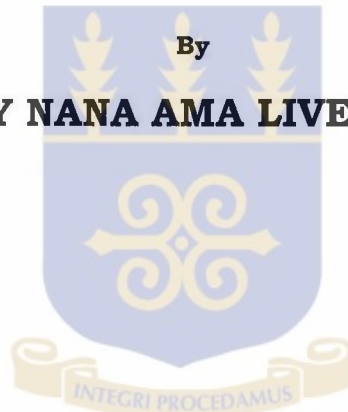


# **WHY WERE THE TARGETS NOT ACHIEVED?**

**A Study Of The Factors Affecting  
Immunisation Coverage In  
The Cape Coast Municipality**

By  
**MARY NANA AMA LIVERPOOL**



**A DISSERTATION SUBMITTED TO THE SCHOOL OF PUBLIC HEALTH, UNIVERSITY OF  
GHANA, LEGON, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD  
OF A MASTER OF PUBLIC HEALTH DEGREE**

**UNIVERSITY OF GHANA  
LEGON**

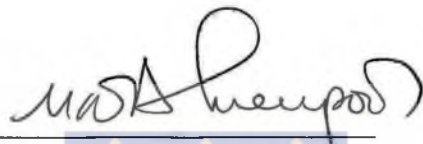
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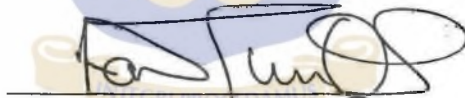
## Declaration

I do hereby declare that with the exception of specific quotations and ideas attributed to specific sources, this is an original work I set myself to do and it has not been credited to anyone for the award of a degree.



**MARY NANA AMA LIVERPOOL**

Candidate



**PROFESSOR L OSEI**

Academic Supervisor



**DR P ANTWI**

Academic Supervisor

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## Dedication

*I dedicate this work to  
God, the Gracious one,  
Yaw, my dearest friend,  
Maame Adwoa, my gift from God,  
The Quartey, the family with a big heart,  
And the children of Cape Coast and their “busy mothers”.*

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Concerning the success of outcomes of human endeavour, the Good Book makes an interesting observation. It notes that whilst one person can plant and the other water a seed, it is only the Almighty alone who provides the increase. My sentiments could not have been better expressed. I am totally indebted to Him.

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Notwithstanding the tremendous assistance I received from diverse sources, any error of omission or commission is entirely mine.

**MARY NANA AMA LIVERPOOL  
LEGON**

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## Abstract

The Immunisation of children is one of the most powerful interventions to improve child survival and reduce morbidity. For immunisation to be effective in reducing mortality as well as preventing the transmission of disease, a high proportion of the target group must be immunised. The regular evaluation of the immunisation programme is necessary to assess progress, identify problems and develop strategies, which may be used to improve the coverage.

The study was conducted in the Cape Coast Municipality in July 2000 to evaluate the immunisation programme following a drop in the immunisation coverage calculated from routine data in 1999. The aim of the study was to determine the actual immunisation coverage, and other factors affecting this coverage.

The study combined both quantitative and qualitative methods, using a modification of the WHO 30-cluster sample survey to establish the coverage. The study population was children aged 12-23 months, and the sample size was increased from 210 to 480, thereby increasing the precision of the results obtained. In-depth interviews with mothers and health workers were also conducted to investigate in more detail the factors affecting immunisation coverage, and assess the techniques used by the health staff to monitor the immunisation services.

The immunisation coverage for the various vaccines exceeded 75%, however, only 68% of the children were fully immunised by their first birthday. The coverage for DPT<sub>3</sub>/OPV<sub>3</sub> was higher (78%) than it was in the routine reports (64%). The potential immunisation coverage among the immunised children was decreased due to the inappropriately timed vaccinations that had been given. Although the knowledge of immunisation among the mothers was low, competing priorities were the main deterrents preventing mothers from attending immunisation sessions. The vaccinations had all been received at government service delivery points mainly the health centre or the outreach stations. Missed immunisation opportunities,

poor attitude of staff and poor communities' involvement in immunisation activities were also problems of the immunisation programme.

Improvement in the immunisation programme in the immediate future requires the retraining and supervision of health staff, increasing the accessibility of services provided, ensuring the availability of vaccines and using all opportunities to vaccinate children. In the medium term, the programme must be reorganised with a well-spelt out mechanism for monitoring the immunisation services, involving the communities and educating mothers in detail on immunisation. In the long term, the main requirement is to improve the educational level of the people in the municipality particularly the women.



# 1 INTRODUCTION

## 1.1 BACKGROUND

### 1.1.1 History of the Expanded Programme on Immunisation

The World Health Organisation (WHO) launched the Expanded Programme on Immunisation (EPI) in 1974 (Bland & Clements 1998). The aim was to take immunisation against the six target diseases - measles, pertussis (whooping cough), diphtheria, tuberculosis, poliomyelitis and tetanus to the children of the world. In 1978, the WHO/UNICEF International Conference on Primary Health Care, in Alma Ata, recommended that Primary Health Care should be the key to the WHO's goal of achieving Health for All by the year 2000 (WHO, 1978). Immunisation against major diseases was one of the eight elements of the PHC, thus making the EPI an integral part of the PHC system.

In May 1982, the World Health Assembly reviewed the EPI and urged member states of WHO to immunise all their children by 1990 (UNICEF, 1983). At this Assembly, member states were called on to promote EPI within the context of PHC, invest adequate human and financial resources in EPI, ensure that programmes are continuously evaluated and pursue research efforts as part of the programme operations. UNICEF also developed the Universal Child Immunisation Programme and set a global target of 80% immunisation coverage among infants worldwide by 1990.

By 1990, the 80% target set was achieved, thereby preventing some 3 million deaths annually (WHO, 1993). At the World Summit for Children in 1990 therefore, one of the major challenges for immunisation for the 1990s that was identified was the maintenance of a high level of immunisation coverage – at least 90% of children under one year of age by 2000. (WHO, 1993). It was anticipated that an increase in coverage to 90% will drastically reduce the two million deaths still caused by vaccine-preventable diseases (Bland & Clements, 1998).

A global polio eradication effort was also launched in 1988 by the World Health Assembly and since then polio has been eradicated from the Americas and several countries are reporting zero incidence of the disease (WHO, UNICEF 1996).

Another initiative related to the EPI is the Children's Vaccine Initiative, which was also launched at the World Summit for Children in 1990. It set out a radical agenda of improving the global vaccine supply and the quality of existing vaccines, as well as developing strategies to ensure that the vaccines will be affordable for use in developing countries. (Hartvelt, 1993) The EPI Plus was introduced in 1993 incorporating vaccines against hepatitis B and yellow fever, as well as vitamin A and iodine supplements into the standard EPI programme. A more recent development in the area of child health and immunisation, has been the development of the Integrated Management of Childhood Illness Strategy by the Division of Child Health and Development of the WHO. This strategy combines improved management of childhood illness, with aspects of nutrition, immunisation, and several other important influences on child health, including maternal health (CHD, WHO 1997).

In Africa, the EPI was launched in 1978 and by the mid-eighties all countries had established national immunisation programmes. A mid decade evaluation conducted in 1985 indicated that the regional immunisation coverage was still 20% for all antigens and therefore the year 1986 was adopted the "African Immunisation Year", and various accelerated efforts implemented till 1990 (Bee and Barakamfitye, 1994).

### **1.1.2 The Expanded Programme on Immunisation in Ghana**

In Ghana, the EPI programme was officially launched in 1978 after a period of feasibility studies with the objective of fully immunising 80% of its children age 0 – 11 months by 1983 (Agadzi, 1978). However, after 20 years of the programme, the percentage of fully vaccinated children before age one was 51% nationally, and 49% in the central region. (GSS/MI, 1999). From this survey, it was realised that although 90% of children nationally received BCG and the first dose of DPT and OPV vaccine before age one, only two thirds of these children had

received the third dose of DPT and OPV by this age. This shows a nation-wide high drop out rate.

The EPI Policy statement, its objectives and targets are summarised below (MOH/WHO/UNICEF, 1989):

“The government of Ghana has adopted the policy of reducing to manageable levels the morbidity and mortality of children under 5 years against the following common childhood preventable diseases, tuberculosis, measles, diphtheria, poliomyelitis, pertussis, neonatal tetanus and yellow fever, through the Expanded Programme on Immunisation (EPI).”

The Specific Objectives of the Programme were:

- To promote continued immunisation of infants through the existing health delivery system.
- To combat diseases for which there are effective vaccines and immunisation methods.
- To ensure that by 1990, all children in the first year of life will have ready access to immunisation and 80% of them will be fully immunised.
- To ensure that a course of tetanus toxoid immunisation is started in at least 80% of women aged between 12-44 years in any particular year.
- To reduce the incidence and mortality due to measles, whooping cough, polio and tetanus by 80%, and tuberculosis by 50% of the present levels.
- To improve data collection and to establish a better disease surveillance through regular reporting from all the health facilities.
- To achieve immunisation in all health facilities.
- To promote EPI with Control of Diarrhoea Diseases (CDD) within the framework of Primary Health Care (PHC) delivery system.
- To improve EPI services and coverage through research.
- To strengthen intersectoral co-operation as well as teamwork amongst health workers and the community in order to improve acceptance and coverage of EPI and CDD services.
- To improve and expand the coverage of health education.

The present EPI schedule for Ghana is shown in table 1.

**Table 1: The EPI Schedule for Ghana.**

Vaccine	Age Given	Disease Protected Against
Bacille Calmette-Guerin (BCG)	At Birth	Tuberculosis
Oral Polio Vaccine (OPV <sub>0</sub> )	At Birth	Poliomyelitis
OPV <sub>1</sub>	6 weeks	“
OPV <sub>2</sub>	10 weeks	“
OPV <sub>3</sub>	14 weeks	“
DPT (Diphtheria-Pertussis -Tetanus)	6 weeks	Diphtheria -Pertussis -Tetanus
DPT	10 weeks	“
DPT	14 weeks	“
Measles	9 months	Measles
Yellow Fever	9 months	Yellow Fever

A more recent update of the policy guidelines (MOH, 1997) set the following goals for the EPI in Ghana:

- Control of Measles,
- Elimination of Neonatal Tetanus,
- Eradication of Poliomyelitis;
- Control of Hepatitis B; and
- Control of yellow fever all by the year 2000.

Although Hepatitis B has been listed as one of the diseases to be controlled by the EPI, in the most recent EPI Draft Policy guidelines, it has not yet been introduced into the immunisation schedule in Ghana. This is due to the financial implications as Hepatitis B costs three times as much as the total sum of the original EPI vaccines.

Ghana has since 1996 joined in the global effort to eradicate polio and has carried out four rounds of the National Immunisation Day exercises, which is aimed at reducing the circulation of the wild polio virus. The other strategies to eradicate polio are also being implemented.

### **1.1.2.1 Organization of EPI in Ghana**

Ghana, with support from donor agencies acquires her supply of vaccines and other logistics such as syringes, needles and the cold chain equipment from outside the country, whereas the Road to health and other cards used to record vaccinations received are produced locally. The National Disease Control Unit receives the supplies and distributes them to the Regions, which in turn distribute them to the various districts. There are guidelines for the storage of the different vaccines, as well as the basic cold chain requirement for the Regional, District and sub-district levels in order to ensure the vaccines are kept at the specified temperature at all times. The vaccines are stored for 6 months to a year at the National Level, for a maximum period of 3 months at the Regional level and one month at the District and Sub-district levels. The EPI Programme Manager has oversight responsibility for the programme at the National level, and together with his team ensures there is adequate supply, as well as an organised logistical and cold chain system for the distribution of vaccines. They also train immunisation managers at all levels of the health system thus building capacity. At the Regional and District level, the Disease Control Officer is in charge of the vaccine supply and also monitors the immunisation services. At the sub-district level, immunisation services are provided by the Maternal and Child Health (MCH) Unit staff - mainly the community health nurses. The sub-districts are the main implementers of the EPI Programme, providing immunisation services through the outreach and fixed point child welfare clinics and the daily-integrated services approach. Other strategies used are the home visits and the mass immunisation campaigns. A review of the EPI programme in the country and other MOH documents suggest that of those facilities where immunisation is provided, only 9% of them offer daily immunisation services (MOH, 1999). This implies that although the strategies have been clearly spelt out, there are still some problems with the implementation.

