Title
Maternal tetanus toxoid immunization in rural South India

Author
Sheehan, Arlene M.

Publication Date
1985

Peer reviewed|Thesis/dissertation

Maternal Tetanus Toxoid Immunization in Rural South India

by

Arlene Sheehan

THESIS

Submitted in partial satisfaction of the requirements for the degree of

MASTER OF SCIENCE

in

NURSING

in the

GRADUATE DIVISION

of the

UNIVERSITY OF CALIFORNIA

San Francisco

Date University Librarian

SEP 8 1985

Degree Conferred: . . . . . .

Maternal Tetanus Toxoid Immunization in Rural South India

Arlene Sheehan

UCSF School of Nursing

Department of Family Health Care Nursing

Acknowledgements

I would like to express my sincere appreciation to the following individuals for the support and guidance they offered to me while I did my research in India and wrote this thesis.

A special thanks to Dr. Ramona Mercer, my graduate advisor and thesis chairperson. She gave me the encouragement I needed to convince me to attempt a research project in India, and worked with me through the mails during the field work phases of my project. It was with her help and expertise that I was able to complete the writing of this paper.

My appreciation to Dr. Afaf Meleis, a member of my thesis committee, and my first contact in the School of Nursing. Also to Dr. Ida Martinson who generously found time in her busy schedule to join my thesis committee and offer her suggestions and support.

I would like to extend my appreciation to my teachers and colleagues at the Christian Medical College in Vellore, India. My advisor in India, Dr. (Mrs.) Kasturi Sundar Rao was of great help in the planning and implementation of my work. Dr. P.S.S. Sundar Rao of the department of Biostatistics generously shared his considerable knowledge in the fields of maternal child health and medical research. Dr. T. Jacob John and Dr. Mark Steinhoff of the department of Virology provided me with invaluable ideas and resources.

Finally, I would like to thank the Director of Student Affairs, Joan Healy, and her staff for overcoming all administrative hurdles, and making my studies in India possible. A special thanks to Susan Csikesz who handled all of the paperwork for me while I was overseas.

Table of Contents

Abstract

A sample of 175 women in rural South India were interviewed to determine rates and effectiveness of tetanus immunization during their most recent pregnancies, and to investigate their knowledge, attitudes and beliefs about antenatal care, neonatal tetanus, and maternal tetanus immunization. Nearly half (47.4%) of the women had received at least one dose of tetanus toxoid during the pregnancy, but less than one third (31.4%) were fully and effectively immunized. The main reason for ineffective immunization was that only one dose of tetanus toxoid was given when two were needed. Over-immunization occurred in nearly half (49.4%) of the immunized group. Two thirds (67%) of the literate women and one third (33%) of the illiterate women were immunized ($X^2.01(1)=6.64$ $X^2=13.66$). There were no other significant correlations between immunization status and socio-demographic characteristics. Of the women (45.1%) who had received antenatal care, 82.3% were immunized and 17.7% were not. Most of the women (71.4%) felt immunization during pregnancy was safe, 28% were unsure, and only 0.6% thought it was not safe. Over three fourths of the study group (76%) did not know what tetanus in the newborn is. Of those with knowledge of the disease, the majority (69%) did not know its cause, or how to prevent it.

Chapter One

The Study Problem

Introduction to the Problem

Tetanus neonatorum, a disease rarely encountered in the U.S. or other industrialized nations, remains an important cause of neonatal death in India and in the rest of the developing world. The significance of tetanus as a cause of death in the neonatal period is demonstrated by the results of a study conducted by the World Health Organization in the South Indian state of Tamil Nadu. In the population studied, neonatal tetanus accounted for 17.7% of the newborn deaths (Directorate of Public Health and Preventive Medicine, 1981). A reduction in the number of deaths caused by neonatal tetanus would greatly reduce the very high infant mortality rate in India (129/1000 live births in 1978) (Sankaran,1980).

Tetanus in newborns occurs when the tetanus organism, Clostridium tetani, enters the newborn bloodstream via the freshly cut umbilical cord. This occurs most commonly when the cord is cut with an instrument contaminated with the tetanus bacillus, or when the bacillus is present in a dressing applied to the cord stump. It can be prevented by using a clean, preferably sterile instrument to cut the cord, and by keeping the cord stump clean while it is healing.

Neonatal tetanus is practically unknown in the Western world because the majority of deliveries are attended by physicians or highly trained midwives who practice sterile technique when cutting the umbilicus. In addition, deliveries are conducted in environments where the tetanus bacillus is rarely present.

In contrast, most births in India take place in the home, and are conducted by untrained attendants. The tetanus organism, although found in the soil of most countries in the world, is more abundant in countries like India where the climate is tropical, and the soil moist and fertile. Most of the population of rural

India live in houses constructed of mud or earthen brick. The tetanus bacillus has been cultured from the walls and floors of mud houses in India, and from the implements commonly used to cut the umbilical cord (Warley & Jelliffe, 1970).

A second reason that tetanus is so prevalent in India is related to the fact that the tetanus organism lives part of its life cycle in the intestinal tract and feces of domestic animals (Senecal, 1970). Cows, goats, water buffalo, and bullocks abound in both urban and rural areas of India. Due to a shortage of wood in India, dried cow dung is an important cooking fuel and is found in abundance around cooking areas. Cow dung mixed with water and formed into a paste is spread on walls and floors to create a smooth hard surface. Finally, cow dung is believed to have antiseptic qualities and is sometimes used as a dressing for the newly cut umbilical cord.

Tetanus has been recognized worldwide as a major cause of neonatal death. The World Health Organization has set target goals for the reduction of neonatal tetanus. They recommend that an effort be made to reduce neonatal tetanus mortality rates to 1/1000 live births by 1990, and zero deaths by the year 2000 (EPI Global Advisory Group, 1982). The Indian Ministry of Health and Family Welfare has taken this recommendation and set target goals of 0.5/1000 live births in the urban areas, and 1.0/1000 in the rural areas by 1985 (Sokhey, Bhargava, & Basu, 1983).

There are two successful means of reducing the numbers of neonatal tetanus deaths in a given population. The first is to assure that all deliveries are conducted in a clean environment by a trained attendant, and that the umbilicus is severed with a sterile instrument. This method of controlling neonatal tetanus has been used with great success in the developed world. Less developed countries have also attempted to use this method but with limited success. The problem is one of

resources. In a country like India there are simply not enough health care facilities or providers to make this method feasible.

The second means of reducing neonatal tetanus mortality can be used successfully even in the absence of a clean environment and a trained birth attendant. It is the immunization of pregnant women with tetanus toxoid in order to confer upon the newborn passive immunity against the tetanus bacillus. It has been shown that two doses of tetanus toxoid administered in the latter half of pregnancy at one month intervals will provide the infant with adequate antibodies to protect against tetanus for at least several months (Cruikshank, 1976). The Indian Ministry of Health has chosen this method to reduce neonatal tetanus mortality. They have set a goal of 85% vaccine coverage of pregnant women with tetanus toxoid by 1985 (Sokhey et al, 1983). Sankaran (1980) estimated that only 40% of expectant women in India are immunized with tetanus toxoid during pregnancy.

Statement of the Problem

The Indian state of Tamil Nadu is located in the southeast tip of the Indian subcontinent. The neonatal tetanus mortality rate in Tamil Nadu is 6.1/1000 live births (Directorate of Public Health and Preventive Medicine, 1981). Vance (1983) estimates that in one area of Tamil Nadu that he studied, only 19.9% of women in the study were immunized with two doses of tetanus toxoid during pregnancy.

This study was designed to determine the success of the maternal tetanus immunization program in one area of rural Tamil Nadu, and to make recommendations to increase effectiveness of future programs. With such a goal in mind, the approach to data collection was three-fold.

Firstly, to quantify the numbers of expectant women in a rural area of Tamil Nadu that were effectively immunized with tetanus toxoid. Secondly, to investigate the reasons that an immunized woman may have been ineffectively immunized.

Thirdly, to identify reasons that women do not receive tetanus immunization during pregnancy.

Research Questions

At the time of the birth of their latest child, what percentage of women were effectively immunized with tetanus toxoid?

What percentage are ineffectively immunized?

In the cases of ineffective immunization, what were the reasons that the immunization was ineffective? (ie. not enough doses of vaccine, doses too close together, immunization given too close to term).

Is there any resistance to the idea of immunization during pregnancy?

Is there any relationship between tetanus toxoid immunization status and

-the socio-demographic characteristics of the population under study?

-the utilization of antenatal services?

-the knowledge, attitudes and beliefs about tetanus and tetanus immunization?

Definition of Terms

Effective immunization. Immunization status of the woman during the birth of her latest child was such that passive immunity against tetanus was conferred upon the newborn.

Ineffective immunization. Immunization status of the woman during the birth of her latest child was not sufficient to confer passive immunity against tetanus upon the newborn.

Chapter Two

Review of Relevant Literature

Literature Review

The incidence of neonatal tetanus worldwide is difficult to determine because in developing countries the cause of newborn death is often unreported. Warley and Jelliffe (1970) estimate that tetanus neonatorum accounts for up to 25% of neonatal deaths worldwide. Black, Huber and Curlin (1980) more conservatively estimate that 10% of the deaths among live born infants are due to tetanus.

An effort is underway in India to collect data on the incidence of diseases preventable by immunization, ie., diptheria, pertussis, tetanus, polio, whooping cough, and typhus. One such study, conducted by the Expanded Programme of Immunization, (EPI), has compiled data on the incidence of tetanus in Tamil Nadu. The EPI, an agency of the World Health Organization, was started in 1978 with a goal of reducing morbidity and mortality from the above diseases. (Sokhey, Bhargava, Indra, Basu, 1983).

According to the findings of the EPI study, the neonatal tetanus mortality rate in Tamil Nadu is 6.1/1000 live births. The actual number of cases is probably 10-15 times higher due to under-reporting. (Directorate of Public Health and Preventive Medicine, 1981). The EPI study also looked at antenatal tetanus immunization rates in both rural and urban areas. In rural areas, 47.3% of the women interviewed had received some immunization with tetanus toxoid, while 52.7% had received no immunization. In the urban areas, 76.9 % of the women had received some immunization, while 23.1% had received none. The sample for this study consisted of women who reported a neonatal death (N=62) in infants born in the prior 4 month period. The EPI recommended an improvement in maternity services coupled with an increased coverage of pregnant women with tetanus toxoid in

order to reduce mortality from neonatal tetanus (Directorate of Public Health and Preventive Medicine, 1981).

In 1982, at a Global Advisory Group Meeting of the EPI, neonatal tetanus was established as a major EPI priority worldwide. The group recommended that the community become involved with EPI work through education of traditional birth attendants and peripheral health workers about the importance of immunization. It was hoped that these workers would in turn be able to educate mothers, families and women's groups about the benefits of antenatal tetanus immunization (Expanded Program of Immunization, 1982).

Tetanus occurs in all age groups, with neonatal tetanus accounting for 10-30% of all tetanus cases. Tetanus has a higher fatality rate in the newborn period than in childhood or adulthood. It is estimated that 80% of all tetanus deaths occur in the newborn (Cruikshank, 1976). Without treatment, 90% of infants with tetanus die. Some facilities in developing countries have reported a 50% survival rate in hospitalized infants receiving diligent medical and nursing care (Daud, Mohammed, and Ahmad, 1981). In developed countries, where newborn intensive care facilities are available, the survival rate is much higher.

