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Comparison of Palestinian Immunization Adherence Rates for Refugee and Non-Refugee 2-Years Old Children

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Dedication

I would like to dedicate this work to my family, whom supported me in all phases of this thesis, particularly to my wife and to my daughters Abeer & Sarah & Romina whom help will not be forgotten.

Suleiman Ata Ghosheh

Chapter One

1.1 Introduction

Immunizations have proven to be one of the most cost-effective and successful public health initiatives of the last century, and are credited with being a major contributor to our increased life expectancy (MOH, 2005). However, Palestine continues to struggle with the problems of under-immunization and periodic resurgences of vaccine-preventable illnesses (MOH, 2005). Research has shown that under-immunized children are likely to be of low SES (MOH, 2004). While attention is often focused on children residing in remote villages when efforts are made to increase immunization rates, this study focuses on other risk factors and attempts to show that they may be just as, or even more influential in affecting immunization rates**.**

In 2004, the MOH report indicated that less than 80% of 2-year-old children had all of the recommended immunizations for their age (MOH, 2004). Children less than 2 years of age are the most susceptible to infectious diseases. However, there are no formal legislative mandates requiring complete immunizations at this age when children are most vulnerable to the devastating consequences of vaccine preventable diseases. With the National goal's being 95% of children having the recommended immunizations by age 2 (MOH, 2004), much work remains to be done.

In the last decade, the number of recommended immunizations for 2-year-olds has increased from ten to 16 (depending on the brand of vaccine used), and the type of vaccine used has also changed. For example, inactivated poliovirus vaccine by injection rather than the oral vaccine is now the standard. So, in addition to more vaccines, all of them are now administered by injection. There is concern that the increased number of injections is a factor in some parents' reluctance to, and/or procrastination in, having their children immunized (Swingle, 2000).

There is also concern that the tremendous success of immunizations in eliminating many of the threats of serious infectious diseases in young children may actually decrease parents' understanding of the importance of vaccines. Because many of today's young parents have never had personal experience with vaccine-preventable illnesses, they may have more fear of the vaccines than of the illnesses they prevent (Gellin, Maibach, & Marcuse, 2000). Childhood immunization is a safe and effective way to prevent many infectious diseases and their consequences. Immunizations have important financial benefits and improve children's quality of life. Examples of quality and cost-benefit issues include: One in 19 children who get mumps may develop meningitis or encephalitis; a child with chicken pox misses 8 or 9 days of school, which results in parents missing work; of 100 people infected with diptheria, 5-10 will die; 3 of 10 people who get tetanus die; half of the children who get pertussis have to be hospitalized (National Committee for Quality Assurance, 2001).

In considering the many factors that can and do influence immunization rates, careful

attention must be focused on the underlying cultural aspects of care-seeking behaviors. It may be too easy to attribute the lack of immunization adherence to Israeli occupation (MOH, 2005), rather than looking at the myriad of factors that may be involved.

1.2 Problem Statement

The availability of immunizations in Palestine is virtually universal. Cost is no longer a major factor since the inception of the EPI Program, which provides free vaccine to children whose parents do not have insurance coverage or other means to pay for vaccine. Many studies and initiatives have focused on vaccine availability, access, and parental compliance, and have resulted in many innovative programs to increase the number of children receiving complete and timely vaccinations (MARAM, 2004). Yet, children continue to contract vaccine-preventable illnesses because they, and others with whom they come in contact, are not fully immunized. In addition, there is a direct correlation between childhood immunization rates and the adequacy of pediatric health care in general. Under-immunized children typically have fewer preventive health care visits, making them less likely to be screened for developmental problems, anemia, sensory deficits, and signs of chronic medical conditions and special needs.

The on-going public education campaigns, special clinics and other efforts to increase the availability of and access to immunizations have, no doubt, increased the numbers of immunized children. However, as reported by MARAM, (2004) children remain unprotected and at risk for serious, debilitating, costly and potentially lethal illnesses. This is unacceptable.

1.3 Problem Significant

Efforts to increase the numbers of immunized children consume a large amount of public health resources. Factors influencing immunization programs include cutbacks in Ministry of Health budget. Given the National economic climate, if resources allocated for public and child health programs decrease, it is increasingly important to concentrate efforts on programs and populations that will render the greatest return in increasing the rates of childhood immunization and decreasing the incidence of vaccine-preventable illnesses. Knowledge of the risk factors for inadequate immunization must be included in strategies to increase rates.

Although health officials in Palestine consider the effects of many cultural influences on the immunization status of children (MARAM. 2004), there may be other factors that are not considered.

It is possible that the redirection of some of the efforts to increase immunizations may result in significantly greater numbers of protected children. Efforts must not only be focused on refugee children, all of whom are now in UNRWA medical care programs with excellent access to care. This may well be the cultural group that includes a significant number of under-immunized children. If one initiative or cultural

consideration that prevents a single death from meningitis, measles or any vaccine-preventable illness in a child can be identified, the effort is worthwhile.

The role of nurses as leaders in the effort to immunize children is well documented. As the level of health care providers with the largest numbers and as the first health care provider with whom parents and children come in contact, nurses are vital to the immunization effort (American Nurses' Association, 1994). Nurses must continue their leadership roles in the effective and efficient delivery of vaccine to children. All nurses must continue efforts in the education of parents and of other vaccine providers regarding the schedule of vaccinations and the necessity for on time, complete immunization of all children. And, they must collaborate with public health agencies, schools, social service programs, and others in the development of innovative strategies to eliminate barriers and to develop policies and programs to assure that all children are immunized.

1.4 Purpose of the Study **(Overall objective)**

The purpose of this study is to compare the rate of adherence to recommended vaccine schedules between refugee and non-refugee 2-year-old children in the West Bank and Gaza. Data are needed to show the degree to which non-refugee children contribute to immunization non-adherence. The study will also identify cultural influences which may affect immunization rates.

1.5 Research Questions (**specific objectives)**

The following research questions will direct this study:

1. What are the demographic characteristics of the children from which data will be obtained for this study?
2. Are there differences in immunization adherence for refugee and non-refugee 2-year-old children in the West bank and Gaza?

1.6 Hypothesis

Refugee is not a primary influence of immunization non-adherence for 2-year-olds in the West Bank and Gaza. Therefore, strategies to improve immunization adherence in this area should be directed to populations other than, or in addition to, the refugee, in order to reach the largest number of children in need of immunizations.

1.7 Operational Definitions

Some of the terms utilized in this study have definitions unique to this effort. Those definitions are provided in the following section.

Refugee : For the purpose of this study, children who receive UNRWA medical care benefits, as determined by verification of their refugee identification number.

Non-refugee: Children who are not listed in the UNRWA Information System as current or previous recipients of Medical benefits.

Immunization adherence: Documentation in the child's medical record that all of the vaccines and doses (16 altogether) recommended by the MOH Immunization Practices for children who are less than 2 years old, have been received.

Two-year-old: A child who has reached the second birthday, but has not reached the third, as documented by the Birth Certificate or hospital birth record found in the child's medical record.

Demographic characteristics: For this study, these will include gender, residency, service provider, number of siblings and birth order, the mother's marital status, and whether or not she is employed outside the home.

1.8 Conceptual Framework

Nola Pender's (1996) Health Promotion Model was used to guide this study. Pender identified three areas for consideration: Individual characteristics and experiences, including prior related behavior and personal factors such as biological, psychological, and socio-cultural issues; behavior-specific cognitions and affect, which include perceived benefits, perceived barriers, perceived self-efficacy, activity-related affect, interpersonal influences, norms, support and models, and situational influences such as options, demand, and aesthetics; and behavioral outcomes including commitment to a plan of action and health-promoting behavior (Pender, 1996).

This model is well suited for a study of immunization adherence rates for 2-year-olds and cultural influences affecting the rates. Although the model was designed for use with adults and this study focuses on children, it is the action of adults, namely the parents/care-givers of children that directly affect immunization adherence. Pender (1996) advocated nursing intervention to reduce barriers to health care and overcome cultural influences that restrict access to care. She encouraged empowerment of individuals to value health and the benefits of health-promoting behaviors to such an extent that they are willing to overcome barriers to healthy behavior.

The Health Promotion Model should be used as a guide to new directions in health care. Dr. Pender pointed out that health care reform is, in actuality, a paradigm shift to health promotion and that health promotion and prevention must be central to the development of health care for the future (Pender, 1999). Using this model to guide a study of immunization adherence is an example of the practical use of a research model in the development of strategies to improve health-promoting behaviors. While the study cannot incorporate all aspects of the model, interpersonal influences and immediate competing demands will be targeted as keys to immunization adherence.

1.9 Assumptions

For the purposes of this study, the following assumptions are presented:

1. All parents want their children protected from preventable illnesses.
2. Cost of the vaccine and/or administration of vaccine are not barriers to immunization adherence in the West Bank and Gaza.
3. Health care providers have the ability to help reduce the number of children who get ill from vaccine-preventable illnesses with interventions to change the behavior of their parents or caregivers.

1.10 Limitations of the study

- This study evaluates the situation at a particular time; it must be recognized that services could be influenced by time, circumstances and so on. Field studies also are subject to problems of ambiguity and biases, which can positively or negatively influence the conclusions drawn from the data.

1.11 Summary

Immunizations are one of the most valuable services available for health promotion and illness prevention in young children. Yet, many children remain under-immunized and susceptible to serious, potentially lethal illnesses. Children must depend on their parents/caregivers to make obtaining immunizations a priority. This study, using Pender's (1996) Health Promotion Model as a guide, seeks to show that non-refugee children, as a result of other cultural influences, play a significant role in the problem of immunization non-adherence in this area.

Chapter 2 provides a review of literature related to immunization adherence and research supportive of the use of Pender's (1996) Health Promotion Model as a framework for this study. It also provides an overview of the diseases for which immunization is required for 2-year-old children.

Chapter Two

Literature Review

This chapter provides a theoretical review of Nola Pender's (1996) Health Promotion Model as it relates to parents' obtaining immunizations for their children. It also provides a review of research studies utilizing theoretical concepts included in, and/or similar to, those in Pender's model. Additionally, a review of adherence as a concept and the variables influencing it, and a discussion of diseases for which immunization has been mandated are presented. Studies utilizing other conceptual frameworks, reports of unique immunization needs and practices, studies pertaining to adherence to medical regimens, and barriers to care are also presented in order to describe fully the body of knowledge related to the research questions.

2.1 Theory

Pender's Models

The Health Promotion Model published by Pender in 1987 and her Revised Health Promotion Model published in 1996 (Pender, 1996) help to explain the disease prevention and health promotion behaviors of individuals. The Health Promotion Model (HPM) provides a framework for personalizing immunization adherence practices. Pender's (1996) behavior-specific cognitions can be identified in studies of immunization adherence and reasons for non-adherence. These same behaviors can be applied to parents' behavior in seeking preventive services, including immunizations, for their children. The effect of indigence on these behaviors is examined by this study.

The HPM identifies and explains six behavior-specific cognitions and affects in the promotion of behavior change:

1. Perceived benefits of the action result in a mental image of positive consequences.
2. Perceived barriers to actions are real or imagined obstacles that reduce the commitment to a plan of action.
3. Perceived self-efficacy is the process of deciding one's ability to perform a certain task with a certain level of expertise.
4. Activity related affect is the subjective feeling one gets prior to, during and after a behavior.
5. Interpersonal influences are the effects of the attitudes and beliefs of other people.
6. Situational influences are the effects of considering options available and the features of the surroundings that affect a behavior (Neely, 2000).

Identifying the roles these factors play in parents' decisions regarding obtaining immunizations for their children can lend insight into adherence with recommended

vaccines and schedules. An example of the perceived benefits of the action resulting in a mental image of positive consequences is described by Gellin, Maibach, and Marcuse (2000) when respondents to their telephone survey spoke about immunizations keeping their healthy children from getting diseases from children who are not immunized.

Real and imagined obstacles reduce parents' ability to obtain immunizations for their children as described by Evers (2000), Wilson (2000), and Yawn et al., (2000). All describe issues such as transportation, competing tasks, past experiences, and the need for reminders as such obstacles.

Perceived self-efficacy in obtaining immunizations was indirectly included in the study by Evers (2000) in obtaining respondent's feelings regarding their responsibility to keep their children healthy. Parents who do not obtain needed immunizations were thought by other parents to be lazy and irresponsible. The same study described parents feeling positive and good about themselves when they did get their children immunized (Evers, 2000).

Interpersonal influences that affect immunization adherence include religious beliefs, negative past experiences, and inaccurate information. An example of such misinformation is parents thinking that if the child has any illness, immunization should be withheld until the child is completely well (Wilson, 2000).

Situational influences, including the barriers described previously, can be overcome by developing optional methods of service delivery. These may include instituting recall and reminder programs, providing incentives and rewards, and creating other means of changing negative influences into positive outcomes (Hillman et al., 1999; Houseman et al., 1997; Yawn et al., 2000).

2.2 UNRWA as a Key Service Provider

The United Nations Relief and Works Agency (UNRWA) was established on December 8th, 1949 as a result of the first Arab-Israeli conflict. The Agency, headquartered in Beirut at the time, became operational in May 1950 and began responding to the immediate humanitarian needs of about 880,000 Palestinian refugees. Since then the Agency has grown into the largest United Nations organization in the region, employing more than 22,000 staff members including teachers, health workers, social workers and other service providers to cover its missions in the fields of health, education, employment and social relief. The majority of the employees are Palestinian refugees. The agency operates about 900 facilities providing education, health, relief and social services for the growing population of refugee who are now more than 4 million in number.(Switzerland, Office of United Nations High Commissioner for Refugee, 1999).

Currently UNRWA operations are handled by 5 separate field offices located in Jordan, Syria, Lebanon, Gaza, and the West Bank. The agency headquarters are located in Gaza and Amman, having been relocated from Vienna. UNRWA is a subsidiary organization

of the United Nations (UN). (UNRWA, 2003).

2.3 Health Department

The mission of the UNRWA health program is to protect and promote the health status of Palestinian refugees and to meet their basic health needs. The agency's strategic approach is to provide quality primary health care and essential health services by using appropriate technology in order to reduce recurrent staff costs, enhancing the process of institutional capacity building in order to improve staff performance and to make optimal use of the limited financial and human resources available to the department. (United Nations Relief and Works Agency, 2003).

Since 1950 the WHO Eastern Mediterranean Regional Office (EMRO) and staff have been providing technical supervision to UNRWA's health care programme; WHO policies and technical advice from the WHO Director of Health are disseminated through the EMRO Commissioner General Director to the UNRWA clinics in the region, influencing their technical activities and overall health program.(Switzerland, WHO, 1987).

UNRWA provides Primary Health Care to registered refugees through 122 outpatient facilities offering outpatient medical care, disease prevention and control, mother and child health, family planning, and health education and promotion. The Agency's 34 primary health care facilities in the West Bank and Gaza have developed an effective programme of disease prevention and control, including vaccine-preventable diseases. Immunization services are an integral part of the comprehensive maternal and child health care program and all health center points follow the open door policy with respect to immunization so that essential vaccines are given or confirmed as having been received at every contact. (UNRWA,2001).

2.4 UNRWA Immunization Program

2.4.1: UNRWA Immunization Program West Bank:

UNRWA adapted the WHO program on immunization in its five fields of operation in the region in close coordination with the host countries. In the West Bank the UNRWA immunization program for children 0-24 months of age follows the immunization schedule shown below:

Table 2.1 Total Doses Required Per Antigen for Children 0-24 Months of Age

Antigen	Total # of Doses in the First Two Years of Life
BCG	1
Hepatitis B	3
IVP	2
DPT	4
OPV	4
Measles	1
MMR	1

The schedule shown in Tables 2.1 and 2.2 is the same vaccination schedule used by the host country (the Palestinian Authority) Ministry of Health.
UNRWA have a different immunization schedule in her five fields of operation, this is coordinated with the host country and UNICEF, in according to needs and budget.

Table 2.2 Immunization Schedule-West Bank(children below 2 years)

Age/category	Vaccine	Course	Dose	Route	Site
At Birth/first registration	BCG Hepatitis-B	Single Dose First dose	0.05ml 0.5 ml	Intradermal Intramuscular	Left upper arm Lateral aspect of thigh
1 month	Hepatitis-B IPV	Second dose First dose	0.5 ml 0.5 ml	Intramuscular Subcutaneous	Lateral aspect of thigh Left upper arm
2 months	DPT OPV IPV	First primary First primary Second dose	0.5nl 2 drops 0.5ml	Intramuscular Oral Subcutaneous	Lateral aspect of thigh Mouth Left upper arm
4 months	DPT OPV	Second dose Second dose	0.5 ml 2 drops	Intramuscular Oral	Lateral aspect of thigh Mouth
6 months	DPT OPV Hepatitis-B	Third primary Third primary Third dose	0.5 ml 2 drops 0.5 ml	Intramuscular Oral Intramuscular	Lateral aspect of thigh Mouth Lateral aspect of thigh
9 months	Measles	Single	0.5 ml	Subcutaneous	Left upper arm
12 months	DPT OPV	Booster Booster	0.5 ml 2 drops	Intramuscular Oral	Lateral aspect of thigh Mouth
15 months	MMR	Single	0.5 ml	Subcutaneous	Left upper arm

Table 2.3 Immunization Schedule for Children below 2 Years in Jordan.

