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"THE DEVELOPMENT OF A SCALE FOR  
PREDICTING MOTHERS COMPLIANCE IN THE EXPANDED  
PROGRAMME ON IMMUNIZATION (EPI)"

BY

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A dissertation in the Department of  
PREVENTIVE AND SOCIAL MEDICINE

Submitted to the Faculty of Clinical  
Sciences and Dentistry in partial  
fulfilment of the requirements for the  
degree of  
MASTER OF PUBLIC HEALTH (HEALTH EDUCATION)  
of the  
UNIVERSITY OF IBADAN, NIGERIA

AUGUST, 1989

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DEDICATION

With Gratitude to Almighty Allah the source of Knowledge, this dissertation is dedicated to my dear son, Abdul Hakim Adekola Alani Adetunji whose birth coincided with the period I gained admission to study for the degree of Master of Public Health.

Abstract

The apparent high drop out rate in Expanded Programme on Immunization (EPI) is constituting a major barrier in the breakthrough of the child survival programme especially in developing countries of the World (Alakija, 1986).

This cross-sectional, descriptive and explorative study was carried out in Obokun Local Government Area (LGA), Oyo State of Nigeria between October, 1987 and July, 1988. The study population consists of mothers who attended EPI clinics for their children's immunization under the Expanded Programme on Immunization.

Respondents were mothers whose children had taken the first doses of diphtheria, pertussis, tetanus and Oral polio vaccines (DPT/OPV) between October 1987, and January, 1988. These mothers were classified as compliers if by the end of July, 1988 they had completed the three doses of DPT/OPV schedules. Those who had not completed these three doses were termed non-compliers. Out of 121 mothers used in the study, 65 were compliers while 56 were non-compliers.

Data gathering tools used included questionnaire to explore demographic, attitudinal and cognitive factors in these mothers

which may affect compliance with EPI appointment schedules. In addition, observational check-list was used to probe into factors which may affect compliance due to clinic settings or arrangements.

After analysis of the data, the identified compliance factors were scored to form a predicting scale that can be used to identify those that are likely not to comply with appointment schedules among mothers in EPI Programme so that measures that will make them comply can be instituted from the start.

The result showed that the respondents in both compliers and non-compliers were similar in such demographic characteristics as age, marital status and parity. They however differ significantly in demographic characteristics such as educational levels, occupation, income and religion.

Also, there were more compliers among mothers who attended orthodox form of ante-natal services, those who had institutionalized deliveries and mothers who brought their children to have first contacts of immunization within their six months of lives.

The risk factors that can determine non-compliance with appointments in EPI based on the findings of the study are low-educational level, low income, semi-skilled and non-occupation, non attendance of Orthodox ante-natal services in pregnancy, no immunization during pregnancy, non-institutionalized deliveries, long distance from home to EPI centres, giving herbs as protection to children, delaying the first immunization till children reached ages six months and lastly religions of mothers in which case muslims can default more than christians.

Based on the findings from the study, it is recommended that the health education approach in EPI be modified to include local communication system for rural women since effective communication is the key to implementation of health education activities. In addition future studies should focus on production of predictor scale that will enable the identification of non-compliance among urban/cities mothers.

### ACKNOWLEDGEMENT

Glory be to God Almighty who has granted me His will to pursue this course.

I wish to express my profound gratitude first to my Principal Supervisor Dr. J.D. Adeniyi who despite his load of departmental assignments at home and abroad found time to give his critical review of this study especially his untiring efforts to see the work going at difficult stages.

My thanks also go to Dr. Dimeji Oladepo my second Supervisor for his thorough supervision and assistances not only on this project but throughout the course. He has really motivated me to work hard.

I appreciate the encouragement, understanding and patience of my wife Kudirat Adeola Adetunji for enduring the hardship of the course with me. The supports I received from my parents are also appreciated.

I thank the Federal Government who provided me the financial support, for the second year of the course. My gratitude also goes to Dr. (Mrs.) Onadeko for her support and assistance in providing useful references especially during the preparation of my research seminar.

The entire staff members Primary Health Centres Ipetu-Ijesa and Ijeda, Health Clinic Ilase and maternity centre Ipetu Ijesa (all in Obokun LGA the site of the study) did everything within their powers to support the study. I thank them all. I also thank those mothers I used for their cooperation.

Finally, I am grateful to all other persons who contributed in making the work a success especially my friends whose names are too numerous to mention here.

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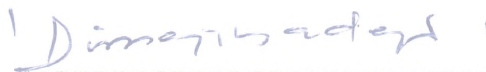
CERTIFICATION

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## CHAPTER 1

### INTRODUCTION

Immunization against the major infectious diseases is one of the 8 essential services of a community based Primary Health Care Programme (WHO, 1978a). The idea of Coordinating and promoting World Wide efforts to protect children from six killer diseases (Diphtheria, Pertussis, Tetanus, Poliomyelitis, Tuberculosis and Measles) through vaccination was conceived by the World Health Organisation (WHO) in 1974 as the Expanded Programme on Immunization (EPI) (Peter, Poore, 1987).

In 1977, three objectives were set for EPI, namely to reduce morbidity and mortality from six major childhood diseases - diphtheria, pertussis, Tetanus, poliomyelitis, tuberculosis and measles by immunizing all the children throughout the World by 1990; to promote national self reliance in delivering immunization services with comprehensive health services; and to promote regional self-reliance in vaccine production and quality control (WHO, 1978b).

Although, it has been observed that immunization is one of the most powerful and cost effective tools of prevention and control of a number of communicable diseases, it remains

tragically underutilized in most developing countries of the world including Nigeria where coverages are below expectations (Sorungbe 1984).

Underutilization of health services could be categorised into two aspects, one deals with whether health consumers utilize available health services and where the consumers fail to comply with treatment regimen or with appointment schedule (Soladoye 1980). Although the two categories of underutilization is being experienced in EPI in the developing countries such as Nigeria the second category dealing with the issue of non-compliance with appointment keeping is the concern of this study, because of the serious non-compliance problems in EPI appointment schedules by mothers in these developing countries like Nigeria.

An intensive immunization programme in a region in Ghana for example achieved 63% coverage for the first dose of OPV, but only 22% for the second dose and 11% for the third dose (WHO, 1979b). Out of 25% coverage recorded nationwide in 1985 in Nigeria, only 15% completed all the six immunizations (Alakija 1986).

In 1986 a study of the immunization coverage of pre-school children in Eruwa, Oyo State, Nigeria (Medical Student Project, B-group, 1986) showed that less than 50% of the 497 children 0-5 years surveyed

had full EPI schedules, 18.9% had defaulted completely while 21.5% had no immunization at all.

The summary of the immunization activities in Obokun LGA between March and September, 1987 also showed consistently high drop out rate between the first DPT/OPV and the third DPT/OPV schedules of immunization for the children. For example, of the 657 children who had DPT1 in March, 462 (70.3%) received DPT2 in April while only 255 (38.8%) had the third dose of DPT in May (see Appendix 23).

Some of the reasons adduced for the non-compliance of mothers in EPI appointment schedules in the above studies included long waiting time at EPI clinics, Lack of education, mothers forgetting dates of appointment and fear of side effects of injections.

Also, the UNICEF representative in Nigeria while commenting on EPI activities in the country stated that Nigerian mothers were seriously lacking in their commitments to the cause of child survival because they defaulted in respect of follow up of vaccination time table for their children (Tuluhungwa, 1988) a very challenging remark.

Reduction in deaths and permanent disabilities caused by these six killer diseases under EPI can only occur if the serious

compliance problems associated with the programme can be overcome.

### Significance of the study

Many research efforts have been made to document reasons for low coverage or high dropout rates in EPI programme. Lola, Adekunle (1978), in her study carried out in Ibadan, Oyo State, Nigeria on impediments for reaching desired goals in immunization documented ignorance and lack of education of mothers as major barriers. In other studies, major reasons found for high dropout rates in EPI included long waiting time, distance of immunization centres from parents homes, and lack of knowledge about when and where vaccinations are offered (Alakija, and Ahakhu, 1983), Bekher, et al. (1978). However, while these studies are useful, none of them looked at the characteristics of compliers and non-compliers among mothers to enable a predictor scale of identification of the two categories to be made.

This study is unique in that it looked at the characteristics in mothers within the same area attending the same EPI clinics and found out what made a group of them compliers and the other group non-compliers with appointment schedules whereas other studies cited above concerned themselves

with the degree of success or failure of the programme.

### Scope of the Study

The characteristics of mothers examined in the study are the demographic characteristics such as young or old age, educational status, marital status, religion, occupation and parity.

Only mothers who attended the chosen EPI centres in the area of the study who could be traced home through contact addresses left at the EPI centres were surveyed. The focus of the study was on those who, completed the three doses of DPT/OPV for their children or defaulted during the period October, 1987 to July, 1988.

Though it may add validity to the result if all immunization schedules were covered, BCG and measles schedules were left out because they are the first and last schedules respectively. Apparently, as the first schedule, BCG is given at any first contact to child between age 0-2 years. Measles also may be given with any of the schedules if the child is above 9 months whereas DPT/OPV are three schedules with specified intervals of at least four weeks between doses. Therefore the study is limited to DPT/OPV1, DPT/OPV2 and DPT/OPV3 schedules only.

It is hoped that this study will enhance further successes in immunization of children by identifying behavioural correlates

of mothers to compliance with EPI schedules leading to the production of simple compliance predictor scale. This scale can be useful as a fast screening tool for identifying would be defaulting mother at the first interactions with EPI services providers. Special attention can then be given to those mothers with a view to making them comply with EPI appointment schedules for their children.

This study consists of five parts. Introduction to the research serves as the first chapter. Chapter two reviews literature on compliance with regards to concept and patterns. It examines the magnitude of problems of EPI target diseases on children especially in the developing world. Factors affecting non-compliance with regimens and appointments keeping are examined and categorized.

Chapter three describes the study area, presents the objectives of the study and the research methodology. The fourth chapter presents the results of the study while chapter five discusses the results and draws conclusion and recommendations.

## CHAPTER 2

### LITERATURE REVIEW

#### INTRODUCTION

Communicable and infectious diseases which are mostly preventable by simple measures and routine immunization are causing infant and childhood morbidity, mortality and disability in most developing countries of the world (William, 1964). The control of such communicable diseases especially in children has become a major challenge to health workers, especially health educators.

This chapter begins with a brief background of EPI in Nigeria and the nature and magnitude of the problems of EPI target diseases with immunization as a preventive option. It also looks at the concept of compliance and its patterns and EPI vaccination schedules. The chapter concludes with a review of factors affecting compliance with regimens and appointment keeping.

#### BACKGROUND OF EPI

The World Health Organisation (WHO) established the Expanded Programme on Immunization (EPI) in 1974 and it was launched in 1977. The aim was to assist all nations carry out immunization of their 0 - 2 years child populations against communicable and

dangerous diseases of childhood viz measles, tuberculosis, pertussis, diphtheria, poliomyelitis and tetanus.

The programme has been endorsed by all member states of WHO and UNICEF is an active participant in EPI, providing vaccines, training, cold-chain equipment and other supports to national programmes (WHO 1985).

### EPI in Nigeria

In 1980, The Federal Government of Nigeria embarked on a ten year (1980-1989) EPI plan. After the fourth year of operating the programme, the coverage for target population stood at barely 15 to 20% (Federal Government and WHO, 1984) may be because the programme was yet to be known at grassroot levels then.

As a result of the poor coverage and at the request of the Federal Minister of Health and Director of Public Health Services, a combined team of the Federal Ministry of Health, UNICEF and WHO representatives was formed and charged with the revision of the existing EPI programme plan. The objectives of the revised plan are:

1. to achieve 80% immunization coverage of the target population by the year 1990 and a mid-term goal of 60% by 1987;



2. to reduce by 1990, by at least 50% the incidence of the target diseases through immunization and other preventive measures,
3. to promote the use of ORT through an intensive educational campaign designed to bring about wide spread adoption of ORT by mothers and by the Nigerian health care system;
4. to establish an efficient system of surveillance and programme monitoring activities, to ensure reliable and systematic procurement and flow of vaccines; and
5. to foster intersectoral cooperation, community involvement and participation at all levels thus enhancing the ability of the programme to sustain itself effectively.

The National launching of EPI/ORT revised programme was performed in October, 1984 followed by launching in other states of the federation and eventually all the LGAS (UNICEF, 1984) Obokun LGA the site of the present study, performed its own launching in 1986.

#### NATURE OF THE PROBLEMS OF EPI TARGET DISEASES

The EPI target diseases have been constituting threats to childhood survival for the past decades in developing countries including Nigeria.

Even though the absence of reliable and vital statistics meant that most figures available especially on child morbidity and mortality represents only estimates which are largely conjectural and based on clinical and field observations, yet the estimates revealed that a high proportion of children born never survived to their first birth days (Hendrickse, 1964) and vast majority of them are exposed to environmental factors which pre-disposed them to hazards of preventable diseases (Oduntan, 1975).

Among children in Nigeria for instance, malaria, pneumonia, gastroenteritis, malnutrition, pertussis, measles, poliomyelitis, tetanus and tuberculosis are still the major causes of deaths among children (Morley, 1966).

#### Measles:

Of the EPI targeted diseases, measles is the most important cause of childhood morbidity and mortality in developing countries. For example, while nearly every child which is not immunized contracts measles, over two millions die from the disease every year currently many of them in Africa and Latin America (Foeger, 1982, Morley, 1975 and WHO, 1985b). Morleys, (1961a) found that in a Yoruba village, out of 2774 children under 12 admitted to hospital in 1960, 397 died and 178

of these deaths were due to measles. According to data produced by Federal Disease Control Unit of Social Development Directorate, Nigeria in 1985, reported cases of measles were estimated as 3,600,000 with 108,000 deaths and 54,000 disabilities.

#### Pertussis:

Pertussis commonly called Whooping cough is second to measles as a cause of serious childhood illness in developing countries (Favin, et al., 1984). It is estimated that currently over 600,000 children die from pertussis each year (WHO, 1985) out of which 64,000 children will die in Nigeria alone in the absence of immunization against Pertussis (Federal Disease Control Unit, 1985).

#### Tetanus:

Neonatal tetanus though often called "neglected disease" because few cases are reported kills at least 800,000 infants each year according to recent data by Stanfield, J.P. and Galazka, A. (1985), Community surveys conducted recently in 14 Asian, Middle Eastern and African countries showed that neonatal tetanus deaths per 1,000 live births was 3 in Yemen Arab Republic 5 in Thailand, 9 in Sudan, 21 in Somalia and 5 to 7 in India (WHO, 1982). In unimmunized Nigerian children, it is estimated

that out of 50,000 cases, 40,000 will die yearly (Federal Disease Control Unit, 1985).

### Poliomyelitis:

Poliomyelitis (Polio) is the major cause of lameness in many developing countries (Jacqueline, , and Richard B., 1986). Where polio is endemic, an estimated 3 to 10 of every 1,000 children develop paralytic polio and World wide, about 300,000 cases occur yearly (Henderson, R.H. 1984, WHO, 1984, and WHO, 1985). Poliomyelitis was also known to be responsible for the cause of at least 100,000 cripples in Nigeria (Collis, 1961).