## 1.2 STATEMENT OF THE PROBLEM

There was a drop in the immunisation coverage for DPT<sub>3</sub> and OPV<sub>3</sub> in the Cape Coast Municipality in 1999. (The DPT<sub>3</sub> and OPV<sub>3</sub> coverage are used as the indicators for immunisation coverage). The 8-year trend of immunisation coverage for the Cape Coast Municipality is shown in table 2.

**Table 2: Immunisation Coverage for the Various Antigens In the Cape Coast Municipality: 1992 –1999.**

Year Vaccine	Target Population	Vaccine Coverage			
		BCG	Measles	DPT <sub>3</sub>	OPV <sub>3</sub>
		%	%	%	%
1992	3912	90.9	49.4	51.7	51.2
1993	4033	94.5	57.6	57.6	68.8
1994	4101	88.0	62	76	73
1995	4183	111.2	65.9	71.4	70.4
1996	4292	66.1	53.0	54.8	58.9
1997	4535	90.8	69.7	71.3	76.2
1998	4656	95.2	71.5	72.3	72.2
1999	4777	91	75.7	64	64.4

Source: Annual Reports – Regional Health Administration 1992 – 1999.

The coverage of DPT<sub>3</sub> and OPV<sub>3</sub> over the past 8 years has not reached the 80% target set nationally, however with the exception of 1996, it has been maintained at a minimum of 70% between 1994 to 1998. There was a drop to below 70% (64%) in 1999. After an all time high coverage of 76% was achieved in 1997, the coverage dropped in 1998 and then in 1999. From the figures it is obvious there has been a problem of dropouts from immunisation in the municipality over the years. The dropout rate however for 1999, is much higher than the rates in 1998, and 1997. The high drop out rate implies the proportion of children fully immunised is low and thus a relatively high number of children are susceptible to the vaccine-preventable diseases.

The DPT<sub>3</sub> and OPV<sub>3</sub> antigens are to be given at the same time, however the immunisation coverage for these two antigens is different for each year. This differential coverage may be due to the shortage of vaccines.

Comparing the immunisation coverage among the sub-districts within the Municipality showed that the Ewim and Adisadel sub-districts had lower coverage than the other two districts. Within these districts, there is no indication of the particular communities, which had the lowest coverage. The low coverage attained was a source of concern to the entire Health Management at the Municipal and Regional levels. The coverage achieved for the vaccines for 1999 by sub-district is shown in table 3.

**Table 3: Immunisation Coverage by Sub-district in the Cape Coast Municipality – 1999.**

Sub-District	Target Population	Antigens			
		BCG (%)	MEASLES (%)	DPT3 (%)	OPV3 (%)
MCH/MAIN	1504	1612(107.1)	1293 (85.9)	1003 (66.7)	1035 (66.7)
UCC	564	500(88.7)	554 (98.2)	536 (95)	536 (95)
EWIM	1080	668(61.9)	511 (47.3)	694 (64.3)	691 (64)
ADISADEL	1629	1568(96.3)	1259 (77.3)	824 (50)	813 (50)
Total	4777	4348 (91.0)	3617 (75.7)	3057 (64.0)	3075 (64.4)

**Source: Cape Coast Municipality Annual Report 1999**

The achieving of percentage coverage higher than 100% for BCG in the tables shown above raises the issue of the possibility of unreliable target populations within the municipality.

The immunisation coverage for the Cape Coast Municipality was also the lowest in the Central Region, using the OPV3 and DPT3 indicators. This is shown in table 4.

**Table 4: Immunisation Coverage for the Various Antigens for all Districts in the Central Region 1999.**

District	Target Pop.	BCG	Measles	DPT <sub>3</sub>	OPV <sub>3</sub>
Awutu-Efutu-Senya	5113	130.9	83.8	98.8	100.2
Assin	7841	106.2	68.6	89.1	98
Asikuma-Odoben-Brakwa	4465	139.4	89.9	80.6	91.3
Upper Denkyira	3890	94.7	71.9	82.2	85.7
Mfantiman	7401	75.6	66.7	85.1	82.8
Gomoa	6736	97.1	76.9	79.9	82.0
Komenda-Edina-Eguafo-Abrem	4214	92.8	80.8	76.8	80.5
Ajumako-Enyam-Esiam	3791	97.7	76.0	76.8	74.8
Agona	6847	87.7	74.5	74.5	74.7
Abura-Asebu-Kwamankese	3907	89.5	66.1	74.2	74.7
Twifo-Heman-Lower - Denkyira	6624	65.3	92.2	71.8	70.0
Cape Coast	477	91	75.7	64	64.4
<b>Regional Total</b>	<b>65606</b>	<b>96.3</b>	<b>76.3</b>	<b>79.9</b>	<b>81.2</b>

Source: Central Regional Health Administration Annual Report 1999.

The number of patients reporting to the health facilities with vaccine-preventable diseases is shown in table 5. The figures show a decreasing trend in the reported cases of tuberculosis, measles and pertussis from 1997 to 1999, implying that the low immunisation coverage has not had any impact on the incidence of disease yet. This is expected as the rise in the incidence of disease occurs when a pool of susceptible people builds up and therefore lags behind a drop in the Immunisation coverage.

**Table 5 Reported Cases of Vaccine Preventable Diseases in the Cape Coast Municipality: 1994 – 1999.**

DISEASE	1994	1995	1996	1997	1998	1999
TUBERCULOSIS	264	232	248	279	257	168
MEASLES	372	294	115	768	237	126
PERTUSSIS	17	11	19	15	7	5
TETANUS	4	4	15	6	2	
NEONATAL TETANUS	-	26	23	14	1	5
DIPHTHERIA	-	-	-	-	-	-
ACUTE FLACCID PARALYSIS		-		-	1?	-

Source: Cape Coast Municipality Annual Reports 1994 – 1999.

### 1.2.1 Measures Taken to Address the Problem of the Low Immunisation Coverage

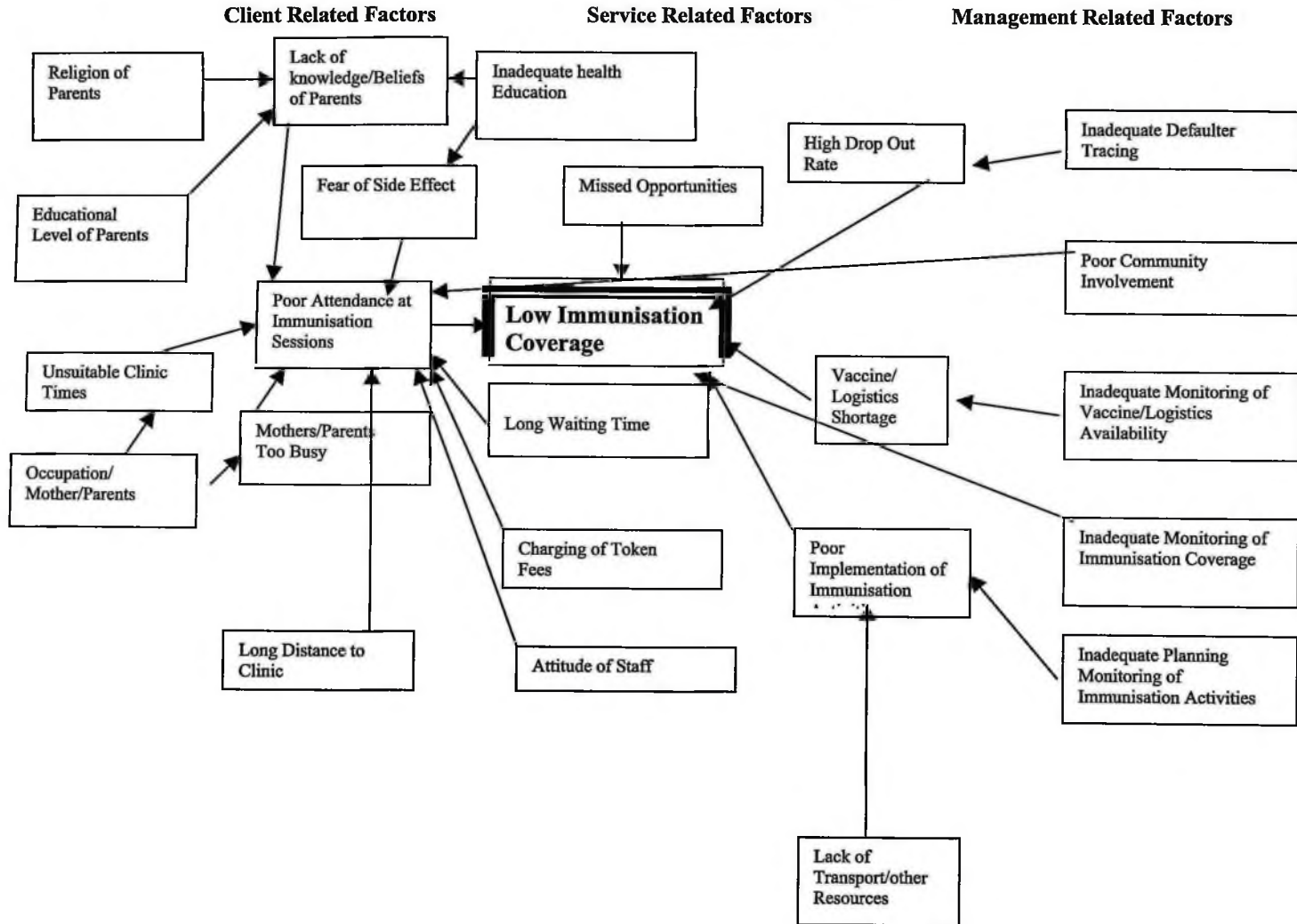
The low immunisation coverage was obtained despite certain measures taken to improve the immunisation services. A measure that has been undertaken in the past to increase coverage

was to stop the payment of all fees at the CWC clinics. There were also mass immunisation campaigns and house to house exercises conducted with the aim of increasing the coverage. These activities however did not yield the desired result of improving the immunisation coverage and thus decreasing the dropout rate.

There are a number of factors, which could have contributed to the low immunisation coverage, and these fall into three main categories - client-related, service-related and management-related factors. These factors are a lack of information or motivation, obstacles, which deter mothers or caregivers from immunising a child, inadequate monitoring of immunisation services and the existence of an unreliable target population.

Figure 1 shows how the factors interplay to result in the low immunisation coverage.

Figure 1: Problem Analysis Diagram



### **1.2.2 Rationale for study**

The study was therefore conducted to explain the drop in the immunisation coverage in the Cape Coast Municipality in 1999. The service-related and client-related factors, which affect the immunisation of infants, were determined and the health system was assessed to determine how the immunisation services were being monitored.

## **2 LITERATURE REVIEW**

### **2.1 IMPORTANCE OF IMMUNISATION**

The immunisation of children is one of the most powerful interventions to improve child survival and reduce childhood morbidity (Ties et al, 1990). Prior to the onset on the EPI, it was estimated that approximately 3.35 million children world wide were dying annually from vaccine-preventable diseases, and although the technology was available to prevent these diseases, less than 5% of children were immunised (Bland and clement, 1998, Rhodes, 1983). Another challenge was the organisation of Health Services such that these technologies available will be accessible to the vast majority of the people, and they would be willing to use the services. There was also the need to ensure political will and commitment of the leaders to the programme to guarantee its success.

