

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF MEDICAL SCIENCES

DEPARTMENT OF COMMUNITY HEALTH

KNUST

***AN EVALUATION OF EXPANDED PROGRAMME ON IMMUNIZATION IN
NEW JUABEN MUNICIPALITY USING COMPONENTS OF THE
FLASHLIGHT TRIAD EVALUATION MODEL***

By

Ama Asamaniwa Attua

Bsc (HONS) Biochemistry

JUNE, 2011.

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

COLLEGE OF HEALTH SCIENCES

SCHOOL OF MEDICAL SCIENCES

DEPARTMENT OF COMMUNITY HEALTH

KNUST

AN EVALUATION OF EXPANDED PROGRAMME ON IMMUNIZATION IN

NEW JUABEN MUNICIPALITY: A VIEW THROUGH THE FLASHLIGHT

TRIAD EVALUATION MODEL



Ama Asamaniwa Attua

**A DISSERTATION PRESENTED TO THE SCHOOL OF RESEARCH AND
GRADUATE STUDIES, KWAME NKRUMAH UNIVERSITY OF SCIENCE AND
TECHNOLOGY, KUMASI, IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR AWARD OF THE MPH**

JUNE, 2011.

DECLARATION

I hereby declare that, except for specific references which have been duly acknowledged, this work is the result of my own field research and it has not been submitted either in part or whole for any other degree elsewhere.

Signature_____ date _____

Miss Ama Asamaniwa Attua (PG 3821409)

Candidate

Certified by

Signature_____ date _____

Dr. Peter Agyei - Baffour

Supervisor

Signature_____ date _____

Dr. Easmon Otupiri

Head of Department

Community Health Department

ACKNOWLEDGEMENTS

I would first and foremost like to thank God for his guidance, wisdom and strength during the pursuit of my academic work.

My profound gratitude goes to my loving husband, Dr. Ebenezer Osei Acheampong for his encouragement and immense support during this period of my life.

I am grateful to Dr. Lovelace Senaya, director of the New Juaben Municipal Health Directorate for his invaluable comments and guidance during my Data collection and also to the New Juaben Municipal Health Directorate team especially Mrs. Fanny Enos for their assistance which was accorded to me during the study.

I wish to thank my supervisor, Dr. Peter Agyei - Baffour for his thought provoking comments, discussions, observations, feedback and time which was invaluable in the presentation of this study. His timely comments and criticisms sharpened my analytical thinking skills, to all my lecturers, thank you so much for equipping me with tools to aid in my career advancement. God richly bless you all.

Finally, my warm and heartfelt thanks go to my family for their support, love and encouragement throughout my studies.

DEDICATION

This dissertation is dedicated to the Almighty God and my dear parents Mr. and Mrs. Attua, for their positive upbringing and support which is the driving force that has brought me to this level of education.

KNUST



ABSTRACT

Immunization is essential in the maintenance of child health and is seen as a cost effective way of preventing child mortality and morbidity. However a lot of children die from causes which could have been prevented by extensive coverage of these immunization programmes. This study was a retrospective evaluation of the practice of EPI in the New Juaben Municipal using the flashlight triad model of evaluation under the headings of technology, inputs and outcome.

A total of 500 caregivers with children less than five years were chosen for this study and interviewed with a structured questionnaire by visiting the households. A total of 40 health centre personnel responsible for EPI were selected to answer a self-administered questionnaire. An evaluation of the health centres providing these services was done using the components of the FTE model aided by an observational study using a checklist.

Descriptive statistics were used to describe demographic characteristics and knowledge level of caregivers and health workers and other independent variables while the associations between these factors were determined using Pearson Chi square, Fisher's exact test, bivariate and multivariate logistic regression.

It was found out that the EPI programme in the New Juaben Municipal was of high quality with a good proportion of children being vaccinated. Maternal characteristics such as education, parity, occupation, and ethnicity, number of children and age of child contributed significantly to child's vaccination status. There was a strong link between the caregivers' knowledge of EPI and completion of the vaccination series. This means that good public education would lead to increase immunization coverage. Some service factors such as the type of facility, time spent to get to the facility, time spent at the facility and satisfaction with the service provided were associated with completing immunization schedule as appropriate

for age. EPI in the municipal had these few challenges and they include inadequate staff numbers, lack of infrastructure improvement and maintenance, inadequate materials for health education and low motivation for staff and volunteers. There was a good coverage of EPI with a low dropout rate and good client satisfaction.

It is recommended that more emphasis be put on training programmes for the health personnel responsible for EPI in the municipal. There should be adequate staff in all the centres to enhance the daily management of the facilities, provision of adequate logistics and increase public education on EPI.



TABLE OF CONTENTS

DECLARATION.....	ii
ACKNOWLEDGEMENTS	iii
DEDICATION.....	iv
ABSTRACT	v
TABLE OF CONTENTS	vii
LIST OF FIGURES	xiii
LIST OF TABLES	xiv
ABBREVIATION/ACRONYMS.....	xvi
 CHAPTER ONE	 1
GENERAL INTRODUCTION.....	1
1.0 INTRODUCTION	1
1.1 CURRENT STATE OF KNOWLEDGE.....	1
1.2 PROBLEM STATEMENT	6
1.3 RATIONALE/JUSTIFICATIONS	8
1.4 RESEARCH QUESTIONS	8
1.5 STUDY HYPOTHESIS.....	8
1.6 OBJECTIVES	9
1.6.1 GENERAL OBJECTIVE.....	9
1.6.2 SPECIFIC OBJECTIVES.....	9
1.7 CONCEPTUAL FRAMEWORK	10
1.8 UNIQUENESS OF THE STUDY	11

1.9 EXPECTED OUTCOMES	11
CHAPTER TWO	12
LITERATURE REVIEW	12
2.0 INTRODUCTION	12
2.1 OVERVIEW	12
2.2 EXPANDED PROGRAMME ON IMMUNIZATION	15
2.3 METHODS OF EVALUATING HEALTH PROGRAMMES	17
2.3.1 EVALUATION METHODS EMPLOYED FOR EPI.....	17
2.3.2 THE FLASHLIGHT TRIAD EVALUATION MODEL.....	18
2.4 SOCIO-DEMOGRAPHIC FACTORS AND IMMUNIZATION.....	20
2.5 KNOWLEDGE AND SOURCE OF INFORMATION ON EPI.....	22
2.6 OTHER RELATED FACTORS	22
2.7 THE IMPLEMENTATION OF EPI.....	23
2.7.1 TECHNOLOGY - EXPANDED PROGRAMME ON IMMUNIZATION	23
2.7.2 INPUT.....	25
2.7.2.1 PUBLIC EDUCATION	25
2.7.2.2 INFRASTRUCTURE AND LOGISTIC DEVELOPMENT	26
2.7.2.3 HUMAN RESOURCES DEVELOPMENT AND REMUNERATION	28
2.7.2.4 IMPROVED LEADERSHIP AND GOVERNANCE/ EFFECTIVE ADMINISTRATION AND MONITORING	29
2.7.2.5 ENCOURAGING COMMUNITY AND FAMILY INVOLVEMENT	30
2.7.2.6 INJECTION SAFETY	31
2.7.3 EXPECTED OUTCOMES	32
2.7.3.1 INDICATORS FOR ASSESSING OUTCOME	32
2.7.3.2 SURVEILLANCE	34
2.8 CHALLENGES IN THE IMPLEMENTATION OF THE EPI PROGRAMME	34

2.9 CONCLUSION.....	35
CHAPTER THREE	36
METHODOLOGY	36
3.0 INTRODUCTION	36
3.1 STUDY TYPE AND DESIGN	36
3.2 STUDY SITE/AREA.....	36
3.3 STUDY POPULATION	37
3.4 SAMPLING	37
3.4.1 SAMPLE SIZE	37
3.4.2 SAMPLING METHOD	39
3.5 DATA COLLECTION TECHNIQUES	39
3.6 DATA MANAGEMENT AND ANALYSIS	41
3.7 STUDY VARIABLES.....	41
3.8 LIMITATIONS.....	43
3.9 ETHICAL CONSIDERATIONS.....	43
3.10 QUALITY CONTROL	43
3.11 ASSUMPTIONS AND THEIR EFFECTS ON FINDINGS	44
CHAPTER FOUR.....	45
RESULTS	45
4.0 INTRODUCTION	45
4.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS	45
4.2 CAREGIVERS' KNOWLEDGE.....	53

4.3 OTHER RELATED FACTORS	59
4.4 MULTIVARIATE ANALYSIS OF FACTORS FOUND TO BE ASSOCIATED WITH IMMUNIZATION STATUS	62
4.5 HEALTH WORKERS CHARACTERISTICS.....	65
4.5.1HEALTH WORKER DEMOGRAPHICS.....	65
4.6 IMPLEMENTATION OF EPI FROM THE FLASH TRIAD PERSPECTIVE.....	69
4.6.1 EPI TECHNOLOGY	69
4.6.1.1 OBSERVATION OF HEALTH WORKERS.....	71
4.6.2 INPUTS FOR EPI.....	72
4.6.2.1 PUBLIC EDUCATION	72
4.6.2.2 INFRASTRUCTURE AND LOGISTICS	74
4.6.2.3 HUMAN RESOURCES DEVELOPMENT AND REMUNERATION	76
4.6.2.4 INJECTION SAFETY	77
4.6.2.5 ENCOURAGING COMMUNITY AND FAMILY INVOLVEMENT	77
4.6.2.6 EFFECTIVE ADMINISTRATION AND MONITORING	77
4.6.3 EXPECTED OUTCOMES	78
4.6.3.1 VACCINATION COVERAGE INDICATORS.....	78
4.6.3.2 SURVEILLANCE	81
4.7 CHALLENGES TO EPI.....	81
 CHAPTER FIVE	85
 DISCUSSION.....	85
5.0 INTRODUCTION	85
5.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF CAREGIVERS/MOTHERS.....	85
5.2 KNOWLEDGE AND SOURCE OF INFORMATION ON EPI.....	87

5.3 OTHER RELATED FACTORS	87
5.4 THE IMPLEMENTATION OF EPI.....	88
5.4.1 TECHNOLOGY	88
5.4.2 INPUTS OF EPI	89
5.4.2.1 PUBLIC HEALTH EDUCATION	89
5.4.2.2 INFRASTRUCTURE AND LOGISTICS	90
5.4.2.3 HUMAN RESOURCES DEVELOPMENT AND REMUNERATION	91
5.4.2.4 COMMUNITY INVOLVEMENT	92
5.4.2.5 ADMINISTRATION AND MONITORING	93
5.4.2.6 INJECTION SAFETY	94
5.4.3 EXPECTED OUTCOMES	94
5.4.3.1 SURVEILLANCE	95
5. 5 CHALLENGES IN THE IMPLEMENTATION OF THE EPI.....	95
 CHAPTER 6.....	 98
 CONCLUSIONS AND RECOMMENDATIONS.....	 98
6.0 INTRODUCTION	98
6.1 CONCLUSIONS.....	98
6.1.1 CAREGIVERS RELATED FACTORS	98
6.1.2 CAREGIVERS' KNOWLEDGE AND SOURCE OF INFORMATION	98
6.1.3 OTHER RELATED FACTORS	99
6.1.4 IMPLEMENTATION OF EPI.....	99
6.1.4.1 EPI-TECHNOLOGY	99
6.1.4.2 INPUTS.....	99
6.1.4.3 OUTCOME.....	100

6.2 RECOMMENDATIONS.....	100
6.2.1 MUNICIPAL HEALTH MANAGEMENT TEAM.....	100
6.2.2 FACILITY HEADS	101
6.2.3 HEALTH WORKERS	101
6.2.4 COMMUNITY	102
6.2.5 CLIENTS	102
6.2.5.1 MOTHERS AND OTHER PRIMARY CAREGIVERS	102
6.2.5.2 FATHERS.....	102
REFERENCES.....	103
APPENDIX.....	111
QUESTIONNAIRES	111
QUESTIONNAIRE FOR DISEASE CONTROL OFFICERS.....	113
QUESTIONNAIRE FOR MOTHERS AND CARE GIVERS OF CHILDREN UNDER FIVE	114
QUESTIONNAIRE FOR MANAGERS OF HEALTH FACILITY	117
MAP OF NEW JUABEN	121

LIST OF FIGURES

FIGURE 1: IMMUNIZATION COVERAGE FOR GHANA FROM 2001 TO 2009-	19
FIGURE 2: WORLDWIDE DPT3 COVERAGE FROM 1980 TO 2003.....	5
FIGURE 3 DISTRIBUTION OF UNIMMUNIZED CHILDREN IN THE WORLD	6
FIGURE 4 CONCEPTUAL FRAMEWORK.....	10
FIGURE 5 OPERATIONS OF IMMUNIZATION SYSTEMS.....	24

KNUST



LIST OF TABLES

TABLE 1: PENTA 3 COVERAGE.....	5
TABLE 2: 2009 NEW JUABEN MUNICIPALITY IMMUNIZATION COVERAGE.....	7
TABLE 3 EXPANDED PROGRAMME ON IMMUNISATION SCHEDULE	16
TABLE 4: FLASHLIGHT TRIAD APPROACH TO EVALUATION.....	18
TABLE 5 VARIOUS INDICATORS AND THEIR MEANINGS	33
TABLE 6: DETAILS OF DATA COLLECTION.....	40
3.7 STUDY VARIABLES.....	41
TABLE 7 STUDY VARIABLES	42
TABLE 4.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF CAREGIVERS/MOTHERS	46
TABLE 4.2 CROSS TABULATION OF IMMUNIZATION STATUS WITH SOCIO DEMOGRAPHIC CHARACTERISTICS N=500.....	49
TABLE 4.3 RESULTS FROM LOGISTIC REGRESSION ANALYSIS N=500	52
TABLE 4.4 KNOWLEDGE AND SOURCE OF INFORMATION ON EPI.....	54
TABLE 4.5 CROSS TABULATION OF IMMUNIZATION STATUS WITH KNOWLEDGE OF CAREGIVERS.....	56
TABLE 4.6 RESULTS FROM LOGISTIC REGRESSION ANALYSIS	58
TABLE 4.7 CROSS TABULATION OF IMMUNIZATION STATUS WITH OTHER RELATED FACTORS	59
TABLE 4.8 RESULTS FROM LOGISTIC REGRESSION ANALYSIS	61
TABLE 4.9 MULTIVARIATE ANALYSIS – CARE GIVERS.....	63
TABLE 4.10 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF HEALTH WORKERS	66

TABLE 4.11 CROSS TABULATION OF SOCIO DEMOGRAPHIC CHARACTERISTICS WITH SPONTANEOUS KNOWLEDGE OF EPI; N=40	67
TABLE 4.12 CHARACTERISTICS OF HEALTH WORKERS BY FACILITY TYPE (INPUTS).....	68
TABLE 4.13 TECHNOLOGY / EPI N=10	71
TABLE 4.14 HEALTH EDUCATION AT FACILITIES.....	73
TABLE 4.15 REPORTED CASES OF EPIDEMIC PRONE DISEASES; HALF YEARS 2006 – 2010.....	78
TABLE 4.16 EPI PERFORMANCE - 1ST HALF YEAR 2010.....	79
TABLE 4.17 TREND OF EPI PERFORMANCE – 1ST HALF 2007 – 2010	80
TABLE 4.18 2009 COVERAGE RATES FOR NIDS IN THE NEW JUABEN MUNICIPAL	80
TABLE 4.19 CHALLENGES TO EPI IMPLEMENTATION	82
TABLE 4.10 SUMMARY OF RESULTS IN FLASHLIGHT TRIAD MODEL	83
TABLE 5.1 SUMMARY OF FINDINGS IN THE CONTEXT OF FTE MODEL	96

ABBREVIATION/ACRONYMS

AFP	Acute Flaccid Paralysis
BCG	Bacille Calmette-Guérin
CHPS	Community-based Health Planning and Services
CHW(s)	Community Health Worker(s)
DHMT	District Health Management Team
DPT	Diphtheria Pertussis Tetanus
EPI	Expanded Program on Immunization
FTEM	Flashlight Triad Evaluation Model
GAVI	Global Alliance for Vaccines and Immunization
GDHS	Ghana Demographic and Health Survey
GF	Global Fund
GHS	Ghana Health Service
GIVS	Global Immunization Vision and Strategy
GIV	Global Immunization Vision
IEC	Information Education Communication
MDG(s)	Millennium Development Goal(s)
MHMT	Municipal Health Management Team
MOE	Ministry Of Education
MOH	Ministry of Health
OPV	Oral Polio vaccine
PENTA	Pentavalent vaccine
PMH	Private Maternity Homes
RCH	Reproductive and Child Health

RED	Reaching Every District
SD	Standard Deviation
SDHT	sub-district health team
UNDP	United Nations Development Programme
UNICEF	United Nations Children's Fund
VPD	Vaccine-Preventable Disease
WHO	World Health Organization
WIFA	Women in Fertility Age
YF	Yellow Fever



CHAPTER ONE

GENERAL INTRODUCTION

1.0 INTRODUCTION

This chapter begins with a history and current knowledge of immunisation while reviewing the global and national (Ghana) situation of EPI. The reasons for the study are also presented in this section.

1.1 CURRENT STATE OF KNOWLEDGE

Children have been noticed to be the most vulnerable among age groups in the area of disease prevention and thus have high morbidity and mortality, and partly because they do not make decisions for themselves. It is however unacceptable that preventable diseases such as malaria, pneumonia, malnutrition and so on result in the death of these children and hence efforts should be made to prevent these deaths (UNICEF, 2009). There has not been much change in the under-five (U-5) mortality rates in some developing countries over the years despite the various established interventions that have been adopted by various countries including Ghana. Although these interventions are efficient in preventing, as well as curing these diseases, majority of children do not have access to them hence reducing their effect on the society (Ibid, 2009). Globally, child mortality continues to fall. Mortality in children under 5 years old in 2008 was estimated at 65 per 1000 live births, which is a 27% reduction from 90 per 1000 live births in 1990.

The World Health Organization rates immunization as one of the interventions with a large potential impact on health outcomes. Immunization is seen as one of the most effective means of reducing under-five (U-5) mortality rates (WHO 2000). The expanded programme on immunization (EPI) was established by the World Health Organization in 1974 to develop and expand immunization programmes for vaccine-preventable diseases throughout the world. In the initial stages of implementation immunization programmes were linked to urban

areas in industrialized countries and hence less than 5% of children had been immunized against initial EPI target diseases. In 1977, the goal was set to make immunization available to every child by 1990. To attain these objectives the WHO set about improving the health system infrastructure and improving vaccination coverage in all countries of the world.

EPI was initially for protection against six diseases- TB, polio, diphtheria, tetanus, pertussis and measles. Vaccine for yellow fever was introduced in 1988 for endemic countries only and given with measles vaccine. In 1992 hepatitis B was introduced in high seroprevalence (>7%) countries by 1995 and in all countries by 1997. Haemophilus influenza type b was also introduced in 1998 based on disease burden and capacity and in all countries by 2006. Global Alliance for Vaccine and Immunization (GAVI) supported vaccines in some of the poorest countries since 2000. The Global Immunization Vision and Strategy (GIVS) has been jointly developed by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) in consultation with many member states and immunization partners for the years 2006–2015. Its objective is to fully immunize 90 percent of children under one year of age in every country, with at least 80 percent coverage in every district by 2015 (United Nations General Assembly Special Session and MDG, 2002). The Reaching Every District (RED) strategy has been initiated especially in African countries since 2002 to improve stagnated routine immunization coverage (WHO, 2007), and the RED strategy implemented in five African countries by WHO and UNICEF showed good results due to outreach services and micro-planning (WHO, 2005). Even with these successes, worldwide, over 3 million children die prematurely annually due to vaccine-preventable diseases.

The Expanded Programme on Immunization (EPI) was launched in Ghana in 1978 and has since 1985 been operational in all 10 regions and all districts. Before 1985, immunization services were organized on mass campaign basis in response to outbreaks of specific diseases. The system in Ghana consists of the Operational Components (Immunization

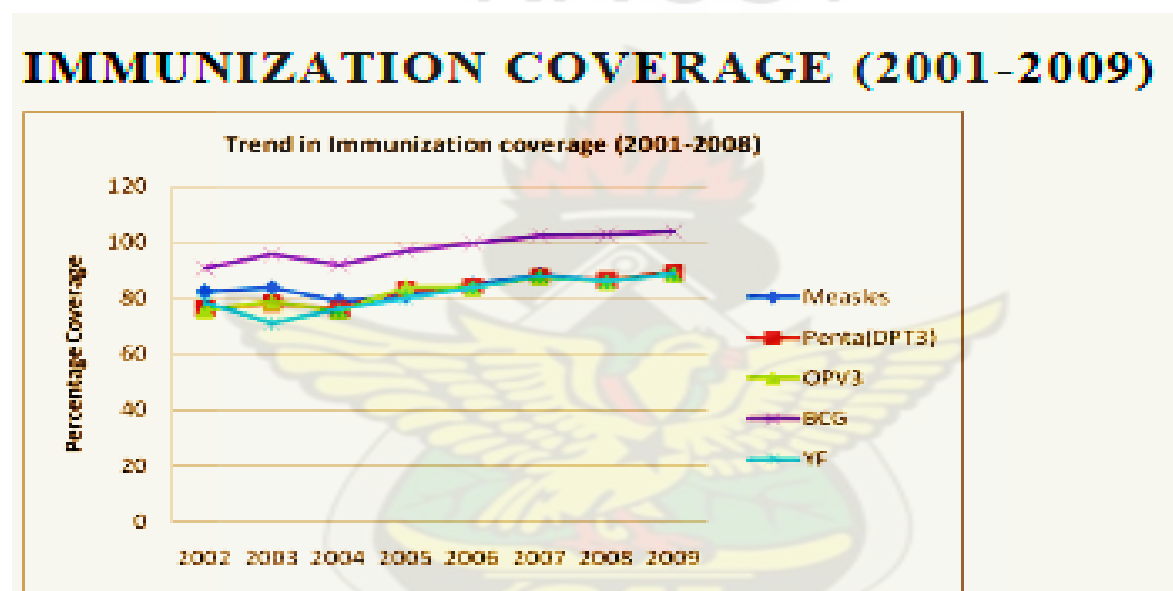
Service, Vaccine Management, Logistics, Surveillance of Vaccine Preventable Infections, and Advocacy and Social Mobilization) and the supportive components (Management, Capacity building and Financing of immunisation services). EPI in Ghana aims at protecting every child in Ghana from nine common childhood communicable diseases; namely, tuberculosis, poliomyelitis, diphtheria, neonatal tetanus, whooping cough, hepatitis B, haemophilus influenza type b, measles and yellow fever (MOH, 2002).