Age\Category	Vaccine
At Birth\first registration	BCG OPV
2 Months	Hepatitis B+DPT OPV Hib
3 Months	Hepatitis B + DPT OPV Hib
4 Months	Hepatitis B+ DPT OPV Hib
9 Months	Measles
15 Months	DPT OPV MMR

2.4.2: UNRWA Immunizations in Jordan:

In Jordan The EPI program in Jordan reached routine immunization coverage of more than 95% in 1996. Mainly due to an adverse event that occurred during a school vaccination campaign with Td, immunization coverage figures decreased and remained less than 90% up to 1999. In 2000, Jordan reported coverage of 91% with DPT3, 94% with OPV3, 92% with measles and 93% with HBV3. The EPI program made a lot of achievements especially in measles and neonatal tetanus elimination and in new vaccines introduction.

A nationwide measles catch-up campaign was successfully conducted in two rounds (1997-99). This has resulted in an important decrease in measles confirmed cases from around 400 cases reported annually since 1994 (except the outbreak registered in 1997 with 7026 cases) to only 115 cases in 1999 and 32 cases in 2000.Hib vaccine was recently introduced in the routine EPI,this is why this vaccine is in UNRWA schedule too.(VPDs,2004).

As we notice the UNRWA immunization schedule in Jordan differ from that of the west bank by the antigen given which are 18 antigen while in the west bank field they are only 16. In Jordan Hib antigen is included and is given twice in the third and fourth month of age. OPV which is given in the west bank at 2 months is given in Jordan at Birth or at first registration.

2.4.3: Immunization program in Israel.

In Israel a state with large resources, and enough funding to the health system, better program exist, with more antigens, and modifications up-to-date.
Israel used to coordinate specially the immunization program with the Palestinian authority; steps are chronolized in cases of outbreaks.

Table 2.4 Immunization Schedule for Children below 2 Years in Israel

Age	HBV	DTaP IPV+Hib	DTaP Hib	Polio Sabin	MMR	HAV	VARILIRIX
At Birth	*						
1 Month	*						
2 Months		*					
4 Months		*		*			
6 Months	*		*	*			
1 Year		*		*	*		
18 Months							*
24 Months							*

In Israel only 13 antigens are included in immunization of children till 2 years of age but it differs from those given in UNRWA clinics whether in the west bank or Jordan field by that it includes:

1) Immunization against Hepatitis A given in two doses at 18 and 24 months of age.
2) Immunization against Varecilla given at 12 months of age
3) The immunization schedule includes vaccinations with 5 antigens together at 2,4 and 1 year and immunization with 4 antigens at six months of age

Countries of the eastern Mediterranean region and UNRWA are committed to achieving the goal of measles elimination by the year 2010. Major steps towards achievement of this target include conducting catch up measles immunization campaigns, and achieving improvements in routine measles and rubella immunization and in laboratory-confirmed surveillance programs for every case of "rash and fever" (suspected measles/rubella). (UNRWA, Child Rights, 2005).

Table 2.5 Coverage rate for Mediterranean region 2004 (EMRO report 2004).

Category	%	Year
Infants attended by trained personnel (%)	99	1998
Infants fully immunized with BCG (%)	58	2004
Infants fully immunized with DPT (%)	95	2004
Infants fully immunized with OPV (%)	95	2004
Infants fully immunized with measles vaccine (%)	21	2004
Infants fully immunized with Hepatitis B vaccine (%)	95	2004

Numbers shown in the table up for the Mediterranean region show low coverage for measles, which is for concern, while it is better in the West bank and Gaza according to the EMRO report for the year 2004.

Table 2.6 Immunization coverage in West Bank and Gaza (EMRO Report 2003).

Category	%	**Year**
Infants attended by trained personnel (%)	95	2003
Infants fully immunized with BCG (%)	100	2003
Infants fully immunized with DPT (%)	98	2003
Infants fully immunized with OPV (%)	98	2003
Infants fully immunized with measles vaccine (%)	36	2003
Infants fully immunized with Hepatitis B vaccine (%)	98	2003

Again the worst immunization coverage is noticed for the measles with only 36%, and only BCG have 100% coverage because it is given at birth.

According to CDC data for 2002,the percentage of deaths from vaccine preventable disease is still very high, especially from Pneumococcal and Measles and represent about 50% of VPDs.

Immunization is among the most successful and cost-effective public health interventions Immunization programs have led to eradication of smallpox, elimination of measles and poliomyelitis in regions of the world, and substantial reductions in the morbidity and mortality attributed to diphtheria, tetanus, and pertussis. The World Health Organization (WHO) estimates that 2 million child deaths were prevented by vaccinations in 2003. Nonetheless, more deaths can be prevented through optimal use of currently existing vaccines.(Vaccine preventable Deaths and the global immunization Vision and strategy 2006).

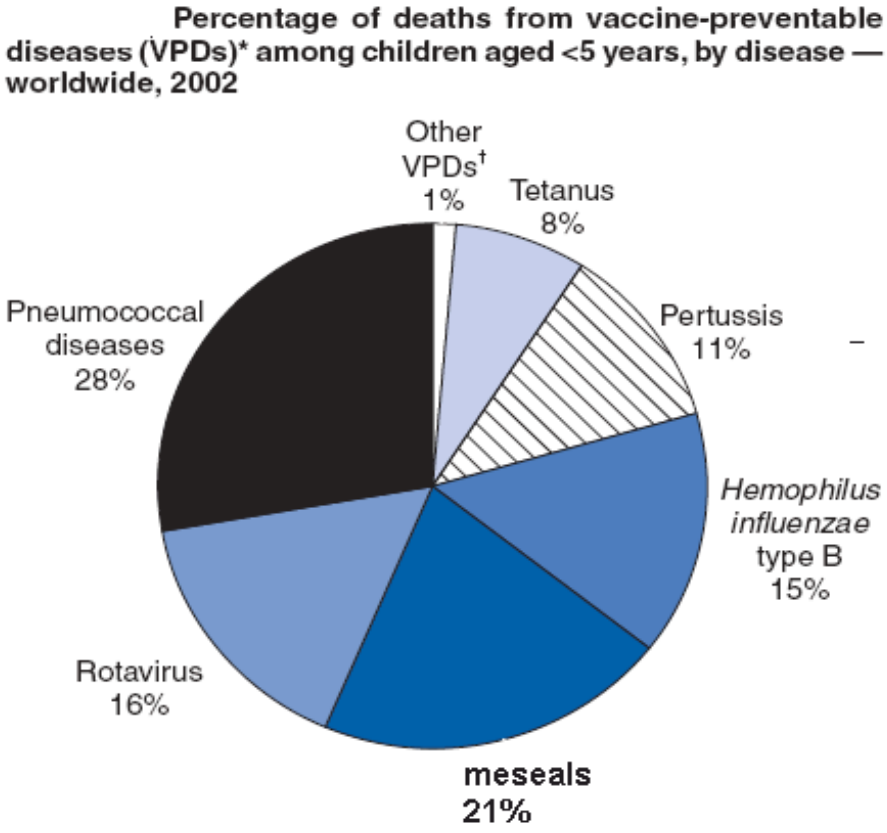


Figure 2.1 Percentage of deaths from vaccine-preventable diseases (Pfeifer M.2003)

UNRWA is still the second most frequently accessed health provider in the West Bank and the first for the Palestinian refugee population, resulting in an increasing demand on services, and a high average workload of around 100 medical consultations per physician per day. UNRWA provides assistance to Palestinian registered refugees by reimbursing the costs of their referral care at the contracted hospital in each of its 3 areas of operation -- the south (Hebron), north (Nablus) and middle (Jerusalem and Jericho).

Immunization is a process used to initiate or augment resistance to infectious diseases. The ultimate goal is to prevent, and in some cases eradicate, potentially serious, life-threatening diseases. Immunity against a variety of bacterial and viral agents can be induced either actively or passively.

2.5 Immunity

Active immunity is induced by using inactive or attenuated live organisms or their products. Live attenuated vaccines include those for poliomyelitis (OPV), measles, mumps and rubella, and BCG vaccine. (Eddelston and Pierni, 1999).

Bacterial and viral vaccines such as whooping cough, typhoid and inactivated poliomyelitis (IPV) vaccines contain inactivated organisms. Others such as influenza and pneumoccoal vaccine contain immunizing components of the organisms; tetanus and diphtheria vaccines contain toxoid that is, toxins inactivated by treatment with formaldehyde. (Hay and Hayward, 2001).

Most vaccines produce their protective effect by stimulating the production of antibodies which are detectable in the serum by laboratory tests. BCG vaccine promotes cell-mediated immunity which is demonstrated by a positive tuberculin skin test. A first injection of inactivated vaccine or toxoid in a subject who has not had prior exposure to the antigen produces a slow antibody or antitoxin response of predominantly IgM antibody- primary response. Two injections may be needed to produce such a response. Depending on the potency of the product and time interval, a further injection will lead to an accelerated response in which the antibody or antitoxin titer (IgG) rises to a higher level, known as the secondary response. Following a full course, the antibody or antitoxin levels will remain high for months or years. But even if the level of detectable antibody falls, the immune mechanism has been sensitized and a further dose of vaccine reinforces immunity. (Beniton, 1979).

Some inactivated vaccines contain adjuvant, substances which enhance the antibody response. Examples are aluminum phosphate and aluminum hydroxide, which are contained in adsorbed diphtheria/tetanus/pertussis vaccine, and adsorbed diphtheria/tetanus vaccine.

Live attenuated virus vaccines such as measles, rubella and mumps promote a full, long-lasting antibody response after one dose. Live poliomyelitis vaccine (OPV) requires three doses. An important additional effect of poliomyelitis vaccine is the establishment of

local immunity in the intestine.(National committee for Quality Assurance,1993).

Passive immunity: results from the injection of human immunoglobulin; the protection afforded is immediate but lasts only for a few weeks. There are 2 types:

- Human normal immunoglobulin (HNIG): derived from the pooled plasma of donors and containing antibody to viruses which are currently prevalent in the general population

- Specific immunoglobulin for tetanus, hepatitis B, rabies, and varicella/zoster: obtained from the pooled blood of convalescent patients and donors recently immunized with the relevant vaccine. Each such immunoglobulin therefore contains antibody at a higher titer than that present in normal immunoglobulin. (Ghaffar, 2003).

Immunization (vaccination): Vaccines are harmless agents that the body perceives as enemies. They are molecules, usually but not necessarily proteins, that elicit an immune response and provide protective immunity against a potential pathogen. Immunity to a virus normally depends on the development of an immune response to antigens on the surface of a virally infected cell or on the surface of the virus particle itself. There may be more than one surface glycoprotein on a virus and one of these may be more important in the protective immune response than the others; this antigen must be identified for a logical vaccine that blocks infectivity.

In order to develop a successful vaccine, certain characteristics of the viral infection must be known. One of these is the site at which the virus enters the body. (Immunization Against Infectious Diseases, 1992).

1) Infection via mucosal surfaces of the respiratory tract and gastro-intestinal tract.
2) Infection via mucosal surfaces followed by systemic spread via the blood and/or neurons to target organs. Virus families in this group are: measles virus; mumps virus; herpes simplex virus; varicella virus; and hepatitis A and B viruses.
3) Infection via needles or insect bites, followed by spread to target organs, like hepatitis B virus.

Four different types of vaccines are currently available:

- Attenuated (weakened) vaccines contain live virus; examples include the measles, mumps, and rubella (MMR) vaccine and varicella (chicken pox) vaccine. These vaccines last longer than other vaccines, but many cause serious infections in people with compromised immune systems.
- Killed (inactivated) vaccines involve killed (inactivated) viruses or bacteria; for example, the influenza vaccine uses killed virus. These vaccines are safe, even in people with compromised immune systems.
- Toxoid vaccines contain a toxin produced by the bacterium or virus. For example, the diphtheria and tetanus vaccines are actually toxoids

♦ Biosynthetic vaccines contain synthetic (man-made) substances which appear to be antigens to the immune system. For example, the Hib (Haemophilus influenza type B) conjugate vaccine is a biosynthetic vaccine. (Polnay and Hull, 1985).

There are many problems inherent in developing a good protective anti-viral vaccine. Among these are:

- Different types of virus may cause similar diseases--e.g. common cold
- Antigenic drift and shift -- This is especially true of RNA viruses
- Large animal reservoirs. If these occur, reinfection after elimination from the human population may occur.
- Recombination and mutation of the vaccine virus in an attenuated vaccine.

Despite these problems, anti-viral vaccines have, in some cases, been spectacularly successful, even in some cases leading to the elimination of the disease from the human population. (Ghaffar,2003).

Attenuated vaccines have many advantages and disadvantages.

Advantages

- They activate all phases of the immune system and they elicit humoral IgG and local IgA
- They raise an immune response to all protective antigens. Inactivation, such as by formaldehyde in the case of the Salk vaccine, may alter antigenicity
- They offer more durable immunity and are more cross-reactive.
- They cost less to produce
- They give quick immunity in the majority of vaccines
- In the cases of polio and adenovirus vaccines, administration is easy
- They are easy to transport
- They can lead to elimination of wild type virus from the community

Disadvantages

- Mutation of the virus; this may lead to reversion to virulence (this is a major disadvantage)
- Spread to contacts of vaccine that have not consented to be vaccinated Virus from the attenuated vaccine itself can be spread to un-immunized children who come in contact with recently immunized children. Although this can result in more cases of disease, since the vaccine virus is usually less serious than the wild virus, the natural immunities that develop in those who contract the virus from the vaccine can be an advantage in communities where immunization coverage is not 100 %.)
- Vaccine virus can mutate and spread, resulting in circulation of virus that is less susceptible to vaccine.
- Live viruses are a problem in patients with immunodeficiency disease (Orenstein, 2000).

Inactivated vaccines also have many advantages and disadvantages.

Advantages

- They give sufficient humoral immunity if boosters are given
- There is no mutation or reversion (This is a big advantage)
- They can be used with immuno-compromised patients
- Sometimes they perform better in tropical areas

Disadvantages

- Some vaccines do not raise immunity
- Boosters tend to be needed
- There is little mucosal / local immunity (IgA)
- They are more expensive (Polnay and Hull, 1985).

2.6 Vaccine-preventable Diseases

2.6.1: Tuberculosis (BCG)

Human tuberculosis is caused by infection with mycobacterium tuberculosis or mycobacterium bovis and may affect any part of the body, including the brain, the kidneys and the bones; but most commonly it affects the lungs (Pulmonary Tuberculosis). The infection is typically acquired through aerosol spread by coughing or sneezing; such transmission is only likely when the index case is sputum smear-positive for the bacillus. The primary stage of the disease may be symptom-free, or the individual may experience a flu-like illness. In the secondary stage, called active disease, there might be a slight fever, night sweats, weight loss, fatigue and various other symptoms, depending on the part of the body affected. Tuberculosis of the lung is usually associated with a dry cough that eventually leads to a productive cough with blood-stained sputum. There might also be chest pain and shortness of breath. This secondary stage, if affecting the lungs, is the contagious stage when the bacteria can be spread to others.(Core curriculum, 1994).

Tuberculosis is on the rise and is revisiting both the developed and developing world. Globally, it is the leading cause of deaths resulting from a single infectious disease. Currently, it kills three million people a year and, if the present trend continues, it is likely to claim more than 30 million lives within the next decade. Recent increases in migration have rapidly mixed infected with uninfected communities and contributed to the spread of the disease. (Chaisson and Slutkin, 1989).

BCG vaccine

- It is freeze-dried live attenuated *Mycobacterium* bovis.
- It confers good immunity in children against the more severe forms of TB such as meningitis and military TB.

- The diluents and the vaccine must be stored cold in the main compartment of the refrigerator.
- After reconstitution, the vaccine is easily damaged by sunlight or heat.
- It should not be shaken after reconstitution, as shaking damages the vaccine
- Proper mixing of BCG vaccine should be done whenever a dose is drawn in order to ensure proper dosing of vaccine and avoid side effects: draw the reconstituted vaccine slowly into the syringe and inject it slowly back into the ampoule or vial. Then inject it to the upper part of the left arm.
- The vial of reconstituted vaccine should be discarded at the end of the immunization session
- There is no need to repeat BCG vaccination if no scar develops
- There is no need for tuberculin testing before giving BCG.

BCG vaccine should not be given to subjects who are:

- Receiving corticosteroid or other immunosuppressive treatment.
- Suffering from a malignant condition such as lymphoma, leukemia, or other tumor of the reticuloenothelial system
- Who are HIV positive
- With pyrexia.(United States, CDC, Core Curriculum, 2001).