Clostridium tetani, the anaerobic gram positive rod responsible for the disease, has a very resistant spore stage. Man contracts tetanus when a spore is introduced into the body during injury. Since the organism is an anaerobe, spore germination most frequently occurs with puncture wounds, although burns and minor wounds may also be sites for entry of the organism. The toxin, tetanospasmin, causes the symptoms. The toxin reaches the nervous system via the bloodstream, or by traveling along the axon cylinders of the motor nerves. It eventually becomes fixed in the ganglion cells of the anterior horns of the spinal cord and cranial nerves, leading to reflex convulsive activity (Senecal, 1970).

In the newborn, incubation period is 3 to 10 days, and the shorter the incubation period, the poorer the prognosis (Warley & Jelliffe, 1970). The mean onset of symptoms is 5.2 days (Daud et al, 1981). The first signs and symptoms noted by the mother are lethargy, and failure of the infant to feed. The infant is unable to eat due to masseteric spasm and trismus. Trying to force feed the infant makes the spasms worse. Fever is usually absent, at least at first. As the condition progresses, spasms spread to the muscles of the neck, vertebral column, face, limbs and abdominal wall. Warley and Jelliffe (1970) describe the classic posture of the infant afflicted with neonatal tetanus. It is called "risus sardonicus", referring to the facial grimace. The jaw is clenched, the lips drawn down laterally and upwards, the eyebrows raised and the legs extended.

Finally, the disease progresses to the tetanic paroxysmal stage. The spasms associated with tetanus are often called convulsions, but this is a misnomer. There is no loss of consciousness, and the spasms are very painful. The muscles of respiration and the diaphragmatic muscles may be involved. Cause of death is often cardiac or respiratory failure due to continuous spasm.

Pneumonia is another potentially fatal complication. The swallowing and cough reflexes may be affected, leading to increased retention of oral secretions, and aspiration into the lungs. Daud et al (1981), report that survivors of tetanus neonatorum usually suffer no mental or motor sequelae, except for a large percentage with umbilical hernia in their study group.

As already noted, the high incidence of neonatal tetanus in developing countries like India is due in part to the childbirth practices in these countries. In India, 80% of the population live in the rural areas, while 80% of the available physicians live and work in the cities (Smith, 1978). Health care in rural areas is often provided by para-professionals and semi-trained village workers. Kumar (1980),

estimates that 70% of the births in rural areas, and 50% of the births in urban areas are attended by untrained midwives. These traditional birth attendants are called dais. Typically, the dai is an older woman, illiterate and uneducated, who inherited her profession as a family right. She provides most of the maternal-child services for the community (Mathur, 1979). Her practice is based on traditional beliefs, rituals and customs, and includes many harmful activities.

The dai attends the delivery in the home of the partutient. The delivery usually takes place on the floor which is often of dirt composition with a cow dung paste spread over it to harden the surface. The tool used by the dai to cut the cord is rarely sterilized. More commonly it is borrowed from the the kitchen or from the fields, and improperly cleaned, if cleaned at all. It may be a sickle or hoe, a kitchen knife or scissors (Gordon, Gideon & Wyon, 1965). One village dai, personally interviewed by the author of this paper, had received training from a local hospital, and kept a delivery bag which she brought with her to each delivery she attended. In it she carried razor blades provided by the hospital for use in severing the cord. She had a supply of three blades which were originally given to her in sterile packages. She was supposed to turn them in to the hospital for re-sterilization after each use. The hospital was at least 5 miles away, with no form of public transportation between the village and the hospital. The dai would have had to travel by bullock cart over the rutted dirt roads to the hospital to exchange her blades. Of course she did not do this, and the blades I saw were quite well used and far from sterile.

Since tetanus immunization is usually given during the antenatal exam, there is a correlation between the utilization of antenatal services by pregnant women and rates of immunization with tetanus toxoid. Rao and Inbaraj (1971), studied trends in the utilization of antenatal services in South India. They found that in

the period 1965-1968, 28.6% of the population in their study (all married women in a selected area), reported utilization of antenatal services. The trend was towards increased use of antenatal services.

In a later study by the same author, (Rao, 1981), utilization of health services in the same area of South India was again investigated. In this study, he looked at preference for type of antenatal service. Of the respondents, 45.5% had had no antenatal check-up, 32.9% preferred the government hospital for antenatal check-ups, 18.5% preferred private clinics, and 3.2% preferred MCH welfare clinics. Of those women who had never had a prenatal check-up, 42.2% felt it was not necessary, 43.1% gave no reason for not going, 9.7% said it was too far from home, and 5% said they couldn't afford a check-up. Concerning awareness of the availability of maternal-child welfare facilities, 33.5% of the population were not aware of availability, 59.3% were aware but were not utilizing the facilities, and 3.6% were utilizing the services. The main reason for not utilizing the facilities was the poor treatment offered. Finally, 98.6% of the total study group believed that immunization could prevent certain diseases.

The prevention of tetanus through maternal immunization has been closely studied in many countries around the world. It is generally accepted that full passive immunity is conferred upon the newborn for at least several months if the mother receives two doses of tetanus toxoid in the last trimester, at one month intervals, with the second dose administered at least 6 weeks prior to delivery (Cruikshank, 1976). If the woman has received prior immunization with tetanus toxoid, a single booster dose in the course of the pregnancy is sufficient to prevent neonatal tetanus (Miller, 1979).

Furste (1981) reports on the findings of a study presented at the Sixth International Conference on Tetanus. The study was designed to test the effectiveness of

maternal immunization with tetanus toxoid in reducing mortality from neonatal tetanus. Pregnant women were immunized twice during pregnancy with tetanus toxoid, more than one month apart, and before the last two weeks of pregnancy. Mortality from neonatal tetanus was reduced from 8% to 0.0% as a result of the immunization program.

In a study done in Bangladesh in 1978-1979, full immunization of pregnant women with two doses of tetanus toxoid reduced neonatal mortality by one half, and neonatal mortality on days 4-14 by 70% (Rahman, Chen, Chakraborty, Yunus, Chowdhury, Sarder, Bhatia, and Curlin, 1982). They also studied mass immunization of non-pregnant women in their child-bearing years, and found that neonatal mortality was reduced in their offspring, but that full protection against neonatal tetanus required a booster vaccine 4-6 years after initial immunization.

Black, Huber and Curlin (1980) also studied the effects of immunizing non-pregnant women in their child-bearing years with two doses of tetanus toxoid. They found a one third reduction in neonatal mortality in the 9-32 month period following vaccination. They attributed the reduction in mortality to the 75% lower mortality rate among 4-14 day old infants, the time period when tetanus is the primary cause of death.

Fouri (1982) notes the possibilities for reducing neonatal tetanus in South Africa by maternal immunization. In the population studied, none of the mothers whose infants had neonatal tetanus had been immunized with tetanus toxoid during the pregnancy. Half of these women had visited the antenatal clinic during the pregnancy. Had they been immunized, one half of the tetanus deaths would have been prevented.

Cvjetanovic, Grab, Vemura, and Bytchenko (1972) designed a mathematical model in order to do a cost/benefit analysis of tetanus immunization programs.

They compared mass immunization of the general population, and immunization of pregnant women only. They note that with tetanus immunization programs, no herd immunity is conferred, and every person must be immunized to be protected. Since resources in developing countries are very limited, immunization of the total population is impractical. They also note that the average cost of tetanus immunization is $.04, while it costs approximately $200.00 for treatment of tetanus (in developing countries). They determined that a much greater benefit for each immunization dollar spent is achieved by immunizing pregnant women alone on a continuing basis. This effect is achieved because there is a much higher morbidity/mortality rate for neonatal tetanus than for tetanus in the rest of the population (Appendix A).

Recent studies on tetanus have focused on natural immunity. From 40-80% of the non-vaccinated population in certain areas of India have tetanus antibodies in their blood. The antibodies are believed to provide some limited protection, or reduce the severity of the disease (Furste, 1981). Possibly, presence of naturally occurring immunity is the factor that has confounded the findings of studies designed to test immunity in the newborn whose mother received only one dose of tetanus toxoid during pregnancy.

Gupta (1978) studied rural Indian women's utilization of the government health care system for maternity care. She found a preference for care by the local midwife because of the quality of care the midwife offered, and because of the need to travel away from the village to seek care at the health center.

Immunization acceptance among pregnant women in rural Bangladesh was investigated by Rahman, Chen, Chakraborty, Yunus, Faruque, and Chowdhury (1982). They found a high rate of non-acceptance of vaccination. Only 34.2% of pregnant women in the sample accepted full immunization, and 4.8% accepted

partial immunization. They found little difference between acceptors and non-acceptors with regard to socio-demographic characteristics. The main reasons for non-acceptance of vaccine were objection by family members, and fear of harming the fetus. Based on their findings, the authors suggest that maternal tetanus immunization programs are not likely to be effective in cultural settings like rural Bangladesh due to resistance to the idea of immunization during pregnancy. For this reason they recommend mass immunization of non-pregnant women, backed up by maternal immunization campaigns.

Conceptual Framework

The conceptual framework for this study was based on health care utilization theories of a variety of authors. The object of utilization theory is to identify the kinds of people who utilize certain types of health care, how and why they seek care, and to make predictions about who will utilize health care services. It was the object of this study to identify the population utilizing antenatal immunization services, to understand their reasons for seeking or rejecting immunization, and to make recommendations for design of future immunization programs to encourage maximum utilization. Concepts used in developing the framework for this study were drawn from the utilization theories of Mechanic (1962) (1979), Igun (1970), Gray, Kesler & Moody (1966), Anderson & Newman (1973), McKinley (1972), Bice & White (1969), and Zola (1973).

It was necessary to draw upon different utilization theories to develop a framework for this study, because of two unique aspects of this study. Firstly, in India, there are two main systems of medical care, the traditional and the western style systems. To pregnant women, this means a choice between two very different options for antenatal care, only one of which offers tetanus immunization. Since nearly all utilization frameworks are designed with a single health care system in

mind, none fully addressed this situation. Secondly, this study is concerned with a preventive health measure, namely immunization, and most of the utilization models focus on behavior in the presence of illness. Nevertheless, many aspects of utilization theory are applicable to this study.

Appendix B contains an outline of health utilization behavior developed as a basis for the conceptual framework for this study. The Anderson-Newman model for the study of health service utilization provides the structural framework for the outline found in Appendix B. It looks at both societal and individual determinant of behavior regarding maternal tetanus toxoid immunization.

Chapter Three

Methodology

This chapter describes the research design, the setting, the sample, techniques for data collection and a discussion of the reliability and validity of the methodology.

Research Design

This study was conducted using an exploratory descriptive design. One-hundred and seventy-five rural village women were interviewed in 20 villages of the North Arcot district of Tamil Nadu. All of the women had delivered a live or stillborn infant within the six month period prior to the data collection. The interviews were conducted over a two month period, beginning on February 2, 1984, and ending on April 11, 1984.

Research Setting

General description. The study was conducted in the North Arcot District of the state of Tamil Nadu in South India. The population of North Arcot District is 4,402,087 (Census of India, provisional figures, 1981). North Arcot District is fairly representative of the 15 other districts in Tamil Nadu state. The climate is warm and dry with irregular seasonal rainfall at the times of the southwest and northeast monsoons. Agriculture is the main occupation with principal crops being rice, sugar cane, peanuts, mango and maize. The main industries are weaving and tanning. Hinduism is the predominant religion, and there are some 50 different castes and subcastes in the district (Rao and Inbaraj, 1978). (A discussion of caste will follow).

Administrative divisions. Anaicut block, in the Vellore Taluk of North Arcot district was chosen as the area for data collection. The administrative divisions of India are concisely described by Rao (1976).