Each sub-district health team (SDHT) provides an integrated static and outreach EPI services to the communities in their catchment areas. The team often consists of Community Health Nurses, Field Assistants and Midwives. It is supervised by a Technical Officers (Disease Control) or more often by a Public Health Nurse. The Disease Control Officers and Field Technicians often manage the district and sub district cold chain whilst vaccination is given largely by the Community Health Nurses. The static services are held at the institutional levels whilst the outreach services are held for a cluster of communities within a designated community and involve transporting service providers into these communities.

There are various indicators used by the EPI programme to assess its performance. The most widely used indicator is the coverage rate which is defined as the proportion of individuals in the target population who have received the vaccine. Based on the WHO/UNICEF global estimates for 2008, trends related to global vaccination coverage continue to be positive. Immunization currently prevents an estimated 2.5 million deaths every year in all age groups from diphtheria, tetanus, pertussis (whooping cough), and measles. More children than ever before are being reached with immunization. In 2008, an estimated 106 million children under the age of one were vaccinated with three doses of diphtheria- pertussis-tetanus (DPT3) vaccine. Three regions the Americas, Europe and Western Pacific maintained immunization

coverage over 90%. The number of countries reaching 90% or more immunization coverage with DPT3 vaccine in 2008 was 120 countries compared to 117 in 2007 and the numbers of countries reaching over 80% DPT3 coverage are 151 countries in 2008 compared to 150 in 2007. In 2009 vaccine coverage for Ghana for DPT3 was 89.3% while that of polio (OPV3) was 88.7%; yellow fever and measles were 88.3% and 89.1% respectively (WHO 2008). The immunization coverage for Ghana from 2001 to 2009 is shown in the figure below.

Figure 1 Immunization Coverage for Ghana from 2001 to 2009



Source: Ministry of Health, Ghana. 2009 annual report

In EPI, completed third dose of DPT (DPT3) is considered as an indicator to get the glimpse of the programme performance. The table on the next page shows DPT3 coverage in the respective regions in Ghana from 2007 to 2009.

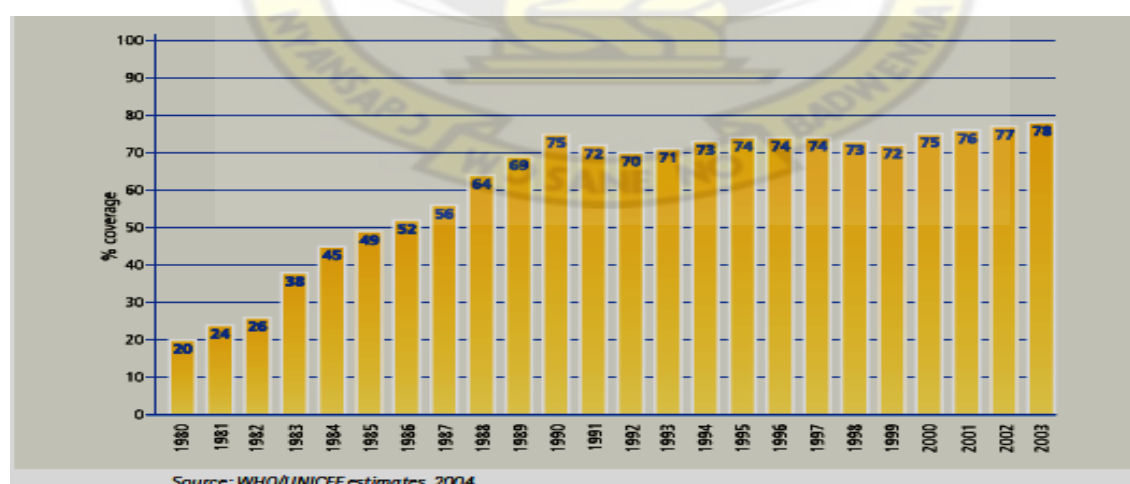
Table 1: penta 3 coverage

	Penta 3 Immunization Coverage Rate		
REGION	2009	2008	2007
Ashanti	83.7	76.8	72.3
Brong Ahafo	95.0	97.3	100.2
Central	96.6	92.2	92.6
Eastern	94.5	93.0	93.0
Greater Accra	72.7	68.3	67.8
Northern	123.0	114.5	123.7
Upper East	106.0	94.8	101.6
Upper West	90.1	87.5	93.9
Volta	82.9	83.8	83.8
Western	88.6	89.0	93.3
National	89.3	86.6	87.8

Source: Ministry of Health, Ghana. 2009 Annual Report

The graph below shows worldwide DPT3 coverage from 1980 to 2003, there is therefore a general increase in DPT3 coverage since the beginning of EPI but from 1990 the coverage rate has been between 70 and 78 percent as shown in the figure below from 1980 to 2003.

Figure 2: Worldwide DPT3 coverage from 1980 to 2003.



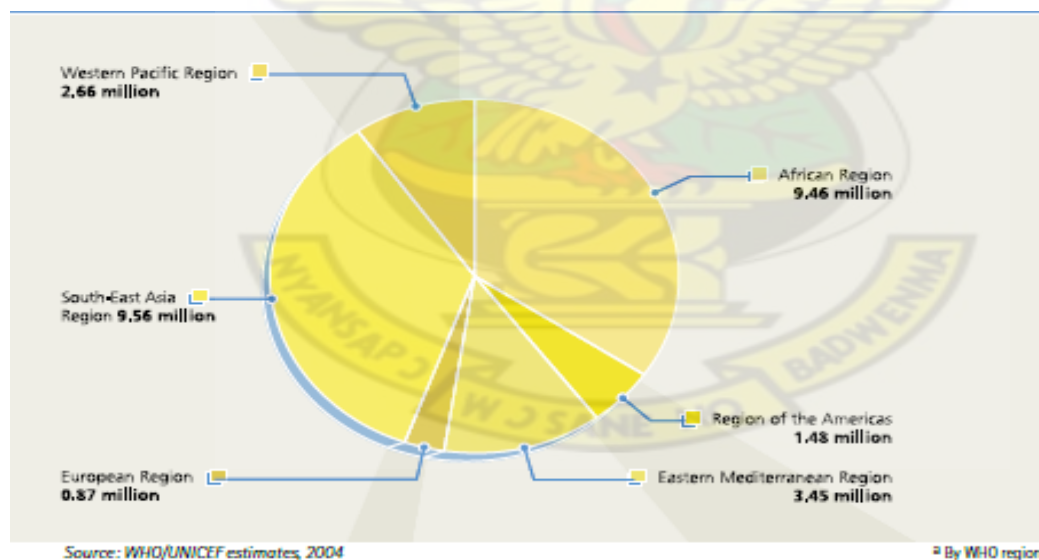
There has therefore been a relatively constant level of immunization coverage and hence the need to find out the shortfalls of the system and how to overcome them. This study seeks to

analyze and evaluate EPI in the New Juaben Municipality using the flashlight triad evaluation Model concept as our mode of evaluation.

1.2 PROBLEM STATEMENT

Immunization is essential in the maintenance of child health and is seen as a cost effective way of preventing child mortality and morbidity. However a lot of children die from causes which could have been prevented by extensive coverage of these immunization programmes. Deaths preventable by vaccinations still account for about two to three million deaths worldwide. An estimated 9.2 million deaths occurred in children under five in 2007, and half of these deaths occurred in Africa (UNICEF, 2008). In 2004 around 23.2 million infants were not immunized with Africa having 8.3 million of these infants as shown in the figure below. About 79% of Ghanaian children between the ages of 12-23 months were completely immunised whilst five per cent had not received any vaccinations at all (Ghana DHS, 2008).

Figure 3 Distribution of unimmunized children in the world



This is largely due to a lack of focus on the major causes of mortality, the failure to invest sufficiently in proven interventions, and the lack of human resources needed to implement them. The second five year programmes for Health sector reforms emphasizes on improvement of services. Recently there has been no further decline in measles cases even

though vaccination coverage increased from 49% to 82% between 1994 and 2001. This study evaluates EPI in the New Juaben Municipal using the flashlight triad evaluation model. According to UNDP, 2007 Ghana is striving to reach a 100% coverage rate by the year 2015. The New Juaben Municipality performance for immunization coverage in the year 2009 for the various vaccines is shown in the table below.

Table 2: 2009 New Juaben Municipality immunization coverage

ANTIGEN	MUNICIPAL TARGET	% COVERAGE	NATIONAL TARGET %	NATIONAL COVERAGE %
BCG	6,199	90.8	90	103.8
MEASLES	6,199	84.6	90	89.1
PENTA3	6,199	89.4	90	89.3
OPV3	6,199	89.4	90	88.7
YELLOW FEVER	6,199	84.6	90	88.8
Total	6,199	87.7	90	91.9

Source: 2009 Annual Report NJM, 2009 Annual Report GHS

In Ghana some of the measures that have been put in place to improve the effectiveness of immunization are in areas of vaccine supply and quality, in service training and capacity building, improving logistics and resources, surveillance and communication. There should be a general increase in quality of the EPI programme and reduction in under-five morbidity and mortality. This has however not been the case and it is evidenced from records and surveillance data, programme monitoring and supervision reports that there could be problems with the immunization services provided. Supervisory reports at the municipal level also point to weak supervision, monitoring and surveillance at the sub district levels as well

as inaccuracies in EPI data collection. This study sought to identify the strengths and weaknesses of the EPI programme in the municipality and to recommend appropriately strategies with the aim of improving its quality.

1.3 RATIONALE/JUSTIFICATIONS

This study sought to assess the strengths, flaws and obstructions to the implementation of EPI in the New Juaben Municipality. Most of the deaths in children are due to some of these preventable diseases, hence improper implementation of EPI will not be able to reduce under-five child mortality. Assessing the effectiveness of the components would enable planners to increase the improved health status of children. The study provided evidence on implementation challenges to help health managers identify and fix bottlenecks such as inadequate access, low demand, or insufficient compliance.

1.4 RESEARCH QUESTIONS

- Is an appropriate technology employed in EPI?
- How would the effectiveness of EPI in the New Juaben Municipal relate to the inputs of public education, logistics, human resources, monitoring and surveillance?
- What are the challenges that affect the implementation of the EPI programme so as to decrease coverage in the Municipality

1.5 STUDY HYPOTHESIS

Null H_0 : The targets of EPI are independent of Inputs and Technology.

Alternate H_a : The targets of EPI are associated with inputs and Technology.

1.6 OBJECTIVES

1.6.1 GENERAL OBJECTIVE

The general objective was to evaluate EPI in terms of inputs, technology and outcomes with the aid of the Flashlight Triad model in the New Juaben Municipality.

1.6.2 SPECIFIC OBJECTIVES

- To describe socio-demographic characteristics of mothers/caregivers in the New Juaben Municipality
- To assess knowledge level and source of information of mothers/caregivers
- To assess the implementation of EPI in terms of:
 - a. Technology
 - b. Input
 - c. Expected outcomes
- To find out other factors influences the implementation of EPI in the municipality
- To identify challenges which affect the implementation of the EPI programme in the New Juaben Municipality

1.7 CONCEPTUAL FRAMEWORK

The conceptual framework for this study is shown in the diagram below:

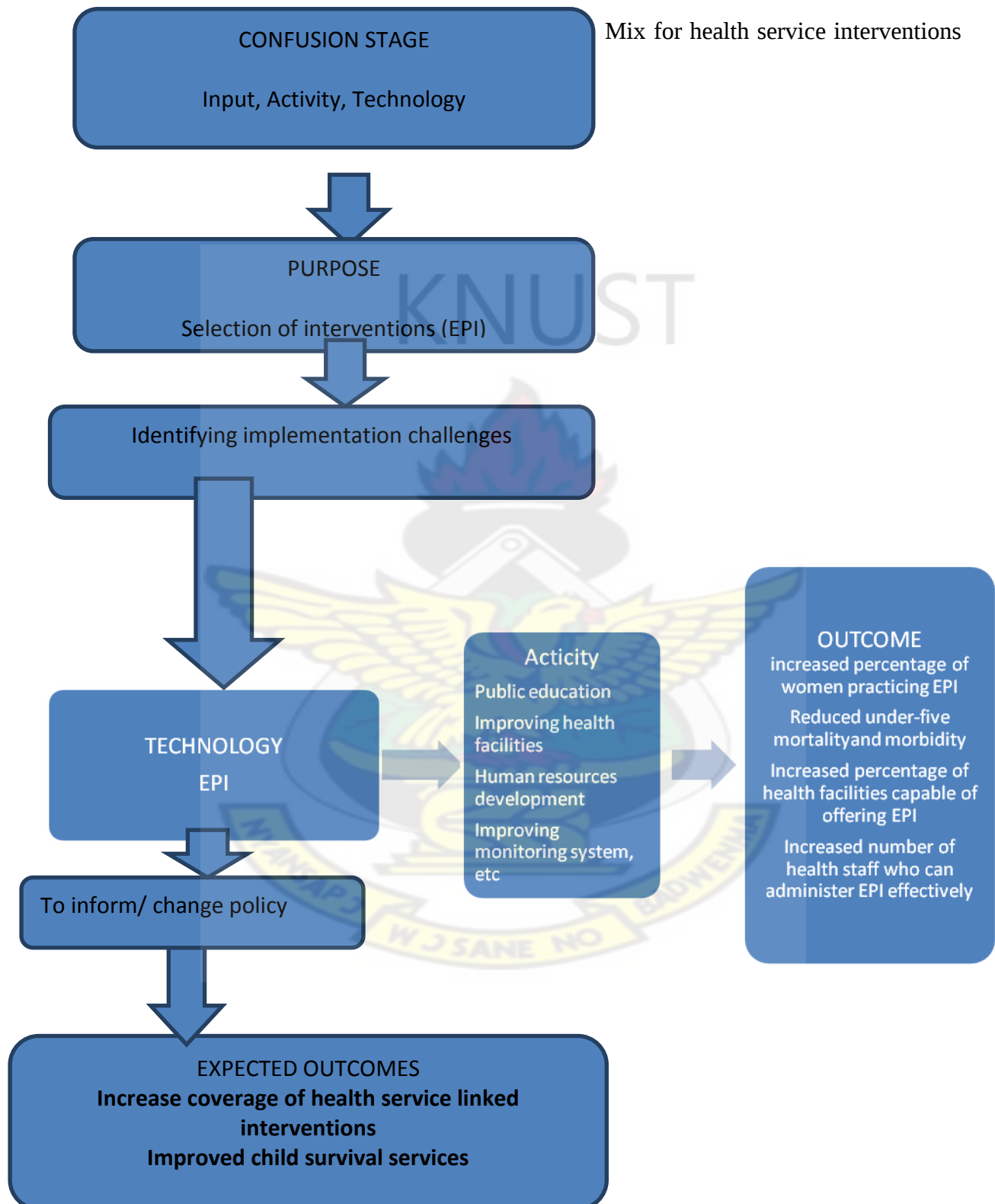


Figure 4 Conceptual framework

Source: Author's Construct, 2010.

In the confusion state the technology, inputs and outcome are all mixed together. For this study EPI was considered as an intervention and analyzed to determine the challenges that affect the implementation of EPI in terms of technology, inputs and outcome. The technology is the practice of EPI and it involves the daily routines of immunization and to assess if they are adequate to enhance its proper implementation. Some of the inputs considered are public education, improvement of logistics, human resource development and improving monitoring system. Some of the outcomes that are expected from this intervention are increased percentage of women practicing EPI, reduced under-five mortality and morbidity, and increased percentage of health facilities capable of offering EPI, increased number of health staff who can administer EPI effectively. These will all in the end go to contribute to increase coverage of health service linked interventions and improved child survival services.

1.8 UNIQUENESS OF THE STUDY

A lot of studies have been done on immunization for children but this study sought to evaluate the components of expanded programme on immunization using a model known as the Flashlight Triad Evaluation Model. The components of the model include technology, input and the expected outcomes.

1.9 EXPECTED OUTCOMES

This study was expected to determine the strengths, weaknesses, opportunities and threats that prevented the inputs of EPI from producing the desired results of reducing under-five mortality and morbidity and bring out recommendations to solve them.

CHAPTER TWO

LITERATURE REVIEW

2.0 INTRODUCTION

This chapter brings out the findings from other studies and literature about EPI and the effects of other factors on the uptake of EPI

2.1 OVERVIEW

The pace of health development has stagnated in the last decade. There has been no significant change in Ghana's under-five and infant mortality rates between 1993 and 2003. Under-five mortality in 1998 was estimated at 108/1000 live births but it increased slightly to 111/1000 live births for 2001 to 2006 with no change for the seven year period from 1999 to 2006 (GDHS 2003, 2008). Infant and child mortality in many developing countries remain high due to widespread infectious diseases such as pneumonia, diarrhoea and malaria (UNICEF, 1992). Preventive and curative interventions can avert these deaths by preventing or treating these diseases. Access to these health care interventions is considered as the link between the health care system and the population it serves (Andersen, 1968; Aday et al, 1974). Utilization is proof of access or it is evidence that access has been achieved (Fiedler, 1981). The volume and type of services, whether or not the service can be reached, the cost of the service, the client's perceptions of the relative worth of the service and the acceptability of services provided, all influence access and the utilization of services (Aday et. al., 1974; Penchansky et. al., 1981). This care is provided by families and communities and through outpatient, outreach and clinical services in order to reduce neo-natal and child deaths. This requires strengthening health systems at community and district levels through a primary health care approach and ensuring these systems respond to the needs of poor families and communities (Penchansky et al., 1981).

Effective health programmes build on established community practices, hence in Thailand, health services are combined with religious organizations at the village level. Thus the success of community health efforts depends critically on the context, including level of development of infrastructure, services, and socioeconomic resources (GDHS, 2003). In practice, achieving this kind of planned, local effort is difficult in low-middle-income countries for several reasons: some of these reasons are that the primary care facilities frequently lack the resources they need to function, staff positions may remain unfilled or staff members may be absent, supplies may not be delivered or may have expired, facilities may not be properly maintained and at times people often seek health care from a variety of traditional healers, pharmacists, and private medical professionals in addition to public services (Streefland et. al., 1999). This fragmentation can make proper surveillance and planning difficult to manage. Andersen's behavioural model of health services utilization proposes that people's use of healthcare services is a function of their predisposition to use services, the factors enabling or impeding use, their need for care, and their satisfaction with services (Andersen, 1995). Factors influencing how symptoms and illness may be perceived, such as commonality of the disease, familiarity of the symptoms or clinical/physical changes, are partly responsible for health care seeking behavior (Jacobsen et. al., 1995). Studies by Padgett and Saamenoet have shown that some primary factors resulting in differences in the use of health services include life-style, cultural or attitudinal factors, age and gender (Padgett et. al., 1994; Saamenoet et. al., 1995).

For child health, health outcome indicators such as IMR, under-fives MR, proportion of under-fives malnourished and selected service output indicators such as EPI coverage; AFP non polio rate; coverage of post-natal care, under-fives malaria case fatality rate, give a clear indication of how some of these health service linked interventions impact on health statuses

of children . The overall U5MR in sub-Saharan Africa has improved, dropping from 187 per 1,000 live births in 1990 to 160 in 2006 (WHO 2008). However, this represents an average annual rate of decline in child mortality of only 1.0 percent over the past 16 years. The infant mortality rate of Ghana was estimated at 61 deaths per 1,000 live births during the ten years preceding the GSPA survey (GDHS 2003). The trend in infant mortality shows a decrease over the last twenty years. The under-5 mortality rate was estimated at 110 deaths per 1,000 live births and the trend in under-5 mortality also shows a decrease over the last twenty years. Childhood immunizations are available at 69 percent of the facilities, and an additional 6 percent provide this service only through village outreach activities. Child immunizations are offered on one or two days per week in 54 percent of the facilities and five days per week in 19 percent of the facilities, while growth monitoring is least frequently offered: 61 percent of the facilities offer this service one or two days per week (GDS 2003).

Immunity is the ability of the body to recognize its indigenous substances and eliminate foreign material. The immune system is comprised of organs and specialized cells that protect the body by identifying harmful substances, known as antigens, and by destroying them by using antibodies and other specialized substances and cells. There are two basic ways to acquire this protection – active immunity and passive immunity. Active immunity is provided by a person's own immune system and comes from exposure to a disease or from vaccination. Active immunity usually often is permanent and lasts longer. Passive immunity results when antibodies are transferred from one person or animal to another. Some sources of passive immunity include blood and blood products, immune or hyper-immune globulin, and animal antitoxins. Passive immunity disappears over time, usually within weeks or months (National Institutes of Health, 1998). A basic concept of public health is that every individual who is protected from a disease as a result of an immunization is one less

individual capable of transmitting the disease to others. Individuals who have been immunized serve as a protective barrier for other individuals who have not been immunized, provided that the number immunized has reached a certain level. Reaching and maintaining that level, which varies by communicable disease, provides “herd immunity” to unimmunized individuals (Essentials of Immunization, 2008). Realizing the potential of immunization requires a commitment from a broad coalition of partners. That coalition involves everyone from the village health worker to the research scientist, from the national EPI manager to the global policy maker, from the donor agency health officer to the Minister of Health. If these partners can work together in coordinated strategies that give appropriate attention to all the essentials of immunization, then the world’s children will face a much safer and brighter future (MOH, 2003).