False contraindications for immunization may include allergy, asthma, and hay fever. Prematurity or small-size-for-gestational-age, malnutrition, a history of jaundice after birth, or a family history of convulsions.

About 2 weeks after immunization a small tender red swelling appears at the vaccination site which may ulcerate and become a scar. Keloid formation at the injection site is a not uncommon, but largely avoidable complication of BCG immunization, injection of the vaccine in the deltoid muscle near the middle of the upper arm may have lower risk of keloid formation.

BCG immunizations are to be given at birth or at first registration as a single dose of 0.05 intradermal.(United Nations Relief and Works Agency, Technical Instruction,2001).

2.6.2: Poliomyelitis: OPV, IPV

Poliomyelitis is an acute illness following invasion of the gastro-intestinal tract by one of the three types of polio virus (1, 2 and 3). The virus has a high affinity for nervous tissue and the primary changes occur in neurons. The infection may be clinically unapparent, or range in severity from a non-paralytic fever to aseptic meningitis or paralysis. Symptoms include headache, gastro-intestinal disturbance, malaise and stiffness of the neck and back, with or without paralysis. The incubation period ranges from three to 21 days, and cases are most infectious from seven to ten days before and after the onset of symptoms; virus may be shed in the faeces for up to six weeks or longer. (Ghaffar, 2003).

There are two types of polio vaccine, both of which were developed in the 1950s. The

first, developed by Jonas Salk, is a formalin-killed preparation of normal wild type polio virus. This is grown in monkey kidney cells and the vaccine is given by injection. It elicits good humoral (IgG) immunity and prevents transport of the virus to the neurons where it would otherwise cause paralytic polio. A second vaccine developed by Albert Sabin is a live viral vaccine that was produced empirically by serial passage of the virus in cell culture. It replicates a normal infection since the virus actually grows in the vaccine and it elicits both humoral and cell-mediated immunity. It is given orally, a route that is taken by the virus in a normal infection since the virus is passed from human to human by the oral-fecal route. The immunity that results from the Sabin vaccine lasts much longer that that of the Salk vaccine, making fewer boosters necessary. The Sabin vaccine has the potential to wipe out wild type virus whereas the Salk vaccine only stops the wild type virus getting to the neurons -- it is still replicated in the human gut.(Beniton ,1979).

OPV is composed of the three types of live/attenuated poliomyelitis virus. It is damaged very easily by heat and light and it confers both intestinal and systemic immunity. The neonatal OPV dose is given during the first month after birth. The interval between this dose and the next OPV is at least three weeks, with two drops of OPV given orally at two months, four months six months and twelve months.

IPV, a trivalent killed poliomyelitis virus vaccine that confers systemic immunity, is given subcutaneously in the left upper arm in two 0.5 ml doses at first registration (at one month) and one month after that. It is used in combination with OPV to reduce the risk of vaccine-related paralysis. IPV is less sensitive to heat and light than OPV. Moderate fever and mild erythematous reaction at the site of injection maybe observed. (Medecies Sans Frontiers, 1997).

Contraindications include acute or febrile illness, vomiting or diarrhea, which should prompt a postponement of immunization, malignant conditions, treatment with corticosteroids and radiation therapy.(Beniton ,1979).

2.6.3: Hepatitis B (HBV)

Hepatitis B is transmitted parenterally. Transmission most commonly occurs as a result of blood to blood contact, including injury with contaminated sharp instruments and sharing of needles by intravenous drug abusers, following vaginal or anal intercourse or by prenatal transmission from mother to child. Transmission has also rarely followed bites from infected persons. Transfusion-associated infection is now rare as treatment of blood products has eliminated these as a source of infection.(Ghaffar,2003).

The illness usually has an insidious onset with anorexia, vague abdominal discomfort, nausea and vomiting, sometimes arthralgia and rash which often progresses to jaundice. Fever may be absent or mild. The severity of the disease ranges from apparent infections, which can only be detected by liver function tests and or the presence of serological markers of acute HBV infection (e.g. HBsAg, anti HBc IgM), to fulminating fatal cases of acute hepatic necrosis. Among cases admitted to hospital the fatality rate is about 1%.

The average incubation period is 40-160 days but occasionally can be as long as nine months.(The Blue Book,2005).

About 2-10 of those infected as adults become chronic carriers of the hepatitis B virus with hepatitis B surface antigen (HBsAg) persisting for longer than 6 months. Those infected as children more frequently become chronic carriers than those infected as adults, and 90% of those infected parenterally become chronic carriers.

A proportion of antigen carriers develop chronic hepatitis. Sometimes there is impairment of liver function tests; biopsy findings range from normal to active hepatitis with or without cirrhosis. The prognosis of the liver disease in such individuals is at present uncertain, but it is known that some will develop hepatocellular carcinoma. (Berham and Vanghan, 1987).

Hepatitis B vaccine contains hepatitis B surface antigen (HBsAg) adsorbed on aluminum hydroxide adjuvant. An antibody level of 100 miu/ml is generally considered to be protective. Antibody titers should be checked two to four months after completion of a full course (3 doses) of HBV. Poor responders (anti-HBs 10-100) and non responders (less than 10) should be considered for a booster dose or, possibly for a repeat course of vaccine. The duration of antibody persistence is not known precisely. At present it is felt that individuals who continue to be at risk of infection should receive a booster dose three to five years after the primary course, and it is important to recognize that immunization against hepatitis B must not encourage relaxation of good infection control procedures. Babies born to mothers who are HBeAg positive, who are HBsAg positive without markers, or who have had acute hepatitis B during pregnancy should receive HBIG as well as active immunization. Health care personnel who have direct contact with blood or blood-stained body fluids such as doctors, surgeons, dentists, nurses, midwives and dayas should receive the vaccine. Contraindications include febrile infections and pregnancy, which can result in severe disease for the mother and chronic infection in the newborn. Soreness and redness to local pigmentation changes may occur after injection, and in some cases influenza-like syndromes, arthritis, arthralgia, and abnormal liver function tests.(Immunization Against Infectious Diseases, 1992).

HBV efficacy is high if the first dose is given to an infant as soon after delivery as possible; the second and third doses are given at one month and six months of age. Each dose is a 0.5ml injection given intramuscularly at the lateral aspect of thigh. (United Nations Relief and Works Agency, 2001).

2.6.4: Diphtheria/Pertussis/Tetanus (DPT)

- Diphtheria is an acute infectious disease affecting the upper respiratory tract and occasionally the skin. It is characterized by inflammatory exudates that form a grayish membrane in the respiratory tract which may cause obstruction. The incubation period is from two to five days. The disease is communicable for up to four weeks, but carriers may shed organisms for longer. A toxin is produced with diphtheria bacilli which affect in particular the myocardium, nervous and adrenal tissues. The disease is spread through

contact with droplets and/or with articles soiled by infected persons (fomites). (Hay and Hayward, 2001).

- Pertussis is a highly infectious bacterial disease caused by bordetella pertussis and spread by droplet infection, with an incubation period of seven to ten days. A case is infectious from seven days after exposure to three weeks after the onset of typical paroxysms. The initial catarrhal stage has an insidious onset and is the most infectious period. An irritating cough gradually becomes paroxysmal, usually within one to two weeks, and often lasts for two to three months. In young infants the typical "whoop" may never develop and coughing spasms may be followed by periods of apnea. Pertussis may be complicated by bronchopneumonia, repeated post-tussive vomiting leading to weight loss, and by cerebral hypoxia with a resulting risk of brain damage. Severe complications and deaths occur most commonly in infants under six months of age.(Switzerland,WHO,1986).

- Tetanus is an acute disease characterized by muscular rigidity with superimposed agonizing contractions. It is induced by the toxin of anaerobic tetanus bacilli which grow at the site of an injury. The incubation period, typically ten days in duration, can last from four to 21 days. Tetanus spores are present in soil and may be introduced into the body during injury, often through a puncture wound, or through burns or trivial, unnoticed wounds. Neonatal tetanus due to infection of the baby's umbilical stump is a significant cause of death in many countries of the third world. Tetanus is not spread from person to person. The elderly are at highest risk, with women being at greater risk than men.(Beniton, 1979).

- DPT vaccine: the diphtheria component is a toxoid which is highly stable in high temperatures but is easily damaged by freezing. The potency of the bacteria component in Td vaccine (a vaccine for adults that combines tetanus toxoid and a lower dose of diphtheria vaccine than is found in the DT vaccine for children) is around one-fifth of the potency of the diphtheria component in DPT or DT. The tetanus component is a toxoid which is easily damaged by freezing.(Berham and Vanghan,1987).

The pertussis component is killed whole cell pertussis bacteria. It is the most easily damaged part of DPT, and is susceptible to heat. It is effective in preventing serious illness but does not protect completely against infections with the organism. Pertussis vaccine should not be given to children with a history of convulsions. (*National Vaccine Advisory Committee. 1999*) Four 0.5 ml. doses of DPT are given intramuscularly at the lateral aspect of the thigh at ages two months, four months, six months, and twelve months. (Wiliams and Dajda, 1980).

Adverse reactions include swelling and redness at the injection site, crying, screaming and fever may occur. More severe neurological conditions including encephalopathy and prolonged convulsions resulting in permanent brain damage or death have been reported.(Christopher and Cynthia, 1991).

2.6.5: Measles, Mumps, Rubella (MMR)

Measles, mumps and rubella are all spread primarily via the aerosol route. Measles and mumps viruses belong to the Paramyxovirus family and are enveloped, non-segmented, negative-sense RNA viruses with helical symmetry.(Philip, 2003).

- Measles (Rubeola): The word measles is derived from the German word for blister. Infection occurs via an aerosol route and the virus is very contagious. It replicates initially in the upper and lower respiratory tract, followed by replication in lymphoid tissues leading to viremia and growth in a variety of epithelial sites. The disease develops one to two weeks after infection. Uncomplicated disease is characterized by: Fever (38 C or above); respiratory tract symptoms such as a running nose (coryza) and cough; conjunctivitis; and/or Koplik's spots on the mucosal membranes small (1 to 3mm), irregular, bright red spots, with bluish-white specks at the centers. The patient may get an enormous number of blisters and red areas may develop into a confluent Maculopapular rash which extends from the face to the extremities. This seems to be associated with T-cells targeting infected endothelial cells in small blood vessels (Switzerland, WHO, 1986).

The infection is prostrating but recovery is usually rapid. The peak of infectiousness occurs before the onset of obvious symptoms (e.g. Koplik's spots, rash). Measles tends to be more severe in adults and the very young (under 5 years of age) and less severe in older children and teenagers.
If a patient has an impaired cell-mediated immune response, there is continued growth of the virus in the lungs leading to giant cell pneumonia (such patients may not have a rash). This is rare, but often fatal. The reason for the giant cells is that since F protein can function at physiological pH, it can facilitate cell-cell fusion. Since the virus grows in the epithelia of the nasopharynx, middle ear and lung, all of these sites may then be susceptible to secondary bacterial infection. Otitis media and bacterial pneumonia are quite common. The outcome of the disease is affected by the patient's nutritional status and access to medical care. Measles is still a major killer in underdeveloped countries, especially in areas with severe vitamin A deficiency. Treating sick children with Vitamin A has resulted in some reduction in morbidity and mortality. Pneumonia accounts for 60% of deaths from measles. Clinical aspects of measles include pneumonia (life threatening), otitis media, oral mucosa spots (kopliks) potentially progressing to severe ulcerating lesions, conjunctivitis, and maculopapular rash to hemorrhage (black measles).(United States,CDC,Epidemiology,2001).
Measles illness during pregnancy leads to increased rates of premature labor, spontaneous abortion, and low birth weight among affected infants (2-5). Birth defects, with no definable pattern of malformation, have been reported among infants born to women infected with measles during pregnancy, but measles infection has not been confirmed as the cause of the malformations

Mumps: The name comes from the British word "to mump," that is to grimace or grin – the appearance of grimacing or grinning in mumps patients results from parotid gland swelling although other agents can also cause parotitis. Clinically, mumps is usually

defined as acute unilateral or bilateral parotid gland swelling that lasts for more than two days with no other apparent cause.(Lewkowicz,1989).

Mumps is caused by a Paramyxovirus. There is one serotype of the virus and in an affected patient it can be found in most body fluids including cerebro-spinal fluid, saliva, urine and blood. Mumps is very contagious and is usually acquired from respiratory secretions and saliva via aerosols or formites. The virus is secreted in urine and so urine is a possible source of infection. It is found equally in males and females. The virus infects the upper and lower respiratory tract leading to local replication. The virus spreads to lymphoid tissue which, in turn, leads to viremia. The virus thus spreads to a variety of sites including the salivary and other glands and other body sites (including the meninges). The average time to full manifestation of disease is 2 - 3 weeks but fever, anorexia, malaise, and/or myalgia may occur during the prodromal phase.(Walters and Richard,2000).

The symptoms of mumps include:
Fever, parotitis: Pain from parotitis swelling persists for 7 - 10 days. This is the most common feature of mumps and is seen in about 40 of patients. It may be unilateral or bilateral depending on which salivary glands are infected by the virus.
Meningitis: Aseptic meningitis is usually mild, and affects about three times more males than females. In symptomatic meningitis the patient experiences stiffness of the neck and a headache which usually resolves in up to 10 days with no further problems. Mumps-related meningitis is more severe in adults. In very rare cases mumps can result in encephalitis.
Deafness: Mumps was a leading cause of acquired deafness before the advent of mumps vaccine. It is usually unilateral. Deafness may improve with time but is usually permanent.
Orchitis (testicular inflammation): This is especially severe in adolescent and adult males and occurs in about 50% of cases, sometimes occurring along with parotitis. The painful swelling diminishes after about seven days but tenderness can last for weeks. In 70% of cases, orchitis is unilateral and results in some degree of testicular atrophy. Damage tends to be patchy and rarely causes infertility.
Pancreatitis: Pancreatitis with transient hyperglycemia that resolves is an infrequent side effect of mumps.
Myocarditis: Myocarditis is observed from electrocardiograms in a minority of patients but is usually otherwise asymptomatic.
Rare complications: These include nephritis, arthralgia (joint pain) and arthritis (joint inflammation).(Hay and Hayward,2001).

- Rubella: Rubella is a mild infectious disease, most common among children four to nine years of age. It causes a transient erythematous rash; lymphadenopathy involving the post-auricular and sub-occipital glands; and occasionally in adults, arthritis and arthragia. Clinical diagnosis is unreliable since the symptoms are often fleeting and can be caused by other viruses; in particular the rash is not a diagnostic sign of rubella. A history of rubella should therefore not be accepted without serological evidence of previous infection. The incubation period is 14-21 days and the period of infectivity is from 1

week before until four days after the onset of a rash. Maternal rubella infection in the first eight to ten weeks of pregnancy results in fetal damage in up 90% of infants and multiple defects are common in the Congenital Rubella Syndrome (CRS). The risk of damage declines to about 10-20% by 16 weeks gestation; after this stage of pregnancy fetal damage is rare. Fetal defects include mental handicap, cataract, deafness, cardiac abnormalities, intrauterine growth retardation, and inflammatory lesions of the brain, liver, lungs, and bone marrow. The only defects which commonly occur alone are perceptive deafness and pigmentary retinopathy following infection after the birth but perceptive deafness may be detected later.(Rubella: A medical Dictionary,2004).

The measles, mumps and rubella (MMR) vaccine has been around for nearly 30 years, and is now used in over 90 countries to control major childhood diseases. Measles is responsible for approximately one-third of the estimated 1.4 million deaths every year due to vaccine-preventable childhood diseases.

An immunization campaign against measles, mumps and rubella was launched on 5 May for 1.2 million children and young people in the West Bank and Gaza strip.

- MMR vaccine: The vaccine is made from a combination of live attenuated measles, mumps and rubella viruses, it was introduced in 1993 , this vaccine must be reconstituted with the appropriate diluent's; once reconstituted the vaccine loses its potency very quickly and must be used in the same immunization session. The vaccine must be protected from the light at all times even after being reconstituted.(Berham and Vanghan,1987).

- The MMR vaccine is given as a single 0.5 ml. dose injected subcutaneously in the upper left arm at 15 months of age, while the measles vaccine is given at 9 months of age. Mild fever, running nose, and mild skin rash may occur after immunization. (Stratton ,Gable and Shetty,2001).

- Two doses of MMR vaccine separated by at least 1 month (i.e., a minimum of 28 days) and administered on or after the first birthday are recommended for all children and for certain high-risk groups of adolescents and adults. The recommended 1-month interval between successive doses of MMR or other measles-containing vaccine is based on the principle that live virus vaccines not administered at the same time should be separated by at least 1 month.
- MMR is the vaccine of choice when protection against any of these three diseases is required on or after the first birthday, unless any of its component vaccines is contraindicated. The purpose of the two-dose vaccination schedule is to produce immunity in the small proportion of persons who fail to respond immunologically to one or more of the components of the first dose. (FAQs,2006)

- Use of combined MMR vaccine for both measles doses and all other indications should provide an additional safeguard against primary vaccine failures and facilitate elimination of rubella and CRS and continued reduction of mumps

incidence. Data also indicate that the favorable benefit/cost ratio for routine measles, rubella, and mumps vaccination is even greater when the vaccines are administered as combined MMR vaccine.(Measles,2006).