For immunisation to be effective in reducing mortality as well as preventing the transmission of disease, a high proportion of the target group must be immunised (WHO/EPI, 1995). The immunisation coverage is also a good indicator of the degree of utilisation of health services both at the aggregate (national/regional level) and at the family/individual level (Ties et al, 1990). The monitoring and evaluation of the performance of immunisation is important in regard to disease surveillance. With regards to disease surveillance the percentage of children completely immunised against a particular disease is of more immediate concern than those fully immunised.

## 2.2 EPI CLUSTER SURVEY

The WHO, as a means of evaluating the EPI, has adopted the cluster sampling survey technique to estimate the immunisation coverage. This technique was originally used in the United States of America (Serfling and Sherman, 1965), and later adapted for use in West Africa (Henderson et al, 1973). This technique is based on an alternative sampling strategy to Simple Random Sampling (SRS) known as “probability proportionate to size” (PPS) cluster sampling (Lemeshow and Robinson, 1985). In this form of sampling, the population is first divided into clusters and a number of clusters selected randomly, such that the clusters, which are larger, have a greater probability of being selected. The second stage is selecting the individual units from the clusters selected and random sampling also does this.

In the EPI cluster survey, 30 clusters are selected from a list of clusters, using a sampling interval to obtain the clusters (WHO, 1991). However, at the second stage only the initial household is selected by random sampling, the subsequent houses being selected on account of their proximity to the initial household. Selection of the households continues till a total of 7 individuals are obtained per cluster, thus giving a total sample size of 210. The basis for arriving at a sample size of 210 is discussed further in the methodology.

In an article by P.W. Kok (1986) some limitations and biases of the EPI cluster sampling method were discussed. The main limitation he described of this method is that the sampling framework is based on the assumed presence of geographically more or less distinct villages and towns, which are listed as the clusters. Another limitation is the choice of the initial or starting household, which is done on the field by the research assistant randomly selecting a direction from the centre of the village. (This may be done by spinning a pen) The houses in the direction chosen are counted and then one house among these is randomly selected. When the village is large or unequal in its dimension, one direction may have a significantly different number of houses from another and therefore the chance of a household being

selected may vary depending on the direction chosen. A third concern raised is the possibility of bias as when a household around the centre of the village is chosen as the initial household, and the subsequent houses chosen around it, as the centre is likely to be located close to the immunisation point in that area.

A review of the EPI cluster method by Henderson and Sundaresan (1982) using actual and stimulated surveys found that the precision of the method as estimated from results of both the actual and simulated surveys is considered satisfactory for the requirements of the EPI. Thus despite the limitations and the possible sources of bias the method can be used effectively to determine immunisation coverage.

### **2.3 APPLICATIONS AND MODIFICATIONS OF THE EPI CLUSTER SURVEY**

The method has also been used in other community based assessments such as the assessing of diarrhoea and malaria practices in addition to immunisation status, using a sample size of 2040 children in 30 clusters – 68 children per cluster (Dabis et al, 1989).

A modified cluster sampling has been described in Kenya, where the standard one primary school child was used as the sampling unit in selecting the starting points. (Kok, 1986). This method was used to remove the sources of bias of the EPI sampling technique which has been discussed earlier, as it is based on the assumption that this school child is the most randomly and proportionally distributed registered sampling unit in the community. The writer was however careful to point out that this method would be defective if the schooling level is below 70%. When the school child is chosen, the household next to the one with a school child is selected as the starting point to remove the bias of household with school child surveyed.

## 2.4 OTHER METHODS OF EVALUATING IMMUNISATION PROGRAMMES

Anthropological, sociological and epidemiological research methods were used in conducting four studies to assess the immunisation programme in Conakry in 1988 and 1989. A health facility assessment – survey evaluated the service provided and the quality of care supplied by the vaccination programme. Another of the studies focused on the attitudes of service providers and the information was obtained through key informant interviews with health workers. The other two studies were community based and the information was obtained through focus group discussions and a survey.

The issues assessed in the FGD included parents knowledge about vaccinations, attitudes towards vaccinations and service delivery experiences with vaccination services and suggestions for improving the services. The knowledge attitudes and practice (KAP) survey obtained data on vaccine coverage and missed immunisation opportunities from home-based health records and vaccination records. It also assessed the users' attitudes to service delivery and it used data on socio-demographic and socio-cultural characteristics, knowledge and attitudes of mothers as well as vaccination service to predict the receipt of first and third doses of (DPT/OPV) in logistic regression equations. It is obvious the preceding information, that several aspects need to be considered in assessing an immunisation programme, and a complete assessment will involve a lot of time.

Another sampling method, which has been proposed for the immunisation coverage assessment, is the Lots Quality Assurance Sampling (LQAS) technique (Lemeshow and Robinson, 1985). With the LQAS method, a large level of coverage is specified for the population. A random sample of individuals in the population is then selected and based on this sample, the population (or "lot") is rejected if it is determined that the coverage is below the target or accepted if the coverage achieves the target. This method is useful to programme managers as it provides a local estimate of the effectiveness of the programme. The main

barrier of this method is the process of selecting a random sample in moderately large populations.

Another approach was used in Uganda to measure immunisation coverage, health service utilisation and childhood mortality (Malison et al, 1987). This approach was relevant in Uganda at the time as the large majority of people had no access to health services, and therefore the population-based surveys were expected to yield low coverage. In this survey, households situated very near the health facilities were focused on, and the immunisation coverage and other parameters investigated. This type of survey though valid for only a small proportion of the district population provided very useful information on the utilisation of the health services by those with the best access.

The use of rapid ethnographic assessment to identify maternal factors, which influence the use of preventive health services, was applied in a study in Haiti (Coreil et al, 1989). In this study group interviews, with mothers of pre-school children, individual interviews with health care providers and observation of rally post activities were conducted to maternal factors which influenced immunisation and these were developed into a questionnaire for use in a larger epidemiological study. This showed that epidemiological studies could benefit from qualitative data.

One major concern during immunisation coverage assessments is the source of information on the immunisation status of the children. Where the Road To Health Cards (RHC) are available, they are considered the most reliable, however when these are not available the mothers report is used. A study by Gareaballah and Loevinsohn determined the extent to which mothers in a developing country can be relied upon to provide accurate data about their children's vaccination status. (Gareaballah and Loevinsohn, 1989). In this study illiterate women were asked about their children vaccination status and compared with the information given on the cards. The study concluded that accurate estimates of the true coverage rates could be obtained by relying solely on mother's reports. They therefore believed that

ignoring mothers' reports about their children's vaccination status could therefore result in serious under estimates of the true vaccination coverage. They however pointed out some methodological issues raising questions about the validity of the study and commented that it is unlikely to be applicable in small coverage surveys as the one conducted. Another study also found out that mothers tended to remember accurately the vaccination status of children less than 6 months. With the older children and the larger the number of doses actually received, the more the mother underestimates the number of doses (Valadez and Weld, 1997).

## **2.5 FACTORS AFFECTING IMMUNISATION COVERAGE**

### **2.5.1 Socio-Economic Factors And Immunisation**

In a study in Dhaka City, Bangladesh in 1994, it was realised that twice as many children in the non-slum area were fully immunised compared to those in the slum area, showing the association between low immunisation and low socio-economic status (Perry et al, 1998). The drop out rate was also higher in the slum than the non-slum households. The socio-economic factors found to influence immunisation coverage were the educational level of mothers, their employment status and the number of children in the family. The proximity of families to the immunisation sites and the number of home visits from the field workers also had a favourable impact on the immunisation coverage. An improvement in people's living conditions is likely to have a positive influence on immunisation coverage.

### **2.5.2 Knowledge About Immunisation**

Maternal as well as community knowledge about Immunisation is an important factor influencing immunisation. In a study conducted to investigate factors influencing attendance to immunisation sessions in the Central Region in Ghana, it was found that only 26% of mothers had adequate knowledge of immunisable diseases, and 19% of them did not know any at all (Bosu et al, 1997). Those with adequate knowledge were more likely to have attended immunisation sessions regularly. A case control study of immunisation use in Haiti

showed significant differences in the maternal knowledge of vaccine name, recommended number of doses and the correct age to begin immunisations between the cases - completely vaccinated children, and the controls - incompletely vaccinated children (Coreil et al, 1989). In a coverage survey conducted in Italy, it was found that the lack of information was the commonest reason for delayed or missed vaccines for the optional vaccines (Angelillo et al, 1999). This was however different for the mandatory vaccines where the coverage was 94% and the delayed or missed vaccine were due to obstacles such as intercurrent illness, or unsuitable hours of the vaccination centre. This emphasises the important effect knowledge has on the immunisation of children, thereby influencing coverage.

### **2.5.3 Community Involvement and Immunisation**

Various studies have confirmed that closer interaction between community members and health workers through home visits and community participation has a positive impact on immunisation coverage (Brugha et al, 1996; Shobha et al, 1990). In an intervention study carried out in the Eastern Region of Ghana, home visits by health workers were found to raise significantly the immunisation coverage in the study area compared to the control area (Brugha et al, 1996). Another aspect of the study, which looked at the fathers' participation in the immunisation decision, showed that children were more likely to be immunised if fathers participated in the decision to immunise the children. The immunisation services were improved in a rehabilitated slum in Bombay when the help of school children or local voluntary agencies were used in door-to-door vaccination activity (Shobha et al, 1990). The children proved to be effective persuaders of the community leading to increase coverage for third doses of vaccines (DPT3, OPV3) to 85%. Involving the community members in immunisation activities thus has a favourable impact on immunisation coverage.

### **2.5.4 Quality of Health Services and Immunisation**

The quality of health of health care, particularly as determined from the clients' point of view, is another important determinant of immunisation coverage as this influences the utilisation of vaccination clinics. In Nigeria, by cutting down on the waiting time of mothers as well as re-

organising the clinical services to extend immunisation to all children under one year of age, health workers were able to achieve a substantial increase in the immunisation coverage in an urban health centre (Ekunwe, 1984). A study carried out in three Asian and two African countries documents the fact that parents are willing to invest considerable effort in having their children vaccinated. However there are a number of shortcomings in the quality of the routine vaccination services such as the poor organisation of the vaccination provision, the long waiting time, the non-availability of drugs and the perceived technical competence of vaccinators (Streefland et al, 1999). The health workers did not give adequate information to clients due to time constraints or the fact that they did not have much information themselves. In China, a scheme has been developed which links payment of the individuals responsible for carrying out immunisation to its efficacy thus making the health provider more responsible, as well as fostering closer interaction between community members (Weillan, 1990). The health worker is a very important link in the vaccination chain that cannot be overlooked.

## **2.6 STRATEGIES TO IMPROVE EPI COVERAGE**

Several strategies have been used to improve immunisation coverage. In Ghana the low immunisation coverage has been a source of concern for several years. The nation-wide accelerated immunisation activities was thus launched in the country in 1988 in an attempt to meet the global target of 80% of children fully immunised by age one (Ahmed, 1989). Some strategies that were used to meet the immunisation target in this exercise were the strengthening of immunisation activities, extended outreach activities, mass campaigns and social mobilisation activities. Some lessons learned from the exercise were the need to ensure availability of vaccines at all levels, training and equipping all categories of staff on EPI. There was also the need for adequate supervision, monitoring and submission of feed back, as well as the need for the introduction of the child's "passport" which indicates the immunisation status of the child. The need for community registers was also reiterated, as

this was the most effective means to follow up default children and ensure sustainability. These strategies which have all not been implemented are still very relevant in addressing the problems of immunisation presently.