2.2 EXPANDED PROGRAMME ON IMMUNIZATION

To prevent and reduce morbidity and mortality of children under five, the World Health Organisation (WHO) in 1977 launched a health scheme known as the 'Expanded Programme on Immunization (EPI). In this programme children who are within the first two years of life are immunized against the six childhood diseases (WHO, 1981). The levels of immunization coverage globally, now stand at around 80% for children under one year of age (WHO 2008). The success of the EPI represents a major public health achievement, but much remains to be done. Worldwide, over 3 million children die prematurely due to vaccine-preventable diseases annually (UNICEF 2008). Additional vaccines have been added to the EPI schedule: Haemophilus Influenza B for all countries, and for endemic countries, either Hepatitis B vaccine or Yellow Fever vaccine, or both. EPI in Ghana now aims at protecting every child in Ghana from nine common childhood communicable diseases; namely, tuberculosis, poliomyelitis, diphtheria, neonatal tetanus, whooping cough, hepatitis B, Haemophilus influenza type b, measles and yellow fever (MOH 2003). The main thrust of the National EPI

Policy is that each child should receive one dose of BCG at birth, three doses of DPT, (at 6, 10 and 14 weeks), four doses of OPV (at birth, 6, 10 and 14 weeks) one dose of measles (at 9 months) and one dose of yellow fever (at 9 months). Every woman of childbearing age (12-44 years) should receive 5 doses of tetanus toxoid (MOH, 2003). In 2002, Ghana replaced DPT in the scheme with the pentavalent vaccine (DPT-Hib-HepB). The schedule for immunization for Ghana is represented in the table below.

Table 3 EXPANDED PROGRAMME ON IMMUNISATION SCHEDULE

ANTIGEN	SCHEDULE
BCG	AT BIRTH
OPV 0	AT BIRTH
OPV 1	6 WEEKS
OPV 2	10 WEEKS
OPV 3	14 WEEKS
PENTA 1 (DPT-HEPB+HIB)	6 WEEKS
PENTA 2	10 WEEKS
PENTA 3	14 WEEKS
MEASLES	9 MONTHS
YELLOW FEVER	9 MONTHS

Source: MOH 2003

The current Global Vaccination goal is to fully immunize 90 percent of children under one year of age in every country, with at least 80 percent coverage in every district by 2015 (United Nations General Assembly Special Session and MDG, 2002). A study in Ghana showed that eighty-four percent of the facilities that provide child immunization services also had the capacity to store vaccines and thirty-seven percent of those had all elements for

adequately monitoring the cold chain. Some of the Routine childhood vaccines in Ghana include BCG, OPV, DPT/HepB/Hib, measles, and yellow fever and they were all available in 43 percent of the facilities offering and storing childhood vaccines. Hospitals were most likely to have all vaccines (56 percent). BCG was missing in 84 percent of the PMHs and fifty-nine percent of the facilities had an adequate supply of syringes and needles. Less than half (43 percent) of facilities documented either DPT dropout or measles coverage (GDHS 2003).

2.3 METHODS OF EVALUATING HEALTH PROGRAMMES

2.3.1 EVALUATION METHODS EMPLOYED FOR EPI

Evaluation has been defined as systematic investigation of the merit, worth, or significance of an object (Shadish et. al., 1991). Evaluation is the process of judging the value or worth of some product, project, or programme. It is a part of monitoring process for health development. Evaluation is typically conducted for three reasons which are determining what type of project should be developed, if there was proper implementation of the project intended and to determine the effects of a project (Rossi et. al., 1989). Effective programme evaluation is a systematic way to improve and account for public health actions by involving procedures that are useful, feasible, ethical, and accurate. Evaluation is a means of separating programmes that promote health and prevent injury, disease, or disability from those that do not; it is necessary in the planning of effective public health strategies, improving existing programmes, and demonstrating the results of inputs into these interventions. Evaluation also focuses attention on the common purpose of public health programmes and asks whether the magnitude of investment matches the tasks to be accomplished (Schorr, 1997). Evaluation would therefore be defined as a scientific and systematic process that has specific objectives for collecting and analyzing data to meet predetermined achievement or related standards in terms of adequacy, effectiveness and efficiency for judging values as well as diagnosing

alternatives to improve and increase programmes efficiency and effectiveness (Bunpool, 2004). The method of evaluation used in this study was the Flashlight Triad Model which is briefly described in the next section.

2.3.2 THE FLASHLIGHT TRIAD EVALUATION MODEL

Evaluation of programmes is an important part of management processes. Through evaluation, one can know the achievement and experience in the previous work, thus to control and strengthen the proceeding work better and ensure the accomplishment of the set goal. An evaluation framework, the Flashlight Triad developed by Ehrmann et. al., 1997 was adapted in this study. The flashlight triad was developed primarily as elements of a tool kit for studying the use of technology to improve teaching and learning activities. It involved three elements: A technology (paper), an activity for which it is used (students draw pictures on the paper), and the educational outcome of the activity (increased skill as an artist). The Flashlight approach to studying teaching and learning with technology relies on this simple construct. It is called a "triad" because it has only three elements (Ehrmann, 1999). Below is a table to summarize the concept of flashlight triad approach to evaluation.

Table 4: Flashlight Triad Approach to Evaluation

TECHNOLOGY	ACTIVITY/INPUT	OUTCOME
How are tools being used to support the health activity; EPI	A health activity (EPI) which relies in part on the technology's use	What outcomes do you expect to see that would indicate success of EPI

Source: Adapted from Ehrmann et. al., 1997

The Flashlight Programme is therefore designed as an aid to monitor the usefulness of technology in implementation of activities and the impacts of such changes on learning outcomes (Chickering et. al., 1996). Relating the Flashlight Triad to this current study ,

considerations were given to the type of inputs to employ in EPI, a specific process that the input enables the implementer (health staff) to perform, and outcomes (immunization status) expected from that type of process which would indicate it as being a success or failure.

The triad's structure suggests five sets of related questions:

I. Questions about the inputs or interventions

For example, questions about its availability and reliability; enquired if the input could be used and if it would work. There was the need to know if EPI was being practiced in communities in the study area and if it was working.

II. Questions about the use of the inputs or intervention.

In evaluating the use of the intervention, there was the need to assess the acceptability of the interventions by the community. Do the communities see them as being essential in improving the health of children under-five in the communities? For example to assess the acceptance of EPI in the community respondents were asked if they saw a need to fully immunize their children.

III. Questions about the activity per se

This determined if the activity itself was valuable or worth carrying out. The main aim was to assess if the activities to be carried out were going to help in achieving results expected. For example it was necessary to enquire if health education component of EPI were essential in enhancing communities' acceptance of EPI.

IV. Questions about whether and how the activity is contributing to the outcome

For example, do people who achieved the outcome report: did they actually participated in the activity? Did they claim that the activity was valuable in achieving the outcome? For example did health education component have any impact on encouraging mothers to accept EPI, did the availability of competent staff increase the number of children vaccinated?

V. Questions about the outcome

For example, is the outcome looking good? Was there evidence that the outcome was valuable when attained? For example there was the need to determine if increasing the percentage of children being immunized made any difference in improvement of under-five child health statuses.

If the answers from these five questions were affirmative, then the result could sometimes be a reasonably continuous chain of evidence that links technology to activity, and activity to outcome. Relating these to this study, the main aim was to identify the existing activities or interventions in the study area and assessed if the activities being carried out under these interventions were really valuable in the implementation of the strategies and if the expected outcomes were being realized as in (Ehrmann et. al., 1997).

2.4 SOCIO-DEMOGRAPHIC FACTORS AND IMMUNIZATION

Various studies have been done to determine the effect of socio-demographic characteristics such as gender, education, religion, occupation, ethnicity, number of children and age of child on immunization.

Studies have shown that there is a relationship between educational level of caregivers and the possibility of having their children immunized (Salaemsak et. al., 2002; Budisuhardja, 1995; Matthews et. al., 1997). Others found no significance between level of education and immunization received (Vongkhamdy, 1989; Ahmed, 1989). Another study in India found a significant relationship between the completion of immunization amongst infants and the number of literate women (Parashar, 2005).

The risk of not being immunized was significantly increased amongst children of Muslim parents compared to those of Christian parents in Nigeria (Antai, 2008). For example the coverage in northern Nigeria was very low in recent polio NID, because a religious sect

refused to participate (Global Polio Eradication Initiative, 2004). This was however not the case in the study by Bonsu in 2005 which found no relationship between religion and immunization status (Bonsu et. al., 2005).

The number of children per family has been found to be related to the complete immunization of children as in studies by Vongkhamdy, 1999 in Lao PDR while another study by Budisuharda, 1995 in Thailand showed that there was no significant association between number of children under five and the completeness of immunization.

Concerning occupation immunization coverage had no significant association with occupation (Vongkhamdy, 1989; Salaemsak et. al., 2002). An analysis of the 2003 Nigerian DHS indicates that the odds of not being fully immunised significantly increased when mothers belonged to clerical, sales, services and skilled manual occupation groups when compared to those belonging to professional, technical and managerial occupation groups (Antai, 2009). There was however a significant relationship between complete immunization and mothers' occupation in other studies (Salaemsak et. al., 2002; Budisuhardja, 1995).

With respect to socio-economic status, higher rate of complete immunization was found in high income groups with statistical significance between income and immunization received (Vongkhamdy, 1989). Another study also found out that there was no significant relationship between complete immunization and socio-economic status (Salaemsak et. al., 2002). According to Gwatkin et. al., 2007 full immunisation coverage rates amongst the poorest 20% of societies in developing countries have been documented to be lower when compared to the richest 20%.

In New Juaben Municipal, there are four main ethnic groups: Akan, Ewe, and Ga-Adangbe in the region (Municipal profile, 2008). Disparities can also be expected among ethnic groups in receiving immunization services owing to differences in access, information and cultural norms. Sociocultural background of children and geographical locations they live in are important predictors of child immunization in Nepal (Pradhan et. al., 2005).

2.5 KNOWLEDGE AND SOURCE OF INFORMATION ON EPI

Education is known to provide people with the knowledge and skills to lead a quality life. It is speculated that literates due to their knowledge levels are more likely to encourage immunization and studies done in other places have confirmed that educational level of mothers do influence the attendance for immunization (Cufts et. al.,1992; Angelillo et. al., 1999). Another study by Bonsu, 2005 in the Techiman district of Ghana also showed that knowledge of the schedules of the antigens was high among the literates and that there is an increased percentage of a child being immunized if parents are well educated about the schedule of EPI. A study in Oyo state, Nigeria showed that there was a high level of knowledge about immunization, the diseases prevented and the side effects (Oyerinde, 1999). One of the reasons found to be responsible for mothers failing to complete their child's or their own vaccination was lack of knowledge of vaccine preventable diseases (Zimicki et. al., 1994). A study in Burkina Faso in the early 1990s showed that mothers who had been exposed to a variety of interpersonal and media messages were more likely to know the requirements to complete vaccination schedule and know the dates for specific vaccines than mothers in the control group (Bhattacharyya et. al., 1994).

2.6 OTHER RELATED FACTORS

EPI utilization has also been linked with certain factors such as client satisfaction, place of vaccination, distance from place of vaccination and time taken to get to the place. A study by Cufts et. al., 1992 found an association between factors such as provision of health services

and side effects from vaccines. A study by Bechler et. al., 1974 revealed that the length of time needed to get to the health facility affected immunization in rural Ghana. Another study found out that unsuitable facility, transportation problems and long waiting periods had an adverse effect on immunization (Bonsu et. al., 2005). More than a third of mothers in a survey conducted in six states in Nigeria claimed distance/access as a problem (Babalola et. al., 2005). Studies by Jamil et. al., 1999; Acharya et. al., 2001; Cui et. al., 2007 also reported that short distance to immunization site enhanced immunisation coverage.

A study by Masaharu et. al., 2007 showed that an influential factor on full immunization of a child was distance from the immunization centre; however, the place to get immunization (outreach site or health facility) and means of access to immunization site were not associated with immunization status. Studies in Bangladesh, Nepal, and China also reported the benefits of short distance to immunization site for coverage (Jamil et. al., 1999; Acharya et. al., 2001; Cui et. al., 2007). Bishalet et. al., 2002 also reported outreach services can reduce socioeconomic differentials in vaccine receipt. In Senegal 71% of children who completed vaccinations on schedule lived less than 10 km from the nearest health centre, while in remote communities only 10% of children were completely vaccinated (WHO, 2009).

2.7 THE IMPLEMENTATION OF EPI

2.7.1 TECHNOLOGY - EXPANDED PROGRAMME ON IMMUNIZATION

In the New Juaben Municipality, immunization is done at the Reproductive and Child Health Centres (RCHs), health centres or Community Based Health Planning Service (CHPS) facilities. The following strategies are employed by most facilities for the EPI implementation: The routine/systematic immunization strategy, The National Immunization Days (NIDs), mopping up immunization, and outreach immunization (MOH 2003).

Periodic limited and targeted mass campaigns in high-risk populations such as populations with poor EPI vaccination coverage; high incidence of cases or outbreaks of vaccine-preventable diseases; poor surveillance information etc. also help to cover up for the missed opportunities (WHO 2006). The figure below shows the operations of EPI which include vaccine supply, logistics, surveillance and advocacy and communication are executed in line with the WHO.

Figure 5 Operations of Immunization Systems



Source: WHO, 2006.

EPI services have been decentralized to the district level where its operational activities are a component of an integrated package of health interventions provided by the District Health Management Teams (DHMT), the health providing institutions (public, private, and NGO), and the Sub district Health Teams. Funding for EPI is mainly from GAVI, Government of Ghana and other sources such as Pan American Health Organization, UNICEF, World Bank and Global Fund for Children's Vaccines (GF). Even the best designed and carefully implemented communication interventions in support of immunization will deliver few results if not properly funded (Waisbord et. al., 2005). EPI service delivery is actually done by the Sub district Health Teams, consisting largely of Community Health Nurses, Field Technicians, Midwives, and Public Health Nurses with the inclusion of volunteers. The

system in Ghana is in line with the WHO's operational definition (WHO, 2006) and consists of the Operational Components (Immunization Service, Vaccine Management, Logistics, Surveillance of Vaccine Preventable Infections, and Advocacy and Social Mobilization) and the supportive components (Management, Capacity building and Financing) of immunisation services.

The specific strategies for providing better quality immunisation services in health facilities and during outreaches include: implementation of national EPI policies and standards, implementation and monitoring of national injection safety policies and standards, improvement in technical and communication skills of immunisation service providers, improvement in motivation of immunisation service providers, implementation of locally appropriate approaches for improving client satisfaction (e.g., changing service delivery times to suit the community, decreasing immunisation session waiting times, etc.), information, education and communication about immunisation targeting mothers, tracking of defaulters, monitoring of adverse events associated with vaccination and monitoring vaccine potency. The specific strategies for improving EPI Programme efficiency at the sub-district and district levels include improving vaccine management (starting with bundling of syringes and needles, use of open vial policy), maintenance of an up-to-date cold chain inventory, preventive maintenance and repair of cold chain equipment, improvement in transport availability and management, strengthening data management and reduction of missed opportunities (e.g. by the provision of daily immunisations services) (WHO, 2003).

2.7.2 INPUT

2.7.2.1 PUBLIC EDUCATION

Immunization programmes use numerous communication channels to reach parents and other target audiences, from radio and television, to folk media, community events to counselling at

health facilities. Communication experts have found that the best channels for reaching rural people are health workers, local leaders and groups, and, in some cases, radio. It is generally not very effective to use print materials with low-literacy populations or mass media for those with little access to television and other mass media. Generally, parents perceive health workers as a credible source of information about health (Srinivasan, 1993). The real value of interventions would not be realized unless there is intensive public education to enlighten the target group on the benefits of the interventions, how and where to access these interventions. Cultural and social factors are barriers that prevent people from using health services and hence accessing these health interventions. One of these factors is lack of knowledge about health services. A cross-sectional survey on knowledge, attitude and practices (KAPs) conducted in 1996 showed how little knowledge the population has of efficient interventions (Wyss et. al., 1996) whilst another study showed a high knowledge level among respondents (Bonsu et. al., 2005). Community access to information can have a substantial impact on whether care-givers seek appropriate health care for themselves and their children when ill (WHO, 2003). Encouraging good health promotional activities in the district will help increase the coverage of EPI and there is also the need to develop appropriate health educational materials, which will be understood by the illiterate community. The use of drama, folksongs and traditional ways of educating the populace will be helpful (Bonsu et. al., 2005; UNICEF, 2004b).

2.7.2.2 INFRASTRUCTURE AND LOGISTIC DEVELOPMENT

The success of these interventions can only be realized if the right structures and resources needed are available. A major strategy that the MOHs has pursued has been increasing access to health care through the rehabilitation of the more than 400 health facilities damaged as a result of the civil-war, construction of new facilities at strategic locations and equipping health facilities (GHS, 2003). Logistics such as drugs, needles, disinfectants, vaccines,

equipment, immunization cards and other resources needed for the daily management of these health facilities in the implementation of the interventions should be made available. Strengthening the management of the national essential drug through increased availability, and greater rational use of effective, safe and affordable drugs would help in ensuring better success of these interventions. There is a direct relationship between infrastructure support and health worker performance and, presumably programme performance (Armstrong et. al., 2004). Another study by Chantawong, 2001 concluded that resources did not have any significant relationship with the effectiveness of programme implementation. In general, low coverage of child health interventions among poor or marginalized population groups is observed in many countries in Africa. The resulting inequalities in access to child health services may perpetuate inequalities in child survival. Redirecting resources allocation for child survival interventions towards underserved populations and remote and isolated communities may thus benefit poor children (WHO, 2003).

The 'cold chain' is an essential aspect of resources for the implementation of EPI. It is a system of storing and transporting the vaccines at recommended temperatures from the point of manufacture to the point of use. There is also a concept called 'reverse cold chain', which is a system of storing and transporting samples at recommended temperatures from the point of collection to the laboratory. The role of the cold chain is to maintain the potency of vaccines. The essential elements include personnel to manage vaccine distribution, equipment for vaccine storage & transport, maintenance of equipment and monitoring. The equipment included in the so-called 'cold chain' is expected to provide 'EPI standard' vaccine storage. The capacity needs to provide for transport and storage of all vaccines required for routine immunization. The cold chain is also expected to provide for the needs related to various supplementary immunization activities at any given time (WHO, 2001).

2.7.2.3 HUMAN RESOURCES DEVELOPMENT AND REMUNERATION

In appointing health workers to man these infrastructures they should have the required qualifications for the job or job training. The health workers selected for training have the appropriate level of education, maturity, language skills, and experiences needed to learn and apply the essential skills (Harmon, 1996). In service training, continuing education has been shown to be helpful in enhancing the health workers' performance. A previous paper describing health workers in Ghana reported that continuing professional education is required to ensure homogenous provision of appropriate quality of services that is training of staff to identify problems and develop solutions to help in the effectiveness of these health interventions (Aiga et. al., 2006). This creates awareness of local problems and empowers the health workers to develop initiatives for change (Akashi et. al.; 2004, Onyango-Ouma et. al., 2001). Ongoing training is needed to maintain and update skills and knowledge and to prevent health practices from becoming inconsistent (Nsubuga 2002). Health workers should be encouraged to use sources of current knowledge such as internet and they should be taught on how to access them (El Zein et. al., 1998). Health workers are motivated by a feeling of having responsibilities and working in a team environment where reliance on each other and differences are dealt with in a team spirit, and by feelings of professional and financial achievement and health workers seeing themselves as agents of change goes a long way in improving their output (Lewin et. al., 2005).

Special training focused and based systematically on the individual health intervention and also key training gaps should be identified and expanded training given to health workers in such areas. Health workers should be trained on currently used national and international policies and guidelines in key child health areas such as management of the sick newborn, IMCI and newborn resuscitation (GHS, 2007). Salaries for health workers often are delayed

and provide inadequate compensation for the work and time involved (Ruck et. al., 1999). In Nigeria, delay or non-payment of salaries and drug stock-outs caused a decline in staff motivation over time, with a negative influence on performance (Akashi et. al., 2004). This may also cause health workers to involve in private practice to increase their income (Ferrinho et. al., 1998).

Quality child health services require adequate supervision and in-service training for providers. Supportive management practices for child health care providers were considered to be routinely provided by the facility if at least half of the interviewed providers had been personally supervised during the past 6 months and had received in-service training during the past 12 months (GSPA 2002). Training health workers in this strategy has led to improved performance in Tanzania, Bangladesh and elsewhere (Armstrong et. al., 2004). The training of health staff is one of the key strategies of addressing these challenges confronting the improvement of the quality and access to EPI services. Training would improve the local management of EPI services at all levels, strengthen the planning and implementation of IEC and social mobilization activities, and consequently improve the demand for EPI services and community participation (WHO 2001). A Knowledgeable staff is most likely to offer quality service to target community members.