Administratively, India is divided into several states and territories. Each state is comprised of several smaller administrative units known as districts, which in turn are further subdivided into taluks or tehsils. In every district, there are cities and towns that make up the urban component which is usually about 20% of the total district population. The remaining 80% is basically rural, made up of villages of various sizes. In each of the main village units, the administration is vested in a group of elected individuals who make up the "village panchayat". A set of village panchayats are organized into a "union", that is known as a "panchayat union" or a "community development block" or simply as a "block". The size of the block varies, usually around 80-90,000 people. A taluk would have four or five such blocks (Rao, 1976).

All of the 20 villages where the study was conducted are located in Anaicut Block, one of four blocks in Vellore Taluk. Vellore Taluk comprises an area of 928.75 square kilometers (886.40 rural and 42.35 urban). The total population of the Taluk is 503,218 (Census of India, provisional figures, 1981).

Population and characteristics. Anaicut Block is representative of the other blocks in Vellore Taluk, and in North Arcot district. It is a mostly rural area, with small towns located along the main roads. In 1971 the population of the block was 103,435 in an area of 131.9 square kilometers. The population density per square kilometer is 784.2, and the birth rate is 27.4/1000. (Vance, 1983). Ninety-seven and one half percent of the population is Hindu, with the remaining 2.5% Muslim and Christian. Most of the families (93.9%) own their own homes, and 58.3% of the homes are 400 sq. ft. or less in size. The mean size of a household is 5.89 persons. Over one half (59.2 %) of the houses are constructed of mud, and 42.6% of brick. Nearly one half (44.1%) are one room dwellings and 73.9% have

no windows. Bathrooms are present in 43.2% of the houses. Electricity is supplied to 36.9% of the households, and water is carried from wells in over 80% (Vance, 1983).

A fairly large but sparsely populated area of the block is forest region. The forest region has no roads and the villages located within it are basically cut off from the rest of the block. No interviews were conducted in the forest region due to lack of transport to the area. It would take many hours by foot to reach the forest villages. Vance (1983) estimates that the forest village population makes up about 9.7% of the population of the block.

The infant mortality rate (birth to one year) in Anaicut block is 108.2/1000 and the childhood mortality rate (one to four yrs.) is 38.7/1000 (Vance, 1983). No figures on the neonatal mortality rate of Anaicut block are available, but Rao (1976) reported that the neonatal mortality rate in a rural area of neighboring K.V. Kuppam Block, according to a prospective study in the period 1969-1974, was 50.4%.

Castes. As mentioned, there are over 50 different castes and subcastes living in Anaicut block. The caste system in India is a categorization of peoples into different social groups. It applies only to the Hindu population, and not to peoples belonging to different religious groups such as the Muslims or the Christians. One's caste determines to a great degree one's place in the society, particularly with respect to occupation. Although the caste system was officially outlawed in India during the time of independence from British rule, it is very much alive in India today.

The caste system originated in ancient times, and the original purposes of the system are much disputed. Nevertheless, the system serves the purpose now of rigidly separating the society into well-defined social groups, each with their

own customs and occupations. One is born into one's caste, there is no vertical movement between castes, and no inter-caste marriage permitted, so the system is preserved. The higher caste peoples do not associate with members of the lower castes and the more menial occupations are assigned to the lower castes, although as the country becomes more urbanized this situation is changing.

There are four main castes, with many subcastes in each of these categories. The four principal castes, in their hierarchical order, are the Brahmins, the Kshatriyas, the Vaisyas, and the Sudras. Outside of the caste system are the untouchables. The untouchables occupy such a low position on the social ladder that they are not even a part of the caste system. The Brahmins are the priestly caste, the Kshatriyas are the soldiers and administrators, the Vaisyas are the artisan and commercial caste, and the Sudras are the farmers and peasants. The untouchables perform the most menial tasks, for example, sweeping and latrine cleaning. That is not to say that Brahmins are never farmers, or that all administrators are Kshatriyas, since the system has undergone much change since its origin. These groupings merely outline the basic occupations of the principal castes.

There are hundreds of "subcastes" of the four main castes, and each of these has an occupation associated with it. The untouchable group, although not officially a caste, also has many subcastes. Untouchables are also referred to as "harijans", or as the "scheduled castes". Grouped with the untouchables in the scheduled caste category are the tribal people, and officially their social groups are referred to as "scheduled tribes".

For official purposes, there are four main categories of castes. They are the "forward castes", the "backward castes", the "scheduled castes" (untouchables), and the "scheduled tribes". The government awards certain opportunities to members of the backward and scheduled castes/tribes, much in the same way that

"equal opportunity" guidelines exist in the U.S. today. There are many more backward castes than forward castes and together with the untouchables, the backward castes form the bulk of the society. This is true of Anaicut Block where 90% of the population are members of backward or scheduled castes or tribes (Vance, 1983).

Health services. Both the private and governmental health services available in Anaicut block are similar to those available in the rest of rural south India. Private services are offered by physicians who operate private clinics in the larger towns. The Christian Medical College and Hospital, a private and well-regarded institution, is located in the city of Vellore, in nearby Vellore block. Bus service to Vellore is available on a regular basis from the villages located along the main roads.

The government health system in India is multi-tiered. In rural areas, like Anaicut block, the major source of governmental health care for the population is the Primary Health Center, or PHC. Ideally, the PHC is staffed by one to three physicians, a number of auxiliary nurses, and various support personnel. The PHC serves a population of about 100,000 people. As the name implies, the center provides primary care for its clients, but refers patients to the government hospital if hospitalization or special treatment of some kind is needed. The PHC personnel also make visits to the more distant villages to hold immunization and other clinics.

The PHC that services Anaicut block is located in Odugatur (see map, Appendix C). It opened its doors in May of 1968. The PHC is at the southern end of the block, and the majority of its patients are from the area close to Odugatur. Patients at the northern end of the block are more likely to seek health care elsewhere, for example in Vellore, at the government hospital in Pallikonda, or at a PHC in another block.

The area serviced by the PHC is subdivided, and subcentres service these smaller areas of 5-10,000 people. The Odugatur PHC has ten subcentres under its direction. The subcentres are staffed by one auxiliary nurse, called an Auxiliary Nurse Midwife, or ANM. The ANM has from one and a half to two and a half years training. She may be assisted by an ayah, an untrained general female worker, and/or a trained dai. The dai is the traditional village midwife. The training period for the dai is one month long. Anaicut block is served by 71 trained dais.

Besides the PHC, Anaicut block has a government hospital in Pallikonda which offers full medical and surgical services, a government hospital in Maratipalayam which offers medical and maternity services, and two government dispensaries (In Anaicut and Pallikonda) that offer pharmaceutical and clinic like services.

There is no cost for care at the PHC, subcentre, or government hospital. Medications or supplies that are not available at the institution must be purchased at the pharmacy by the patient. Maternity care is free. All immunizations are free.

There are a variety of places where antenatal tetanus immunization is available to the women of Anaicut block. Antenatal check-ups with immunization are offered free of charge at the government hospitals and at the PHC. Women can go to the private hospital in Vellore for low cost antenatal care and immunization. Private physicians in the larger towns also offer these services. Finally, the PHC and subcentre personnel make village visits to do antenatal check-ups and immunization. Not all of the villages are visited by health teams, nor is this service offered on a regular basis.

Sample

The sample for this study was selected using a modified stratified random sampling technique. The target population of the study is rural women of childbearing age in the North Arcot District of Tamil Nadu. The sample population consists of 175 rural women of childbearing age from randomly selected villages of Anaicut block in the North Arcot district. Anaicut block was selected as the area of study because it is representative of other blocks in the North Arcot District in terms of size, accessibility, character of the population, and type of health services available.

There are 46 villages and one city in Anaicut block. Since this study looks at antenatal tetanus immunization rates in rural areas, the city, Pallikonda, was omitted from the study. The seven forest villages were also omitted for reasons explained. The remaining 39 villages were divided into nine categories based on size and distance to a PHC, subcentre or hospital. There were three size categories; less than 1000 population, 1000-3000 population, and greater than 3000 population. In each size category there were three sub-categories based on distance to a health facility. Villages were grouped in the less-than-two km. group, the two- to-five km. group, or the five-to-ten km. group. There were no villages in any size category that were more than 10 kms. from a health facility. None of the villages in the greater than 3000 population category were more than five kms. from a health facility. Therefore, there were really only eight categories. Because each category had a different number of villages, it was decided to randomly select half of the villages from each category for a total of 20 villages.

In each village selected, all of the women who had delivered a live or stillborn baby in the six month period prior to the study were interviewed. Women who had experienced early or intermediate fetal loss (less than 28 wks. gestation) were

excluded from the sample population. Women who had migrated to the village for delivery were included in the study population, but their home villages were noted. (It is common in India for women to return to their mother's village to give birth.)

A house to house survey method was used to identify women meeting the sample criterion. In this way it was hoped that all women in the village who had delivered in the six month period prior to the study would be contacted for interview. The sample then, consisted of 175 rural women who had delivered a live or stillborn infant in the six month period prior to the study.

Techniques for Data Collection

Structured, standardized interviews of the sample population were conducted (see Appendix D). The interview schedule consisted of a total of 54 questions. The interview tool was designed to collect information about the subjects in the following areas: Socio-demographic characteristics, obstetrical history, knowledge of availability of antenatal services, attitude about necessity of antenatal care by trained personnel, utilization of antenatal services, knowledge about neonatal tetanus, knowledge about tetanus immunization, attitudes about safety of immunization during pregnancy, and tetanus immunization history.

In actuality, each woman was asked an average of about 35 questions, because a " no " answer to one question often canceled the need to ask the questions immediately following it.

The interviews were conducted in Tamil, the local language, by a trained female interpreter who used an interview schedule prepared in Tamil. (Appendix E) Two interpreters were used to collect data. Both spoke fluent English and Tamil, and were both primary school teachers. The researcher accompanied the interpreters to all interviews, and supervised collection of data. Following each inter-

view period, the responses were translated into English and transferred to data collection sheets.

The Interview schedule was designed by the researcher to determine the rate of effective antenatal tetanus toxoid immunization in the study population, to identify reasons that women are ineffectively immunized, and to identify factors which influence whether or not a woman will seek immunization during pregnancy.

The interview schedule was field-tested twice in two different villages outside of the study area. Following each pretest, the interview was revised, eliminating unnecessary questions, adding others, and reworking the questions where necessary to make intent clear. A total of 12 interviews were conducted during the field-testing.

Data Analysis

Analysis of data was accomplished by content analysis of the responses to the open-ended interview questions. Using a nominal scale, responses were assigned to various independent categories and frequencies of occurrence noted. Descriptive statistics were utilized to report the findings. The chi square test was employed to determine whether differences between categories were significant, or due to chance. The Yates correction was applied where cell sizes were less than 10.

Validity/Reliability of Methodology

As the use of translators to collect data may threaten the reliability and validity of a study, every attempt was made to minimize this threat. The two interviewers were fully trained in advance, including education about tetanus, antenatal tetanus immunization, and the purposes/goals of the study. A structured, standardized interview format was used, in order to minimize variability and bias in translation. The translation of the Interview Schedule itself was done by a Tamil language teacher, and then checked by the Indian advisor of the project. Every interview

was personally supervised by the researcher so that problems with translation, or uncertainty about responses could be discussed on the spot. The researcher carried an Interview schedule in English so that the progress of the interview could be followed. Also, the interviewer had some familiarity with the Tamil language, so close supervision of the data collection phase was possible.