In Sudan, measures taken to rehabilitate the National EPI Programme after a poliomyelitis outbreak in 1993, led to an increase in the immunisation coverage, with a concomitant decrease in incidence of all the EPI Target diseases from 1993 to 1996 (Elzein et al, 1998). Some measures that had been implemented to rehabilitate the programme were the renewing of the political and financial commitment, the decentralisation of EPI responsibilities and strategic planning at national and state levels. There was also a change in the immunisation delivery strategy from one involving mobile teams to a fixed site strategy with limited outreach service. Other measures implemented were the use of the solar cold chain, training of middle level staff and intensification of the disease surveillance was also done to improve reporting. Social mobilisation activities were enhanced and there was more local and community involvement in immunisation activities resulting in increased immunisation coverage.

Immunisation of children through the EPI programme remains the most effective strategy to improve child survival and must be regularly monitored and evaluated to ensure it achieves the maximum impact. The cluster sampling survey technique has been used as a means of evaluating the EPI programme and how various factors affect the coverage. Some factors, which have been found to influence immunisation coverage, are the socio-economic status of mothers or carers, maternal knowledge of vaccines and community participation in the immunisation activity.

### 3 OBJECTIVES

#### 3.1 GENERAL OBJECTIVES

The **general objective** was to identify the factors contributing to the drop in immunisation coverage in the Cape Coast Municipality.

#### 3.2 SPECIFIC OBJECTIVES

The specific objectives of the study were as follows:

- [1] To determine the true immunisation coverage of children aged 12 – 23 months in the Cape Coast Municipality.
- [2] To determine the social and economic characteristics of the mothers/carer of fully immunised<sup>1</sup>, partially immunised<sup>2</sup>, and non-immunised children<sup>3</sup> and identify factors contributing to the incomplete immunisation.
- [3] To assess the techniques used by the District for monitoring the immunisation services and make recommendations for improving immunisation services at the Municipality.

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<sup>1</sup> Children who have received all the required vaccinations on the immunisation schedule for Ghana

<sup>2</sup> Children who have received some, and not all of the vaccinations, on the immunisation schedule

<sup>3</sup> Children who have not received any immunisation at all.

## **4 METHODOLOGY**

### **4.1 STUDY AREA**

The study was conducted in the Cape Coast Municipality in the Central region. The municipality has a population of 119,340 (obtained from the 2000 housing and population census). The municipality has both urban and rural communities and is divided into four health sub-districts, each having at least one government or quasi government health facility. The Maternal and Child Health Unit is responsible for the provision of immunisation services for the catchment area in each sub-district. The Unit also provides Antenatal and Postnatal Care during which mothers are educated on the need for immunisation and where the mothers and infants may also be immunised.

The infants are immunised mainly at Child Welfare Clinics or immunisation sessions held at the health facilities (weekly) as well as other outreach points (stations). Daily integrated services including vaccination is also provided at all the health facilities to immunise any incompletely immunised children who visit the facility.

The frequency of visits to outreach points varies, however as recommended by the Ministry of Health, there is at least one visit per month to each outreach point. There are Community Based Surveillance Workers in each community who are to keep a community register with the immunisation status of each child and mobilise the community members for immunisation activities.

### **4.2 STUDY DESIGN**

The study was mainly a community-based cross-sectional study combining both quantitative and qualitative methods. Information on children's immunisation status, the socio-demographic and socio-cultural characteristics of parents/caregivers and the reasons for incomplete or non-immunisation of children was obtained through the quantitative survey. The quantitative aspect was done using the EPI Cluster Sampling technique. The information on infant immunisation was obtained from the child's Road to Health Card (RHC) if this was

available, or from the history given by the mother/carer. Where the RHC was available, the immunisation record for each vaccine, when and where it was received was noted. In situations where the card was not available, the mother or carer was asked about the immunisation status and where it was received. For the mothers with partially immunised children, the single most appropriate reason for the incomplete immunisation was asked. (Please see appendix for the interview guide.)

In-depth interviews were conducted with mothers of fully immunised and partially immunised children to explore further, their knowledge, attitudes, practices and beliefs on immunisation, their preferences for timing and location of clinics and also factors influencing their participation or non-participation in immunisation activities. These interviews were necessary to investigate into more detail some of the reasons that had been given by the mothers for not completely immunising their children. (Please see appendix for the interview guide.)

Another aspect of the study focussed on the health workers, obtaining information on the monitoring of the immunisation services from the sub-district and Maternal and Child Health (MCH) unit heads through the use of a checklist. The aspects of the immunisation services that were assessed were:

- Availability of vaccines.
- Coverage targets of vaccines.
- Problem of immunisation dropouts<sup>4</sup>.
- Routine use of recommended immunisation practices e.g. avoiding missed opportunities<sup>5</sup>.
- Implementation of all planned immunisation activities.
- Complete, accurate and timely compilation, analysis and submission of disease surveillance data.
- Community involvement in the immunisation activities.

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<sup>4</sup> Immunisation dropouts refer to those children who receive the initial vaccination, but do not return for subsequent visits and hence do not complete the immunisation schedule.

<sup>5</sup> Situations in which children eligible for immunisation have contact with the health facility or health worker and are not immunised

The knowledge, attitude and practices of the nurses involved in immunisation were also obtained through in-depth interviews. (Interview guide and checklist in appendix.)

### **4.3 SAMPLING**

#### **4.3.1 Study Population**

The study population for the main survey was children aged 12 to 23 months within the Cape Coast municipality. The number of such children within the municipality was estimated at 4873, forming 4% of the projected population of 121,826 of the municipality for 2000.

#### **4.3.2 Sampling Method**

The communities in the entire municipality were listed each with its population and the cumulative population calculated. The population for the communities was estimated using the coverage for the National Immunisation Days (NID), as there was no other reliable source of such information. (The last census conducted in 1984, does not have many of the communities which are in the municipality presently.) The District Disease Control Officer compiled this list of communities and their populations. The total cumulative population therefore, did not add up to the projected population for the Municipality, but rather to 105,000, as there was not 100% coverage in the NID. This population figure was therefore used to obtain the sampling interval.

The sampling interval was obtained by dividing the total population of the Cape Coast municipality by the number of clusters to be used, that is thirty clusters (30).

Given by:  $105000/30 = 3505$

Using a table of random numbers, the number 2310 that fell between 0000, and the sampling interval number – 3505 was selected. This number was taken as the starting point and the community whose cumulative population encompassed this number was chosen. The first community chosen was Asenade/Taido. The selection of the other 29 communities was done by adding the sampling interval to the starting point twenty nine times, as shown below.

Each time the sampling interval was added, the community whose cumulative population encompassed the number obtained was the one selected.

Starting Cluster - Cluster whose population encompassed 2310

Second Cluster - Cluster whose population encompassed  $2310 + 3505 = 5815$

Third Cluster - Cluster whose population encompassed  $2310 + 3505 + 3505 = 9320$  etc.

The entire list of communities, with their cumulative populations and the clusters chosen can be found in the appendix.

### 4.3.3 Sample Size

The sample size ( $N$ ) was calculated using the formula shown below (Cochran, 1963). This is based on the fact that the EPI method treats immunisation status as a binomial variable, where an individual belongs to one of two categories: immunised or not immunised. For binomial variables, the size of the random sample required to produce results of given accuracy and precision is shown below.

#### Equation 1

$$N = (z^2 pq) / d^2$$

Where:

- ( $z$ ) is the normal deviate given a value of 1.96 for 95% confidence interval
- ( $p$ ) is the estimated proportion of the target population having the attribute being sampled ( children immunised) assigned value of 0.6 as the immunisation coverage for DPT3 was 64%.
- ( $q$ ) is  $1 - (p)$  children not immunised, and assigned the value 0.4
- ( $d$ ) is the precision of estimates set for this study at 6% - this implies that the actual coverage obtained is +/- 6 percentage points.

$$N = \frac{1.96^2 \times 0.6 \times 0.4}{0.06^2} = 256.1, \text{ rounded up to } 257.$$

This sample size of 257 is the number needed when the sampling is to be done randomly. However due to the fact that cluster sampling was used, there is an effect of clustering, as individuals in a cluster are likely to share common characteristics and therefore decrease the precision of the sample result. The number obtained (257) must be multiplied by the clustering coefficient to compensate for the bias introduced by the clustering effect. A clustering coefficient of 1.85 was used in this study based on the earlier work done by Henderson et al (1973).

Thus multiplying 257 by the sample coefficient of 1.85 yields 475.45.

In order to have an equal number of children in each cluster, 16 children were selected per cluster giving a total of 480 children.

## **4.4 DATA COLLECTION**

### **4.4.1 Coverage Survey**

The Municipal Health Administration had also planned to carry out the coverage assessment and hence the data collection was done with their support. Health service providers who do not take part in the provision of immunization services did the data collection for the coverage survey. There were 12 field assistants who were paired to form 6 teams, three supervisors and the principal investigator.

A two-day training session was conducted for the participants and the following issues were discussed:

- Importance of the EPI coverage Survey
- Review of the standard EPI survey questionnaire and the addendum to obtain information from the mothers /carers
- Mapping and location of households
- Selection criteria for households and children
- Extraction of data from Road to Health Cards (RHC)
- Clear definition of roles of all team members

- Training on interview skills
- Community entry skills

The questionnaire was pre-tested after the initial training of the field assistants in a community in the nearby district. Certain issues, which came up mainly in the questionnaire on the characteristics of the parents or carers, were explained to the assistants and where necessary the questionnaire was modified.

#### **4.4.1.1 Field Work**

The actual data collection for the coverage survey was done over a week – from the 12<sup>th</sup> of July to the 20<sup>th</sup> of July 2000. The field assistants were sent to the cluster location on each day of the survey. Each team had a cluster area demarcated with important landmarks indicated. At the cluster site, the first household was obtained by first locating the centre of the cluster and then spinning a pen to select a direction. All the houses in the direction chosen were then counted and the first house selected randomly among these houses. The team moved from the first house to the next house (house with the nearest door) and subsequent houses till 16 children had been obtained. In each house visited the mothers/ carers of all the children in the age group 12 – 23 months were interviewed. The BCG scars of the children who were available at the time of the data collection were examined and used to validate the immunization received.

#### **4.4.2 In-depth Interview with Mothers**

The mothers who were interviewed were from four different areas – Brofeyedur, Effutu, Amissano and Kakomdo. These areas were chosen based on their performance in the coverage survey, Effutu, Kakomdo and Amissano were low-coverage areas whereas Brofeyedur was a high-coverage area.

In each area, a member of the community – in most cases the Community-Based Surveillance (CBS) worker was contacted, and he served as the liaison between the investigator and the mothers interviewed. This CBS worker helped the investigator to identify women in each

community with children aged 12 - 23 months, and one woman with a fully immunised child and another with a partially immunised child were interviewed in each community. In situations where more than one woman was available, the woman interviewed was picked arbitrarily.

At Amissano, it was difficult to find a woman with a child a year or older who had not been fully immunised. The data collection was done from the 31<sup>st</sup> of July to the 2<sup>nd</sup> of August.

#### **4.4.3 In-depth Interview with the Health Workers**

In each of the four sub-districts the health workers who monitored and supervised the immunisation services (MCH and sub-district Heads) as well as those who did the actual immunisation (community Health Nurses) were interviewed. In the MCH/Main and the UCC sub-districts, the MCH head doubles as the Sub-district head. Two community health nurses were chosen at random in each sub-district and interviewed with the exception of the UCC where only one nurse was at post. The data collection was done from the 20<sup>th</sup> to the 27<sup>th</sup> of July.

### **4.5 DATA HANDLING**

The supervisors and the principal investigator did numbering of questionnaires and the storing of data for the coverage survey. The supervisors first checked all the questionnaires and inconsistencies seen were resolved through discussions with the research team.

The principal investigator handled all data obtained through the in-depth interviews.

### **4.6 DATA PROCESSING AND ANALYSIS**

#### **4.6.1 Quantitative Data Processing**

Data from all structured questionnaires were entered onto EPI-INFO 6. Verification and validation of data sets was done. Some logical and consistency checks were programmed into the data entry system, to ensure ease of entry as well as minimise the possibility of wrong entries. In addition, data sets were checked regularly.

