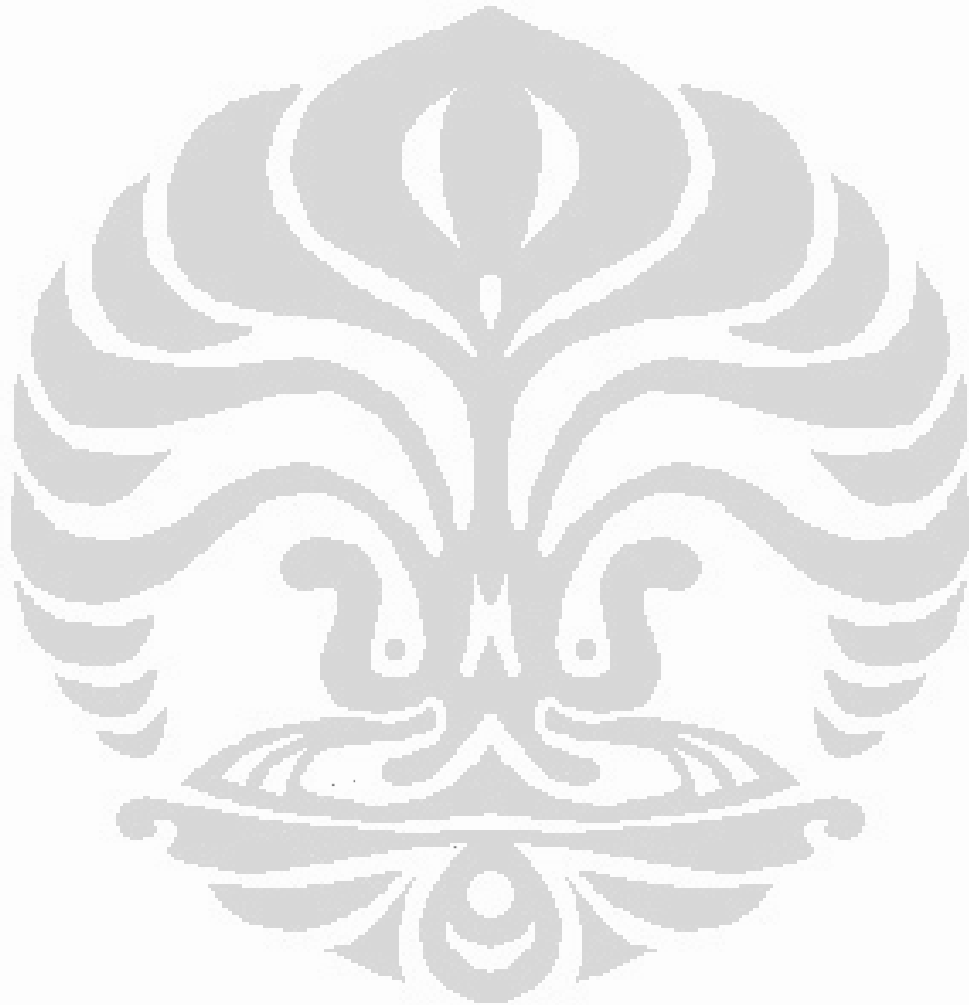
Jakarta, 15. Februari. 2010

Chairman  
Ketua

Prof. Dr. dr. Agus Firmansyah, SpA(K)

**-Peneliti wajib menjaga kerahasiaan identitas subyek penelitian.**

**APPENDIX 4**  
**INFORMED CONSENT**



**SEAMEO TROPMED Regional Center for Community Nutrition**  
**Pusat Gizi Regional, Universitas Indonesia**  
Jl. Salemba Raya No. 6 Jakarta 10430 Telp: 021-3914017, 31930205

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**LEMBAR PERSETUJUAN (IBU/PENGASUH BALITA)**

**Untuk Berpartisipasi dalam Penelitian:**

Kajian pada Sistem Distribusi Program Tabur Gizi  
di Kecamatan Praya Tengah, Kabupaten Lombok Tengah

Setelah mendengar penjelasan mengenai tujuan penelitian, prosedur penelitian, resiko dan manfaat penelitian, dan semua pertanyaan-pertanyaan saya yang berkaitan dengan penelitian ini telah terjawab sepenuhnya.

Saya mengerti bahwa:

- Pada diri saya akan dilakukan wawancara tentang hal-hal yang berkaitan dengan keadaan sosiodemografi, keberadaan, aksesibilitas dan partisipasi dalam program tabur gizi di Posyandu.

Maka dengan ini saya yang bertanda tangan dibawah ini:

Nama : \_\_\_\_\_  
Umur : \_\_\_\_\_ tahun  
Jenis kelamin : \_\_\_\_\_  
Alamat : \_\_\_\_\_

Menyatakan setuju bahwa saya akan berpartisipasi sebagai subyek penelitian ini secara sukarela dan bebas tanpa ada paksaan, dengan catatan apabila suatu ketika merasa dirugikan dalam bentuk apapun berhak membatalkan persetujuan ini.

\_\_\_\_\_, tanggal \_\_\_\_/\_\_\_\_/2010

Pembuat pernyataan,

(\_\_\_\_\_)

Mengetahui,

Penanggungjawab penelitian,

(Muharni, SP)

**SEAMEO TROPMED Regional Center for Community Nutrition**  
**Pusat Gizi Regional, Universitas Indonesia**  
Jl. Salemba Raya No. 6 Jakarta 10430 Telp: 021-3914017, 31930205

**LEMBAR PERSETUJUAN (MANAJER/STAKEHOLDER)**

**Untuk Berpartisipasi dalam Penelitian:**

**Kajian pada Sistem Distribusi Program Tabur Gizi  
di Kecamatan Praya Tengah, Kabupaten Lombok Tengah**

Setelah mendengar penjelasan mengenai tujuan penelitian, prosedur penelitian, resiko dan manfaat penelitian, dan semua pertanyaan-pertanyaan saya yang berkaitan dengan penelitian ini telah terjawab sepenuhnya.

Saya mengerti bahwa:

- Pada diri saya akan dilakukan wawancara tentang hal-hal yang berkaitan dengan aspek kebijakan, manajemen dan operasional terkait sistem distribusi program tabur gizi.

Maka dengan ini saya yang bertanda tangan dibawah ini:

Nama : \_\_\_\_\_  
Umur : \_\_\_\_\_ tahun  
Jenis kelamin : \_\_\_\_\_  
Jabatan : \_\_\_\_\_  
Alamat : \_\_\_\_\_

Menyatakan setuju bahwa saya akan berpartisipasi sebagai subyek penelitian ini secara sukarela dan bebas tanpa ada paksaan, dengan catatan apabila suatu ketika merasa dirugikan dalam bentuk apapun berhak membatalkan persetujuan ini.

\_\_\_\_\_, tanggal \_\_\_\_/\_\_\_\_/2010

Pembuat pernyataan,

(\_\_\_\_\_)

Mengetahui,

Penanggungjawab penelitian,

(Muharni, SP)

**SEAMEO TROPMED Regional Center for Community Nutrition**  
**Pusat Gizi Regional, Universitas Indonesia**  
Jl. Salemba Raya No. 6 Jakarta 10430 Telp: 021-3914017, 31930205

**LEMBAR PERSETUJUAN (KADER)**

**Untuk Berpartisipasi dalam Penelitian:**

Kajian pada Sistem Distribusi Program Tabur Gizi  
di Kecamatan Praya Tengah, Kabupaten Lombok Tengah

Setelah mendengar penjelasan mengenai tujuan penelitian, prosedur penelitian, resiko dan manfaat penelitian, dan semua pertanyaan-pertanyaan saya yang berkaitan dengan penelitian ini telah terjawab sepenuhnya.

Saya mengerti bahwa:

- Pada diri saya akan dilakukan wawancara tentang hal-hal yang berkaitan dengan keadaan sosiodemografi, keberadaan, aksesibilitas, operasional dan partisipasi ibu serta masyarakat dalam program tabur gizi di Posyandu.

Maka dengan ini saya yang bertanda tangan dibawah ini:

Nama : \_\_\_\_\_  
Umur : \_\_\_\_\_ tahun  
Jenis kelamin : \_\_\_\_\_  
Alamat : \_\_\_\_\_

Menyatakan setuju bahwa saya akan berpartisipasi sebagai subyek penelitian ini secara sukarela dan bebas tanpa ada paksaan, dengan catatan apabila suatu ketika merasa dirugikan dalam bentuk apapun berhak membatalkan persetujuan ini.

