

**IMPROVING IMMUNIZATION COVERAGE: A REVIEW
OF EPI IN WEST SULAWESI PROVINCE, INDONESIA**

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IMPROVING IMMUNIZATION COVERAGE: A REVIEW OF EPI IN WEST SULAWESI PROVINCE, INDONESIA.

A thesis submitted in partial fulfilment of the requirement for the degree of Master of Public Health

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Declaration:

Where other people's work has been used (either from a printed source, internet or any other sources) this has been carefully acknowledged and referenced in accordance with departmental requirements.

The Thesis "Improving Immunization Coverage: A Review of EPI in West Sulawesi Province" is my own work.

Signature

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I wish to thank to colleagues in ICHD, friends and my relatives and especially to my mom that supporting me during my study in Amsterdam.

Abbreviations

ADS	Auto Disable Syringes
AEFI	Adverse Events Following Immunization
AFP	Acute Flaccid Paralyzed
BCG	Bachille Chalmete Guarine
BHCWs	Basic Health Community Workers
cMYP	Comprehensive Multi Year Plan
DALYs	Disability Adjusted Life Years
DPT	Diphtheria-Pertusis-Tetanus
DPT-HB	Diphtheria-Pertusis-Tetanus-Hepatitis B
DT	Diphtheria-Tetanus
DHO	District Health Office
EPI	Expanded Program on Immunization
GAVI	Global Alliance for Vaccine and Immunization
GIVS	Global Immunization Vision Strategies
GDP	Gross Domestic Product
GNI	Gross National Income
HBV	Hepatitis B Vaccine
JE	Japanese Encephalitis
JFR	Joint Reporting Form
LAM	Local Area Monitoring
MCV1	Measles-containing vaccine 1
MCCI-IP	Millennium Challenge Corporation- Immunization Project
MOH	Ministry of Health
MNT	Maternal Neonatal Tetanus
MNTE	Maternal Neonatal Tetanus Elimination
NID	National Immunization Day
NIP	National Immunization Program
OPV	Oral Polio Vaccine
PHO	Provincial Health Office
PUSKESMAS	Pusat Kesehatan Masyarakat, Community Health Centre
POSYANDU	Pos Pelayanan Terpadu, Integrated service post
PRSP	Poverty Reduction Strategy Paper
PNA	Performance Needs Assessment
SIA	Supplementary Immunization Activities
TT	Tetanus Toxoid
UCI	Universal Childhood Immunization
UNICEF	United Nations Children' Fund
VPDs	Vaccine Preventable Diseases
WHO	World Health Organization

Glossary

Adverse events following immunization are a medical incident that takes place after an immunization, causes concern and is believed to be caused by the immunization

Bundling system is a system which requires that certain items must be ordered, distributed and used together. Through this system, vaccines, diluents, syringes, needles and safety boxes are tied together.

Cold chain system is a system to keep vaccines in the appropriate temperature to remain potent during vaccine orders and supplies, their transportation, storage and distribution from factory to the delivery points.

Catch up campaign is a technical term that refers to a population-wide measles campaign designed to achieve very high population immunity in one action. It is designed to target all age groups up to the age where all order birth cohort have an immunity of at least 95%. In practice, it often targets children age 6 to 12 years of age regardless of prior diseases or vaccination history.

Crash programme campaign is a campaign which is almost the same with catch up campaign but it targets children of age 6 to 59 month.

Drop out is a comparison of number of children who started receiving immunization and the number who do not receive later doses of full immunization. It is related to drop out DTP1 - DTP3.

Fully Immunized child is a child who has received one dose of BCG, three doses of diphtheria-tetanus-pertussis, three doses of polio, and one dose of measles.

Partially immunized child is a child who has not received complete vaccines in terms of doses or type of antigens.

Local area monitoring is a management tool to monitor immunization coverage progress. It is visualized by graph in order to analyze the declined coverage. It is also a concept where stakeholders take apart to support EPI in health center level.

Micro planning is a detailed planning on providing immunization services. Vaccines and supplies are calculated against the number of target per each delivery site.

Missed opportunities are defined when a child in eligible age to be immunized comes into immunization service deliveries but he/she is not immunized for some reasons such as illness or unavailable of some antigens.

National Immunization Days are a strategy for interrupting wild poliovirus circulation in endemic countries. During NIDs all children aged less than five years in a country receive two doses of OPV one month apart, regardless of their prior immunization status. NIDs are not for increasing routine immunization.

Outreach service is a term for immunization services provided at posyandu

Posyandu is an integrated health post where outreach services for EPI are conducted. Posyandu is run by health volunteers and supported by local governments.

Supportive supervision is a concept that offers better performance by strengthening communication (two way communication), focusing on problem solving (offers alternative solving), facilitating teamwork, providing leadership and support to empower health providers to monitor and improve their own performance. The supervisor finds the situation based on the observations, interviews, review of documentation.

Supplementary immunization activities are mass campaigns targeting all children in a defined age group with the objective of reaching a high proportion of susceptible individuals. Each campaign is conducted over a wide geographical area (e.g. province or country) in order to achieve rapid reduction in the number of susceptible children. It is not usual to conduct screening for vaccination status.

Sweeping activities are an activity to reach missed opportunities children on villages. It is conducted by door to door with help from health volunteers.

Abstract

Background: Expanded program on immunization aims to protect children from vaccine preventable diseases. However, the coverage of immunization program in Indonesia particularly in West Sulawesi remains low. The target, achieving 80% of villages by UCI by 2010 is facing many challenges.

Objectives: To describe current situation of EPI in Indonesia particularly in West Sulawesi, to describe government strategies to improve EPI coverage, to analyze and compare coverage of EPI amongst districts in West Sulawesi, to identify and analyze the barriers on the implementation of EPI in West Sulawesi, and to formulate recommendations to in order to strengthen EPI.

Methodology: This thesis is based on literature review. Journals reviewed and secondary data has been used. PRSP framework was used to analyze the coverage amongst 5 districts in West Sulawesi. Indicators were measured against the MOH standards.

Result: this study revealed that EPI coverage in West Sulawesi was low. The comparison of the five districts showed that Majene district had higher levels of accessibility, availability of resources, organizational quality, social accountability, EPI utilization, continuity of services and technical quality than the other 4 districts.

Conclusion and recommendation: Inadequate support from local government was the root cause of low immunization coverage. Limited budget support affects the EPI services. Therefore, advocacy to local governments and parliament is necessary in order to strengthen EPI services.

Keywords: Expanded Program on Immunization (EPI), immunization coverage, barrier, Indonesia, vaccine, and vaccine preventable diseases.

Words: 11,842

Introduction

The Expanded Program on Immunization was adopted by the MOH in 1979 with 6 antigens against measles, polio, diphtheria, pertusis, tetanus, and hepatitis B. Immunization program in all provinces follows the national EPI guidelines. The main goal of Universal childhood immunization (UCI) was to target 80% of village with UCI by the year 2010. However, the coverage of immunization remains low particularly in West Sulawesi, causing more than one thousand measles cases in 2006.

I was a provincial supervisor of West Sulawesi for 3 years before attending the ICHD course. This thesis will review the EPI coverage ranging from potential coverage to actual coverage with focus on West Sulawesi Province. I have chosen this topic because it has been my areas of interest. The results and findings of this thesis will be shared with the MOH, PHO of West Sulawesi including the recommendations. I hope that the information might be useful as reference to increase EPI coverage in the province where I work.

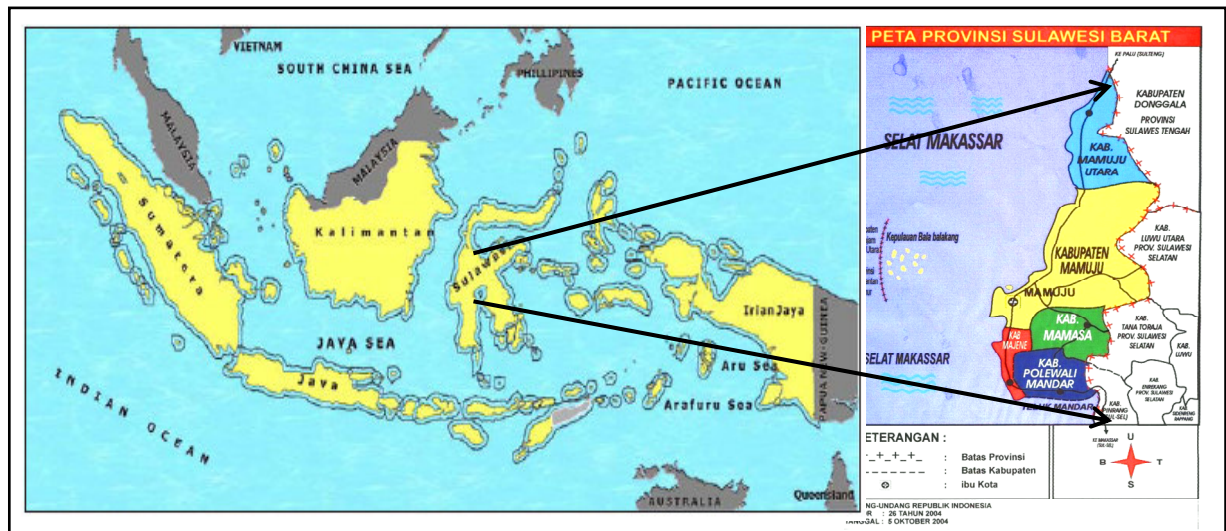
When I go back to Indonesia, I will continue my work as provincial supervisor for EPI and I will apply the EPI recommendation that I have formulated in this thesis.

Chapter 1: Background Information

1.1. Indonesia and West Sulawesi Geographical and Demographic profile

Indonesia is an archipelago with approximately 17,000 islands. Its Total surface area is about 1,919,440 km² bordered by Malaysia, Singapore, Brunei Darussalam and the Philippines in the North, Papua New Guinea in the East, Australia and Timor Leste in the Southeast (Marine and Fisheries Dept, 2008). Indonesia consists of 33 provinces, 465 regencies and municipalities, 6,131 sub districts and 73,405 villages (Statistic of Indonesia, 2008).

Map 1. Map of Indonesia and West Sulawesi Province



Source: The Ministry of Marine and Fisheries, 2008.

Indonesia is one of the most populous countries with a total population of 228 million in 2007 and a total fertility rate of 2.3. About 40% of the population live in urban areas and 60% in rural areas. Population density differs by islands; the highest population density is in Java Island: 1,019 persons per km² (Statistic of Indonesia, 2008).

West Sulawesi Province was formed according to the law 26 in 2004 whereby West Sulawesi was set up as the newest province in Indonesia and Mamuju as the capital city (The Ministry of Internal Affairs, 2004). West Sulawesi comprises of 5 districts, 57 sub districts (kecamatan) and 534 villages (desa/kelurahan). All districts in West Sulawesi are underdeveloped according to the Ministry of Development Acceleration of Underdeveloped Areas (MoDAoUA). Most areas are mountainous, poor

infrastructure with limited public transportation, and poor human resources (MODAOUA, 2005). See annex 1.

West Sulawesi has a total population of 1.2 million and total fertility rate of 2.6. Population density was 11 per km², with a total land area of 16,787.19 km² (Statistic of West Sulawesi, 2007).

1.2. Socio-economic profile

Agriculture, trade and industry form the Indonesian economic structure. Even though Indonesia is conceived as an agricultural country, trade, construction, transportation and banking contributes 40% of its Gross Domestic Product (GDP) compared to agriculture which made 19.4% of its GDP in 2007 (Statistic of Indonesia, 2008).

The economic crises 2007 adversely affected the Gross National Income (GNI) per capita. In 2007, the GNI per capita (PPP int. \$) was US\$ 3,950 which declined to US\$ 3,580 in 2007 (Statistic of Indonesia, 2008). The economic crises affected more people living under the poverty line both in rural and urban areas. It was about 23.6% and 13.6% respectively (Statistic of Indonesia, 2008). *Bantuan Tunai langsung* or cash aid programme is implemented by the central government aiming to a give chance to the poorest of the poor to provide enough nutritious food. The main goal of this program is to prevent famine in the poorest people (Adam L, Lestari E, 2008).

1.3. Health system

Health infrastructure

The Indonesian health system uses bottom-up approach to deliver health services. Community health centre (*Puskesmas*) play an important role in the Indonesian health system. They function as centres of health development, community empowerment in health sector and centres of primary care. *Puskesmas* are responsible to provide basic health services through integrated health posts (*Posyandu*), maternity huts (Pondok bersalin desa- *Polindes*) and Sub health centre (*Puskesmas pembantu*) (MOH, 2009). The *Puskesmas* are located in sub district levels. There are 7.779 existing *Puskemas* in Indonesia (MOH, 2007) and 70 in West Sulawesi (PHO, 2008). Secondary and tertiary cares are provided at district and provincial levels. At least one hospital is placed at each district (type C hospital) as the first referral hospital and type B hospital at provincial level as the second referral hospital (MOH, 2009)

Tabel 1. Health facilities at different levels.