2.7 Adherence

The concept of adherence has been investigated in the context of the Health Belief Model (HBM). The HBM has three broad concepts: General health motivation; perception of the amount of threat imposed by a specific disease; and, perception of the effectiveness of a specific behavior in reducing the threat. Therefore, someone who is positively motivated toward health, perceives a disease as a threat, and a particular behavior, such as immunization, as threat-reducing, is more likely to engage in that behavior than someone who lacks any one of these beliefs (Mirotznik, Ginzler, Zagon, & Baptiste, 1998). An individual must also have a psychological state of readiness for action before undertaking a recommended health action. It must be perceived that the individual, in this case the child, is susceptible, and the threat is severe and unmodified by barriers and other factors to the extent that the parent is motivated to act (Redeker, 1988). The concept of adherence is also affected by numerous other factors including knowledge of the need for the action or behavior, such as immunizations, past experiences, competing activities, cost, and transportation (Wilson, 2000).

2.7.1: Immunization Requirements

West and Koop (2000) pointed out that there are no formal legislative mandates requiring complete immunizations by the age of 2, thereby leaving children vulnerable to the potentially devastating effects of these preventable illnesses.

2.7.2: Immunization Rates

A National Immunization Survey conducted by MARAM in 2004 found that less than 70% of 2-year-old children had received all recommended vaccines (MARAM, 2004). A more detailed list of rates, by vaccine, estimates that 85-% of children are fully vaccinated against diphtheria, tetanus and pertussis.

Although the rates for the individual vaccines are much higher, the rates for the basic series are disappointing. It should be noted that the rates are based on a sample of 1650 randomly selected 2-year old children in the West Bank and Gaza. The success of vaccine coverage in Palestine is attributed the efforts of MOH and UNRWA services.

Abdeen (2004) reported that the measurement of immunization rates is affected to a large degree by mobility of the population and the lack of a coordinated immunization tracking system. Because many non-refugee children receive immunizations at various clinics and other medical facilities, the rates reported for this population may be

inaccurately low. Abdeen et al. (2000) reported that the key issue in immunization assessment methodology is defining the patient population. In Palestine, the majority of children now receive vaccines through governmental and UNRWA providers. The providers that participate in the EPI Program provide aggregate numbers of immunizations given. National immunization rates are computed by using data reported for all children by all providers. While the data are assumed to be representative of the actual populations, it is possible that the true immunization rate for non-refugee children is negatively affected by their mobility and the frequency with which they change medical providers.

2.7.3: Effects of Poverty and Other Sociodemographics

In reviewing the literature on the topic of adherence rates for immunizations, it was quickly evident that the vast majority of the published studies show poverty and a lower overall socioeconomic status to place children at risk for immunization non-adherence. Santoli, Szilagyi, and Rodewald (1998) identified five factors strongly linked to low immunization rates: socioeconomic factors including poverty and cost; starting vaccinations late; a lack of patient and provider awareness of the need for more information; provider practices such as missed opportunities and failure to track needed immunizations and remind parents when they are due; and, office or clinic factors like long waits and inconvenient hours.

Yawn et al. (2000) spoke to family characteristics that have been associated with lower immunization rates in 2-year-olds. These include large family size, less formal parental education, lower socioeconomic status, being nonwhite, single parent families, receiving public health department services, and inadequate insurance. This study, however, found many serious barriers to immunization adherence in a non-indigent population as well. These findings support the assumption that factors other than indigence play a significant role in immunization non-adherence. Examples of these factors are inconvenience, fear of reactions, sick child delays, and not knowing the recommended schedule of immunizations. Parents commonly suggested the need for a recall system and for a unified immunization schedule.

Several reports indicated that sociodemographic characteristics are linked to immunization status.(Prislin, Dyer, Blakely, and Johnson 1998) concluded that children's immunizations are affected primarily by their parents' beliefs, attitudes, and perception of control over immunizations. This conclusion is not consistent with the findings of(Strobino, Hughart, & Guyer, 1999). Which indicate that while socio-demographics are closely associated with immunization status, there is little relationship between parents' attitudes and immunization status? However,(Gellin, Maibach, and Marcuse, 2000) indicated that parents frequently have an attitude of indifference. Since vaccines have greatly reduced the threat of many serious childhood illnesses, parents may now undervalue immunizations. The diseases prevented by vaccines no longer serve as a reminder of the importance of childhood immunization (Gellin, Maibach, & Marcuse, 2000).

The National Immunization Survey conducted by MARAM in 2004 indicated that less than 70% of individuals who are the most susceptible to vaccine-preventable diseases, children under the age of 2, are fully immunized (MARAM, 2004). Data from URWA (2004) documented better over-all immunization rates than the national rates.

2.8 Research

Pender's Model

Using Pender's (1996) Model as a framework for studying immunization practices, the behavior specific cognitions she identified can be seen in studies that examine perceived benefits of, and barriers to, immunization. The qualitative study by Evers (2000) included these cognitions. Caregivers sampled (*N*=13), using focus-group interviews, reported that immunizations "keep our children healthy" and protect them from some common childhood illnesses. Barriers reported in the study included long waiting times at clinics and conflicts with clinic hours and work or school. Despite the small sample in the study, interesting commonalities emerged among the four focus groups in response to the same open-ended questions asked of each group. None of the caregivers mentioned cost or transportation as barriers to obtaining immunizations. They did include less commonly voiced barriers such as caregiver laziness and lack of responsibility for the well-being of their children.

Houseman, Butterfoss, Morrow, and Rosenthal (1997) in another qualitative, focus-group study of public, military and private sector mothers (*N*=41) also reported long waits as a barrier, in addition to concerns about immunization safety and side effects, difficulty reaching the clinic or doctor's office for appointments, and problems with child care, and transportation. This study also included questions to elicit information regarding caregivers' feeling of self-efficacy, another of Pender's cognitions. The respondents reported the perception that health care providers were insensitive in communicating with young, inexperienced, and/or poor mothers. The study concluded that obtaining optimal; on-time immunizations are a complex task that requires planning and resources. To achieve maximum success, the health care system must identify and remove barriers, and assist caregivers to maximize opportunities.

Findings in other studies, including that by Gellin, Maibach, and Marcuse (2000) would lead to questions about parents' self-efficacy when they (25%) reported fears that children's immune systems may be weakened by too many immunizations. This nationally representative telephone survey of 1600 parents also reported that a substantial minority of respondents (23%) believed that children get more immunizations than are good for them. Although most of the parents surveyed understood the importance of immunization and supported them (86.9%), many (19 to 25%) had misconceptions that could erode confidence in their safety. The study concluded that more education is needed to address common misconceptions and ensure informed decisions regarding immunizations. It further reported that parents see physicians and nurses as the most important source of information about immunizations, further documenting the importance of the role of health care providers in reducing this barrier to immunization.

Data from this study can be very useful in helping providers and public health officials design strategies to better meet the needs of communities and children relative to immunization provision.

Yawn, Xia, Edmonson, Jacobson, and Jacobsen (2000) reported that fear of reactions to vaccines was the biggest barrier to obtaining immunizations. They also listed long waits as a problem. The population-based, case-control designed study included 332 cases and 1,053 controls, all parents of under-immunized and fully immunized children, under 20 months of age. It is note-worthy that in multivariable analysis, there were two significant family demographics associated with under-immunization: income and self-payment. In the study, conducted in a relatively affluent Midwestern community, 47% of the parents reported some barriers to immunization series completion, although less than 3% were considered major barriers. Identification of barriers, as indicated by this study, may provide useful information on strategies to overcome them.

Interpersonal and situational influences on health promotion, specifically those related to immunization adherence, have been examined in numerous studies. Rodewalk et al. (1995), in a historical cohort study of 1,178 children, aged 12 to 30 months; found that 34% were under-immunized at 12 months of age. Compared to fully immunized children, the under-immunized group made 47% fewer preventive health visits and was at greater risk for delayed screening for anemia (38%), lead (69%), and tuberculosis (76%). They also had 50% more missed appointments. The researchers concluded that under-immunization is a strong indicator of inadequate health supervision in this population. The study makes a strong case against uncoupling immunizations and primary care.

Another type of situational influence was examined by Wilson (2000). Because rural areas usually have fewer sources of health care, higher rates of poverty, and a generally poorer health status, it would seem logical that the children would have lower immunization rates. However, Wilson reported on data that indicated comparable immunization rates between rural and urban children. In his study, a grounded theory, qualitative analysis of data obtained from 12 subjects (parents), Wilson identified other situational influences that contributed to under-immunization, including negative past experiences with immunizations, such as adverse reactions, and competing tasks which included work schedules and other causes of lack of time to obtain immunizations. The study also concluded that maintaining a strong relationship between parents and health care providers and providing accurate and timely information are key components to improved immunization adherence.

The aspects of the Health Promotion Model described by these studies clearly indicate the applicability of the use of this model in studying immunization adherence and comparison of adherence between refugee and and non-refugee children.

2.8.1: Immunization Preventable Diseases

The study by Gellen, Maibach, and Marcuse (2000), cited previously, asked respondents to rate the severity of vaccine-preventable diseases. Meningitis from H Influenza B, polio, and hepatitis B were rated the most serious, with pertussis and measles being considered somewhat less serious and varicella perceived as the least serious. In the study, 87% agreed that immunization is extremely important in keeping children well. However, 25% believed that too many immunizations may actually weaken a child's immune system and 23% thought that children get more immunizations than are good for them. The study provides valuable insight into parents' misconceptions regarding immunizations and the on-going need for education.

Adherence

Irigoyen, Findley, Earle, Stambaugh, and Vaughan (2000) found that reminding parents that vaccinations are due is an effective strategy for increasing vaccination coverage. In their study of 1,273 children, ages 4 through 18 months, patients were assigned to 1 of 4 groups: a control group who received no intervention (n = 346); a group that received post card reminders (n = 314); a group that received telephone call reminders (n = 307); or, a group that got both a post card and a telephone call (n = 306). The primary outcome variables were kept-appointment rate and vaccination coverage. Children assigned to the reminder groups were significantly more likely to keep appointments than controls (13.7% higher), with children who received both a post card and a telephone call being 2.3 times more likely to keep appointments than the controls (95% CI = 1.4, 3.7). The reminders were also significantly effective in increasing vaccination coverage for the subgroup of children who were not up-to-date at baseline. The study showed that appointment reminders are a sensible and cost-effective way to increase kept-appointment rates, thereby reaching and vaccinating children who are not up-to-date. Children who kept their appointments were more than twice as likely to be immunized fully for their age. For children who were not up-to-date at baseline, the postcard and the telephone reminders tripled their immunization coverage rate compared to controls (OR = 2.9, CI = 1.1, 8.0). The study by Wilson (2000) corroborates the importance of immunization reminders, with 58% of the mothers in that study admitting to confusion about the immunization schedule and depending on reminders to know when immunizations are needed.

Immunization Rates

Determination of immunization rates must include specific criteria for inclusion in any evaluation of the rate for a specific population. In a study by Perrin et al. (2000), an assessment of immunization rates in 10 pediatric practices was conducted using four methods of defining the denominator of active patients. The assessments were done using the Clinic Assessment Software Application (CASA) to determine the number of records to be assessed in each practice, based on the size of the practice. A total of 1,823 patients' charts were reviewed, 641 from high- Medicaid practices and 1,182 from low-Medicaid practices. For all practice types (high- and low-Medicaid), the mean immunization rate

was 83%. The rate in the high- Medicaid group was 71.8%, with the low-Medicaid group being 87.8%. The immunization rates were significantly higher in practices that frequently purge inactive patients. In the high-Medicaid practices, 61% of the patients were considered active, compared to 83% in the low-Medicaid groups. The study also concluded that immunization rates reported by County Health Departments and other providers with no means of adjusting for patients who leave the area or obtain care through alternate providers, understandably, demonstrate lower immunization rates when analyzing aggregate data.

(Stokely, Rodewald and Maes, 2001), in a study that analyzed data from the 1995 National Immunization Provider Record Check Study, reviewed 1,352 records of children 19 to 35 months of age. From an immunization history questionnaire mailed to and completed by parents, 1,352 (65%) had provider immunization data. A total of 304 (22%) children went to more than one provider for immunizations. Sensitivity, specificity, and predictive value analysis of the most recent provider was performed to determine if the ability to identify under-immunized children varied by provider type. They found that among children with more than one immunization provider, the records of the most recent provider were wrong 23% of the time, indicating that completely vaccinated children were in need of additional immunizations. The study affirmed that scattered immunization records significantly reduce clinicians' ability to determine the immunization status of their patients, potentially resulting in both over- and under-immunization. Analysis of the study indicates that a significant number of fully immunized children (150,000) are thought to be under-immunized. Numbers of this proportion could significantly impact immunization rate data throughout the country.

Effects of Poverty and Other Socio-demographics

Many studies have examined the effects of poverty and other socio-demographics on childhood immunization. (Moore, Fenlon, and Hepworth, 1996) in a study of 566 mother/infant dyads which included interview and immunization record review, compared Mexican-American (n = 274) and white, non-Hispanic (n = 292), Medicaid-sponsored 1-year-olds. Comparisons were made between the two groups using the chi-square test. Correlations and multiple regressions were used to determine relationships between variables such as maternal age (χ^2 = 2.309; df = 5; p = 0805), number of siblings (χ^2 = 32.999; df = 2; $p \leq .001$), maternal education (χ^2 = 42.376; df = 3; $p \leq .001$), marital status (χ^2 =12.575; df = 2; p = .002), employment status (χ^2 =8.343; df = 1; p = .004), travel time (χ^2 = 17.277; df = 4; p = .002), and the infant's health status and immunization level. Most of the infants, 90.1%, were considered by their mothers to be in good or excellent health. The other 9.9% thought their babies were in fair or poor health. The mean number of children in the white, non-Hispanic families was 2.33, while the Mexican-American families averaged 3.14 children. More of the white, non-Hispanic infants received the basic series of immunizations by 1 year of age (74%) than the Mexican-American children (58%). Other variables that correlated with higher completion of the basic series were younger maternal age and higher maternal education levels.

The results of this study are comparable to the results of the analysis by the State of Florida, Department of Health (2002) of the immunization status of 2-year-old children by high-risk characteristics. Higher maternal education was an indicator for higher immunization rates, with 89% whose mothers completed grade 12 fully immunized, compared to 78.2% fully immunized whose mothers did not finish high school. Children with more siblings also had lower immunization rates in Florida. Of those with no siblings, 88% were fully immunized compared to 68% who had three or more siblings. Greater maternal age, however, in Florida, correlates to higher immunization rates with 87.9% of children whose mothers were over 30 being fully immunized and 76.4% whose mothers were less than 20 having all recommended shots.

2.9 Summary

A review of the theoretical and research implications of Pender's (1996) Revised Health Promotion Model, with its six behavior-specific cognitions and affects in the promotion of behavior change, support its appropriateness as a framework for this study. Identifying and analyzing the roles these factors play in parents' decisions regarding immunizing their children provide insight into immunization adherence.

Vaccines to provide immunization against the 10 diseases, which are currently recommended for children, age 2 and below, have significantly reduced morbidity and mortality for the diseases (MOH, 2004). Yet, there is no formal legislative mandate that all children be immunized by age 2. The literature clearly indicates that many children are not adequately immunized and that many factors contribute to immunization non-adherence, including the methods by which immunization rates are calculated (Perrin et al., 2000). While studies have found that poverty is a factor (Findley, Irigoyen & Schulman, 1999; Hillman et al., 1999), other studies indicated that factors not related to income were as, or more, problematic (Houseman et al., 1997; Wilson, 2000; Yawn et al., 2000). This study further examines and will ultimately add to the body of knowledge regarding factors related to immunization adherence.

Chapter 3 describes the methodology used for this study. It also presents the design, setting, sample size, protection of human subjects, instruments, data collection, and data analysis procedures utilized.

Chapter Three

Methodology

This chapter describes the methodology applied to the study. The design, setting, sample, protection of human subjects, instrumentation, data collection, and data analysis procedures are discussed.

3.1 Study Design

The study consisted of an ex-post-facto, retrospective review of the immunization records of 2-year-old children in the West Bank and Gaza. The independent variable of refugee or non-refugee was expected to affect the dependent variable of immunization adherence.

The Research Questions examined are: (1) What were the demographic characteristics of children from which data was obtained for this study? (2) Are there differences in immunization adherence for refugee and non-refugee 2-year-old children in the West Bank and Gaza?

3.2 Setting

The immunization records of 2-year-old children from survey participants were examined. The 1997 census conducted by the Palestinian Center of Bureau Statistics was used in order to reach a cross section of the geographic locations of the children's residences.