\_\_\_\_\_, tanggal \_\_\_\_/\_\_\_\_/2010

Pembuat pernyataan,

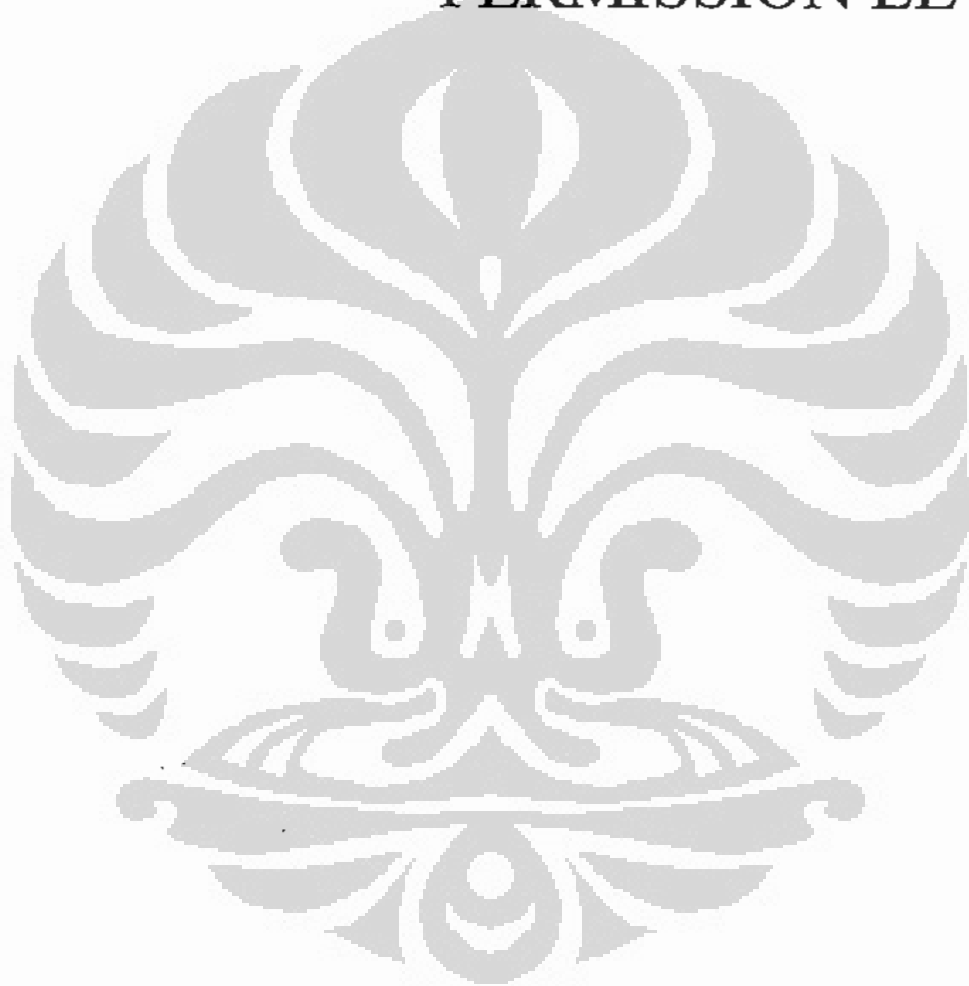
(\_\_\_\_\_)

Mengetahui,

Penanggungjawab penelitian,

(Muharni, SP)

APPENDIX 5  
OFFICIAL  
PERMISSION LETTER



**KEMENTERIAN DALAM NEGERI**  
**REPUBLIK INDONESIA**  
**DIREKTORAT JENDERAL KESATUAN BANGSA DAN POLITIK**  
Jalan Medan Merdeka Utara No.7 Telp. 3450038 Jakarta 10110

---

**SURAT PEMBERITAHUAN PENELITIAN**  
**( S P P )**

NOMOR : 444.02/135.DI.....

**MEMBACA** : Surat dari Deputi Direktur Program SEAMEO-TROPMED, Regional Center for Community Nutrition, Nomor: 025/SEAMEO-PROG/I/2010, Tanggal 19 Januari 2010, Perihal Permohonan Ijin Penelitian.

**MENGINGAT** : 1. Keputusan Menteri Dalam Negeri Nomor : 130 Tahun 2003 tentang Organisasi dan Tata Kerja Departemen Dalam Negeri.  
2. Surat Keputusan Menteri Dalam Negeri Nomor : SD.6/2/12 Tanggal 5 Juli 1972 tentang Kegiatan Riset dan Survei diwajibkan melapor diri kepada Gubernur Kepala Daerah atau Pejabat yang ditunjuk.  
3. Keputusan Direktur Jenderal Sosial Politik Nomor : 14 Tahun 1981 tentang Surat Pemberitahuan Penelitian (SPP).

**MEMPERHATIKAN** : Proposal Penelitian Ybs.

**MEMBERITAHUKAN BAHWA :**

**NAMA** : Muharni, SP

**ALAMAT** : SEAMEO TROPMED Bldg. Campus Of UI Salemba Raya 6, Jakarta 10430

**PEKERJAAN** : Peneliti

**KEBANGSAAN** : Indonesia

**JUDUL PENELITIAN** : Kajian pada Sistem Distribusi Program Tabur Gizi di Kecamatan Praya Tengah, Kabupaten Lombok Tengah, Provinsi Nusa Tenggara Barat

**BIDANG** : Gizi

**DAERAH** : Provinsi Nusa Tenggara Barat

**LAMA PENELITIAN/KEGIATAN** : Februari s/d Maret 2010

**PENGIKUT PESERTA** : drg. Rosnani V. Pangaribuan, MPH, dr.rer.nat, Lindawati Wibowo, MSc, dan 3 org tenaga pengumpul data

**PENANGGUNG JAWAB** : Dr. Drupadi HS. Dillon, PhD

**SPONSOR** : -

**MAKSUD DAN TUJUAN** : Untuk mendeskripsikan sekaligus mengkaji sistem distribusi pada program tabur gizi di Praya Tengah, Kabupaten Lombok Tengah, Provinsi Nusa Tenggara Barat

**AKAN MELAKUKAN PENELITIAN DENGAN KETENTUAN SEBAGAI BERIKUT :**

1. Sebelum melakukan kegiatan Penelitian harus melaporkan kedatangannya kepada Gubernur Cq Kaban Kesatuan Bangsa dan Perlindungan Masyarakat/ Badan Informasi, Komunikasi dan Kesbang setempat dengan menunjukkan surat pemberitahuan ini.
2. Tidak dibenarkan melakukan Penelitian yang tidak sesuai/tidak ada kaitannya dengan judul penelitian dimaksud.
3. Harus mentaati ketentuan perundang-undangan yang berlaku serta mengindahkan adat istiadat setempat.
4. Apabila masa berlaku Surat Pemberitahuan ini sudah berakhir, sedangkan pelaksanaan penelitian belum selesai, perpanjangan penelitian harus diajukan kembali kepada instansi pemohon.
5. Hasil kajian agar diserahkan 1 (satu) eksemplar kepada Ditjen Kesbang dan Politik Up. Direktorat Pengembangan Nilai-nilai Kebangsaan.
6. Surat Pemberitahuan ini akan dicabut kembali dan dinyatakan tidak berlaku, apabila ternyata pemegang Surat Pemberitahuan ini tidak mentaati/mengindahkan ketentuan-ketentuan seperti tersebut diatas.

Dikeluarkan di Jakarta

Pada tanggal, 27 Januari 2010

A.n. MENTERI DALAM NEGERI  
DIREKTUR JENDERAL  
KESATUAN BANGSA DAN POLITIK  
Ub.  
SEKRETARIS,



**WARNO PUTRA RAHARJO, M.Si**  
Pembina Utama Madya  
NIP. 19580416 198503 1 001

**Tembusan :**

1. Yth. Gubernur Nusa Tenggara Barat.  
Up. Kaban Kesbang dan Linmas Prov.
2. Yth. Deputi Direktur Program SEAMEO-TROPMED, Regional Center for Community Nutrition di Jakarta.