The data was analysed using Epi-Info 6 and SPSS 10.

#### **4.6.2 Qualitative data processing**

In-depth interviews with the mothers were conducted in the local language, transcribed into English and data analysed manually. The data from the interviews with the health service providers were also analysed manually.

### **4.7 LIMITATIONS**

The data for the coverage survey was collected together with the Municipal Health Administration and therefore was done on their terms. The interviewing of mothers to elicit reasons why their children had completed the immunisation schedule after their first birthday was not agreed upon by the Health Administration, and therefore could not be done.

The sampling framework for the coverage survey was based on the assumed presence of geographically more or less distinct known communities, which were listed as the clusters. Any new settlements or small remote areas or hamlets, which were not known at the time, were not included in the sampling frame.

The research assistants chose the initial or starting household on the field, and this was therefore subject to the researchers' biases.

The houses, which were visited and found to be empty, were not revisited. As the data was collected mostly during the working hours, there was the increased likelihood of selecting only mothers or carers who a flexible working schedule or were unemployed thus introducing some bias into the study.

## **5 FINDINGS**

### **5.1 COVERAGE SURVEY**

480 mothers or carers of Children aged 12 – 23 months were interviewed in the survey. 403 (84%) of them had their children's RHC whereas 77 (16%) of them did not have it.

#### **5.1.1 Demographic Characteristics of Parents / Carers of Children studied**

A little less than half of the mothers (43.8%) had no education at all, and less than 10% had completed secondary, vocational or tertiary level. The educational level among the fathers was different; whereas 16.7% of them had no education, 24% had secondary or higher education.

A fifth (20.8%) of the women were unemployed, and two-fifths (41.5%) of them in unskilled employment such as petty trading, whereas, only 4% of the fathers were unemployed, and 9.4% of them in unskilled labour. The commonest religion amongst both males and females was Christian orthodox. Table 6 shows selected characteristics of parents and guardians.

**Table 6: Selected Characteristics of parents or guardians**

SOCIODEMOGRAPHIC CHARACTERISTICS		Mother		Father	
		No	%	No	%
Age	<19 years	32	6.7	1	0.2
	20 – 39 years	425	89	351	81.8
	> 40 years	20	4.2	77	17.9
Educational Level completed	Nil	210	43.8	80	16.7
	Primary	66	13.8	51	10.6
	JSS/Middle	158	32.9	215	44.8
	Secondary and higher	45	9.4	114	23.8
Occupation	Unemployed	100	20.8	19	4.0
	Unskilled /Petty trading	199	41.5	45	9.4
	Artisan	66	13.8	216	45
	Farming/Fishing	71	14.8	76	15.8
	Clerical	4	0.8	37	7.7
	Business <sup>6</sup>	29	6.0	21	4.4
	Professional	1.7	8	40	3.5
Religion	Christian-Orthodox	213	44.4	196	40.8
	Christian-Pentecostal	121	25.2	108	22.5
	Spiritual	58	12.1	28	5.8
	Traditional	13	2.7	29	6.0
	Islam	59	12.3	65	13.5

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<sup>6</sup> Large-scale enterprise

### 5.1.2 Immunisation Coverage of Children

The immunisation coverage by card was at least 75% for each of the vaccines, and the percentage of fully immunised 68%. For the immunisation coverage by card, the dropout rate from BCG to DPT3/OPV3 is 4-5%, and from BCG to measles is 7%.

The BCG scar was present in 91.9% of the children.

Table 7 shows the immunisation coverage by card and by history.

**Table 7: Immunisation Coverage in Cape Coast Municipality by Card and by History**

ANTIGEN	TOTAL CARD			HISTORY and CARD	
No interviewed	403			480	
			% of Total	No.	% of Total
BCG	399	99	83	475	99
OPV1	400	99	83	474	99
OPV2	393	97	82	466	97
OPV3	375	93	78	444	93
DPT1	400	99	83	476	99
DPT2	394	98	82	467	93
DPT3	378	94	79	447	93
Measles	366	91	76	429	89
	-	-	-	-	
Partially Immunised	42	11	9	58	12
Fully Immunised	359	89	75	420	78
Fully Immunised Before Age One	325	81	68	325	68

The immunisation coverage as shown in the table above does not take into account the vaccines given which were not valid. For the triple vaccines such as OPV and DPT,

subsequent doses must be given at least 4 weeks apart to ensure that the child develops the necessary immunity. Vaccinations, which are less than 4 weeks apart, are therefore not considered valid, as adequate immunity is not achieved. For the starting doses of OPV1 was considered valid if given at 6 weeks or more, and 4 weeks or more for DPT1. In the case of measles, vaccinations given before 9 months of age (<270 days) are also not considered valid. Validity was determined using the immunisation dates and thus applicable only to those who had immunisation cards.

Taking into account the validity of the vaccines, the percentage coverage for the various antigens is shown in Table 8.

**Table 8: Validity of Vaccines Given**

Antigen	Invalid Vaccinations Given		% of total Valid
	Number	% of Antigens given by Card	
OPV1	26	6.5	<b>75.5</b>
OPV2	24	6.1	<b>75.9</b>
OPV3	12	3.2	<b>74.4</b>
DPT1	2	0.5	<b>82.5</b>
DPT2	22	5.6	<b>76.4</b>
DPT3	9	2.4	<b>76.6</b>
Measles	116	31.7	<b>45.7</b>

The immunisation coverage for the routine reports is compared with the coverage obtained in the survey. Table 9 shows the comparison.

**Table 9: Immunisation Coverage obtained by Routine Data Compared with that Obtained by Survey**

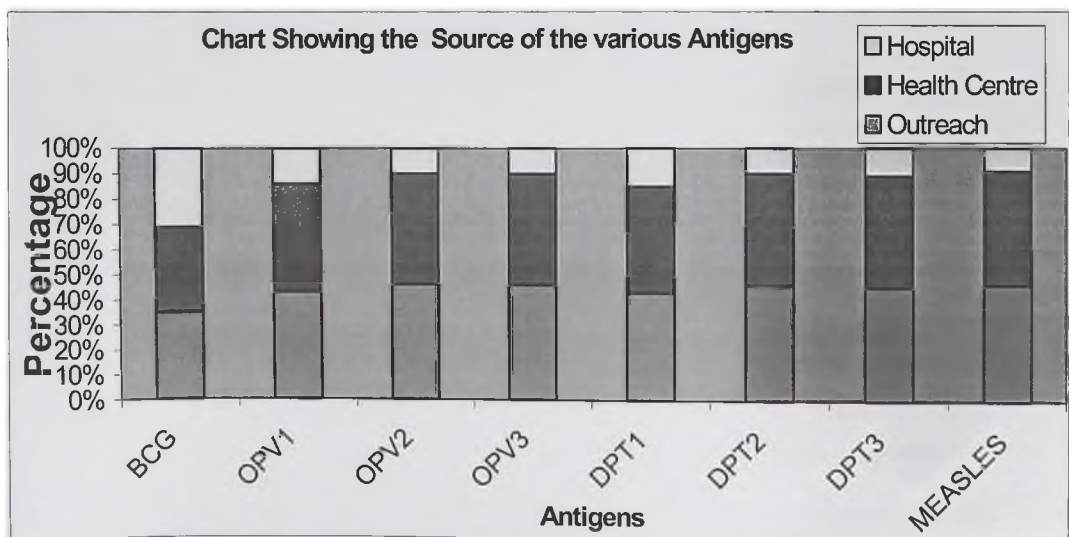
Antigen	Coverage Obtained Through:	
	Routine Data (%) (CCMHA, 2000)	Survey (%)
BCG	91.0	91.9 (by scar)
DPT3	64.0	78.8
OPV3	64.3	78.1
Measles	75.7	76.2

### 5.1.3 Source of Immunisation

Table 10 and figure 2 indicate the source of immunisation for the various antigens. The commonest source of immunisation is the outreach point followed by the Health Centre and the least common is the hospital.

**Table 10: Source of Immunisation for the various Antigens**

Antigen	Vaccination Centre at which Antigen was given.					
	Health Centre		Hospital		Outreach	
	No.	%	No.	%	No.	%
BCG	158	34	145	31	165	35
OPV1	201	43	68	14	203	43
OPV2	205	44	45	10	215	46
OPV3	194	44	46	10	201	46
DPT1	198	42	72	15	206	43
DPT2	206	44	47	10	213	46
DPT3	196	44	48	11	201	45
MEASLES	192	45	37	9	197	46

**Figure 2: Source of the Various Antigens**

#### **5.1.4 Reasons for Not Completing Immunisation Schedule**

Fifty-eight mothers interviewed had children who had not completed their immunisation at the time of the survey. The commonest reason given by the women was that they were too busy to send their children for immunisation. The other reasons given are shown in table 11.

**Table 11: Reasons for incomplete immunisation**

Reasons for Incomplete immunisation		
	No	%
<b>Lack of Information</b>		
▪ Unaware of need for immunisation	1	1.7
▪ Unaware of need to return for 2nd or 3rd dose	3	5.1
▪ Place /Time of immunisation unknown	2	3.4
▪ Fear of side-effects	2	3.4
▪ Wrong ideas about contraindications		
▪ Others	1	1.7
▪ Total	9	15.5
<b>Lack of motivation</b>		
▪ Postponed until another time	2	3.4
▪ No faith in immunisation		
▪ Rumours		
▪ Total	2	3.4
<b>Obstacles</b>		
▪ Place of Immunisation too far	1	1.7
▪ Time of Immunisation not suitable	9	15.5
▪ Vaccinator Absent	3	5.1
▪ Vaccine not available		
▪ Mother too busy	19	32.7
▪ Family Problem including illness of mother	3	5.1
▪ Child ill – not brought	1	1.7
▪ Child ill –brought but not given immunisation	2	3.4
▪ Long waiting time		
▪ Other	5	8.5
▪ Total	43	74.1

### **5.1.5 Relationship Between The Parents' Socio-Demographic Characteristics And The Immunisation Status Of Child**

A cursory glance at the results showed differences in the immunisation status of children whose mothers had different levels of education, different occupations and different religions, and whose fathers had different income levels.

However analysis of the results using Pearson Chi squared tests to compare the characteristics of the parents of the partially immunised, the fully immunised and the fully immunised by age one did not yield valid results as some cells had counts of less than 5. Table 12 shows the relationship between the selected socio-demographic characteristics of the parents and the immunisation status of the children.



**Table 12: Relationship between the Selected Socio-Demographic Characteristics of the Parents and the Immunisation Status of the Children.**

SOCIODEMOGRAPHIC CHARACTERISTICS		Immunisation Status			Total	Chi-squared	Significance 2-sided
		Partially Immunised	Fully Immunised	Fully Immunised by age one			
Educational Level Completed of mother	Nil	36	40	134	210	25.996	.011
	Primary	7	8	51	66		
	JSS/Middle	12	32	114	158		
	Vocational		3	8	11		
	Secondary	1	9	14	24		
	Tertiary	1	3	6	10		
Occupation Of mother	Unemployed	16	13	71	100	36.360	.001
	Unskilled /Petty trading	20	52	127	199		
	Artisan		9	57	66		
	Farming/Fishing	16	12	43	71		
	Clerical		1	3	4		
	Business	4	5	20	29		
	Professional	1	3	4	8		
Religion of Mother	Christian-Orthodox	18	40	155	213	32.566	.001
	Christian-Pentecostal	12	25	84	121		
	Spiritual	18	8	32	58		
	Traditional	3	4	6	13		
	Islam	4	16	39	59		
Income of Father	Nil	1	4	2	7	25.608	.029
	<¢100,000	24	34	111	169		
	¢100,000-250,000	14	16	92	122		
	¢250,000-500,000		8	21	29		
	>¢500,000		2	1	3		
	Not Known	17	31	91	139		

## 5.2 THE MOTHERS' PERSPECTIVE

Six mothers were interviewed in depth to determine their perceptions on the immunisation, and these are described below.