Administrative level	Facility	Schedule for serving
Village	1. Community based facility:	
	• Integrated Service Post (Pusat Pelayanan Terpadu- <i>Posyandu</i>)	1 time per month
	• Maternity Hut (Pondok bersalin Desa - <i>Polindes</i>)	Daily-Office hours
	2. Sub health center (Puskesmas Pembantu - <i>Pustu</i>)	Daily-Office hours
	3. Mobile service unit (Puskesmas Keliling - <i>Pusling</i>)	Daily-Office hours
Sub district	Health center with and without inpatient facility	Daily-Office hours
District	First Referral	Daily-Office hours
Province	Second Referral	Daily-Office hours
Central	1. Tertiary top referral hospital 2. Hospital as centre of excellence	Daily-Office hours

Source: MOH, 2009

Health financing

A decentralization policy was put into practice in 2001 according to the Law No.25/1999. As a result financial responsibility was also delegated to district levels as well as implementation of operational programs. Under decentralization reform, there are six sources of funding of health sector at district level: (1) Natural resource and tax revenue. The district governments have authority of its allocation. (2) The central government general allocation fund (Dana Alokasi Umum, DAU), local government have prerogative to decide this fund's distribution. (3) The central government special allocation fund (Dana Alokasi Khusus, DAK), which is designed for specific purposes and is allocated to local governments with less income and poor funding on health. (4) Local government revenue such as taxes and profit of its property. (5) Companies and communities contribution and (6) Individual households (Kristiansen S, Santos P, 2006).

Health resources allocation has been a crucial issue in political debate. A minimum of 15 per cent should be allocated for health expenditure. However, in 2006 Total Expenditure on Health was only 2.2 of GDP.

Indonesia had lower expenditure on health than other ASEAN countries (PNHA, 2005). In 2006, about 66.3% of health financing came from out of pocket (WHO, 2008b).

Tabel 2. Indonesia National Expenditure on health

National health account	2006
Total expenditure on health as a percentage of gross domestic products (GDP).	2.2
General government expenditure on health as a percentage of total expenditure on health	50.4
Private expenditure on health as a percentage of total expenditure on health.	49.6
Social security expenditure on health as a percentage of general government expenditure on health.	20.1
Out-of-pocket expenditure as a percentage of private expenditure on health.	66.3
Per capita total expenditure on health (PPP int. \$).	87.0

Source: World Health Organization, 2008

To protect the poorest communities, the government set social security expenditure on health. There is an increase in proportion of social security expenditure on health from 1998 (8.3%) to 2006 (20.1%) as a percentage of general government expenditure on health. The Ministry of Health (MOH) set *Jamkesmas* as the scheme of social insurance for the poorest people (MOH, 2008f).

1.4. Health Profile

To improve health situation, the MOH has set up vision of Healthy Indonesia by the year 2010 where all Indonesian are expected to live in the healthy environment, demonstrate healthy and hygienic behaviours, and have access to sufficient health services in order to gain a high degree of health. Immunization programme was one of the strategies toward this vision (MOH, 2005).

Table 3. Health indicators for Indonesia and West Sulawesi (2008)

No	Indicator	National	West Sulawesi Province
1.	Life expectancy at birth	68.5	67.0
2.	Total fertility rate	2.3	2.6
3.	Maternal mortality ratio	228	502
4.	Infant mortality rate	25	37
5.	Under five mortality rate	31	

Source: MOH, 2008,

Childhood health problem is not only related to vaccine preventable diseases but also related to other diseases. Acute Respiratory Infection (ARI), diarrhoea and fever are the most common childhood illnesses in children under 5 years of age. According to Indonesia Demographic Health Survey (IDHS) of 2007, the prevalence of ARI and fever was 11.2% and 31.6% respectively. The prevalence of ARI and fever were slightly higher in rural than urban (ARI in rural: 11.9%, in urban: 10%, fever in rural: 33.4% and in urban: 29.1%). The prevalence of diarrhoea was 13.7% and more children affected in rural than in urban (rural: 14.9% and urban: 12%) (Statistic of Indonesia et al, 2007).

1.5. Expanded program on immunization profile

The expanded program on immunization (EPI) is an initiative with intention to reduce Vaccine Preventable Diseases (VPDs) such as diphtheria, tetanus, poliomyelitis, whooping cough, and to make vaccine available to all children worldwide in 1990. This initiative was launched by the World Health Organization (WHO) in 1974 (WHO, 2000). By 1979 EPI was adopted by the MOH to national health policy (Vision of Healthy Indonesia by the year of 2010). Many efforts have been done to protect children against the VPDs. According to the decision of the Ministry of Health 2004 of EPI guideline, Indonesia should provide routine immunization and Supplementary Immunization Activities (SIAs) (MOH, 2005).

Tabel 4. Schedule of Indonesia Routine immunization

Age of administration	Antigens		
0 Month	BCG	HB0	OPV 0
2 months	DPT1	HB1	OPV 1
3 months	DPT2	HB2	OPV 2
4 months	DPT3	HB3	OPV 3
9 months	Measles		
School age (1st grade)	DT and Measles		
School age (2nd grade)	TT		
School age (3rd grade)	TT		
Women in childbearing age	TT (5 doses)		

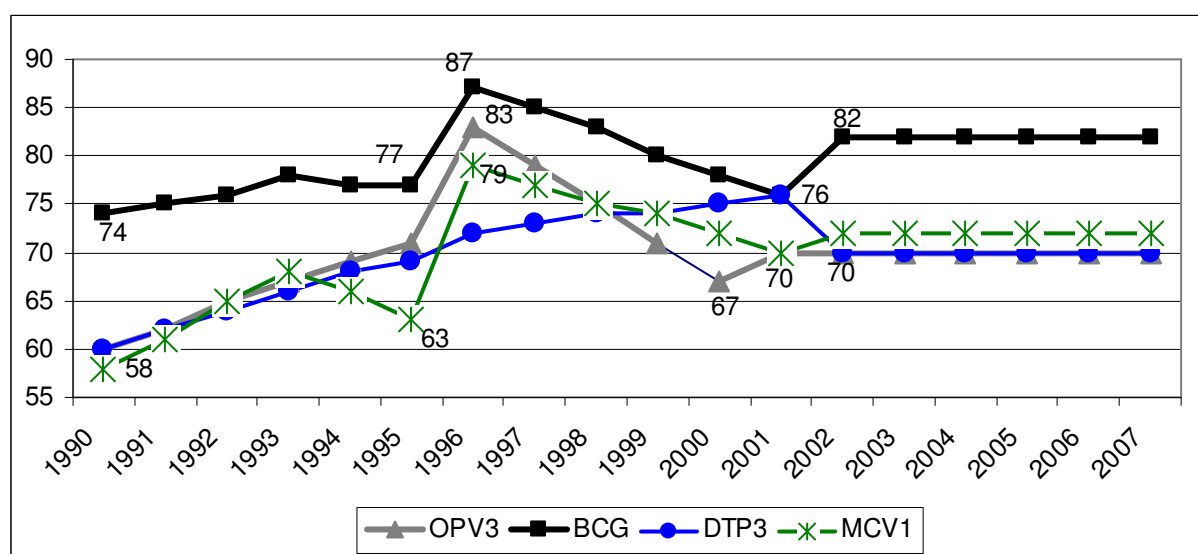
Source: MOH, 2005.

Routine immunization consists of basic immunization for infants and advance immunization for children at school age and women of childbearing age. Although WHO recommended many antigens, Indonesia policy prioritized 6 antigens as a basic immunization (MOH, 2005)

In 2007, the MOH targeted about 4.5 million infants, 12 million children of school age, and 49.6 million women of childbearing age including pregnant women that needed to be immunized (MOH, 2008e). Infant immunization is conducted monthly at static sites (*Puskesmas, Pustu* and hospital) and mobile sites (MOH, 2005).

Coverage of infant routine immunization for selected antigens has been increasing over years. WHO/UNICEF Joint Reporting Form documented that DPT3 coverage increased from 60% in 1990 to 76% in 2001 (WHO/UNICEF, 2008). However, between 2002 and 2007 it decreased to 70%. MCV1 (Measles-containing vaccine 1) coverage had almost similar trends with BCG and OPV3, where the MCV1 coverage increased from 1990 (58%) to 1993 (68%), but slowly decreased to 63% in 1995. In 1996, there was increase in measles coverage (79%). However it declined to 72% in 2001 and until 2007 the 72% coverage has remained constant (see graph 1 below).

Graph 1. Indonesia EPI coverage 1990-2007 (WHO/UNICEF estimated coverage)



Source: WHO/UNICEF JRF, 2008

Vaccination for children of school age is conducted in November annually. Through this, girls receive one dose of DT and 2 doses of TT. Currently measles antigen is also added into this program to prevent measles outbreaks (MOH, 2004). Through optimal use and wider coverage of vaccines, more child deaths could be prevented (MOH, 2007). The national schedule of EPI requires a woman of childbearing age to receive 5 doses of TT vaccine. This means a woman received TT vaccine three times during infancy from combination of diphtheria-tetanus-pertusis (DTP) vaccine and two times at school age or during pregnancy (MOH, 2005).

Supplementary immunization activities such as Crash Program, Catch up Campaign, and National Immunization Day (NID) and are conducted if required. SIAs are conducted based on the problem findings that come out from monitoring and evaluation at provincial and district and that need urgent response (MOH, 2005). In the period between 2005 and 2007, Indonesia had conducted supplementary immunization activities to response polio pandemic and measles outbreaks. The NIDs have been nationally conducted 4 times in 2005-2006 as a result of polio outbreaks (305 cases within 10 provinces). Then sub NID were conducted in 10 provinces where wild polio viruses were found. Moreover, Crash Program campaign of measles (targeting for children at age of 6-59 months) and Catch Up campaign (targeting children at age of 6-12 years) have also been conducted nationally due to measles outbreaks (MOH, 2007).

Chapter 2: Problem statement, Objectives, methodology and study limitations.

2.1. Problem Statement

WHO stated that immunization is the most cost effective health intervention to reduce infant and child deaths. It costs US \$ 5 to US \$10 per child per year (Brenzel L, Claquin P, 1994). Vaccine Preventable Diseases (VPDs) are a global burden which needs to be reduced. It was estimated that 11 million Disability Adjusted Life Years (DALYs) averted and 0.3 million deaths can be averted by measles vaccine in Southeast Asia region (Wolson L et al, 2007).

It is an obvious fact that immunization programs evidently reduce the number of deaths due to measles, diphtheria, whooping cough, poliomyelitis and tetanus but about 2.5 million children in the world die every year due to vaccine preventable diseases (WHO, 2008a). In 2006, a substantial number of children suffered from measles due to outbreaks or routine cases. About 18,488 measles cases were reported as routine cases and 2408 cases were outbreak cases. A thousand (1000) children suffered from measles in West Sulawesi in 2006, of which 5 died (PHO, 2007). Diphtheria outbreaks have also occurred in 10 provinces with total cases of 183 and case fatality rate of 6%. In 2006, Acute Flaccid Paralyzed (AFP) cases were 1,351 of which 305 were confirmed by detection of wild polio virus (MOH, 2008b).

The MOH plans to have 80% of children under age 11 months, fully immunized by the year 2010 (MOH, 2006). However, IDHS 2000-2003 documented low coverage (52%) of children (12-23 months) with fully immunized (Statistic of Indonesia et al, 2000-2003). In 2007, EPI Coverage and Evaluation Survey found that the immunization coverage of children (12-23 months) who are fully immunized, partially immunized and not immunized nationally was 64.2%, 32% and 3.8% respectively (MOH, 2008c). In West Sulawesi it was 60.4%, 30.5% and 9% respectively (MOH, 2008d). Achieving and maintaining EPI coverage above 80% for fully immunized children is important to getting herd immunity, and to reduce vaccine preventable diseases (WHO, 2004).

West Sulawesi is the newest province of Indonesia. Health programmes have been recently established. In such scenario, reaching 80% children with full immunization has many challenges. If the challenges are not tackled, Universal Childhood Immunization (UCI) can not be achieved by 2015 as indicated in national health vision "Bringing health to Indonesia by year of 2015" where 100% village with UCI status should be met. This also hinders achievement of the Millennium Development Goal (MDG) 4 (measles coverage > 90%). Moreover, vaccine preventable diseases can

not be reduced if vaccine coverage for all antigens is less than 80%. Efforts to improve EPI coverage are on going. However, there is a need to employ strategies that can work effectively in setting with limited resources. Therefore, it is essential to review the coverage of EPI, and identify the challenges in order to formulate the recommendation.