Giving socially acceptable answers is a second threat to reliability/validity. It is quite possible that some women gave answers to questions that they wouldn't ordinarily give because of the interview situation. For example, they may have stated that they were immunized with tetanus toxoid even if they weren't, because they thought the interviewer wanted them to answer positively. This problem was avoided by asking whether the subject had had any injections during the pregnancy. If the answer was yes, further questions were asked to determine whether the injection was an immunization.

One of the objects of the study was to determine the rate of immunization of pregnant women with tetanus toxoid. This information was collected by asking the interviewees to recall their immunization histories. This method was chosen as opposed to searching through hospital and clinic files because of problems with record keeping in India. In some instances, such as when a woman was immunized by a private doctor, immunization records were not available. Because of problems with recall, the sample was limited to women who had delivered in the six month period prior to the study, rather than including all childbearing women in each village. An attempt was made to cross-check recall histories with actual hospital and clinic records. This was possible in only a small number of cases where records had been kept.

There were a small number of cases where women reported that they had received injections at antenatal check-ups but did not know for what reason the

injections had been given. In these cases, closer questioning was necessary to determine whether or not the injections could be considered immunizations. The women were asked whether or not they were sick at the time of the injections. If a woman answered negatively, it was assumed that the injection was an immunization. If a women answered that she had gone to the doctor because of a disease commonly treated by injectable antibiotics (urinary tract infection, diarrhea, upper respiratory infection), it was assumed that the injection was not an immunization.

All interviews were conducted at or near the home of the woman being interviewed. In most cases, the woman herself answered all of the questions. There were times when a domineering husband, mother, or mother-in-law would answer some or all of the questions. Attempts were made to address the questions to the woman being interviewed, or to validate responses with her. In such situations, it was assumed that the person answering the questions was the decision maker for the family regarding health care, and these interviews could be included in the sample.

Most villages were small enough to complete interviews in one day. Some of the larger villages required a return trip. There was one refusal. The woman was retarded and her family did not want her interviewed. In three instances, neighbors indicated that a household had a woman meeting the criterion, but upon reaching that household the occupants informed the interviewers that a mistake had been made. It appeared as if, in these three cases, there was some resistance to being interviewed. Resistance may have been a problem because of local ill feelings towards health care personnel. In this researcher's experience, this was almost entirely due to the sterilization program. Some villagers are afraid that health workers who make door-door inquiries are looking for sterilization candidates. It

has been some time since India has had mandatory sterilization, but fear along these lines still exists. This reluctance to talk to health workers was a threat to the validity of the study findings because some interviews may have been missed.

As mentioned, the distant forest villages were excluded from the study because of their inaccessibility. This exclusion affects generalization of the findings. It can be surmised that the inhabitants of these villages do not frequently make the long journey to health centers for antenatal care. The health teams from the PHC do not make visits to these villages. Undoubtedly, inclusion of data from these villages would have had a negative effect on the findings, that is, lowering the rates of immunization, utilization of antenatal services etc.

It has also been mentioned that an Indian women will often go to her mother's village sometime during the pregnancy in order to give birth in her mother's home, and to have her help in the post-partal period. For this reason, some women were missed because they were in their mother's villages during the time of data collection. To correct for this problem, women who had come to one of the selected villages to give birth in their mother's homes homes were included in the study population. In most cases they also get antenatal care and immunization in their mother's village because most women do not seek antenatal care until late in the pregnancy.

Chapter Four

Results

Results are presented in four sections: immunization status, correlations between immunization status and sociodemographic data, antenatal care and immunization status, and knowledge, attitudes and beliefs about tetanus and tetanus immunization.

Immunization status

Rates of immunization. Just under half (47.4%) of the women in the sample had received at least one dose of tetanus toxoid during their most recent pregnancies. The remaining 52.6% had not been immunized at all with tetanus toxoid during their most recent pregnancies.

However, of the immunized group, two thirds (66.0%) were effectively immunized with tetanus toxoid during the pregnancy. Unfortunately, 44% of the immunized group were ineffectively immunized. The reasons for ineffective immunization will be discussed subsequently.

Therefore, of the total group of women, less than a third (31.4%) were effectively immunized with tetanus toxoid. This means that only 31.4% of the children born to the women in the sample during their most recent pregnancies were protected against neonatal tetanus.

Effectiveness of immunization Women were considered effectively immunized if they had received two or more doses of tetanus toxoid during the most recent pregnancy, with the doses spaced at least one month apart, and the second dose administered at least one month prior to delivery. Women receiving only one immunization during the pregnancy were also considered effectively immunized if they had been immunized in adolescence or during a prior pregnancy with tetanus toxoid.

Of the immunized group of women, 44.0% were not effectively immunized. Analysis of the reasons for ineffective immunization shows that 64.3% of the ineffectively immunized group received only one dose of tetanus toxoid during the pregnancy, and had no prior immunization with tetanus toxoid. More than one fourth (28.5%) of the group received two or more doses, but the immunization was given too late in the pregnancy for protection of the newborn. Finally, 7.0% of the ineffectively immunized group received two or more doses of tetanus toxoid, but the doses were given too close to one another for effective production of antibodies.

Over-immunization occurred in 47.0% of the immunized population, that is, 47.0% of the women immunized received more doses of tetanus toxoid than were necessary to effectively prevent tetanus in the newborn. Of the over-immunized population, 73% received 3 doses of vaccine, 7% received more than 3 doses, and 20% received two doses when only one was required for effective immunization.

Correlation Between Immunization Status and Socio-Demographic Data.

Immunization status of the women in the sample was analyzed with regard to socio-demographic characteristics of the population. The socio-demographic picture of the sample in this study corresponds closely with that of the population of women of childbearing age in Anaicut block and North Arcot district as reported in previous studies conducted in the area (Census of India, 1981; Rao, 1981; Vance, 1983). Differences between immunized and non-immunized groups on the basis of age, caste, education and other demographic variables were subjected to the chi square test to determine whether there were significant differences.

Religion. Nearly all of the sample population (95.4%) were Hindu, with 1.7% Muslim, 2.3% Christian, and 0.5% other religions. Chi square analysis showed no significant difference between the Hindu and non-Hindu groups with regard to immunization status ($X^2.05(1)=3.84$ $X^2=0.26$).

Caste. Twenty-nine castes and tribal groups were represented in the sample. A small percentage (2.8%) of the sample population of this study were from castes defined as forward castes (FC). Members of backward castes (BC) formed 58.9% of the sample. The remaining 34.3% were untouchables or scheduled castes (SC), and 1.7% scheduled tribes (ST). In the sample studied, there was no significant difference between the scheduled castes (SC+ST), and the caste Hindus (BC+FC), with regard to immunization status ($X^2.05(1)=3.84$ $X^2=0.21$). Because of the small sample size of forward caste Hindus (four), immunization status of the forward castes versus other castes was not analyzed.

Age. The majority (74.3%) of the sample were in the youngest age groups of 15-20, and 21-25. The percent of the sample represented declined as the age groups advanced. A total of 15.5% of the sample fell into the 26-30 age group, 8.0% in the 31-35 group, 1.7% in the 36-40 category, and only 0.6% in the 40+ age group. There was no significant difference between age groups by immunization status ($X^2.05(5)=11.07$ $X^2=8.98$).

Literacy. Women in the sample were classified as either literate or illiterate. The definitions of literate and illiterate used in this study were the same as those used by the Census of India. Women who could read and write were classified as literate. Women who could read but not write, and women who could do neither were classified as illiterate.

In the total sample population, 33.1% were classified as literate, and 66.9% as illiterate. Among the literate population, 67.0% were immunized and 33.0% were not. Among the illiterate women, 38.0% were immunized, while 62.0% were not. There was a significant difference between immunized and non-immunized populations with regard to literacy ($X^2.01(1)=6.64$ $X^2=13.66$).

Further analysis showed no significant difference in literacy when tested for

effectiveness of immunization. Of the immunized, literate women, 74.4% were effectively immunized, and 25.6% were not. Of the immunized, illiterate women, 59.1% were effectively immunized, and 40.9% were not ($X^2.05(1)=3.84$ $X^2=2.14$).

Immunization status and Antenatal Care.

Utilization of antenatal care. Close to half (45.1%) of the study population received some antenatal care during their most recent pregnancies, while 54.9% had no antenatal care. When asked why they sought antenatal care, the majority (49.4%) of those seeking care, gave some response indicating a belief in the utility of preventive maternity care. Responses included, "for the health of the baby", "to assure a safe delivery", and "to have a safe pregnancy". Some women (25.3%) stated that they sought maternity care only because they became sick during the pregnancy. Antenatal care was sought for immunization alone by 12.7% of the sample, while 5.1% of the women stated they sought antenatal care only because they wished to be sterilized after the delivery. Other reasons for seeking antenatal care were given by 7.6%, such as problems with past pregnancies, infertility, and advice of a doctor.

Of the women who did not seek antenatal care, 41.7% stated they did not think it was necessary to be checked during the pregnancy if the woman was well. About one quarter (26%)said that they were not accustomed to the idea of having a prenatal check-up. A smaller number (16.7%) stated that antenatal care was too expensive, and 5.2% that facilities offering check-ups were too far away. Finally, 1% said they did not know that antenatal care was necessary, 5.2% gave some other reason, and 4.2% did not know why they did not go for a check-up.

Antenatal care and rates of immunization. Of the women who had an antenatal check-up during their most recent pregnancy, 82.3% received some tetanus immunization, and 17.7% did not. Of the women who did not seek antenatal care,

19.8% were immunized, and 81.3% were not. (These women were immunized in their villages by immunization teams from the local PHC.) If all of the women who had had antenatal check-ups had also been immunized, the overall immunization rate would have been increased by 8% (from 47.4% to 55.4%). This study did not investigate the reasons why women were not immunized during the antenatal visit.

Antenatal care and effectiveness of immunization. The majority of the women who received antenatal care (54.4%) utilized a hospital for care. Antenatal care was received by 13.9% at the PHC, 12.6% at a private clinic, 7.6% at a subcentre, 6.3% at a home visit, and 5.1% at a dispensary. Of the immunized population, 44.0% were immunized at a hospital, 26.2% at the PHC, 21.4% during a home visit, and 8.3% at a private clinic.

All of the women who were immunized in private clinics were immunized effectively. The majority of those immunized in private hospitals (81.9%), and those immunized in government hospitals (65.4%), were immunized effectively. Of those immunized at PHC's or subcentres, 59.1% were immunized effectively, and those receiving immunization at home were immunized effectively 50.0% of the time.

Of the ineffectively immunized population, 35.7% received immunization too late in the prgnancy for effective prevention against tetanus in the newborn. This is in part a reflection of the sample's tendency to seek antenatal care late in the pregnancy. From the third to the fifth months of pregnancy, 24.1% sought antenatal care, 51.9% in the fifth through seventh months, and 24.0% after the eighth month when tetanus immunization would not be effective. Analysis of data shows that in fact, 22.9% of the immunized population received their first dose of tetanus toxoid at eight or more months gestation. 67.5% were immunized with the first dose during the fifth through seventh months, and only 9.6% at less than

five months gestation.

A second major reason for ineffective immunization was that many women received only one dose of tetanus toxoid when two were needed. Of the ineffectively immunized population, 64.2% received only one dose of tetanus toxoid, but 89.9% of these women could potentially have received a second dose at least one month before delivery. Analysis of the number of antenatal visits made shows that of this group, only 12.5% made two or more antenatal visits. Half of this group (50%), made only one visit, and 37.5% made no visits but were immunized by visiting immunization teams.