### Tuberculosis:

Sudden epidemic, such as with measles or polio occur infrequently in tuberculosis (TB) since it usually progresses slowly and transmission of ten goes unnoticed (Jacqueline, and Richard, 1986). Nonetheless, T.B. remains a health problem throughout the World but rates are particularly high in developing areas. The incidence of Pulmonary T.B. alone is as high as 300 cases per 100,000 in some parts of Africa, Asia and Oceania. Reported rates in South America range as high as 255 per 100,000 in Bolvia, and 70 per 100,000 is typical (PAHO, 1983, WHO, 1981 and WHO, 1974).

In Ibadan, Nigeria, the incidence of tuberculosis among children was reported as 6.2 per 1,000 (WHO, 1958). Carrena, (1973) in an unpublished survey report showed that the incidence of PTB in Nigeria was 19,334. Also, during the year 1977, a total of 1,719 new cases were notified in Oyo State alone (Ministry of Health, Oyo State, 1977).

#### Diphtheria:

Diphtheria though is endemic in many developing countries, it is not as significant a public health problem as other EPI diseases (Jacqueline, and Richard, 1986) and data on diphtheria are inadequate for projections. According to WHO, (1986) statistics, the number of diphtheria cases was about 92,000 in 1980 and 46,000 in 1983. Worldwide.

As a result of the above high deaths and disabilities from preventable diseases especially among children in developing countries such as Nigeria, a preventive option was adopted to overcome the problem.

#### IMMUNIZATION AS A PREVENTIVE OPTION TO EPI DISEASES

Immunization programme can greatly reduce the incidence of many infectious diseases. In many developed countries where immunization is routine and nearly universal, serious childhood

diseases such as measles, polio, diphtheria and whooping cough are now rare (Jacqueline, and Richard, 1986).

In developing countries, it appears that immunization programmes prevent much sickness and saves many lives. For instance, in the late 1960s, it was estimated that in West Africa, vaccination campaigns halved the number of measles cases and prevented about 170,000 deaths each year (Foegen, and Eddins, 1973). Through vaccination, Africa has been declared small pox free by the World Health Organization (WHO) (Peterpoore, 1987).

This review showed that immunization if given properly is capable of preventing the six killer diseases of EPI in children. However, some logistic problems including giving of vaccination at wrong times may affect efficacy of the vaccines. That is probably one of the reasons why vaccinations under EPI are arranged in schedules.

#### VACCINATION SCHEDULING IN EPI

##### WHO Schedules:

World Health Organization (WHO) recommends that BCG and OPV be given at birth; at six weeks, first DPT/OPV at ten weeks, second DPT/OPV; third DPT/OPV at fourteen weeks and at 9 months,

measles vaccines (WHO, 1984a, WHO, 1985 and WHO, 1984b). Pregnant women in the schedule are to receive first tetanus toxoid at 28 weeks and the second at 32 weeks.

At the beginning of EPI operation in 1977, the schedule recommended starting DPT/OPV series at two to three months interval between doses. During this time, OPV dose at birth was not included. It was in the early 1980s that starting DPT/OPV at six weeks was first recommended to provide complete protection by 14 weeks, particularly against pertussis and polio (Jacqueline, and Richard, 1986). The dose of OPV at birth was only recently recommended (WHO, 1985) and many programmes are not yet providing this dose.

#### Nigeria's EPI Schedules:

THE FIRST EPI schedule have BCG at birth, first DPT/OPV at two months, 2nd DPT/OPV at three months, at four months, 3rd OPT/OPV and measles at 9 months. Tetanus toxoid for pregnant women are scheduled at 6th and 7th months of pregnancy. These schedules are to be followed at static EPI units.

Mobile and out-reach units are to give at first contact, BCG only if child is below two-months and BCG, 1st DPT/OPV if is two months of age. At second contact, 6 months to 8 months, 2nd DPT/OPV while at third contact, 9 months to 11 months, 3rd

DPT/OPV and measles are given to the child. Tetanus toxoid are to be administered to pregnant mothers at 6th and 7th months of pregnancy (Federal Government/UNICEF and WHO, 1984).

What can be deduced from slight change between WHO recommended schedules of immunization and the Nigerian schedules is that the programme limitations logistics such as scarced good roads or transportation ~~and~~ in most parts of the country might have led to adjustment of the WHO recommended schedules. For instance, in rural areas, children do not have ready access to health services as in Urban areas of the country. In view of these logistic problems, De Quadros, (1982) recommended that vaccinators should be told to give DPT and OPV at anytime during the first year of life after age six weeks as long as there is at least four weeks between doses, and to administer measles vaccine at any time after age nine months.

One major risk of departing from the recommended schedule is that infants may be left susceptible to pertussis for much of their first year of life. The efficacy of various vaccination schedules used in EPI therefore need to be studied. Their administration should be done at a time when maximum results can be obtained.



If schedules are made in accordance with the abilities of the vaccines to produce the required immune responses in children, mothers should therefore comply with these schedules for good results of vaccinations. The issue of compliance thus needs to be examined.

#### THE CONCEPT OF COMPLIANCE

Compliance in hospital/health care settings can be said to exist when patient/client carries out his health care providers orders with regard to the use of medical regimen or appointment keeping (Milton, B. and Robert, 1963). Compliance may necessitate giving up certain behaviour which patient/client may not want to relinquish. If he does comply, his attachment to learned ways of behaviour creates dissonance, and if he refuses to comply, the consequences is a function of the new information - that is he is endangering his health. After a decision has been made, the patient/client attempts to establish internal harmony, consistency or congruity among his actions, attitudes or values. This is described as a drive towards consonance among cognition (Festinger, 1957).

#### Patterns of Compliance:

It may be misleading to label patients/clients compliers and non-compliers without elaboration. This is because the medical

regimen is just a composite of recommendations as such, a patient/client may comply with all, some or none of the advice. Each regimen is characterized with different degree of compliance and if a patient/client complies at all, he may do so consistently over time (Milton, and Robert . . ., 1963).

#### Factors Affecting Compliance:

Factors affecting compliance with treatment and appointment keeping have been generally categorized on those related to:

1. Patient characteristics;
2. Characteristics of regimen;
3. Personal influence/Family support characteristic and
4. Characteristics of the Patient/health providers relationship or interaction
5. Health care delivery system characteristics (Soladoye . . ., 1980).

#### a. Patient characteristics

In most of the literature reviewed on non-compliance, it is only possible to cull some impressions about what patient characteristics influence non-compliant behaviour. Even though demographic characteristics of patients have been extensively studied, few associations have been found predictive of compliance (Mitchel, . . . 1974).

Age:

While older people have been reportedly to be least likely to follow doctor's order (Davis, M.S. and Erichhorn, R.L. 1963, Leone C. et al, 1966), age was shown in another study not to be associated with compliance. In a later study conducted by Finnerty (1973) among older people at the onset of diabetes, positive association was found between compliance and age.

Socio-economic status:

There are conflicting reports about peoples social-economic status and compliance. Davis, M.S. and Erichhorn, R.L. (1963), stated that compliance is least expected in patient with low socio-economic status. Income was however reported later to be unassociated with compliance (Finnerty, D.A. 1973, Carpenter, J.C. and Davis, M.S., 1976. Also a study was carried out at a cardiac clinic of the Johns Hopkins Siniai Hospital of Baltimore to find out why patients did not follow medical advice in the study of children on long-term anti-streptococcal prophylaxis. Among the families of the 111 patients, 30 had total incomes of less than \$3,000, 28 had incomes of \$7,500 or more. Leon Gordis et al., (1969) found no significant relationship between total annual income of the family and compliance. Similarly, when the

relationship was examined of compliance to other indices of socio economic status such as educational and occupational characteristics of the patients of the children there were no consistent relationships.

#### Educational levels:

In the study conducted with patients suffering from hypertension, diabetes and cardiac conditions, it was generally shown that educational level of patient is unassociated with compliance (William F. 1967, Finnerty 1963 and Carpenter and Davis, 1976).

Generally, finding related to socio-economic factors are conflicting (Vida Francis et al. 1969). Low education was reported to have led to poor understanding and cooperation in patients with rheumatic heart disease (Elling et al., 1960). Also, in a study of cardiac patients (Davis and Erchhorn, 1963), a greater proportion of patients with high education reported failure in compliance over a given period of time. Whereas it was found in another study that cardiac patients with higher education were more compliant in carrying out recommendations regarding smoking. The study of Davis and Eichhorn (1963) cited above agreed with one carried out on immunization coverage of pre-school children in Eruwa, Nigeria. This study was carried out by

a group of medical students on rural posting in 1986 and it was found that immunization increased as mothers' education rose (student project 'B' group, 1986). It was a confirmation of the study carried out earlier on also in Nigeria whereby children with illiterate mothers or mothers with only Primary education were the group with least complete immunization (Lola Adekunle, 1978). It was also found that many illiterate mothers often simply forget the date of children's appointments for immunization especially vaccines, which needed booster doses such as DPT/OPV.

#### Occupation:

Little association was found between compliance and occupation in a study conducted by Finnerty, (1973) elsewhere. This researcher used 217 respondents drawn from heterogeneous professions including architecture, medicine, law, nursing and such jobs like farming and labourers with few unemployed. However, in Nigeria, children of mothers who are traders and farmers were found to be unlikely to receive complete immunization or no immunization at all (Lola Adekunle, 1978 and Student Project, 'B' Group, 1986).

#### Religion:

No association was found between compliance and religion

according to studies carried out among christians, muslims and agnostics (Carpenter, and Davis. 1976). Likewise, no religious differences was found among mothers who had more immunization for their children in Igbo-Ora, Nigeria (Student Project, 'B' Group, 1986).

Even though few association have been found predictive of compliance with regard to patient characteristics, those studies reviewed above showed that in some cases demographic characteristics do affect compliance.

#### Physical Characteristics:

Influence of physical characteristics of Patients on compliance have not been clearly stated. Most studies focused on a population with particular diagnosis and as such made comparative studies to be few. However, it was recorded that patients with long term illness are more compliant when careful instructions were given. In the same manner, urgency nature of an acute illness have also been related to compliance (Abramson, et al, 1961, Ambuel, et al, 1964 and Leo Gordis, 1969).

#### Psychological characteristics:

Various studies on psychological characteristics of patients that could affect compliance showed that examination of coping mechanisms, dependency and defensiveness together with

externalization would enable compliant patient to be identified (Elis, 1964, and Ambuel, et al, 1964). Leventhal, 1965) suggested the presence of fear arousal as a necessity for acceptance of a medical advice.

b. Characteristics of Regimen:

Usually, a medical regimen combines prescription (behaviours to be initiated) and proscription (behaviours to be prohibited) Mizruchi, and Perncci, 1962). Two out of three regimes are complied with by most patients and selections are made of those which are least difficult (Donabechina and Rosenfield, 1964). Most of the time, restrictions which involve relinquishing personal habits are the most difficult to follow.

Compliance with one specific regimen appear to affect adherence with others (Davis, 1967). No association was found between the regimens which require patient self care or with advice that involve the patient in the clinic procedure and compliance no associations were found (Berkowitz et al, 1963).

No relationship was found between the duration of treatment and compliance in studies of diabetic patients (Williams, 1967). The diabetics in the said study were told different managements for treating the various categories of their diabetes and the likely duration of treatment. No difference was found in

default rate of those placed on both injectable insulin and diet regimes. Also, no association was found between the duration of illness before the beginning of treatment and compliance in the studies of cardiac (Mitchel, 1974) and rheumatic fever patients (Charney et al., 1967). Default rate was found to be very high in all the groups of patients with duration of illness ranging from 6 months to 5 years who reported for treatments later. Those groups of patients were commenced on both medication and health education. However, most of the patients with rheumatic fever were children and compliance was found to be high among those children whose parents played supportive roles and were very eager to see quick recovery of their children.

#### Side effect of drug and compliance

There appeared to be contradictory findings among studies conducted in different settings as far as relationship between side effects of drugs and compliance is concerned. A study showed an association between non-compliance with treatment regimens of epileptic and hypertensive patients due to side effects of drugs (Caldwall, 1970).

Study carried out in Ibadan, Nigeria also showed an association between compliance and side effects of drugs among pulmonary tuberculosis (PTB) patients. There were high dropouts



of patients in a chest hospital due to side effects of PTB drugs (Soladoye, 1980). Olugbile (1975), in his own study also documented that feared side effect of immunization and complications were important reasons causing deterrent in children immunization in Ibadan, Nigeria. This association was also reported by Alakija and Anakhu, (1983) as one of the reasons for high drop out rates of mothers in EPI in Nigeria.

In other studies however, side effects have been shown not to be a serious hindrance to compliance. Green, Lerin, and Deeds, (1975) studied 60 hypertensive patients to examine the influence of side effects of their drugs on compliance with subsequent appointments keeping. They employed individual counselling method to each of the patients and importance of drug taking and appointments keeping were stressed. Fifty-two out of sixty of them kept their appointment regularly. This finding might have been influenced by health education given.

c. Personal influence /Family support characteristics:

Even though influence from Family members, friends and associates may conflict with the medical advice and counteract the doctor's potential order, it is also possible that extra medical influence may reinforce the doctors recommendations.

Eichhorn, et al., (1958) reported that increased levels of compliance was strongly associated with availability of local help and family convenience in crisis period. Whereas family discord is closely related to non-compliance, positive reinforcement of medical advice is perhaps associated with the more stable home situation (Elling et al., 1960). The functionality of such positive reinforcement is achieved when one considers that the patients could not be able to relate to his doctor or any other health service provider with the same frequency and intensity as he does with family, friends and co-worker (Abramson, et al., 1961).

There is an agreement on the positive role of family and social supports on patient compliance among various investigators. In studies conducted by Pratt, (1973), Beecker, and Green, (1975), where comparisons were made of patients with various disease conditions who had family and social supports in heterogeneous community and those who did not have such supports, it was found that higher percentages of those who kept their appointments came from those who received social supports. They kept their appointments regularly until they were declared cured, whereas those without family and social supports failed in their appointments keeping.

Similar findings had been documented earlier on in an arthritic (Heizel - Mann and Bangley, 1970) and Obese (Stuart, and Davis, 1972) patients. In an exercise programme for arthritic patients, continued participation of 87 of them in the exercise therapy was highly influenced by supports from their spouses. The supports given included looking after their children, provision of means of transport to and from the hospital and taking care of their domestic works. The study carried out in Chicago hospital among Obese patients who were on weight reduction management also showed that those patients who had helps from family members had greater and long lasting weight reduction than those who did not receive such helps. These findings also agree with Finnerty's (1973) study on compliance of diabetic patients with diet regimen where supports from spouses accounted for greater compliance with regimen among married than obtained from patients who were yet to marry. It could therefore be concluded from the above review that personal influence or family supports are needed for enhancing high rate of compliance in appointments keeping as well as proper following of regimens.

d. Health Provider/Patient relationship characteristics:

Fewer works have been done on exactly how interaction

between patient and health provider influences patient compliance. In those studies, congruent findings were got. For instance, barriers in doctor-patient communication was shown to have led to patient non-compliance (Berkowitz et al., 1963, and Johnson, , 1965). However, it was not clear how the communication barriers were measured.

Even though there is no complete agreement on how doctor-patient relationship affects compliance, most investigation showed recognition of the importance of communication and explanation (William, . and Davis, . 1965, Mohler, et al., 1955). Johnson, et al., (1966) noted that communication between doctor and patient is less important than the psychological readiness of the patient. However, another study showed a reciprocal failure on the part of the patients to comply when doctors failed to clearly convey the significance of regimen to them (Sobel, and Igalls . 1964, Davis, M.S. and Vonderlippe, , 1968).