3.3 Survey Design

An area based sampling frame was used with a three stage stratified design consisting of a selection of clusters/primary sampling units (PSUs), households within the selected clusters/PSU, and selecting the mother and youngest child as respondents within a household.

3.4 Sampling

As for most surveys, the sample design was influenced by statistical, financial and operational considerations. A random sample of 2-year-old child's immunization records was reviewed. Given that the assumptions specified in the Data Analysis are credible for the populations of interest and the researcher's having set alpha at .05, power (1-β) at .80, and a moderate effect, a minimally adequate sample size was determined to be 160 records each of refugee and non-refugee children (346 total). Every effort was made to keep the sample sizes equal in order to prevent reductions in power.

3.5 Protection of Human Subjects

The study was conducted following approval by the Ministry of Health Institutional Review Board. In conducting the record review, patient confidentiality was protected, to the extent allowed by law, at all times. The children's names were not recorded. Their immunization records were copied by field workers specially trained and given to the researcher with no identifying information other than a number, which was assigned by the staff. Other demographic information, including the child's date of birth (to verify the age), sex, family size and composition, birth order, insurance status, mother's marital and work status, and refugee versus non-refugee status, contained no information that could be linked to a specific child. Consent forms were not required since the records were anonymous.

3.6 Instruments

The UNICEF tool was available for use in recording immunization and demographic information (See Appendix A). It contained the date of birth of each child whose record was reviewed as well as an indicator of the refugee eligibility status. The review tool also included the list of recommended immunizations that should be obtained by children who have reached age 2, and a space for the date of receipt of the vaccine. Children who received all of the immunizations, at the appropriate time intervals, were considered fully immunized and therefore, adherent. In lieu of the review tool, staff could also provide a copy of the child's immunization record, with no name, an example of which is Appendix B, on which they also recorded the other needed information.

3.7 Pilot Testing

The pilot test included the following steps:
Two-stage pilot testing of the questionnaire was carried out to ensure reliability and the highest possible validity. The first pilot was carried out to test the clarity, consistency, and relevance of the questions to the mothers who would be surveyed. A second pilot test was conducted after final modifications of the questionnaire to ensure that the questionnaire was reliable and relevant to the target population.
1) Two experts who helped in revising the questionnaire reviewed the instruments and their notes were taken into consideration.
2) Pilot testing at the health center level was also done; participants were the staff nurses from the Jerusalem Health Center and Amary Health Center.These two centers were not included in the survey letter in order to decrees the bias.

3.8 Data Collection

Data collection started on June the first and continued to the 30th of July 2005

3.9 Data Entry

In this stage data were entered into the computer using an EpiInfo number 6 data entry template. The data entry program was designed to satisfy the following requirements:

- Duplication of the questionnaire on the computer screen.
- Logical and consistency checks of data entered.
- Possibility for internal editing of questionnaire answers.
- Minimizing of potential errors in digital data entry and fieldwork.
- User-friendly handling.

3.10 Quality Control

Included repeating data collection of at least 5% of the household questionnaires to ensure quality and validity of data collection.

At least 5% of the data entered were re-entered to ensure maximum quality of data entered.

3.11 Editing, Cleaning and Coding

All completed questionnaires were edited, using the same instruments and coding according to the Palestinian Central Bureau of Statistics (PCBS) coding system. A code book was developed for the questionnaire to ensure consistency in data entry and to serve as the reference for the data base and analysis.

All the home based (child) records and clinical records were recorded by digital camera, and saved to the computer to serve as a reference.

3.12 Data Analysis

Research Question 1 (What are the demographic Characteristics of children from which data will be obtained for this study?) was examined by using and presenting descriptive statistics including central location measures, dispersion measures, and displays of frequency such as graphs, charts, plots, etc. Both the arithmetic mean and the median are provided to describe the central location of the data for variables that are measured on at least an interval scale. The median is the more representative central location measure since, under conditions of asymmetry, it is unaffected by extreme scores in a data set (Thorndike & Dinnel, 2001).

To describe the general dispersion of scores from the mean, variance and standard deviation are provided. Again, because a scale of measurement that is at least interval is needed for meaningful interpretation of these statistics, the investigator only presents these summaries when that condition is reasonably defensible.

For Research Question 2 (Are there differences in immunization adherence for refugee and non-refugee 2-year-old children in the West Bank and Gaza?) the primary analytical and inferential aspect of the inquiry is the need for a statistical inference regarding the difference, if any, in immunization adherence rates for refugee and non-refugee 2-year-old children in the West Bank and Gaza. Since the children in the study are either be up-to-date or not with regard to immunizations, the data are dichotomous. The primary independent variable of refugee or non-refugee is also dichotomous. Therefore, data are considered nominal in scale. This research question was addressed through the use of two analogous, independent sample techniques, the traditional Chi-square test for a 2 X 2 contingency table with a correction for continuity, and the Fisher Exact test (Conover, 1971). Although these two techniques make the same assumptions (the observations both within and between the samples are independent; the four cells in the contingency table are mutually exclusive and exhaustive; the underlying nature of the dependent variable is continuous; the samples are drawn randomly) and test the same null hypothesis, the first test gives an approximate *p* value and the second provides an exact *p* value for the statistical outcome. While both were determined for comparison purposes, the conclusions of the study result from the *p* value provided by the Fisher Exact procedure.

The null hypothesis (H_o) is that there is no difference in immunization adherence for refugee and non-refugee 2-year-olds in the West Bank and Gaza. Another way to state the null is that the two samples are selected from the same population. The alternate hypothesis (H_a) is that there is a difference in the immunization adherence rates for these groups of children. This can also be stated that the two samples are drawn from two different populations.

3.13 Summary

This chapter described the methodology applied to the study, which compared immunization adherence rates of refugee 2-year-old children to those of non-refugee 2-year-old children. The design of the study is described, as are the setting, sample size determination, protection of human subject's information, instruments, procedure, and data analysis. The ex-post-facto, retrospective review of randomly chosen immunization records from households in the West Bank and Gaza was described. The sample of 173 each refugee and non-refugee children's records are included and analyzed using descriptive statistics and two independent sample techniques. The null and the alternate hypotheses are described. Analysis of the data will be presented in Chapter 4.

Chapter Four
Analysis and Findings

This Chapter presents the statistical findings of the study. Data describe the demographic characteristics of the sampled population (Research Question 1) and address the answer to Research Question 2, determining if there are differences in immunization adherence for refugee and non-refugee 2-year-old children in the West Bank and Gaza.

4.1 Demographic Description of the Sample

The randomly selected immunization records of 346 2-year-old children residing in the West Bank ad Gaza, refugee, 50% (*n* = 173), and non-refugee, 50% (*n =173*), settings were reviewed. The gender of the children was almost evenly divided with (n=178; 51.4%) males and (n=168; 48.6%) females equally divided between the West Bank and Gaza.

An attempt was made to determine the number of siblings and the birth order of each child in order to analyze the possible correlation between immunization adherence and those factors.

Table 4.1 presents the number of siblings of each child whose record was examined.

Table 4.1 Number of Siblings, Siblings Frequency, Percent Valid Percent

Number of Sibling	**Siblings Frequency**	**Percent Valid Percent**
0	8	2.3
1	22	6.4
2	25	7.2
3	10	2.9
4	16	4.6
5	27	7.8
6+	238	68.8
Total	346	100

Of the children's records (*n* = 346) from which information regarding siblings could be obtained, 2.3% (*n* = 8) had no siblings, while 28.9% (*n* = 100) had from 1 to 4 brothers and/or sisters. The majority had 68.8 percent; n= 238 of the 2-year-old children had six and more siblings. We expected that as the number of siblings increased to 2, 3, and 4, the number fully immunized decreased to 66.7% (*n* = 8), 57.1% (*n* = 4), and 44.4% (*n* = 4) respectively, leading to the conclusion that the families with multiple children who were sampled were less adherent with immunizations which was not the case for five 91.7 % (*n* = 11) and for six plus siblings (61%; n= 72) respectively.

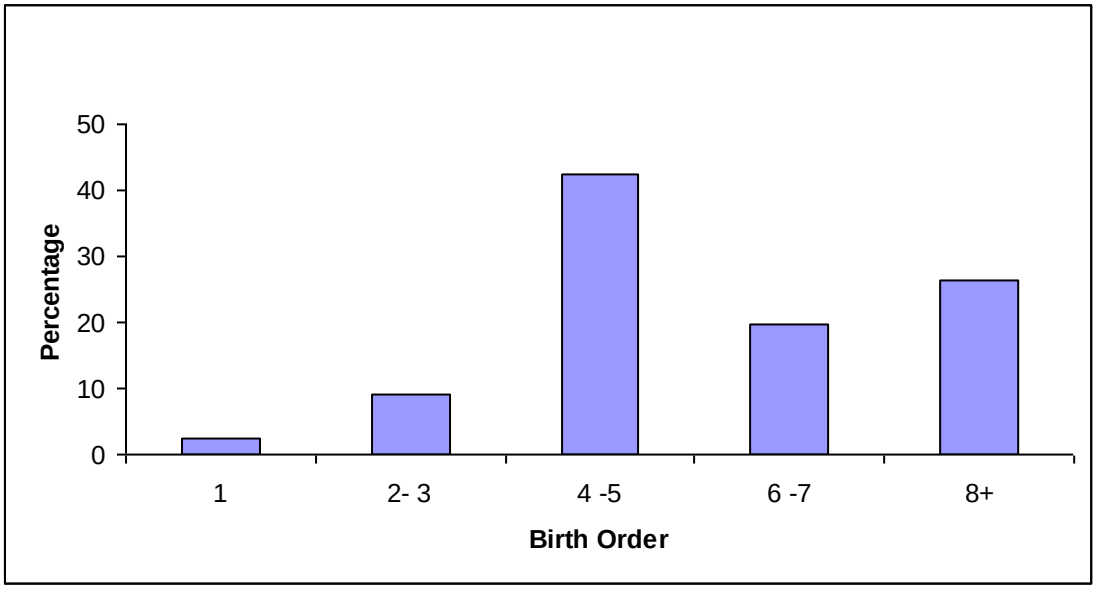


Figure 4.1 Birth Order Frequencies, Percent Valid Percent

Of the first, second and third-born children whose records were sampled, 66% (*n* = 16) were fully immunized. In the 4 - 5 and 6 -7 -born groups, 65% (*n* = 43) and 52.6% (*n* = 20) respectively were completely adherent. The data, therefore, indicate that immunization adherence decreased as the order of birth increased. However, the rate of adherence was higher for the 8 plus-born group, 62.5% (*n* = 30).

The data revealed that the percentage of mothers who had finished secondary school and above were 37.6% (*n* = 130) while 35.8% (*n* = 124) had finished preparatory school. Only 1.7% (*n* = 6) had no education.

The number of refugee (*n* = 173) and non-refugee (*n* =173) children in the sample was virtually even. The children with UNRWA medical care, therefore considered refugee, comprised 50%, while 50% had private or governmental health care coverage, making them considered non-refugee.

4.2 Results

The study examined a total of 346 immunization records of 2-year-old children to determine if they were fully immunized for the required specific diseases.

To be considered fully immunized, the records had to contain documentation of sixteen antigens according to the list of vaccination doses.

The total number of children in the study who received all of the required vaccines was

58.8%. Of the 80 children who were not fully immunized, 58.1% (n = 36) were refugees and 59.1% (n = 44) were non-refugees. Table 3 shows the frequency and percentage of children who were immunized for each vaccine:

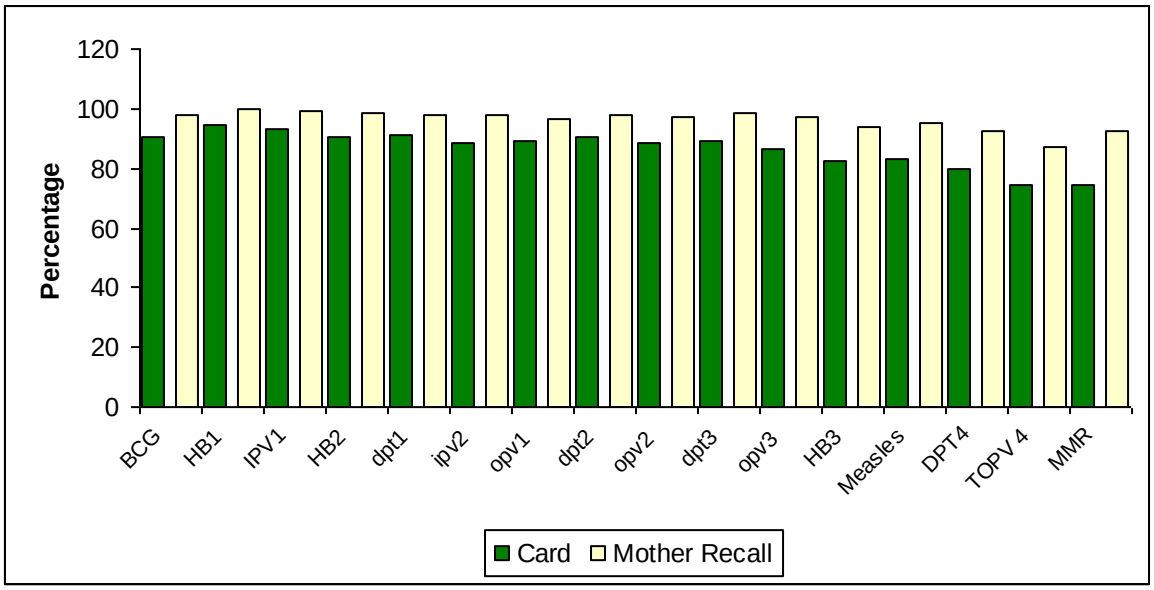


Figure 4.2. Percentage of children up-to-date at age 2 years, by type of vaccination, according to mother recall, vaccination cards and medical records (vaccination card subset; n = 346).

MMR and TOPV accounted for the largest number of missed doses. The percentage coverage was (74.3% and 74.4% respectively. This is not unexpected since they were two of the vaccines in critically short supply during the study period.

The next largest number of missed doses was DPT4 vaccine with percentage coverage of 79.5%.

Figure 4.3 provides a comparison of adherent refugee and non-refugee children and the exact p value for each specific type of vaccine. To determine the statistical significance, if any, between immunization adherence for refugee and non-refugee children, the Fisher Exact Test was used. The exact p value for refugee and adherence was p = .034, a significant difference from Alpha, which was set at .05, leading to the conclusion that the sample data was sufficient for the claim that refugee and immunization adherence are independent of each other. The null hypothesis, there is no difference in immunization adherence between refugee and non-refugee children, must be accepted.

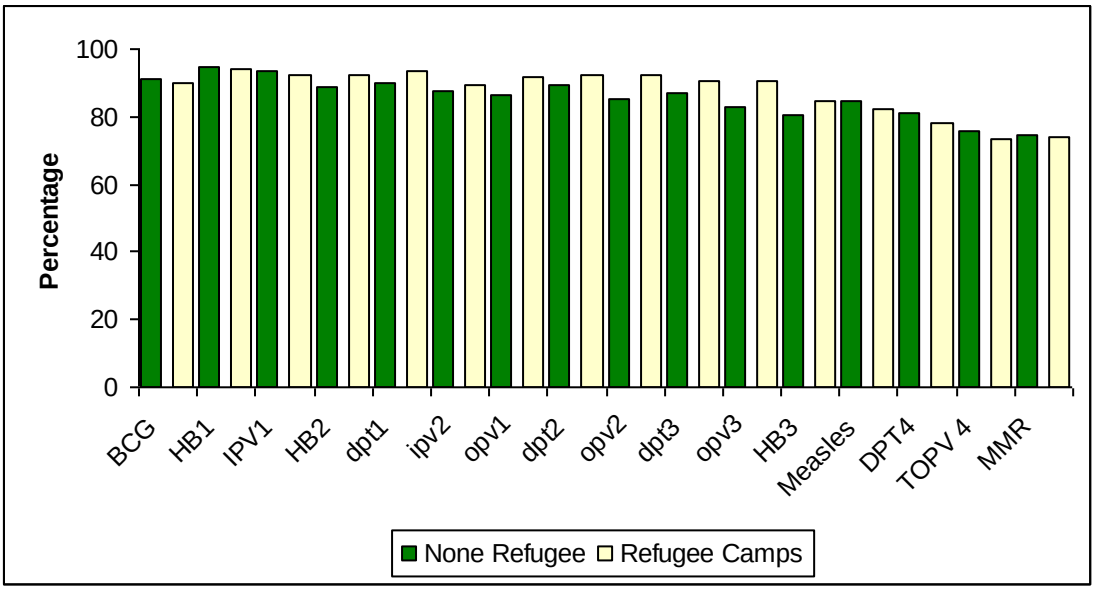


Figure 4.3 Number of Adherent Refugee and non-refugee By Vaccine Type

4.3 Conclusions

The following conclusions are drawn from analysis of the data:

1. No statistical significance difference was detected in terms of immunization coverage between females and males.
2. There was no clear association between immunization coverage and number of siblings as well as birth order for both refugee and non-refugee children.
3. No statistical significance difference was detected in terms of immunization coverage between refugee 2-year-olds and non-refugee.
4. MMR Vaccine accounted for the greatest number of missed doses, with TOPV and DPT4 ranking second and third respectively.