### 5.2.1 Knowledge of Immunisation

Among the mothers interviewed most of whom had no formal education, polio was the commonest vaccine-preventable disease known, and other diseases mentioned were measles, yellow fever, tetanus, tuberculosis and whooping cough. One mother interviewed did not know any disease at all despite the fact that her child was completely immunised. Some other diseases thought to be vaccine preventable were malaria, yaws, kwashiorkor and blindness.

The common illnesses of children as reported by these mothers were fever, convulsions, passage of yellow urine, malaria, diarrhoea and measles. Children, they said, are usually sent to the hospital when ill and they may be given some medication, or admitted and in a few instances may die. Some children were also given herbal preparations when they fell ill. Childhood illnesses did not seem to be a major source of concern for the mothers and particularly for those with partially immunised children. When asked about the prevention of these diseases they said this could be done by keeping food clean and also by taking good care of the children. None of the respondents mentioned immunisation as a means of preventing these common diseases in children.

The mothers all had some idea about the age range during which immunisation is expected to take place – saying this was from about a month or 6 weeks to 9 months of age. They however did not know the exact schedule saying that whenever you attended an immunisation session, you were told when to return for the next vaccine.

The benefits of immunisation were recognised by all the respondents saying it prevents illness and also gives strength to the children.

They did not think there were significant side effects of immunisations mentioning slight swelling of the arm and fever, both of which subside rapidly. They believed a child could be

sent for immunisations at all times even when ill and there were no taboos against immunisation.

### **5.2.2 Reasons for Immunising a Child**

The reasons given for immunising the children was the desire for the children to be strong and also as a means of protection for them. Some also felt that the immunisations would enable the child to acquire a RHC which is a useful document needed when the child has to go to school and acquire other documents such as birth certificates. Some also said that without the RHC, your child would not be cared for when you visited the hospital.

### **5.2.3 Reasons for not Immunising the Children**

There were multiple factors at play for each mother, which had resulted in her child not being completely immunised. All the mothers, who were involved in petty trading, were busy and did not have much time. They were therefore unable to send their children for immunisation as expected. Thus for these women, earning a living was the major priority competing with immunisation for their time.

The immunisation centre was also considered as located too far for one mother and she seemed to have benefited from home visits by health workers during which time her child received some immunisations. For those who had immunisation services within their communities, they felt that the times for holding the immunisation sessions were not suitable and there was the need to lengthen the duration of time spent at the outreach site, and if possible hold a session on another day of the week

Financial considerations were also very much at play in influencing mothers' attendance to immunisation sessions. Quite apart from the fact mothers were unable to leave their income generating activities to attend the immunisation sessions, there were also certain charges which deterred the mothers from attending. As one mother said:

*“You are asked to buy one thing or the other and as I do not have money, I do not go.”*

The attitude of staff was also found to deter mothers from attending the CWC when they had missed some sessions or when their children were beyond 9 months old - by which time they are expected to have completed their immunisations. One mother said:

*“When you send your child for immunisation after 9 months of age, the health workers insult you and ask you what you were doing at home”*

#### **5.2.4 Ways of Motivating Mothers to attend the Immunisation Sessions**

When asked about possible ways of encouraging them to attend immunisation sessions, the mothers said that the clinic hours should be lengthened starting earlier and staying longer hours. They also suggested that in certain communities, which are very big, there is the need to use a public address system to inform the community members of the presence of the health workers during immunisation sessions. One mother also felt that the chiefs or elders of the town should be involved in the immunisation activities so they advise the women and also reprimand those who do not attend.

### **5.3 THE HEALTH WORKERS' PERSPECTIVE**

Seven community health nurses were interviewed on their knowledge; attitudes and practices on immunisation and the findings are below.

#### **5.3.1 Missed Opportunities**

There were some missed opportunities occurring. The nurses did not immunise all eligible children who had contact with the health facilities, as they thought this wasted the vaccines. The community nurses when asked about their view on opening a vaccine vial for a single child readily answered that they practice daily-integrated services, providing immunisation services on a daily basis. However on probing, some admitted that this was not done for BCG and yellow fever vaccines. They explained that for BCG, a vial contains 20 doses and this has to be discarded 8 hours after opening, therefore vaccinating only one child wastes the vaccine. They therefore would advise the mother of the child due for the immunisation to come on another day when the clinic held its immunisation session. The DPT and OPV vaccines vials can be kept for twenty-four hours after opening and they were prepared to open these.

#### **5.3.2 False Contra-indications to immunisation**

The contraindications to immunisation the nurses mentioned were "small for date" or premature babies, and one nurse mentioned when the child has malaria. All the Community Health Nurses knew the immunisation schedule and went on to indicate the time intervals for the multiple vaccines. Some of the nurses also said that in instances when a child had already had measles, the measles vaccination was not given. They however had different views on what vaccines should be given when the child is older than 2 years of age.

They knew the side effects of immunisation - fever and swelling of the injection site, and advised the mothers on the use of anti-pyretic.

### **5.3.3 Improving Immunisation Coverage**

The nurses believed that the EPI coverage in their catchment area could be improved through health education of the mothers to let them understand the importance of immunisation, and by better interaction with community members to get them involved in immunisation activities. Other strategies suggested were mini-mass immunisation campaigns and home visits. In the mini- mass immunisation campaign, a large number of people are immunised within a short time, and this involves the mobilisation of the community members and the necessary resources for the immunisation.

They also said the availability of a vehicle or funds for transportation would also improve coverage. In addition they thought adjusting the time of the immunisation sessions to start very early before mothers go out, or holding them in the evenings would also help to improve the coverage.

The nurses could be motivated by incentives such as allowances, snacks or certain items that they could use in their work – hats, bags and shoes. They would also be motivated when their efforts are acknowledged by commendations and promotions.

## **5.4 MONITORING OF IMMUNISATION SERVICES**

Four MCH Unit heads and two Sub-district heads were interviewed on the monitoring of the immunisation services and the findings are presented below.

### **5.4.1 Organisation of Immunisation Activities**

The use of tally cards to monitor vaccine availability was practised in two of the four sub-districts. For the other sub-districts, the health workers usually look into the refrigerator and then check to see if the vaccines are adequate or running out. Only one sub-district had experienced a shortage of vaccines (diluent) within the last two months prior to the study and this had lasted about a week. This shortage was not due to an actual lack but rather an individual failing to collect this from the district.

There was a schedule of all immunisation activities present in all the facilities, and this was available to the Sub-district and MCH heads. There was no indication on the schedules seen of those activities that had been carried out and those that had not. Only one scheduled activity was said to have been missed in the last two months.

The checking of children's RHC was not being done in all health facilities in the Municipality. At the University Hospital, this was not done routinely for all the children that were seen. In facilities where the cards were checked, those due for immunisation were referred to the community health nurses who either immunised them, or asked the mothers to bring their children for immunisation on a later date.

#### **5.4.2 Immunisation Performance**

There were immunisation coverage charts in three out of the four districts, and two districts had charts, which were up to date. The fourth district had tables of the immunisation coverage for each month, but these did not show the trend of immunisation clearly, and whether the sub-district was meeting its target.

There was no systematic effort to follow up the defaulters of immunisation. The compilation of lists of children who had defaulted in their immunisations was done only in one sub-district but then these lists were not kept. For the other sub-districts, those who had defaulted were met by chance during routine home visits and were immunised.

The forms and charts showing the incidence of EPI diseases were kept in the sub-districts with health facilities and they were with facility head. The MCH Unit heads that were directly responsible for immunisations had no idea of the incidence of vaccine-preventable diseases in their catchment area.

There was also very little community involvement in immunisation activities, and this was usually limited to the work of the CBS workers in mobilising people for immunisation sessions. Only one sub-district head had plans to meet the community members. The health providers were therefore unable to appraise the community members' perceptions of their services and take specific measures to improve.

## 6 DISCUSSION

### 6.1 INTRODUCTION

Evaluation of immunisation services is a useful tool in improving the EPI performance as problems of the programme are identified, and strategies outlined to address those problems. (Cutts et al, 1990). The progress of such programmes can be assessed by coverage surveys and compared to other indications obtained through routine data (Borgdorf and Walker, 1988). In this study, the immunisation coverage was assessed, and some client-related and health service-related factors, which affect immunisation coverage, were identified using quantitative and qualitative methods.

### 6.2 IMMUNISATION COVERAGE

The estimate of the immunisation coverage obtained from the survey was higher than that obtained from the routine data for the DPT<sub>3</sub>/OPV<sub>3</sub> antigens. There was not much disparity between the BCG and measles coverage. Table 9 (section 5.1.2) compares the coverage from the two sources. The difference between the coverage obtained from the two sources is 14.8 and 13.8 percentage points for DPT<sub>3</sub> and OPV<sub>3</sub> respectively, and this is significant considering the fact that the precision of the survey coverage is +/- 6 percentage points. The difference between the coverage obtained from the two sources raises issues such as the accuracy of the routine reports, the differential immunisation coverage and the precision of sample survey (Borgdorf and Walker, 1988).

In the routine reports, the immunisation coverage is calculated using the number of children immunised in the health facilities as the numerator, and the target population of children within the municipality as the denominator. However, this target population used is unreliable as it is a projection from the national census carried out in 1984 –sixteen years ago. (Projections of the population using census figures greater than 10 years old are unacceptable.) The provisional results from the 2000 housing census estimates the population

as 119,340, about 2000 people less than the projected population of 121,826. Using this figure, the coverage of DPT3 is 65%, a very slight difference from 64% obtained from the projected population.

Another possible explanation for the disparity may be the differential coverage in various areas. In the rural areas there may be hamlets or very remote areas with pockets of low immunisation (Beltran et al, 1990). These pockets may not be part of the clusters selected in the sample survey and thus the coverage obtained is over-estimated.

There is also the possibility that the immunisation coverage obtained from the routine data reflects the coverage in those under age one whereas the coverage from the survey reflects all those immunised whether this was done before age one or not.

The immunisation coverage has improved over the years comparing the results obtained in this study with that of the study conducted in the municipality in 1994.

Coverage by Card	1994 (%)	2000 (%)
BCG	78	83
DPT 1	77	83
DPT <sub>3</sub>	68	79
OPV <sub>1</sub>	76	83
OPV <sub>3</sub>	67	78
Measles	53	76

The improvement in the immunisation coverage is most significant with the measles antigen, and there is a decrease in the drop out rate in 2000 compared to 1994. This improvement is also observed when the percentage of fully immunised children by age one for Central Region in 1993 – 39% (GSS/MI, 1994) is compared with the percentage in 1998 – 49% (DHS, 1998). It is unfortunate to note that although the percentages have improved, the potential coverage is still very low since as many as the third of the measles vaccines given were not valid.

Although there has been an improvement in the coverage in the municipality over the past 5 years, there is still a long way to go in terms of coverage and particularly in an urban area such as Cape Coast with the highly populated areas and therefore even a coverage of 80% will still leave density of susceptible people high enough to maintain disease (Arita et al, 1986). There was also a disparity between DPT3 and OPV3 for both surveys even though they are expected to be given at the same time.

For the triple dose vaccines, the challenge is to get a child to receive all three doses of the vaccines as early in life as possible without compromising on the validity – at least four weeks interval between doses (WHO/EPI, 1995). From the survey however it was found that some of the triple vaccines had been received at intervals of less than four weeks and therefore were not valid. The high rate of inappropriately timed vaccinations is of concern as this reduces the potential vaccine coverage (Cutts et al, 1990, Cutts et al, 1991). There were also children who had been immunised against measles at less than 9 months of age, and this is associated with a lower sero-conversion rate compared to those immunised at 9 months and above (Breman et al, 1975). This indicates there is a need to retrain staff, and supervise them regularly in order that these intervals are respected when vaccinating children.