Knowledge, Attitudes and Beliefs About Tetanus and Tetanus Immunization

Tetanus. Most of the women in the sample (76.0%) did not know what tetanus in the newborn is. A small percentage (7.4%) were able to give an accurate description of the disease, and the remainder (16.6%) described tetanus as convulsions.

Those women who had knowledge of newborn tetanus were asked what they felt was the cause of the disease. The majority (69.0%) did not know of any cause. The remainder stated that tetanus was caused by "cold", either in the mother or the newborn. The Tamil word used for cold in this sense was "yeerum". Examples of "yeerum" causing tetanus included the ingestion of "cold" foods during pregnancy, pregnant women working in cold water in the rice paddies, and exposure of the newborn to cold.

Women with knowledge of tetanus were also asked how tetanus could be prevented. Again, the majority, (69.0%) did not know. Prenatal care was seen as a prevention against tetanus by 14.3% of the sample. Immunization in pregnancy was the response of 7.1%, and avoidance of cold foods, 2.4%. A small number (2.4%) stated that medicine given to the newborn could prevent tetanus. The remainder (4.8%) stated that tetanus could not be prevented.

Tetanus immunization. Because women's feelings about immunization may influence their decision to accept or reject immunization during pregnancy, data were analyzed with regard to attitudes about immunization.

The women in the sample were asked whether they felt that immunization during pregnancy was safe for the mother and baby. The majority (71.4%) felt that immunization in pregnancy was safe. A small percentage (0.6%) felt it was unsafe, and the remainder (28.0%) did not know if it was safe or not.

Of the total sample, 69.7% felt that immunization during pregnancy could protect the baby from disease. Only 0.8% felt it could not, and the remainder did not know. Further analysis showed a significant difference between the immunized and non-immunized populations with regard to attitudes towards safety of immunization. Among the immunized population, 91.6% felt that immunization in pregnancy was safe, and 8.4% did not know if it was safe or not. Among the non-immunized population, 53.3% felt immunization was safe, 45.7% did not know if it was safe, and 1.1% felt it was not safe to be immunized while pregnant ($X^2.01(2)=9.21$ $X^2=52.02$).

Summary

In summary, this study found that just under one half of the women in the sample had been immunized with tetanus toxoid during their most recent pregnancies. Of the immunized group, two-thirds were effectively immunized, and the remainder were not. Therefore, of the total sample, less than a third were effectively immunized.

The main reason for ineffective immunization was that many women received only one dose of tetanus toxoid during the prgnancy. A second major reason was immunization given too late in the pregnancy. Finally, nearly one half of the immunized women were over-immunized.

There were no relationships between immunization status and religion, caste, or age. There was a strong relationship between literacy and immunization status. Many more literate women were immunized than illiterate women.

Nearly half of the study group received some antenatal care during their pregnancies. A fairly large number of these women (17.7%), were not immunized during the antenatal visit, or at all during the pregnancy.

This study found very little resistance to the idea of immunization during pregnancy as only a small fraction (0.6%) felt immunization during pregnancy was unsafe.

Regarding knowledge about tetanus among the study group, over two-thirds of the sample did not know what tetanus in the newborn is.

Nearly the same number of women did not know how it could be prevented.

Chapter Five

Discussion and Implications

Analysis reveals that nearly half of the women (47.4%) in the sample population received some immunization with tetanus toxoid during the course of their most recent pregnancies, while less than one third (31.4%) were effectively immunized. These figures fall far short of the goal set by the Indian Ministry of Health for maternal tetanus toxoid immunization. Efforts to improve rates of immunization can be approached in two ways. Firstly, an attempt can be made to reach those women who received no immunization during the pregnancy. Secondly, efforts can be directed to improve effectiveness of immunization among the population already reached by the immunization program.

Contrary to the results of a previous study, this study found little overt resistance to the concept of immunization during pregnancy. In their study in rural Bangladesh, Rahman et al (1982) found that non-acceptance of maternal immunization was due in large part (over 67% of the time) to objection to the idea of immunization during pregnancy by the women or their families. In contrast, the majority of non-immunized women in this study (53.3%) felt that immunization during pregnancy was safe, and only 1.1% felt it was not. The remaining 45.7% expressed no fear of immunization, but rather a lack of knowledge about the concept. These findings indicate that resistance would not be a problem if efforts were made to increase coverage with tetanus toxoid among the non-immunized population.

Interpretation of the findings shows only small differences among the immunized and non-immunized populations with regard to socio-demographic characteristics. The exception is literacy. A far greater number of literate women were immunized (67%), than illiterate women (38%). This finding supports the hypoth-

esis that an improvement in the general educational level of a given population leads to a concurrent improvement in health status. Further efforts to increase female literacy in India would have a positive effect on the physical health of the nation.

Taking into consideration the fact that improvements in literacy rates come slowly, maternal immunization coverage could be increased more quickly by a program aimed at educating the population about tetanus and its prevention. As noted, little overt resistance to the idea of maternal immunization was found in this study, but many women expressed a lack of knowledge about tetanus and tetanus immunization. Findings show that most of the women (76.0%) do not know what neonatal tetanus is. Of the small number who had some knowledge of the disease, the majority (69.0%) did not know its cause or how to prevent its occurrence. Education of the population about tetanus and tetanus immunization could go a long way towards improving rates of immunization. Education could take place in a variety of ways, for example, through media campaigns and at local health centers and women's groups.

Since most of the women who were immunized (72.3%) received immunization during an antenatal check-up, increasing rates of antenatal check-ups would also increase coverage with tetanus toxoid. Analysis of the reasons given for not seeking antenatal care (not necessary, not used to it, too expensive or far away), reveals that many women could be reached with both immunization and antenatal care if the program to bring these services to the villages themselves were intensified. House to house visits by a public health nurse would be one way to achieve this goal. A second, and probably more economical and efficient way is the concept of the mobile clinic. In this instance, a team from the PHC visits the village on a monthly basis to provide certain health care services, among them immunisation

and antenatal care. Although mobile clinics are in operation now in South India, there is a need to increase both the number of villages visited, and the frequency of visiting each village. If villages were visited on a regular basis, better immunization coverage could be achieved. Advance publicity about the necessity of prenatal care and immunization would result in better attendance by pregnant women at mobile clinics.

A surprisingly large number (17.7%) of the women who received antenatal care were not immunized. Although the reasons for this were not specifically investigated in this study, one finding indicates a need for education of the health care providers about immunization during pregnancy. A fairly large number of the unimmunized women (15.39%) in the study group visited a doctor sometime during the pregnancy for illness, but were not immunized at that time. Health professionals should be aware that tetanus toxoid can safely be given during pregnancy even if the woman is ill, with for instance diarrhea, or a urinary tract infection. Unless the woman is severely ill, she should be immunized if possible whenever contact is made with a health care provider during the pregnancy. If a second immunization is required, she should also be told at that time where and when it can be obtained.

Education of health care providers should also extend to the recommended regime for tetanus immunization during pregnancy. Data analysis reveals that over-immunization occurred in 49.4% of the immunized population. Either health care personnel are not taking immunization histories, or they are unaware of the numbers of doses required for effective immunization. Over-immunization is a waste of valuable vaccine in a country that cannot afford to waste it.

Obviously it is not enough simply to increase rates of immunization, but efforts must be taken to increase rates of effective immunization. This study shows

that 44.0% of the immunized population were not effectively immunized. Of the ineffectively immunized population, 64.3% received only one dose of tetanus toxoid when two were required. Half of the ineffectively immunized group made only one antenatal visit during the pregnancy. Of these women, 89.9% received the first dose early enough in the pregnancy to allow time for complete immunization. This situation could be improved by counseling women to return for a second immunization/antenatal visit to the PHC or hospital. Regular monthly visits to villages for the purpose of immunization by public health nurses or health teams would also increase the rates of effective immunization. Finally, instituting a program of immunization of adolescent females with tetanus toxoid would eliminate the need for two doses during the course of the pregnancy.

Of the ineffectively immunized population, 28.5% received two doses of tetanus toxoid, but immunization was given too late in the pregnancy. Nearly one fourth of the women in the group did not seek antenatal care until after the eighth month of pregnancy when immunization can not be given effectively. Education of pregnant women to seek early entry into the health care system would allow time for immunization. Also, village visits by health teams with advance publicity would be effective.

In summary, this study has documented the existence of significant problems with the maternal tetanus toxoid immunization program in Anaicut block, both in the areas immunization coverage, and the effectiveness of coverage. Less than one third of the infants born to women in the study during their most recent pregnancies were protected against tetanus at the time of birth by maternal immunization.

Several recommendations were made to improve this situation, including increases in female literacy, education of rural women about tetanus and tetanus immunization, and promotion of early entry into the health care system for ante-

natal care. Health care professionals in India should be instructed to immunize all pregnant women at the time of entry into the health care system, and to encourage them to return one month later for a second immunization if it is required. Health care administrators in India should consider instituting a program of immunization of non-pregnant adolescents so that only one dose of tetanus toxoid would be required during pregnancy. Finally, extending and improving the system of village visits by health teams for the purpose of immunization, especially to more remote areas, would greatly increase both overall immunization rates, and effectiveness of immunization.

Perhaps the most encouraging finding of this study is the fact that little resistance to the idea of immunization during pregnancy seems to exist among the study group. This means that a maternal tetanus immunization program is feasible in the cultural setting in which this study was conducted, and the effectiveness of the program could be improved if some of the recommendations of this study were implemented.

Reference List

Anderson, P. & Newman, J.F. (1973) . Societal and individual determinants of medical care utilization in the United States. Milbank Memorial Fund Quart-, erly 51, 95-124.

Bice, T.W. & White, K.L. (1969). Factors related to use of health services-an international comparison study. Medical Care, 7(2), 124-138.

Black, R.E., Huber, D.H., & Curlin, G.T. (1980). Reduction of neonatal tetanus by mass immunization of non-pregnant women; duration of protection provided by one or two doses of aluminum adsorbed tetanus toxoid. Bulletin of the W.H.O., 58, 927-930.

Census of India. (1981). Provisional population totals- Series 20 Tamil Nadu (Paper 1 of 1981 Supplement). Madras, India: Alamu Printing Works.

Cruikshank, R. (1976). Tetanus and diptheria. In R. Cruikshank, K.L. Standard, & H.B.L. Russell (Eds.), Epidemiology and Community Health in Warm Climate Countries. New York: Churchill Livingstone.

Cvjetanovic, B., Grag, B., Vemura, K., & Bytchenko, B. (1972). Epidemiological model of tetanus. International Journal of Epidemiology, 1(2), 125-137.

Daud, S., Mohammed, T., & Ahmed, A. (1981). Tetanus neonatorum (a preliminary report of assessment of different therapeutic regimes) Journal of Tropical Pediatrics, 27(6), 308-311.

Directorate of Public Health and Preventive Medicine. (1981). Survey to estimate the Incidence of poliomyelitis and neo-natal tetanus in Tamilnadu and Pondicherry. 258 Anna Salai, Madras, India.

Directorate General of Health Services-EPI section. (1982). The Expanded Program on Immunization-A Review. New Delhi, India.

Expanded Program on Immunization. (1982). Global Advisory Group Meeting.

October, 1982.

Fourie, D.T. (1982). Some aspects of tetanus neonatorum in the Pretoria area. South African Medical Journal, 61(6), 183-185.

Furste, W. (1981). The Sixth International Conference on tetanus. Journal of Trauma, 22(12), 1032-1035.