4.4 Summary

This chapter provided the statistical findings to describe demographic information regarding the sample studied and to determine if there are differences in immunization adherence between refugee and non-refugee 2-year-old children who reside in the West Bank and Gaza. In the sample studied, there was no significant difference in adherence rate between refugee and non-refugee children. A discussion of factors that could have had an effect on the outcome of the study will be presented in Chapter 5.

Chapter Five
Discussion

The value of immunizations to the public health of this and future generations is rarely disputed. However, the number of fully immunized children in the West Bank and Gaza is far from optimal and it is declining. Historically, studies of immunization adherence have focused on barriers and missed opportunities. One barrier often targeted as a reason for low adherence is occupation (MARAM, 2004). This study was designed to look again at refugee and non-refugee 2- year-old children to determine if indigence is a factor in immunization adherence in the West Bank and Gaza. The data from the study show that a number of non-refugee children are not fully immunized, and they significantly exceed the number of refugee, non-immunized children.

This chapter will discuss the findings of the study and possible trends related to them. It will relate the findings to both supportive and differing literature and tie the results of the study to the conceptual framework used as a guide for the research. Limitations will be presented and reviewed. The relationships of assumptions to the outcomes of the study will be examined, as will recommendations for future research. Implications of the study for nursing practice, including advanced practice, administration, and education, will also be presented.

5.1 Findings

The results of this study, that refugee 2-year-old children have similar rates of immunization adherence to non-refugee 2-year olds in the West Bank and Gaza, were not unexpected, given the resources available for immunizing children in the area. UNRWA medical programs offer refugee children a medical home and preventive care. This trend is expected to continue unless the resources to fund the Program are seriously reduced or eliminated.

5.2 Relationship to Literature

The literature reviewed for this study contained numerous findings and opinions regarding the effect of socioeconomic status on immunization adherence. Some studies cite parental attitudes and beliefs as a barrier to immunization adherence (MARAM, 2004). The findings of this study clearly correlate with the studies that cited barriers irrespective of refugee status as the cause for under-immunization.

5.3 Conceptual Framework

Using concepts from Pender's (1996) model as a guide for this study was useful in determining the scope of the data elements needed to draw conclusions about the population and their parents. The effect of refugee on parents seeking immunizations for their children is tied to the behavior-specific cognitions. Since over 58% of all children whose records were reviewed were fully immunized, most parents apparently perceived that immunizations have positive consequences and are beneficial for their children.

These positive feelings may have led to the parents' feeling good about themselves as they overcame negative interpersonal influences, such as bad past experiences, inaccurate information, and numerous barriers and hardships making immunization adherence difficult. Real, or imagined, obstacles to immunization adherence may be linked to family income, transportation issues, working mothers with many competing demands, and other family dynamics (MARAM, 2004). In this area, as evidenced by this study, the health promotion behavior of low-income families, specifically in obtaining immunizations for their children, significantly exceeds that of non-refugee parents.
The hypothesis of this study, that refugee is not a primary influence on immunization non-adherence for 2-year-olds in the West Bank and Gaza, was supported by this study.

Pender (1996) advocated nursing intervention to reduce barriers to health care and overcome cultural influences that restrict access to care. She encouraged empowerment of individuals to value health and the benefits of health-promoting behaviors to such an extent that they are willing to overcome barriers to healthy behaviors. In the West bank and Gaza, many refugee children have the benefit of a nurse-case managed, UNRWA medical care program, that helps to reduce barriers and to empower parents to obtain health care, including immunizations, for their children. Although the usual barriers to immunization exist, in the West Bank and Gaza, they seem to have a greater effect on the non-refugee population than on the refugee.

One aspects of Pender's model were utilized in determining key data elements obtained in the study. Assessing elements such as urban versus rural dwelling, maternal marital status, number of siblings, and birth order, targeted interpersonal influences and immediate competing demands. These are key components of Pender's model and provided insight into the characteristics of the population studied and their families.

Another unexpected finding was that more non-adherent children reside in urban areas. Logistically, it would seem that immunization adherence would be more difficult for children residing in rural areas. The fact that parents often commute to the urban locations for work and for day care for their children, it is likely that they also commute for medical care. This assumption is validated by the fact that there are few pediatric medical care providers in the rural areas. It is possible that having to expend more effort to obtain immunizations makes the availability of the care more appreciated by the non-urban parents, resulting in greater adherence. Conversely, those who have the service readily available and who have to expend little effort to obtain immunizations may undervalue their worth and underutilize the services.

The influence of the number of siblings and birth order of the children whose records were reviewed is also interesting. Children with higher numbers of siblings adherent and those who were fifth or more child born in the family were reasonably adherent. These findings may indicate that parents become less concerned with immunization as the size of the family increases. However, they could also validate that larger families result in more competing demands for parents' time, making immunization adherence a lower priority.

The use of Pender's (1996) model as the framework for this study provided good points of reference for examining immunization adherence. With adherence as the target, Figure 1, Target: Immunization Adherence depicts the influence of individual characteristics and experiences, including prior experiences, on perceived benefits, barriers, and self-efficacy. It shows that the influence of family and other support systems, providers, peers, role models and the norms of the community have an effect on reaching the ultimate goal of adherence. It also shows that competing demands affect all levels of activity in route to attaining the target, immunization adherence.

Relating the behavior-specific cognitions, as well as interpersonal and situational influences, on health promotion, described by Pender, to parents' actions in obtaining immunizations for their children worked well and provided interesting supportive information. The data indicate that efforts to increase immunization adherence in the West bank and Gaza should focus on non-refugee, urban dwelling, later-born children, with employed mothers, would potentially render the greatest impact.

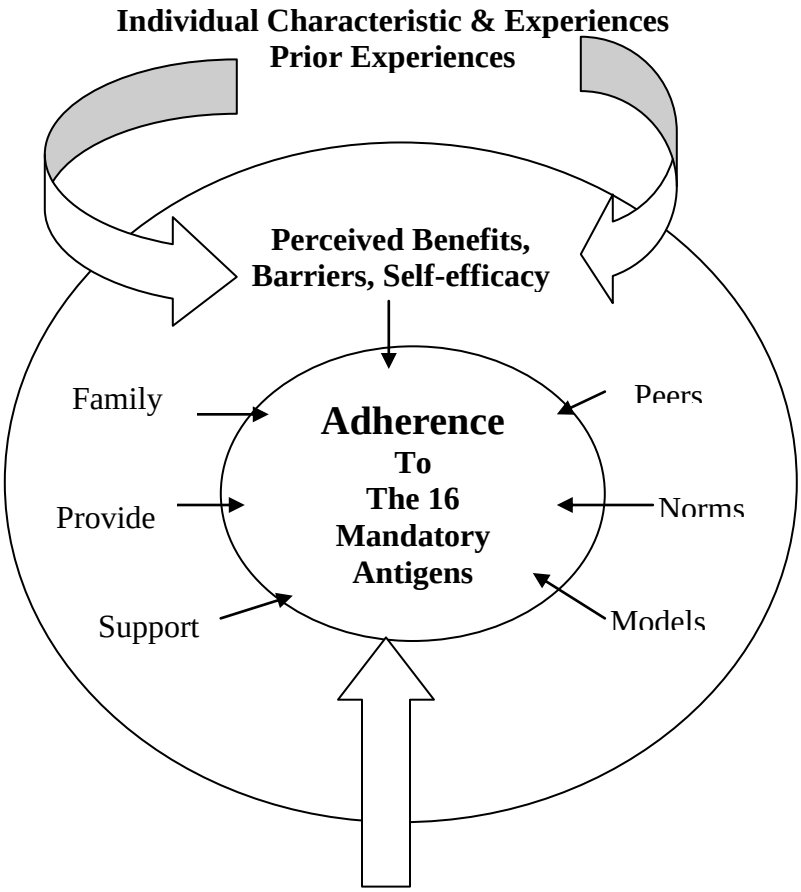
5.4 Assumptions

The assumptions presented in Chapter 1 were neither supported nor unsupported by this study. The argument could be made that the first assumption, all parents want their children protected from preventable illnesses, was supported, given the number of children shown by the study to be adherent with immunization recommendations. However, it is not possible to state that non-adherence correlates to parents' wanting their children to contract illnesses. Rather, barriers and competing demands may outweigh the risk of illness, sadly forcing parents to gamble with their children's health and well-being.

An unstated assumption of the study was that there would be an adequate supply of vaccine available for all children seeking immunizations. Unfortunately, this is no longer a valid assumption. In recent years there have been critical shortages of MMR, Hib, and Hepatitis B vaccines, resulting in children's missing doses (MARAM, 2004), and creating an unanticipated limitation to the study.

5.5 Limitations

In addition to the limitation stated in Chapter 1, there were several others that presented during the course of the study. There is no standard form or format for recording immunizations in primary health care clinics. Even within the clinics, multiple formats are used, and almost all of the records are hand-written, making reviewing and recording the data very arduous. However, the reliability of the data collected is thought to be very high. None of the offices used the tracking form developed for this study, opting instead to provide copies of immunization records. Having copies of the actual records placed responsibility for recording the data solely on the researcher, leaving no concern for the possibility of the doctors' staff making errors.
The geographic area within which this study was conducted is heavily penetrated by health providers for both the refugee and the non-refugee population.



Immediate Competing Demands:

Work
Sibling
Spouse
Extended Family
Transportation
House Keeping
Meals
Shopping
Budgeting
Etc.

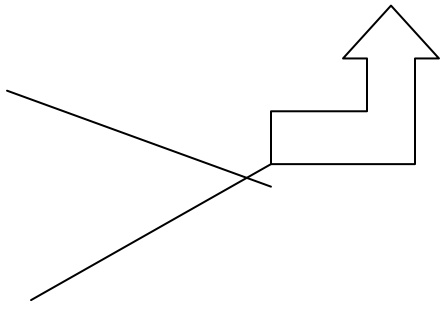


Figure 5.1 Target: Immunization Adherence

Vaccine shortages and the necessity of postponing doses of vaccine resulted in delay of this study until the major shortage was over. And, it is likely that the shortage did affect the outcome of the study in that one of the vaccines most frequently missing in non-adherent children's records was MMR.

5.6 Implications for Nursing

The implications for nursing that result from this study include the need to place renewed emphasis on barriers to immunizations that affect not just refugee, but non-refugee families as well. Nurses working in public health and UNRWA primary care settings must focus on ways to make vaccines readily available to all children irrespective of curfews and closures imposed by the occupation.

5.6.1: Clinical Expert/Advanced Practitioner

Advanced practice nurses, working, as clinical experts in pediatric offices, must take the lead to redefine the norm in the provision of pediatric well and preventive services and make the care available at times that will accommodate the difficulties created by occupation. The office-based clinical experts also must address the reduction of missed opportunities to immunize children in their practices by keeping abreast of the most current recommendations regarding contraindications to immunizations. All nurses working in primary care settings must work to assure that opportunities to immunize children are maximized by reviewing immunization records at all primary care visits, and immunizing children at every opportunity rather than just during scheduled well care visits.

5.6.2: Administration

Nurse administrators have the duty and responsibility for development and implementation of practice standards for many of the public and private entities that provide childhood immunizations. Although case management to help ensure adherence to immunization recommendations works, it has a price tag that some think is too high. Program administrators must assess the cost-benefit of case management or other strategies to increase immunization adherence, such as appointment reminders, after-hours clinics, etc. Comparing the costs of prospective initiatives to that of morbidity, disability, lost parental work time and, therefore, income, and even death due to vaccine-preventable illnesses may yield data to show that the cost is not too high.

5.6.3: Education

Nurse educators are key participants in the effort to improve immunization adherence. Nursing curricula at both the undergraduate and graduate levels must include emphasis on all preventive care, starting with well child services and immunizations. Teaching nurses to recognize barriers to immunization and strategies to ameliorate them are

paramount to increasing adherence. Teaching the principles of immunology and ways to translate the immune response produced by vaccines to parents, in terms they can understand, will address one of the major barriers, parental misunderstanding of how vaccines work (Yawn et al., 2000), and encourage them to have their children immunized.

Continuing education aimed at office nurses and pediatric nurse practitioners regarding vaccine recommendations and strategies for overcoming barriers is needed. Vaccine manufacturers invest large amounts of money in professional education programs and materials. They are forced to compete for nurses' and physicians' time in order to give them the resources they have available. Making the information and continuing education offerings available at convenient times and in appealing locations will likely result in greater utilization.

5.7 Recommendations for Future Research

This study supports the hypothesis that efforts to increase immunization adherence in the West bank and Gaza should focus on non-refugee children. However, it is not likely that the results of one study will convince policy-makers to change their strategies for reaching children who are not adequately immunized.

5.8 Summary

A comparison of immunization records of refugee and non-refugee 2-year-old children residing in the West Bank and Gaza revealed that non-refugee children were not significantly less adherent than non-refugee children. Health-promotion behaviors and efforts to overcome barriers by the parents of non-refugee children must be improved through education and interventions to make immunizations more readily available. Health care providers, including advanced practice nurses, administrators, and educators have a role in achieving this goal.

Children do not get a choice in the parents who receive them. The priorities of most parents include the best interests of their children, but competing demands for parental time, energy, and resources may delay or derail children's needs, especially those that are not crisis-oriented. Fortunately, the failure to obtain immunizations in a timely manner does not frequently result in a crisis. But, if and when it does, children suffer needless pain, disability, and even death. The efficacy of immunizations is scientifically proven and well documented. Vaccines are available to all children, regardless of parents' insurance status or ability to pay. Accepting excuses and allowing children to remain unprotected from vaccine-preventable illnesses must stop. Children deserve nothing less.

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Appendix One Questionnaire Used in the Household survey Interview Arabic Version

استمارة الاسرة "التطعيمات"

جميع المعلومات في هذه الاستمارة هي لأغراض إحصائية ودراسية محضة وليست لأي غرض آخر. وتعتبر سرية بموجب القانون

1- رقم الاستمارة المتسلسل: ☐☐☐	**4- العنوان :**___ _____
2- المخيم:_ ☐☐	**5- اسم العائلة:**___ _____
3- المنطقة : _ ☐☐☐☐☐	**6-** رقم الهاتف: ☐☐--☐☐☐☐☐☐☐☐☐

سـجـل المـقابلـة

7- جدول الزيارات	**اليوم**	**الشهر**	
	☐☐	☐☐	

8- نتيجة المقابلة	1	اكتملت ☐
	2	رفضت
9-- مجموع أفراد الأسرة ☐☐		**10- عدد الأطفال اقل من سنتين** ☐☐ ☐

القسم الأول: بيانات أفراد الأسرة

HR01	HR02	HR03	HR04	HR05	HR06
رقم الفرد المتسلسل	أسماء أفراد الأسرة (الاسم الثلاثي) من فضلك سمي لي أسماء جميع أفراد أسرتك بما في ذلك الأطفال الصغار والرضع، ولنبدأ برب الأسرة أولاً	١. العلاقة برب الأسرة ٢. رب الأسرة ٣. زوج/زوجة ٤. ابن/بنت ٥. حفيد/حفيدة ٦. جد/جده ٧. أخ/أخت ٨. أب/أم ٩. زوجة ابن/زوج بنت ١٠. أقرباء اخرون	جنس الفرد هل (الاسم) ذكر أم أنثى؟ 1. ذكر 2. أنثى	ما هو تاريخ ميلاد (الاسم) باليوم والشهر والسنة؟ **يسجل ذلك من خلال وثائق رسمية إن أمكن.** **اليوم الشهر** **السنة**	**يحتسب العمر من تاريخ الميلاد في HR05 وتسجل الإجابة بالسنوات الكاملة.** **وفي حال عدم معرفة تاريخ الميلاد يسال عن العمر ويسجل يسجل (00) إذا كان العمر أقل من سنة** **98 لا أعرف**
01		|_____|	|_____|	|__|__| / |__|__| / |__|__|__|__|	|_____|_____|
02		|_____|	|_____|	|__|__| / |__|__| / |__|__|__|__|	|_____|_____|
03		|_____|	|_____|	|__|__| / |__|__| / |__|__|__|__|	|_____|_____|
04		|_____|	|_____|	|__|__| / |__|__| / |__|__|__|__|	|_____|_____|
05		|_____|	|_____|	|__|__| / |__|__| / |__|__|__|__|	|_____|_____|
06		|_____|	|_____|	|__|__| / |__|__| / |__|__|__|__|	|_____|_____|
07		|_____|	|_____|	|__|__| / |__|__| / |__|__|__|__|	|_____|_____|
يوضع دائرة حول رقم سطر الطفل الذي يقل عمره عن سنتين					

الأسئلة HR07-HR11 يتم استيفاء بياناتها عن الزوج والزوجة

HR07A	HR08	HR09	HR10	HR11
الاسم	***هل (الاسم)***	***ما هو المستوى التعليمي لـ (الاسم)***	**ما هي العلاقة بقوة العمل لـ (الاسم)**	**ما هي مهنة (الاسم) المهنة الرئيسية (نوع العمل الذي يقوم به الاسم. يسأل اذا كان الفرد مشتغلا أو متعطلا سبق له العمل**
	١. يعيش معكم في الأسرة ٢. متوفي ٣. معتقل ٤. يعيش خارج المنزل ٥. يعيش خارج الوطن	١١. أمي ١٢. ملم ١٣. ابتدائي ١٤. اعدادي ١٥. ثانوي ١٦. دبلوم متوسط ١٧. بكالوريوس ١٨. دبلوم عالي ١٩. ماجستير ٢٠. دكتوراه	١. مشتغل من 1-14 ساعة ٢. مشتغل 15 ساعة فأكثر ٣. متعطل سبق له العمل ٤. متعطل لم يسبق له العمل ٥. طالب متفرغ للمدرسة ٦. متفرغ لأعمال المنزل ٧. عاجز عن العمل ٨. لا يعمل ولا يبحث عن عمل ٩. أخرى	مدير 01 متخصص 02 موظف 03 مزارع04 مهني 05 عامل 06 عاطل عن العمل 07 رب منزل 08 عاجز عن العمل 09 **المهنة** **الرمز**
الزوج	|_____|	|_____|	|_____|	|_____|
الزوجة	|_____|	|_____|	|_____|	|_____|

القسم الثاني: استمارة الطفل (المطاعيم)

يتم جمع بيانات حول جميع الأطفال الذين تتراوح أعمارهم أقل من سنتين والمقيمين مع الأسرة، وفي حال وجد أكثر من طفل مؤهل يتم استخدام استمارة اضافية (استمارة لكل طفل).