General objective

To review EPI coverage in West Sulawesi province and to provide recommendation in order to strengthen implementation of EPI in West Sulawesi.

Specific Objectives

1. To describe the current situation of EPI in Indonesia particularly in West Sulawesi
2. To describe the government strategies to improve EPI coverage
3. To analyze and compare the coverage of EPI amongst district in West Sulawesi.
4. To identify and analyze the barriers on the implementation of EPI in West Sulawesi.
5. To formulate recommendations in order to strengthen EPI.

Study questions:

1. What is the current situation of EPI in Indonesia particularly in West Sulawesi?
2. What are the government strategies to improve EPI coverage?
3. How is the implementation of EPI amongst 5 districts in West Sulawesi province?
4. What are the barriers towards the implementation of EPI in West Sulawesi province?
5. What should be recommended to strengthen the implementation of EPI?

2.2. Methodology

2.2.1 Study Design

This thesis will be a literature review study in Indonesia. I used of the journal articles and secondary data to support my arguments. Literature review was done by internet searching and KIT library. Internet searching was done using search engine such as Pubmed, Google scholar, and Scopus. In addition, I have retrieved documents from WHO and the MOH of Indonesia.

2.2.2 Data Source

Published and unpublished reports and data from the MOH and West Sulawesi provincial health office were used. Report submitted by regional

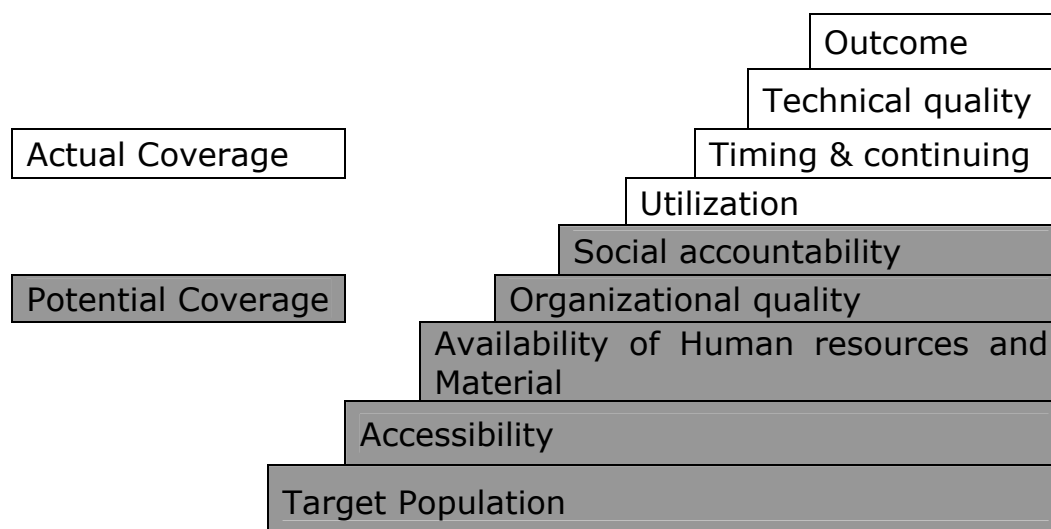
supervisor EPI of West Sulawesi and 5 DHOs of West Sulawesi were analyzed to understand the EPI performance in West Sulawesi.

Data sets used were:

1. National routine report of Sub Directorate of the Ministry of Health of Indonesia 2006-2008.
2. National evaluation and plan meeting of the MOH 2006 and 2007.
3. Provincial evaluation and plan meeting of West Sulawesi 2007.
4. Regional supervisor report of West Sulawesi 2007 and 2008.
5. Routine immunization report of DHO of Mamuju 2006-2008.
6. Routine immunization report of DHO of Majene 2006-2008.
7. Routine immunization report of DHO of Mamasa 2006-2008.
8. Routine immunization report of DHO of Polewali 2006-2008.
9. Routine immunization report of DHO of Mamuju Utara 2006-2008.
10. External observer report (the WHO and UNICEF) of Measles campaign 2007.

2.2.3 Study Framework

PRSP Framework



Source: adapted from PRSP sourcebook.

The conceptual framework of poverty reduction strategy program (PRSP) was applied in to analyze the coverage of expanded program on immunization. This framework was chosen considering the comprehensiveness of analyses which includes potential coverage and actual coverage. Potential coverage was reflected by accessibility to health services, availability of human resources and material, organizational quality and social accountability. Then utilization, timing &

continuity, and technical quality reflected the actual coverage. Indicators of those components will be explained below.

Indicators

1. Accessibility

Indicators used were:

- Ratio Puskesmas per population
- Ratio Posyandu per population
- Availability of public transportation.

2. Availability of human resources and material

Required inputs are available in sufficient quantity for target population.

Indicators used were:

- Availability of EPI staff per Puskesmas.
- Stock out of vaccines, and supplies.
- Proportion of Puskesmas with at least one refrigerator.
- Availability of budget for operational cost.

3. Organizational quality

The extent to which how services are managed. Indicators used were:

- Number of training conducted yearly.
- Availability of supportive supervision.
- Proportion of Puskesmas using micro plan.
- Proportion of Puskesmas using local area monitoring.

4. Social accountability

Community involvement on EPI activities. Indicators used were:

- Proportion of Puskesmas conducting intersectoral meeting.
- Proportion of Puskesmas involving health volunteers at Posyandu.

5. Utilization

The proportion of target population with initial contact EPI of services.

Indicators used were:

- Proportion of infants immunized with DPT-HB1.
- Proportion of pregnant women immunized with TT1.
- Proportion of Children at school age immunized with DT.

6. Timing and continuity

Availability schedule and follow up. Indicators used were:

- Duration of services
- Proportion of Puskesmas with regular outreach services (monthly based).
- Proportion of villages with "sweeping activities".

7. Technical quality

Adherence to the technical protocols. The indicators were:

- Proportion of Puskesmas practicing recapping syringes.
- Proportion of Puskesmas doing daily temperature monitoring.
- Proportion of puskesmas practicing waste management.

2.2.4 Data Analysis Procedure

1. Create a matrix consisted of components of framework, indicator, level of standard, actual coverage by districts and conclusion.
2. Compare level of actual coverage per indicator for each district against the standard of MOH.
3. Analyze and describe the result of comparison.

Keywords: Expanded program on immunization (EPI), immunization coverage, barrier, Indonesia, vaccine, and vaccine preventable diseases.

2.3 Study Limitations.

This study used secondary data therefore some difficulties were met during analysing stage. Firstly, secondary data taken from unpublished report of 5 DHOs of West Sulawesi took time to collect them completely. Secondly, Indonesian EPI coverage and evaluation survey were only in the year of 2007/2008, so there is no scientific data from 2005-2006 that support analysis stage of this study as the author expected to analyze the performance of EPI for the first time West Sulawesi was formed.

Chapter 3: Current Situation of Expanded program on Immunization in Indonesia and West Sulawesi

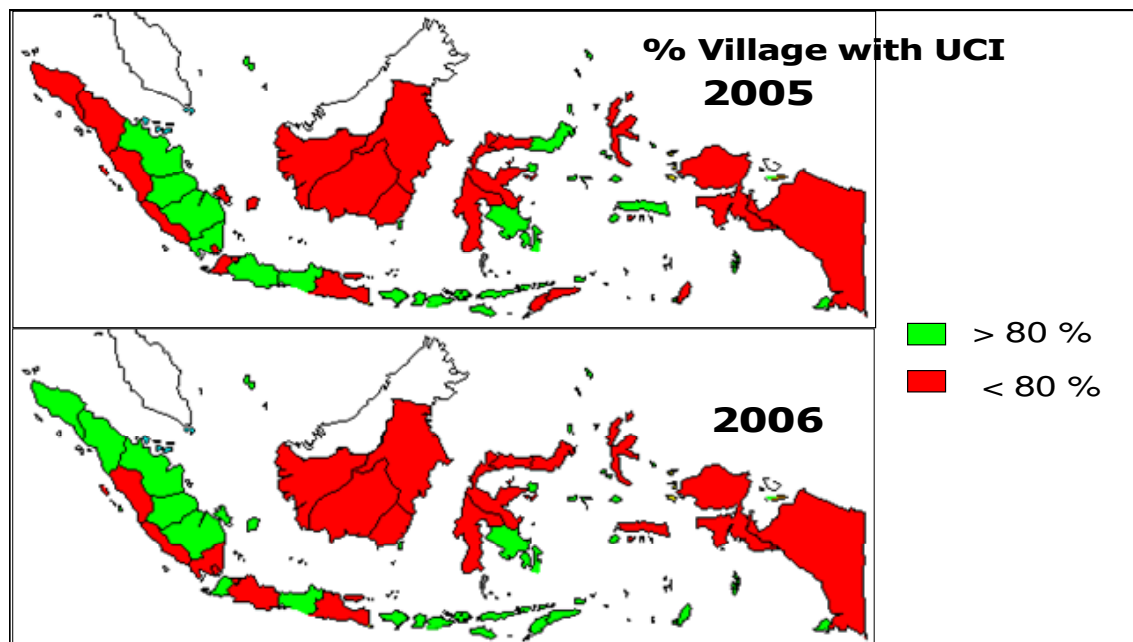
3.1. Current situation of EPI in Indonesia

Global immunization coverage has been increasing yearly. Currently, over 2.5 million of deaths due to vaccine preventable diseases such diphtheria, tetanus, whooping cough (pertussis) and measles are averted by immunization (WHO, 2008).

However, about 26.3 million infants globally are not immunized against these vaccine preventable diseases. An estimated 75% of these unimmunized children lives in Asian and African regions. Of the 26.3 million unimmunized children, 1.3 million live in Indonesia (WHO, 2008).

The MOH targeted to achieve 80% of UCI villages by 2010 and 100% of UCI villages by 2015; measles vaccine coverage of 80% is used as the indicator for defining the villages meeting the UCI standard (WHO, 2009). Each province should reach at least 80% of UCI villages. However, most provinces achieved less than 80% of UCI villages in 2005 and in 2006. There is an increasing province that achieve more than 80% UCI village in 2006 comparing to 2005 (MOH, 2007) as shown map 2 below.

Map 2. Percentage of village achieving UCI by province



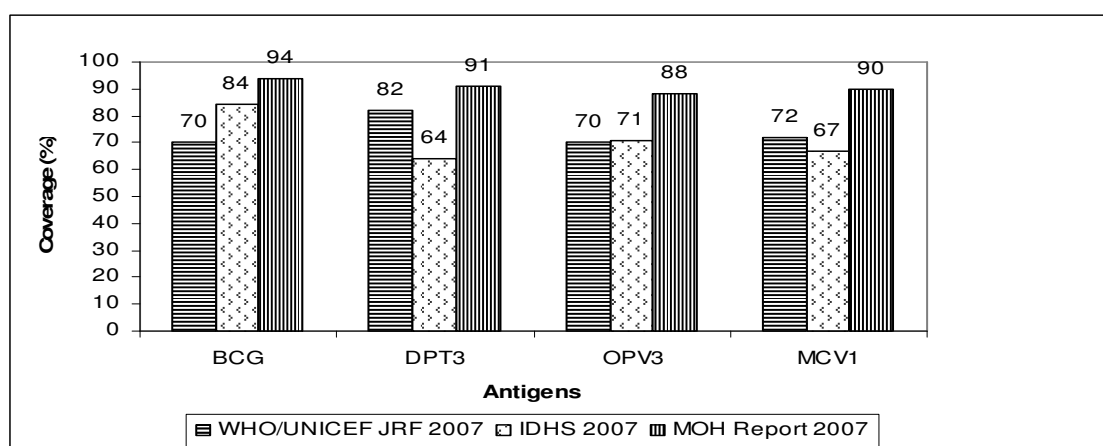
Source: MOH, 2007

It is globally agreed that coverage of three doses of DPT vaccine is used as a proxy indicator to monitor the progress of routine immunization at

the country and regional levels (GAVI, 2007). However, the MOH also introduced antigen coverage such as HB0, DPT1 and measles as the indicators of EPI (MOH, 2006).

IDHS 2007 reported that 84% of children have been vaccinated with BCG, 64% with DPT3, 71% with OPV3 and 67% with MCV1. There are several data sources of immunization coverage (See graph 2. below). The official reports on the coverage of BCG, DPT3, OPV3, and MCV1 in 2007 are higher than those of coverage reported by WHO/UNICEF JRF and IDHS.