Both hypertensive (Caldwall et, al., 1970 Mckenney, et al., 1973 and Svarstand, , 1974) and diabetic (Huka et al., 1975) population studied have shown that poor physician instructions to patients concerning regimens caused negative association with the patient compliance. In these studies, such acts as providing

feed back from results of blood or other kinds of test, to patients and enquiring about patient behaviour have been consistently associated with improved compliance. Majority of patients who were either examined without opportunity of asking any question from the physician defaulted than those who were chanced to ask questions.

Hertz, and Stamps, (1977), studied communication between the patients and health provider and its relationship with appointments keeping. They studied 2,683 patients with various disease conditions for one year period. Their findings showed that increased efforts at communication such as sending notes to patients who missed appointments resulted in reduction of the appointment broken rate.

Evidence from programmes shows that communication efforts do increase immunization coverage (Kharom, and Salahuddin, 1983, Shattock, 1976 and WHO, 1981). For instance in the Yemen Arab Republic in 1980 and 1981, during a television campaign for immunization, the number of DPT and Polio Immunizations increased to twice the previous monthly coverage and demand for immunizations remained high for several months after the television campaign (WHO, 1982).

Good communication and clear vaccination cards have been

shown to be crucial to overcoming the problem of high dropout rates in EPI (Jacqueline, et al., 1986). It was then suggested by these same authors that most continuing services could increase immunization coverage and reduce dropout rates through more effective communication. Quality of communication was earlier demonstrated in another study by Samora, (1968) to be a factor that affected appointment keeping. They looked at the role of therapeutic communication in the treatment of 4 chronic diseases. There was consistent association between communication and appointment keeping in 4 different sample groups studied. They therefore recommended that since the goal of medicine is the concern to relief, re-assure and restore the sick, comments and remarks must neither be derogatory nor condemning but should be such that the clients would be motivated to come for cure in the hospital.

Effect of motivation on appointment keeping has been shown to be a strong influencing factor. Becker, and Green, (1975) applied the health belief model in the study of children in a heterogeneous community. The study, which lasted 12 months, examined the willingness of mothers to take their children to the hospital any time they were ill. It was discovered that over 87% of the motivated mothers who brought their sick children to the

hospital on appointment days were those that received treatments for their children on their first visits to the hospital.

e. Health Care delivering System Characteristics:

Long Distance

The issue of accessibility of the health care facilities have been demonstrated by many researchers as a strong factor that could affect the use of such facilities by the health consumers. In a study of 109 hypertensive patients who lived far from the hospital, where they were receiving treatments, Stamler, (1975) employed the principle of acceptability, accessibility and continuity of care in the clinic to reduce to a significant extent, the dropout rate among those patients which was originally associated with the relatively long distance between their various homes and hospital.

High defaulting rates of pulmonary Tuberculosis patients in Ibadan was also found to be due to long distance between the homes of the patients to the chest hospital where they were receiving treatments (Soladoye, 1980).

Low immunization coverages in children have been demonstrated to be due to unaccessibility of clinics or long distance from mothers homes in both Ibadan and Eruwa, Nigeria

(Olugbile, (1975), Lola Adekunle, (1978 and Student Project 'B' Group, 1986). These studies agreed with Ademuwagun, (1986) ascertainment that the issue of availability is not enough to influence the use of a health facility, accessibility should be considered as well. The health facility which is available may not be put into appropriate use, if it is not accessible to the people it is meant for.

#### Waiting Time:

Effects of waiting time before patients/clients are attended to by the health care providers during the clinic days were looked into by various studies against appointments keeping. Perkins, (1974), studied a group of patients over a period of six months in a hospital to find out the effect which availability of services and long waiting time have on appointment keeping. She discovered that after a long waiting patients were generally referred only to end up being given another appointment day. These acts in turn discouraged the patients not only from making use of this hospital but also contributed to them stopping the utilization of other available health services.

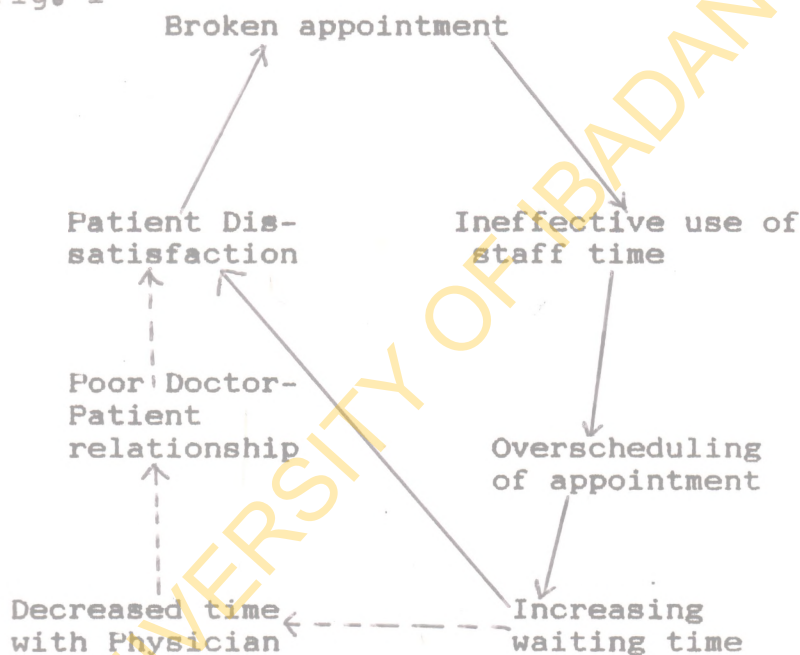
Excessive time wasting on clinic days was also discovered to be a contributing factor to appointment breaking among the



pulmonary tuberculosis patients (Soladoye, 1980). This was also reported to cause dropout in EPI to be high (WHO, 1984).

Figure 1 shows the broken appointment cycle as described by the 5th Annual Institute on Education at John Hopkins University School of Hygiene and Public Health, Division of Public Health Education (1979).

Fig. I



The institute interpreted the areas shown with unbroken lines as the common cycle of broken appointments while the areas

shown with dotted lines explain how increased waiting time can lead to patients dissatisfaction which leads to broken appointment eventually. If jobs which ought to be delegated to non-professional staff are done by professional staff, it may lead to ineffective use of the latter's time which may result in overscheduling of appointment for the professional staff.

When there are more patients for appointment on the same day than what the staff on duty could cope with, it is likely to lead to increased waiting time for the patients. The more patients wait on the clinic days especially for preventive services, the more dissatisfied they are likely to become and they may finally decide to break appointments.

In the alternative, even if the patients decide to endure the long waiting time, doctors or other health providers may be tired and as such write prescription hurriedly without enough time for good interaction that may lead to proper diagnosis. The bad quality of interaction that may result could lead the health provider to shouting on the patients unnecessarily or to condemnation of certain behaviours in the patient which may make the patient to be dissatisfied and thus break appointments or totally boycott the use of the entire health service.

Inadequate Drug Supply:

When expectations of patients are met, they are motivated to come back for subsequent services and vice versa. Drug supply on the appointment days can have positive or negative effects on appointments keeping of patients. For instance, Lola Adekunle, (1978) in her study carried out in Ibadan, the capital of Oyo state, Nigeria on major impediments to child immunization, discovered that a large proportion of educated mothers abandoned their children's immunization because of lack of vaccines on immunization days resulting in postponement of vaccination. She then suggested that regular supply of enough vaccines at vaccination centres will likely reduce problems of defaulting among mothers.

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## CHAPTER THREE

### METHODOLOGY

This chapter describes the study area and the objectives.

#### Description of the study area:

Obokun Local Government Area (LGA), the site of the study is one of the 24 LGA's in Oyo State. It has its headquarters at Ijebu-Jesa 150 kilometers from Ibadan the capital of Oyo State, Nigeria. Obokun LGA covers a large area of about 4,320 square kilometers. It is bounded in the North by Ifelodun LGA, in the South by Atakunmosa LGA, in the West by Ilesa LGA, and in the East by Ondo State. This LGA was chosen because of the high drop out in DPT/OPV schedules among mothers in the area (appendix 2).

The population of Obokun LGA as projected to 1987 from population census figure of 1963 is 331,091. The EPI target population to be immunized from 0-24 months is about 16,555 (Idowu, 1986).

Health facilities include a rural comprehensive health centre, two primary health centres, two primary health clinics, twenty five maternity centres, and sixteen dispensaries. These health facilities are evenly spread in the LGA.

The Educational facilities in the area include 112 primary schools, 47 secondary schools and one satellite campus of Polytechnic.

For the purpose of executing the EPI in Obokun LGA, 10 out of 48 health facilities listed above have been designated as static units and 8 as outreach centers.

There are five semi-urban towns and over one hundred rural towns and villages in the LGA. The so called semi-urban towns (Ijebu-jesa, Ipetu-Ijesa, Esaoko, Ibokun and Imesi-Ile) had pipe borne water supply and electricity supply commissioned the same year, in 1976.

It should be noted that about 65% of the LGA is not motorable. Most villagers trek long distances to reach motorable roads. The economic base of the people in the LGA is primarily agricultural. Traditional cash crops are mainly cocoa and rice while the food crops are yam, cassava, plantain and maize.

#### Objectives of the study

The general objective is to produce a simple scale for predicting mothers' compliance and non-compliance with EPI schedules.

#### Specific Objectives are

- (1) To examine the characteristics of mothers who completed the three DPT/OPV immunization schedule for their children,
- (2) To examine the characteristics of mothers who did not complete the three DPT/OPV immunization schedules for their

children,

(3) To show the commonalities if any, between the characteristics of mothers who completed the three DPT/OPV immunization schedules for their children and those who did not,

(4) To show the differences between the characteristics of mothers who completed the three DPT/OPV immunization schedules for their children and those who did not;

(5) To use the above information to produce a simple scale for predicting mothers who are likely to comply with DPT/OPV schedules and mothers who are likely to default;

and

(6) To test the effectiveness of the scale in predicting mothers who are likely to comply with DPT/OPV schedules and mothers who are likely to default.

### Hypothesis

Based on Literature reviewed on compliance issue, the following assumptions were formulated and tested in the study. They are in the form of NULL hypotheses in which case Non-compliance of mothers in EPI schedules is assumed Not to be associated with any of the followings:

(1) Demographic characteristics such as young/old age, low educational status, marital status, gender, religious beliefs,

- occupation, low income and small or large family size;
- (2) Long distance from homes to immunization centers;
  - (3) Lack of knowledge on the need to come back for subsequent doses of vaccination for their children;
  - (4) Lack of belief in the efficacy of vaccination.
- in preventing EPI target diseases;
- (5) Rude and impolite behaviors of vaccination staff and
  - (6) Fear of adverse effects of immunization on children such as fever, convulsion, abscess or paralysis.

#### Research Design

The study is of cross-sectional descriptive explorative design.

For the purpose of this study, respondents were taken from among mothers whose children had taken the first doses of DDT/OPV between the months of October, 1987 and January, 1988. They were classified into two categories as follow:

The first category named Compliers were those mothers whose children completed all the three doses of DDT/OPV by the end of July, 1988. The second category named Non-compliers are those mothers who did not complete the three doses of DPT/OPV for their children within that period of October, 1987 to July 1988 or

had defaulted completely.

### Universe

The universe consisted of mothers of the target population of children to be immunized from 0-24 months in the LGA. These mothers were estimated to be about 16,555 (Idowu, 1986).

The study population consisted of 215 mothers who attended the four EPI clinics used and had first doses of DPT/OPV within the period of October, 1987 and January 1988 for their children. Mothers were selected as target population because they are the main health care providers of children under five years in Yoruba rural communities (Afilaka, et al, 1985). It was mothers who usually took children to EPI centers.

### Selection Procedure

The researcher had the original intention of using the whole 215 mothers for the purpose of the study. However, limited time and resources as well as the actual difficulty in locating the houses of mothers due to poor numbering system prevented this. Even where the houses were located, the experience showed greater difficulty in finding mothers at home no matter what time of the day as was also found by Brieger, (1984).

As a result, the researcher and his assistants visited all



homes that could be located (and most of them up to three times) and eventually, 140 mothers were interviewed out of which 121 questionnaires were good enough for analysis because those mothers were not patient enough to allow full interview. Sixty-five are compliers while non-compliers made up the remaining fifty six.

#### Operational Definitions

Compliers: are those mothers whose children received the first doses of DPT/OPV between October, 1987 and January, 1988 and had completed the 3 doses or all schedules at the end of July, 1988.

Non-Compliers: are those mothers whose children received the first doses of DPT/OPV between October 1987 and January 1988 but did not complete the third doses by the end of July, 1988.

#### Stratification Procedure

Stratified random sampling method was used to select 4 out of 10 EPI static units (centres with permanent EPI stations) in the LGA. Stratification was based on two broad criteria. One is on the status of the centre whether it is a health centre, a health clinic or a maternity centre. The second criterion is where the said EPI centre is located. This could either be in semi-urban or rural towns (see table 1).

According to the above stratification, out of the 10 EPI static units in the LGA, 4 are maternity centres, all located in

TABLE 1

Stratification of area of sample by Clinic  
and their sites.

SITE	MAT CENTRE	HEALTH CENTRE	HEALTH CLINIC	TOTAL
SEMI-URBAN	4	2	0	6
RURAL	0	2	2	4
TOTAL	4	4	2	10

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Semi-urban towns, 4 are Primary Health Centres two located in semi-urban towns and the other two in rural towns. There are only two health clinics and the two are located one each in two rural towns.

One out of 4 maternity centres was picked randomly, two Primary Health Centres (one each in semi-urban and rural towns) and one health clinic were also randomly picked by ballot (one each in the boxes shown in table 1).

#### Instruments for Data Collection and Procedure

In this study, three methods of data collection were used namely:

1. Review of Records
2. Interview using formal questionnaire
3. Observation using observation checklist.

#### Review of Records

Baseline data on the EPI clinic attenders was obtained from the 4 chosen EPI clinics. Records reviewed were the cards and register of children who attended the clinics for immunization purpose. Information obtained included the age, sex, home address, the immunization already received by each child and dates of next appointments. The information was supplemented

and validated through informal interviews with both groups of mothers used in the study.

### Questionnaire

In order to investigate the relationship of demographic, attitudinal and cognitive factors to compliance status among mothers who complied with the three DPT/OPV EPI schedules and those who did not, same type of questionnaire was used for the home visit interview (appendix 1).

The questionnaire sought information about the mothers' demographic characteristics, ages of children at first immunization contacts, history of ante-natal services and places where the children were delivered. Other information sought included the mothers beliefs about EPI.

In the administration of the questionnaire the author made use of three staff nurses and a ward orderly who are working in the chosen EPI clinics as research assistants. They were already familiar with the areas of the research as well as with the mothers. They were therefore used to assist in tracing the mothers homes.

When a house was located, the research team introduced themselves to the occupants and asked politely for the particular mother of the child who was immunized at the clinic in that area.

Customary greetings were exchanged and the purpose of the visit explained.

The conduct of the interview was done exclusively by the author except three occasions where there was more than one mother in the same house. Interview were conducted in such cases simultaneously by the author and the staff nurses at different locations of such homes.

#### Observation check list tool:

The observation check list (appendix 3) sought information about the time spent by the mothers in the EPI clinic during each visit the interactions between them and the health staff in the clinic and whether the vaccines to be used for the children were all available at each clinic day.