CH01	**اسم الطفل من قائمة افراد الاسرة**	**____**
CH02	**تاريخ ميلاد (اسم الطفل)**	**__/__/____**
CH03	**جنس (اسم الطفل)**	***1. ذكر 2. أنثى*** **/_____/**
CH04	**هل سبق وتلقى (اسم الطفل) أي نوع من المطاعيم؟**	***1. نعم (انتقل الى سؤال CH06)*** ***2. لا ، لم يتلق مطلقاً*** **/_____/**

CH05	**لماذا لم يتلق (اسم الطفل) أي مطعوم؟** **يجب الاجابة على جميع الخيارات** **1. نعم** **2. لا**	١. عدم توفر المطعوم ٢. عدم المقدرة للوصول الى مكان الخدمة. ٣. مرض الطفل. ٤. عدم المعرفة بجدول المطاعيم/ليس لدى الأم الخبرة الكافية. ٥. وجود مخاطر طبية. ٦. الخوف من الآثار الجانبية للمطعوم. ٧. ليس الوقت المناسب للمطعوم (صغر سنه). ٨. المطعوم غير ضروري أو غير هام. ٩. أخرى/حددي ــــ	1.|_____| 2.|_____| 3.|_____| 4.|_____| 5.|_____| 6.|_____| 7.|_____| 8.|_____| 9.|_____|
CH06	**هل لدى (اسم الطفل) بطاقة تطعيم؟**	١. نعم، شوهدت ٢. نعم، لم تشاهد ٣. لا	|_____|
CH07	**اذا كانت الاجابة في سؤال CH07 لا، اسأل عن السبب؟**	١. لم يتم اعطاء الأم بطاقة ٢. البطاقة مفقودة ٣. أخرى ــــ	|_____|

CH08: جدول المطاعيم: بالرجوع لبطاقة العيادة وبطاقة الطفل البيتية تسال الأم عن كل طفل مؤهل على حده حول التالية، استخدم بطاقة العيادة و بطاقة الطفل للتوثيق الصحيح للأسئلة أدناه

نوع المطعوم	A هل تلقى الطفل اسم المطعوم حسب ذاكرة الأم Recall	B اذا كانت الاجابة نعم، هل تلقى الطعم في الوقت المناسب (ليس بعد 4 أسابيع من الموعد المحدد) حسب كرت الطفل Child record	B2 اذا كانت الاجابة نعم، هل تلقى الطعم في الوقت المناسب (ليس بعد 4 أسابيع من الموعد المحدد) حسب كرت العيادة Clinical record	C ، سجل تاريخ تلقي المطعوم. سجل التاريخ (99) في حال كان تاريخ المطعوم غير مسجل. سجل (00) في حال كان اسم المطعوم غير مسجل 1)السطر الأول لبطاقة الطفل 2)السطر الثاني لبطاقة العيادة.	D السبب في عدم تلقي المطعوم. دون رقم السبب من القائمة المرفقة لديك أو من سؤال CH05. يمكن اختيار أكثر من سبب
	1. نعم 2. لا 3. لا اعرف	1. نعم 2. لا 3. لا اعرف	1.نعم 2.لا 3.لاأعرف		
0. مطعوم BCG، حقنة تعطى في الكتف خلال أيام معدودة من الولادة. ينتج عنها ندبه	|_____|	|_____|	|_____|	__/__/____ __/__/____	|_____| |_____| |_____| |_____|
1. HB(1)، يعطى بعد الولادة مباشرة من خلال حقنة في الفخذ.	|_____|	|_____|	|_____|	__/__/____ __/__/____	|_____| |_____| |_____| |_____|
2. IPV (1)، حقنة ضد الشلل تعطى في الشهر الأول من عمر الطفل	|_____|	|_____|	|_____|	__/__/____ __/__/____	|_____| |_____| |_____| |_____|
3. HB(2)، حقنة تعطى في الفخذ، تعطى في الشهر الأول من العمر	|_____|	|_____|	|_____|	__/__/____ __/__/____	|_____| |_____| |_____| |_____|
4. DPT (1) ، تطعيم ثلاثي/حقنة في الفخذ، تعطى في عمر شهرين	|_____|	|_____|	|_____|	__/__/____ __/__/____	|_____| |_____| |_____| |_____|
5. IPV (2)، حقنة تعطى في اعلى الذراع، تعطى في عمر شهرين	|_____|	|_____|	|_____|	__/__/____ __/__/____	|_____| |_____| |_____| |_____|

6. (1) OPV، نقط تعطى في الفم، تعطى في عمر شهرين	____|	____|	____|	__/__/__ __/__/__	____| ____| ____| ____|
7. (2) DPT، تطعيم ثلاثي في الفخذ، تعطى في عمر 4 شهور	____|	____|	____|	__/__/__ __/__/__	____| ____| ____| ____|
8. (2) OPV، نقط في الفم، تعطى في عمر 4 شهور	____|	____|	____|	__/__/__ __/__/__	____| ____| ____| ____|
9. (3) DPT، حقنة تعطى في الفخذ، تعطى في عمر 6 شهور	____|	____|	____|	__/__/__ __/__/__	____| ____| ____| ____|
10. (3) OPV، نقط في الفم، يعطى في عمر 6 شهور	____|	____|	____|	__/__/__ __/__/__	____| ____| ____| ____|
11. (3) HB، حقنة اخرى تعطى في الفخذ الاخر، تعطى في عمر 6 شهور	____|	____|	____|	__/__/__ __/__/__	____| ____| ____| ____|
12. مطعوم الحصبة، يعطى من خلال حقنة في أعلى الكتف. يعطى في عمر 9 شهور	____|	____|	____|	__/__/__ __/__/__	____| ____| ____| ____|
13. جرعة منشطة من DPT، حقنة تعطى في الفخذ	____|	____|	____|	__/__/__ __/__/__	____| ____| ____| ____|
14. جرعة مدعمة من شلل الأطفال TOPV، تعطى نقط في الفم، تعطى في عمر 12 شهر	____|	____|	____|	__/__/__ __/__/__	____| ____| ____| ____|

15. جرعة مدعمة من MMR، حقنة تعطى في اعلى الذراع، تعطى في عمر 15 شهر	____|	____|	____|	--/--/---- --/--/----	____| ____| ____| ____|

CH09	**اضافة الى المطاعيم التي تم ذكرها أعلاه، هل تلقى (اسم الطفل) جرعات اضافية من نقاط مطعوم شلل الأطفال (TOPV) أو/و مطعوم الحصبة**	1. نقاط مطعوم شلل الأطفال(TOPV).	1. نعم 2. لا ____|
			اذا نعم، حدد التاريخ -/-/- -/-/- -/-/-
		2. مطعوم الحصبة	1. نعم 2. لا ____|
			اذا نعم، حدد التاريخ -/-/- -/-/- -/-/-
CH10	**هل تلقيت استشارة حول تطعيم (اسم الطفل)؟**	١. نعم ٢. لا (انتقل الىCH16)	____|

CH11	**من قدم لك المشورة حول تطعيم طفلك؟** ***: يجب الاجابة على جميع الخيارات*** *١. 1. نعم* *٢. 2. لا*	١.طبيب عام. ٢.طبيب مختص. ٣.طبيب نساء وتوليد ٤.طبيب أطفال ٥.قابلة ٦.ممرضة ٧.عاملة صحية ٨.الأصدقاء ٩.لا تذكر ١٠. لا أعرف ١١. أخرى/حددي -	1._____| 2._____| 3._____| 4._____| 5._____| 6._____| 7._____| 8._____| 9._____| 10._____| 11._____|
CH12	**في أي وقت تلقيت مشورة حول تطعيم طفلك؟** ***: يجب الاجابة على جميع الخيارات*** ***1. نعم 2. لا***	١.خلال تلقي الرعاية أثناء الحمل. ٢.خلال زيارة العاملة الصحية للبيت ٣.خلال زيارتي لتطعيم الطفل. ٤.عندما حصلت على برنامج التطعيمات. ٥.خلال ندوات	1._____| 2._____| 3._____| 4._____| 5._____| 6._____|
CH13	**هل كنت مرتاحة وأنت تسألين مقدم الخدمة الصحية حول تطعيم (اسم الطفل)؟**	١. نعم ٢. لا	_____|
CH14	**اذا كانت الاجابة نعم، هل تلقيت اجابة مفيدة لسؤالك؟**	١. نعم، الى حد كبير ٢. نعم، الى حد ما. ٣. غير متأكدة ٤. لا	_____|

CH15A	**في أي من المواضيع التالية والمتعلقة بالتطعيم تم نقاشها معك أثناء الزيارة الأخيرة لمركز التطعيم لتطعيم (اسم الطفل)؟** **١. أهمية التطعيم** **٢. أهمية أخذ المطعوم في وقته** **٣. جدول المطاعيم** **٤. الآثار الجانبية للمطعوم** **٥. وقت الزيارة للمطعوم التالي** **٦. المتابعة/التحويل اذا لزم الأمر** **٧. المخاطر في عدم متابعة التطعيمات** **٨. موانع إعطاء التطعيم** **٩. أخرى/حددي ـــ**	1. نعم 2. لا 1.|_____| 2.|_____| 3.|_____| 4.|_____| 5.|_____| 6.|_____| 7.|_____| 8.|_____| 9.|_____|	مقابل كل اجابة نعم، اختار رقم مقدم المشورة من سؤال CH11 1.|_____| 2.|_____| 3.|_____| 4.|_____| 5.|_____| 6.|_____| 7.|_____| 8.|_____| 9.|_____|
CH15B	**هل تلقيت أي مواد تثقيفية لها علاقة بتطعيم (اسم الطفل) أثناء تلقي الاستشارة أو بعدها؟**	١. نعم ٢. لا ٣. لا أذكر	|_____|
CH15C	**هل كانت مفيدة؟**	1 . نعم إلى حد كبير 2. نعم إلى حد ما 3. غير مفيدة	|_____|
CH16	**خلال زيارتك الأخيرة لمركز التطعيم، هل تلقيت في أي من المواضيع التالية مشورة حول رعاية (اسم الطفل)؟**	١. نعم ٢. لا ٣. لا اعرف ٤. لا ينطبق	مقابل كل اجابة نعم، اختار رقم مقدم المشور من سؤال CH11
	١. وضع الطفل الصحي	|_____|	|_____|

	٢. السؤال حول هل تلقى الطفل أي أدوية تتعارض مع التطعيم	_____|	_____|
	٣. السؤال حول وجود أي أمراض مثل السرطان وأمراض الدم	_____|	_____|
	٤. السؤال فيما اذا يعاني الطفل من حساسية أم لا (من الطعام، البيض، المطعوم)	_____|	_____|
	٥. فحص درجة حرارة الطفل	_____|	_____|
	٦. أخذ وزن الطفل	_____|	_____|
	٧. أخذ طول الطفل	_____|	_____|
	٨. تقديم نصائح	_____|	_____|
	٩. اعطاء وقت الزيارة القادمة	_____|	_____|
	١٠. السؤال فيما اذا يعاني الطفل من اسهال	_____|	_____|

CH17	**كم من الوقت انتظرت في الزيارة الاخيرة؟**	الوقت بالدقائق	|___| |___||___| دقيقة
CH17B	**كيف تصفين وقت الانتظار؟**	1. قصيرة 2. معقولة 3. طويلة نسبياً 4. طويلة جداً	|_____|
CH18	**هل استخدمت أكثر من جهة/عيادة لتطعيم (اسم الطفل)؟**	١. نعم ٢. لا ٣. غير متأكدة	|_____|
CH19	**هل قمت بتغيير الجهة التي طعمت فيها عادة (اسم الطفل)؟**	١. نعم ٢. لا(انتقلي الى سؤال	|_____|
CH20	**اذا كانت الاجابة في CH19 نعم، حدد الأسباب وراء تغيير جهة التطعيم؟** **اختار السبب الرئيسي**	٤. عدم توفر المطعوم المطلوب ٥. عدم المقدرة على دفع الرسوم ٦. الاغلاق/منع التجول ٧. تغير عنوان الأسرة ٨. تم افتتاح مركز جديد ٩. جودة الخدمة غير مرضية ١٠. عدم ملائمة ساعات عمل المركز ١١. فقدان بطاقة التطعيم ١٢. لم يتم استقبالي بشكل جيد ١٣. الخدمة متوقفة ١٤. أخرى/حدد _	|_____|
CH21	**هل سبق وأن فقدت أي جرعة من المطاعيم ل (اسم الطفل)**	١. نعم ٢. لا (انتقل الى سؤال CH23) ٣. لا أعرف	|_____| اذا كانت الاجابة نعم، حدد كم مرة حصل ذلك خلال السنة السابقة عدد المرات |___||___|
CH22	**اذا كانت الاجابة نعم، ما هي الاسباب وراء فقدان (اسم الطفل) المطعوم؟** ***: يجب الاجابة على جميع الخيارات***	1. نعم 2. لا	