Gray, R.M., Kesler, J.P., & Moody, P.M. (1966). The effects of social class and friends expectations on oral polio vaccination participation. American Journal of Public Health, 56, 2028-2032.

Gordon, J., Gideon, H., & Wyon, J.B. (1965). Midwifery practices in rural Punjab in India. American Journal of Obstetrics and Gynecology, 93, 734-742.

Gupta, K. (1978). Qualified personnel or traditional midwives? Women's choice in rural India. International Nursing Review, 25(6), 175-191.

Igun, U.A. (1979). Stages in health seeking-a descriptive model. Social Science and Medicine, 13A, 445-446.

Kumar, V. (1980). Home care of the newborn and management of high risk pregnancies in rural India. Indian Journal of Pediatrics. 47, 33-36.

Mathur, H.N., Damodar, Sharma, P.N. & Jain, T.P. (1979). The impact of training traditional birth attendants on the utilization of maternal health services. Journal of Epidemiological and Community Health, 33, 142-144.

McKinlay, J.B. (1972). Some approaches and problems in the study of the use of services-an overview. Journal of Health and Social Behavior, 13, 115-152.

Mechanic, D. (1979). Correlates of physician utilization; why do major multivariate studies of physician utilization find trivial psychosocial and organizational effects? Journal of Health and Social Behavior, 20, 387-396.

Miller, J.K. (1979). The prevention of neonatal tetanus by maternal immunization. The Journal of Tropical Pediatrics and Environmental Child Health, 18, 160-

167.

Rahman, M., Chen, L.C., Chakraborty, J., Yunus, M.D., Chowdhury, A.I., Sarder, A.M., Bhatia, S., & Curlin, G.T. (1982). Use of tetanus toxoid for the prevention of neonatal tetanus. 1. Reduction of neonatal mortality by immunization of non-pregnant and pregnant women in rural Bangladesh. Bulletin of the W.H.O., 60(2), 261-267.

Rahman, M., Chen, L.C., Chakraborty, J., Yunus, M.D., Faruque,A.S.G., & Chowdhury, A.I. (1982). Use of tetanus toxoid for the prevention of neonatal tetanus. 2. Immunization acceptance among pregnant women in rural Bangladesh. Bulletin of the W.H.O., 60(2), 269-277.

Rao, P.S.S. (1976). The effects of inbreeding on human reproduction. Doctoral dissertation, School of Public Health of the Faculty of Medicine of Columbia University, New York.

Rao. P.S.S. (1981). Study on socioeconomic and demographic correlates of medical care utilization and health behavior (Research monograph) Vellore, India: Christian Medical College, Department of Biostatistics.

Rao, P.S.S. and Inbaraj, S.G. (1971). Trends in the utilization of maternal care services in North Arcot District of Tamil Nadu, India. Longitudinal studies in Human Reproduction. (Monograph No. 2) Vellore, India: Christian Medical College, Department of Biostatistics.

Rao, P.S.S. and Inbaraj, S.G. (1978). A prospective study of infant mortality and congenital malformations in relation to intra-uterine growth rates in south India. Indian Journal of Medical Research, 67, 245-254.

Sankaran, B. (1980). Pediatric priorities in India in the 1980's. Indian Journal of Pediatrics, 47, 97-102.

Senecal, F. Tetanus. (1970). In D.B. Jelliffe (ed.) Diseases of children in the

subtropics and tropics. Baltimore: Williams and Wilkins Co.

Smith, J.C. (1978). Health care in India; Medical education, physicians, and the rural health scheme. (Final report for the Professional Studies in India Program). Berkeley: University of California at Berkeley, Department of International Education.

Sokhey, J., Bhargava, I., & Basu, R.N. (1983). The Immunization Program in India - a handbook for medical officers New Delhi, India: Ministry of Health and Family Welfare.

Vance, J.C. (1983). Anaicut control study (Research report). Vellore, India: Christian Medical College and Hospital, Rural Unit for Health and Social Affairs.

Warley, M.A., & Jelliffe, D.B. (1970). The newborn and premature infant. In D.B. Jelliffe (ed.) Diseases of children in the subtropics and tropics. Baltimore: Williams & Wilkins Co.

Zola, I.K. (1973). Pathways to the doctor-from person to patient. Social Science and Medicine, 7, 677-689.

Cost/Benefit Analysis of Tetanus Immunization

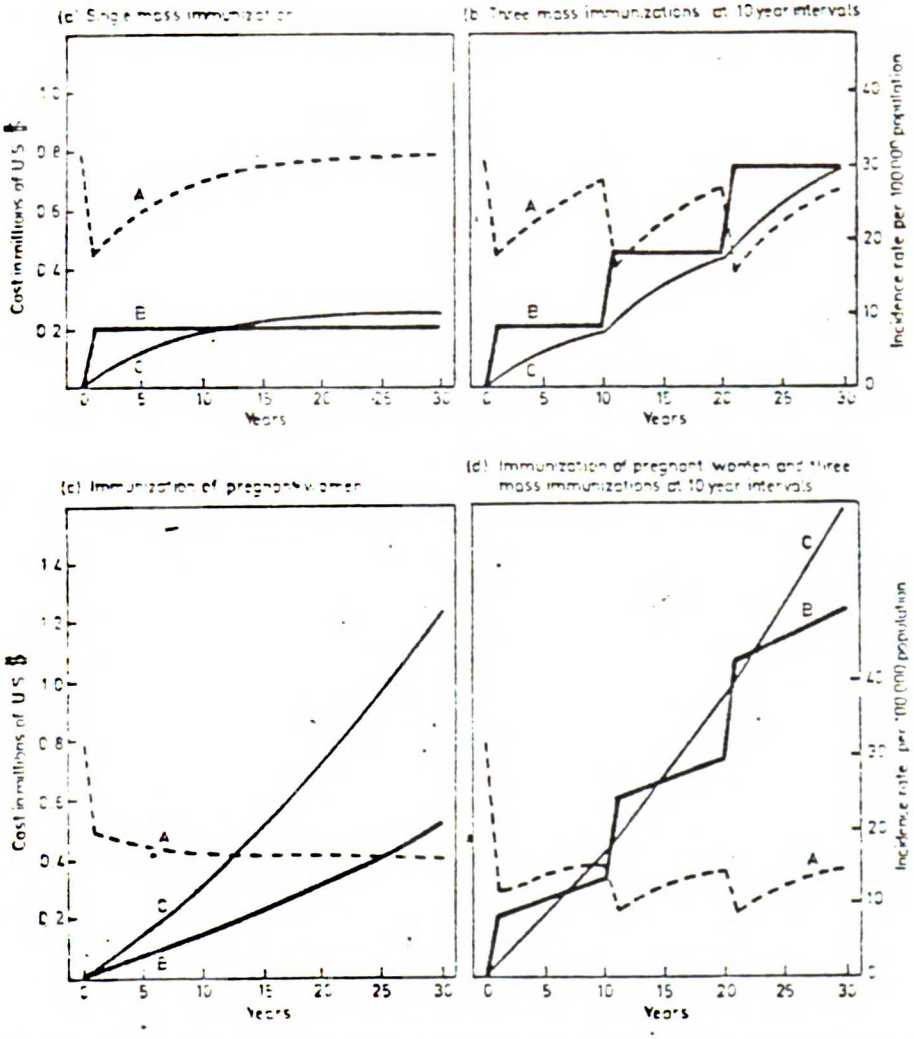


Fig. 3.6 Cumulative costs and benefits of various immunization programmes. Vaccine effectiveness, 95 per cent. Vaccination coverage: for total population, 50 per cent; for pregnant women, 90 per cent.

A = Incidence of tetanus cases (all cases per 100,000 population)
B = Cumulative costs of immunization.
C = Cumulative benefits on case treatment.

Note. From "Epidemiological model of tetanus" by B. Cvetanovic, B. Grab, K. Vemura, & B. Bytchenko. International Journal of Epidemiology, 1972, 1(2), 125-137.

Appendix B

Outline of Health Care Utilization Behavior

I Societal Determinants

A. Technology

Is the technology needed for an effective tetanus toxoid immunization program available in the area under study?

B. Norms

1. Cultural

a. Is pregnancy viewed as a normal or illness state?

b. Is it appropriate/expected that one seek health care during pregnancy?

c. Are injections acceptable during pregnancy?

d. What are the cultural beliefs about injections and immunizations?

e. Can the outcome of a pregnancy be influenced?

2. Familial

a. Do other family members influence a woman's decisions about pregnancy care?

II Individual Determinants

A. Predisposing - certain characteristics of an individual predispose to the utilization of health services.

1. Demographic

Age, marital status, parity, caste, employment, education, religion, immunization history.

2. Beliefs- Attitudes-Knowledge

a. Beliefs about causes of tetanus.

b. Beliefs about immunization.

c. Attitudes about antenatal care.

d. Attitudes about government health services.

e. Attitudes about safety of immunization during pregnancy.

f. Knowledge of availability of antenatal services and immunizations.

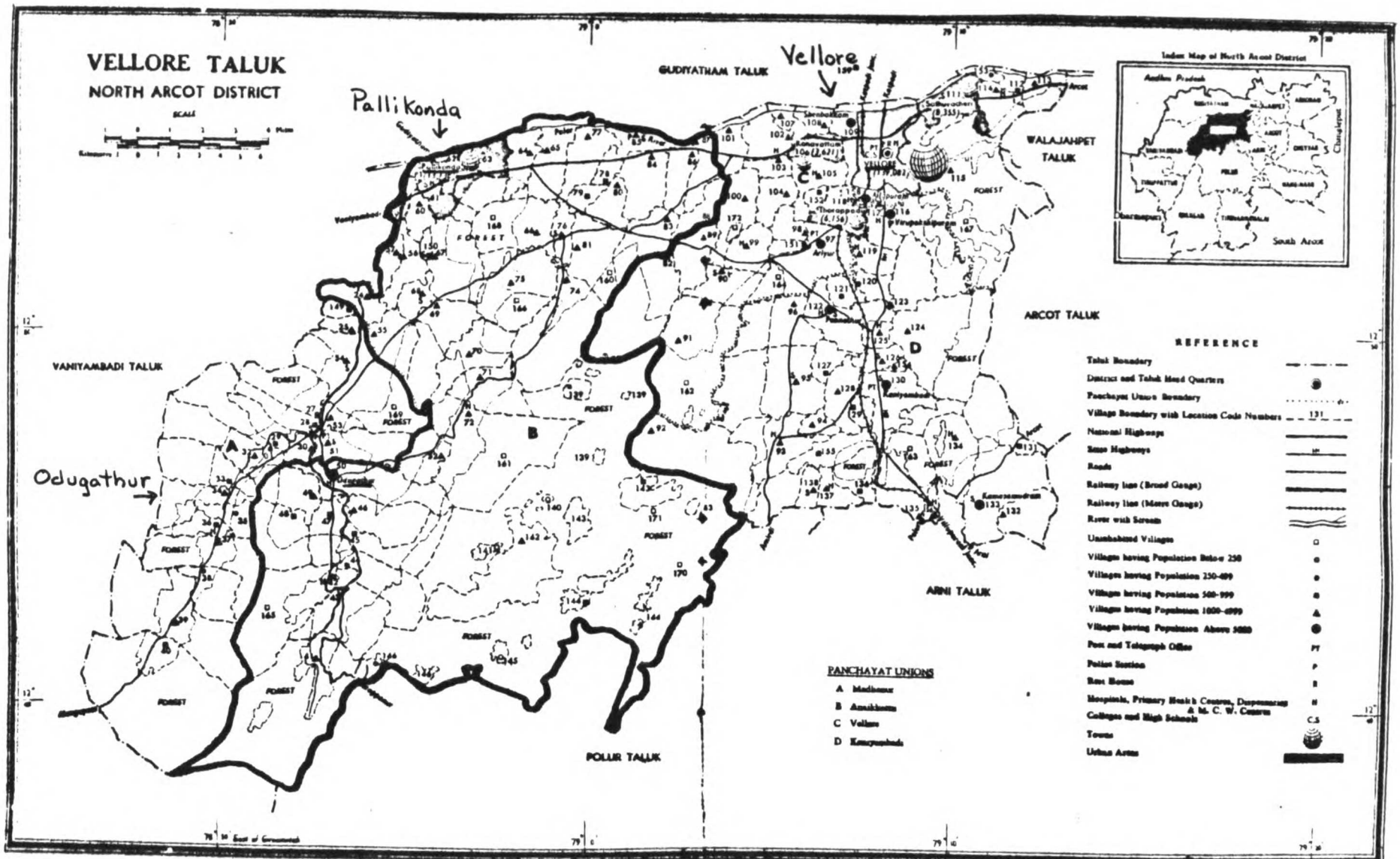
g. Knowledge about cause and prevention of neonatal tetanus.