PEMERINTAH PROVINSI NUSA TENGGARA BARAT  
**BADAN KESATUAN BANGSA DAN POLITIK DALAM NEGERI**

Jln. Pendidikan No. 2 Telepon (0370) 631215

**M A T A R A M**

Kode Pos : 83125

**REKOMENDASI**

Nomor : 070/ 68/R/2/2010

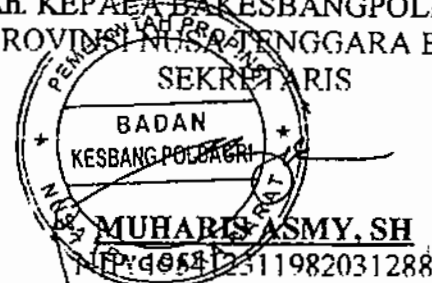
1. Dasar  
Berdasarkan Surat dari Southeast Asian Minister Of Education Organization (SEAMEO) Nomor : 070/SEAMEO-PROG/II/2010, Tanggal 8 Februari 2010.  
Perihal : Permohonan Ijin Penelitian.
2. Setelah mempelajari rencana kegiatan yang diajukan, maka dapat memberikan Rekomendasi /ijin kepada :  
Nama : Muharni, SP  
Pekerjaan : Peneliti  
Bidang/Judul : "Kajian pada Distribusi Program Tabur Gizi di Kecamatan Praya Tengah, Kabupaten Lombok Tengah Provinsi Nusa Tenggara Barat"  
Lokasi : Kabupaten Lombok Tengah  
Jumlah Peserta : 1 (satu) Orang  
Iamanya : 2 (dua) Bulan (Fehruari s/d Maret 2010)
3. Dalam melakukan kegiatan agar yang bersangkutan mematuhi ketentuan sebagai berikut :
  - a. Sebelum melakukan kegiatan agar melaporkan kedatangan Kepada Bupati/Walikota atau Pejabat yang di tunjuk
  - b. Tidak melakukan kegiatan yang tidak ada hubungan dengan Bidang/judul dimaksud, apabila melanggar ketentuan akan dicabut Rekomendasi/Ijin dan menghentikan segala kegiatannya
  - c. Mentaati sesuai ketentuan undang-undang yang berlaku serta mengindahkan adat istiadat setempat
  - d. Apabila masa berlaku Rekomendasi/ijin telah berakhir, sedangkan pelaksanaan belum selesai maka perpanjang Rekomendasi/ijin agar diajukan kepada Instansi pemohon
  - e. Melaporkan hasil-hasil kegiatan kepada Gubernur Nusa Tenggara Barat, melalui Kepala Bakeshangpoldagri Provinsi Nusa Tenggara Barat.

Demikian Surat Rekomendasi/Ijin ini dibuat untuk dapat dilaksanakan sebagaimana mestinya.

Mataram, 13 Februari 2010

An. KEPALA BAKESBANGPOLDAGRI  
PROVINSI NUSA TENGGARA BARAT

SEKRETARIS



Tembusan, disampaikan kepada Yth

1. Kapolda NTB
2. Kepala BPI,HP Prov. NTB
3. Bupati Kabupaten Lombok Tengah Cq. Kesbangpol dan Linmas
4. Yang bersangkutan



**PEMERINTAH KABUPATEN LOMBOK TENGAH  
BADAN KESBANGPOL DAN LINMAS**

Jln. K.H. Agus Salim No. 01 Praya Tlpn 654123

**REKOMENDASI**

**No : 070/18/KESBANGPOL**

Berdasarkan Surat dari Southeast Asian Ministers Of Education Organization (SEAMEO) Nomor : 070/SEAMEO-PROG/II/2010, tanggal 8 Pebruari 2010 perihal Izin Penelitian/Survey, dengan ini memberikan Rekomendasi kepada :

Nama : MUHIARNI, SP  
Pekerjaan : Penelitian  
Melakukan Kegiatan : "Kajian pada Distribusi Program Tabur Gizi di Kecamatan di Kabupaten Lombok Tengah Provinsi Nusa Tenggara Barat".  
Lokasi : Kabupaten Lombok Tengah  
Jumlah Peserta : 1 (satu) orang  
Lamanya : 2 (tiga) bulan (Februari s/d Maret 2010)


Dengan ketentuan sebagai berikut :

1. Setibanya Petugas ditempat lokasi harus melaporkan diri kepada pejabat yang berwenang
2. Petugas harus bekerja secara objektif, tidak dibenarkan melakukan penelitian yang tidak sesuai/tidak ada kaitannya dengan judul penelitian yang dimaksud.
3. Harus mentaati ketentuan perundang-undangan yang berlaku serta mengindahkan adat istiadat setempat.
4. Melaporkan Hasil Penelitian kepada Bupati Lombok Tengah Cq. Kepala Bakesbangpol dan Linmas Kabupaten Lombok Tengah.
5. Surat Rekomendasi ini akan dicabut apabila tidak mentaati ketentuan-ketentuan tersebut diatas.

Demikian surat Rekomendasi ini dibuat dan dapat dipergunakan sebagaimana mestinya.

Praya, 15 Pebruari 2010

Ahli Kepala Badan Kesbangpol dan Linmas  
Kabupaten Lombok Tengah  
Sekretaris,  
Drs. H. AHMAD MURDHANI, MM  
NIP. 19661028 198608 1 002

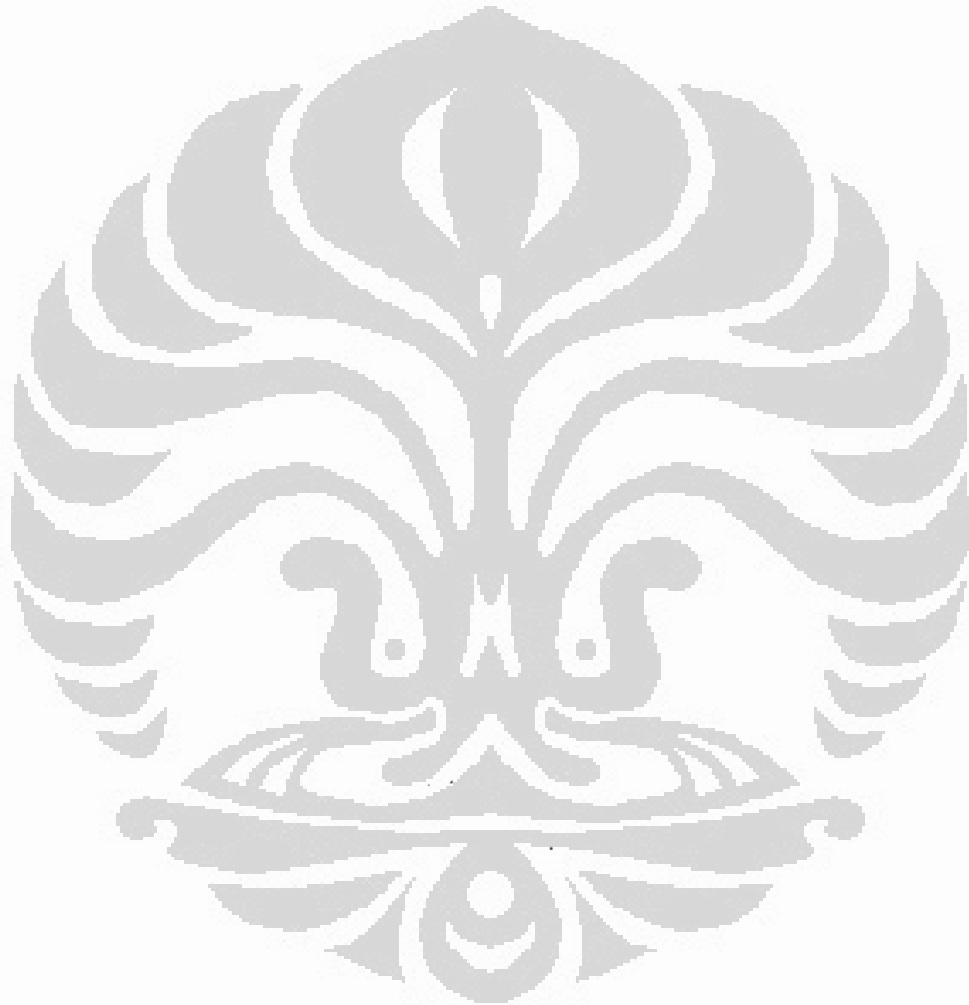


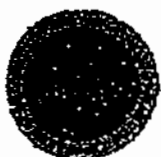
Tembusan disampaikan kepada Yth

1. Bupati Lombok Tengah di Praya
2. Kepala Bappeda Kab. Loteng di Praya
3. Kapolres Lombok Tengah di Praya
4. Kepala Dinas Kesehatan Kab. Loteng di Praya
5. Kepala Puskesmas Batunyala di Praya Tengah
6. Kepala Puskesmas Pengadangan di Praya Tengah
7. Yang bersangkutan

# APPENDIX 6

## QUESTIONNAIRES





**SYSTEM REVIEW ON DISTRIBUTION OF MULTIPLE  
MICRONUTRIENTS POWDER PROGRAM IN PRAYA TENGAH,  
CENTRAL LOMBOK DISTRICT**



South East Asian Ministers of Education Organization (SEAMEO)  
Tropical Medicine and Public Health (TROPMED)  
Regional Center for Community Nutrition (RCCN) - University of Indonesia (UI)  
Jl. Salemba Raya 6 Jakarta Pusat  
Phone : (021) 3913932 / 330205, Fax : (021) 3913933

**MOTHER/CAREGIVER'S QUESTIONNAIRE**

Name of Puskesmas	: .....	[ ]
Name of Posyandu	: .....	
Name of village	: .....	[ ][ ]
Name of sub-village	: .....	[ ][ ]
Name of Interviewer	: .....	[ ]
Date of Interviewer	: ...../...../ 2010 (dd/mm/yy)	
Time of interview	: .....until.....	