The Immunisation drop-out rate was not as low as expected from the routine data, however the percentage of those fully immunised by one year of age still fell below the target of 80%. This implies the health service is unable to get mothers or carers of infants to follow the immunisation schedule as desired, in order to ensure that the children are fully immunised at an early stage before the age of high risk for infection (WHO/EPI, 1995).

A register or list of all defaulting children with their detailed addresses should be kept so these children can be followed up. Targeted home visiting of defaulting children will minimise the fall out in the immunisation and raise the number of children immunised within the scheduled time (Brugha and Kevany, 1996, Dietz et al, 2000). These visits may be used to involve the father in immunisation and this has been found to have a strong association with completion of the immunisation schedule by 12 months (Brugha et al, 1996).

### **6.2.1 Source of Immunisation**

It is significant to note the private sector was not involved in immunisation service provision although this has been shown to be associated with increase availability of vaccines and easy access (Balraj et al, 1993). The major concern in the provision of these services is the cost, as the vaccines are supposed to be provided free of charge. The government supporting the services in the private sector through collaborative programs may overcome this hurdle. In the event that the private sector provides this at a cost to the client, the free services in the public facilities could be provided along side thereby giving the clients the option choose where to obtain the service.

The fact that 31% of the infants had received their BCG vaccination at the hospital shows that there is some initial contact with the hospitals most likely at birth. Those who have had this contact are more likely to return to the hospital when they encounter problem, and therefore strengthening the immunisation services provided at the hospital is likely to reach these ones. Increasing the supervised deliveries would therefore increase immunisation coverage both at birth and subsequently as children born in hospital are more likely to be immunised than those born at home (Amwualia et al, 1988). Antenatal care should also be used as an opportunity to educate mothers on immunisation and thus improve immunisation coverage (Bates et al, 1994, Barron, 1997).

## **6.3FACTORS AFFECTING IMMUNISATION COVERAGE**

### **6.3.1 Socio-Economic Factors**

Although no valid conclusions on the relationship between the socio-economic status and immunisation status, could be drawn in this study (refer to section 5.1.5), several studies have found that children of more educated mothers are less likely to be under-immunised at all ages. (Bobo et al, 1993, Alemu et al, 1991, de Silua et al, 1999). The low educational level of the mothers is rather surprising for an area such as Cape Coast where it is assumed that there are a lot of educated people on account of the large number of secondary schools. The fact

that less than 10% of them had secondary or higher education has implications not only on immunisation, but also on the general health of the children (GSS/MI, 1999).

The other factors such as mothers' occupation, religion and fathers' income which had apparent association with immunisation in this study have also been found in other studies (Fassin et al., 1981, Borgdorf et al)

### **6.3.2 Knowledge of Immunisation**

It is also interesting to note that although the mothers interviewed in-depth had not much knowledge on the vaccine-preventable diseases and the immunisation schedule, the lack of information formed just 15.5% of the reasons given for the incomplete immunisation of infants. It appears as if for the majority of mothers just knowing immunisation is beneficial to the child and that it makes the child strong is adequate to get them to attend and they do this until the immunisation is complete. This finding supports another study in which mothers in a high immunisation coverage area were unaware of the immunisation schedule (Murthy and Kumar, 1989).

This lack of knowledge is not very surprising, considering the low level of maternal education (Freeman et al, 1992). There is also very little health education at the immunisation sessions. Although a talk is given, there does not seem to be much time for individual education, as there are several clients (a session had 65 clients to two health workers, and this session was over in three hours). A child may therefore be fully immunised without the mother knowing what immunisations the child has received.

The high knowledge of polio, most likely due to the National Immunisation day exercises, indicates that mothers and community members when given information repeatedly are able to internalise the information and remember it. A strategy to educate mothers on the vaccine – preventable diseases must therefore be repetitive, and not just a one time action.

Although not found in this study, other studies have found low levels of immunisation knowledge amongst the mothers to be associated with low immunisation coverage (Salmaso et al, 1999). For these mothers interviewed, they had various other reasons why they attended

immunisation sessions such as the acquiring of a road to health card. With the present level of knowledge, mothers are likely to attend immunisation sessions when it is convenient to them. However when there are other priorities, or the time is unsuitable, mothers will need more information to motivate them to send their children for immunisation. This was evident in the case of one woman who had not completely immunised her child because she was not available on the day the immunisation services were provided in her community. Although she went to the city centre often, she did not regard it necessary to send her child for immunisation there.

Among the mothers with partially immunised children, childhood illnesses were not regarded as a major threat, and therefore the perceived benefit of immunisation to combat childhood illnesses was not taken seriously. A study by Bates et al, showed that perceived susceptibility to common illness and the perceived benefit of medical care to prevent disease were inversely related to the immunisation status (Bates et al, 1994). This must be taken into account in health education, so that the mothers realise although the vaccine-preventable diseases are not too common presently, any drop in the coverage could lead to a sudden outbreak of severe disease.

The Health Administration must therefore consider the options available – to have community members who are not very knowledgeable on immunisation and attend when convenient. Presently this is the most feasible option, and all efforts must be made to take the services as close to the clients as possible. Another option, which must be considered in the medium term, is to systematically educate mothers in depth on immunisation. The mothers will then know the full benefits of immunisation and will be highly motivated to attend and therefore make an effort to attend even when it is not convenient. This is a more permanent measure as immunisation is a long-term commitment.

### **6.3.3 Obstacles to attending Immunisation Sessions**

The fact that the mothers were too busy to attend immunisation sessions may be explained by the large proportion (two-fifths) of them that are employed in unskilled labour. They

therefore have a marginal existence and have little time to devote to childcare (Cutts, 1991). This finding was confirmed in the qualitative aspect of the study. Some health workers recognised that mothers were busy and they need to reschedule the immunisation sessions. This is a significant step in addressing these problems.

In addition to being busy other factors such as the suitability of the clinic times, the distance from the clinic and the financial costs influenced their attendance at immunisation sessions (Bosu et al, 1996).

It is of concern that a mother was deterred from attending immunisation session on account of the negative attitude of the health workers. This negative attitude of health staff to mothers has been found to have a strong association with non-completion of immunisation (Bukonya and Freeman, 1991). There is therefore a need to improve the social interaction between health workers and the mothers through training; regular supervision and providing some form of motivation for the health workers. In the long term, there is the need to incorporate social aspects of the relationship between the health practitioner and the client into the training curricula for health workers.

## **6.4 MANAGEMENT OF THE IMMUNISATION SERVICES**

### **6.4.1 Organisation of services**

Missed opportunities reduce the immunisation coverage, as some children who have contact with health facilities are not immunised (Cutts et al, 1991). In Cape Coast this occurred because of perceived wastage of vaccines by the health workers and the fact that not all the children attending a health facility had their immunisation card checked. There were also instances where there had been shortages of vaccines during immunisation mop up exercises thus missing the opportunity to immunise several children. To minimise this, all categories of staff must be educated on the immunisation policy and the provision of daily integrated in the facilities. There must be in addition, adequate supply of vaccines as previous shortages may have led the health staff to avoid wasting the vaccines.

In some instances false contraindications prevented health workers from immunising an eligible child. This practice of sending the mothers away from immunisation sessions without vaccinating the children has been found to influence attendance to immunisation sessions (Alemu et al, 1991). The health workers must therefore be educated and if possible given a handbook on immunisation they may refer to when in doubt.

#### **6.4.2 Monitoring Immunisation Performance**

The fact that there was very little community involvement in immunisation activities, is of note as community involvement is associated with improved immunisation coverage (Elzein et al, 1998, Shoba et al, 1990). Although the health workers directly involved in immunisation recognised this, it was not being done. In one of the communities, there were the farmers and the traders, and they had different days for their activities, the immunisation sessions, which were held on Tuesdays, were therefore suitable for the farmers but not the traders. A discussion with the community members would therefore bring out this situation so that alternative solutions may be found. Also the health workers suggested a change in the time of holding immunisation sessions as a way of improving immunisation coverage, but this will only be successful if done in conjunction with the communities.

## 6.5 CONCLUSION

The Immunisation coverage in the Cape Coast Municipality is much higher than what was calculated in the routine reports, however the percentage of children fully immunised by one year of age is still less than the national target of 80%. The potential immunisation coverage is lower than the actual immunisation coverage as a number of vaccines given are inappropriately timed and hence are not valid.

Although mothers have very little knowledge of immunisation, this does not deter them from attending immunisations sessions but rather competing priorities do.

Service delivery factors such as the collection of various token fees and the attitude of the service provider also affect the mothers' attendance at Immunisation sessions.

There are some shortcomings in the monitoring of immunisation services and this may potentially affect the immunisation coverage.

## **7 RECOMMENDATIONS**

### **7.1 IMMEDIATE**

#### **7.1.1 Training of Health Workers**

The immunisation service providers must receive training to re-orient their perceptions on their role, their interaction with the community, and their attitude to the mothers. They must also have some refresher training on technical issues going into detail to ensure they understand the whole concept of immunisation.

#### **7.1.2 Regular Supervision**

Regular supervision must be done to ensure the health workers practice all that they learn and carry out recommended practices. This is particularly important to check the timeliness of the vaccines given, and assess the attitude to the mothers.

#### **7.1.3 Improving Accessibility to Immunisation Services**

Suitable times for immunisation sessions must be found and when adjusting the times/days, this must be done in consultation with community members.

The immunisation points must be to ensure that it is as close as possible to the community members/clients, and vaccines should be available to immunise all eligible children. The concept of placing Community Health Nurses in the communities will also greatly improve immunisation coverage but this cannot be done immediately. The community members must be mobilised during immunisation sessions to get them all to attend. There must be regular home visiting especially to the defaulters to educate them and give immunisations to those who have are eligible.

## **7.2 SHORT-TERM**

### **7.2.1 Health Education**

The Municipal Health Service must develop a strategy to educate mothers/community members in depth on immunisation and its importance. Antenatal care visits and other visits should also be used as an opportunity to educate mothers on immunisation.

### **7.2.2 Organisation of Immunisation Services**

A monitoring system where all the aspects of the immunisation services can be monitored must be developed.

In the case of drop outs detailed addresses must be obtained and the register should be used to check monthly the number who did not attend and the names compiled so that follow up may be done.

It may be necessary to organise the immunisation services such that immunisation sessions are held at weekends. The staff will then have to be given extra duty allowances and these must be budgeted for.

A systematic way of involving the community members must be devised so that feed back can be obtained from the community on a regular basis.

### **7.2.3 Financing of the Immunisation Programme**

The financing of the EPI must be assessed to know the full costs of running the programme. A budget for EPI should therefore include all the running costs – the cost of logistics transportation and other costs and these must be a part of the annual budget.

### **7.2.4 Staff Motivation**

A strategy for motivating the staff must be devised to encourage them to provide quality service. They may be motivated by giving allowances for snacks, transport and for working extra hours. They must also be given commendation when this is due, and their promotions must be followed up.

## **7.3 LONG TERM MEASURES**

### **7.3.1 Education**

Efforts must be made to improve the educational status of the people in the municipality especially among the females. This can only be done with the support of the Municipal Assembly. The Health directorate should therefore work together with M/A to ensure the Free Compulsory Universal Basic Education policy is enforced, and the girls must be encouraged to stay in school till at least the secondary level.

### **7.3.2 Training of Health Workers**

There is the need to incorporate social aspects of the relationship between the health practitioner and the client into the training curricula for health workers.