Graph 2. Indonesia EPI coverage 2007



Source: WHO/UNICEF JRF, 2007; Statistic et al, 2007; MOH official report, 2008e

Recently, coverage of HBV at birth (HB0) was added as another indicator to measure the overall immunisation coverage according Global Alliance for Vaccines and Immunization (GAVI). According to the MOH (2008e) reported the coverage of HBV at birth was low (only 54%), but the EPI Coverage and Evaluation Survey found even lower HBV coverage of only 21% (MOH, 2008c).

Indonesia has developed strategy to achieve Maternal Neonatal Tetanus Elimination (MNTE) through routine TT vaccination to girls of school age, pregnant women and women who are getting married. The objective of this strategy is to protect women throughout their childbearing age and their descendants against neonatal tetanus. However, data of TT and DT vaccination for children at school age are not very well documented. This problem leads to some difficulties to analyze the coverage and to track doses of TT vaccination of woman in childbearing age (to determine TT grade such T1, T2, T3, T4 and T5). The coverage of TT2+ for pregnant women is well documented, because vaccinations for pregnant women and infants are integrated to maternal and child programme which is carried out on its activities under the Sub Directorate of Maternal Health

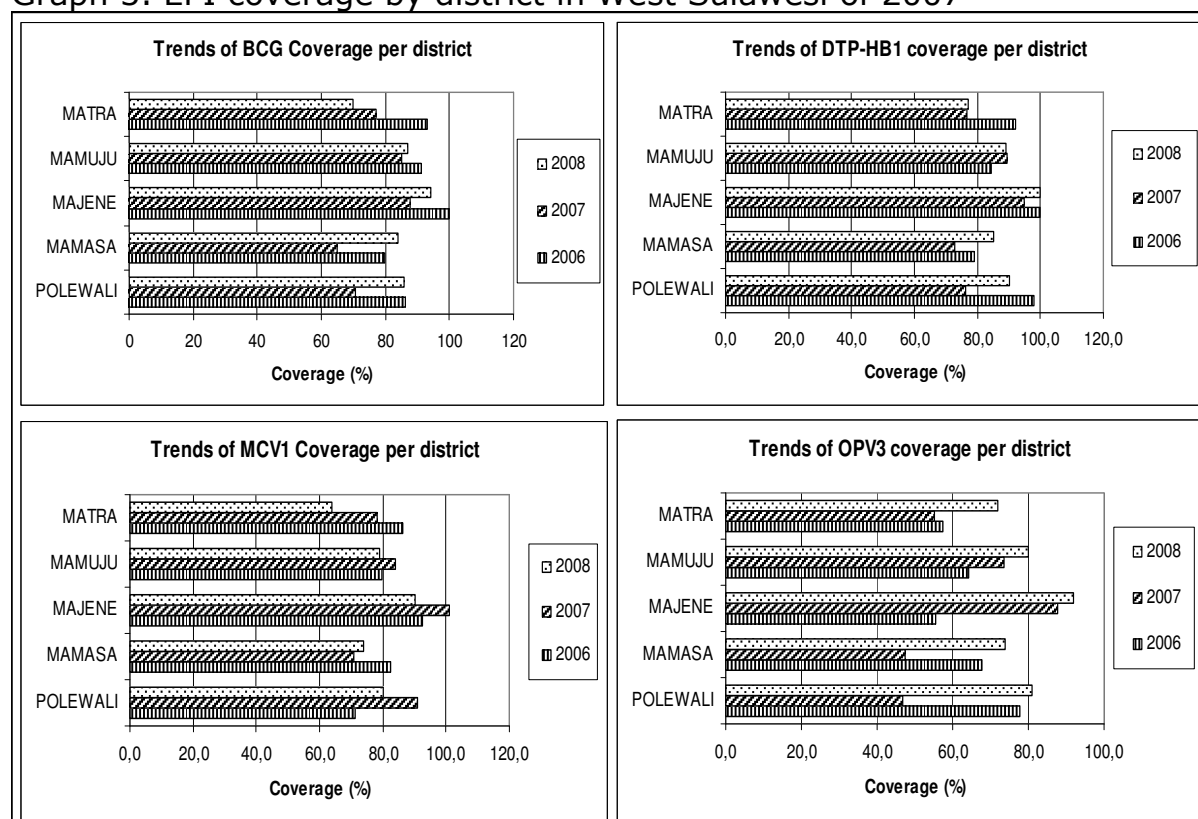
and Sub Directorate of Immunization in the Ministry of Health (MOH, 2008a). According to the WHO/UNICEF Joint Reporting Form, coverage of 2 or more doses of TT (TT2+) in pregnant women for 2006, 2007 and 2008 was 60%, 60% and 72% respectively (WHO, 2009a).

However, data presented above did not include data from private sector. Hospital and private clinics also provide EPI services, but there is no line reporting system of EPI from public hospital to district health office. The MOH set EPI information system in which it is compulsory for *Posyandu* and hospital to send the EPI report to *Puskesmas*. The *Puskesmas* compiles all the data and send it to the DHO, PHO and then to the MOH (MOH, 2005). See annex 2. However, there is still no clear reporting system to include the private sector.

3.2. Current situation of EPI in West Sulawesi Province

West Sulawesi is implementing basic immunization program services according to the national guidelines. Based on the EPI Coverage Evaluation Survey 2007/2008, total coverage of BCG, DTP-HB1, OPV3 and measles in 2007 was still below the national targets. This survey reported the immunization coverage of BCG, DPT-HB1, OPV3 and measles (MCV1) 86.1%, 82.7%, 72.1% and 73.2% respectively (MOH, 2008d).

Graph 3. EPI coverage by district in West Sulawesi of 2007



Source: (PHO, 2007; PHO, 2008a; PHO, 2009)

According to the graph 3 above, it is observed that in the period of 2006-2008, Majene district recorded coverage closer to the target of 95% of BCG, 95% of DTP-HB1, 90% of OPV3 and 80% of MCV1. Other districts such as Mamasa, Mamuju, Polman and Mamuju utara were below the standard (PHO, 2007; PHO, 2008a; PHO, 2009). In 2007, coverage of MCV1 was reported higher than other antigens in Majene and Polman districts. This was because this antigen was registered in the same time of measles campaign, resulting confusion on the report whether to be reflected on routine report or campaign report (PHO, 2008b).

Measuring DPT3 and measles (MCV1) coverage against DPT1 are useful indicators for utilization of immunization services. These indicators are also referred to as drop outs. Maximum tolerance for drop out of DPT1 to DPT3 and DPT1 to MCV1 was 10% (MOH, 2006). The percentage of drop out from routine report is slightly high compared to EPI Coverage and Evaluation Survey 2007/2008. In 2007, the provincial health office of West Sulawesi reported 17% drop out DPT1 to DPT3 compared to 13.5% and drop out DPT1 to measles was 9.5% compared to 11% (MOH, 2008d; PHO, 2008b). Under reporting, over reporting and inappropriate denominator at each district could be the reason for these differences as it was found through supportive supervision (PHO, 2008b).

Chapter 4: Government strategies to improve EPI coverage

Indonesia is one of the countries with a comprehensive Multi Year Planning (cMYP) to run national EPI. The strategic comprehensive multi year plan for National Immunization Program (NIP) of Indonesia has been developed for 2007-2011. The plan was developed based on the Global Immunization Vision and Strategy (GIVS) and is in line with the strategic plan of the MOH; its vision and mission, and four strategic pillars. This plan is also correlated to the GAVI goals of 2006-2011 (MOH, 2006c). The goal and objectives of the Indonesia cMYP were focused on the priority targets of:

1. To achieve coverage of 80% village with UCI by the year of 2010.
2. To achieve coverage 80% HBV one dose at birth by the year of 2010.
3. To provide combination vaccine of DPT-HB for DPT (1, 2, 3) and HB in 2007.
4. To develop waste management policy in 2008 and ensure its implementation accordingly, by the year of 2010.
5. To achieve coverage of 95% measles for children at school age (second opportunities).
6. To maintain 100% the use of Auto Disable Syringes (ADS).
7. To eradicate polio by the year of 2010.
8. To eliminate MNT by the year of 2010 (incidence rate <1 per 1000 live births in all districts).
9. To reduce annual death of measles by 90% in 2010.
10. To introduce japanese encephalitis vaccines in 2009, Hib vaccines in 2010 and pneumococcal vaccines in 2011 in selective areas.

As EPI is a vertical program, provincial and district follow the guideline and policy from the MOH on the implementation of EPI. The strategies that the MOH put in place were:

4.1. Accessibility.

Accessibility to immunization services needs to be expanded to increase immunization coverage. To improve access to EPI services, delivery sites for vaccination are not only through static sites but also outreach sites (MOH, 2005).

At static sites, EPI services are provided at health centre (*Puskesmas*). To improve geographical accessibility of the health centres, the average distance of 5 km between beneficiaries home from the health centre was accepted as standard, and each health facility serves to a 6000 population (MOH, 2006e). One sub district should have one *Puskesmas*. The MOH

also set one outreach services (*Posyandu*) should serve at least 100 children less than five years old per month (Shield, L & Hartati ,L.E, 2006).

The role of outreach services is becoming important because it is community based. The MOH requires the *Puskesmas* to provide monthly outreach service through *Posyandu*. This helps the program, to reach more eligible children to be vaccinated (MOH, 2006a). *Posyandu* makes the EPI services more accessible particularly for those who are poor and who live in rural and remote areas (MOH, 2006e).

4.2. Availability of human resources and material

Insufficient number of health workforce is still a national problem. However, health services should be provided. For immunization program, it is stated that there should be one person who is responsible for managing EPI at *Puskesmas* level (MOH, 2005). The responsibility is data management, management of vaccines and supplies, and program planning (MOH, 2005). To tackle this problem, local government and the MOH employed temporary staff for remote areas. The MOH and the local governments recruit nurses and midwives who can provide immunization services (MOH, 2008a).

Availability of funding for immunization program is affected by implementation of decentralization. The central government is only responsible for regulation of national EPI, development of guidelines, technical assistance, monitoring and evaluation, quality control and training, supplementary immunization activities, and procurement of vaccines and syringes. It does not include operational and handling costs. The local governments now take the responsibility to fund the handling and operational costs (MOH, 2005). In order to ensure sustainability of funds, the MOH suggests the DHOs to advocate for the programme specially advocacy to other stakeholders particularly to district parliaments (MOH, 2007c).

To ensure the availability of vaccines and supplies at national level, the central government financed 86% of all spending on routine vaccines in 2006, which was increased to 92% in 2007 (WHO, 2009). Then to assure the availability of vaccine and supplies at provincial, district and *Puskesmas* level, the MOH set a mechanism on vaccines and supplies management. The rule on when and how to request vaccines and supplies was in place (MOH, 2005).

4.3. Organizational quality

- Conduct training on Mid Level of Management (MLM) and Basic Health Care Workers (BHCWs).

It is indicated that all EPI staff at MLM and at operational level should be sufficiently trained (MOH, 2005). Therefore, the Performance Needs Assessment (PNA) was conducted to determine the training needs. It was reported that low level of knowledge and inadequate experience on the cold chain management, injection safety, data management, and planning was common among staff at the mid level management and basic health care workers. In 2006 training for MLM and BHCWs aiming to improve EPI performance was conducted in all provinces. The MOH expected that provincial and district management could sustain the training or refresher trainings, so that the newly employed staff could be trained and the previous staff refresh their knowledge and skills (MOH, 2006b).

- Strengthen use of micro planning

Micro planning is a detailed plan of EPI services at *Puskesmas* level. Vaccine and supplies can be calculated against the targets in order to avoid unnecessary extra or inadequate amounts of vaccines and supplies during outreach services (MOH, 2006b). Lack of vaccines was found as one of the reasons for missed opportunities and high drop out (MOH, 2008c). Therefore, the MOH put micro plan as a guide for *Puskesmas*, on conducting immunization services, and requires them to use it (MOH, 2006b).

- Revitalize the use of Local Area Monitoring (LAM)

LAM is a management tool that has been developed in Indonesia in 1985 to increase vaccination coverage and more recently to improve the quality of vaccination services (The MOH, 2007c). Principally, through LAM, existing data (immunization coverage per antigen at village levels) were analyzed against targets, time, and area (village) for monitoring. This analysis result is visualized by graph. So trends of achievement such as up and down coverage at village level are easily detected in order to prioritize areas which are requiring follow up activities such as sweeping activities (MOH, 2007c; Weeks M, 2008). See annex 3.

Since LAM has been introduced, the routine immunization coverage at *Puskesmas* levels was high due to strong participation of all sectors to increase EPI coverage, but it decreased slowly in all provinces after the implementation of decentralization (MOH, 2007c).

Millennium Challenge Corporation- Immunization Project (MCC-IP) project in 7 provinces suggested that through revitalizing the use of LAM, the coverage of DPT3 and measles at *Puskesmas* level increased (USAID, 2008). Therefore, the MOH (2008) revitalized the concept of LAM.