Note for completeness of the questionnaire:		
Checked by enumerator 1	Checked by enumerator 2	Checked by Researcher
.....	.....	.....
1) complete    2) not complete	1) complete    2) not complete	1) complete    2) not complete
Note:	Note:	Note:
Signature*	Signature*	Signature*

\* Please make sure that the questionnaire has completed before sign it.

Name of mother/ caregiver:		Name of children aged 6-59 months:	
Age: ..... yr		Birth date: ...../...../..... (dd/mm/yy)	
Sex: 1) Male 2) Female [ ]		(confirmed by Posyandu's card or HH card)	
Relation of the respondent with the children:		Age: ..... mo (completed)	
1. Mother 2. Other (specify) ..... [ ]		Sex: 1) Male 2) Female [ ]	

A: GENERAL INFORMATION			CODE
1	How many persons live in the household? <i>(household defined as eat from the same kitchen routinely)</i>		
2	How many underfive children in the household? <i>(including targeted children aged 6-59 months)</i>		
3	Father/mother/caregiver educational level	(1) Never go to school (2) Elementary school (<3 years) (3) Elementary school (graduate) (4) Junior high school (graduate) (5) Senior high school (graduate) (6) University (graduate) (66) NA (88) DNK (99) No answer	Father [ ][ ] Mother [ ][ ] Caregiver [ ][ ] <i>(if caregiver is not mother)</i>
4	Father/mother/caregiver main occupation (currently)	(1) Farmer (land owner) (2) Farmer (not land owner) (3) Fisherman (boat owner) (4) Fisherman (not boat owner) (5) Breeder (husbandry owner) (6) Breeder (not husbandry owner) (7) Government employee (8) District honorer (9) Private employee (10) Entrepreneur (11) Laborer (12) Daily paid worker (13) Housewife (14) Unemployed (15) Student (16) Retired (17) Migrant workers (18) Driver/ Ojek (66) NA (77) Others (specify)..... (88) DNK (99) No answer	Father [ ][ ] Mother [ ][ ] Caregiver [ ][ ] <i>(if caregiver is not mother)</i>

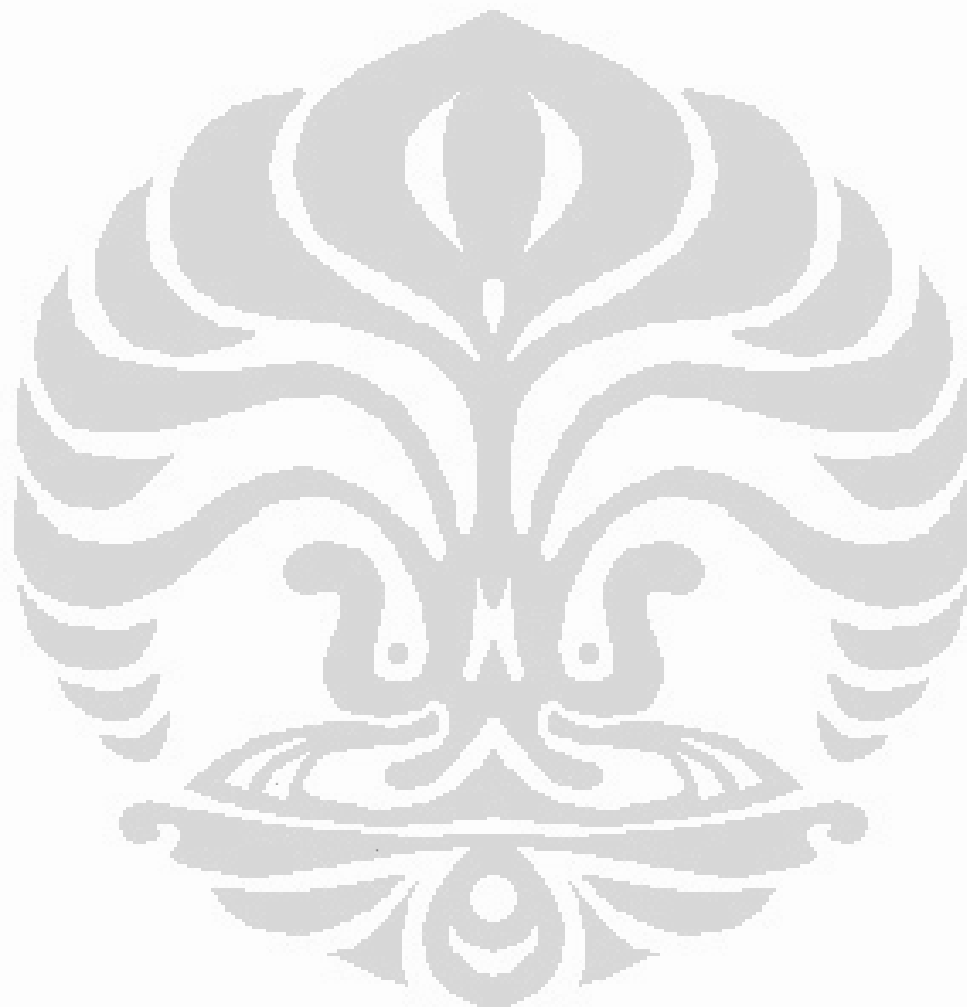
B: AVAILABILITY OF MNP PROGRAM			CODE
1.	In the last six months, how many times did your child attend Posyandu session?	(1) ≥4 times (2) < 4 times (3) Never attended Posyandu (88) DNK (99) No answer	[ ][ ]
2.	If it was <4 times, what is the main reason?	(1) Mother/caregivers was busy working (2) My child was sick (3) Posyandu is too far (4) No benefit for the child (5) The child has no problem with his/her growth (6) The child is less than 4 months (66) Not relevant (never attended Posyandu/attending >4 times) (77) Other, mention:..... (88) DNK	[ ][ ]

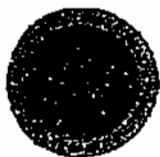
		(99) No answer	
3.	Do you know about MNP program?	1) Yes 2) No	88) DNK 99) No answer [ ][ ]
4.	Have you ever got information about the schedule of MNP distribution?	1) Yes 2) No 66) NA	88) DNK 99) No answer [ ][ ]
5.	If yes, how did you get the information?		
	<b>No</b>	<b>Source of information to mother/caregiver</b>	<b>1) Yes 2) No 66) NA</b>
	1	Through home visit of cadre	
	2	Through letter of invitation	
	3	Announcement from the mosque	
	4	Poster or banner	
	5	Others, specify.	
	<i>(Mention all source of information to mother, answer could be more than one)</i>		
6.	How many sachets did your child receive MNP sachet in the last 4 months?		
	<b>No</b>	<b>Month</b>	<b>Number of MNP sachets received from Posyandu</b>
			<b>Number of MNP sachets given in your home</b>
	1	January	
	2	December	
	3	November	
	4	October	
	5	September	
	6	August	
	66) NA (if never received MNP sachets)		
7.	Why your child did not get MNP? <i>(if the child did not receive MNP at least one month)</i>	1) Posyandu attendance irregularly 2) Posyandu too far away 3) The child dislike MNP 4) Mother dislike MNP to be given to her child 5) Mother has no information regarding MNP program 66) NA 77) Other, specify: _____ 88) DNK 99) No answer	[ ][ ]
8.	If your child did not attend Posyandu session, did your child receive MNP after the Posyandu session? <i>(if the child did not receive MNP at least in the last two months)</i>	1) Yes 2) No 66) NA 88) DNK 99) No answer	[ ][ ]
9.	If yes, who delivered the MNP to you?	1) Neighbour 2) Cadre 3) Puskesmas staff 66) NA	77) Other, specify: _____ 88) DNK 99) No answer [ ][ ]

C. ACCESSIBILITY OF POSYANDU			CODE
1.	Is the Posyandu easy to reach?	1) Yes      2) No	[ ]
2.	Walking distance to Posyandu?	_____ hours _____ minutes	
3.	Do you use any vehicles to reach Posyandu?	1) Yes      2) Sometimes      3) No	[ ]
4.	If yes or sometimes, what kind of vehicle do you use to reach Posyandu?	1) Cidomo      4) Car 2) Bicycle      66) NA 3) Motorcycle      77) Others, specify: _____	[ ][ ]
5.	How much does it cost you to reach Posyandu?	Rp. _____ 66) NA	
6.	Is there any place other than Posyandu often use for MNP distribution	1) Yes      2) No	[ ]
7.	If yes, where is it (mostly used)?	66) NA	[ ][ ]
8.	Is the place easy to reach?	1) Yes      2) No      66) NA	[ ][ ]

9.	Walking distance to that place?	_____ hours _____ minutes	66) NA	[ ] [ ]
10	Do you use any vehicles to reach that place?	1) Yes 2) Sometimes	3) No 66) NA	[ ] [ ]
11.	If yes or sometimes, what kind of vehicle do you use to reach that place?	1) Cidomo 2) Bicycle 3) Motorcycle	4) Car 66) NA 77) Others, specify: _____	[ ] [ ]
12.	How much does it cost you to reach that place?	Rp. _____ 66) NA		[ ] [ ]

THANKS FOR YOUR PARTICIPATION





**SYSTEM REVIEW ON DISTRIBUTION OF MULTIPLE  
MICRONUTRIENTS POWDER PROGRAM IN PRAYA TENGAH,  
CENTRAL LOMBOK DISTRICT**



South East Asian Ministers of Education Organization (SEAMEO)  
Tropical Medicine and Public Health (TROPMED)  
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Jl. Salemba Raya 6 Jakarta Pusat  
Phone : (021) 3913932 / 330205, Fax : (021) 3913933

### POSYANDU'S QUESTIONNAIRE

Name of Puskesmas	:	.....	[ ]
Name of Posyandu	:	.....	
Name of sub-village	:	.....	[ ] [ ]
Name of village	:	.....	[ ] [ ]
Name of Interviewer	:	.....	[ ]
Date of Interviewer	:	...../...../2010 (dd/mm/yy)	
Time of interview	:	.....until.....	