2.7.2.4 IMPROVED LEADERSHIP AND GOVERNANCE/ EFFECTIVE ADMINISTRATION AND MONITORING

Policies and strategies made by Government also help in improving and enhancing the efficiency of these health interventions. Such policies should be used to guide development of child health intervention and help in developing interventions more effectively. The quality of child care at outpatient facilities and outcome of the various interventions have to be used to frequently monitor these programmes to ensure that they are achieving the necessary outputs. Good administration of these health interventions coupled with good monitoring help

in increasing the success of the programme. The provision of appropriate supportive supervision is also critical for an effective and efficient programme. Health administrators and planners at regional and district level are not adequately involved in drawing up of budgets by Government and in most cases are insufficient for running of these health facilities (GHS 2003). To also enable the smooth running of EPI services in the various districts, strengthening the capacity of the District Health Management Teams to undertake situational analysis, problem identification and analysis, planning, implementing and evaluating their work would be of great help (GHS, 2002). A study by Tobwongsri, 1997 indicated that administrative factors had no relationship on the performance of EPI. Another study by Ngimhaung, 1999 showed that managerial process had significant relations to the effectiveness of health centres.

2.7.2.5 ENCOURAGING COMMUNITY AND FAMILY INVOLVEMENT

Health interventions when implemented with community participation and tuned to meet the cultural and social context of the community are more successful (Scott. 2001). A substantial number of children worldwide do not complete immunization schedules because neither health services nor conventional communication mechanisms regularly reach their communities (GAO, 1999). In some communities, low immunization rates are associated with families living a long distance from health services, having little access or exposure to large-scale or local media, and low doctor- and nurse-patient ratios (e.g., slum-dwellers in the Philippines and South Africa, nomadic populations in Sub-Saharan Africa, and internal migrants in Brazil, Cameroon, and Mozambique) (Waisbord et. al., 2004). Community involvement could also be improved through social mobilization and advocacy. Social mobilization aims at gaining and maintaining the involvement of a broad range of groups and sectors; for example, by holding a series of meetings with representatives of private companies, other government agencies, and NGOs to discuss how they can support polio

eradication as well as routine immunization. Social mobilization also includes mobilizing the public to participate in immunization activities. Advocacy focuses on gaining and maintaining the support of political leaders, opinion leaders, and other decision-makers (UNICEF and WHO, 2000). Communication with religious and political leaders is essential to increase acceptance of immunization (UNICEF 2004a) and it has been credited with increasing the acceptance of immunization campaigns in India (Das et. al., 2003, Verma et al., 2004). In another study, communication interventions that included advocacy with leaders, community involvement with service delivery and child tracking, and media partnerships at various levels were responsible for dropout reduction and immunization coverage above the national average in two provinces in Madagascar in 2003 (Shimp, 2004). Communication provided significant support to diphtheria immunization programmes in Russia in the mid-1990s, following outbreaks after a significant drop in DPT coverage (Porter et. al., 2000). Studies have documented several successful experiences including the work of the Catholic Church in Angola and the Philippines; community mobilization in rural districts in Ethiopia, Ghana, and Madagascar; the programmes of Urban Volunteers in Bangladesh and school children in Indonesia; and the network of motivators in Zimbabwe (Awoonor-Williams, 2003; Kidane et. al., 2003; Streatfield et. al., 1988; Waisbord 2003).

2.7.2.6 INJECTION SAFETY

The World Health Organization defines safe injection as an injection that: does not harm the recipient, does not expose the health care worker to any avoidable risks and does not result in waste that is dangerous to the community (Lloyd, 2001). Unsafe injections can result in transmission of some diseases. Poor injection techniques can also cause abscesses and lymphadenitis (Children's Vaccine Programme, 2000). Improved equipment, such as auto-disable (A-D) syringes and safety boxes, has helped, but changes are required in human behaviour and in the health system. There is therefore the need for provision of appropriate

injection equipment and infection control supplies coupled with proper management of waste (WHO, 2003).

2.7.3 EXPECTED OUTCOMES

Proper implementation of these inputs are expected to result in strengthened public health infrastructure/capacity at the community level to prevent disease and address the health needs of populations in selected countries, increased EPI coverage and hence reduced under-five mortality.

2.7.3.1 INDICATORS FOR ASSESSING OUTCOME

Some health policy indicators used in assessing EPI include political commitment, adequate allocation of resources, community involvement and improved organizational and surveillance systems. These could be coupled with provision of health indicators such as availability, increased utilization of services and improved quality of care. Level of health literacy and service availability in the community could also be used as health care coverage indicators (Week et. al., 2002).

Managers also use indicators to assess quality, efficiency, effort, and impact. Some examples are given below:

Table 5 Various indicators and their meanings

Indicator	What it may indicate
Number of immunization sessions that are actually held compared to the number planned	Quality of programme management
Supply of unexpired vaccines	Effectiveness of vaccine procurement, delivery, and management
Vaccine usage	Effectiveness of fixed and outreach session scheduling, vaccination administration, and vaccine handling
Temperature monitoring of cold chain equipment	Quality of cold chain management
Updated inventory of refrigeration equipment at national, subnational, and district levels; monthly reporting at district level on status of equipment	Quality of cold chain management
Use of a sterile syringe and needle for each injection	Quality of injection practices
Disease incidence	Impact of immunization services
Parents' knowledge of common side effects and when to return for additional vaccinations	Quality of communication between parents and health workers

Source: WHO immunization essentials, 2006

High drop-out rates may reflect problems in demand for vaccinations, client satisfaction with services, and the ability of the immunization programme to provide those services. In a study by Masaharu et. al., 2007 in Lao PDR found a high drop - out rate of about 20% and shows poor utilisation but a study by Bonsu et. al., 2005 showed a penta 1-penta 3 drop- out rate and

penta 1- measles drop-out rate less than 10% which indicated good utilisation of the EPI service.

2.7.3.2 SURVEILLANCE

Disease surveillance is the collection, analysis, and interpretation of data to determine disease trends and patterns. Disease surveillance provides information such as: disease incidence, morbidity, and mortality, and progress in achieving disease control goals, changes in patterns of morbidity and mortality among different age groups in different geographical areas and among different economic, social, or cultural groups and the Impact of immunization strategies on disease incidence (An Integrated Approach to Communicable Disease Surveillance, 2000). Passive surveillance is defined as the process of detecting and reporting information on diseases that patients report with at the health facility. Since many sick people do not visit health facility and hence passive surveillance yields only limited data, at times the cases that report are not correctly recorded or classified. Active surveillance which involves visiting health facilities and communities to seek out cases can be used to enhance the completeness of passive surveillance (Community Surveillance Kit, 2001). A study in Ghana showed that the present surveillance system is inadequate and is crippled with lateness and many other lapses. It is also not robust enough to identify any of the target diseases should it occur. Majority of clinical staff and community volunteers do not report clinical cases identified and this could occur without it being noticed (Bonsu et. al., 2005).

2.8 CHALLENGES IN THE IMPLEMENTATION OF THE EPI PROGRAMME

The effectiveness of EPI usually depends on having adequate logistics; good knowledge of immunization for both caregivers and health personnel; good community participation in both the planning and monitoring of vaccination services; stringent cold chain monitoring and management; and also high level of injection safety practices with good surveillance of the target diseases (Bonsu et. al., 2005). Some of the challenges encountered by the EPI

operation in Ghana include geographical access to immunization services, uncertain denominator or poor data quality, inadequate knowledge of both health workers and staff on vaccine policies, insufficient health education/lack of awareness of carers on vaccination schedule, misconceptions regarding vaccines e.g. use in sick child, inadequate understanding and insufficient demand for immunization by families and communities, inadequate health staff to provide services to very large and scattered communities, inconsistent and inadequate performance by health workers and insufficient allocation and delayed financial support for immunization services (MOH, 2002).

2.9 CONCLUSION

The literature present a concise description of the EPI programme and some methods of evaluation for the programme .The whole programme of EPI would be assessed under the following headings; the technology; the inputs and the outcomes and hopefully provide information on which standards to maintain and which standards to focus on increasing to ensure and maintain good coverage of the vaccines.

CHAPTER THREE

METHODOLOGY

3.0 INTRODUCTION

This chapter is concerned primarily with research methodology employed in this study.

3.1 STUDY TYPE AND DESIGN

The study was a retrospective evaluation using the Flashlight Triad Evaluation Model (FTEM). It applied the use of structured questionnaires with caregivers with children below five years as well as key health providers involved with the Expanded Programme on Immunization and its components. An evaluation of the health centres providing these services was done using the components of the FTE model aided by an observational study using checklist from May to November 2010.

3.2 STUDY SITE/AREA

The study was undertaken in the New Juaben Municipality over a period of three months. New Juaben is the administrative capital of the Eastern Region, and has an estimated population of 157,168. It covers a land size of 110.0 square kilometers with a population density of 1,507. The municipality shares boundaries on the North, East Akim district, on the south with Akwapim North, Yilo Krobo district on the east and Suhum Kraboa Coaltar district on the west. It lies between latitude 60⁰N and 70⁰N. The municipality has been demarcated into eight (8) sub-municipalities with 150 communities. There are a number of ethnic groups in the municipality. The major ethnic group is Akan. Other ethnic groups found in significant numbers in the municipality are the Ga-Adangbes, Ewes and the Northern group (from both within and outside Ghana). The common language spoken is Twi. The Municipal's under five population is divided by ages as follows: Children 0 – 11 months -

6,287; Children 12 – 23 months -4,244; and Children 24 – 59 months - 13,831 and constitute 20% of the total population. The WIFA population is 23.1% of the total population (36,306). The inhabitants seek health services through the following network of health facilities: Regional hospital (1), mission hospital(1), health centres (2), private clinics (11), private maternity homes (3), RCH centres (10), trained TBAs (80), CHPS centres (6) and chemical shops (70). The municipal has the following human resources strength: Nurses (387), Doctors (public sector - 56), Doctors (private sector - 6), Pharmacists (public sector - 5), Pharmacists (private sector - (8), Nurses Midwives (public - (368), Nurses Midwives (private - 6), Trained TBAs (78).

3.3 STUDY POPULATION

The study population included all caregivers with children less than five years in the municipality who consented to participate in the study. The inclusion criterion was location within the municipality and consenting to be part of the study. The exclusion criterion was location outside the municipality. Health personnel involved in the execution of the EPI were also interviewed in the assessment of the EPI service in the Municipality.

3.4 SAMPLING

3.4.1 SAMPLE SIZE

Total sample size of caregivers was calculated using the proportion of children under five years as a sampling frame. In each sub-district, systematic sampling (using A sample interval of six was calculated by the formula $k = \text{average population size per sub district} / \text{sample size}$) was employed to select caregivers with children below five years in each sub district with caregivers being selected from every sixth house starting from the point of entry into the community. The health workers who see children were selected purposively. Those selected included the head of the facilities, disease control officers and others from the public health

nurses, midwives and auxiliary staff. Total number of sample size was calculated using Cochran's sample size formula which is in two steps. For populations that are large, Cochran (1963:75) developed the Equation below to yield a representative sample.

$$\text{Equation 1:} \quad n_0 = \frac{Z^2 pq}{e^2}$$

Equation 1

Which is valid where n_0 is the sample size, Z^2 is the abscissa of the normal curve that cuts off an area at the tails ($1 - \alpha$ equals the desired confidence level, e.g., 95%), e is the desired level of precision, p is the estimated proportion of an attribute that is present in the population, and q is $1-p$. The value for Z is found in statistical tables which contain the area under the normal curve.

If the population is small then the sample size can be reduced slightly. This is because a given sample size provides proportionately more information for a small population than for a large population. The sample size (n_0) can be adjusted using Equation 2 below.

$$\text{Equation 2:} \quad n = \frac{n_0}{1 + \frac{(n_0 - 1)}{N}}$$

Equation 2

Where n is the sample size and N is the population size. Sample size determined was 380 respondents for the study and 30% was added to cater for non-response and errors in sample variability to bring the total number of respondents to 500.

3.4.2 SAMPLING METHOD

A total of 500 questionnaires were administered to male and female caregivers with children less than five years of age living in communities in the sub-districts (and who were not health staff). In the selection of caregivers to administer questionnaire to, systematic sampling was used. The list of caregivers of children under five was compiled using the list from the Community based surveillance volunteers. A sample interval of six was calculated by the formula $k = \text{sample size} / \text{average population size per sub district}$. After open contacts with the study communities done: visiting the chief's palace, assembly men and also attending various community Durbars, the first house from the health centre was identified using the grid method and a caregiver was selected from that house and after that, caregivers from each sixth house was interviewed. Health service providers were selected purposively and interviewed for assessment of health facilities and the intervention. In all 40 questionnaires were administered to staff of 10 facilities which included district hospitals, CWCs, and sub-district clinics that treat or care for children. The Managers and Disease Control Officers of these facilities were also interviewed.

3.5 DATA COLLECTION TECHNIQUES

All data collection instruments were developed, pretested and finalized prior to their usage in the field. Pretesting was done in the Suhum with a sample size of 50 and then the data collections tools were re-analyzed and drawn up to suit the requirements of the Municipality. Five field assistants were identified and trained by the principal investigator for two days on how to administer the various questionnaires. The training for research assistants was done at the Municipal Health Directorate in Koforidua and they were supervised by the principal

investigator. Both primary and secondary data were collected and used in the study. The secondary data was collected from relevant existing literature, reports, presentations both published and unpublished. Primary data collection involved the use of both qualitative and quantitative tools.

The following approaches were used: Household survey among mothers with children 1 – 2 years, facility inventories, facility record review, health worker interview and observation of client provider interactions. The quantitative data collection involved the use of structured questionnaires for Household survey among mothers with children 1 – 2 years and health personnel interviews. Data on immunization were obtained from health cards and in cases where health cards were not available, verbal reports of vaccination details were accepted from mothers. The qualitative data collection involved observation of client provider interactions with the researcher being a complete observer, facility inventories and facility record review. Structured questionnaire were administered to the health personnel and a checklist and facility survey was used to determine the activities being done and its quality and also determine the logistics available to each facility and if they met the required standards. The details of data collection for the study are shown below:

Table 6: Details of Data Collection

LEVEL	OBJECTIVE	METHOD/TOOL	RESPONDENT
FACILITY	2,3	Logistic inventory Record review In depth interview Questionnaire administration Complete participant observation	Service providers In-charges, health workers Client-provider interactions
COMMUNITY	1,3	Questionnaire Administration	Mothers/ Fathers

Source: Field Work, 2010.

3.6 DATA MANAGEMENT AND ANALYSIS

An analysis of the association between immunization status (which is defined by completeness of the immunization series for age) and various socio-demographic variables, knowledge of caregivers and other related factors such as time spent to get to facility, time spent at the facility and satisfaction of caregiver were performed. Analysis of health workers demographics and knowledge was performed to ascertain if there was an association between them.

The type of health Facility was considered as an input and analysis was done to assess whether there was an association between the health Worker Demographics and other related Characteristics.

A brief description of the observation of client – provider interactions has also been documented.

Logistic regression was performed to assess the independent effect of socio-demographic variables, knowledge of caregivers and other related factors such as time spent to get to facility, time spent at the facility and satisfaction of caregiver on the immunization status.

Variables showing significant statistical association in the bivariate analysis were included in the multivariate analysis.

3.7 STUDY VARIABLES

The study variables used in the study are summarized in the table below

Table 7 Study variables

Objectives	Dependent variables	Independent variable	Source of data	Scale of measurement	Indicators	Statistical analysis/software
To describe socio-demographic characteristic, knowledge and source of information on EPI in the NJ Municipality	Practice of EPI	Knowledge of mothers about EPI Age Education Religion Occupation Number of children	caregivers	nominal	Percentage practicing EPI, successful completion of schedule for age, etc	Descriptive, logistic regression, bi- variate and multiple variate analysis
To assess the inputs for the HS-interventions	inputs for the HS-interventions	Motivation, supply chain, Training of staff, health education, Cold chain Surveillance Logistics etc	Literature, health staff, etc	Categorical; Human Materials, financial, time, etc; Ratios, qty, quality, etc	Ratio of health staff-clients, qty in numbers, regularity of supplies, storage facilities	Descriptive; proportions, frequencies(numbers), etc
To relate inputs to outputs (targets)	Health outcomes	Training , health education, motivation, compliance, supply chain	Caregivers, health staff, literature	Ordinal	% decrease in mortality and morbidity	Descriptive , freq, ratios, %, etc Indicators of immunization coverage

Source: Author's construct, 2010.

3.8 LIMITATIONS

The various ethnic groups in the municipality had diverse languages they spoke so language was a barrier and there was difficulty in the interpretation of the questions to some of the respondents. Language therefore presented itself as a barrier therefore some of the answers were lost in translation. Resources for the study were limited. Due to the size of the Municipality few communities were difficult to access due to distance and poor road network to these areas and were not included in the sample frame.

3.9 ETHICAL CONSIDERATIONS

Community entry protocols were strictly enforced. The assembly man or local leader in each area was contacted and the study explained to him before seeking permission to carry out the study in the various communities. Administrative clearance was sought from the Department of Community Health, College of Health Sciences, and KNUST. In addition, the research protocol was cleared by the Committee for Human Research Publication and Ethics of KNUST/KATH. Consenting process involved selection of study participants, followed by explanation of the aims of the study, the risk and benefits associated with the study and ways to minimise risks, assurance of confidentiality, anonymity and social justices. Consented study participants signed informed consent in the presence of witnesses and copies kept by the research team. Study participants were provided with identification numbers and no response were linked to any study participant. All information collected have been put under lock and key.

3.10 QUALITY CONTROL

As part of the quality control measures to ensure that quality and reliable information were obtained, the following actions were undertaken to handle the data.

- Pretesting
- Data gathered were checked to ascertain its completeness and accuracy.

- The questionnaires were numbered before storage.
- The place and the person responsible for the storing the data were also determined
- The data was stored on a computer with backups made.

3.11 ASSUMPTIONS AND THEIR EFFECTS ON FINDINGS

- That all respondents understood the questions and objectives of the questionnaires and hence the answers were a true reflection of their knowledge.
- That the service provision by providers of intervention was ideal
- That the results of the study hold true for the entire area, despite the small size of the study population.
- That all the quality control measures were strictly adhered to during the administration of the questionnaires.
- That the sampled population was representative of the study population.
- That a comprehensive list of all issues or elements confronting or feeding into the problem have been identified.
- That the most crucial issues affecting caregivers and mothers assessing this EPI intervention were identified.
- That the most crucial issue that affected health providers so that optimal care was not given to clients was identified.

CHAPTER FOUR

RESULTS

4.0 INTRODUCTION

This study has the principal aim of evaluating EPI in the New Juaben Municipal using the flashlight triad model. The findings are presented as follows:

- Socio-demographic characteristics
- Caregivers' knowledge
- Other related factors
- Health workers characteristics
- Implementation of EPI
 - EPI technology
 - Inputs for EPI
 - Expected outcomes
- Challenges to EPI

4.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS

The socio-demographic characteristics investigated were age of child, sex of child and mother, number of children in the family, number of children under-five, marital status, religion, education, and occupation, ethnicity and socio-economic status and is shown in details in table 4.1 on the next page.

Table 4.1 Socio-Demographic Characteristics of Caregivers/Mothers**N=500**

Background information	Frequency	Percentage (%)
Gender of child		
Male	258	51.60
Female	242	48.40
Caregivers' Gender		
male	48	9.6
female	452	90.4
Marital status		
Married	378	75.6
Single	92	18.4
Widow/divorced/separated	24	4.8
Cohabiting	6	1.2
No of children		
1	148	29.60
2	178	35.60
3	100	20.00
4 and above	74	14.80

Age (Months)

Below 2	86	17.20
2-4	104	20.80
5-7	110	22.00
8-10	92	18.40
Above 10	108	21.60

Educational level

None	42	8.4
Primary	164	32.8
JSS	152	30.4
Secondary	86	17.2
Tertiary	56	11.2

Religion

Christian	346	69.20
Moslem	154	30.80

Occupation

Trading	238	47.60
Farming	46	9.20
Students	15	3.00
Civil servant	30	6.00
Professional	55	11.00
Artisans	30	6.00

Business men	18	3.6
Unemployed	68	13.6

Ethnicity

Akan	210	42
Ewe	82	16.4
Ga/Adangbe	50	10.00
Northern	60	12.00
Foreign nationals (others)	98	19.6

Economic status

Very low	26	5.20
Low	94	18.80
Medium	328	65.60
High	52	10.40

Source: Field work, 2010

Considering the gender of the children there was a slight male predominance (male-51.6%; female-48.4%). For the age of the children they were mostly below 10 months (78.4%) and 21.6% below 10 months with the distribution shown in table 4.1.

The caregivers were predominantly female (90.4%) and majority were married (75.6%). Majority of the caregivers' family had less than three children (65.2%) and 34.8% had more than three children with their distribution in the table 4.1 below. Most of the caregivers attended school up to primary (32.8%) or JSS (30.4%) with a small percentage of 8.4 not

having had any education at all. The caregivers were predominantly Christians (69.2%) with the others (30.8%) being Moslems. The major occupation of the caregivers was trading (47.6%) with a few being students (3%). For their ethnicity they were mostly Akans (42%) with a small percentage belonging to the Ga/ Adangme ethnic group. The economic status of the caregivers was mostly medium (65.6%) and a percentage of 5.2 were in the very low economic status.

Univariate analysis of the socio-demographic factors against immunization status showed a significant statistical relationship between immunization status and the number of children, age of child, educational status of caregivers, occupation, and ethnicity as in Table 4.2.