#### Training of Research Assistants:

Three staff nurses and a ward orderly were used as research assistants during the data gathering of the project. They were told about the objectives of the study and the areas where their assistance would be needed especially in the aspect of tracing the mothers homes. The three staff nurses were trained on the technique of administration of questionnaire in order to minimise observer errors and variations.

### Validity and Reliability of Data Gathering Instruments

In order to ensure reliability of the questionnaire a pre-test was conducted on ten mothers who attended the EPI clinics chosen (five compliers and five non-compliers). These mothers were later removed from the actual study population. It was as a result of the pre-test that few questions were reframed to remove ambiguities. Examples of such questions were those which their answers required likert scale options where the respondents were asked to "strongly agree" 'don't know' 'strongly disagree' or 'disagree'. They were changed to 'agree' 'uncertain' 'disagree' and 'don't know'.

The interview was carried out in respondents' own familiar environment which was likely to have enhanced the mothers' confidence and as such encouraged them to express their views freely.

Administration of questionnaire in translated form to illiterate mothers added to the comprehensiveness and clarity of the tool.

During the use of the observation check list, the author tried as much as possible not to allow the health staff or the mothers to have prior knowledge of some aspects of what were being observed from them such as the interaction between the

health staff and the mothers. This action made what were being observed to appear in their natural form to a large extent.

### Data Analysis

All the data collected through questionnaire were analysed statistically by the computer.

### Formation and Testing of Compliance Scale

After subjecting the variables that could affect mothers compliance with EPI appointment schedules to chi-square test, the variables that showed associations with compliance with EPI schedules were then assigned arbitrary scores in ascending order of magnitude as they affected compliance positively or negatively. Then, the scored variables became the predictor scale for compliance or non-compliance. The higher the scores the greater the probability that the mother will comply with schedule of appointment and vice versa.

### Test of effectiveness of Predictor Scale:

The effectiveness of the predictor scale was pilot tested in one of the already used EPI clinics for initial data gathering. Ten mothers were picked randomly and then scored accordingly with the predictor scale in order to predict their compliance or non-compliance with subsequent appointments of DPT/OPV schedules. They were marked 'reported' or 'not reported' as the case might

be after two appointments.

Limitations of the study:

Six months may be too small to label mothers non-compliers because they might bring their children later to complete the schedules becoming 'delayed compliers'. In other words, complete EPI defaulters for all the expected vaccination if identified and used solely could have added more quality to the results.

Few respondents especially the literates flipped through the six and half pages of the questionnaire and lamented because of its length. The length could have affected the ways such mothers answered the questions in the few questionnaires that were self administered by those mothers.



## CHAPTER 4

### RESULTS

The findings of this study are presented under five broad subsections. First, the demographic characteristics of the compliers and non-compliers are described, followed by their responses on the children brought for immunization.

The third sub-section compares the two groups knowledge about EPI. Source of information, different schedules in EPI, diseases covered by the programme and other methods that the mothers employed apart from Orthodox immunization.

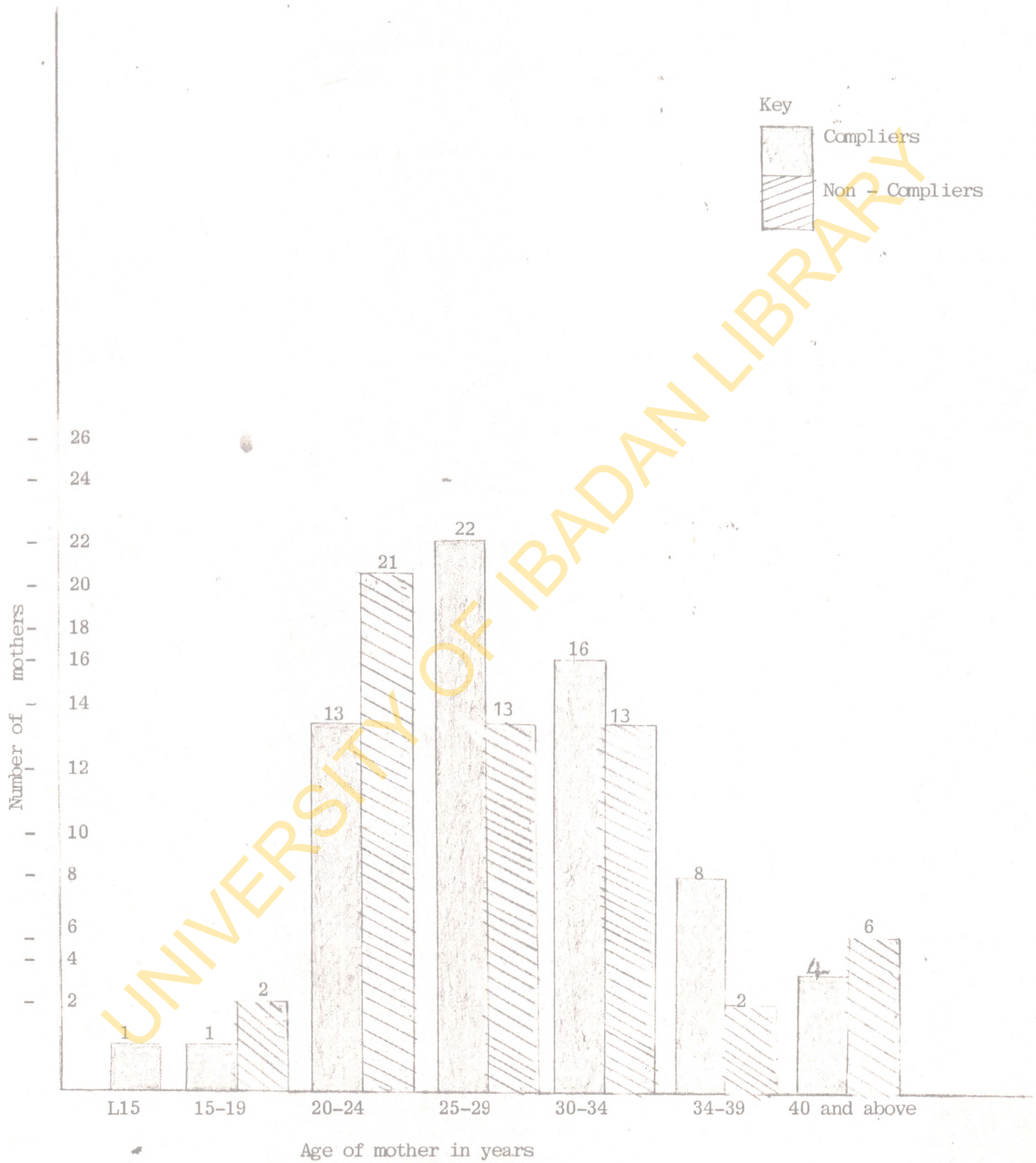
Other areas examined are the beliefs about the efficacy of vaccinations on six killer diseases and opinions about the health staff and clinics arrangements at various places of immunization used.

Finally, the last subsection presents the outcome of observation checklist carried out during the clinic sessions. The subsection ends with the result of application of predictor scale formed.

TABLE 2DISTRIBUTION OF RESPONDENTS BY GROUP OF COMPLIERS  
AND NON-COMPLIERS IN THE EPI CENTRES

CENTRE	COMPLIERS %	NON-COMPLIERS %	TOTAL %
A	14 (21.5)	20 (35.7)	34 (28.1)
B	18 (27.7)	12 (21.4)	30 (24.8)
C	15 (23.1)	10 (17.9)	25 (20.7)
D	18 (27.7)	14 (25.0)	32 (26.4)
TOTAL	65 (100)	56 (100)	121 (100)

Compliance status and age of mothers



Note! 1 cm represent 2 mothers in 'Y axis'

TABLE 3

Compliance status of mothers  
and their marital status

MARITAL STATUS	COMPLIERS	NON-COMPLIER	TOTAL
SINGLE	7	2	9
MARRIED	58	52	110
DIVORCED	0	2	2
TOTAL	65	56	121

$$\chi^2 = 4.46, df = 2$$

(p > 0.05).

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(a). Demographic Characteristics

Demographic variables are used to compare the characteristics of compliers and non-compliers in EPI appointment schedules.

The results of 121 mothers used for the study are presented. Of these, 65 (53.7%) are compliers while 56 (46.3%) are non-compliers (see table 2).

Compliance Status and mothers age

Figure 2 compares the compliance status and age of mothers. Ages of mothers studied range between less than 15 and above 40 years. More compliers were found in the following age ranges 25 to 29 years, 30 to 34 years and 35 to 39 years, while majority of non-compliers were more in age ranges 15 to 19 years, 20 to 24 years and 40 years and above.

In all, the age range with the highest proportion of compliers was 25 to 29 years with 22 (62.9%) compliers and 13 (37.1%) non-compliers as compared to age range 20 to 24 with the highest non-compliers 21 (61.8%) and 13 (38.2%) compliers. The observed differences among the two groups were however not-statistically significant ( $p > 0.05$ ).

### Marital status

The marital status of the two groups are compared in table 3. Majority of mothers surveyed, 110 (91%), were married, only 9 (7.4%) were single while just 2 (1. %) were divorcees. There is almost equal distribution of compliers 58 (52.7%) and non-compliers 52 (47.3%) among the married mothers. However, of the 9 mothers who were single, 7 (77.8%) were compliers as compared to 2 (22.2%) non-compliers. The two mothers who were divorcees failed to comply with EPI schedules. No statistical difference was found among the two groups with regards to their marital status  $\langle p \rangle 0.05$

### Compliance Status of mothers and type of Family

Table 4 displays the compliance status of respondents and their type of family. Majority of mothers studied, 96 (79.3%) were from monogamous families while 22 (18.2%) were from polygamous families. The result shows that more compliers are found in monogamous families. Out of 96 monogamous mothers, 54 (56.3%) were compliers as against 42 (43.7%) non-compliers. Among the 22 polygamous mothers, 8 (36.4%) and 14 (63.6%) were compliers and non-compliers respectively.

Compliance Status and Child Alive/Total births

The respondents' compliance status and number of children alive per total births are displayed in tables. Mothers with 100% children alive formed the majority numbering 110 with 57 (51.8%) compliers and 53 (48.2%) non-compliers. Out of 8 mothers who had between 50 and 74% children alive, 6 (75%) were compliers as against 2 (25%) non-compliers. The result showed that the higher the number of dead children per total births, the greater the tendencies of mothers to comply with appointment schedules in EPI.

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TABLE 4Compliance status of mothers  
and type of family

TYPE OF FAMILY	COMPLIERS	NON-COMPLIER	TOTAL
MONOGAMY	54	42	96
POLYGAMY	8	14	22
NO RESPONSE	3	0	3
TOTAL	65	56	121

$$\chi^2 = 5.5, df = 1$$

(p > 0.05).

NOTE :  $\chi^2$  excludes the 'noresponse' values.



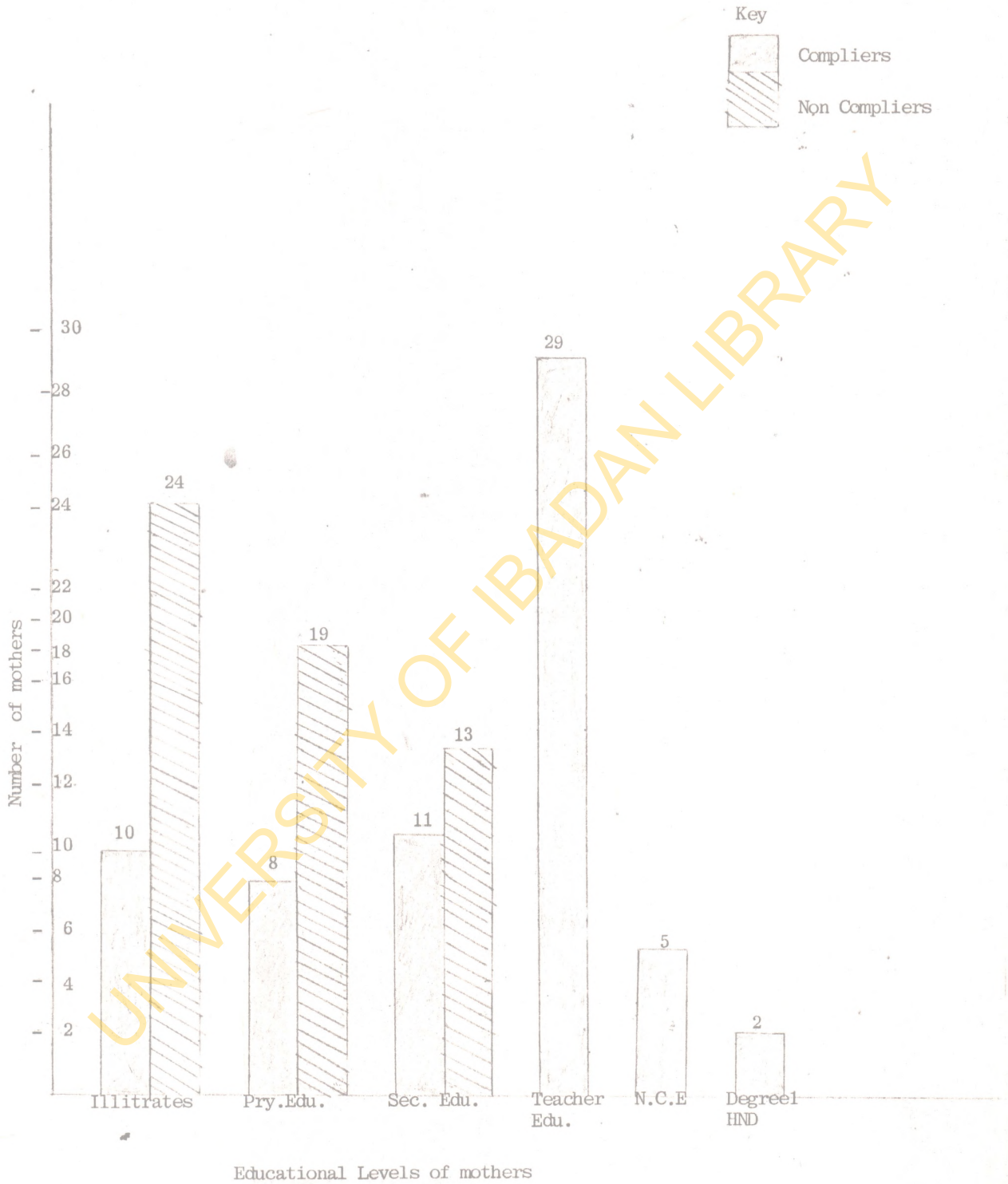
TABLE 5COMPLIANCE STATUS OF MOTHERS AND NUMBER OF CHILDREN ALIVE PER TOTAL BIRTHS

CHILDREN ALIVE/ TOTAL BIRTHS	COMPLIERS	NON-COMPLIER	TOTAL
50 - 74% alive	6	2	8
75 - 99% "	2	1	3
100% "	57	53	110
TOTAL	65	56	121

$$\begin{aligned} \chi^2 &= 2.3 \\ df &= 2 \\ (P > 0.05) \end{aligned}$$

NOTE: No mother had 50% Children alive

Educational levels of mothers and compliance



Note! 1 cm represent 2 mothers in 'Y axis'

**TABLE 6****Compliance status of mothers and occupation**

<u>JOB</u>	<u>Compliers</u>	<u>Non-compliers</u>	<u>TOTAL</u>
UNEMPLOYED	14	17	31
PETTY TRADING	20	24	44
CIVIL SERANTS	23	1	24
OTHERS	8	14	22
<b>TOTAL</b>	<b>65</b>	<b>56</b>	<b>121</b>

$\chi^2 = 21.9, df = 3$   
( $p < 0.001$ )

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### Compliance Status and Mothers education

In figure 3, mothers educational levels are compared with their compliance status. Out of 34 mothers who were illiterates, only 10 ( 29.4%) were compliers as against 24 (70.6%) non-compliers. Mothers with primary education were twenty-seven out of which 8 (29.6%) were compliers as against 19 (70.4%) non-compliers. The result showed that the higher the educational levels of mothers the better their compliance tendencies in EPI appointment schedules and vice-versa. This is evident from the result showing all the 36 mothers with educational levels above secondary school as compilers. Also, there was a significant difference among the two groups statistically  $\langle p < 0.0001 \rangle$ . Therefore, the earlier hypothesis that non-compliance with appointment schedules in EPI among mother is not due to educational level is rejected.