Note for completeness of the questionnaire:		
Checked by enumerator 1	Checked by enumerator 2	Checked by Researcher
.....	.....	.....
1) complete    2) not complete	1) complete    2) not complete	1) complete    2) not complete
Note:	Note:	Note:
Signature*	Signature*	Signature*

\* Please make sure that the questionnaire has completed before sign it.





C. ACCESSIBILITY OF POSYANDU			CODE
1.	Is the Posyandu easy to reach?	1) Yes                      2) No	[ ]
2.	Walking distance to Posyandu?	_____ hours _____ minutes	
3.	Do you use any vehicles to reach Posyandu?	1) Yes                      2) Sometimes              3) No	[ ]
4.	If yes or sometimes, what kind of vehicle do you use to reach Posyandu?	1) Cidomo                      4) Car 2) Bicycle                      66) NA 3) Motorcycle                      77) Others, specify: _____	[ ][ ]
5.	How much does it cost you to reach Posyandu?	Rp. _____ 66) NA	[ ][ ]
6.	Is there any place other than Posyandu often use for MNP distribution	1) Yes                      2) No, go to D.	[ ]
7.	If yes, where is it (mostly used)?	_____ 66) NA	[ ][ ]
8.	Is the place easy to reach?	1) Yes                      2) No                      66) NA	[ ][ ]
9.	Walking distance to that place?	_____ hours _____ minutes              66) NA	[ ][ ]
10.	Do you use any vehicles to reach that place?	1) Yes                      3) No 2) Sometimes                      66) NA	[ ][ ]
11.	If yes or sometimes, what kind of vehicle do you use to reach that place?	1) Cidomo                      4) Car 2) Bicycle                      66) NA 3) Motorcycle                      77) Others, specify: _____	[ ][ ]
12.	How much does it cost you to reach that place?	Rp. _____ 66) NA	[ ][ ]

D. CADRE'S KNOWLEDGE ON MNP			CODE	
1	In your opinion, what is the benefit of MNP for underfive children?	a) improving anemia status and other micronutrient deficiency	1) True	[ ]
		b) other, specify..... 88) Do not know 99) No answer	0) False	
2	In your opinion, what are the contents of MNP?	a) vitamin and mineral	1) True	[ ]
		b) other, specify..... 88) Do not know 99) No answer	0) False	
3	In your knowledge, how many sachets should the child take every day?	a) 1 sachet daily in one meal	1) True	[ ]
		b) other, specify..... 88) Do not know 99) No answer	0) False	
4	How many sachets of MNP should be given to underfive children monthly?	a) 15 sachets	1) True	[ ]
		b) other, specify..... 88) Do not know 99) No answer	0) False	
5	How to define target group (children aged 6-59 months) in your working area?	a) collecting real data by survey children aged 6-59 months in the working area	1) True	[ ]
		b) other, specify..... 88) Do not know 99) No answer	0) False	
6	How to calculate MNP needs in your working area?	a) number of children aged 6-59 month x 15 + 10%	1) True	[ ]
		b) other, specify..... 88) Do not know 99) No answer	0) False	
7	How to calculate the request of MNP stock to Puskesmas monthly?	a) MNP needs - available stock	1) True	[ ]
		b) other, specify..... 88) Do not know 99) No answer	0) False	
8	What should be done if mother/caregiver does not come on the day of MNP distribution in Posyandu?	a) conduct sweeping activity	1) True	[ ]
		c) other, specify..... 88) Do not know 99) No answer	0) False	

9	If underfive still has MNP left over, how many sachets should be given for the next month?	a) 15 sachets and ask mother to return the left over	1) True	[ ]
		b) other, specify..... 88) Do not know 99) No answer	0) False	
10	How to store MNP?	a) store in dry and cool place away from animal i.e. rat, cockroach, insects etc b) avoid direct sun light	1) True	[ ]
		b) other, specify..... 88) Do not know 99) No answer	0) False	
11	What is the sign of broken MNP?	a) leakage sachet b) color change c) coagulated powder d) exceed the expire date	1) True	[ ]
		d) other, specify..... 88) Do not know 99) No answer	0) False	

E: AVAILABILITY OF MNP PROGRAM							CODE		
1.	Does the MNP program always take place along with Posyandu session monthly?			1) Yes 2) No	88) DNK 99) No answer	[ ] [ ]			
2.	Can I see the record of MNP distribution/register book in the last 6 months?			1) Available 2) Not available	88) DNK 99) No answer	[ ] [ ]			
3.	Record of MNP distribution/register book in the last 6 months								
	No	Month	Date (dd/mm/yy)	Venue	Number of registered children aged 6-59 month (S)	Number of children aged 6-59 months attend MNP distribution	Number of children aged 6-59 months received MNP		
	1	January							
	2	December							
	3	November							
	4	October							
	5	September							
	6	August							
66) NA (if there is no record of MNP distribution/register book)									
4.	Do all the children aged 6-59 months always come to MNP distribution?			1) Yes 2) No			[ ]		
5.	If no, according to you, what are the reasons?			1) lack of program socialization to mother 2) over workload of mother in the HH 3) mother dislike MNP given to their child 4) children dislike MNP 77) other, specify..... 88) Do not know 99) No answer			[ ] [ ]		
6.	What are the difficulties in performing MNP distribution? (answer could be more than one)			1) conducting the sweeping activity 2) mother's attitude not supporting the program 3) over workload of cadre's job 4) lack of supervision from supervisor 5) lack of program socialization to mother 6) no guideline available 77) other, specify..... 88) Do not know 99) No answer			[ ] [ ]		
7.	Do you have logistic record of MNP supply from Puskesmas?			1) Yes 2) No	88) DNK 99) No answer	[ ] [ ]			

8.	If yes, can I see the logistic record of MNP supply?	1) Available 2) Not available	88) DNK 99) No answer	[ ] [ ] [ ]		
9.	Logistic record of MNP supply in the last 6 months					
	No	Month	Arrival date (dd/mm/yy)	Number of MNP received from Puskesmas	Number of MNP leakage during storing or expired	Number of MNP left over
	1	January				
	2	December				
	3	November				
	4	October				
	5	September				
	6	August				
	66) NA (if no logistic record)					

F. SWEEPING ACTIVITY				CODE
1.	Do the cadres in this Posyandu conduct sweeping activity?	1) Yes 2) No	88) DNK 99) No answer	[ ] [ ] [ ]
2.	If yes, may I see the record of sweeping activity?	1) Available 2) Not available	66) NA 88) DNK 99) No answer	[ ] [ ] [ ]
3.	Record of sweeping activity conducted in the last month?			
	No	Name of children	Date (dd/mm/yy)	Number of MNP distributed through sweeping
	1			
	2			
	3			
	4			
	5			
	6			
	66) NA (if there is no list of sweeping activity)			
3.	Is there any SOP/guideline for sweeping system of MNP distribution?	1) Yes 2) No	88) DNK 99) No answer	[ ] [ ] [ ]
4.	If yes, can I see the SOP/guideline?	1) Available 2) Not available	66) NA 88) DNK 99) No answer	[ ] [ ] [ ]
5.	What are the difficulties of performing sweeping activity? (answer could be more than one)	1) too far away 2) no transportation fee 77) other, specify..... 88) Do not know 99) No answer		[ ] [ ] [ ]
6.	What kind of transportation used in sweeping activity?	1) By foot 2) cidomo 3) bicycle 4) motorcycle	66) NA 77) Other, specify..... 88) DNK 99) No answer	[ ] [ ] [ ]
7.	How much does it cost to get the farthest HH for sweeping activity?	Rp. .... 66) NA		[ ] [ ] [ ]