B. Enabling - conditions which determine the availability of services.

1. Is there a facility in the village where immunization is offered?
2. How far away is the nearest health center where antenatal care/tetanus immunization are available?
3. What type of transportation is available ?
4. Do health teams visit the village to immunize pregnant women?
5. What is the cost of services?

Appendix C

Map of Anaicut Block



Appendix D
Interview schedule

Date

Village

Sample Number

I Socio-demographic Info

1) Name

2) Husband's Name

3) Address

4) Village of permanent residence

5) Age

15-20	31-35
21-25	36-40
26-30	40+

6a) Education

No formal education	9-10 yrs
1-5 yrs	11-12 yrs
6-8 yrs	college or prof school

6b) Reads
- Yes
- No

6c) Writes
- Yes
- No

7a) Occupation (FT-PT-Casual)
- Housewife
- Agriculture
- Clerical
- Other

7b) Husband's Occupation (FT-PT-Casual)

7c) Occupation of other household members
- a)
- b)
- c)

8) Religion

Hindu	Other
Muslim	
Christian	

9) Community Group (caste)

II Obstetrical History

1) Gravida

2) Para

3) Number of living children

4) Outcome of most recent pregnancy
   Liveborn
   Stillborn

5) Date of delivery

6) Gestational age at most recent delivery
   6 mos. 9 mos.
   7 mos. 10 mos.
   8 mos.

7) If living, sex

8) If deceased, age and cause of death

9) Place of delivery (name)
   Home Hospital
   Private clinic Other

10) Delivered by:
   Doctor
   Trained nurse
   Midwife (ANM, FHN, HA)
   Village dai
   Other

III Knowledge of Availability of Antenatal Services

1) Are there any clinics, hospitals , or health centers nearby where village women can get a pregnancy check-up? (names)
   Yes
   No
   Don't know

2) Do health visitors or nurses make visits to your village to do pregnancy check-ups?
   Yes
   No
   Don't know

IV Attitude About Neccesity of Antenatal Care by Trained Personnel

1) When a pregnant woman is well, is there any need to go for a pregnancy check-up?

Yes
No
Don't know

2) If no, why not?
No need if well
Too expensive
Not used to it
Other
Don't know

3) If yes, why do you think she should be checked during pregnancy?
To assure a safe delivery
Good growth of the baby
Other
Don't know

4) How often do you think a pregnant woman should be checked?
Once
Twice
Every week
Every month
When the doctor tells you
Other
Don't know

V Utilization of Antenatal Services

1) Did you have any pregnancy check-ups for the most recent pregnancy?
Yes
No
Don't know

2) If no, why not?
No need if well
Too expensive
Not used to it
Other
Don't know

3a) If yes, why did you go for a check-up?
Sick
Don't know
Problems with last pregnancy
For a safe delivery
Want sterilization
Other

3b) If yes, where did you go for a check-up? (name)
Hospital
Government clinic

Private clinic
Other

3c) If yes,who checked you?
Doctor
Dai
Trained nurse
Other
Midwife (ANM, FHN, HA)

3d) If yes, how many times were you checked?
Once — Every month
Twice — Other
Thrice

3e) How many months pregnant were you on the first visit?

3f) What did you think of the services?
Good — Poorly treated
Too expensive — Other
Too far away

VI Knowledge About Tetanus Imunization

1) Do you know of any injections or immunizations that a woman should receive during pregnancy?
Yes
No
Don't know

2) If yes, what are they?
Immunization — Other
Tetanus immunization — Don't know

3) If yes, what is the injection given for?
To help the baby grow — Other
To prevent tetanus in the newborn
Don't know

4) How many injections are needed?
One — Other
Two — Don't know
Three

5) Where can a pregnant woman go to get the injections? (names)
Hospital — Other
Government clinic — Don't know
Private clinic

VII Attitudes About Safety of Immunization During Pregnancy

1) Do you think it is safe to have an immunization during pregnancy?
   Yes
   No
   Don't know

2) If no, why not?
   Might harm baby
   Might harm mother
   Might cause abortion
   Fear of pain
   Other

VIII Attitude About Value of Antenatal Tetanus Immunization

1) Do you think an immunization given during pregnancy will prevent a baby from getting a disease?
   Yes
   No
   Don't know

IX Knowledge About Neonatal Tetanus

1) Do you know what tetanus in the newborn is?
   Yes
   No
   Don't know

2) If yes, please describe it.
   Fever
   Fits
   Stiffness
   Blue color
   Clenches jaw
   Stops feeding
   Dies
   Other

3) If no, have you ever seen a baby having fits, fever, that stops feeding, becomes stiff, and probably dies?
   Yes (name of the disease)
   No

4) If yes, what causes this disease?
   Spiritual causes
   Birth injury
   Mother did something wrong during pregnancy
   Putting cow dung on the cord
   Cutting cord with a dirty tool
   Other

5) How do you know about this disease?
   Own child had it
   Relative or neighbor child had it
   Don't know
   Other

6) Can a pregnant woman do anything to prevent this disease in her baby?
   Yes
   No

Don't know

7) If yes, what?
   Proper diet
   Have pregnancy check-ups
   Immunization
   Trained person deliver baby
   Other
   Don't know

X Tetanus Immunization History

1) Did you have any injections during your most recent pregnancy?
   Yes
   No
   Don't know

2) If yes, what was the injection for?
   Sickness
   Immunization (which one?)
   Tetanus immunization
   Don't know
   Other

3) If yes, where did you get the injection? (name)
   Hospital
   Government clinic
   Home visit
   Private clinic
   Local practicioner
   Other

4) How many injections did you get?

One	Three
Two	Other

5) When during your pregnancy did you get them? (note interval between injections)

Month	Interval (wks)
First injection	
Second injection	
Third injection	
Other	

6) How long after last injection did you deliver?

7) Did you have childhood immunizations?
   Yes
   No

Don't know

8) In past pregnancies, did you have any immunizations? (how many)
   Yes
   No
   Don't know

தேதி :

Tamil Interview Schedule

கிராமம்:

மாதிரி எ :

I SOCIO - DEMOGRAPHIC INFO:-

1. பெயர் :
2. கணவர் பெயர் :
3. விலாசம் :

4. நிரந்தரமான இருப்பிடம் :
(கிராமம்)

5. வயது :

15 - 20
21 - 25
26 - 30
31 - 35
36 - 40
40க்கு மேல்

6(எ) கல்வி அறிவு

படிக்காதவர்கள் -
1 - 5 வகுப்புகள் -
6 - 8 வகுப்புகள் -
9 - 10 வகுப்புகள் -
11 - 12 வகுப்புகள் -
கல்லூரி & தொழிற்கல்வி -

6(பி) வாசித்தல்

ரும் - -
ல்லை -

6(சி) எழுதத் தெரிதல்

ரும் -
ல்லை -

7(எ) வேலைவிவரம் பகுதி/முழுநேரம்/அல்லது போக

குடும்ப வேலை-
விவசாயம் -
எழுத்தர் -
இதர வேலை -

7(பி) கணவரின் தொழில்

முழு நேரம் -
பகுதி நேரம் -
அல்லதுபோக -

7(சி) வீட்டிலுள்ள இதரர் தொழில்

ர.
பி.
சி.

8 மதம்

இந்து -
முஸ்லீம் -
கிருத்துவர் -
இதரர் -

9. வர்கம்

II OBSTETRICAL HISTORY

1. பிரசவ எண்ணிக்கை -
2. உயிர் பிரசவம் -
3. உயிரோடிருக்கும் குழந்தைகள் -
4. பிறந்த குழந்தையின் தன்மை - உயிருடன் பிறந்தது -
இறந்த பிறந்தது -

5. பிரசவ தேதி :

6. எத்தனை மாதங்களில் பிரசவம் ஏற்பட்டது.

6 மாதம் -
7 மாதம் -
8 மாதம் -

..2.

9 மாதம் -

10 மாதம் -

7. உயிருடன் இருக்கும் குழந்தை : ஆம்: பெயர்:

8. மரித்திருக்கும் குழந்தையின் வயது: ஆம்: பெண்:

9. பிரசவமான இடம்: மருத்துவமனை -

வீடு -

தனியார் மருத்துவமனை -

10. யார் மருத்துவம் பார்த்தது :- வைத்தியர் -
மருத்துவ தாதி -
மருத்துவச்சி -
மற்றவர் -

III KNOWLEDGE OF AVAILABILITY OF ANTENATAL SERVICES

1. மாதாந்திர பரிசோதனைக்குச் செல்ல மருத்துவ மனை/தாய்சேய் நலம்/ தனியார் மருத்துவமனை ஏதாவது அருகில் இருக்கிறதா? (பெயர் சொல்)

ஆம்: இல்லை தெரியாது

2. தாதிமார்கள் அல்லது பயிற்சி பெற்ற தாதிமார்கள் கருத்தரித்திருக்கும்போது உங்கள் கிராமங்களில் சந்திப்பு பரிசோதனை செய்வதுண்டா?

ஆம் இல்லை தெரியாது

IV ATTITUDE ABOUT NECESSITY OF ANTENATAL CARE BY TRAINED PERSON

1. உடல் நலம் சரியாக இருக்கும் சமயம் கருதரித்திருக்கும் போது பரிசோதனை செய்ய பயிற்சி பெற்றவர்களிடம் உடல் பரிசோதனை செய்யவேண்டுமா?

ஆம்: இல்லை தெரியாது

2. இல்லை என்றால் ஏன்?

தேவையில்லை: அதிகச் செலவு: தெரியாது:

வேறு-பழக்கம் இல்லை:

3. ஆம் என்றால் ஏன்? கருதரித்த பெண் மருத்துவப் பரிசோதனைக்குச் செல்ல வேண்டும்?

சுக பிரசவம் : வேறு:

குழந்தை நல்ல வளர்ச்சி: தெரியாது:

4. ஆம் என்றால் கருதரித்த பெண் பரிசோதனைக்கு எத்தனை முறை செல்லவேண்டும்?

ஒரு முறை: ஒவ்வொரு வாரமும்: ஒவ்வொரு மாதமும்:

வைத்தியர் கூறும்படி: வேறு: தெரியாது:

V. UTILIZATION OF ANTENATAL SERVICES

1. கருதரித்திருக்கும் காலத்தில் ஏதாவது பரிசோதனை செய்யப்பட்டதா?