### Occupation of mothers and compliance status

Compliance Status of mothers and their occupation are presented in table 6. Most of the mothers studied were petty traders, 44 ( 36.4% of total population). Salary earners among the mothers were the most compliers. Out of 24 who claimed to be on monthly salary, 23 (95.8%) were compliers as against one (4.2%) non-complier . The difference observed between the two

groups were statistically significant ( $p < 0.0001$ ). Therefore, the hypothesis that occupation of mothers has nothing to do with their EPI appointment compliance is rejected.

#### Mothers income and their compliance status

Results of monthly earnings of mothers are presented in table 7. Thirty-seven mothers had no idea of their monthly earnings. Out of 39 mothers (32.2% of total) who earned monthly income of below N100, 21 (53.8%) are non-compliers as compared with 18 (46.2%) compliers. Among the 20 mothers with N200-299 a month, 16 (80%) were compliers while the rest 4 (20%) were non-compliers. All the 11 mothers (9.1% of total population studied) earning N300 and above were compliers. The test of significance showed an association between compliance with appointment schedules and monthly earning ( $p < 0.001$ ).

#### Compliance Status of Mothers and Religion

The religious beliefs of mothers compared with their compliance status is shown in table 8. Christian mothers formed the majority numbering 95 (78.5% of total population) of whom 59 (62.1%) were compliers and 36 (37.9%) non-compliers. Out of 26 Muslims (21.5% of the total population) only 6 (23.1%) were compliers with the rest 20 (76.9%) non-compliers. From the

result, christain mothers have more tendencies to comply with appointments schedules than Muslims. There was a statistically significant association between compliance and religions (p 0.0001).

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TABLE 7

Compliance status of mothers and their monthly earnings

MOTHLY EARNING(N)	Compliers	Non-compliers	TOTAL
< 100	18	21	39
100 - 199	8	6	14
200 - 299	16	4	20
* 300 - 399	7	0	7
* 400 and above	4	0	4
No Idea	12	25	37
TOTAL	65	56	121

$$\chi^2 = 22.7, df = 2$$

( $p < 0.05$ )

\* NOTE :  $\chi^2$  excludes the cells with Zero value.

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TABLE 8Compliance status of mothers and  
their religious beliefs

RELIGION	Compliers	Non-compliers	TOTAL
ISLAM	6	20	26
CHRISTAINITY	59	36	95
TOTAL	65	56	121

$\chi^2 = 10.9$ ,  $df = 1$   
 $(p < 0.0001)$

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TABLE 9Compliance status of mothers and ages of their children at first immunization contact

AGE RANGE (MONTH)	Compliers	Non-compliers	TOTAL
0 - 1	21	4	25
- 2	11	2	13
- 3	4	0*	4
- 4	13	8	21
- 5	0*	1*	1
- 6	0*	1*	1
above 6	16	40	56
<b>TOTAL</b>	<b>65</b>	<b>56</b>	<b>121</b>

$$\chi^2 = 34.8, df = 3$$

( $p < 0.001$ )

\* NOTE :  $\chi^2$  excludes cells with values less than 5.

TABLE 10COMPLIANCE STATUS OF MOTHERS AND SEX OF  
THEIR IMMUNIZED CHILDREN

SEX OF CHILD	COMPLIERS	NON-COMPLIERS	TOTAL
MALE	40	32	72
FEMALE	25	24	49
TOTAL	65	56	121

$\chi^2 = 9.33$   
df = 1  
P > 0.05

## CHARACTERISTICS RELATED TO THE IMMUNIZED CHILDREN

Ages of children at first immunization:

The mothers compliance status is compared with the ages of their children as at first immunization contacts in table 9. Fifty-six (46.3%) mothers who brought their children for first immunization contacts after the age of 6 months formed the majority. Sixteen (28.6%) of this number are compliers and 40 (71.4%) are non-compliers. However, among the 25 (20.7%) mothers whose children received first doses of immunization before their first month of lives. 21 (84%) are compliers while 4 (16%) are not.

The result further showed that more mothers in the compliers group brought their children for immunization before these children reached ages 6 months. Test of significance indicated that ages of children at the time mothers brought them for first immunization contacts are related to compliance with subsequent appointment schedules of EPI ( $p < 0.001$ ).

Sex of children

Another child factor considered was the sex of the immunized children and mothers' compliance status (see table 10 ). The proportions of male and female children brought by compliers and

non-compliers were 72 (59%) and 49 (41%) respectively. There were more compliers, 40 (55.6%) as against 32 (44.4%) non-compliers among mothers with male children compared to mothers who brought female children, 25 (51%) compliers versus 24 (49%) non-compliers. No statistical significant difference were found indicating that the compliance status among the two groups of mothers were similar regardless of the sex of their immunized children.

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**TABLE 11****Compliance status and places where mothers delivered children**

PLACE OF DELIVERY	COMPLIERS	NON-COMPLIERS	TOTAL
HOME	3	11	14
HEALTH CENTRE	30	6	36
MAT. CENTRE	18	26	44
GOVT. HOSPITAL	8	1	9
PRIVATE HOSPITAL	5	10	15
* CHURCH	1*	2*	3
TOTAL	65	56	121

$$\chi^2 = 19.2, df = 4$$

(p < 0.001)

\* NOTE :  $\chi^2$  did not include church values.

### Places of Deliveries

Table 11 considers the compliance status of mothers and where they delivered their children. Most mothers, 44 (36.4%) claimed to have delivered their children in the maternity centres while only 3 (2.5%) delivered in the church. Out of 14 mothers (11.6%) who delivered children at home, 11 (78.6%) were non-compliers. However, most mothers who delivered their children at health centres and government hospitals were compliers.

For instance, out of 9 mothers who delivered at government hospitals, only 1 (11.1%) belonged to the non-compliers group. Similarly, of all the 36 mothers (29.8%) who had their deliveries at health centres, 30 (83.3%) and 6 (16.7%) were compliers and non-compliers respectively.

Chi-square result showed that there is a relationship between where mothers delivered their children and their compliance status with EPI schedules ( $p < 0.001$ ).

### MEDICAL HISTORY CHARACTERISTICS

#### Immunization in Pregnancy:

Result of information sought from mothers on their immunization status while carrying the pregnancies of their children is presented in table 12. Out of the 73 (60.3%) mothers who had immunization themselves during pregnancy, 19 (26%) did not

comply with schedules for their children delivered from such pregnancy as compared whereas out of the 47 (38.8%) mothers who did not receive immunization in pregnancy 36 (64.3%) were non-compliers.

Previous Siblings and EPI history:

Another area of consideration was whether mothers immunized their previous children. As presented in table 13, out of the 58 mothers (47.9%) who immunized other children before, 30 (51.7%) were compliers and 28 (48.3%) non-compliers. However, chi-square suggest that previous child immunization experience by mothers does not necessarily influence compliance with future schedules.

EPI versus other protections:

In table 14, compliance status of mothers were compared on the basis of whether they gave other protective measures to the children besides EPI. Over all, 54 (44.6%) answered "yes" while 65 (53.7%) said they did not give any other form of protection. Out of 54 with "yes" responses, 41 (75.9%) were non-compliers who admitted giving other forms of protection such as native drugs (see table 15) to their children as compared to 13 (24.1%) compliers. The difference between the two groups was significant statistically (p 0.001).

**TABLE 12**

**Compliance status of mothers and whether they received Western immunization in pregnancy.**

Had immunization in Pregnancy	COMPLIERS	NON-COMPLIERS	TOTAL
YES	54	19	73
NO	11	36	47
* No response	0*	1*	1
<b>TOTAL</b>	<b>65</b>	<b>56</b>	<b>121</b>

$$\chi^2 = 29.1, df = 1$$

( $p < 0.001$ )

\* NOTE :  $\chi^2$  excludes the 'No' response values .



**TABLE 13**

**Compliance status of mothers and whether the children immunized were the first to undergo EPI among the mothers other children.**

1st CHILD IMMUNIZED	COMPLIERS	NON-COMPLIERS	TOTAL
YES	30	28	58
NO	33	27	60
* No response	2*	1*	3
TOTAL	65	56	121

$$\chi^2 = 0.13, df = 1$$

(p 0.05)

\* NOTE :  $\chi^2$  excludes the 'No' response values .

TABLE 14

Compliance status of mothers and whether they gave any other forms of protection to children apart from EPI.

OTHER PROTECTION WAS GIVEN TO CHILD	COMPLIERS	NON-COMPLIERS	TOTAL
YES	13	41	54
NO	50	15	65
* No response	2*	0*	2
TOTAL	65	56	121

$$\chi^2 = 23.5, df = 1$$

( $p < 0.001$ )

\* NOTE :  $\chi^2$  excludes the 'No' response values .

TABLE 15

Compliance status of mothers and other  
type of protection given apart from EPI.

PROTECTION GIVEN	COMPLIERS	NON-COMPLIERS	TOTAL
NATIVE DRUGS	4	31	37
ORTHODOX DRUGS	7	1	8
* GOOD FOOD/GOOD HYG.	2	1	3
Nothing	52	21	73
TOTAL	65	56	121

$\chi^2 = 37.1, df = 1$   
( $p < 0.001$ )

\* NOTE :  $\chi^2$  excludes Western drugs and good food/hygiene values.

TABLE 16

Distribution of compliance by schedule of immunization received for the children by mothers

Schedules received	B C G		DPT1/OPV1		DPT2/OPV2		DPT3/OPV3		MEASLES
	NO	%	NO	%	NO	%	NO	%	NO
Compliers	YES	65 (100)	65 (100)	65 (100)	65 (100)	65 (100)	47 (72.3)		
	NO	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	18 (27.7)		
Non-compliers	YES	56 (100)	56 (100)	24 (42.9)	0 (0)	0 (0)	8 (14.3)		
	NO	0 (0)	0 (0)	32 (57.1)	56 (100)	48 (85.7)			

TABLE 17NON-COMPLIERS REASON(S) FOR FAILURE TO  
COMPLY WITH SCHEDULES

REASONS	NON-COMPLIERS %	
No Reasons	19	(33.9)
Child was sick	12	(21.4)
Forgot the date	14	(25)
Travelled	1	(1.8)
Not staying at home most of the time	2	(3.6)
Feared side-effect	1	(1.8)
Child did not need other doses	7	(12.5)
TOTAL	56	(100)

TABLE 18COMPLIANCE STATUS OF MOTHERS AND THEIR  
KNOWLEDGE OF EPI SCHEDULES

KNOWLEDGE OF SCHEDULE	COMPLIERS	NON-COMPLIERS	TOTAL
Correct	58	41	99
In Correct	7	15	22
TOTAL	65	56	121

$$\begin{aligned} \chi^2 &= 4.2 \\ df &= 1 \\ (P > 0.05) \end{aligned}$$

### Compliance and type of schedule

In table 16, proportions and types of EPI schedules complied with or missed by mothers were considered with their compliance status. All mothers 121 (100%) complied with BCG and DPT1/OPV1, all the 65 compliers (53.7%) complied with DPT2/OPV2 and DPT3/OPV3. Whereas only 24 (19.8%) mothers in non-compliers group complied with DPT2/OPV2 while none of them complied with DPT3/OPV3 schedules. Forty-seven (38.8%) mothers from compliers group and 8 (6.6%) from non-compliers group had measles vaccination for their children.

### Reasons for Non-compliance with schedule

When mothers were asked to give reason(s) for their failure to turn up on appointed dates for their children's immunization (see table 17) 14 (25%) Non-compliers forgot appointed dates, 12 (21.4%) of them alleged that their children were sick, while 7 (12.5%) did not realise the importance of taking their children back for repeated doses. Only 1 (1.8%) mother feared side effect of immunization and 19 (34.2%) gave no reason at all.

## Cognitive Factors and Compliance

### (a) Knowledge of EPI schedules.

The knowledge of mothers about the number of schedules of immunization were tested and compared with compliance status (see table 18 ). Those who mentioned the five schedules correctly were simply labeled "correct" and those who missed any of the schedules were termed "incorrect". Among the 99 (81.8%) mothers with "correct " answers, 58 (58.6%) were compliers as compared to 41 (41.4%) Non-compliers.

### Belief in immunization effectiveness against childhood disease

Belief of mothers on the effectiveness of immunization against the childhood diseases were also examined and compared with their compliance status (see table 19). Nearly all mothers, 117 (96.7%) believed that EPI is efficacious against the six killer diseases. A striking result is that all the 56 (100%) Non-compliers had this positive belief. The observed differences between the two groups was non-statistically significant ( $P > 0.05$ ).

### Sources of EPI information and Compliance Status

In table 20, the compliance status of mothers was compared with their sources of information about EPI. Majority of mothers 65 (53.7%) with 40 (61.5%) in the compliers group and 25 (38.5%)



non-compliers obtained their information through the health workers, followed by radio and television 34 (28.1%) out of which 16 (47.1% were compliers as against 18 (52.9%) non-compliers. The least source was through the husband (0.8%).

#### Compliance Status and Sickness after Immunization

Compliance status of mothers and their children post - BCG illness state was examined (see table 21). Majority of mothers 99 (81.8%) claimed that their children were not ill after the first immunization. Of the 16 (13.2%) mothers who said "Yes", 15 (93.7%) belonged to the group of non-compliers.