G. REQUESTING SYSTEM				CODE
1.	Do you ever make a request of MNP stock to Puskesmas?	1) Yes 2) No	88) DNK 99) No answer	[ ] [ ] [ ]
2.	How is the frequency of requesting MNP stock?	1) Monthly 2) Bimonthly 66) NA	77) Other, specify: _____ 88) DNK 99) No answer	[ ] [ ] [ ]
3.	If yes, may I see the record of requesting MNP stock?	1) Available 2) Not available	66) NA 88) DNK 99) No answer	[ ] [ ] [ ]
4.	If yes, can I see the record in the last 6 months?			
	No	Month	Date of request (dd/mm/yy)	Number of MNP requested
	1	January		
	2	December		

	3	November		
	4	October		
	5	September		
	6	August		
<b>66) NA (if request of MNP never been done)</b>				
5.	Is there any SOP/guideline for requesting system of MNP distribution?		1) Yes 2) No	66) NA 88) DNK 99) No answer
6.	If yes, can I see the SOP/guidelines?		1) Available 2) Not available	66) NA 88) DNK 99) No answer
7.	How did the requesting deliver to Puskesmas?		1) cadre sent to Puskesmas 2) Puskesmas staff came to get the request at Posyandu 66) NA 77) other, specify..... 88) Do not know 99) No answer	
8.	If sent by cadre, what kind of transportation used to deliver it?		1) By foot 2) cidomo 3) bicycle 4) motorcycle 66) NA 77) Other, specify..... 88) DNK 99) No answer	
9.	How much does it cost to reach Puskesmas?		Rp. _____ 66) NA	
10.	What are the difficulties of performing requesting MNP stock? (answer could be more than one)		1) lack knowledge of calculating MNP needs 2) Puskesmas too far away for delivering MNP request 66) NA 77) other, specify..... 88) Do not know 99) No answer	
11.	Have you ever experienced inadequacy of MNP stock on the day of distribution?		1) Yes, if yes how many time in the last 5 months: _____ 2) Never 88) Do not know 99) No answer	
12.	If yes, what are the reasons? (answer could be more than one)		1) leakage of MNP supply from Puskesmas 2) leakage of MNP stock during storing 3) MNP supply arrival not in time before distribution day 66) NA 77) other, specify..... 88) Do not know 99) No answer	

H. FINANCIAL SUPPORT				CODE
1.	Do you think you need some funding to perform MNP distribution?		1) Yes 2) No	66) NA 88) DNK 99) No answer
2.	If yes, how much did it cost?		Rp. _____	
3.	Did you receive any financial support?		1) Yes 2) No	66) NA 88) DNK 99) No answer
4.	If yes, source of funding?		<b>66) NA (if there is no financial support for MNP distribution)</b>	
	Source of funding	1) Yes 2) No	Amount (Rp)	Frequency: 1) once a month; 2) > once a month
	Sub-district office			
	Puskesmas			
	Village office			
	Funded by community			
	Other, specify:			
5.	Usage of funding?		<b>66) NA (if there is no cost to conduct MNP distribution)</b>	
	No	Items	Amount (Rp)	
	1.			
	2.			
	3.			

4.			
5.			
Total			

I. PUSKESMAS SUPERVISION				CODE																									
1.	Who usually attend the MNP distribution?	1) Health personnel from health center 2) Village representative 77) Other, specify: _____	1) Yes 2) No 1) Yes 2) No 1) Yes 2) No	[ ] [ ] [ ]																									
2.	In the last 5 months, how often they come to attend MNP distribution?	1) Health personnel from health center 2) Village representative 77) Other, specify: _____	_____ times _____ times _____ times																										
3.	What do they do during MNP distribution?	<table border="1"> <thead> <tr> <th>No</th> <th>Activities</th> <th>Health personnel from health center*</th> <th>Village representative*</th> <th>Other, specify: *</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Quality control of MNP distribution</td> <td></td> <td></td> <td></td> </tr> <tr> <td>2.</td> <td>Assist the distribution of MNP to children</td> <td></td> <td></td> <td></td> </tr> <tr> <td>3.</td> <td>Record the MNP logistic</td> <td></td> <td></td> <td></td> </tr> <tr> <td>4.</td> <td>Other, specify: _____</td> <td></td> <td></td> <td></td> </tr> </tbody> </table>			No	Activities	Health personnel from health center*	Village representative*	Other, specify: *	1.	Quality control of MNP distribution				2.	Assist the distribution of MNP to children				3.	Record the MNP logistic				4.	Other, specify: _____			
No	Activities	Health personnel from health center*	Village representative*	Other, specify: *																									
1.	Quality control of MNP distribution																												
2.	Assist the distribution of MNP to children																												
3.	Record the MNP logistic																												
4.	Other, specify: _____																												
* 1) Yes 2) No 66) NA (if there is no supervision)																													

J. REPORTING SYSTEM				CODE
1.	Have you ever made any report on MNP distribution to Puskesmas?	1) Yes 2) No	88) DNK 99) No answer	[ ][ ]
2.	Do you have to make the report of MNP distribution?	1) Yes 2) No	88) DNK 99) No answer	
3.	If yes, when do you have to submit it?	1) Monthly 2) Bimonthly 66) NA	77) Other, specify: _____ 88) DNK 99) No answer	[ ][ ]
4.	If yes, can I see the report?	1) Yes 2) No	66) NA 99) No answer 88) DNK	[ ][ ]
5.	Is there any SOP/guidelines regarding report MNP distribution	1) Yes 2) No	88) DNK 99) No answer	[ ][ ]
6.	If yes, can I see the SOP/guidelines?	1) Yes 2) No	66) NA 99) No answer 88) DNK	[ ][ ]

K. COMMUNITY PARTICIPATION				CODE																				
1.	What kind of contributions did head of sub-village ever done on MNP program?	<table border="1"> <thead> <tr> <th>No</th> <th>Contribution</th> <th>Yes</th> <th>No</th> </tr> </thead> <tbody> <tr> <td>1.</td> <td>Attend at every MNP distribution</td> <td></td> <td></td> </tr> <tr> <td>2.</td> <td>Assist cadre informing schedule of MNP distribution</td> <td></td> <td></td> </tr> <tr> <td>3.</td> <td>Prepare a place for MNP distribution</td> <td></td> <td></td> </tr> <tr> <td>4.</td> <td>Other, specify: _____</td> <td></td> <td></td> </tr> </tbody> </table>			No	Contribution	Yes	No	1.	Attend at every MNP distribution			2.	Assist cadre informing schedule of MNP distribution			3.	Prepare a place for MNP distribution			4.	Other, specify: _____		
No	Contribution	Yes	No																					
1.	Attend at every MNP distribution																							
2.	Assist cadre informing schedule of MNP distribution																							
3.	Prepare a place for MNP distribution																							
4.	Other, specify: _____																							

THANKS FOR YOUR PARTICIPATION

## POSYANDU'S OBSERVATION

Name of Posyandu	: .....
Name of sub-village	: .....
Name of village	: .....
Name of Observer	: .....

### I. Storage condition (note: observe and check the condition of storage)

No	Storage condition	Yes	No	Description
1	Kept in specific room			Condition:
2	Cleanliness of storage			Condition:
3	Availability of pest (i.e. cockroach, mouse etc)			Condition:

### II. Other resources (note: observe and check the availability and functionality of resources)

No	Storage condition	Yes	No	Description
1	Record of MNP stock/ logistic			Items recorded:  Kept by:
2	Requesting report of MNP to Puskesmas			Items requested:  Kept by:
3	Record of sweeping activity			Items recorded:  Kept by:
4	Children registration book			Items recorded:  Kept by:
5	Schedule of MNP distribution			Items reported:
6	SOP/Guidelines of MNP distribution			Items recorded:  Kept by:
7	Report of MNP distribution to Puskesmas			Items reported:  Kept by:



**SYSTEM REVIEW ON DISTRIBUTION OF MULTIPLE  
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Phone : (021) 3913932 / 330205, Fax : (021) 3913933

**PUSKESMAS'S QUESTIONNAIRE**

Name of Puskesmas	:	.....
Name of sub-district	:	.....
Name of respondent	:	.....
Sex of respondent	:	1) Male            2) Female
Position of respondent	:	.....
Name of interviewer	:	.....
Date of interviewer	:	...../...../ 2010 (dd/mm/yy)
Time of interview	:	.....until.....

Note for completeness of the questionnaire:		
Checked by enumerator 1	Checked by enumerator 2	Checked by Researcher
.....	.....	.....
1) complete    2) not complete	1) complete    2) not complete	1) complete    2) not complete
Note:	Note:	Note:
Signature*	Signature*	Signature*

\* Please make sure that the questionnaire has completed before sign it.