- Institutionalize the use of Supportive supervision

Concept of supportive supervision was included into immunization program aiming to improve EPI coverage evenly and continuously. It is also aimed to improve performance of EPI staff including managerial and technical competency. This concept was introduced in 2007 (MOH, 2006a).

Supportive supervision offers better performance by strengthening communication (two way communication), focusing on problem solving (offers alternative solving), facilitating teamwork, providing leadership and support to empower health providers to monitor and improve their own performance. This concept provides follow up system, whereby supervision is continuously done (Clements CJ et al, 2007; Marquez L & Kean L, 2002). Specifically, this concept aimed to identify problems and to solve the problems at each level of administration. In addition, supportive supervision was intentionally introduced to strengthen existing local area monitoring and the use of micro planning at district and health centre levels (MOH, 2006a). The role of supportive supervision is important because it is an opportunity to do on the job training (PATH, 2007).

4.4. Social accountability

Social accountability can not be neglected. Role of various stakeholders such as community leaders, heads of sub districts, and health volunteers is important to achieve the target (MOH, 2006b). As community participation drives to better performance of program (Garfield R, 1999), the government embrace various stakeholders to involve in EPI programme through intersectoral evaluation meeting in sub district levels. The aim of this meeting is to engage the stakeholders to support the programme and increase the ownership of health activities (MOH, 2007c). The role of health volunteers in *Posyandu* has been emphasized in the improvement of health programmes (MOH, 2006b).

4.5. Utilization

The MOH has accepted 95% coverage of DTP-HB1 as the indicator of utilization for infant, 100% coverage of DT for children at school age, and 80% TT1 for pregnant women vaccinations (MOH, 2005). To increase utilization of EPI, the government established some strategies. Besides improving access to health facilities, and increasing number of staff, the

government is committed to improve communities' knowledge on immunization. Health information and education are broadcasted through television and radio. Posters of EPI are available at health facilities, so people can read the information. For better information and education of EPI in the field, the government in cooperation with United Nation Children' Fund (UNICEF) trained health volunteers of *Posyandu* (*Kader Posyandu*) to get basic information on maternal and child health, since EPI was integrated to maternal and child health programme (MOH, 2008).

4.6. Timing and continuity

Immunization services are available during working days for 8 hours a day, at static sites. The outreach services are usually provided for 3 hours per month at the *Posyandu*. For continuation of vaccination series, the health providers are required to provide clear information on the next vaccination schedule and the vaccines that the children need in the next visit to the children's mothers. In the areas with high drop out and missed opportunities, it is required to conduct sweeping activities (MOH, 2005). Realizing that not all districts provide budget for sweeping activities, the MOH emphasized the importance of sweeping and in collaboration with Global Alliance for Vaccine and Immunization (GAVI) finance the sweeping activities for some years.

4.7. Technical quality

Cold chain system policy was in place to improve vaccine quality. Daily monitoring vaccine at provincial storage, district storage and *Puskemas* refrigerator is required to assure the vaccine in the appropriated temperature that preserves vaccine potency. At the outreach services, it is recommended to use cool packs rather than cold packs since it was found that using cold packs reduces vaccine potency for vaccines highly sensitive to freezing (WHO, 2006).

Safety issue which related to safety of injections and Adverse Events Following Immunization (AEFI) is a crucial issue to improve EPI. Activity work plan is available for injection safety and waste management where bundling system use is obligatory (use of auto disable syringes and safety box). The injection safety has been given a high importance, and this importance is no less than high immunization coverage. Injection safety, waste management and AEFI were put into the national EPI training curriculum (MOH, 2006).

Chapter 5: EPI coverage among districts in West Sulawesi

Using the PRSP approach, it was easy to analyse potential coverage (accessibility, availability of human resources and material, organizational quality, social accountability) as well as actual coverage. Target population were infants (0-11 months of age), children of school age at 1st to 3rd grade and women in childbearing age (15-39 years old) including pregnant women. Data were obtained based on the district health office (DHO) report of Mamuju, Majene, Mamasa, Polewali, and Mamuju Utara in 2007. Report from the regional supervisor for EPI was also used to triangulate the information.

5.1. Accessibility

Accessibility is referring to physical accessibility. Due to limited data, in this study accessibility was measured against the MOH policy of one Puskesmas per 6000 population, and one Posyandu per 100 children below five years of age.

Table 5. Coverage on accessibility in five districts

Dimension	Indicator	MOH Standard	District				
			Mamuju	Majene	Mamasa	Polewali	Mamuju Utara
Accessibility	Ratio Puskesmas per population	1:6000	1: 15,752	1: 17,358	1: 9,148	1: 18,764	1: 11.447
	Ratio Posyandu per children under five year of age	1:100	1: 120	1: 130	1: 75	1: 110	1: 80
	Public transportation	Available	Limited	Available	Limited	Available	Limited

Source: DHO of Mamuju, 2008; DHO of Majene, 2008; DHO of Mamasa, 2008, DHO of Mamuju Utara 2008, Krisnawan IB, 2008.

According to table 1, *Puskesmas* ratio per population was lower than the MOH standard of all districts, particularly in Polewali district where *Puskesmas* ratio per population was 1 per 18,674.

Although *Posyandu* ratio per children under five year of age was around the standard of the MOH in Mamasa, Mamuju and Mamuju Utara, but the communities had limited access to public transportation. In contrast, in Majene and Polewali *Posyandu* ratio per population was higher than the standard and in the mean time public transportation was available that facilitate easy access of mothers to health services.

5.2. Availability of human resources and material

To provide EPI services, availability of required resources are essential to ensure the implementation of services. Availability of staff to manage immunization program needs to be addressed. Availability of vaccines and supplies, sufficient funds for operational costs (transportation cost, refrigerator maintenance) are also important to be addressed.

Table 6. Coverage on availability of human resources and material in five districts

Dimension	Indicator	MOH Standard	District				
			Mamuju	Majene	Mamasa	Polewali	Mamuju Utara
Availability of human resources and material	Availability of EPI staff per Puskesmas	Yes	Yes	Yes	Yes	Yes	Yes
	Stock out of Vaccines and supplies	No	Sometimes	No	Sometimes	Sometimes	Sometimes
	Availability of budget for operational cost	Yes	No	Yes	No	No	No
	Proportion of Puskesmas with refrigerator	100%	60%	100%	47%	89%	56%

Source: DHO of Mamuju, 2008; DHO of Majene, 2008; DHO of Mamasa, 2008, DHO of Mamuju Utara 2008, Krisnawan IB, 2008.

Availability of Human resources

According to the national EPI guidelines each *Puskesmas* should have one person responsible for the EPI programme. Data showed that EPI staff was available at each *Puskemas* on all districts but most of the staff had other responsibilities (maternal health, child health, malaria and etc) in the health facility along with EPI programme.

Availability of material

Stock out of some vaccines was observed in Mamuju, Mamasa, Mamuju Utara and Polewali. According to the report of regional supervisor for EPI, stock out of BCG and its diluents was found in some *Puskemas* in Mamuju, Mamuju Utara and Mamasa during period of April to July 2007. Stock out of measles and polio vaccines were also found in Mamasa and Polewali district. However, stock out of supplies such as syringes and safety box were not reported.

To keep vaccines inside the recommended temperature, availability of refrigerator is needed. However, data showed that some *Puskesmas* did not have refrigerators. It was found that only in Majene district where 100% of *Puskesmas* had refrigerators.

Availability of budget for operational programme is an important factor to conduct outreach services and maintenance of refrigerators. However, of the 5 districts in West Sulawesi, only District Health Office (DHO) of Majene provided specific budget for outreach services. Other DHOs such Mamuju, Mamuju Utara, Mamasa and Polewali did not provide specific budget, and declared it *Puskesmas*' responsibility.

5.3. Organizational quality

Organizational quality is related to the management of services. This study focuses on the number of EPI training conducted in the last 3 years, use of micro plan on EPI services, availability of supportive supervision and the use of local area monitoring.

Table 7. Coverage on organizational quality in five districts

Dimension	Indicator	MOH Standard	District				
			Mamuju	Majene	Mamasa	Polewali	Mamuju Utara
Organizational quality	Availability of supportive supervision to Puskesmas	Yes	No	Yes	No	No	No
	Number of training conducted in the last 3 years	3	1	3	1	1	1
	Proportion of Puskesmas using micro planning	100%	80%	100%	73%	86%	78%
	Proportion of Puskesmas using LAM	100%	56%	100%	60%	70%	78%

Source: DHO of Mamuju, 2008; DHO of Majene, 2008; DHO of Mamasa, 2008, DHO of Mamuju Utara 2008, Krisnawan IB, 2008.

Upgrading the technical and managerial knowledge of staff at BWHC is an important issue and it is done at least once in a year. The training is conducted by DHO (MOH, 2005). It was documented that in the last 3 years, DHO of Majene conducted three EPI trainings, in contrast in Mamuju, Mamasa, Polewali and Mamuju Utara, the EPI training was conducted only once despite that these districts have higher staff turnover and new recruitments.

Use of micro planning as a guidance to manage EPI services is required by national EPI guideline. It was found that in 4 districts some *Puskesmas* did not use micro plan.

Supportive supervision as a requirement to monitor the program activities in order to improve performance of EPI programme was not provided in four DHOs (Mamuju, Mamasa, Polewali, and Mamuju Utara). Since its introduction (supportive supervision) in 2006 only Majene district provided supportive supervision.

The use of LAM to monitor monthly coverage was not as strong as it was in 1985. Recently, it was found that only Majene district where 100% of *Puskesmas* still using LAM.

5.4. Social accountability

Social accountability is a concept where communities involve in all activities related the health programme. Concept of social accountability in this study was related to intersectoral meetings and involvement of health volunteers in EPI services.

Table 8. Coverage on social accountability in five districts

Dimension	Indicator	MOH Standard	District				
			Mamuju	Majene	Mamasa	Polewali	Mamuju Utara
Social accountability	Proportion of <i>Puskesmas</i> providing intersectoral meetings	100%	56%	100%	60%	73%	66%
	Proportion of <i>Puskesmas</i> involving health volunteers into EPI services	100%	100%	100%	100%	100%	100%

Source: DHO of Mamuju, 2008; DHO of Majene, 2008; DHO of Mamasa, 2008, DHO of Mamuju Utara 2008, Krisnawan IB, 2008.

Concept of social accountability was in place since introduction of LAM. Stakeholders such as sub district leaders, community leaders and health volunteers participated in the intersectoral meetings. There is a link between utilization of LAM and conducting intersectoral meetings. Data showed that in Majene district where all *Puskesmas* still use LAM, intersectoral meetings were also held.

The *Pukesmas* in all districts authorized the health volunteers to help the staff to manage their activities such as finding missed opportunities. Data

showed that all *Puskesmas* in each district involved the health volunteers to help them managing *Posyandu*.

5.5. Utilization

Utilization of EPI was defined as the coverage of DPT1 for infant vaccination, TT1 for pregnant women vaccination and DT for children at school age (MOH, 2006).

Table 9. Coverage on utilization in five districts

Dimension	Indicator	MOH Standard	District				
			Mamuju	Majene	Mamasa	Polewali	Mamuju Utara
Utilization	Initial contact for infant (DPT-HB1)	95%	87%	95%	71%	77%	85%
	Initial contact for pregnant women (TT1)	80%	56%	79%	38%	57%	62%
	Initial contact for children at school age	100%	60%	99%	20%	78%	86%

Source: DHO of Mamuju, 2008; DHO of Majene, 2008; DHO of Mamasa, 2008, DHO of Mamuju Utara 2008, Krisnawan IB, 2008.

It is globally agreed that DPT-HB1 is an indicator for initial contact of EPI services. Data showed that coverage of DPT1 which has been combined with HB1 (DPT-HB1) was still below the target of 95% in all districts, except in Majene district with a coverage of 95% for DPT-HB1.

Since Indonesia provides vaccination for children at school age, DT coverage in school students who are in their first year of school has been accepted as indicator for initial contact. Majene district achieved 99% DT coverage, while DT coverage in Mamasa was reported only to 20%.

To prevent maternal neonatal tetanus (MNT), pregnant women are required to receive TT2+ vaccination. TT1 coverage is the indicator for initial contact in pregnant women. The reports indicated that TT1 coverage for all districts was lower than 80%. In Majene the coverage was reported 79% followed by Mamuju Utara (62%), Polewali (57%), Mamuju (56%), and Mamasa (38%). This low coverage put Polewali, Mamuju and Mamasa at high risk of MNT.

5.6. Timing and continuity

Timing EPI was defined as duration of services, while continuity was regarded as outreach services and sweeping activities.