TABLE 19

COMPLIANCE STATUS AND MOTHERS BELIEFS ON  
EFFICACY OF ORTHODOX - IMMUNIZATION AGAINST  
EPI TARGET DISEASES

MODERN IMMUNIZATION CAN PREVENT EPI DISEASES	COMPLIERS %	NON-COMPLIERS %	TOTAL %
YES	61 (93.8)	56 (100)	117(96.7)
NO	4 (6.2)	0 (0)	4(3.3)
TOTAL	65 (100)	56 (46.3)	121(100)

TABLE 20

COMPLIANCE STATUS OF MOTHERS AND SOURCE  
OF INFORMATION ABOUT EPI

SOURCE OF INFORMATION	COMPLIERS (%)	NON-COMPLIERS (%)	TOTAL (%)
Radio/Television	16 (24.6)	18 (32.1)	34 (28.1)
Health Worker	40 (61.6)	25 (44.6)	65 (53.7)
Husband	1 (1.5)	0 (0)	1 (0.8)
Relative	3 (4.6)	11 (19.6)	14 (11.6)
Neighbour	3 (4.6)	2 (3.6)	5 (4.1)
Others	2 (3.1)	0 (0)	2 (1.7)
TOTAL	65 (100)	56 (100)	121(100)

TABLE 21

TABLE 21

COMPLIANCE STATUS OF MOTHERS AND EXPERIENCE OF  
SERIOUS SIDE-EFFECTS IN CHILDREN AFTER THE  
FIRST DOSE OF DPT/OPV

CHILDREN BECAME SERIOUS SICK AFTER FIRST DOSE	COMPLIERS %	NON-COMPLIERS %	TOTAL %
YES	1 (1.5)	15 (26.8)	16 (13.2)
NO	64 (98.5)	35 (62.5)	99 (81.8)
I can't remember	0 (0)	6 (10.7)	6 (5.0)
TOTAL	65 (100)	56 (100)	121 (100)

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TABLE 22

COMPLIANCE STATUS OF MOTHERS AND THEIR  
PERCEPTION OF SERIOUSNESS OF DIPHTHERIA  
DISEASE

DIPHTHERIA IS NOT A SERIOUS DISEASE	COMPLIERS %	NON- COMPLIERS %	TOTAL %
AGREE	0 (0)	2 (3.6)	2 (1.7)
UNCERTAIN	2 (3.1)	0 (0)	2 (1.7)
DISAGREE	57 (87.7)	54 (96.4)	111 (91.6)
DON'T KNOW	6 (9.2)	0 (0)	6 (5.0)
TOTAL	65 (100)	56 (100)	121 (100)

TABLE 23COMPLIANCE STATUS OF MOTHERS AND THEIR BELIEFS  
ON THE CAUSE OF PARALYSIS IN POLIO

PARALYSIS IN CHILDREN IS CAUSED BY WITCH- CRAFTS, AS SUCH CANNOT BE PREVENTED BY VACCINATION	COMPLIERS %	NON- COMPLIERS %	TOTAL %
AGREE	2 (3.1)	0 (0)	2(1.7)
UNCERTAIN	1 (1.5)	1 (1.8)	2(1.7)
DISAGREE	56 (86.2)	51 (91.1)	107(88.4)
DON'T KNOW	6 (9.2)	4 (7.1)	10(8.2)
TOTAL	65 (100)	56 (100)	121(100)

TABLE 24

COMPLIANCE STATUS OF MOTHERS AND THEIR PERCEPTION  
ABOUT THE CAUSE OF CHILDHOOD TUBERCULOSIS

T.B. IN CHILDREN IS CAUSED BY NATIVE MEDICINE AND ITS PREVENTION CAN ONLY BE BI IT	COMPLIERS%	NON- COMPLIERS%	TOTAL %
AGREE	0 (0)	1 (1.8)	1 (0.8)
UNCERTAIN	4 (6.2)	0 (0)	4 (3.3)
DISAGREE	54 (83.0)	52 (92.9)	106(87.6)
DON'T KNOW	7 (10.8)	3 (5.3)	10 (8.3)
TOTAL	65 (100)	56 (100)	121(100)

TABLE 25COMPLIANCE STATUS OF MOTHERS AND THEIR  
PERCEPTION ABOUT PREVENTION OF MEASLES

ONLY NATIVE MEDICINE CAN PREVENT MEASLES	COMPLIERS %	NON- COMPLIERS %	TOTAL %
AGREE	1 (1.5)	4 (7.1)	5 (4.1)
UNCERTAIN	2 (3.1)	3 (5.4)	5 (4.1)
DISAGREE	59 (90.8)	49 (87.5)	108 (89.3)
DON'T KNOW	3 (4.6)	0 (0)	3 (2.5)
TOTAL	65 (100)	56 (100)	121 (100)



### Attitudinal Factors

Mothers were asked to "agree" or "disagree" with a number of statements which examined their perceptions towards causes and prevention of childhood diseases in EPI as well as their attitudes towards the programme in general. The findings are presented in tables 22 to 27.

Most mothers (compliers and non-compliers) disagreed generally with the statement that "diphtheria is not a serious childhood disease to warrant immunization". See table 22). This disagreement was more among the non-compliers, 54 (96.4%) as compared to 57 (87.7%) of the compliers.

In table 23, both groups of mothers believed that poliomyelitis is not inflicted by the enemies to children.

Causes of childhood tuberculosis were also probed into against the erroneous beliefs that it is inflicted through native medicine (see table 24). Majority of these mothers 106 (87.6%) especially the non-compliers 52 (92.9%) believed that T.B. cannot be inflicted through native medicine.

Mothers perceptions on the preventive measure for measles were also compared with their compliance status (see table 25). While majority of mothers, 108 (89.3%) disagreed with the statement that "only native medicine can prevent measles", the

disagreement was higher among the compliers.

Furthermore, majority of mothers, 117 (96,7%) consisting of 61 (93.8%) compliers and 56 (100%) non-compliers did not share the opinion that Western immunization makes children to become more prone to sickness (see table 26).

In addition, the perception of mothers on whether herbs taking in pregnancy can be enough measure to prevent childhood diseases was also examined (see table 27). One hundred and fifteen mothers (95.9) comprising of 62 (95.4%) compliers and 54 (96.4%) non-compliers did not believe that only herbs taken in pregnancy can prevent all the childhood diseases after births.

#### Characteristics due to clinic arrangements and Services

##### (i). Distance from home to clinics

The compliance status of mothers was examined against home distances to EPI clinics (see table 28). More mothers, 68 (56.2%) of which 40 (58.80%) from the compliers group were from homes less than 1 kilometer to the various EPI clinics as compared to 28 (41.2%) non-compliers. However, more mothers in the non-compliers group, 15 (83.3%) lived in distances of between 1 to 2 kilometres to clinics as compared to 3 (16.7%) compliers.

##### (ii). Means of transportation to EPI clinics:

In table 29, compliance status among mothers are compared

against means by which they travelled to EPI clinics. Majority of mothers, 84 (69.4%) of which 41 (48.8%) were compliers and 43 (51.2%) were non-compliers trek to the clinics. Among 34 mothers (28.1%) who went by public transport, there were 21 (61.8%) compliers as against 13 (37.2%) non-compliers. The observed differences was not significant statistically ( $P > 0.5$ ).

(iii). Mothers perceptions of the clinic staff

Mothers were asked whether the health workers listened to them whenever they complained about their children's health (see table 30). Almost all mothers (100% compliers and 98.2% non-compliers) said 'yes'.

In addition, all the mothers, 121 (100%) stated that the health workers explained the different schedules of immunization to them and that they also explained the changes that could occur or could be observed in children after receiving immunizations. Fever, mild weakness, and swelling from injection sites were specifically mentioned.

As could be seen in table 31, most mothers in both groups, 94 (77.7%) were unanimous in saying that health workers in the immunization centres were not rude except 27 (22.3%) of which 13 (45.2%) and 14 (51.8%) were compliers and non-compliers respectively. In

addition most mothers, 108 (89.2%) consisting of 59 (90.6%) compliers and 49 (87.5%) non compliers agreed that the health workers were not hurrying while attending to them during the vaccination sessions.

When the mothers were asked whether the health workers in their various EPI clinics were 'always friendly' 'sometimes friendly', 'not friendly' or very 'friendly', majority 60 (45.6%) of whom 22 (36.2%) were compliers and 38 (63.3%) non-compliers said the health workers were 'always friendly' to them. All the 6 (5%) mothers who perceived the health workers as being 'unfriendly' were non-compliers.

It is a general assumption that satisfied patients will likely comply with the advice they receive from health care provider. As could be seen in table 33, most mothers in the two groups were satisfied with the services received at the EPI centres. However, a more higher level of satisfaction was noticed among the compliers. Among the 52 who said they were very satisfied 43 (82.7%) were compliers as against 9 (17.3%) non-compliers.

In table 34, compliance status of mothers was examined in relation to their decisions to participate in future immunization. All the 56 (100%) non-compliers pledged to immunize

their children in future contrary to expectation. However, 3 (4.6%) of the compliers could not decide on the future immunization of their children.

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TABLE 26

COMPLIANCE STATUS OF MOTHERS AND THEIR PERCEPTION  
ABOUT ORTHODOX IMMUNIZATION OF CHILDREN

ORTHODOX IMMUNIZATION MAKES CHILDREN TO BE MORE SICK	COMPLIERS %	NON- COMPLIERS %	TOTAL %
AGREE	1 (1.5)	0 (0)	1 (0.8)
UNCERTAIN	0 (0)	0 (0)	0 (0)
DISAGREE	61 (93.9)	56 (100)	117 (96.7)
DON'T KNOW	3 (4.6)	0 (0)	3 (2.5)
TOTAL	65 (100)	56 (100)	121 (100)

TABLE 27

COMPLIANCE STATUS OF MOTHERS AND THEIR BELIEFS THAT HERBS DURING PREGNANCY IS ADEQUATE FOR PREVENTING CHILDHOOD DISEASES

ONCE I TAKE HERBS IN PREGNANCY CHILD IS PROTECTED AGAINST ANY DISEASE	COMPLIERS %	NON-COMPLIERS %	TOTAL %
AGREE	1 (1.5)	2 (3.6)	3 (2.5)
UNCERTAIN	1 (1.5)	0 (0)	1 (0.8)
DISAGREE	62 (95.5)	54 (96.4)	116 (95.9)
DON'T KNOW	1 (1.5)	0 (0)	1 (0.8)
TOTAL	65 (100)	56 (100)	121 (100)

table 28Compliance Status of mothers and distance from their homes to EPI Clinic.

Home Distance	COMPLIERS	NON-COMPLIERS	TOTAL
< 1 Kilmeter	40	28	68
* 1 - 2 "	3	15	18
+ 3 - 4 "	13	4	17
+ 5 - 6 "	4	2	6
+ above 6 "	4	1	5
+ No response	1	6	7
TOTAL	65	56	121

$$X^2 = 20.4, df = 1$$

( $p < 0.05$ )

\*NOTE: Home Distances 1-2 and 3-4 were merged for values used to calculate  $X^2$

+NOTE:  $X^2$  excludes kilometres 5 and above and 'no response' values.



TABLE 29

Compliance Status of mothers and means  
of getting to EPI CLINIC

Means of getting to clinic	COMPLIERS	NON-COMPLIERS	TOTAL
By foot	41	43	84
Public transport	21	13	34
*other means	3	0	3
TOTAL	65	56	121

$\chi^2 = 2, df = 1$   
( $p > 0.05$ )

\* NOTE:  $\chi^2$  excludes other means values.

TABLE 30COMPLIANCE STATUS OF MOTHERS AND THEIR PERCEPTIONS  
OF HEALTH WORKERS ATTITUDE TO THEM AT CLINIC SESSIONS

HEALTH WORKERS LISTENED TO MOTHERS WHEN THEY COMPLAINED ON THEIR CHILDREN'S HEALTH	COMPLIERS %	NON- COMPLIERS %	TOTAL %
YES	65 (100)	55 (98.2)	120(99.2)
NO	0 (0)	1 (1.8)	1(0.8)
TOTAL	65 (100)	56 (100)	121(100)
HEALTH WORKERS EXPLAINED SCHEDULES TO MOTHERS			
YES	65 (100)	56 (100)	120(99.2)
NO	0 (0)	0 (0)	1(0.8)
TOTAL TOTAL	65 (100)	56 (100)	121(100)

TABLE 31

COMPLIANCE STATUS OF MOTHERS AND WHETHER THE HEALTH WORKERS EXPLAINED SIDE-EFFECTS OF IMMUNIZATION AND WHETHER THEY APPEARED RUDE OR IMPATIENT TO MOTHERS AT CLINIC SESSIONS APPEARED

HEALTH WORKERS EXPLAINED CHARGES TO OBSERVE AFTER IMMUNIZATION TO MOTHERS	COMPLIERS %	NON-COMPLIERS %	TOTAL %
YES	65 (100)	55 (98.2)	120(99.2)
NO	0 (0)	1 (1.8)	1(0.8)
TOTAL	65 (100)	56 (100)	121(100)
HEALTH WORKERS WERE RUDE TO MOTHERS			
YES	13 (20)	14 (25.0)	27(22.3)
NO	52 (80)	42 (75.0)	94(77.7)
TOTAL	65 (100)	56 (100)	121(100)
HEALTH WORKERS APPEARED HURRIED			
YES	6 (9.2)	7 (12.5)	13(10.7)
NO	56 (90.8)	49 (87.5)	108(89.3)
TOTAL	65 (100)	56 (46.3)	121(100)

TABLE 32

COMPLIANCE STATUS OF MOTHERS AND WHETHER THE HEALTH WORKERS AT THE CLINICS WERE FRIENDLY TO MOTHERS AND THEIR CHILDREN

MOTHERS PERCEPTION OF THE HEALTH WORKERS	COMPLIERS %	NON-COMPLIERS %	TOTAL %
ALWAYS FRIENDLY	22 (33.8)	38 (67.9)	60 (49.6)
SOMETIMES FRIENDLY	4 (6.2)	1 (1.8)	5 (4.1)
NOT FRIENDLY	0 (0)	6 (10.7)	6 (5.0)
VERY FRIENDLY	33 (58.5)	11 (19.6)	49 (40.5)
NO RESPONSE	1 (1.5)	0 (0)	1 (0.8)
TOTAL	65 (100)	56 (100)	121 (100)

TABLE 33COMPLIANCE STATUS OF MOTHERS AND THEIR LEVELS OF SATISFACTION WITH THE EPI CLINICS SERVICES

LEVELS OF SATISFACTION OF MOTHERS	COMPLIERS %	NON-COMPLIERS %	TOTAL %
NOT SATISFIED	1 (1.5)	0 (0)	1 (0.8)
SATISFIED	18 (27.7)	46 (82.1)	64 (53.0)
FAIRLY SATISFIED	2 (3.1)	1 (1.8)	3 (2.4)
VERY SATISFIED	43 (66.2)	9 (16.1)	52 (43.0)
NO RESPONSE	1 (1.5)	0 (0)	1 (0.8)
TOTAL	65 (100)	56 (100)	121 (100)

TABLE 34COMPLIANCE STATUS OF MOTHERS AND THEIR FUTURE  
DECISIONS ON IMMUNIZATION

I WILL IMMUNIZE MY CHILDREN IN FUTURE	COMPLIERS %	NON-COMPLIERS %	TOTAL %
YES	62 (95.4)	56 (100)	118 (97.5)
I CAN'T DECIDE NOW	3 (4.6)	0 (0)	3 (2.5)
TOTAL	65 (100)	56 (100)	121 (100)

OBSERVATION CHECKLIST RESULT

From what was observed, none of the four clinics selected for the study have a standardized system of giving health talks. The discussion topics were usually unplanned and diffused rather than specific.

Another, crucial finding was that mothers waiting time were excessively and unnecessarily prolonged. Time range spent by mothers was between 7.30 a.m. to 1.30 p.m. (6 hours) with mean hours of approximately two and half hours. The EPI health staff do not normally start clinic sessions until most mothers who came early enough started to frown and reflect 'unhappiness' in their faces. The early attenders would start to arrive as from 7.30 a.m. whereas the earliest time the clinic session would start was 10.00 a.m. - a difference of two and half hours.

It was also observed that most of the health staff serving at EPI clinics were temporarily assigned to the clinics. In addition the nursing staff are assigned daily to the immunization clinics without prior information. The system precipitated by shortage of staff did not give room for continuity of relationship with the mothers.

Also, it usually took the assigned staff between 30 minutes and one hour to orient themselves to the clinic sessions.