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**APPENDICES**

**8.1 Appendix 1**

*Data Collection Instruments*

**Infant Immunisation Form – Background Information on Parents**

1. Cluster Number		5. Infant's Name																	
2. Date																			
3. Area																			
4. Range of Birth Date: From:																			
To:																			
Child Number in cluster			1	2	3	4	5	6	7	8									
			Mother	Father	Mother	Father	Mother	Father	Mother	Father	Mother	Father	Mother	Father	Mother	Father	Mother	Father	
6. Care of Infant: Tick all Appropriate																			
7. Parent Living Y/N																			
8. Age (years attained this year - 2000)		Actual																	
		Estimate																	
9. Education -- Level completed	Nil																		
	Primary																		
	JSS/Middle																		
	Vocational																		
	Secondary																		
	Tertiary																		
10. Occupation	Unemployed																		
	Unskilled <sup>a</sup>																		
	Farming/Fishing <sup>b</sup>																		
	Artisan/Vocational <sup>c</sup>																		
	Business																		
	Clerical																		
	Professional																		
11. Average Monthly Income	< ₧100,000/month																		
	₧100,000-250,000																		
	₧250,000-500,000																		
	>₧500,000																		
12. Religion	Christian-Orthodox																		
	Christian-Pentecostal																		
	Spiritual																		
	Traditional																		
	Islam																		

<sup>a</sup> Labourers, messengers, petty trading

<sup>b</sup> this includes the fishmongers

<sup>c</sup> Driving ,carpentry, dressmaking, baking, kenkey/gari processing catering etc

**Cluster Form  
Infant immunisation**

1. Cluster Number: _____ 2. Date : _____ 3. Area : _____ 4. Range of birth dates: From: _____ Until: _____	(5) N A M E S											TOTAL		
												card	Card Plus history	
5. Child number in cluster		1	2	3	4	5	6	7	8	9				
6. Birth date														
7. Immunisation card	Yes/No													
8. BCG	Date/+/0													
	Scar: yes/No/A													
	Source													
9. DPT 1	Date/+/0													
	Source													
DPT 2	Date/+/0													
	Source													
DPT 3	Date/+/0													
	Source													
10. OPV 1	Date/+/0													
	Source													
OPV 2	Date/+/0													
	Source													
OPV 3	Date/+/0													
	source													
11. MEASLES	Date/+/0													
	Source													
12. Immunisation status	Not													
	Partially													
	Fully													
13. Fully immunised before one year of age														

14. Tally of household visited: \_\_\_\_\_

15. Name of interviewer : \_\_\_\_\_

Signature: \_\_\_\_\_

**KEY: date/+/0**

Date = copy date of immunisation from card, if available

+ = mother report immunisation was given

0 = immunisation not given

**source:**

OUT = Outreach

HOS = hospital

HC =health Centre

PRIV= private/non-government

**Cluster Form  
Reasons for Immunisation failure**

(1) Cluster number: \_\_\_\_\_ (4) Range of birthdates : From: \_\_\_\_\_  
 (2) Area: \_\_\_\_\_ Until: \_\_\_\_\_  
 (3) Date: \_\_\_\_\_

NOTE: ASK ONLY ONE "Why was the child not fully immunised? Mark (X) the single most Important reason according to your judgement.

Children number in cluster			1	2	3	4	5	6	7	8	TOTAL
(5) Immunisation Status		Not Immunised									
		Partially immunised									
		Fully immunised									
(6)	Lack of Information	a. Unaware of need for immunisation									
		b. Unaware of need to return for 2 <sup>nd</sup> or 3 <sup>rd</sup> dose									
		c. Place and/time of immunisation unknown									
		d. Fear of side reactions									
		e. Wrong ideas about contraindications									
		f. Other									
	Lack of Motivation	g. Postponed until another time									
		h. No faith in immunisation									
		i. Rumours									
		j. Other									
	Obstacles	k. Place of immunisation too far									
		l. Time of immunisation inconvenient									
		m. Vaccinator absent									
		n. Vaccine not available									
		o. Mother too busy									
p. Family problem, including illness of mother											
q. Child ill – not brought											
r. Child ill – brought but not given immunisation											
s. Long waiting time											
t. Other											

## **8.2 INTERVIEW GUIDE FOR MOTHERS/CARERS**

What are the common illnesses of young children and babies in this community?

When a child falls ill, what happens?

Can any of these illnesses be prevented? Which ones? How?

Can anyone tell us about the 6 childhood vaccine-preventable diseases? What are they? Can they be prevented? How?

Does anyone know about the immunisation schedule? Please tell us.

What are the benefits of immunisation? What are the dangers or side effects?

When should a child be immunised? When should a child not be immunised?

Can a child develop another illness from immunisation?

At home, who decides whether a child can be immunised? Why? What happens when that person is absent?

Why do some mothers fail to send their children for immunisation? Explore issues in depth – clinic hours, travel time, travel costs, cost of immunisation, staff attitude etc

How can mothers in your area be motivated or encouraged to send their children for immunisation? Explore issues in depth.

What clinic opening hours suit you best? And why?

Are there any cultural beliefs or taboos against immunisation in your community?

### **8.3 INTERVIEW GUIDE FOR HEALTH WORKERS WHO ADMINISTER IMMUNISATIONS)**

What is the immunisation schedule?

What are the dangers of immunisation?

When should a child not be immunised?

What is your view on opening a vaccine vial for a single child?

How can EPI coverage in your clinic/catchment area be improved?

How can staff be motivated to improve EPI coverage?

## 8.4 CHECKLIST FOR THE MCH HEADS AND SUB DISTRICT IN CHARGES ONLY

What techniques do you use to monitor and evaluate the following?

*(For each technique must check the practice as evidenced by charts etc.)*

[1] Availability of vaccines.

- Vaccine Ledger/ Stock book
- Stock out of any vaccine in the last 2 months:

Vaccine	No of Days Stock out

[2] Coverage targets of vaccines.

- Existence of Immunisation coverage charts
- Charts up to date

[3] Problem of dropouts.

- Compilation of list of defaulters
- List up to date.

[4] Routine use of recommended immunisation practices to ensure all children who have any contact with the health facility are immunised.

- Regular Checking of Road to Health cards of all children under 5years reporting to the facility.
- Daily vaccination of children at the health facility
  - Opening a vial of vaccine to vaccinate irrespective of the number of children seen.

[5] Implementation of all planned immunisation activities:

- Immunisation Schedule for the month.
- Number of scheduled activities / outreach sessions not carried out.

[6] Complete, accurate and timely compilation, analysis and submission of disease surveillance data.

- Forms, Charts or graphs of EPI diseases (particularly measles)
- Information up to date.

[7] Community involvement in the immunisation activities.

- Schedule of meetings with opinion leaders or community members.
- Number of meetings carried out.

### 8.5 List of Communities in the Cape Coast Municipality and their cumulative populations, and the clusters selected for the survey.

Number	Community/Settlement	Population	Cumulative Population	Cluster	Sampling Number
A	B	C	D	E	
1	Akaikrom/Kyirakomfo/Kamoda	395	395		
2	Krofofordo	510	905		
3	Ebunbonko	905	1810		
4	Basakrom/Danquahkrom/Senew	120	1930		
5	Asenade/Taido	560	2490	1	2310
6	Brimso/Abebewano/Ekoo	300	2790		
7	Nyamabekyere/Zongo	135	2925		
8	Eyifua/Onyibibekamihu	915	3840		
9	Abura Atsifi (Methodist)	1900	5740		
10	Amisano/Nanabokrom/Kulu	570	6310	2	5815
11	Abura Nkwantado	1205	7515		
12	Abura Assin	4115	11630	3	9320
13	Kakumdo	4070	15700	4	12825
14	Abura Ahmadiya	1980	17680	5	16330
15	Harris School	755	18435		
16	Adisadel Mosque	1515	19950	6	19835
17	Adisadel Alarba	650	20600		
18	Adisabel Anglican	735	21335		
19	Maxwell Rabb	310	21645		
20	Adisadel Pentecost	830	22475		
21	Pedu D/C Primary	1510	23985	7	23340
22	Pedu Montessori	785	24770		
23	Amoyaw	575	25345		
24	Dehia Acquahkrom	480	25825		
25	Brabedzie	525	26350		
26	Ntoto	865	27215	8	26845
27	Nyinasn	975	28200		
28	Efutu	2600	30800	9	30350
29	Efutu Manpong	350	31150		
30	Ankaful Village	1255	32405		
31	Essuekyir	1220	33625		
32	Anto-Essuekyir	1245	34870	10	33855
33	Moeasem	880	35750		
34	Ansapetu/Kokoado	540	36290		
35	Wonyiato/Yayaakwano	265	36555		
35	UCC Hospital	555	37110		
36	UPSS-UCC	495	37605	11	37360
37	OLA GNTC	2075	39680		
38	Abakam/Ahenboboi	955	40635		
39	Presby JSSOLA	615	41250	12	40865
40	Kwaprow	1460	42710		
41	Akotokyir	1206	43915		
42	Amamoma/Kwesipra	1080	44995	13	44370
43	Apewosika/Kokoado	1660	48215		

Number	Community/Settlement	Population	Cumulative Population	Cluster	Sampling Number
A	B	C	D	E	
44	Duakor/Okyeso	1560	48215	14	47875
45	Bakakyir Methodist School	335	48550		
46	Gegem (TNT)	1020	49570		
47	Krootown (Staff Office)	660	50230		
48	Gegeano (MDCC)	2035	52265	15	51380
49	Krootown (St. Cecillia)	715	52980		
50	Ntsin Yard	1700	54680		
51	Idan	3040	57720	16	54885
52	Amisackyi	2285	80005	17	58390
53	Chapel Square (T. Yard)	1600	61605		
54	N.I.B. (Ntoto)	1520	63125	18	61895
55	Turom Faith Church	1470	64595		
56	St. Francis lodge	505	65100		
57	Gyankobir (Mr. Gaisie's House)	770	65870	19	65400
58	Philip Quaoe girls	221	66091		
59	Christ the King Academy	635	66726		
60	St. John Co-operative Office	65	66791		
61	Analyin (Suro0basia House)	1450	68241		
62	Aboom AME School	575	68818		
63	Municipal Assembly	2020	70836	20	68905
64	Cherubim and Seraphim	460	71296		
65	Central Hospital	150	71446		
66	Kotokoraba Fire Office	1900	73346	21	68905
67	Antem Village	665	74011		
68	Sikafoambantem (lower)	720	74731		
69	Sikafoambantem (upper)	740	75471		
70	Siwudu	910	76381	22	75915
71	Master Sam	470	76851		
72	Anakyin Beulah Lane	775	77626		
73	Central Mosque	965	78591		
74	Tsintsihwe (St. Monica)	405	78996		
75	Aboom Wells	455	79451	23	79420
76	Aquarium	600	80051		
77	Silent Brotherhood	980	81031		
78	Church of Christ	860	81891		
79	AME Zion Church	605	82496	24	82925
80	Presby Primary	270	82766		
81	Christian Divine Church	835	83601		
82	True Church of Christ	600	84261		
83	Bar Italia	520	84781		
84	Methodist Church (Amanful)	1675	86456	25	86430
85	Mosque Ayeko Ayeko	1020	87476		
86	Apostolic church Ash. Rd.	1090	88566		
87	Wiseway (Sarbah Rd)	855	89421		
88	Near GCB Bungalow	665	90086	26	89935
89	Ekon JSS	2200	92286		
90	Ekon D/C Primary	1985	94271	27	93440

Number	Community/Settlement	Population	Cumulative Population	Cluster	Sampling Number
A	B	C	D	E	
91	Messiah Church	1780	96051		
92	P & T (Brofoyedur)	1875	97926		
93	Mr. Amoako's House (Brof)	1560	99486	28	96945
94	Ghana National	245	99731		
95	Queen Elizabeth Nursery	600	100331		
96	Hill Top	410	100741	29	100450
97	Third Ridge	300	101041		
98	Nkanfoa	2000		30	103955
99	St. Michael Holy Child	545	104546		
100	Trokeshi	010	105158		

MAP OF THE CAPE COAST MUNICIPALITY