Table 10. Coverage on timing and continuity in five districts

Dimension	Indicator	MOH Standard	District				
			Mamuju	Majene	Mamasa	Polewali	Mamuju Utara
Timing and continuity	Duration of services	8 hours	3 hours	3 hours	3 hours	3 hours	3 hours
	Proportion of Posyandu that provide EPI services monthly based	100%	80%	100%	70%	90%	86%
	Proportion of village got sweeping activities	100%	30%	100%	30%	30%	30%

Source: DHO of Mamuju, 2008; DHO of Majene, 2008; DHO of Mamasa, 2008, DHO of Mamuju Utara 2008, Krisnawan IB, 2008.

EPI services are free of charge as a part of basic package of health services at *Puskesmas*. Data showed that EPI services are provided only for 3 hours in a working day.

Outreach services increase accessibility to EPI services, however, some *Puskesmas* are not able to provide monthly based EPI service through *Posyandus*. Data showed that in Majene 100% of *Posyandus* have provided monthly based EPI services, while in Polewali 90%, in Mamuju Utara 86%, in Mamuju 80% and in Mamasa 70% of *Posyandus* have provided monthly based EPI services.

In order to reach missed opportunities follow up activities such as sweeping are needed. Though almost all districts had high drop outs and missed opportunities, only Majene district has conducted sweeping activities which covered 80% of the villages while the rest of the districts covered only 30% of villages through sweeping activities.

5.7. Technical quality

Activities such as recapping of syringes after use, use of cool pack, daily monitoring of refrigerator temperature, management of waste are factors which determine technical quality.

Table 11. Coverage on organizational quality in five districts

Dimension	Indicator	MOH Standard	District				
			Mamuju	Majene	Mamasa	Polewali	Mamuju Utara
Technical quality	Proportion of Puskesmas practicing syringe recapping	0%	55%	12%	60%	30%	44%
	Proportion of Puskesmas doing daily temperature monitoring	100%	60%	100%	33%	65%	33%
	Proportion of Puskesmas implementing waste management	100%	89%	100%	80%	90%	89%

Source: Krisnawan IB, 2008.

It was observed by the regional supervisor for EPI that syringe recapping was still practiced by the staff at all *Puskesmas* in each district. It was reported that only 12 % *Puskesmas* in Majene still practicing syringe recapping.

Waste management system was in place in 100% of *Puskesmas* in Majene while in Polewali 90%, in Mamuju Utara 89%, in Mamuju 89% and Mamasa 80% of *Puskesmas* had functional waste management system.

In order to preserve vaccines, daily temperature monitoring is needed. In Majene district 100% of *Puskesmas* were doing the daily monitoring of refrigerators temperature.

Chapter 6: Discussion, Conclusion and Recommendation

In order to identify and analyze the barriers in reaching the EPI targets, reviewing EPI coverage is important. In this chapter I have made use of PRSP matrix in order to identify barriers toward achieving EPI targets in West Sulawesi and provide feasible and concrete recommendations.

6.1. Increasing the number of Puskesmas to improve access to EPI services

It was mentioned before that accessibility is defined as travel distance of the clients to health facilities and travel time to reach health facilities. A maximum distance of 5 km or 1 hour travel time is recommended by the WHO (2001). The MOH has adopted this standard and takes it into consideration while planning to build new health facilities. However, there is no data available to estimate the proportion of population living in 5 km distance or in hour travel time from the health facilities. Ratio of health centres per population is also an appropriated measurement for accessibility (MOH, 2001). Although the MOH set a standard that one *Puskesmas* should cover 6000 populations, but in West Sulawesi *Puskesmas* in all districts, serving to more than 6000 population. It implies that each *Puskesmas* has high workload compare to the limited resources available. *Puskesmas* are located in the capital cities of sub districts. However, each sub district has wider distance with dispersed population (PHO, 2008b). Therefore, the *Puskesmas* are not able to ensure optimal coverage and the communities can not reach to *Puskesmas*.

According to the above mentioned facts, accessibility to EPI services is poor in Mamuju, Mamasa and Mamuju Utara compared to Majene and Polewali. Geographical constraints and high costs of transportations were found the major barriers for the poor to reach health services.

Geographical barrier is one of the main barriers of immunization program in West Sulawesi, particularly in three districts (Mamasa, Mamuju and Mamuju utara). Most of its areas are mountainous with poor infrastructure and limited means of transportation. Majene and Polewali districts are more developed with permanent road and available of public transportations (PHO, 2008). Hence, in the mentioned districts, mothers can easily access health facilities. Distance from home to health services affects the likelihood of children to get immunized. A cross sectional survey in Central Sulawesi found that the likelihood of immunization for the children living far from the health facilities and have less access to transportation is very low (Syamsuddin HM, et al, 2007). Similar to that,

a study in Nepal found that access to health service was significant predictors of child immunization (Bandhari P, 2007). Furthermore, IDHS documented more children vaccinated with BCG in urban than in rural, the coverage was 90% in urban and 74% in rural areas (Statistic of Indonesia et al, 2007), which indicated the effects of geographical accessibility to low vaccination coverage.

All 5 districts of West Sulawesi are underdeveloped (MOADOUA, 2005). Poor infrastructures and limited public transportation are major problems in West Sulawesi, that leads to high transportation costs in Mamuju, Mamasa and Mamuju Utara (Rahim R, 2007). About 12% of people in West Sulawesi live under poverty line (Statistic of Indonesia, 2007). It may affect children in low socio-economic status to have their vaccinations (PHO, 2007). Mother should pay rental motorbike for Rp. 30,000 per one trip (DHO of Mamuju, 2007; DHO of Mamasa, 2007). IDHS 2007 documented 75% of children in the highest wealth quintile have completely vaccinated compared to 34% of children in lowest wealth quintile (Statistic of Indonesia et al, 2007). Smith and Singleton (2008) summarized that poverty was correlated to low county-level vaccination coverage. Therefore, the MOH emphasized outreach services as the strategy to overcome geographical barrier and make EPI services more accessible (MOH, 2006b).

Conclusion

Accessibility to health services was low in some districts and the ratio *Puskesmas* per population was lower than the standard of the MOH, Which implies that *Puskesmas* covers bigger population within wider distance. Although ratio of *Posyandu* per children was in line with the standard, geographical and financial barriers continued to affect the results of low EPI coverage.

Recommendation

1. DHO should conduct a detailed assessment to select the site for building new *Puskesmas*.
2. Due to implementation of decentralization, DHO should advocate to local governments and parliament to establish new *Puskesmas* as it is indicated in MOH policy that one *Puskesmas* should serve to a population of 6000.

6.2. Increasing number of staff and funds for EPI

It is indicated in the GAVI board meeting that human resources in terms of quantity and capacity are "a major barrier" in improving immunization

coverage (GAVI, 2003). Indonesia has increased human resources on health through massive program of village midwife (MOH, 2008a), however, Indonesia employs health workers that their duties are multi purpose (Fauveau v, et al, 2008). EPI staff is not only responsible for EPI but also other programs such mother and child health (PHO, 2007). Besides doing technical activities such as vaccination and monitoring vaccine, the EPI staff should also manage the program. Though the *Puskesmas* have their EPI staff but due to the above mentioned side responsibilities, they can not manage the EPI programme. This has a negative influence on performance of immunization program (PHO, 2008). However, Anand S & Barnighausen T (2007) found that health workers density (particularly nurses and midwives) was significantly associated with coverage of MCV ($p=0.0024$), DPT3 ($p=0.0004$) and OPV3 ($p=0.0083$).

After decentralization was started in 2001, EPI as vertical program has been facing low political support. Theoretically, in decentralization the decision making authority is transferred to the community in order to better identify and prioritize local health needs. However, this is not the case in Indonesia as Tabrany pointed out that public health programs are not prioritized by the local governments (Thabrany H, 2006).

In 2002, the MOH and the heads of the districts (Bupati) made an agreement to allocate 15% of district's revenue to health sector, in order to prevent short fall of the health budget. However 15% budget allocation for health expenditure was not met by all districts (WHO, 2006b). It was documented that in 2007, health expenditure in 5 districts in West Sulawesi did not reach to 15% of district revenue (PHO, 2008). Contrary to West Sulawesi Khalegian found a positive association between decentralization and improved measles and DPT3 coverage in low-middle income countries (Khalegian, 2004). This study found decentralized countries have additional 8.5 percent coverage of measles and DTP3 than centralized ones (Khalegian, 2004).

Although there is guidance to spent 15% on health, but within health itself there is no clear cut guidance on how to allocate the budget. As a result immunization program is not prioritized and this led to allocation budget for EPI to be lower and varied amongst districts. In 2007, Majene's reported allocated budget for EPI was 5%, followed by Mamuju Utara (2.5%), Polewali (2%), Mamuju and Mamasa (1%) (PHO, 2008b). Handling cost of vaccines and supplies, outreach service cost and maintenance were sometimes not prioritized. As a result, stock out of some antigens happened due to absence of handling cost (PHO, 2008) (see matrix 1). The absence of refrigerator in some *Puskesmas* was due to inadequate of maintenance cost. It was reported that refrigerators were not available for some reasons. First, there was insufficient

maintenance cost, so the refrigerators run out of service. Second, some *Puskesmas* did not have refrigerator from the beginning and no budget was allocated to purchase new refrigerators (PHO, 2007).

Conclusion

Availability of human resources and materials on EPI was a problem in most of the districts as a result of inadequate support from the local governments and MOH. Providing sufficient number of staff in order to reduce staff's workload is necessary for better performance of EPI programme. Absence of clear cut guidance on budget allocation on health and what proportion to be used on EPI is a major problem and cause insufficient allocation for EPI.

Recommendation

1. MOH and Local government should increase number of temporary staff to reduce staff's workload.
2. MOH should provide clear guidance of spending on EPI program
3. DHO should strengthen advocacy to local governments and parliament to invest on health particularly on EPI.
4. Local governments should keep their promise to spend 15% on health.
5. DHO should routinely conduct vaccine monitoring to prevent vaccine stock out.

6.3. Improving components related to organizational quality

In this study, organizational quality is related to training, use of micro planning, availability of supportive supervision, and the use of local area monitoring. It varied among districts in West Sulawesi. Data shows that organizational quality is higher in Majene than other districts.

To upgrade knowledge and skills of staff, the MOH recommended, staff trainings including refresher trainings on EPI annually (MOH, 2007c). Only Majene has conducted trainings annually in the past three years, therefore the other districts needs conduct the training annually. Most of the staff complained that they are not supported with sufficient managerial and technical skills. A literature review indicates that training is cost effective to increase immunization coverage (Pegurri E et al, 2005). However, conducting training depends heavily on the budget support and trainers' skills and competency (MOH, 2007c).

The use of micro planning in EPI services is required at the *Puskesmas* level. The importance of micro planning for service delivery has been

proved effective (MOH, 2005). However, data showed that some *Puskesmas* did not use it. It is believed that lack of skills to develop micro plan and low motivation of the staff in Mamasa, and Mamuju were the main reason for not using micro plan (Krisnawan, 2008).

Supportive supervision is considerably important to facilitate capacity building particularly for new districts with scarce resources. Improvement of EPI performance in the 7 provinces has been shown since the introduction of supportive supervision in 2007. For example, an evaluation in Banda Aceh showed that supportive supervision was significantly associated with better performance of EPI. Overall, 75% of districts have implemented cold chain procedures properly after 4 supportive supervision visits ((PATH, 2008). Although supportive supervision provision is a requirement in all five districts, only Majene has institutionalized and operationalized this concept by addressing it into the district annual plan. Concept of supportive supervision might not be understandable in some districts. Some heads of DHO thought that concept of supportive supervision is the same with traditional concept of supervision which is not very helpful to improve the program performance (Krisnawan IB, 2008). This implies that the concept of supportive supervision should be promoted up to the level of head of DHO.

It is proven that use of LAM increased immunization coverage (MOH, 2007c). However, there is degradation on the use of LAM. Until now in Indonesia more than half of *Puskesmas* reportedly still use LAM from which around three quarters of *Puskesmas* are in West Sulawesi. However, the quality and reliability of LAM data is not known (Weeks M, 2008). Some reasons for low use of LAM have been identified. Firstly, too many graphs are being drawn from the results and they need monthly updating, which is not always practical staff. Secondly, lack of attention to keep up LAM from both the MOH and local governments contributed to neglecting LAM. Both the MOH and local governments did not give feedbacks to support the LAM. Thirdly, there is no structure for maintaining and updating the LAM. The participatory process by which LAM was developed has diminished. And fourthly, the MOH budget is apparently decreasing, thus forecasting the reduction of staffing and allocation of less money for supervision programmes such as LAM (Weeks, 2008). Having identified these reasons, thus the MOH revitalized the use of LAM. However, it needs strong commitment from the MOH itself, PHO, DHO, *Puskesmas* and local governments.