Furthermore, the officers in charge of vaccine distribution to the EPI Clinics (who usually belonged to LGA council staff) also contributed to mothers long waiting time as vaccines do not reach the clinic until about 11.00 a.m. On two occasions the observer recorded none supply of vaccines to the clinic. On these two occasions, mothers were sent back home without immunization for their children. No efforts were made to track down the defaulters even though the EPI baby tracking slip (see fig 4) was available. Lack of vehicles for home visits and shortage of staff to go round were observed to be major handicaps preventing the tracing of the defaulters.



Fig.4

Baby tracking slip.

**BABY TRACKING SLIP**

**E. P. I.**

Please bring your child.....

To.....Health Centre/Clinic

On.....At.....

REMEMBER: Your Baby Needs 5 visits To The Clinic in order to complete ALL the doses of Vaccination and become fully protected. Ask The Nurse when In Doubt.

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## FORMATION OF COMPLIANCE PREDICTOR SCALE

In Summary, results showed significant associations between compliance and the following variables viz educational level ( $P < 0.001$ ), occupation ( $P < 0.001$ ), monthly earnings ( $P < 0.001$ ) distance from home to clinic ( $P < 0.05$ ), ages of children at first immunization contacts ( $P < 0.001$ ), Places where mother delivered ( $P < 0.001$ , whether mother received Western ante-natal services ( $P < 0.001$ ), whether mother received immunization in Pregnancy ( $P < 0.05$ ), whether mother gave child other protection like herbs ( $P < 0.001$ ) and mothers religion ( $P < 0.001$ ).

Compliance Predictor Scale

The predictor scale of compliance is displayed in figure 5. The ten variables that showed associations with compliance were simply given arbitrary scores ranging from zero to six according to their association with compliance (whether enhancing compliance or not).

On educational levels, illiterate mother scores zero while another with HND/Degree certificate will score six. Mother who is unemployed is zero, a semi-skilled mother scores one, a petty trader two and salary earner scores the highest which is three. The monthly earning scores range from zero for no earning to five

for any mother earning N400 and above.

Next to be scored is the age of child when receiving the first contact of immunization. A child brought after the age 6 months scores zero for the mother while other marks run from one for less than 6 months to six for a child under one month of age. Any mother who attended institutionalized ante-natal services and received immunization in pregnancy will score one mark each for the two acts whereas another one who did not will be scored zero each.

Place where mother delivered the child brought for EPI is also scored ranging from zero for home to 5 for government hospital. If a mother gave other protection like herbs to child, the mark for that is zero whereas mother who did not will have one full mark. Distance from home to EPI clinic less than one kilometer scores one and if above one kilometer it is zero. And lastly, a christian mother will earn one mark and another who is a muslim will score zero in the scale.

Based on the above arbitrary scores, compliance predictor scale thus consists of two zones viz-<sup>non</sup>compliance zone for any mother whose total scores after interaction falls below 15 marks from the 30 total obtainable and compliance zone for mother whose total marks is above 15.

Simply put, any mother who is participating in EPI in rural areas and falls within non-compliance zone will not <sup>be</sup> likely to comply with schedule whereas another who falls within a compliance zone is likely to comply.

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Fig.5

Compliance Predictor ScaleEducational levels of mother

Illiterate	0
Primary	1
Secondary	2
Technical	3
Teacher Training	4
NCE/OND/Equivalent	5
HND/Degree	6

Mother attended Western ante-natal

No	0
Yes	1

Mother received immunization in Pregnancy

No	0
Yes	1

Occupation of Mother

Unemployed	0
Semi-skilled	1
Petty trading	2
Civil Servant	3

Place where mother delivered

Home	0
Church	1
Private Hosp.	2
Mat. Centre	3
Health centre/ clinic	4
Govt. Hosp.	5

Monthly Earning of Mother

No earning	0
< N100	1
N100-N199	2
N200-N299	3
N300-N399	4
N400 and above	5

Mother gave child other Protection (Herb)

Yes	0
No	1

Mother's home to EPI Clinic

Long (above 1 km )	0
Short (below 1 km )	1

Child's age at 1st Immunization Contact

Above 6 months	0
- 6 months	1
- 5 months	2
- 4 months	3
- 3 months	4
- 2 months	5
0 - 1 month	6

Mothers religion

Islam	0
Christianity	1

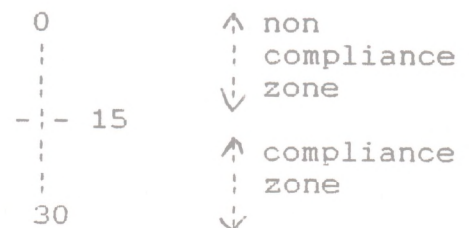


TABLE 35

Distribution of 10 Mothers used for pilot testing of the effectiveness of compliance predictor scale according to scores based on the scale

Mothers	Educational level (6)	Occupation (3)	Monthly earning (5)	Child's age at 1st contact (6)	Attended Western antenatal (1)	Received immunization in preg. (1)	Place delivered (5)	Gave other protection (1)	Distance from home to clinic (1)	Religion (1)	Total score out of '30'	Prediction of would-be compliers
1	1	2	3	4	1	0	0	1	1	1	14	No
2	2	3	2	4	1	1	4	1	1	0	19	Yes
3	4	3	3	2	1	1	2	1	0	1	18	Yes
4	3	1	1	3	1	1	2	1	0	1	14	No
5	1	0	0	6	1	0	1	0	0	1	10	No
6	6	3	3	6	1	1	4	1	0	1	26	Yes
7	5	3	4	6	1	1	3	1	1	1	26	Yes
8	3	2	1	4	0	0	0	0	1	1	12	No
9	5	3	5	6	1	1	3	1	1	0	26	Yes
10	5	3	5	6	1	0	2	0	0	0	22	Yes

TABLE 36

Would-be compliers and non-compliers after  
3DPT/OPV appointment schedules

Reported as scheduled	would-be compliers		would-be Non-compliers		Total	
	No	%	No	%	No	%
Yes	4	(66.7)	1	(25)	5	(50)
NO	2	(33.3)	3	(75)	5	(50)
Total	6	(100)	4	(100)	10	(100)

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Result of Application of Compliance Scale:

Tables 35 and 36 show the result of the pilot test of compliance prediction scale. In table 35, the distribution of 10 mothers used for the test of effectiveness of compliance scale is displayed according to their total scores. Four mothers had a total score of below 15 each and they were marked would-be non-compliers. The remaining six mothers on the other hand had total scores above 15 each forming would be compliers.

After three months, four out of the six mothers categorized as would be compliers actually complied, they reported for the 3DPT/OPV immunizations for their children (see table 36). The remaining two, failed to turn up as scheduled.

Also among the four mothers in the category of would-be non-compliers, one reported at the three appointment days. The other three missed two appointments each.

The above result showed that the scale formulated can predict mothers compliance in semi-urban or rural setting. This is because it has been able to predict atleast 4 out of 6 would-be compliers and three out of 4 would-be non-compliers.



## CHAPTER FIVE

### DISCUSSIONS, CONCLUSION AND RECOMMENDATIONS

In this chapter, the implications of this study are discussed. This discussion follows the same arrangement as the results and as such grouped into five broad areas.

#### DISCUSSION:

##### Demographic Characteristic

##### (i). Socio-economic Status:

Income and education have been shown by various studies (Glasser, ., (1958), Cassel, (1963) and Winkelstein, W. (1961) and Grahams, (1959), to be related to better participation in free-polio vaccine programme. A positive association of education, income and occupational status have also been reported with preventive dental visits (Rosenfield, and Donebedian, 1958, Yan Kaner, 1961 and Kegeles, 1963). In the present study, strong associations were found between compliance and educational levels of mothers, their occupation as well as monthly earnings.

Higher compliance in mothers of high socio-economic status (measured by their monthly income, educational levels and occupation) suggests that mothers in this category apart from

having high education, will probably be salary earners who have better access to journals, pamphlets, write-ups and radio/television where information about EPI could be correctly gained than mothers in low socio-economic group who are likely to be illiterates or with very low educational levels, without job and little or no income. Such category of mothers may possibly not be able to read or afford radio/television sets and will depend on incomplete information either from neighbour or other not well-informed individuals.

(ii). Mothers age.

Even though there is no significant association statistically between the ages of mothers and their compliance status, mothers in age groups 20-24 years and 40 years and above need to be watched because they formed the age groups where there were more non-compliers.

(iii). Marital Status:

Also, marital status is among the demographic characteristics without strong association with compliance. However, divorcee mothers who come to clinic may not likely comply because none of the two (1.7%) of such mothers who came to clinic used for the study was a complier. If this finding is interpreted as reflecting a low degree of family cohesiveness,

—therefore it agreed with a study conducted elsewhere by White et al., (1976) where family disorganisation was found to be an important barrier to providing comprehensive medical care to poor urban families. However, Winger, et al., (1968) studying the relationship of family organisation to utilization of pediatric emergency services, found no relationship between utilization of health services and family organization. They speculated that in any such families, there may be hidden sources of stability to enable parents to manage adequately their children's health problems.

(iv). Religion:

The higher compliance of christian mothers with EPI schedules than their muslim counterparts relate to the higher number of christian respondents in the study. In addition, it is because majority of muslim mothers in the area are traders who move from one place to the other in search of their trading articles thereby causing 20 (35.7%) of them not to comply as against 6 (9.2%) who complied.

(v). Compliance status and parity:

It is always expected that mothers with many children will find it difficult to comply because of many responsibilities attached to child-bearing with consequent neglect of preventive

medical services. However, this hypothesis failed to hold in this study probably because high parity in developing areas of the world such as Nigeria does not necessarily mean that all the children are alive. In Nigeria for instance, the infant mortality rate is extremely high (110/1000) compared to developed countries such as United States of America or Sweden with infants mortality rates of 11/1000 and 7/1000 respectively (World Dev. Report, 1986). It is not uncommon to find a woman who has given births ten times, but has only two of them alive. As could be seen from the result in table 5 the higher the number of alive children per total births the lower the mother's tendency to comply with the schedules and vice-versa.

(b) Characteristics related to Immunized Children:

(i) Age of child at 1st immunization contacts: The strong association between compliance status of mothers and ages of children at first immunization contacts agree with expectation. Statistically significant association ( $P < 0.05$ ) showed probably that mothers who reported early enough according to schedules might have come from among educated categories who have correct information about EPI during pregnancy and at deliveries.

(ii). Places of child delivery/mothers ante-natal services:

Also, in the study, there was statistical association

between compliance and places where the mothers delivered the immunized children ( $P < 0.001$ ). Mothers who delivered at government hospitals and health centres complied more than those who delivered at home or private clinics. One is not surprised non-compliance of those mothers who delivered at home, this is because un-institutionalized deliveries showed that mothers themselves have not been well informed or motivated to use available health services not to talk of using preventive services for the children.

The same reason would hold for most mothers 47 (38.8%) in the non-compliers group who did not receive tetanus toxoid vaccination during pregnancy. These mothers might have picked wrong information about EPI from other sources because they did not have institutionalized ante-natal services or deliveries where such information could be obtained.

(c). Medical History Characteristics

(i). Giving other Protection to Children:

Majority of those mothers who gave either herbs or any other protection to their children apart from EPI did not comply with schedules. They were 41 (73.2%) out of 56 non-compliers. This group of mothers might probably be satisfied and sure that at least they have protected their children. The association of

giving other protection and compliance is statistically significant ( $P < 0.001$ ). Mothers in this group need to be closely monitored when they first appear at EPI clinics and probably educated that even though herbs may be good, EPI deals with specific diseases which can further help the children who already had herbs.

Mothers Compliance and EPI Schedules:

The fact that compliance decreased as schedules progressed in this study substantiates the earlier findings on default rates in EPI carried out elsewhere. For instance, similar result was obtained in an intensive immunization programme in a region in Ghana whereby 63% coverage was achieved in the first dose of OPV but only 22% for the 2nd dose and 11% for the third dose WHO, 1979).

Reasons for non-compliance:

Twenty-five percent of mothers (14) who defaulted said they 'forgot dates' of appointments while 12 (21.4%) claimed that their children were sick (see table 17). One may not be too surprised to find such reasons as these. They are related to lack of appropriate communication as was earlier documented by Hertz and Stamps, (1977). It may also reflect inadequate utilization of appropriate local media for the purpose of

informing mothers on future immunization schedule dates as well as other health education/information relevant to immunization. For example next appointment dates are usually written at the back of immunization cards (figure 6) which are given to both literate and illiterate mothers to take home.

(d). Cognitive factors and Compliance

Knowledge of EPI Schedules:

The finding of this study showed that 41 (73.2%) of the 56 non-compliers had good knowledge of EPI schedules. Surprisingly, this did not help them to comply. Health knowledge is expected to positively influence the attitudes and beliefs of the recipient towards taking appropriate measure regarding his health. This also show that acquisition of knowledge alone may not necessarily lead to practice. Though these mothers demonstrated that they have acquired some knowledge, yet they have not been keeping their appointment days. It is probably that certain barriers were yet to be removed from these mothers through a more efficient health education approach as suggested by Soladoye, (1980).

### Mothers beliefs in Efficacy of EPI

It was anticipated that mothers who believed in the efficacy of vaccines in EPI against target disease would comply with appointment schedule. The finding is however in line with the Null hypothesis set at the beginning of this study that compliance to EPI schedule is not due to lack of belief in the efficacy of EPI vaccination on those 6 killer diseases.

### Sources of information to mothers about EPI

The most common source of information about EPI to mothers in this study was through health workers at various EPI clinics (see table 20). Out of 65 (53.7%) whose source of information was through this medium, there were 40 (61.5%) compliers. This study agrees with the earlier study by a group of medical students ('B' Group, 1986) at Igbo-ora, a rural town in Nigeria where it was discovered that 91.3% of their study population of mothers heard about EPI through the clinics and that the mothers in this category had higher proportion of children (47.0%) with full immunization schedule.



fig.6

EPI appointment Card showing schedules  
where next appointment is given

1. -----
2. -----
3. -----
4. -----

IMMUNIZATION SCHEDULE

<u>Vaccine</u>	<u>Age of Child</u>
B.C.G.....	At Birth
Oral polio 1st Dose.....	Two Months
D.P.T. 1st Dose.....	Two Months
Oral polio 2nd Dose.....	Three Months
D.P.T. 2nd Dose.....	Three Months
Oral polio 3rd Dose.....	Four Months
D.P.T. 3rd Dose.....	Four Months
Measls.....	Nine Months

## (e). Attitudinal Factors

(i). Fear of Side-Effect of Immunization:

One may not be too surprised to find 15 (26.9%) non-compliers out of 16 mothers who claimed that their children became seriously sick after the first immunization schedule. It is probable that those mothers feared a repeat situation where their healthy babies receiving what is regarded as preventive medication suddenly become sick after receiving injections. Lola Adekunke (1975) also discovered the same even among elite parents in Bodija area (a peripheral area of Ibadan, Nigeria) in her study of impediments to immunization coverage. Generally, side effects of drugs have been documented to be associated with non-compliance (Soladoye, 1980).

(f). Characteristics due to Clinic arrangement and Services(i). Distance of Mothers from home to EPI Clinic

According to expectation, distance showed strong association with compliance ( $P < 0.05$ ). Mothers who lived at a distance of less than one kilometer to the clinics were found mostly among the compliers 40 (61.52) compliers as against 28 (50%) non-compliers (see table 28).

To substantiate the view that availability of health services may not necessarily lead to use of such services, those

who went to EPI by foot complied more than those who went by any other means. In table 29, out of 65 compliers, 41 (63.1%) went by Foot. This means, that health facility should not only be available, but it should also be accessible - put within reach of people it is meant for (Ademuwagun, 1986).