Table 4.2 Cross tabulation of Immunization Status with Socio demographic

Characteristics N=500

Variable	Incomplete for age(%)	Complete for Age (%)	Total (%)	Pearson chi - square (P – value)
Sex of child				
Female	84 (44.7)	174 (55.8)	258 (51.6)	(P=0.016)
Male	104 (55.3)	138 (55.3)	242 (48.4)	
Sex of caregiver				
Female	176 (93.6)	276 (88.5)	452 (90.4)	5.7754
Male	12 (6.4)	36 (11.5)	48 (9.6)	(P=0.058)

Marital status

Married	136 (72.3)	242 (77.6)	378 (75.6)	1.7353
single	52 (27.7)	70 (22.4)	122 (24.4)	(P=0.188)

No of children

1	34 (18.1)	114 (36.5)	148 (29.6)	20.5269
2	78 (41.5)	100 (32.1)	178 (35.6)	(P<0.001)
3	40 (21.3)	60 (19.2)	100 (20.0)	
4 and above	36 (19.5)	38 (12.2)	74 (14.8)	

Age (Months)

Below 2	26 (13.8)	60 (19.2)	86 (17.2)	36.8262
2-4	24 (12.8)	80 (25.6)	104 (20.8)	(p<0.001)
5-7	34 (18.1)	76 (24.4)	110 (22.0)	
8-10	56 (29.8)	36 (11.5)	92 (18.4)	
Above 10	48 (25.5)	60 (19.2)	108(21.6)	

Education

None	12 (6.4)	30 (9.7)	42 (8.4)	10.3084
Basic	166 (88.3)	236 (75.6)	402 (80.4)	(P=0.006)
Tertiary	10 (5.3)	46 (14.7)	56 (11.2)	

Religion

Christianity	130 (69.1)	216 (69.2)	346 (69.2)	0.0004
Moslem	58 (30.9)	96 (30.8)	154 (30.8)	(p=0.985)

Occupation

Trader	106 (56.4)	132 (42.3)	238 (47.6)	20.6574
Farmer	20 (10.6)	26 (8.3)	46 (9.2)	(P<0.001)
Other	34 (18.1)	114 (36.5)	148 (29.6)	
Unemployed	28 (14.9)	40 (12.8)	68 (13.6)	

Ethnicity

Akan	100 (53.2)	110 (35.3)	210 (42)	40.8829 (P<0.001)
Ewe	30 (16.0)	52 (16.7)	82 (16.4)	
Ga/Adangme	28 (14.9)	22 (7.1)	50 (10.0)	
Northern	8 (4.3)	52 (16.7)	60 (12.0)	
Foreign	22 (11.7)	76 (24.4)	98 (19.6)	
nationals/Others				

Socioeconomic**Status**

Very low	12 (6.4)	14 (4.5)	26 (5.2)	3.1498
Low	36 (19.2)	58 (18.9)	94 (18.8)	(p=0.369)
Medium	116 (61.7)	212 (68.0)	328 (65.6)	
High	24 (12.8)	28 (9.0)	52 (10.4)	

Total	188	312	500	
--------------	-----	-----	-----	--

Source: Field work, 2010

Logistic Regression analysis results is shown in table 4.3, the significant factors from the chi-square analysis were used.

Table 4.3 Results from logistic regression analysis N=500

Background information	Odds ratio	95% confidence interval	
		Lower limit	Upper limit
No of children			
1	1.00		
2	0.38	0.23	0.62
3	0.44	0.25	0.78
4 and above	0.31	0.17	0.57
Age (Months)			
0 - 2	1.00		
2 - 4	1.44	0.75	2.76
5 - 7	0.97	0.52	1.78
8 - 10	0.27	0.14	0.52
Above 10	0.54	0.30	0.98
Educational level			
None	1.00		
Basic	0.57	0.28	1.14
Tertiary	1.84	0.71	4.80
Occupation			
Traders	1.00		
Unemployed	1.15	0.66	1.98
Others	2.69	1.70	4.26
Farmers	1.04	0.55	1.97

Ethnicity

Akan	1.00		
Ewe	1.58	0.93	2.66
Ga/Adangme	0.71	0.38	1.32
Northern	5.91	2.67	13.05
Foreign nationals	3.14	1.82	5.43

Source: Fieldwork, 2010

The following independent variables - sex of child, sex of caregiver, marital status, religion and occupation included in the chi-square test failed to reach significance levels and were not included in the logistic regression. When compared with families with one child it was found out that an increasing number of children were associated with a decreasing likelihood of immunization series being completed. The odds of being fully immunized for age was significantly higher for the age group 2 to 4 months (OR=1.44) but declined after five months of age when compared to the age group 0-2 months. In comparison with caregivers without any education Caregivers who had attained tertiary educational level had increased odds (OR=1.84) of completing their child's immunization. When compared with children of Akan mothers, children of mothers of the Northern tribes had the highest odds of likelihood of completing immunization while those of foreign nationality also had a 3.14 chance of being immunized completely.

4.2 CAREGIVERS' KNOWLEDGE

The major source of information for the caregivers was the use of loudspeaker announcements (27.16%) while newspapers (3.29%) were a poor source of knowledge on EPI for them. It was interesting to note that 4.12% had not heard about EPI at all. The importance of immunization was known by most of the caregivers (90.4%). There was good knowledge of polio (46.4%), measles (26.0%) being prevented by immunization with none of

the caregivers knowing that vaccination prevents Haemophilus influenza B. The schedule for vaccination was also well known (90%). Majority (85.6%) of the caregivers knew the side effects of the vaccinations and how to handle them and the importance of the child welfare card was also known by 85.6% of the caregivers.

Table 4.4 Knowledge and source of information on EPI

N=500

Variables	Frequency	Percentage (%)
Source of Information		
Radio	64	13.2
Television	94	19.3
Loudspeaker	132	27.2
Public	66	13.6
Notice/Billboards	94	19.3
Health units	16	3.3
Newspapers	20	4.1
None		
Know the Importance of vaccination		
Correct	452	90.4
Incorrect	48	9.6

Diseases prevented by**vaccination**

Polio	232	46.4
Measles	130	26.0
Tetanus	48	9.6
Tuberculosis	24	4.8
Diphtheria	34	6.8
Yellow Fever	26	5.2
Hepatitis B	6	1.2
Haemophilus Influenza B	0	0

Know vaccination schedule

Yes	450	90
No	50	10

Knowledge of side effects of**vaccination**

Yes	464	92.8
No	28	7.2

Know the importance of the**child welfare card**

Yes	428	85.6
No	72	14.4

Source: Fieldwork, 2010.

The chi-square test for independence indicated significant associations at $p < 0.05$ between immunization status and knowledge of diseases prevented by vaccination, importance of vaccination and side effects of vaccination.

Table 4.5 Cross tabulation of immunization status with knowledge of caregivers

N=500

N-300

Variable	Incomplete (%)	Complete (%)	Total (%)	Pearson chi - square (P – value
Know the Use of child welfare card				
Yes	160 (85.1)	268 (85.9)	428 (85.6)	0.0596 (P=0.807)
No	28 (14.9)	44 (14.1)	72 (14.4)	
Diseases prevented by Vaccination:				
Polio	80 (42.6)	152 (48.7)	232 (46.4)	57.9414 (P<0.001)
Measles	54 (28.7)	76 (24.4)	130 (26.0)	
Tetanus	32 (17.0)	16 (5.1)	48 (9.6)	
Tuberculosis	0 (0)	24 (7.7)	24 (4.8)	
Diphtheria	4 (2.1)	30 (9.6)	34 (6.8)	
Yellow Fever	18 (9.6)	8 (2.6)	26 (5.2)	
Hepatitis B	0 (0)	4 (1.9)	6 (1.2)	
Haemophilus Influenza B	0 (0)	0(0)	0(0)	

Know vaccination**schedule**

Yes	172 (91.5)	278 (89.1)	450 (90.0)	0.7426
No	16 (8.5)	34 (10.9)	50 (10.0)	(P=0.389)

Knowledge of side effects**of vaccination**

Yes	122 (64.9)	244 (78.2)	366 (73.2)	10.5962
No	66 (35.1)	68 (21.8)	134 (26.8)	(P=0.001)

Know the importance of**the vaccination**

Yes	156 (83.0)	296 (94.9)	452 (90.4)	19.1201
No	32 (17.0)	16 (5.1)	48 (9.6)	0.001

Total	188	312	500	
--------------	-----	-----	-----	--

Source: Fieldwork, 2010.

Results from Logistic Regression Analysis indicated that not knowing the vaccination schedule did not affect the immunization completion for age. Caregivers who did not know the importance of vaccination were less likely to have their children completely immunized as compared to those who knew the importance of the vaccination with an OR of 0.26.

Table 4.6 Results from Logistic Regression Analysis

N=500

Knowledge	Odds Ratio	95% CI
Know the Use of child welfare card		
Yes	1.00	
No	0.94	0.56 - 1.57
Diseases prevented by Vaccination:		
Polio	1.00	
Measles	0.74	0.48 - 1.15
Tetanus	0.26	0.14 - 0.51
Tuberculosis	-	-
Diphtheria	3.95	1.34 - 11.60
Yellow Fever	0.23	0.10 - 0.56
Hepatitis B	-	-
Haemophilus Influenza B	-	-
Know vaccination schedule		
Yes	1.00	
No	1.31	0.70 - 2.45

Knowledge of side effects

of vaccination

Yes	1.00	
No	0.51	0.34 - 0.77

Know the importance of

the vaccination

Yes	1.00	
No	0.26	0.14 - 0.50

Source: Fieldwork, 2010.

4.3 OTHER RELATED FACTORS

The time taken to reach most of the immunization centres was less than one hour (95.2%) as shown in table 4.6 below with transport being either by foot (50.8%) or vehicle (49.2%). majority of the vaccination centres being RCHs (52%) and just a few being vaccinated at maternity homes. With 62% being satisfied with the services offered at the health centres and most caregivers (94.8%) spending less than two hours at the facilities.

Table 4.7 Cross tabulation of Immunization Status with Other Related Factors

N=500

Variable	Incomplete	Complete	Total	Pearson chi - square
	(%)	(%)	(%)	(P-value)

Time taken to get to

immunization centre

1 – 30 minutes	56 (29.8)	172 (55.1)	228 (45.6)	60.0904
31 – 60 minutes	108 (57.5)	140 (44.9)	248 (49.6)	(P<0.001)
Above 60 minutes	24 (12.8)	0 (0)	24 (4.8)	

Means of transport

By foot	102 (54.3)	152 (48.7)	254 (50.8)	1.4392
Vehicle	86 (45.7)	160 (51.3)	246 (49.2)	(P=0.230)

Place of vaccination

RCH	98 (52.2)	162 (51.9)	260 (52.0)	18.1044
CHPS	70 (37.2)	120 (38.5)	190 (38.0)	(P<0.001)
Maternity home	4 (2.1)	24 (7.7)	28 (5.6)	
other	16 (8.5)	6 (1.9)	22 (4.4)	

**Time spent at
vaccination centre**

Below 1 hour	82 (43.6)	176 (56.4)	258 (51.6)	9.7966
1 – 2 hours	98 (52.1)	118 (37.8)	216 (43.2)	(P=0.007)
More than 2 hours	8 (4.3)	18 (5.8)	26 (5.2)	

**Satisfaction with
service**

Yes	100 (53.2)	210 (67.3)	310 (62.0)	9.9221
No	88 (46.8)	102 (32.7)	190 (38.0)	(P=0.002)

Total	188	312	500	
--------------	------------	------------	------------	--

Source: Fieldwork, 2010.

Pearson Chi square analysis showed a significant statistical relation between immunization status and time taken to get to immunization, place of immunization, time spent at vaccination centre and satisfaction with the service provided.

When compared to caregivers who spend less than thirty minutes to get to the immunization centre those who spend more than thirty minutes to get to the centres have a decreased likelihood of completing the immunization of their children. Hence as time spent to get to the immunization centres increases the possibility of completing immunization decreases. The comparison of caregivers who were not satisfied with service offered at the facilities to those who were satisfied showed that they were less likely to complete the immunization of their children as shown in table 4.8.

Table 4.8 Results from Logistic Regression Analysis

N=500

Other related factors	Odds Ratio	95% CI
Time taken to get to immunization centre		
1 – 30 minutes	1.00	
31 – 60 minutes	0.42	0.29 - 0.62
Above 60 minutes	-	-
Means of transport		
By foot	1.00	
Vehicle	1.25	0.87 - 1.79

Place of vaccination	1.00	
RCH	1.04	0.70 - 1.53
CHPS	3.63	1.22 - 10.77
Maternity home	0.23	0.09 - 0.60
Other		

**Time spent at vaccination
centre**

Below 1 hour	1.00	
1 – 2 hours	0.56	0.39 - 0.82
More than 2 hours	1.05	0.44 - 2.51

Satisfaction with service

Yes	1.00	
No	0.55	0.80

Source: Fieldwork, 2010.

4.4 MULTIVARIATE ANALYSIS OF FACTORS FOUND TO BE ASSOCIATED WITH IMMUNIZATION STATUS

Table 4.9 presents results of multivariate logistic regression analysis of all covariates related to maternal and child demographics, knowledge of caregivers and some other related factors found to be statistically significant in logistic regression.

Compared with children of mothers with single parity, those with parity two or more were significantly less likely to be unvaccinated (OR=0.14, 95%CI: 0.17- 0.48) after accounting for the effect of other factors. When compared with children below two months, children aged 2-4 months were significantly more likely to complete their immunization series. In

comparison with caregivers without any education Caregivers who had attained tertiary educational level had increased odds of completing their child's immunization. When compared with children of Akan mothers, children of mothers of the Northern tribes had the highest odds of likelihood of completing immunization while those of foreign nationality also had a 3.95 chance of being immunized completely while taking the effects of the other covariates into consideration. The children of caregivers who did not know the importance of vaccination when compared to those who knew the importance of vaccination were significantly less likely to complete the vaccination series.

For time taken to reach the vaccination centre when compared to spending less than 30 minutes, mothers who spent more than 30 minutes to get to the site were significantly less likely to vaccinate children and complete vaccination schedule.

Table 4.9 Multivariate analysis – Care Givers

N=500

Background information	Model 1		Model 2		Model 3	
Background Information	OR	CI	OR	CI	OR	CI
No of Children						
1	1.00		1.00		1.00	
2 and above	0.72	0.60 – 0.86	0.52	0.42 – 0.65	0.38	0.29 – 0.51
Age (Months)						
Below 2	1.00		1.00		1.00	
above 2 months	0.81	0.73 – 0.90	0.82	0.73 – 0.93	0.80	0.69 – 0.92

Education	1.00		1.00		1.00	
None	1.27	0.93 – 1.73	0.90	0.62 – 1.28	0.96	0.63 – 1.46
Basic / tertiary						
Occupation						
Traders	1.00		1.00		1.00	
Others workers	1.20	1.06 – 1.35	1.27	1.07 – 1.51	1.49	1.22 – 1.82
Ethnicity						
Akan	1.00		1.00	1.00	1.00	
Other tribes	1.36	1.20 – 1.54	1.36	1.17 – 1.59	1.12	0.92 – 1.35
Knowledge						
Know the Importance of vaccination						
Correct			1.00		1.00	
Incorrect			0.22	0.11 – 0.43	0.19	0.09 – 0.42
Knowledge of side effects of vaccination						
Yes			1.00		1.00	
No			1.53	0.11 – 2.69	1.26	0.67 – 2.35
Other related factors						
Satisfaction with service						
Yes					1.00	
No					0.60	0.38 – 0.96

Place of vaccination	1.00	
RCH	0.84	0.64 – 1.12
other facilities		
Time spent at the vaccination centre		
Below 1 hr.	1.00	
More than 1 hr.	0.22	0.15 – 0.36
Time taken to get to immunization centre	1.00	
1 – 30 mins.	3.14	
Above 30 mins.		1.90 – 5.17

Source: Fieldwork, 2010

Model 1: N= 500, LR Chi2 (5) =72.60, p< 0.001, log likelihood = -294.74

Model 2: N=500, LR Chi2 (7) = 95.39, p<0.001, log likelihood = -283.34

Model 3 N=500, LR Chi2 (11) =164.42, p<0.001, log likelihood = -248.83

4.5 HEALTH WORKERS CHARACTERISTICS

4.5.1HEALTH WORKER DEMOGRAPHICS

Characteristics of health staff that are responsible for the EPI implementation in the New Juaben Municipality are presented in this section. Majority of the health workers were community health nurses (60%), midwives made up 30% while auxiliary workers such as orderlies and health aides made up 10%. Concerning their educational status they mostly had been to the tertiary level (90%) with the rest having ended at SSS level. There was an average working experience of 11.4 years with a standard deviation of 0.975. Health workers who had less than 10 years of work experience made up 30% of the total number, 11-20 years (35%), 21-30 years (25%) and above 30 years (10%). Majority of the health workers'

facilities worked in CHPS facilities (60%), the rest worked in RCH (40%). Table 4.10 below shows the demographic characteristics of the health workers.

Table 4.10 Socio-demographic characteristics of health workers

N=40

Background information	Frequency	Percentage
Educational Background		
SSS	4	10
Tertiary	36	90
Qualification		
Community Health Nurse	24	60
Midwife	12	30
Auxiliary worker	4	10
Health Facility Type		
RCH	16	40
CHPs	24	60
Average Working Hours per day		
Less than 8 hours	4	10
8 – 12 hours	36	90
No. of Years in Service		
Less than 10 years	12	30
10 – 20 years	14	35
21 – 30 years	10	25
More than 30 years	4	10

Source: Fieldwork, 2010

Cross tabulation of socio-demographic characteristics with spontaneous knowledge of the EPI schedule showed a statistical significance at $p < 0.05$ for number of years spent in the health service. There was however no association with educational background, qualification or the type of facility where they work as shown in table 4.11.

Table 4.11 Cross tabulation of Socio demographic Characteristics with Spontaneous Knowledge of EPI; N=40

Variables			Total	Fisher Exact
Spontaneous	Yes	No		Test
Knowledge of EPI	(%)	(%)	(%)	
Educational				
Background				
SSS	4 (13.3)	0 (0.0)	4 (10.0)	0.556
Tertiary	26 (86.7)	10 (100.0)	36 (40.0)	
Qualification				
C'ty health Nurse	16 (53.3)	8 (80.0)	24 (60.0)	0.356
Midwife	10 (33.3)	2 (20.0)	12 (30.0)	
Auxiliary worker	4 (13.4)	0 (0.0)	4 (10.0)	
Health Facility Type				
RCH	12 (40.0)	4 (40.0)	16 (40.0)	1.000
CHPs	18 (60.0)	6 (60.0)	24 (60.0)	
Average Working				
Hours per day				
Less than 8 hours	4 (13.3)	0 (0.0)	4 (10.0)	0.556
8 – 12 hours	26 (86.7)	10 (100)	36 (90.0)	

No. of Years in**Service**

Less than 10 years	12 (40.0)	0 (0.0)	12 (30.0)	0.003
10 – 20 years	6 (20.0)	8 (80.0)	14 (35.0)	
21 – 30 years	8 (26.7)	2 (20.0)	10 (25.0)	
More than 30 years	4 (13.3)	0 (0.0)	4 (10.0)	
Total	30	10	40	

Source: Fieldwork 2010

Cross tabulation comparing socio-demographic characteristics with type of health facility showed a significant association between the educational status of the health worker and the type of facility they work in as shown in Table 4.12

Table 4.12 Characteristics of health workers by facility type (Inputs)

N=40

Variables			Total	Fisher
Health Facility type	RCH	CHPs	(%)	Exact Test
	(%)	(%)		
Educational				
Background				
SSS	4 (25.0)	0 (0)	4 (10.0)	0.020
Tertiary	12 (75.0)	24 (100)	36 (90.0)	

Qualification

C'ty health Nurse	4 (25.0)	20 (83.3)	24 (60.0)	
Midwife	8 (50.0)	4 (16.7)	12 (30.0)	0.356
Auxiliary workers	4 (25.0)	0 (0)	4 (10.0)	

Average Working**Hrs/day**

Less than 8 hours	2 (12.5)	0 (0)	4 (10.0)	1.000
8 – 12 hours	14(87.5)	10 (100)	36 (90.0)	

No. of Years in**Service**

Less than 10 years	2 (12.5)	10 (41.7)	12 (30.0)	
10 – 20 years	6 (37.5)	8 (33.3)	14 (35.0)	0.188
21 – 30 years	6 (37.5)	4 (16.7)	10 (25.0)	
More than 30 years	2 (12.5)	2 (8.3)	4 (10.0)	

Totals	16	24	40	
---------------	-----------	-----------	-----------	--

Source: Field Work 2010.

4.6 IMPLEMENTATION OF EPI FROM THE FLASH TRIAD PERSPECTIVE**4.6.1 EPI TECHNOLOGY**

All the facilities have a well outlined protocol on EPI and they were all employing the protocols. All the facilities visited had routine days on which they provided immunization services, 90% of these facilities had campaign days at least twice a year when there was a mass immunization of polio with vitamin A supplementations, 90% also went on home

vaccinations while 70% of the facilities went on outreach services to reach remote places. Majority of the facilities (90%) went on outreach monthly while 10% had outreach services biweekly. 70% of the facilities have had mop ups less than 6 months ago, 20% within 6 to 12 months while 10% had it over 12 months ago.

All the facilities had EPI properly placed in the organizational chart and was religiously followed. Majority (90%) of the facilities had adequate placement of their vaccination site making it easily accessible to members of the communities in which they are located, 10% felt that the vaccination site was improperly placed and would prefer relocation to a better site. The vaccination schedule of all the facilities was found to be appropriate and adequate for meeting targets of coverage. The study also found out that the RCHs have EPI services daily, the health centres and the CHPS facilities have immunization services twice weekly, weekly or biweekly combined with outreach services.

Financing was predominantly from the Ghana Health Services with very little support from the community or private enterprises or organizations in the community. The community leaders sometimes helped in some communities by providing space for the EPI implementation such as community centre or building a health centre for the implementation of EPI.

Table 4.13 Technology / EPI N=10

Factor	Percentage of facilities
Vaccination strategies	
Routine days	100
Campaign days	90
Home vaccinations	90
Outreaches	70
Mop ups	100
How often Do you go on outreaches	
Biweekly	10
Monthly	90
When you last had a mop up	
Less than 6 months	70
6-12 months	20
Over 12 months	10
Adequate placement of vaccination site	
Yes	90
No	10
Support from community	
Yes	70
No	30

Source: field Work, 2010.