Conclusion

Organizational quality heavily affects the achieving of high immunization coverage. However, organizational quality of EPI which is including sufficient training, use of micro planning and LAM at *Puskesmas* level, and availability of supportive supervision to strengthen use of micro plan and LAM was below the MOH standard. Yearly training is needed to upgrade the knowledge and skills of staff. The use of micro plan and LAM are needed to be promoted through supportive supervision. Therefore, supportive supervision should be institutionalized in DHOs.

Recommendation

1. DHO should provide yearly training of EPI to update skills of staff.
2. MOH should improve promotion of supportive supervision in order to improve institutionalization of supportive supervision at DHO.
3. DHO should improve advocacy to local government to increase budget of EPI training.
4. DHO should institutionalize supportive supervision into district annual plan.
5. PHO should assist the DHOs on conducting supportive supervision.
6. PHO, DHO and local governments should be more proactive to support revitalization of LAM by providing funds and feedback for LAM.

6.4. Increasing intersectoral meeting to improve social accountability

Basically, LAM is a management tool to improve EPI coverage; it is also a tool to provide community accountability. The analysed result of LAM is presented to the stakeholders in the intersectoral meetings (MOH, 2007c). However, lack of interest in LAM culture was followed by lack of interest to hold intersectoral meetings as well. A study in Tanzania shows that increasing community participation and local political environment would lead to increased EPI coverage (Semali IAJ et al, 2005). In addition, Garfield (1999) argued that it is important to involve all stakeholders in the planning process for better implementation and expected outcomes. Though 100% *Puskesmas* have involved health volunteers in the outreach services, support from stakeholders decreased due to the decline in advocacy through intersectoral meetings. It finally leads to low budget

allocation for EPI. Strong support and commitment from various stakeholders is needed through advocacy activities.

Conclusion

Social accountability is important to ensure stakeholders support for better EPI coverage. If the intersectoral meeting is not conducted, the importance of meeting for advocacy to stakeholders may diminish, and this will negatively affect EPI services. Suspension of intersectoral meetings follows neglecting use of LAM.

Recommendation

1. PHO and DHO should routinely monitor the intersectoral meeting held by *Puskesmas*.
2. DHO should strengthen the use of LAM at *Puskesmas* level in order to promote holding intersectoral meetings.

6.5. Increase outreach services and knowledge related to EPI to increase utilization

From PRPS analysis, utilization of EPI in 5 districts was low if compared to the indicators of the MOH. Various factors influence utilization of EPI ranging from demand and supply side factors. Demand side was influenced by geographical accessibility, unaffordable transportation costs, insufficient knowledge on EPI and low maternal education (USAID, 2003). Geographical barrier and unaffordable transportation costs were described in the previous section. EPI Coverage and Evaluation Survey 2007/2008 indicated that fear of side effects of vaccinations caused 11.7% of children to get partially immunized in West Sulawesi (MOH, 2008d). IDHS indicated significant association between maternal education and immunization status. Lower education leads to lower immunisation utilization (Statistic of Indonesia et al, 1997; 2000-2003; 2007). Ningrum (2006) found the positive correlation between high maternal education and fully immunized children in Boyolali district. However, a study in South Sulawesi indicated that educational levels and occupation were not associated with DPT3 coverage (Abbas M, 2001).

In the supply side, low utilization of EPI services is due to poor management of services (MOH, 2008c) and also some *Puskesmas* can not provide regular outreach services in areas with hard accessibility. Although EPI Coverage and Evaluation Survey 2007/2008 (MOH, 2008d) proves the important role of outreach services (75% children in West Sulawesi were vaccinated at *Posyandu*), but the budget for outreach services were inadequate in some districts. Inadequate budget for

outreach services hindered staff to provide vaccination at some *Posyandu* in hard to reach areas in a monthly based manner (PHO, 2008b).

Conclusion

Both supply and demand side factors contributed to low utilization of EPI services in West Sulawesi. Geographical barriers, unaffordable transportation cost and low knowledge of EPI led to low utilization. Inadequate budget for outreach services also contributed to low utilization of EPI.

Recommendation

1. PHO and DHO expand IEC on EPI through local TV and radio
2. MOH should create key messages guides that cater a non-literate population as well.
3. DHO should provide budget for outreach services as it is the most efficient strategy to increase immunization coverage.

6.6. Ensuring timing and continuity of services to increase immunization coverage

Timing for conducting EPI services should be scheduled on the working days. Service-related factors of supply side such as suitability of timing of immunization, service charge, waiting time, and motivation for subsequent immunization highly influence the attendance of immunization (Bosu WK, et al, 1997). Although EPI services are free of charge, percentage of partially immunized is high in West Sulawesi. Data showed that some *Posyandu* can not provide EPI services monthly, due to irregular presence of vaccinators. This leads to unclear schedules which make mothers not knowing whether the services are available or not. It also leads to the user's confusion in terms of type of vaccines for next visit (Krisnawan IB, 2008). Irregular schedules at several *Posyandus* in Central Sulawesi shows that irregular vaccination schedules in some *Posyandus* reduced the likelihood of children to get vaccinated (Syamsuddin HM, et al, 2007). A survey found that 15.5% partial immunizations in West Sulawesi were due to lack of information on subsequent immunizations, 2.7% because of inconvenient times and 11.7% because of vaccinators' absence (MOH, 2008d). Schedules of services including information on subsequent immunization need to be clear for mothers to prevent partial immunization.

To complete immunization series of children in eligible age, sweeping activities are recommended particularly in villages with high drop out and high missed opportunities. Sweeping activities is an effective strategy to

reach missed opportunities (MOH, 2005). However, from the five districts, only Majene district provided sweeping activities that covered 100% of the villages. According to the report, four districts could not cover 100% of the villages due to insufficient budget allocation for sweeping activities (PHO, 2008b).

Conclusion

Clear information about the need for subsequent immunization and regularity of schedule might prevent partial immunization. To reach partial immunized children in eligible age, sweeping activities are the most effective strategies to capture them. However, it was not provided for all villages.

Recommendation

1. Health workers need to be trained on communication skills; how to provide clear information and motivate mothers to come for subsequent immunization.
2. *Puskesmas* should have clear schedule for EPI particularly at *Posyandu*
3. *Puskesmas* should train health volunteers to provide basic information on EPI including schedule for services at *Posyandu*.
4. DHO should provide budget for sweeping activities to capture missed opportunity children and to reduce drop out particularly to reach children in remote villages.

6.7. Improving Injection safety and cold chain system in order to improve technical quality

Besides increasing coverage of EPI, increasing quality of services is also crucial aspects to be improved. Children should be immunized with potent vaccines and appropriate injections. Though there was no AEFI case reported, technical qualities including cold chain system and injection safety were practically poor in West Sulawesi particularly in Mamasa, Mamuju and Mamuju Utara districts. Cold chain system is a system that preserves the vaccines in an appropriate temperature (heat sensitive and freeze sensitive vaccines). The WHO (2006a), reports indicates that in some parts of the world though the staff had the knowledge on cold chain but they are not adhering to it. As provincial supervisor of EPI in West Sulawesi, the author observed that although the staff showed their knowledge on the importance of cold chain system including daily temperature monitor of refrigerator, they did not apply their knowledge. The regional supervisor for EPI indicated that low motivation and

inadequate temperature forms led staff to be inconsistent with protocols (Krisnawan IB, 2008). These were also reported by external observer from WHO and UNICEF during measles campaign (MOH, 2007d). Keeping vaccines not kept in appropriate recommended temperature reduces vaccine potency. Therefore, vaccines should be stored correctly to prevent more child deaths and to avoid more illnesses of vaccine preventable diseases (WHO, 2006a).

Injection safety is another issue of technical qualities such as syringe recapping and inappropriate technical injections. Although almost all EPI staff have been trained in injection safety, unsafe injection practices were observed in 5 districts of West Sulawesi. Safety boxes were provided in order to prevent syringe recapping, however, staff in some *Puskesmas* in all districts did not use it because it was practically difficult for the vaccinators to transport it to the *Posyandus* (Krisnawan IB, 2008). Health providers are at risk of needle-stick injuries and may be infected with blood borne diseases if they do not practice and observe injection safety protocols (Mantel C, et al, 2007). Unsafe practices of injections are responsible for the spread of new infections of hepatitis B virus (HBV), hepatitis C virus (HCV) and human immunodeficiency virus (HIV). It is indicated that each year, unsafe injection practices may cause 8-16 million Hepatitis B infections, 2.3 – 4.7 million hepatitis C infections and 80,000 – 160,000 HIV infections worldwide (Kane, 1999).

Conclusion

Technical issues such as cold chain system and injection safety is important as well as the high coverage to prevent more child death and to avoid more illnesses of VPDs. Safe injection practices and observing protocols protects health providers from blood borne diseases.

In spite of receiving training, in some districts staff did not observe injection safety protocols.

Recommendation

1. PHO and DHO should provide supportive supervision to motivate EPI staff to follow the guideline and together to find the root causes of the problem and its solution.
2. The use of safety boxes at delivery sites should be ensured by quarterly monitoring through DHO.

6.8 Overall barriers

Analysing the barriers toward implementation of EPI in West Sulawesi, inadequate support from the local governments to the EPI was identified as the root cause of low EPI coverage.

In order to achieve health program's targets, particularly immunization program targets, political commitment to support health programs is very essential. It implies that need for advocacy to health programs particularly EPI is very urgent, in order to content the decision makers to allocate 15% of GDP to health sector. In the same manner advocacy for EPI is very essential in order to content the authorities and decision makers within the health sector, to increase EPI budget. It will definitely contribute to the achievement of goals set in line with Health Indonesia by 2010, and MDG4.

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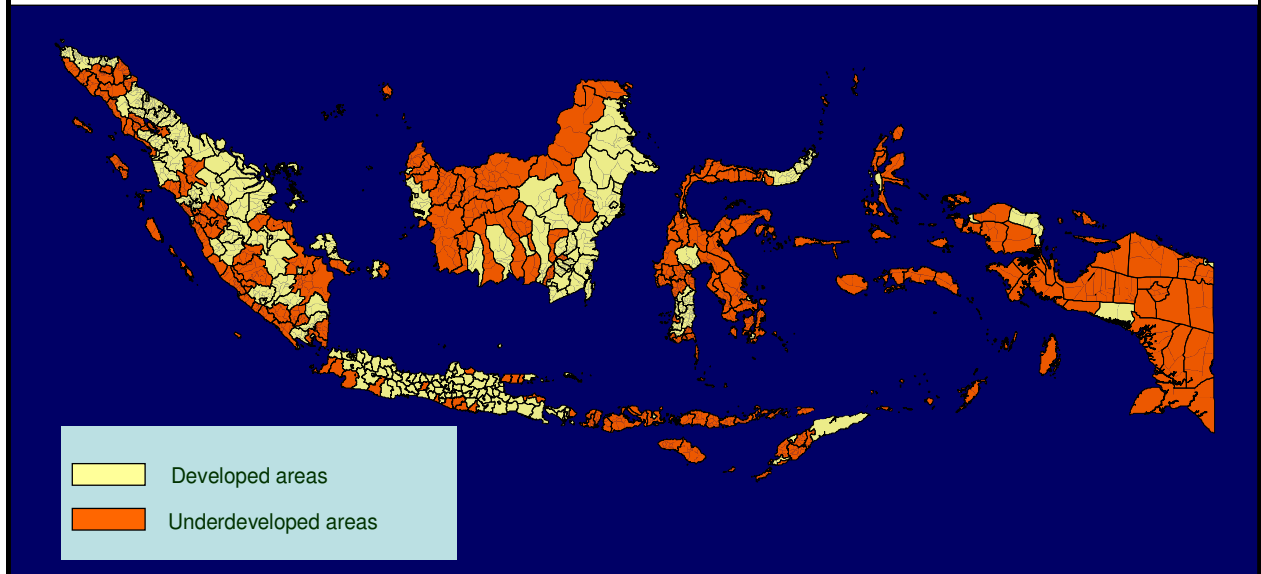
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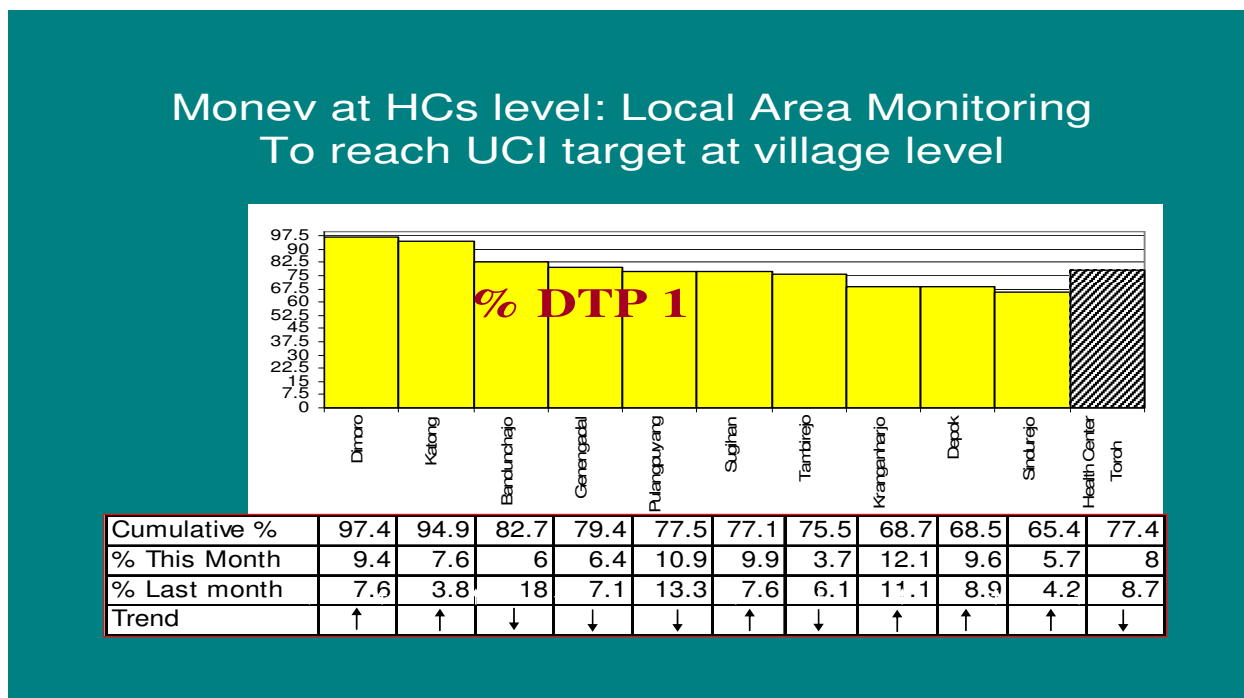
Annex 1. Location of underdeveloped districts in Indonesia