ஆம்: இல்லை: தெரியாது:

2. இல்லை என்றால் காரணம் என்ன?

பரிசோதனைக்குச் செல்ல வேண்டும் என்பது தெரியாது:

தேவையில்லை தாய் சுகமாக இருப்பதால்:

பழக்கம் இல்லை:

மருத்துவ மனை அதிக தூரத்தில் இருப்பது:

செலவு செய்ய பணம் இல்லை : வேறு:

3(எ) ஆம் என்றால் என் பரிசோதனைக்குச் சென்றாய்?

வியாதியாக இருந்ததால் :

முதலாவது பிரசவத்தில் கஷ்டம் ஏற்பட்டது:

கர்பத் தடை செய்வதற்காக :

வேறு: தெரியாது :

பி. நீங்கள் எந்த ஆரோக்கிய நிலையம் சென்றீர்கள் என்ற பெயர் சொல்லவும்

மருத்துவமனை ----------

அரசாங்க தாய் சேய் இல்லம் ----------

வேறு ----------

தனியார் மருத்துவ நிலையம் ----------

சி. யாரால் கவனிக்கப்பட்டது?

வைத்தியர்
பயிற்சி பெற்ற தாதிமார்
மருத்துவ தாதிமார்
கிராம மருத்துவச்சி
தெரியாது

டி. 1. முறை
2. "
3. "
மாதம் தோறும்
வேறு

இ. முதல் முறையாக எந்த மாதமளவில் மாதம் பரிசோதனைக்குச் சென்றீர்கள்

எப். நீங்கள் அவர்களின் சேவைப்பற்றி என்ன நினைக்கிறீர்கள்?

1. நல்ல கவனிப்பு
2. அதிகச் செலவு
3. அதிக நேரம்
4. மோசமான கவனிப்பு
5. வேறு மோசமான கவனிப்பு.

VI UTILISATION OF ANTENATAL SERVICES.

1. கருத்தரிக்கும் போது போட வேண்டிய ஊசி, தடுப்பூசி முறைகளைப் பற்றி உங்களுக்குத் தெரியுமா? ஆம் - இல்லை - தெரியாது.

2. நீங்கள் எந்தவை என்ன?

தடுப்பூசி
அம்மை தடுப்பூசி
வேறு
தெரியாது

3. நீங்கள் எதற்காக ஊசி போடப்பட்டது?

குழந்தையின் வளர்ச்சிக்காக
குழந்தைக்கு அம்மை வராமல் தடுக்க
வேறு
தெரியாது

4. எத்தனை பயிகள் தேவை:-

ஒன்று
இரண்டு
மூன்று
வேறு
தெரியாது

5. கருத்தரித்த பெண் ஊசி போட்டுக் கொள்வதற்கு எங்கு செல்லலாம்

அரசாங்க மருத்துவமனை
தாய் சேய் இல்லம்
தனியார் மருத்துவமனை
வேறு
தெரியாது

VII ATTITUDE ABOUT SAFETY OF IMMUNIZATION DURING PREGNCY

1. கருத்தரித்திருக்கும் போது ஊசிகள் போடுவது பாதுகாப்பானது என்று நினைக்கிறீர்களா? ஆம் -- இல்லை ---- தெரியாது

2. இல்லை என்பதன் காரணம் சொல்லுங்கள்:-

குழந்தையை பாதிக்கலாம்
தாயை பாதிக்கலாம்
கலாதி ஏற்படலாம்
வலி ஏற்படும் என்ற பயம்
வேறு

VIII ATTITUDE ABOUT VALUE OF ANTENATAL TETANUS IMMUNIZATION

1. கருத்தரித்தக் காலத்தில் தடுப்பூசி போடுவதன் மூலம் குழந்தை நோய்வாய்ப் படாது என்று நினைக்கிறீர்களா? ஆம் -- இல்லை -- தெரியாது ---

IX KNOWLEDGE ABOUT NEONATAL TETANUS

1. பிறந்த குழந்தைகளுக்கு அம்மை என்பதன் என்ன என்று தெரியுமா?

ஆம் ---- இல்லை --- தெரியாது ------

2. ஆம் என்பதன் தயவு செய்து விளக்கிச் சொல்லுங்கள்

சுரம்
பற்கள் கிட்டிக் கொள்ளுதல்
விடாத்து போதல்
நீர் நிறம்

வலிப்பு
பாய்ச்சுமல் இருத்தல்
இறத்தல்
வேறு

3. இல் லை என்றால் பிறந்த குழந்தைக்கு விரைத்தல், சுரம், ஜன்னி, பாயச்சுமை, இறத்தல், இப்படிப்பட்ட வியாதிகள் ஏதேனும் பார்த்திருக்கிறீர்களா? ஆம் ---- இல்லை ---- தெரியாது ----

4. அந்த வியாதி வரக் காரணங்கள் என்ன?

தூக்கிக் காரணங்கள் பிறக்கும்போது காயமடைதல் தொற்று நோய் கருவுற்றிருக்கும்போது தாய் தவறு செய்தல்
தொப்புளின் மேல் சாணி (அ) சாம்பல் போடுதல் தொப்புள் கொடி அறுக்கும் போது அசுத்தமான கருவிகள் பயன்படுத்துதல் வேறு தெரியாது

5. அந்த வியாதியைப் பற்றி உங்களுக்கு எப்படி தெரியும்?

என் குழந்தைக்கு இருந்தது உறவினர் (அ) அடுத்த வீட்டுக் - குழந்தைக்கு இருந்தது வேறு தெரியாது

6. கருவுற்றப் பெண் ஏதாவது முறை பயன்படுத்தி இந்த வியாதி குழந்தைக்கு வராமல் இருக்க நடை செய்ய முடியுமா? ஆம் இல் லை தெரியாது

7. ஆம் என்றால் என்ன?

சரியான உணவு கருவுற்ற போது உடல் பரிசோதனை செய்தல்
தடுப்பூசி போடுதல் மூலம் பயிற்சி பெற்றவர்கள் மருத்துவம் செய்வதன் மூலம் தெரியாது வேறு

X TETANUS IMMUNIZATION HISTORY.

1. தற்சமயம் கருவுற்றிருந்த காலத்தில் ஏதாவது ஊசி போடப்பட்டதா? ஆம் இல் லை தெரியாது

2. ஆம் என்றால் எதற்காக ஊசி போட்டுக் கொள்ளப்பட்டது? வியாதி (அ) சுகயீனம் தடுப்பூசி போடுதல் எனை தடுப்பூசி போடப்பட்டது ஜன்னி தடுப்பூசி போடுதல் தெரியாது

3. ஆம் என்றால் ஊசி எங்கு போடப்பட்டது?

அரசாங்க மருத்துவமனை மருத்துவமனை வீடு சந்திக்க வரும் தாதிமார் தனியார் மருத்துவமனை உள்ளூர் வைத்தியர்கள் இதரர்

4. எத்தனை ஊசிகள் போட்டுக் கொண்டார்கள்:- ஒன்று இரண்டு மூன்று அநேகம்

5. நீங்கள் கருவுற்ற காலத்தில் அவைகளைப் போட்டுக் கொண்டீர்களா?

முதல் ஊசி
இரண்டாம் ஊசி
மூன்றாம் ஊசி

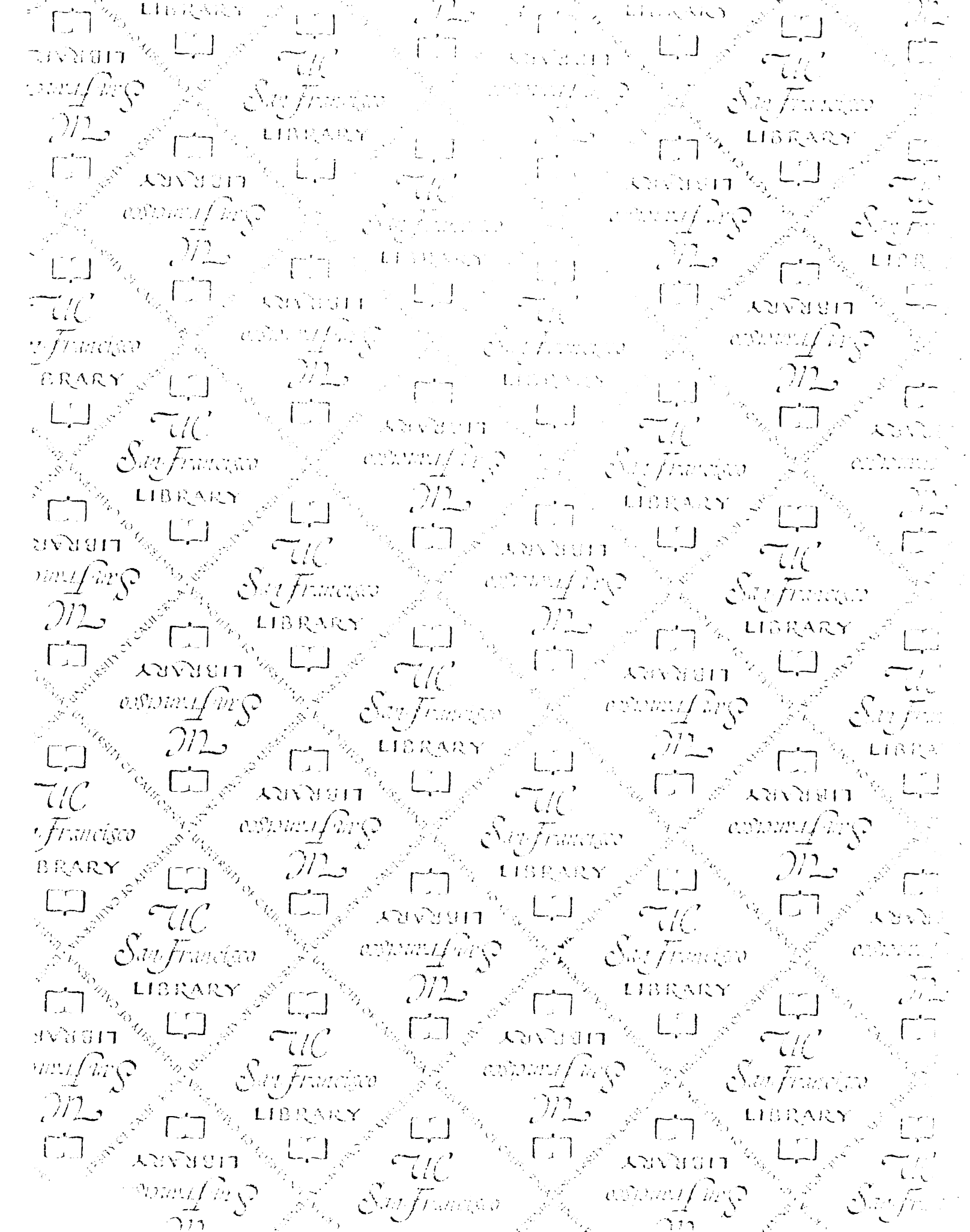
வேறு
இடைக்காலம்

6. சிறு பிள்ளையாக இருந்த காலத்தில் உங்களுக்கு தடுப்பூசி போடப்பட்டதா?

ஆம் இல் லை தெரியாது

7. முன்னர் கருவுற்ற காலத்தில் உங்களுக்கு தடுப்பூசி போடப்பட்டதா?

ஆம் இல் லை தெரியாது


UC
San Francisco
LIBRARY