4.6.1.1 OBSERVATION OF HEALTH WORKERS

It was observed that the number of staff in EPI teams was usually very small compared to the amount of work available such as registering of clients, entering of tally book and recording

of vaccines given in the child health record books. At most of the facilities workers worked up to 5pm on vaccination days. There was proper reconstitution of vaccines and cold chain maintenance during vaccinations. Auto disposable syringes were used and disposed of in safety boxes that were later transported for incineration at the municipal incinerator. All vaccines given were recorded on the card of the child with the date given and the batch numbers. Almost all the children were given paracetamol syrups after vaccination.

Health staff also informed clients about the vaccination schedules, side effects and the number of sessions left for the child. The next appointment date for vaccination was recorded in the child health records books. It was noticed on two separate occasions at different facilities that two clients who had not yet received BCG were turned away because they were the only ones coming for vaccination for BCG. This was because the rest of the vaccine would go waste.

4.6.2 INPUTS FOR EPI

4.6.2.1 PUBLIC EDUCATION

Facilities normally have public education sessions on their routine vaccination days and mothers receive education on EPI, EBF, family planning etc. All the facilities educate their clients on importance of vaccination, recognition of side effects of vaccines and the management of these side effects. This was done mainly by talks in all the health facilities, 70% of the health facilities also employ questions and answers in their education of the clients, only 10% of the facilities use illustrative lectures and distribution of IECs as shown in table 7. 60% of the facilities do the education daily, while 20% do it twice weekly and another 20% do it weekly. 80% employ materials such as flip charts, while 20% were not using any form of materials for education. Fathers are all encouraged to accompany their wives for immunization or take part in the decision making for immunization and at all the

facilities fathers who brought their wards or accompanied their wives were given preferential treatment.

Table 4.14 below summarizes the results on the practice of health education by health staff at the various health facilities

Table 4.14 Health Education at facilities

N=10

Factor	Percentage of facilities
Educate caregivers	
Yes	100
No	0
How do you educate caregivers	
Talk	100
Illustrative lecture	10
Media campaigns	0
Questions and answers	70
Medium of education	
Meetings	90
Discussions	80
Radio	0
Use of mobile vans	30
Social gathering	20
Gong-gong beating	10

Materials used for education

Flip charts	80
Manuals	0
Tapes	0
Projectors	0
None	20

How often do you do the education

Daily	60
Twice weekly	20
Weekly	20

Fathers encouraged to be involved in EPI

Yes	100
No	0

How do you encourage them

Preferential treatment	100
------------------------	-----

Source: Field Work, 2010.

4.6.2.2 INFRASTRUCTURE AND LOGISTICS

All health facilities had physical space devoted exclusively to vaccination activities and at all health facilities their locations in the community were easily accessible to users. All these facilities also had a waiting area designated for clients while they waited for EPI service. Vaccines were readily available in all ten health facilities and seven of the facilities had refrigerators for storage of vaccines, the other three collected their vaccines from the Municipal Health Directorate (MHD) on the immunization days. It was noticed in the facilities which had refrigerators that they were adequate for the vaccine storage.

A checklist done for the facilities showed that syringes, needles, cotton swabs, alcohol, health cards, nutritional supplements, safety boxes and vaccine carriers were adequate in all the facilities. Gloves was adequate in only eight of the facilities, thermometers were inadequate in three of the facilities but adequate in the other facilities. Concerning furniture six of the facilities had enough while four of the facilities did not have enough furniture. Nine of the facilities had a counseling and examination room while only one did not have any room for counseling or examination. Out of the ten facilities six of them had a store for supplies and the rest did not have a supply store. Other infrastructure noticed not available in majority of the facilities were alternative power supply such as generators and also facilities for quarantining of babies suspected to have any of the disease prevented by the vaccination. Only one facility had alternative power source such as a generator for power fluctuations. However power fluctuation did not seem to have an effect on vaccine storage. Out of the 10 facilities visited, 3 did not have an up to date inventory of logistics.

Concerning cold chain all the facilities with capacity for storage vaccines had adequate storage equipment. Only one facility did not have a schedule for preventive maintenance of their refrigerator. The cold chain was, however, well maintained, as the temperature in the refrigerators was monitored twice a day and always read between +2 and +8 degrees Celsius, an acceptable range of vaccine storage temperature. The refrigerators in these facilities were used exclusively for storage of vaccines, vaccines were organized in adequate trays and refrigerators were also in good condition. They all had thermometers in the refrigerators for temperature monitoring. Despite there being some few power cuts, this did not have an effect on the vaccine storage. Six of the facilities who stored vaccines knew what to do when there was a power cut and they kept the vaccines in the flasks for up to 24 hours and return the vaccines then to the MHD for storage since they had a generator for keeping the vaccines at the right conditions. One facility had a generator which was used as standby energy source.

Only one out of the ten facilities have had their refrigerator malfunctioning once within the last 6 months since maintenance was done regularly. All facilities had adequate supply of thermoses or vaccine carriers, vaccines were properly stored and kept for between 6 -8 hours. Vaccines were all received in good condition from the MHD and only one facility did not have adequate transport for vaccine collection.

4.6.2.3 HUMAN RESOURCES DEVELOPMENT AND REMUNERATION

Most of the facilities (65%) agreed that they did not have enough staff to manage their facilities while 35 per cent thought their staffs was adequate for the day to day management of their facilities. To cope with the situation 60% of the facilities whose staff was not adequate distributed labour among them to enable work to go on smoothly and at times closed late. The other 40% made up for the inadequacy of staff on routine days of immunization by requesting for help from other facilities who were not running routine immunization that day. The health workers had attended a training programme on EPI within the last six months made up 80% , while 5% had their last training in EPI within 6 -12 months. 15% had had their last training in EPI over 12 months ago some up to 6 years ago. The training in EPI was mostly on OPV and occurred before NIDs though some had been involved in training programmes on CHPS management including EPI. All health workers had been supervised within the last 6 months whilst at work. The knowledge of providers regarding the target diseases of the immunization programme, official immunization schedule, multi-dose vial policy and correct temperature of storage of vaccines was assessed and found to be satisfactory. Most of the health workers knew of the official schedule of the vaccination programme however some of the staff were prompted to recall the schedule for BCG (25%) and OPV (20%).

4.6.2.4 INJECTION SAFETY

In all the ten facilities visited safety injection practices were being practiced and all the facilities employed the use of safety boxes for the disposal of used needles and syringes. These were then incinerated at the municipal incinerator. It was however observed that in two of the facilities gloves were not used by staff and injections were given with unprotected hands. Needles and syringes were adequate at most of the facilities and this would help in the adherence to injection safety.

4.6.2.5 ENCOURAGING COMMUNITY AND FAMILY INVOLVEMENT

In two of the facilities it was noticed that there was no community/stakeholder involvement in the activities of EPI in the community. The support from the community basically involved provision of site and infrastructure for the activities of EPI. There were very few or no volunteers in most of the communities, and the efforts made by some of the facilities to recruit them have proved futile since there is no form of motivation for them. Only three facilities received support from private enterprises and social groups in the community. Social mobilization was done by organizing discussions (80%) in churches, schools and workplaces to bring out the negative perceptions and attitudes about EPI and hence correct the thinking of the populace. 30% of the facilities employed the use of mobile vans to disseminate information, meetings (90%) social gathering (20%), and gong- gong beating (10%).

4.6.2.6 EFFECTIVE ADMINISTRATION AND MONITORING

There was adequate supervision and in all the facilities there were guidelines for vaccine, cold chain transport and immunization safety management. Management of the supplies was found to be adequate in the facilities, most of the facilities visited had vaccine requisition books and the ledgers were up to date. The needles and syringes collected were all entered

into the ledger books. There was adequate supervision at all the facilities. EPI was factored into the organizational chart of all the facilities.

There was co-ordination in all the facilities with other programmes such as family planning, ANC, postnatal care etc. However coordination with other institutions or sectors was adequate and well documented in seventy percent of the health facilities while thirty percent did not have any form of coordination with other sectors and was made up of CHPS and health centres. There were 10 cases of suspected measles, one case of suspected AFP found in the municipal for the half year of 2010 but no case of yellow fever reported as shown in table 4.15 below.

Table 4.15 Reported Cases of Epidemic Prone Diseases; Half Years 2006 – 2010

Disease	Half Year	Half Year	Half Year	Half Year	Half Year
	2006	2007	2008	2009	2010
Suspected Measles	0	9	38	3	10
Suspected AFP	2	0	2	0	1
Suspected Cases of	10	59	27	17	34
Meningitis					
Suspected Yellow	0	0	0	1	0
Fever					

Source: New Juaben Municipal Half Year Report, 2010.

4.6.3 EXPECTED OUTCOMES

4.6.3.1 VACCINATION COVERAGE INDICATORS

Coverage of the various antigens in the New Juaben Municipality for the half year 2010 was in a range of 81.4% to 88.4%. The dropout rate of Penta 3 was 3.2 while that of measles and yellow fever was 0.0. The EPI performance for the 2010 half year is shown below in table

4.16. The target population of children 0 – 11 months (4.0%) had a size of 6,287 and the expected Target for 1st Half Year is to immunize 3,144 out of the total.

There half year vaccine coverage is shown below in table 4.17 with BCG having a percentage of 88.4% and coverage for measles and yellow fever were 84.3% each. OPV and penta 3 coverage was 81.4% each with 83.5% for penta 1.

EPI performance for the various antigens shows a general decrease in the percentage coverage from 2007 though just minimal as shown in table 4.18. In 2009, NIDs were organized in the Municipality. There were no refusals and the coverage in all the sub districts of the municipal was very high indicating high immunization coverage in the municipal as shown in table 4.18.

Table 4.16 EPI Performance - 1st Half Year 2010

Antigen	Target for	Expected for 1st	Actual	% Coverage	
	2010	Half 2010	Immunized in 1 st Half 2010	By annual	By ½ yr
BCG	6,287	3,144	2,782	(44.2)	88.4
Measles	6,287	3,144	2,651	(42.1)	84.3
Yellow Fever	6,287	3,144	2,651	(42.1)	84.3
OPV3	6,287	3,144	2,561	(40.7)	81.4
Penta 3	6,287	3,144	2,561	(40.7)	81.4
Penta 1	6,287	3,144	2,625	(41.7)	83.5

Source: New Juaben Municipal Half Year Report, 2010

Table 4.17 Trend of EPI Performance – 1st Half 2007 – 2010

Antigen	Half Year 2007		Half Year 2008		Half Year 2009		Half 2010	
	Immu.	% Cov.	Immu.	% Cov.	Immu.	% Cov.	Immu.	% Cov.
BCG	3,235	53.7	2652	43.3	2,867	46.2	2,782	44.2
Measles	2,818	46.5	2508	41.0	2,678	43.2	2,651	42.1
Yellow Fever	2,818	46.5	2508	41.0	2,678	43.2	2,651	42.1
OPV3	3,055	50.7	2382	38.9	2,765	44.6	2,561	40.7
Penta 3	3,055	50.7	2382	38.9	2,765	44.6	2,561	40.7

Source: New Juaben Municipal Half Year Report, 2010.

Table 4.18 2009 coverage rates for NIDs in the New Juaben Municipal

Sub Municipal	Estimated Population	1 st Round 09 OPV 0 – 5 Yrs.(20%)			2 nd Round March 09	3 rd Round May 09
Oyoko/Jumapo	20,563	4,269 (103.8%)			3,850(103.9)	4,206 (98.5%) (102.7)
Eff./Akwadum	29,987	6,951 (115.9%)			5,966(110.5)	7,508 (108.0%) (102.6)
K'dua/Zongo	45,776	10,455 (114.2%)			8,910(108.1)	10,281 (98.3%) (101.0)
Med.Vill./Old Est.	58,662	12,786 (108.9%)			10,976(103.9)	12,982 (101.5%) (101.0)
Municipal	154,988	34,461 (111.2%)			29,702(102.4)	34,977 (101.4%) (101.5)

Source: New Juaben Municipal Half Year Report, 2010

4.6.3.2 SURVEILLANCE

In all the ten facilities the indicators for measles, AFP, and neonatal tetanus are known and observed. There was active search for cases of measles and AFP but facilities were not actively searching for neonatal tetanus. One case of AFP and ten suspected cases of measles had been detected in the municipal but data on neonatal tetanus was not available and the facilities did not report any cases. From the study three children were said to have had measles but this could not be confirmed. Keeping track of immunization and tracing of defaulters was made possible using registering of clients, use of tally sheets and monitoring charts at all the facilities. All the facilities also recorded the vaccines given in their immunization cards.

Evaluation of the progress of the EPI was done using monthly coverage with monitoring of frequency of incomplete schedules of vaccination. The graph of monitoring coverage was up to date and visible. There was also up to date information on cases and laboratory results of suspected cases. Areas of risk and epidemic potential have been identified by all the facilities in their communities. Defaulters were traced principally through home visits. Some of the challenges faced during surveillance include inadequate logistics (40%), financial constraints (30%), inadequate staff (20%), and lack of motivation and wrong addresses of clients (10%).

4.7 CHALLENGES TO EPI

The main challenges faced by the health workers in the implementation of EPI were identified as shown in Table 4.19. There was inadequate staff (40%) and most of the facilities had to outsource help from staff of other facilities on static immunization days or close very late from work on those days. some facilities also reported of poor state of their facilities (15%), lack of financial motivation for the staff (15%) and inadequate logistics (15%) while 5% were in need of an administrative head to allow the health workers focus on the implementation of the services.

Table 4.19 Challenges to EPI Implementation

Challenges faced by health

N = 40

workers

percentage

Inadequate Logistics 6 15

Lack of financial Motivation 6 15

Inadequate Staff 16 40

Limited Financial Resources 4 10

Need of Administrative Head 2 5

Poor state of the facility 6 15

(building)

Source: Field Work, 2010.

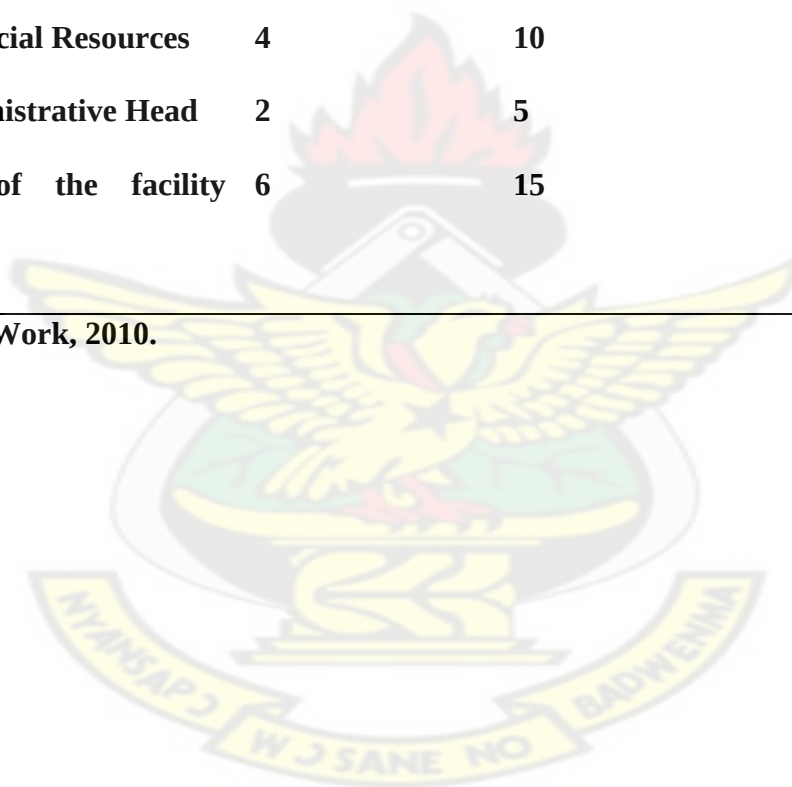


Table 4.10 Summary of results in Flashlight Triad model

TECHNOLOGY		ACTIVITY/INPUT	OUTCOME
		→	→
		←	←
Health staff related factors			
No of years in service	Knowledge of EPI	Physical Space, Financial and non - financial motivation, Training more staff on EPI, More in – service training, Adequate logistics, adequate financial support	Increased Awareness of EPI schedule, willingness to go over and beyond the call of duty to trace defaulters which will improve immunization coverage rates
Caregivers related factors			
No of children	Immunization	Increased with other activities such as family planning	Complete immunization for the age
Level of Education	Immunization	Increased Co-ordination with other Governmental Sectors such MOE	Complete immunization for the age
Occupation	Immunization	Make more immunization centres	Complete immunization for the

		available so	age
		proximity will not be	
		an issue	
Ethnicity	Immunization	Reaching more	Complete
		through frequent	immunization for the
		outreach programmes	age
Know the importance	Immunization	Increased public	Complete
and side effects of		education through	immunization for the
vaccines and VPD		audio visual	age
		mediums	
Time spent at the	Immunization	Provision of more	Complete
facility and time		trained Staff,	immunization for the
taken to get there.		Provision of more	age
		immunization centres	

Source: Field Work, 2010.

CHAPTER FIVE

DISCUSSION

5.0 INTRODUCTION

This study which was an evaluation of the Expanded Programme on Immunization in New Juaben Municipality using the flashlight triad evaluation model revealed interesting findings. The significant findings are discussed in this chapter within the framework of the FTE model.

5.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF CAREGIVERS/MOTHERS

There were two dominant religious sects in the Municipal and in some studies religion was seen to have an impact on immunization coverage. There was an equal likelihood of being immunized completely despite the religion one belongs to. This finding is in line with a study by Bonsu et. al., 2005 which showed that there was no relationship between religion and immunization status. However another study in northern Nigeria indicated a very low coverage in recent polio NID, because a religious sect refused to participate (Global Polio Eradication Initiative, 2004) in contrast to the findings of this study. Another study by Antai, 2008 showed that the risk of not being immunized was significantly increased amongst children of Muslim parents compared to those of Christian parents in Nigeria which also was in contrast to the findings of this study.

Majority of the caregivers had been educated up to JSS in the Municipal. There was an influence of education of caregivers on the immunization of their wards. In comparison with caregivers without any education caregivers who had attained tertiary educational level had increased odds (OR=1.84) of completing their child's immunization. This corresponds with findings from a study by Salaemsak et. al., 2002 which concluded that there was an increased probability of completing immunization when mothers had a high level of education. Another study by Parashar, 2005 showed that literate women were more likely to immunize their

children in India as was found in this study. This contradicts with findings by Budisuhardja, 1995 also found out that the level of education had no significant association with the acceptance of basic immunization in Thailand.

The predominant ethnicity was the Akan and the ethnic distribution was in line with that expected in the Municipal. It was however noticed that the ethnic group you belong to had an effect on the immunization status of the child. Children of mothers of the Northern tribes had the highest odds of likelihood of completing immunization while those of foreign nationality also had a 3.14 chance of being immunized completely. This is in agreement with studies by Pradhan and Shrestha, 2005 which shows that immunization is affected by differences in ethnicity, sociocultural background and geographical location.

The major occupation in the Municipal was trading and in this study there was an association between occupation and the completeness of immunization and this is in line with study by Budisuhardja, 1995 which showed that there was significant relationship between complete immunization of children and their caregivers' occupation. On the contrary studies by Vongkhamdy (1989), Salaemsak et. al., (2002) showed no relationship between the type of job of the caregiver and the completion of immunization.

In this study the respondents were mostly of the middle socioeconomic status and there was a significant statistical association between socioeconomic status and the completion of immunization. This contradicts findings in the study by Vongkhamdy K., (1989) which indicated that there was statistical significance between socioeconomic status and immunization received. The findings of this study correspond to findings by Petsavai et. al., (1987) and Salaemsak et. al., (2002), who in their respective studies had results which ruled out any significant relationship between children completing immunization and the economic status of caregivers.

5.2 KNOWLEDGE AND SOURCE OF INFORMATION ON EPI

The main source of information is through the use of loudspeaker announcement but very few caregivers receive information about EPI from newspapers. This could be due to the high cost of newspapers or their inability to read and hence prefer other sources of information especially by loudspeaker announcement which is normal done in the local language. The source of information is not linked significantly to completion of immunization. However in this study there was a statistical relationship between knowledge on EPI and immunization. Not knowing the vaccination schedule did not affect the immunization completion for age and this could be due to the fact that the caregivers are informed of the next date to report for immunization by the health workers. Caregivers who do not know the importance of vaccination were less likely to have their children completely immunized as compared to those who know the importance of the vaccination. This finding corresponds to studies by Bonsu (2005) who found out that there is an increased percentage of a child being immunized if parents were well educated about the schedule of EPI and that by Zimicki et al, (1994) showed that mothers failed to complete their child's or their own vaccination due to lack of knowledge of vaccine preventable diseases. Bhattacharyya et al. (1994) also had findings similar to that of this study that exposure to information about EPI aided in the likelihood of completing the vaccination schedule.

5.3 OTHER RELATED FACTORS

Most of the caregivers spent less than an hour getting to their facilities and the nearer the health facility was to their residence the higher the likelihood of completing a child's immunization and there was a significant statistical relation between immunization status and time taken to get to the immunization centre. This corresponds to findings by studies by Babalola et. al. (2005), which showed that distance affects access to health services and also

enhances immunization coverage. The findings of these studies report that short distance to immunization site enhance immunization coverage as found in this study.

There was also a relationship between the place of immunization and time spent at the immunization and immunization status but the means of getting to the facility was not associated with immunization status as found out in a study by Masaharu, 2007 which found out that the means of access to immunization site was not associated with immunization status.

There was also a significant association between satisfaction with services offered at the health centre and completing of immunization.