7.	Who wrote the plan?			
8.	Who approve the plan?			
9.	What are the main specific targets set for you?			[ ] [ ] [ ]
		88) DNK		
10.	Does the plan specify who does what and when?	1) Yes 2) No	88) DNK	[ ] [ ] [ ]
11.	Is there any regular meeting / discussion between Puskesmas staff and cadre to monitor plan-implementation and discuss problem regarding MNP distribution?	1) Yes 2) No	88) DNK	[ ] [ ] [ ]
12.	If yes when did you hold the last one?	1) Within the last 4 months 2) Longer than 4 month ago	88) DNK	
13.	Do you develop schedule of planned activities for MNP distribution?	1) Yes 2) No	88) DNK	[ ] [ ] [ ]
14.	If yes, can I see them for the latest period?	1) Available 2) Not available	66) NA	[ ] [ ] [ ]
15.	Do you have a job description of yourself?	1) Yes 2) No	88) DNK	[ ] [ ] [ ]
16.	Do you have a job description of your technical staff?	1) Yes 2) No	88) DNK	[ ] [ ] [ ]
17.	If yes, can I see them?	1) Available 2) Not available	66) NA	[ ] [ ] [ ]
18.	Are areas of responsibility clearly defined within the health team?	1) Yes 2) No	88) DNK 99) No answer	[ ] [ ] [ ]
19.	if yes, give brief description			[ ] [ ] [ ]
	66) NA			

THANKS FOR YOUR PARTICIPATION

## PUSKESMAS'S RECORD CHECKING

Name of Puskesmas	: .....
Name of Observer	: .....

### I. MNP logistic in the last five months

Month	Number of MNP requested	Number of MNP received from Puskesmas	Number of MNP leakage during storing	Number of MNP distributed	Number of MNP left over
January					
December					
November					
October					
September					
August					

### II. Request of MNP

Month	Time (dd/mm/yy)	Timeliness of requesting*	Number of MNP requested	Number of MNP needed	Correctness of requesting*
January					
December					
November					
October					
September					
August					

\* 1) Yes 2) No 66) NA (if there is no requesting system)

### III. MNP Delivering

Month	Time (dd/mm/yy)	Timeliness of requesting*	Person in-charge
January			
December			
November			
October			
September			
August			

\* 1) Yes 2) No 66) NA (if there is no requesting system)

## PUSKESMAS'S OBSERVATION

Name of Puskesmas	: .....
Name of Observer	: .....

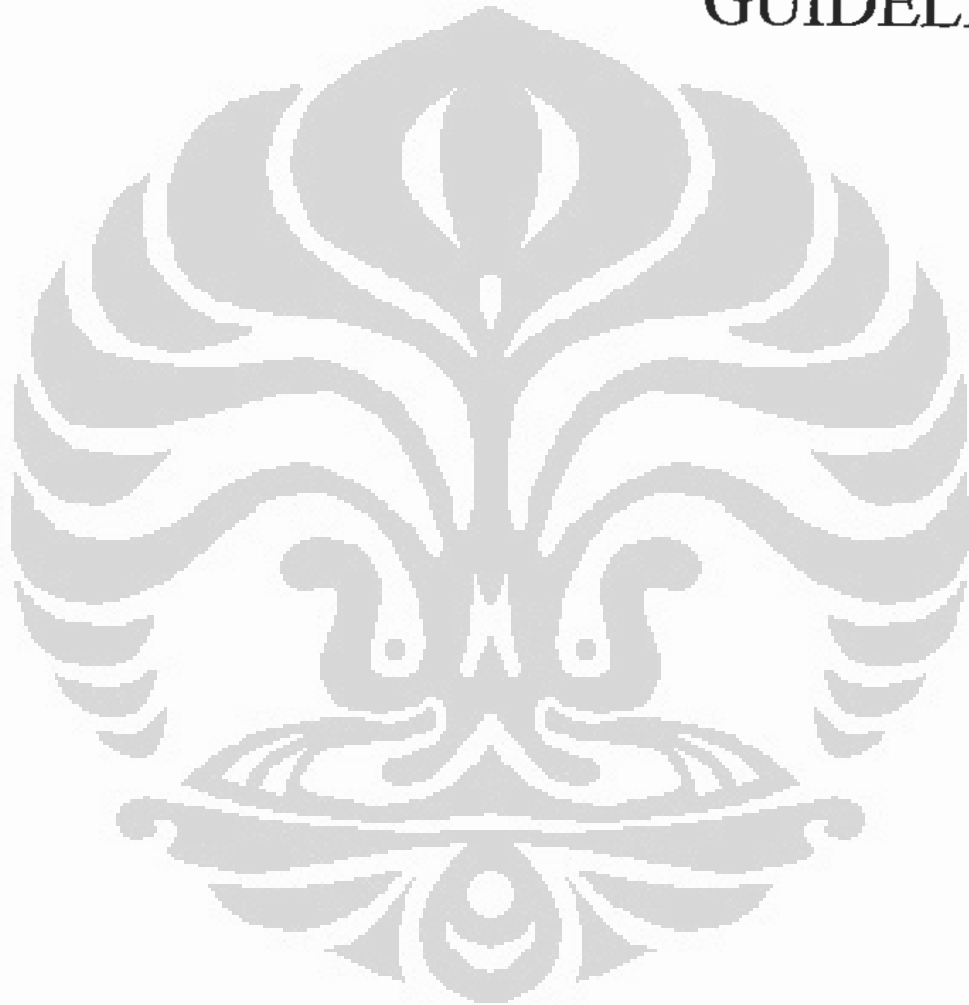
### I. Storage condition (note: observe and check the condition of storage)

No	Storage condition	Yes	No	Description
1	Kept in specific room			Condition:
2	Cleanliness of storage			Condition:
3	Availability of pest (i.e. cockroach, mouse etc)			Condition:

### II. Other resources (note: observe and check the availability and functionality of resources)

No	Storage condition	Yes	No	Remark
1	Record of MNP stock/ logistic			Items reported:
2	Requesting report of MNP to DHO			Items reported:
3	Record of MNP delivery to Posyandu			Items reported:
4	SOP/Guidelines of MNP distribution			Items reported:
5	Report of MNP distribution to DHO			Items reported:

**APPENDIX 7**  
**IN-DEPTH INTERVIEW**  
**GUIDELINES**





**SYSTEM REVIEW ON DISTRIBUTION OF MULTIPLE  
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**INDEPTH INTERVIEW GUIDELINES:  
RESPONSIBLE PERSON OF MNP PROGRAM IN PUSKESMAS**

Name of Puskesmas staff	:
Puskesmas	:
Position in Puskesmas	:
Education	:
Duration of being in charge of MNP program	:
Name of interviewer	:
Date of interview	:
Duration	:

MNP program

1. Do MNP program exist in your area?
2. How is the role of Puskesmas in delivering MNP program? (*Probing: task, responsibility and authority*)
3. Is there any supervision performed from DHO to Puskesmas? Puskesmas to Posyandu?
4. What is the purpose of the supervision?
5. How is the supervision performed? (*Probing: the regularity in the last 3 months, person in-charge, schedule*)
6. What kind of feed back given back to Posyandu?
7. What kind of feed back received from DHO?
8. Is there any specific regulation and policy in delivering the MNP program?
9. How is the implication to operational of MNP distribution?
10. Is there any strategic planning regarding MNP program from DHO?
11. Is there any strategic planning regarding MNP program on your Puskesmas?
12. Is there any SOP or guidelines for MNP distribution including requesting, delivering, storing and reporting?
13. Generally what are your constraints in delivering MNP program, especially regarding MNP distribution to the community?
14. How do you cope with those constraints?
15. According to you, what kind of support needed regarding MNP distribution?

Requesting, delivery and storing system

16. Does the requesting system of MNP distribution exist in your area?
17. How is the mechanism of requesting system? Does it work? (*Probing: the flow, person in-charge, time, form of request and ask for the record of requesting*)
18. How is the role of Puskesmas in requesting system?
19. How do you calculate the estimation of MNP sachets to be requested?
20. How do you make request of MNP to DHO?
21. How do you encourage cadre to make request of MNP?