Mothers perception of the Clinic Staff:

Studies have shown that personality and manner of physician as well as the quality of the doctor patient relation or health worker - client relation do influence compliance (Francis, et al, 1969). In the present study, it was found that friendliness or warmth on the part of the health workers at EPI Clinics surveyed (as perceived by mothers) did not itself result in increased compliance. However, where the mothers stated that the health workers were not friendly, there was a noticeable reduction in the compliance behaviour (see table 32). This finding is supporting by Francis et al (1969).

Compliance and Client Satisfaction

A crucial finding is the extent to which compliance is influenced by the mothers satisfaction. Although high satisfaction does not necessarily imply total compliance with EPI appointment schedule, there was certainly an impressive association between the two. It has been suggested that a patient/client who

cooperated with health care providers in the course of relationship do have the feeling of satisfaction with himself that may be reflected on to the health provider and medical consultation (Francis et al, 1969). Even though it is not yet proved, the much more likely explanation seems to be that client/patient who is satisfied with the health care provider behaviour and services would be more apt to carry out the medical advice than one who was unimpressed and thought that his needs are not met by such visit.

#### CONCLUSIONS

From the results of the study, many factors are found associating with non-compliance of mothers with appointment schedules in EPI. Among these factors are low-socio-economic status measured by income, educational level and occupation. Others include distance between homes to EPI centres, uninstitutionalized ante-natal services, none taking of immunization by mothers in pregnancy, and delivering children at homes or church. Mothers who brought children for first immunization after ages of six months may also not comply with schedule so also for those who gave their children other protection. Lastly muslims are likely to default than christians

will do. All these factors should be given adequate attention to minimise defaults in EPI.

The study also recalled other factors that affected compliance not due to mothers faults. The factors included inadequate supply of vaccines on clinic days, excessive waste of mother time at clinic session and deficiencies in health education methods in EPI. All these factors can be removed with appropriate planning and job consciousness by the health care providers responsible for EPI.

In order to improve compliance in EPI schedules especially among the rural dwellers, a predictor scale has been produced with the study for use in EPI centres to enable the staff responsible for immunization identify those would-be defaulters and give them extra attention right from the first visits to make them comply with subsequent appointments. The scale can also serve as a guide for future studies for production of predictor scale for mothers in the cities/urban centres participating in EPI.

#### **RECOMMENDATIONS**

Two broad areas of recommendations are presented to round up this study. One focuses attention on improvement in appointment schedules of immunization in rural areas like Obokun LGA where

the study took place. The other is in relation to health education components of EPI in general.

1. Integration of EPI to other health services may contribute to vaccination coverage when children are brought to health centres for treatment, for example, they can be vaccinated at the same time. Continuing immunization services could increase coverage and reduce drop out rates.
2. How to communicate the concept of immunization of healthy children to prevent an illness that might or might not occur later is one of the most difficult problems faced in promoting immunization. Therefore, health workers concerned with EPI in rural settings should adopt communication whereby local experiences will be used for the mothers. For instance health workers can compare immunization to using an umbrella to protect against rain. If a person out doors sees that rain is likely to fall and wants to stay dry, before the rain begins, he picks a banana leaf which he will use as an umbrella. If such person could wait until the rain starts, he may be wet by it. In the same manner, if a person waits until children became ill before having them vaccinated, they will not have the protection. This type of system using local examples increased four-fold the

number of children brought for immunization in Kenya as reported by Were, (1985).

3. Formalised Health Education needed in EPI should be emphasized and possibly the health staff in charge of the immunization be trained on approach to health education. This will enable them to explain to mothers the basic information needed to motivate the parents so that they will be told:

- (i) that it is important to have children vaccinated
- (ii) that children need specific and repeated vaccinations on a definite schedule, and
- (iii) that side effects of vaccines are normal and rarely serious.

4. Present design of vaccination card is effective for literate mothers only. Illiterate mothers are unable to tell from the cards which vaccinations their children had received, how many doses had been given, or how many were still needed. Thus the cards are not reminding parents to turn up when the next schedule is ripe. Studies have shown that mothers recognized vaccines by the way they were administered i.e. either orally, or injected in the arm or buttock. A small booklet of six pages each depicts a

particular type of vaccine administered in particular type of vaccine being administered in picture form is recommended. This has been effectively employed in Honduras (William, et al., 1984).

5. Future studies may wish to explore how compliance in cities and urban centres mothers would be predicted to for a comparison of this work.
6. Where this study took place and like in many other areas in the rural settings, people patronize private health institutions than they do to government established ones. It will go a long way in improving coverage as well as reducing drop outs if registered private clinics could have regular supply of vaccines so that mothers who have more confidence in such institutions will have their children vaccinated in them.



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## APPENDIX 1

## QUESTIONNAIRE

INTERVIEW SCHEDULE FOR MOTHERS WHO ATTENDED EPI  
CENTRES FOR THEIR CHILDREN IMMUNIZATION

PLACE .....

LANGUAGE ..... SERIAL NO .....

## SECTION A

## INFORMATION ABOUT THE MOTHER

(Please tick ( ) or write the number of your choice as appropriate in the opposite boxes)

- |  |   |       |       |       |
|--|---|-------|-------|-------|
| 1. Age last birth day in years or year of birth (e.g. 1940)                              | <table border="1" style="width: 100px; height: 100px; border-collapse: collapse;"> <tr><td style="border: none;">-----</td></tr> <tr><td style="border: none;">-----</td></tr> <tr><td style="border: none;">-----</td></tr> </table> | ----- | ----- | ----- |
| -----  |   |       |       |       |
| -----  |   |       |       |       |
| -----  |   |       |       |       |
| 2. Marital Status  | <table border="1" style="width: 100px; height: 100px; border-collapse: collapse;"> <tr><td style="border: none;">-----</td></tr> <tr><td style="border: none;">-----</td></tr> <tr><td style="border: none;">-----</td></tr> </table> | ----- | ----- | ----- |
| -----  |   |       |       |       |
| -----  |   |       |       |       |
| -----  |   |       |       |       |
| 1. Single<br>2. Married<br>3. Divorced<br>4. Separated<br>5. Widowed<br>6. Never married |   |       |       |       |
| 3. If married, What type of family?  | <table border="1" style="width: 100px; height: 100px; border-collapse: collapse;"> <tr><td style="border: none;">-----</td></tr> <tr><td style="border: none;">-----</td></tr> </table>   | ----- | ----- |       |
| -----  |   |       |       |       |
| -----  |   |       |       |       |
| 1. Monogamous<br>2. Polygamous   |   |       |       |       |

4. If Polygamous what is your rank among other wives of your husband?

1. 1st wife
2. 2nd wife
3. 3rd wife
4. 4th and above

1. No of children .....
2. No alive .....
3. No dead .....

6. What type of job do you do?

1. Unemployed
2. Petty trading
3. Salaried work
4. Student
5. Other (specify) .....

7. What is your educational level?

1. Illiterate
2. Primary School
3. Attended Arabic School
4. Secondary School Education
5. Teacher Training Education
6. NCE Holder
7. University Degree
8. Other (specify) .....

8. About how much do you earn or say do you get from your trade in a month? .....

9. How many male children do you have? .....

10. How many female children do you have? .....

11. What is the actual distance of your home to the EPI clinic  
(where you immunized your child)?

.....

12. How do you get to the EPI Clinic?

1. By foot
2. By public transport
3. By private vehicle
4. Other (specify)

13. How much do you spend in bringing your child for  
immunization on each day?

.....

14. Who provides the said money for transport?

1. Self
2. Husband
3. Relatives
4. Other (specify)

15. What is your religion?

1. Islam
2. Christianity
3. Traditional religion
4. Other (specify)

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SECTION BINFORMATION ABOUT THE CHILD YOU IMMUNIZED LAST AT THE EPI CLINIC

16. What is the age of the child when you first took him/her to EPI clinic for immunization?

.....

17. Sex of the child  
 1. Male  
 2. Female

18. Rank of the child among your other children.  
 1. 1st born  
 2. 2nd born  
 3. 3rd born  
 4. 4th born  
 5. 5th born and above

19. Where did you deliver the child?  
 1. At home  
 2. Government Health Centre  
 3. Maternity Centre  
 4. Government Hospital  
 5. Private Hospital/Clinic  
 6. Spiritual Church  
 7. Native Healer's House  
 8. Other (specify) .....

20. Before the birth of the child, did you receive antenatal care from hospital/health centre /clinic?

1. Yes

2. No

21. Where do you normally deliver your baby?

1. At home

2. Government health centre/hospital

3. Maternity Centre

4. Private Hospital

5. Spiritual Church

6. Native healer's house

7. Other (specify) .....

22. Have you done any other thing to protect the child against illness apart from EPI programme?

1. Yes

2. No

3. I don't know

23. If yes to question '22' above, specify what you have done

.....

24. Did you receive any form of immunization during the child's pregnancy?

1. Yes

2. No

3. I don't know

25. Is he/she your first child to be immunized through EPI programme?

1. Yes

2. No

3. I don't know

26. Which of the following EPI schedule has the child received?

1. BCG	1. Yes	-----	2. No	-----	9. I don't know	-----
		-----		-----		-----
2. 1st DPT/OPV	1. Yes	-----	2. No	-----	9. I don't know	-----
		-----		-----		-----
3. 2nd DPT/OPV	1. Yes	-----	2. No	-----	9. I don't know	-----
		-----		-----		-----
4. 3rd DPT/OPV	1. Yes	-----	2. No	-----	9. I don't know	-----
		-----		-----		-----
5. Measles	1. Yes	-----	2. No	-----	9. I don't know	-----
		-----		-----		-----

27. State the reason(s) for missing the immunization schedule which the child did not receive in 'Q 26' above

28. Which of the following diseases is very common with the children in your area?

1. Diphtheria	1. Yes	-----	2. No	-----	9. I don't know	-----
2. Pertusis	1. Yes	-----	2. No	-----	9. I don't know	-----
3. Tetanus	1. Yes	-----	2. No	-----	9. I don't know	-----
4. Poliomyelitis	1. Yes	-----	2. No	-----	9. I don't know	-----
5. Measles	1. Yes	-----	2. No	-----	9. I don't know	-----
6. Tuberculosis	1. Yes	-----	2. No	-----	9. I don't know	-----

29. Do you think the child can be immunized against the following diseases?                      1. Yes                      2. No                      9.1 don't know

1. Diphtheria			
2. Pertussi			
3. Tetanus			
4. Poliomyelitis			
5. Measles			
6. Tuberculosis			

30. How many times were you turned back without having your child immunized at the EPI clinic you attended?  
 .....

31. Did your child become seriously sick after the first immunization schedule?

1. Yes                          2. No                          9. I don't know   

**SECTION C**  
**KNOWLEDGE OF MOTHER ABOUT EPI**

32. By what means did you get to know about EPI?

1. Radio/TV
2. Newspapers/Magazine
3. Health Worker
4. Husband
5. Relative
6. Neighbour
7. Other (specify) .....

33. How many schedule of immunization is your child supposed to take before completing his/her immunization?  
 .....

34. Were you told about the ages for different EPI schedule?

1. Yes  2. No  9. I don't know

35. In your opinion, do you consider modern immunization of children enough preventive measure against childhood diseases covered by EPI?

1. Yes  2. No  9. I don't know

36. If 'no' to question 35 above, what else can one do to prevent tetanus in children.

.....  
.....

37. What else can one do to prevent childhood tuberculosis?

.....  
.....

38. What else can one do to prevent Poliomyelitis in children?

.....  
.....

39. What else can one do to prevent diphtheria in children?

.....  
.....

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40. What else can one do to prevent measles in children?

.....  
.....

41. What else can one do to prevent whooping cough in children?

.....  
.....

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SECTION DBELIEF/IMPRESSION OF MOTHERS ABOUT EPI

(Please check the opposite column for each question or statement according to your degree of agreement or disagreement and tick (</>) as appropriate.

	Argee	Uncer- tain	Disag- ree	Dont know
42. Modern Immunization makes the chid to become more prone to sickness				
43. Once I take herbs (native medicine) during pregnancy, the child is immunized against all childhood diseases				
44. Immunization of children can only be effectively carried out in the church				
45. Only native medicine can prevent measles				
46. Paralysis in children is caused by witch-crafts handwork, therefore modern immunization cannot prevent it.				
47. Diphtheria is not a serious childhood disease to warrant immunization.				
48. Tuberculosis in childhood is caused by native medicine so its prevention can only be done by nation medicine man.				

SECTION E

Opinion of mothers about the Health Staff and working arrangement in EPI clinics.

Please tick (</) as appropriate).

49. Would you say that the health workers at the EPI clinic where you Immunized your child listen to mothers when they have something to say about their children condition?

1. Yes  2. No  9.I don't know

50. Did the health workers in the clinic explain to you how often you need to bring your child for immunization?

1. Yes  2. No  9.I don't know

51. Did the health workers tell you what changes in your child's condition you should expect after each immunization?

1. Yes  2. No  9.I don't know

52. If answers to questions '49' and '50' above are both 'yes' did the health workers talk to you

1. Individually   
2. In group

53. Do the health workers appeared hurried when they attend to you?

1. Yes  2. No  9.I don't know

54. Would you say the health worker in the clinic were rude when talking to you?

1. Yes  2. No  9.1 don't know

55. Would you say that the health workers in the clinic were

1. Always friendly  
2. Sometimes friendly  
3. Not friendly  
4. Very friendly

56. On the whole, how satisfied are you with the services given to you/your child at the EPI clinic you attended

1. Not satisfied  
2. Satisfied  
3. Fairly satisfied  
4. Very satisfied

57. Have you ever failed to attend the clinic on any immunization appointment day?

1. Yes  2. No  3.1 can't remember

58. Please state reason(s) why you did not take your child to complete his/her immunization schedule

.....

.....

59. Will you like to immunize any child born by you in future in modern way?

1. Yes  2. No  3. I cannot  
decide now

60. Would you have preferred immunizing your child at another  
EPI centre to the one you attended?

1. Yes  2. No  3. I can't say

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APPENDIX 2Summary of Immunization Exercise in Obokun LGA, March-September, 1987

	BCG	DPT I	DPT II	DPT III	POLIO I	POLIO II	POLIO III	MEALSES	TT I	TT 2
March	640	657	144	130	682	179	128	559	211	150
April	883	727	462	315	679	586	207	730	521	287
May	386	377	315	255	381	231	417	402	194	198
June	601	644	543	413	695	574	430	408	294	163
July	380	406	318	274	450	351	271	407	159	352
August	352	305	276	227	300	285	205	229	199	137
Sept.	424	347	280	329	369	338	337	341	282	191
Total	3666	3463	2338	1945	3556	2566	1995	3576	1860	1478

Source: EPI coverage record Obokun LGA.

APPENDIX 3CHECKLIST FOR OBSERVATION AT EPI CLINICS

1. Name of the Centre..... 2. Date.....
3. Name of mother .....
4. Time of arrival to the clinic .....
5. Is today your appointment day? .....
6. Time attended to at the clinic .....
7. Interaction between mothers and health workers.....  
(1) Poor (2) Fair (3) Good
8. Number of mother reported for their children vaccination  
today .....
9. Number of mothers who turned up as scheduled .....
10. Number of mothers who defaulted today .....
11. All vaccines are available in the clinic today  
Yes/No .....
12. Enough health personnel are present at the clinic today