5.4 THE IMPLEMENTATION OF EPI

5.4.1 TECHNOLOGY

It was apparent that all the facilities had laid down procedures and guidelines that they employed for EPI activities as proposed by the Ministry of Health, Ghana (MOH 2003). EPI was among the priorities of the municipal health directorate and was outlined in their organizational chart. Financing of the project was basically from the MOH and their donor partners such as GAVI and hence there was very little or no support from most communities or local enterprises.

There was an annual plan of action on EPI in the Municipal with clearly defined goals, objectives and priorities. There was coordination with other health programmes such as IMCI and also with other sectors but the only flaw being that there was inadequate documentation and this should be paid attention to.

The vaccination schedules were found to be adequate at most of the immunization centres with easy accessibility by their communities. The Municipal had 3 health centres, 8 RCHs and 15 CHPS who were all providing EPI services to increase availability and accessibility. All the vaccination strategies were being used with good overall outreach activities to reach

those in inaccessible areas. The vaccination schedules in most facilities were also found to be adequate for the provision of services in the community being served. There was no evidence of illicit charging for services which sometimes pose problems in certain communities.

5.4.2 INPUTS OF EPI

5.4.2.1 PUBLIC HEALTH EDUCATION

The practice of health education was high despite the few shortfalls described below and this impacted positively on the effectiveness of the programme. This was in line with studies by Bonsu, 2005 but contradicted with the findings by Wyss et. al., 1996.

The main medium of education was talk sessions at the facilities when mothers come to vaccinate their children with questions and answers afterwards. The use of illustrative lectures which would have a better impact on the education of the clients was not being used. Also distribution of IECs was low in the municipal because most of the mothers could not read or write English and hence though the facilities had a lot of these IECs they were not being distributed. The talks at the facilities were done routinely but did not only focus on EPI but other issues such as hygiene, family planning etc.

Materials for educating mothers such as flip charts were available in the facilities but video tapes and projectors for illustrative education were not available in the facilities. Some of the facilities did not have teaching aids (20%). In educating the clients, fathers were encouraged to be involved in the process of immunization and were promised preferential treatment when they attended with their children. Clients being educated on side effects and vaccines had a positive influence on the child being immunized and this finding corresponds with that of study by Bonsu, 2005. The Promotion of very good health educational activities in the Municipal will increase the knowledge of caregivers and the likelihood of immunization and adherence to the schedule. To make this possible there is the need to develop appropriate

health educational materials such as the use of drama, folksongs and video shows which would be easily understood by local folks in the Municipal.

5.4.2.2 INFRASTRUCTURE AND LOGISTICS

Physical space for EPI activities appeared to be adequate in the Municipal and these were all easily accessible to the community, waiting areas were provided for all the facilities visited with protection from the weather. There were reports from Health workers at the CHP centres about inadequate seating for clients as well as complaints about space. Vaccine supply was adequate and 80% of the facilities had places for storage. The other remaining kept vaccines in coolers for the day and after close of work transported it to the nearest facility with a refrigerator. Vaccines were always received in good conditions and means of transporting vaccines to the facilities generally was adequate. Power supply was adequate and there was laid down procedure to prevent disruption of the cold chain in the event of interrupted power supply. However the unavailability of backup power supply in 90% of the facilities could still affect the potency of the vaccines in case power interruptions became more frequent especially at periods when the staff may not be around as on weekends and at night. Cold chain management was adequate and cold chain guidelines were present in all the facilities. There was an up to date inventory in all the facilities and maintenance and replacement culture was good. Temperature monitoring was also up to standards and there was adequate supply of vaccines carriers in all the facilities. Three out of the ten facilities did not have a logistic inventory which needed to be addressed; stores should be made available to all the facilities to enhance storage of their supplies. Safety gloves were found to be inadequate in the 30% of facilities and this is bound to affect the practice of injection safety due to the need for rationing of the ones available and it was seen that most of the workers did not change gloves or even wear gloves when administering vaccinations. Furniture, thermometers, weighing scales should be provided for all the facilities since they were inadequate in 60% of

them. Logistics were found to be necessary for management of these facilities though not proven scientifically and corresponds with Piyathidatrudech's (1987) conclusion that logistics are important resources that should always be managed carefully in terms of its adequacy, timing, maintenance and disposal and this was being adhered to in majority of the facilities. This contradicts findings by Chantawong (2001) that resources are not related to the effectiveness of maternal and child health activities. Armstrong et. al. (2004) found a direct relationship between infrastructure support and health worker performance and presumably, programme performance. Inadequacy of logistics could have a significant effect on EPI but the facilities borrow from each other in times of inadequacy.

5.4.2.3 HUMAN RESOURCES DEVELOPMENT AND REMUNERATION

Health workers were inadequate for the running of EPI programme in the Municipal and hence a need for more staff recruitment. The lack of staff makes the facilities close late when there were large numbers of clients. Some of the facilities make up for their lack of staff by requesting for help from other facilities. Inadequate staff seemed to have a negative impact on the EPI programme and this was in line with findings by Sarawuti 1999 and contradictory to those by Hareuthai 1997 whose study concluded that manpower adequacy had no effect on the EPI programme.

Training of workers on EPI was being done in the Municipal but the in service training should be focused on all the vaccines, and their side effects, cold chain management and injection safety and biosafety management. Health workers should be educated on what to do when faced with clients who have either missed their vaccination or have other peculiar problems. Qualified staff in adequate numbers is needed to ensure quality services at immunization clinic. In-service training needs to be strengthened in the Municipal to periodically update the health workers on current policies regarding the vaccination programme. There was no significant association between regular training and staff

performance and this could be explained by the fact that EPI is a routine job. This finding was consistent with the study of Wareeratana, 1999 but contrary with that of Aspara, 1995. Studies by Nsubuga, 2002 had findings similar to this study which showed a positive significance between performance and regular training.

There appeared to be a good knowledge of the schedule of the various antigens and these led to appropriate administration of vaccines and increase the quality of care. This was contradictory to findings by Bonsu et. al., (2005) whose study showed a low level of knowledge about the vaccines among health workers. However a high emphasis was not placed on knowledge of health workers since most of the workers had high working experience (average of 11.5 years with a standard deviation of 0.975). Supervision of the health workers was being done by the MHMT and this enables them to know areas where additional training will be needed to help maintain a high standard of service. This was in line with standards provided by the MOH.

There was however low motivation of staff but there was no indication of it affecting EPI performance since EPI is a routine activity and there is a shared responsibility among the workers in the maintenance of a high level of performance as presumed by Lewin et. al. (2005).

There is no indication that motivation of volunteers and also increase staff numbers would improve the quality of the programme which was high in the district. This finding is in line with that by Pratuan 1999 that personnel, money and materials did not have a relationship with the effectiveness in implementation of EPI.

5.4.2.4 COMMUNITY INVOLVEMENT

There was support from the community leadership by way of providing temporary places for the CHP centres and joining in periodic review meetings but recruiting volunteers was being thwarted by the lack of motivation for these volunteers. For good functioning of the volunteer

system in the community, training, supervision and motivation of volunteers and must be planned for and finances provided for its implementation. The Community participation in immunization programmes has been shown to result in higher coverage and, ultimately, reduce the numbers of cases of vaccine preventable diseases. All the facilities held frequent community durbars which went a long way to improve on the relationship between the facility and the community in which it was located. Managers at all levels should seek the participation of local politicians, religious leaders, community group leaders, and parents in scheduling the days and hours for immunization sessions, organizing outreach activities, promoting immunization, and monitoring performance. Leaders are normally of the view that the health system alone is responsible for making sure that children are immunized. Social mobilization was practiced in the Municipal but it was more geared towards the public participation and there was very little support from private enterprises and social groups in the community and this should be addressed. This however did not affect the performance of EPI which was in line to other studies by (Awoonor-Williams 2003; Kidane et. al., 2003; Streatfield et. al., 1988; Waisbord 2003) that found out that EPI performance was enhanced by community participation and advocacy. However this could also be due to the fact that the public education efforts were high and EPI was accepted culturally and socially in the Municipal.

5.4.2.5 ADMINISTRATION AND MONITORING

There was adequate supervision and monitoring of EPI activities in the Municipal and hence reduction of apathy among health workers. At most of the centres majority of the officers-in-charge were midwives and community health nurses who plan, manage and monitor immunization services at their facility. At each facility there was laid down guidelines for EPI and also EPI and its activities had been factored into their organizational chart for the year. This could also account for the good EPI performance in the Municipal as found in a

study by Sarawuti et. al., (1999) that managerial process had significant relations to the effectiveness of health centres another study by Hareuthai et. al., (1997) indicated that administrative factors had no influence on the performance of EPI in contradiction to the findings of this study.

5.4.2.6 INJECTION SAFETY

The practice of Injection safety was acceptable except for the observation of health workers not using gloves during administration of vaccines in two of the facilities. There was however safe disposal of used needles and syringes which were incinerated. This was in line with WHO demands (WHO, 2003).

5.4.3 EXPECTED OUTCOMES

Utilization of the immunization service was found to be within acceptable limits with the coverage of the various antigens in the New Juaben Municipality for the half year 2010 being in a range of 81.4% to 88.4%. The dropout rate of Penta 3 was 3.2 while that of measles and yellow fever was 0.0. The low drop-out rates may be due to good demand for vaccinations, client satisfaction with services, and the ability of the immunization programme to provide those services. This is in line with the findings by Bonsu et. al. (2005) whose drop-out rates for penta 3 and measles were also less than 10% while it contradicted the high drop-out rate in Lao PDR found by Masahuru et. al., (2007). The NIDs for 2009 was within 101.4% to 111.2% for OPV and 101.5% to 102.4% for Vitamin A. However comparing EPI coverage to that of previous years shows a small decline. These demands prompt attention since it may mean some missed opportunities are not being taken care of. Utilization of the services was also found to be good as the dropout rates was below 10 percent. The challenge of the district is to achieve the national target of 90 per cent for all antigens. This can be done by reduction of the invalid doses and developing plans to reach every child. BCG coverage for 1st half 2010 was slightly higher than that of Penta1 and this could be due to missed opportunities at

the various facilities. Measles and yellow fever had the lowest coverage and this could be due to the assumption by some parents that immunization had been completed by 6 or 7 months and hence the need to emphasize on it.

5.4.3.1 SURVEILLANCE

There was active search for measles and AFP but not for neonatal tetanus and in 2009 the returns submission assessment was 100%. Health facilities submitted weekly and monthly reports on time in the municipal. Cases detected so far for the first half of the year in the Municipal has been just as was projected for. Tracing of defaulters was done using the clients register to determine defaulters and then visiting them in their homes to vaccinate their children. This was contrary to the findings by Bonsu et. al. (2005).

The major challenges met by the surveillance teams include inadequate logistics, financial constraints, inadequate staff, and lack of motivation and wrong addresses of clients.

5. 5 CHALLENGES IN THE IMPLEMENTATION OF THE EPI

The major challenge is inadequate staff but also lack of logistics, lack of financial motivation for staff and lack of financial resources also affect the implementation of EPI as shown in the annual report of the MOH (2002).

Table 5.1 Summary of findings in the context of FTE model

	TECHNOLOGY	ACTIVITY/INPUT	OUTCOME
		→	→
		←	←
Health staff related factors			
No of years in service	Knowledge of EPI	Physical Space, Financial and non - financial motivation, Training more staff on EPI, More in – service training, Adequate logistics, adequate financial support	Increased Awareness of EPI schedule, willingness to go over and beyond the call of duty to trace defaulters which will improve immunization coverage rates
Caregivers related factors			
No of children	Immunization	Increased with other activities such as family planning	Complete immunization for the age
Level of Education	Immunization	Increased Co-ordination with other Governmental Sectors such MOE	Complete immunization for the age

Occupation	Immunization	Make more immunization centres available so proximity will not be an issue	Complete immunization for the age
Ethnicity	Immunization	Reaching more through frequent outreach programmes	Complete immunization for the age
Know the importance and side effects of vaccines and VPD	Immunization	Increased public education through audio visual mediums	Complete immunization for the age
Time spent at the facility and time taken to get there.	Immunization	Provision of more trained Staff, Provision of more immunization centres	Complete immunization for the age

Source: Field work, 2010.

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.0 INTRODUCTION

In this chapter conclusions made based on the study findings and recommendations made based on the conclusions drawn are presented.

6.1 CONCLUSIONS

The general conclusions from the study are presented in this sub-section.

6.1.1 CAREGIVERS RELATED FACTORS

The EPI programme in the New Juaben Municipal can be said to be of high quality with a good proportion of children being vaccinated. The caregivers were found out to have a low level of education with most of them being JSS leavers, had primary education or no education at all. Maternal characteristics such as parity, occupation, and ethnicity, number of children and age of child contributed significantly to child's vaccination status. Children in their early age (less than 4 months) were most likely to have their vaccination series complete for age than those in the older ages. In the district they were predominantly Akans and trading was the main occupation in the Municipal with most of them being in the middle socio-economic status.

6.1.2 CAREGIVERS' KNOWLEDGE AND SOURCE OF INFORMATION

The knowledge of diseases prevented by vaccination, knowledge of side effects and knowledge of the importance of vaccination were all linked positively to the completion of the vaccination series. This means that good public education would lead to increase immunization coverage.

6.1.3 OTHER RELATED FACTORS

Other factors such as the place of vaccination, time spent to get to the facility, time spent at the facility and satisfaction with the service provided were associated with completing immunization schedule as appropriate for age.

6.1.4 IMPLEMENTATION OF EPI

6.1.4.1 EPI-TECHNOLOGY

The overall effectiveness of implementing EPI was at a good level (range of 81.4% to 88.4%). EPI was seen to be a great priority in the municipal and there were appropriate guidelines to its implementation. It was also backed with resources which at times were delayed. There were clearly defined goals and objectives with details on how to achieve these targets. This was coupled with coordination with other health care programmes; however coordination with other institutions and local enterprises was not that adequate with very little support for EPI in the municipality from private institutions. EPI in the municipal had these few challenges and they include inadequate staff numbers, lack of infrastructure improvement and maintenance, inadequate materials for health education and no motivation for staff and volunteers.

6.1.4.2 INPUTS

Health education was basically done by radio and at the health centres. IECs materials such as posters and leaflets distribution were not popular and hence there is the need to develop appropriate health educational materials such as the use of drama, folksongs and video shows which would be easily understood by local folks in the Municipal. Infrastructure was adequate in the municipality; power supply was good though most of the facilities lacked a standby power source. Vaccine supply was excellent with proper cold chain management

being practiced. Logistics such as gloves, weighing scales, thermometers and furniture should be accessed and beefed up to meet the demands of each facility.

It was general phenomenon in the municipal that staff for EPI was inadequate leading to late closing of facilities and at times the cumbersome way of outsourcing workers from one facility to the other to help. A greater majority of the workers had received adequate in-servicing training within the last six month and they had adequate knowledge about the schedule of EPI. However the in- service trainings were not organized solely for EPI. Health workers however had a good knowledge of the vaccine schedule. Supervision by the MHMT was also being done on regular basis. Community involvement was averagely acceptable. There were few or no volunteers helping with EPI due to lack of motivation for these volunteers. Injection safety was being practiced throughout the Municipal but the proper use of gloves during vaccination was lacking.

6.1.4.3 OUTCOME

There was a good coverage of EPI with a low dropout rate and good client satisfaction and the challenge to the municipal is to achieve the national target of 90 per cent for all antigens. Surveillance was generally adequate with compliance with the surveillance indicators for measles and AFPS. However there was no active search for cases of neonatal tetanus. The areas of risk and epidemic potential had been identified and case definitions and the appropriate action to take known for measles and AFP. Surveillance had challenges of inadequate logistics such as transport and staff coupled with lack of motivation for staff.

6.2 RECOMMENDATIONS

6.2.1 MUNICIPAL HEALTH MANAGEMENT TEAM

- Specific training for EPI should be organized for health personnel involved in EPI and should focus on the half-life of the vaccines, duration of active immunity for each

vaccine, criteria for vaccination in abnormal children and techniques and methods of vaccination.

- Adequate logistics should be made available based on the needs of the health facilities such as thermometers, weighing scales and transport for outreach.
- Procure and distribute health aides such as flip charts, video equipment etc. and health education materials on EPI to the staff of various facilities to aid in health education.
- Collaborate with the Municipal Assembly, local leaders and religious leaders on the promotion of EPI in the municipal.
- Supervisors should monitor handling of injection equipment, use of safety boxes, and management of supplies. The health system should promote safe handling of injection equipment through policies, training, supervision, and informational campaigns.
- Supervisors should monitor and reward good health staff dedication, commitment and communication. The municipal should also motivate volunteers financially to make them more interested in the EPI programme

6.2.2 FACILITY HEADS

- Create an operational map of their catchment area with all difficult to reach areas and map out strategies to cover these areas.
- Proper cold chain managements such as keeping an equipment inventory, Planning and budgeting for maintenance and repair or replacements and preparation for emergencies.

6.2.3 HEALTH WORKERS

- Health workers should give mothers and other caregivers essential information about EPI.

- Schedule and organize services to make them convenient for parents and praise families whose children are fully immunized by one year of age.

6.2.4 COMMUNITY

- Describe the benefits and safety of vaccinations to others in the community and Remind families when children need to receive the next dose(s) of vaccine.
- Encourage families to complete each child's basic immunizations in his or her first year of life.
- Inform families about outreach services, supplemental immunization activities, and new vaccines and improvements in the immunization programme.
- Assist health facility staff in planning and monitoring services through volunteering and provide logistical support, e.g., by transporting vaccines, supplies, and staff.

6.2.5 CLIENTS

6.2.5.1 MOTHERS AND OTHER PRIMARY CAREGIVERS

- Caregivers should bring children to immunization service delivery points at the ages recommended in the national schedule. They should bring each child's health or vaccination card to each health visit and treat side effects as recommended.
- During campaigns, mothers should bring children of the recommended ages to immunization sites on the day(s) recommended. For a house-to-house strategy, keep those children around the home and have them immunized when the team arrives.

6.2.5.2 FATHERS

- Encourage their mother to bring children for immunization and provide mothers with money for transport or other expenses related to immunizing children.

REFERENCES

Aday LA, Andersen R. (1974). A Framework for the Study Of Access To Medical Care. *Health Serv Res. Fall*; 9(3):208–220.

Ahmed AU. (1989). Factors Affecting Immunization Acceptance Amongst Mothers Of One Year Old Children In Kabinburi District, Prachiburi province, Thailand [M.P.H.M Thesis Primary Health Care Management]. NakhonPathom: Faculty Of Graduate Studies, Maidol University

Akashi, H; Yamada T, Huot E, Kanai K, Sugimoto T (2004). User Fees at a Public Hospital In Cambodia: Effects On Hospital Performance and Provider Attitudes. *Soc. Sci. Med.* 3: 553–564.

Andersen RM. (1968). Behavioral Model Of Families' Use Of Health Services. Chicago, IL: University of Chicago, Center for Health Administration Studies. *Research Series*, 1968: 25.

Andersen, R. (1995). Revisiting the behavioral model and access to medical care: Does it matter? *Journal of Health and Social Behavior*, 36(1), 1-10.

Armstrong, Sue, Chris Fontaine and Andrew Wilson. (2004). Report on the global HIV/AIDS epidemic: 4th global report. Joint United Nations Programme on HIV/AIDS (UNAIDS).

Awonoor-Williams, J. K. 2003. Setting the stage for scaling-up a successful experiment: The Nkwanta initiative in rural Ghana. Paper presented at the American Public Health Association conference, San Francisco.

Bellon Saameno JA, Delgado Sanchez A, Luna del Castillo J de D, Lardelli Claret P.(1995). Influence of age and sex on various types of utilization of the primary health care. *GacSanit*; 9: 343-53.

Bhattacharyya, K., Shafritz, L & Graeff, J. 1994. Sustaining health workers' performance in Burkina Faso. Washington: BASICS.

Budisuhardja D.(1995). Factors affecting immunization coverage in children under five years in rural areas of Chonburi province, Thailand [m.p.h.m thesis Primary Health Care Management]. Nakhonpathom: Faculty of Graduate Studies, Maidol University.

Chickering, A. W., & Ehrmann, S. C. (1996). Implementing the seven principles: Technology as lever. *AAHE Bulletin*, 49(2), 3-6.

Corhran WG (1978) sampling techniques 3rd ed. New York Wiley; 12-15

Cufts FT, Orenstein WA, Bernier RH.(1992). Causes of low preschool immunization coverage in the United States. *Annual review of public health*, 13: 385- 398.

Das, J & Das, S. 2003. Trust, leaning and vaccination: A case study of a North Indian village, *Social Science & Medicine* 57: 97-112.

Oyerinde 1999. National Programme on Immunization Patronage in Selected Local Government Areas of Oyo State

Easterly, William (2007). “How the Millennium Development Goals are unfair to Africa”, Global Economy and Development, Working Paper 14, November 2007.

Ehrmann, S. C. (1999). Asking the hard questions about technology use and education. *Change*, 31(2), 24-29.

Ehrmann, S. C., & Zuniga, R. E. (1997). The Flashlight Evaluation Handbook. The Teaching, Learning, and Technology Group.

El Zein HA et al. (1997). Poliomyelitis outbreak and subsequent progress towards poliomyelitis eradication in Sudan. *Lancet*, 350 (9079): 715–716.

Expanded Programme on Immunization. (1993). General immunology: the immunological basis for immunization. Geneva: World Health Organization; WHO/EPI/Gen/ 93.11

Ferrinho, p. de L.G.M. et al. a profile of Alexandra. (1991). *South African Medical Journal*, 80: 374 – 378

Field Guide for the Ghana Immunisation Programme, GHS 2003.

GAVI. 2000. Advocacy for Immunization. How to Generate and Maintain Support for Vaccination Programmes. Geneva: Secretariat for the Global Alliance for Vaccines and Immunization.