22. How is the timeliness of cadre making the request?
23. What are the constraints of this requesting system?
24. How do you handle those constraints?
25. How is the mechanism of MNP delivering system? Does it work? (*Probing: the flow, person in-charge, time, expedition book for delivering and ask to see it*)
26. How is the role of Puskesmas in delivering system?
27. How is the timeliness of MNP delivering from DHO?
28. What are the constraints of this delivering system?
29. How do you handle those constraints?
30. How do you handle MNP stock/supply from DHO? (*Observe the storage: condition of the room, temperature, pest in the room, FIFO system*)

#### Financial source

31. What is the main source of operational cost of MNP program? (*Probing: the amount and is it enough*)
32. Is it routinely implemented? If not, how do you cope with it?
33. Other source of operational cost regarding MNP program?
34. How is the utilization of the budget?
  - Operational in Posyandu (for cadre, sweeping activity)
  - Operational in Puskesmas (for Puskesmas staff, requesting, storing, delivering)

#### Report and record system

35. How is the mechanism of recording and reporting of MNP program? *Probing from Posyandu to Puskesmas and to DHO?*
36. What is the purpose of the report?
37. What kind of data to be reported? (*ask to see the document*)





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**INDEPTH INTERVIEW GUIDELINES:  
HEAD OF PUSKESMAS**

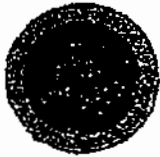
Name of Head of Puskesmas	:
Puskesmas	:
Education	:
Duration of being head of Puskesmas	:
Name of interviewer	:
Date of interview	:
Duration	:

MNP program

1. What is the role of Puskesmas in MNP distribution? (*Probing: task, responsibility and authority*)
2. Who is the responsible person on MNP distribution to Posyandu?
3. How is the supervision performed on the day of MNP distribution at Posyandu? (*Probing: routinely, person in-charge, schedule on every Posyandu*)
4. What is the purpose of the supervision?
5. What kind of feed back given back to Posyandu?
6. What kind of feed back received from DHO?
7. Is there any specific regulation and policy in delivering the MNP program?
8. How is the implication to operational of MNP distribution?
9. Is there any strategic planning regarding MNP program from DHO?
10. Is there any strategic planning regarding MNP program on your Puskesmas?
11. Is there any SOP or guidelines for MNP distribution including requesting, delivering, storing and reporting?
12. How is the coverage of MNP program? Does it meet the target?

Financial source

13. Who give fund for MNP distribution? How much? (*Probing: DHO, APBD, UNICEF*)
14. How is the budget allocation?
  - Operational for cadre (*probing: amount, frequency, mechanism, source of fund*)
  - Sweeping activity (*probing: amount, frequency, mechanism, source of fund*)
  - Puskesmas staff for MNP delivering i.e. for transport or gasoline (*probing: amount, frequency, mechanism, source of fund*)
15. Other source of operational cost regarding MNP program?
16. Generally what are your constraints in delivering MNP program, especially regarding MNP distribution to the community?
17. How do you cope with those constraints?
18. According to you, what kind of support needed in delivering nutrition education regarding MNP?



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**INDEPTH INTERVIEW GUIDELINES:  
RESPONSIBLE PERSON OF MNP PROGRAM  
IN DISTRICT HEALTH OFFICE**

Name of DHO staff	:
Position in DHO	:
Education	:
Duration of being in charge of MNP program	:
Name of interviewer	:
Date of interview	:
Duration	:

Availability of MNP program

1. What is the role of DHO in delivering MNP program? (*Probing: its task, responsibility and authority*)
2. Is there any specific regulation and policy in delivering the MNP program? How is the implementation?
3. How is the implication to operationalize of MNP distribution?
4. How is the support from local government?
5. How is the support from UNICEF?
6. Is there any strategic planning regarding MNP program? How much the target of coverage set?
7. How is the coverage of MNP program? Does it meet the target?
8. Is there any SOP or guidelines for MNP distribution including requesting, delivering, storing and reporting?
9. Is there any supervision performed from DHO to Puskesmas and Posyandu?
10. What is the purpose of the supervision?
11. How is the supervision performed?
12. What kind of feed back given back to Puskesmas and Posyandu?
13. Generally what are your constraints in delivering MNP program, especially regarding MNP distribution to the community?
14. How do you cope with those constraints?
15. According to you, what kind of support needed regarding MNP distribution?

Training program for cadres

16. Do training programs regarding MNP for health staff and cadre exist in the last two year? (*Probing: topic of training, method, duration, size of class, evaluation*)
17. Is there any refreshing training?
18. What are the criteria in attending the training program?
19. What are the sources of reference used to develop the curricula of training?

Requesting, delivery and storing system

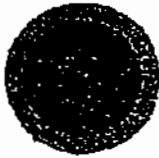
20. Does the requesting system of MNP distribution exist in your area?
21. How is the mechanism of requesting system? Does it work? (*Probing: the flow, person in-charge, time, form of request and ask for the record of requesting*)
22. How do you calculate the estimation of MNP sachets to be requested?
23. How do you make request of MNP to producer?
24. How do you encourage Puskesmas staff to make request of MNP?
25. How is the timeliness of Puskesmas staff making the request?
26. What are the constraints of this requesting system?
27. How do you handle those constraints?
28. How is the mechanism of MNP delivering system? Does it work? (*Probing: the flow, person in-charge, time*)
29. How is the role of DHO in delivering system?
30. How is the timeliness of MNP delivering from producer?
31. What are the constraints of this requesting system?
32. How do you handle those constraints?
33. How do you handle MNP supply/stock in DHO? (*Observe the storage: condition of the room, temperature, pest in the room, FIFO system*)

Financial source

34. What is the main source of operational cost of MNP program?
35. Is it routinely implemented? If not, how do you cope with it?
36. Other source of operational cost regarding MNP program?
37. How is the utilization of the budget?
  - o Operational in Posyandu (for cadre, sweeping activity)
  - o Operational in Puskesmas (for Puskesmas staff, requesting, storing, delivering)

Report and record system

38. How is the mechanism of recording and reporting of MNP program? *Probing from Puskesmas and to DHO?*
39. What is the purpose of the report?
40. What kind of data to be reported?
41. How is the utilization of the report?
42. Who used the data?
43. Does it use to make decision/program/policy?



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**INDEPTH INTERVIEW GUIDELINES:  
HEAD OF DISTRICT HEALTH OFFICE**

Name of head of DHO	:
Education	:
Duration of being head of DHO	:
Name of interviewer	:
Date of interview	:
Duration	:

Availability of MNP program

1. What is the role of DHO in delivering MNP program? (*Probing: its task, responsibility and authority*)
2. Is there any specific regulation and policy in delivering the MNP program? How is the implementation?
3. How is the implication to operational of MNP distribution?
4. How is the support from local government?
5. How is the support from UNICEF?
6. What does UNICEF demand from you? (*probing: implementation of the program, report, coverage*)
7. Is there any strategic planning regarding MNP program? How much the target of coverage set?
8. How is the coverage of MNP program? Does it meet the target?
9. Is there any SOP for MNP distribution including requesting, delivering, storing and reporting?
10. Is there any supervision performed from DHO to Puskesmas and Posyandu?
11. What is the purpose of the supervision?
12. How is the supervision performed?
13. What kind of feed back given back to Puskesmas and Posyandu?
14. Generally what are your constraints in delivering MNP program, especially regarding MNP distribution to the community?
15. How do you cope with those constraints?  
According to you, what kind of support needed regarding MNP distribution?

Financial source

16. What is the main source of operational cost of MNP program?
17. Is it routinely?
18. Other source of operational cost regarding MNP program?
19. How is the utilization of the budget?
  - o Operational in Posyandu (for cadre, sweeping activity)
  - o Operational in Puskesmas (for Puskesmas staff, requesting, storing, delivering)



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**INDEPTH INTERVIEW GUIDELINES:  
UNICEF'S RESPONSIBLE PERSON FOR MNP DISTRIBUTION**

Name	:
Education	:
Duration of being in charge of MNP program	:
Name of interviewer	:
Date of interview	:
Duration	:

Availability of MNP program

1. What is the role of UNICEF in delivering MNP program? (*Probing: its task, responsibility and authority*)
2. How is the support from local government?
3. Is there any strategic planning regarding MNP program? How much the target of coverage set?
4. How is the coverage of MNP program? Does it meet the target?
5. Is there any SOP for MNP distribution including requesting, delivering, storing and reporting?
6. Is there any supervision performed from UNICEF for MNP distribution?
7. What is the purpose of the supervision?
8. How is the supervision performed?
9. Is there any financial support for MNP distribution aside providing MNP procurement?
10. What kind of feed back given back to DHO, Puskesmas and Posyandu?
11. Generally what are your constraints in delivering MNP program, especially regarding MNP distribution to the community?
12. How do you cope with those constraints?
13. According to you, what kind of support needed regarding MNP distribution?

Requesting and delivery system

14. Does the requesting system of MNP distribution from DHO exist?
15. How is the mechanism of requesting system? Does it work? (*Probing: the flow, person in-charge, time*)
16. How do you calculate the estimation of MNP sachets to be stock?
17. How do you encourage DHO staff to make request of MNP?
18. How is the timeliness of DHO staff making the request?
19. How is the mechanism of MNP delivering system? Does it work? (*Probing: the flow, person in-charge, time*)
20. How do you handle MNP stock in before deliver to DHO? (*Observe the storage*)
21. What are the constraints of this requesting and delivery system?
22. How do you handle those constraints?