Map of Underdeveloped areas in Indonesia



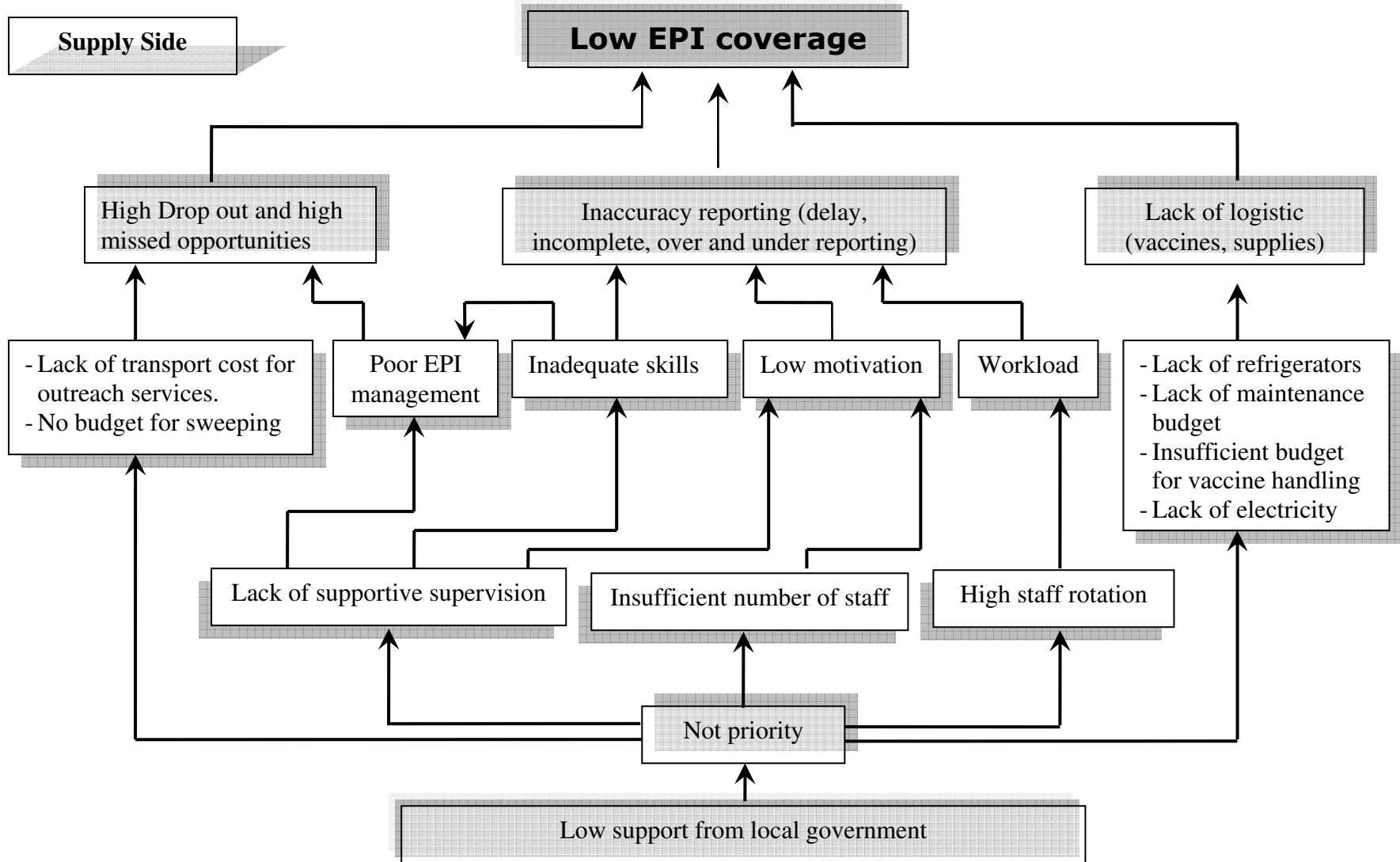
Source: The Ministry of Acceleration development of underdeveloped areas, 2005.

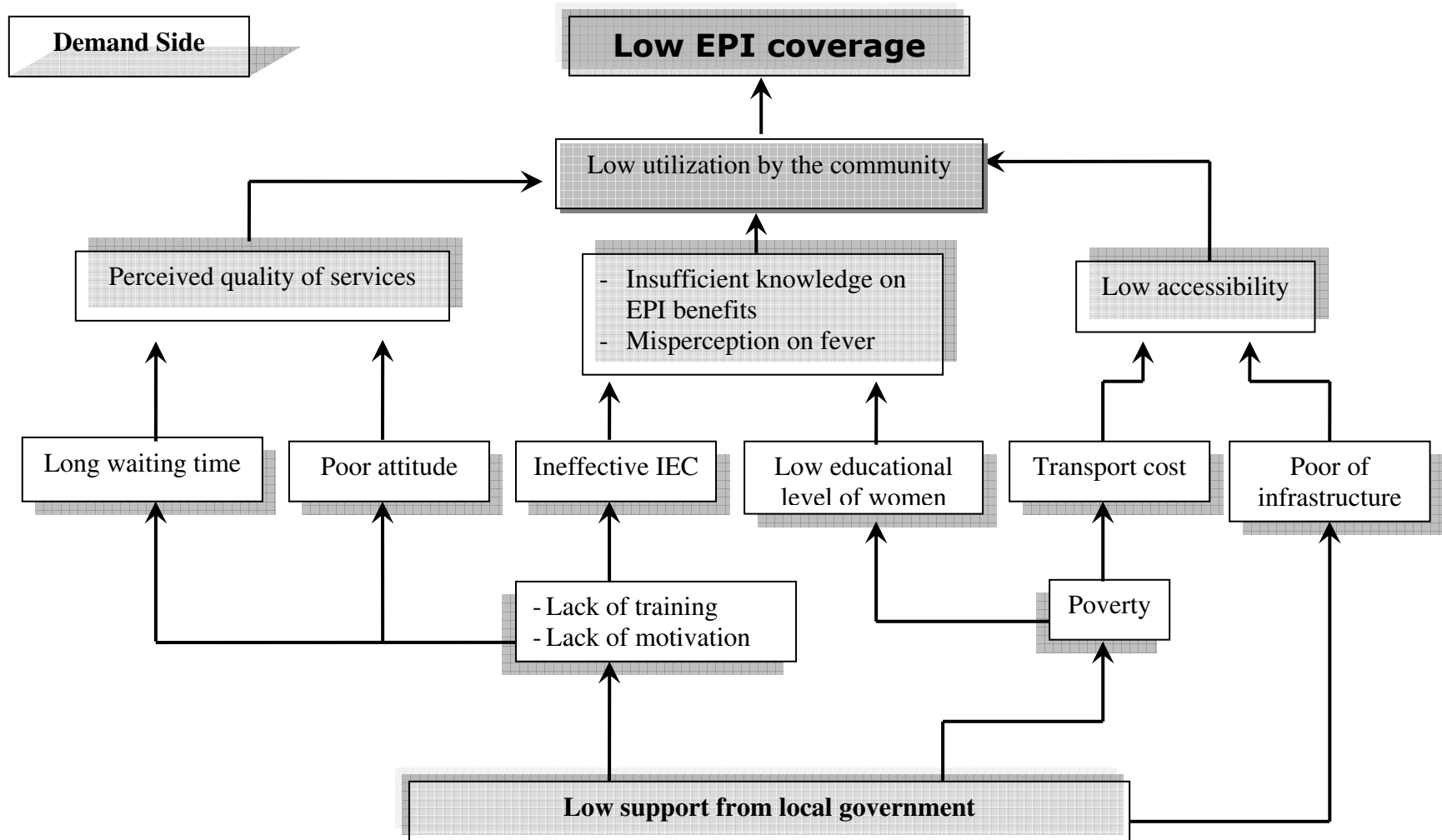
Annex 3. Example Graph of Local Area Monitoring



Source: the MOH, 2007.

Annex 4. Problem Tree





Annex 5. Summary table of PRPS framework

Framework	Indicator	Standard	District				
			Mamuju	Majene	Mamasa	Polewali	Mamuju Utara
Accessibility	<ul style="list-style-type: none"> Ratio Puskesmas per population. Ratio Posyandu per target Population. Public transportation. 	1:6000 1:100 Available	1: 15,752 1: 120 Limited	1: 17,358 1: 130 Available	1: 9,148 1: 75 Limited	1: 18,764 1: 110 Available	1: 11.447 1: 80 Limited
Availability of human resources and material	<ul style="list-style-type: none"> Availability of EPI staff per Puskesmas Stock out of vaccines and supplies Availability of Budget for operational cost Percentage of Puskesmas with refrigerator. 	Yes No Yes 100%	yes Sometimes No 60%	yes No Yes 100%	yes Sometimes No 47%	yes Sometimes No 89%	yes Sometimes No 56%
Organizational quality	<ul style="list-style-type: none"> Availability of supportive supervision to Puskesmas. Number of EPI training conducted in the last 3 years. Proportion of Puskesmas using micro plan to conduct EPI services. Proportion of Puskesmas using Local area monitoring. 	Yes 3 100% 100%	No 1 80% 56%	Yes 3 100% 100%	No 1 73% 60%	No 1 86% 70%	No 1 78% 78%
Social accountability	<ul style="list-style-type: none"> Proportion of Puskesmas providing intersectoral meeting Proportion of Puskesmas involving community into EPI services (health volunteers) 	100% 100%	56% 100%	100% 100%	60% 100%	73% 100%	66% 100%
Utilization	<ul style="list-style-type: none"> Initial contact for Infant (DPT-HB1) Initial contact for pregnant women (TT1) Initial contact for school age (DT) 	95% 80% 100%	87% 56% 60%	95% 79% 99%	71% 38% 20%	77% 57% 78%	85% 62% 86%
Timing and continuing	<ul style="list-style-type: none"> Duration of services Posyandu that provide EPI services monthly based Proportion of village got sweeping 	8 hours 100% 100%	3 hours 80% 30%	3 hours 100% 100%	3 hours 70% 30%	3 hours 90% 30%	3 hours 86% 30%
Technical quality	<ul style="list-style-type: none"> Proportion of Puskesmas practicing Syringe recapping. Proportion of Puskesmas doing daily temperature monitoring. Proportion of Puskesmas implementing waste management. 	0% 100% 100	55% 60% 89%	12% 100% 100%	60% 33% 80%	30% 65% 90%	44% 33% 89%