George Bonsu, Judith Addoquaye, Seth Owusu-Agyei (2005). A Comprehensive Assessment of the Quality of Immunization in Techiman District;

Ghana Demographic and Health Survey, 2003

Ghana Health Service EPI 5YPOW (2002-2006), October 2002

Ghana Statistical Service (GSS) Ghana Demographic and Health Survey 1998.

Ghana Statistical Service (GSS), Ghana Health Service. Ghana Demographic and Health Survey 2008.

Ghana Statistical Service (GSS). Ghana Demographic and Health Survey 2003.

GHS, 2002. Ghana Expanded Programme on Immunization: Reducing Missed Opportunities

GHS, 2002. Injection Safety Policy and Strategic Plan. The Expanded Programme on Immunization 2002-2006.

GHS, 2003. The National EPI Integrated 5-Year Communication Plan 2003-2007

Harmon, R. G. (1996). Training and education for public health: the role of the U.S. Public Health Service. *Am J Prev Med*, 12(3), 151-5.

IF Angelillo, G. Ricciardi, P. Rossi, P. Pantisano, E. Langiano, & M. Pavia (1999). Mothers and vaccination: knowledge, attitudes, and behaviour in Italy. *Bull World Health Organ* 77, pp. 224–229

Ministry of Health. 2008. Independent Review Health Sector Programme of Work 2007.

MOH, 2002. The Second Health Sector 5YPOW 2002-2006 Partnership for Health: Bridging the Inequalities Gap

National Institutes of Health, National Institute of Allergy and Infectious Diseases. Understanding Vaccines. 1998. Washington, DC: U.S. Department of Health and Human Services. *NIH Publication No. 98-4219*.

Onyango-Ouma W. Rose Laisser, Musiba Mbilima, Margaret Araoye, Patricia Pittman, Irene Agyepong, Mairo Zakari, Sharon Fonn, Marcel Tanner and Carol Vlassoff (2001). An Evaluation Of Health Workers For Change In Seven Settings: A Useful Management And Health System Development Tool. *Health Policy And Planning*, 16 (Suppl. 1):24–32.

P. Nsubuga, N. Eseko, W. Tadesse, N. Ndayimirije, C. Stella and S. McNabb.(2002). Structure and Performance of Infectious Disease Surveillance and Response, United Republic of Tanzania, 1998 *Bulletin of the World Health Organization* 80: 3 196 - 203

Padgett DK, Patrick C, Burns BJ, Schlesinger HJ. (1994). Ethnicity and the use of outpatient mental health services in a national insured population. *Am J Public Health* 1994; 84: 222-6.

Penchansky, R., and J.W. Thomas. 1981. “The Concept of Access: Definition and Relationship to Consumer Satisfaction.” *Medical Care* 19(2): 127-140.

Pradhan R. and Shrustha A. (2005). “Ethnic and Caste Diversity: Implication for Development.” *Working paper Series no 4. Nepal Resident Pension, Asian Development Bank*

Rossi, P. H., & Freeman, H. E. (1993). *Evaluation: A systematic approach* (5th ed.). Newbury Park, CA: Sage Publications, Inc.

Saleumsak K. (2002). *Knowledge and Perception of Mothers with Children under 2 Years of Age On Immunization Status*[M.P.H.M Thesis Primary Health Care Management] Nakhonpathom:Faculty Of Graduate Studies,Maidol University;

Shimp, L. 2004. *Strengthening Immunization Programmes: The Communication Component. BASICS*.http://www.childrensvaccine.org/files/Strengthening_Immunization_Communications_ASICS.pdf

Streefland P, Chowdhury AM, Ramos-Jimenez P (1999). Patterns of vaccination acceptance. *Soc. Sci. Med.*, 49 (12): 1705 – 1716.

Srinivasan, Lyra. 1993 *a manual for training trainers in participatory techniques*
State of the world's children 2006

UNICEF 2002. *The State of the World Children*. Geneva: UNICEF

UNICEF 2003. *The State of the World Children*. New York: UNICEF.

UNICEF 2005. *The State of the World Children*. Geneva:UNICEF

Vongkhamdy K. (1989). *Knowledge and Attitude on Immunization Preventable Diseases of Mothers with Children 6 -24 Months Old and Completeness of their Children's Immunization in Pakse District, Champasake Province,Laopdr* [M.P.H.M Thesis Primary Health Care Management].Nakhonpathom:Faculty Of Graduate Studies, Maidol University;

Waisbord, S., and H. Larson. (2005). Why Invest in Communication for Immunization: Evidence and Lessons Learned. A joint publication of the Health Communication Partnership based at Johns Hopkins Bloomberg School of Public Health/Center for Communication Programmes (Baltimore) and the United Nations Children's Fund (New York).

WHO (World Health Organization), 2000b. An Integrated Approach to Communicable Disease Surveillance. *Weekly Epidemiological Record*, 75:1-8. January

WHO (World Health Organization). 2006. The World Health Report 2006: Working Together for Health. Geneva, Switzerland: WHO.

WHO, (1981). Formulating strategies for Health for all by the year 2,000: Guiding principles and Essential Issues, WHO publication* Geneva.

WHO, 1991. Training for Mid-level Managers: Manage the Cold Chain. Geneva: World Health Organization. *WHO/EPI/MLM/91.5*.

WHO, 2003. Ensuring the Quality of Vaccines at Country Level. Guidelines for Health Staff. Geneva: World Health Organization. *WHO/V&B/02.16*.

WHO. 2003. Increasing Immunization Coverage at the Health Facility Level. Geneva: World Health Organization. *WHO/V&B/02.27*.

World Health Organization. The world health report 2000, health systems: improving performance. Geneva: World Health Organization; 2000

Wyss K, Moto DM, Callewaert B (2003) Constraints to scaling-up health related interventions: the case of Chad, Central Africa. *J IntDev*; 15:87-100.

Zimicki, S, Hornik, R, Verzoza, C., Hernandez, J., de Guzman, E., Dayrit, M, Fausto, A, Lee, M. B. & Abad, M. (1994). Improving vaccination coverage in urban areas through a health communication campaign: The 1990 Philippines experience, *Bulletin of the World Health Organization* 72: 409-422.



APPENDIX

QUESTIONNAIRES

KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL, OF MEDICAL SCIENCES
KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
COLLEGE OF HEALTH SCIENCES, DEPARTMENT OF COMMUNITY HEALTH,
KUMASI.
QUESTIONNAIRE FOR HEALTH PERSONEL

TOPIC: AN EVALUATION OF THE EXPANDED PROGRAMME ON IMMUNIZATION
IN THE NEW JUABEN MUNICIPALITY: A VIEW THROUGH THE FLASHLIGHT
TRIAD EVALUATION MODEL

Introduction

Good morning/afternoon and thank you all for coming/receiving us. We are with the Kwame Nkrumah University of Science and Technology (KNUST), Kumasi. My name is Ama Asamaniwa Attua and these are my colleagues..... (Let them introduce themselves). We are talking to several people like you to ascertain their views about the effectiveness of EPI intervention for children under 24 months. The findings will be used first, as an MPH Thesis, papers for publications in peer reviewed journals and policy briefs. Your opinions are very important and they will help us to improve the kind of health care we provide. There is no right or wrong answers. Your contribution is valuable. Whatever you say will be confidential so feel at ease to express your opinion. In this exercise, you will be required to respond to some questions about the subject matter at your own convenience. Be guided that your refusal to answer any of these questions will not affect your access to health in anyway. You are free to participate or not. But we encourage you to help us improve the health system to improve the health status of people especially children living in Ghana. THANK YOU!!

IDENTIFICATION NUMBER:

DATE:

SOCIO-DEMOGRAPHIC CHARACTERISTICS

1. Qualification
2. Type of health facility in which you work
3. Educational background
4. Location of facility
5. Average number of working hours
6. Number of years in service

Knowledge of health workers on EPI schedule

7.

ANTIGEN	YES SPONTANEOUS PROMPTED	NO
BCG		
OPV 0		
DPT+HEPB+HIB 1		
DPT+HEPB+HIB 2		

DPT+HEPB+HIB 3			
MEASLES			
YELLOW FEVER			

8. When was your last training on EPI done? _____
9. Have you received supervision in the last six months? Yes ____ No ____
10. Are fathers encouraged to be involved in deciding whether to immunize children?
Yes____ No ____
11. What do you do to encourage fathers' involvement in immunization of the child.-

12. Will you say the number of staff is adequate in terms of the required number needed? Yes.... No.....
13. If No how do you cope with the situation?
.....

Biosafety

14. After use do you separate the syringe from the needle? Yes__ No__

SECTION C: Recommend Strategies to Inform Health Policy

15. What would you want to see added to these Child Survival Services? -----

16. Is there anything wrong with the current EPI protocols? YES----- NO -----
17. IF YES; what are the shortfalls of these Child Survival Service. -----

18. What would you recommend to be done instead?

19. What are some of the challenges faced in the implementation of EPI?

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
COLLEGE OF HEALTH SCIENCES, DEPARTMENT OF COMMUNITY HEALTH,
KUMASI.
QUESTIONNAIRE FOR DISEASE CONTROL OFFICERS**

**TOPIC: AN EVALUATION OF EXPANDED PROGRAMME ON IMMUNIZATION:
A VIEW THROUGH THE FLASHLIGHT TRIAD EVALUATION MODEL**

Date:

Identification:

SURVEILLANCE

1. Are there epidemiological surveillance indicators for:
2. measles ___
3. AFP ___
4. neonatal tetanus ___
5. Are the indicators known? Yes___ No___
6. Are the indicators observed? Yes___ No___
7. Is there an active search for suspected cases of
8. measles Yes___ No___
9. AFP Yes___ No___
10. neonatal tetanus Yes___ No___
11. Do you evaluate the progress of the program with the pertinent indicators?
12. Coverage -Yes___ With what frequency?___ No___
13. Percentage of incomplete schedules. Yes___ With what frequency?___ No___
14. Is the graph of the monitoring of coverage up-to-date and visible? (Confirm.) Yes___ No___
15. Is there up-to-date information on cases and laboratory results? Yes___ No___
16. Have areas of risk and epidemic potential been identified in the community? Yes___ No___
17. How do you trace defaulters?

18. Do you encourage social mobilization? Yes No
19. If yes,
how _____
20. What are some of the challenges you face in your daily activities?
21. What would like to see changed/added so that the surveillance activities can go on successfully without any hitches?

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
COLLEGE OF HEALTH SCIENCES, DEPARTMENT OF COMMUNITY HEALTH,
KUMASI.**

**QUESTIONNAIRE FOR MOTHERS AND CARE GIVERS OF CHILDREN UNDER
FIVE**

**TOPIC: AN EVALUATION OF EXPANDED PROGRAMME ON IMMUNIZATION
IN NEW JUABEN DISTRICT: A VIEW THROUGH THE FLASHLIGHT TRIAD
EVALUATION MODEL**

Introduction

Good morning/afternoon and thank you all for coming/receiving us. We are with the Kwame Nkrumah University of Science and Technology (KNUST), Kumasi. My name is Ama Asamaniwa Attua and these are my colleagues..... (Let them introduce themselves). We are talking to several people like you to ascertain their views about the effectiveness of EPI for children. The findings will be used first, as an MPH Thesis, papers for publications in peer reviewed journals and policy briefs. Your opinions are very important and they will help us to improve the kind of health care we provide. There is no right or wrong answers. Your contribution is valuable. Whatever you say will be confidential so feel at ease to express your opinion. In this exercise, you will be required to respond to some questions about the subject matter at your own convenience. Be guided that your refusal to answer any of these questions will not affect your access to health in anyway. You are free to participate or not. But we encourage you to help us improve the health system to improve the health status of people especially children living in Ghana. THANK YOU!!

DATE:

IDENTIFICATION:

SECTION A: SOCIO-DEMOGRAPHIC

- A.1 Age of Child (months)..... SEX (female []/male [])
A.2 Sex of Caregiver (female []/male [])
A.3 NO of CHILDREN
- A.4 Marital Status: Married [] Single [] Divorced [] Other []
A.5 Religion: Christian.... Moslem.... Traditional..... Other.....
A.6 Educational Level: None... Primary.....Secondary.....Tertiary.....
A.7 Occupation: Farmer... Trader... Unemployed... Housewife..... Other.....
A.8 Ethnicity: Akan _____ Ewe _____ Ga/Aganbe _____ northern
_____ foreign nationals _____
- A.9 Based on your properties and income earned, how would you rate yourself on the socioeconomic scale
1. Very low
 2. Low
 3. Middle class
 4. High class

Section B: knowledge and source of information

- B.1 Have you heard or seen messages about vaccination in the last month

1. Yes
2. No

B.2 Source of information :

3. Radio
4. Television
5. Loudspeakers
6. Public notices
7. Health unit
8. Newspapers
9. Others

B.3 Use/importance of vaccination

1. Correct
2. Incorrect

B.4 What diseases do they prevent

3. Polio
4. Measles
5. Tetanus
6. Tuberculosis
7. Diphtheriae
8. Yellow fever
9. Hepatitis b
10. Haemophilus influenza B

Section c: Immunization of child

C.1 Age at which immunization schedule was completed for child _____

C.2 Where do you usually have the immunization sessions

1. RCH
2. CHPS
3. Maternity home
4. Other

C.3 How long does it take to get to the immunization centre

1. Less than one hour
2. One to two hours
3. More than two hours

C.4 What is your means of getting to the immunization centre

1. By foot
2. Vehicle
3. Other

C.5 Which vaccines were administered to the child and at what month

Vaccine	Administered	Age of child at time of immunization
BCG	1. Yes 2. No	
OPV0	1. Yes 2. No	
OPV1 PENTA 1	1. Yes 2. No	
OPV2/PENTA 11	1. Yes 2. No	

OPV3/PENTA III	1. Yes No	2.	
Measles	1. Yes No	2.	
Yellow fever	1. Yes No	2.	

C.6 Were you informed about the diseases that the vaccines prevent?

1. Yes
2. No

C.7 Were you informed about the side effects of the vaccine?

1. Yes
2. No

C.8 Did the child experiences any unusual signs of illness after the vaccination

1. Yes
2. No

C.9 What was the side effect (s)?

1. fever
2. chills
3. vomiting
4. abscess at the site of immunization
5. cyanosis
6. paralysis of the limbs
7. jaundiced
8. spasms
- 9 other please state

C.10 Were you given any medication after the immunization?

1. Yes
2. No

C.11 If yes, what medicine was it?

1. Paracetamol syrup
2. Antibiotics
3. De-wormer

C.12 Were you satisfied with the services rendered to your child

1. Yes
2. No

C.13 Which of these disease have your child ever had?

	Yes	No
1. Measles (rashes with sore mouth)		
2. Tuberculosis		
3. Acute paralysis of the limbs		
4. Viral Hepatitis		
5. whooping cough		
6. influenza		
7. diphtheria		
8. Tetanus		

**KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY
COLLEGE OF HEALTH SCIENCES, DEPARTMENT OF COMMUNITY HEALTH,
KUMASI.**

QUESTIONNAIRE FOR MANAGERS OF HEALTH FACILITY

TOPIC: AN EVALUATION OF CHILDREN UNDER FIVE'S HEALTH SERVICE-LINKED INTERVENTIONS IN NEW JUABEN DISTRICT: A VIEW THROUGH THE FLASHLIGHT TRIAD EVALUATION MODEL

Introduction

Good morning/afternoon and thank you all for coming/receiving us. We are with the Kwame Nkrumah University of Science and Technology (KNUST), Kumasi. My name is Ama Asamaniwa Attua. We are talking to several people like you to ascertain their views about the effectiveness of health service linked interventions for under five children. The findings will be used first, as an MPH Thesis, papers for publications in peer reviewed journals and policy briefs. Your opinions are very important and they will help us to improve the kind of health care we provide. There is no right or wrong answers. Your contribution is valuable. Whatever you say will be confidential so feel at ease to express your opinion. In this exercise, you will be required to respond to some questions about the subject matter at your own convenience. You are free to participate or not. But we encourage you to help us improve the health system to improve the health status of people especially children living in Ghana. THANK YOU!!

Date :

Identification:

SECTION A: SOCIO-DEMOGRAPHIC CHARACTERISTICS

1. Qualification
2. Type of health facility in which you work
3. Professional background
4. Location of facility
5. Average number of working hours
6. Number of years in service

SECTION B: KNOWLEDGE OF HEALTH WORKERS

1. Knowledge of health workers on EPI schedule

ANTIGEN	YES SPONTANEOUS PROMPTED	NO
BCG		
OPV 0		
DPT+HEPB+HIB 1		
DPT+HEPB+HIB 2		
DPT+HEPB+HIB 3		
MEASLES		
YELLOW FEVER		

2. When was your last training on EPI done? _____
3. Have you received supervision in the last six months? Yes ____ No ____

SECTION C: TECHNOLOGY

1. Is there a well outlined protocol for the implementation of EPI? Yes... no.....
2. Does your facility employ or use these outlines. Yes ____ No ____

3. Are these Childhood Survival interventions accepted by the community? Yes... no.....
4. Which vaccination strategies and tactics are utilized most?
 - a. Campaigns/days_____
 - b. Routine/systematic_____
 - c. Vaccination in the home_____
 - d. Systematic movement from place to place_____
 - e. Mobile vaccination equipment_____
 - f. Services for remote areas_____
 - g. Other (specify)_____
5. Is the EPI properly placed in the organizational chart? Yes__ No__
6. Is the placement of the vaccination site adequate? Yes ____ No ____
7. Is the vaccination schedule adequate? Yes ____ No ____
8. Is the coordination with other health care programs adequate? Yes ____ No ____
9. Is coordination with other institutions or sectors adequate and documented?
Yes ____ No ____
10. What was the date of the last campaign or mop up used as a vaccination strategy and which vaccines were used?
Date __/__/__ Vaccines _____
11. Do you go on outreach services to remote areas? Yes No
12. If yes how often _____

SECTION D: INPUTS FOR THE INTERVENTIONS

1. How many staff undertake the Child Survival Service in the facility?
2. Are there sufficient personnel to carry out the tasks?
3. Are the vaccines needed for this Child Survival Service readily available? Yes.... No.....
4. What storage facility do you have for storing these vaccines?
.....
5. Are these storage facilities adequate for storing all the vaccines? Yes.... No.....
6. What effect does the frequent power fluctuation have on storage equipment?

7. What effect does these power fluctuations have on your work?
.....
.....
8. Have you made any provisions for vaccine storage in the event of equipment breakdown?
Yes... No
9. If Yes what are they
.....
.....
.....
10. Are the logistical and management resources adequate? Yes... No
11. In the event that syringes, vaccination cards, or other inputs were lacking, what action would be taken? _____
12. Is there adequate financial support for EPI in your community? Yes... No
13. Is there a local contribution of funds from other institutions? Yes ____ No ____
14. Is there a medical waste box (specific container) for used needles and syringes? Yes____
No__
15. Are the contents of the medical waste box:
 - a. Buried ____

- b. burned__
 - c. discarded with the hospital refuse__
 - d. combined with the common refuse__
 - e. otherwise disposed of (specify)_____
16. Are there open flasks of vaccine (MMR, BCG, yellow fever) from the previous day?
Yes__ No__
17. How long are the open flasks (DPT, Td; Sabin) kept? _____

SECTION E: COLD CHAIN

1. Is there an up-to-date inventory? Yes__ No__ { physically check the inventory}
2. Is the equipment adequate for the needs? Yes__ No__
3. Is there a schedule for preventive maintenance of the refrigerator and replacement of equipment? Yes__ No__
4. Are the cold chain standards applied? Yes__ No__
5. Does the unit have a refrigerator exclusively for vaccines? Yes__ No__
6. If no Why? _____
7. Is it in good operating condition? Yes__ No__
8. If no Why? _____
9. Does it have a thermometer? Yes__ Specify type. _____ No__
10. Is there a permanent energy supply? Yes__ No__
11. How many hours per day? _____
12. Type of energy utilized? Gas __ Electric __ Solar __
13. Was the energy supply cut during the last 30 days? Yes__ No__
14. How many times? _____ how long did it last? _____
15. Do you know what actions to take or the written emergency plan in case of an energy supply cut? Yes__ No__ Does not know __
16. What are the measures to be taken when the energy supply is cut?
17. Explain. _____
18. Has the refrigerator malfunctioned in the last six months? Yes__ For how long? _____ No__
19. Has a refrigerator temperature over 8°C or under 2°C been recorded in the last month? Yes__ No__
20. How many times? _____ How many degrees (over or under)? _____
21. Is the supply of thermoses and coolers (for transport) sufficient? Yes__ No__
22. How many hours are the vaccines kept in the thermos? (Record.) _____ hours
23. Do you receive the vaccines in good condition (packing intact, proper temperature on arrival)? Yes__ No__
24. Is the type of transport adequate? Yes__ No__

SECTION F: PUBLIC HEALTH

1. Are clients educated on recognition of side effects of vaccines and what to do if they recognize such symptoms? Yes.... No.....
2. Education of the caregivers on these Child Survival Service

• How often do you do the education? - Daily - Twice a week - Thrice a week - Weekly - Monthly - Two weekly - Others	• Through what medium do you do the education - Meetings - Radio - Use of mobile vans - Gong gong beating - Social gathering - Others
---	---

- With what materials do you do the education? - Flip charts - Manuals - Tapes - Projectors - Others (Please specify)	Talk [] Illustrative lecture [] Media campaigns [] Questions and answers [] Others (please Specify)

3. Are the community stakeholders involved in the activities of the EPI? Yes___ No___
4. If yes, _____
5. Is there support for the EPI from private enterprise, social groups, or the community?
6. What are solutions for the problems with
7. The immunization program? _____
8. Epidemiological surveillance? _____



MAP OF NEW JUABEN

NEW JUABEN MUNICIPAL HEALTH MAP