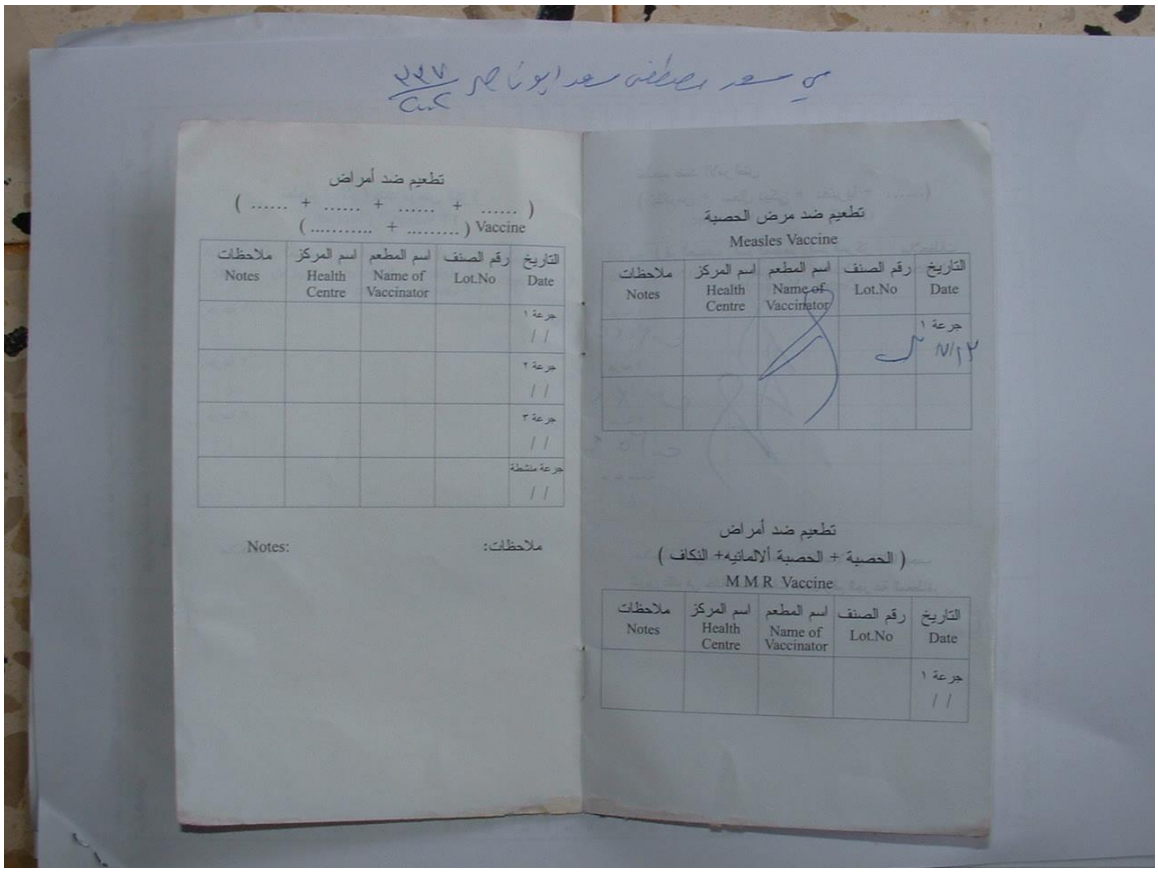
	١. المطعوم غير متوفر	|_____|
	٢. خدمة التطعيم غير متوفرة في المركز	|_____|
	٣. عدم وجود الطاقم المختص	|_____|
	٤. عدم ملائمة جدول المطاعيم	|_____|
	٥. عدم ملائمة موقع مركز الخدمة	|_____|
	٦. عدم المقدرة على الوصول لمكان الخدمة	|_____|
	٧. عدم المقدرة على الوصول لمكان الخدمة بسبب عدم توفر المواصلات العامة	|_____|
	٨. قلة اهتمام في أو عدم فهم لجدول المطاعيم	|_____|
	٩. مرض الطفل	|_____|
	١٠. الخوف من الآثار الجانبية للمطعوم	|_____|
	١١. الخوف من مخاطر السفر	|_____|
	١٢. التطعيمات غير مهمة	|_____|
	١٣. أخرى/حدد __	|_____|
هل سبق وأن عدت الى المنزل بدون الحصول على خدمة التطعيم ل (اسم الطفل)؟	١. نعم ٢. لا (انتقل الى سؤال CH25)	|_____| اذا كانت الاجابة نعم، حدد متى حصل ذلك قبل |____||____| شهر

	اذا كانت الاجابة نعم، ما هي الأسباب وراء عودتك الى البيت بدون تلقي المطعوم ل (اسم الطفل) لآخر مرة حصل فيها ذلك؟ **يجب الاجابة على جميع الخيارات** ***1. نعم*** **2. لا**	١. عدم توفر المطعوم المطلوب ٢. عدم توفر معدات (مثل الابرة). ٣. غير مؤهل للتطعيم لأسباب طبية ٤. سوء فهم لجدول المطاعيم أو تاريخ التطعيم المطلوب ٥. عدم وجود الطاقم المختص ٦. لم يتم ابلاغك عن السبب ٧. عدد كبير من المراجعين لكل ممرض أو طبيب. ٨. الخدمة متوقفة ٩. عدم فهم الموعد ١٠. عدم الحصول على موعد مسبق ١١. أخرى/حدد ــ	1. |_____| 2. |_____| 3. |_____| 4. |_____| 5. |_____| 6. |_____| 7. |_____| 8. |_____| 9. |_____| 10.|_____| 11.|_____|
CH25	**ما هي الآثار الجانبية التي قد تنتج عن اعطاء المطعوم للطفل؟** **لا تقرأ أي من الآثار المذكورة** **يجب الاجابة على جميع الخيارات** **1. نعم** **2. لا**	١. حمى ٢. تقرحات ٣. انتفاخ ٤. احمرار ٥. تهيج (الحكة) ٦. طفح جلدي ٧. لا أعرف ٨. أخرى / حددي ــ	1. |_____| 2. |_____| 3. |_____| 4. |_____| 5. |_____| 6. |_____| 7. |_____| 8. |_____|
CH26	**هل لاحظت) أي من الآثار التالية على (اسم الطفل عند تطعيمه؟** **اقرأ جميع الخيارات الموجودة، ويجب الاجابة على جميع الخيارات** **1. نعم** **2. لا** **اذا كانت الاجابة على جميع الخيارات (لا) انتقل الى سؤال CH.28**	١. ٢. حمى ٣. تقرحات ٤. انتفاخ ٥. احمرار ٦. تهيج (الحكه) ٧. طفح جلدي ٨. أخرى /حددي ــ	1. |_____| 2. |_____| 3. |_____| 4. |_____| 5. |_____| 6. |_____| 7. |_____|

CH27	**عندما لا حظت أحد الآثار التي ذكرت أعلاه على طفلك، ماذا فعلت؟** **يجب الاجابة على جميع الخيارات** **1. نعم** **2. لا**	١. لا شيء، كانت آثار عادية. ٢. ذهبت الى الطبيب/المستشفى لمراجعة المختصين. ٣. استخدمت العلاجات البيتية. ٤. لم أعطه المطعوم التالي. ٥. حولت مساعدته، لكن لم أستطع. ٦. استعنت بأحد من الاقارب/الاصدقاء ٧. أخرى/حددي ــ	1. |_____| 2. |_____| 3. |_____| 4. |_____| 5. |_____| 6. |_____| 7. |_____|
CH28	**خلال الزيارة الأخيرة لتطعيم (اسم الطفل)، هل أعطي؟**	١. نقط من فيتامين أ/د ٢. شراب حديد	1. نعم 2. لا |_____| |_____|
CH29	**هل تلقى (اسم الطفل) أي من المطاعيم التالية اضافة الى المطاعيم الأخرى؟**	١. مطعوم التهاب السحايا ٢. مطعوم التهاب الكبد نوع A ٣. الحصبة الألمانية ٤. جدري الماء ٥. مطاعيم أخرى/حددي ـ	1. نعم 2. لا 3. لا أعرف 1. |_____| 2. |_____| 3. |_____| 4. |_____| 5. |_____|
CH30	**كيف تقييمن رضاك عن خدمة التطعيم التي تلقيها عند تطعيمك (اسم الطفل) في المركز الذي تم تطعيم (اسم الطفل) آخر مرة؟**	١. مرضي جداً ٢. مرضي. ٣. بين بين. ٤. غير مرضي ٥. غير مرضي بشكل كبير	|_____|
CH31	**هل ستقومين بتطعيم (اسم الطفل) في نفس المركز الذي طعمت طفلك فيه آخر مرة؟**	١. نعم بالتأكيد. ٢. غير متأكدة ٣. لا نهائياً (انتقلي الى CH33) ٤. لا ينطبق	|_____|

CH32	**اذا كانت الاجابة نعم، ما هي الأسباب التي ستجعلك تطعيم (اسم الطفل) في نفس المركز؟** ***يجب الاجابة على جميع الخيارات*** ***1. نعم*** **2. لا**	١. المكان الوحيد الذي يسهل الوصول اليه. ٢. مجانية الخدمة. ٣. المركز يزودني بحوافز، كالطعام ٤. سمعة المركز جيدة ٥. الرضى عن الخدمة المقدمة ٦. أخرى/حددي ــ	1. |_____| 2. |_____| 3. |_____| 4. |_____| 5. |_____| 6. |_____|
CH33	**ما هي الأسباب التي دفعتك للبحث عن مكان آخر لتطعيم (اسم الطفل)؟** ***يجب الاجابة على جميع الخيارات*** ***1. نعم*** **2. لا**	١. جودة الخدمة غير جيدة. ٢. عدم المقدرة على دفع تكاليف المطعوم. ٣. برنامج العيادة/المركز غير ملائم ٤. صعوبة الوصول لمكان الخدمة ٥. الخدمة متوقفة ولا يتوفرالتطعيم المطلوب ــ	1. |_____| 2. |_____| 3. |_____| 4. |_____| 5. |_____|

Appendix Two Copy of Child Record



تطعيم ضد أمراض

(..... + ... + ... + ...)

(..... + ...) Vaccine

ملاحظات Notes	اسم المركز Health Centre	اسم المطعم Name of Vaccinator	رقم الصنف Lot.No	التاريخ Date
				جرعة ١ / /
				جرعة ٢ / /
				جرعة ٣ / /
				جرعة منشطة / /

Notes: ملاحظات:

تطعيم ضد مرض الحصبة

Measles Vaccine

ملاحظات Notes	اسم المركز Health Centre	اسم المطعم Name of Vaccinator	رقم الصنف Lot.No	التاريخ Date
				جرعة ١ ١٧/١٢

تطعيم ضد أمراض

(الحصبة + الحصبة ألالمانيه+ النكاف)

M M R Vaccine

ملاحظات Notes	اسم المركز Health Centre	اسم المطعم Name of Vaccinator	رقم الصنف Lot.No	التاريخ Date
				جرعة ١ / /

Appendix Three Tables

Table 4.2 Birth Order Frequency, Percent Valid Percent*

Birth Order	Frequency	Percent
1	8	2.3
2 - 3	32	9.2
4- 5	147	42.5
6- 7	68	19.7
8 +	91	26.3
Total	346	100.0

Table 4.3 Number of Siblings, Siblings Frequency, Percent Valid Percent

Number of Sibling	Frequency	Percent
0	8	2.3
1	22	6.4
2	25	7.2
3	10	2.9
4	16	4.6
5	27	7.8
6 +	238	68.8
Total	346	100.0

Table 4.4 Mother Education

Mother Education	Frequency	Percent
No Education	6	1.7
Some Primary	20	5.8
Complete Primary	66	19.1
Preparatory school	124	35.8
Secondary school +	130	37.6
Total	346	100.0

Table 4.5 Number of Adherent refugee and Non-refugee by Vaccine Type (%)

	BCG	HB1	IPV1	HB2	dpt1	ipv2	opv1	dpt2	opv2	dpt3	opv3	HB3	Measles	DPT4	TOPV	MMR
Vaccine Card																
None Refugee	91.2	94.7	93.5	88.8	89.8	87.3	86.1	89.4	85.4	87.1	82.6	80.3	84.5	80.9	75.5	74.3
Refugee Camps	89.8	94.0	92.2	92.2	93.3	89.6	92.0	92.1	92.1	90.6	90.6	84.8	82.2	78.0	73.2	74.2
P-Value	0.397	0.814	0.201	0.868	0.633	0.884	0.297	0.507	0.156	0.199	0.050	0.178	0.592	0.232	0.321	0.347
Mother Recall																
None Refugee	98.2	100.0	98.2	97.6	97.0	97.0	95.8	96.7	95.4	97.7	95.5	93.9	97.3	94.7	89.4	91.9
Refugee Camps	97.6	100.0	100.0	100.0	98.8	98.2	97.5	99.3	99.3	99.3	99.3	94.2	93.5	90.2	84.1	93.5
P-Value	0.202	1.000	0.305	1.000	0.843	1.000	0.852	0.121	0.090	0.464	0.245	0.495	1.000	0.634	0.545	0.386

Table 4.6 Number of Adherent refugee and Non-refugee by Vaccine Type (n)

	BCG	HB1	IPV1	HB2	dpt1	ipv2	opv1	dpt2	opv2	dpt3	opv3	HB3	Measles	DPT4	TOPV	MMR
Vaccine Card																
None Refugee	155	161	159	151	149	145	143	135	129	115	109	106	93	76	71	55
Refugee Camps	149	156	153	153	152	146	150	139	139	125	125	117	88	64	60	46
Total	304	317	312	304	301	291	293	274	268	240	234	223	181	140	131	101
Mother Recall																
None Refugee	167	170	167	166	161	161	159	146	144	129	126	124	107	89	84	68
Refugee Camps	162	166	166	166	161	160	159	150	150	137	137	130	100	74	69	58
Total	329	336	333	332	322	321	318	296	294	266	263	254	207	163	153	126

Table 4.7. Percentage of children up-to-date at age 2 years, by type of vaccination, according to mother recall

Antigens	BCG	HB1	IPV1	HB2	dpt1	ipv2	opv1	dpt2	opv2	dpt3	opv3	HB3	Measles	DPT4	TOPV	MMR
Vaccine Card	90.5	94.3	92.9	90.5	91.5	88.4	89.1	90.7	88.7	88.9	86.7	82.6	83.4	79.5	74.4	74.3
Mother Recall	97.9	100.0	99.1	98.8	97.9	97.6	96.7	98.0	97.4	98.5	97.4	94.1	95.4	92.6	86.9	92.6

Table 4.8 Vaccination by Background Characteristics (Cards)

Child Card	BCG	HB1	IPV1	HB2	dpt1	ipv2	opv1	dpt2	opv2	dpt3	opv3	HB3	Measles	DPT4	TOPV	MMR	Total Coverage without MMR	N
Gender																		
Male	88.4	93.1	92.5	89	90.5	87.5	88.1	91.1	88	89.2	84.9	84.2	84.3	80.9	73	59.6	64	178
Female	92.6	95.7	93.3	92	92.5	89.4	90.1	90.3	89.6	88.5	88.5	80.9	82.4	78.2	75.9	56.3	59.8	168
Total	90.5	94.3	92.9	90.5	91.5	88.4	89.1	90.7	88.7	88.9	86.7	82.6	83.4	79.5	74.4	58	61.9	346
Locality																		
None Refugee	91.2	94.7	93.5	88.8	89.8	87.3	86.1	89.4	85.4	87.1	82.6	80.3	84.5	80.9	75.5	58.5	63.8	173
Refugee Camps	89.8	94	92.2	92.2	93.3	89.6	92	92.1	92.1	90.6	90.6	84.8	82.2	78	73.2	57.3	59.8	173
Total	90.5	94.3	92.9	90.5	91.5	88.4	89.1	90.7	88.7	88.9	86.7	82.6	83.4	79.5	74.4	58	61.9	346
Birth Order																		
1	100	100	87.5	100	100	75	100	87.5	87.5	85.7	85.7	71.4	100	100	100	50	50	8
2-3	90.6	93.8	93.8	93.8	87.5	87.5	84.4	90	90	85.2	85.2	85.2	82.6	90	80	65	70	32
4-5	91.6	95.1	92.3	90.2	93.5	90.6	89.9	93.8	90.6	92.1	86.8	81.6	85.7	83.3	78.8	65.2	65.2	147
6-7	90.8	93.8	93.8	92.3	92.3	90.8	90.8	88.5	86.9	90.2	88.2	82.4	84.4	65.8	63.2	52.6	52.6	68
8+	87.5	93.2	93.2	87.5	88.2	84.7	87.1	88	86.7	84.5	85.9	84.5	78	79.2	72.9	50	62.5	91
Total	90.5	94.3	92.9	90.5	91.5	88.4	89.1	90.7	88.7	88.9	86.7	82.6	83.4	79.5	74.4	58	61.9	346

Child Card	BCG	HB1	IPV1	HB2	dpt1	ipv2	opv1	dpt2	opv2	dpt3	opv3	HB3	Measles	DPT4	TOPV	MMR	Total Coverage without MMR	N
Number of Sibling																		
0	100	100	87.5	100	100	75	100	87.5	87.5	85.7	85.7	71.4	100	100	100	50	50	8
1	86.4	95.5	86.4	90.9	90.9	81.8	86.4	89.5	89.5	94.1	94.1	82.4	80	78.6	71.4	71.4	57.1	22
2	100	95.8	100	87.5	100	100	83.3	100	86.4	95.2	76.2	85.7	93.8	100	91.7	75	66.7	25
3	100	100	100	90	100	90	90	100	87.5	100	87.5	87.5	87.5	71.4	71.4	57.1	57.1	10
4	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	73.3	71.4	71.4	64.3	66.7	44.4	44.4	33.3	44.4	16
5	96	100	100	100	100	100	96	100	96	100	95.5	95.5	100	100	100	58.3	91.7	27
6 +	89.7	94.4	93.1	90.5	90.2	88	89.8	89.8	89.3	87.3	87.3	82.3	81.4	78	72	56.8	61	238
Total	90.5	94.3	92.9	90.5	91.5	88.4	89.1	90.7	88.7	88.9	86.7	82.6	83.4	79.5	74.4	58	61.9	346
Mother Education																		
No Education	83.3	100	100	100	100	100	100	100	100	100	100	100	66.7	100	66.7	66.7	66.7	6
Some Primary	95	100	95	90	88.2	82.4	94.1	100	100	80	80	73.3	84.6	90	90	70	50	20
Primary	92.4	93.9	93.9	90.9	92.3	87.7	92.3	90.2	90.2	94.4	92.6	87	77.8	69.4	69.4	55.6	55.6	66
Preparatory school	90	93.3	92.5	89.2	89.1	87.4	84.9	87	84.3	86	83	79	83.5	81	71.4	49.2	60.3	124
Secondary school +	89.5	94.4	91.9	91.1	93.5	90.2	90.2	92.9	90.2	89.7	87.6	84.5	87	81.3	78.1	65.6	68.8	130
Total	90.5	94.3	92.9	90.5	91.5	88.4	89.1	90.7	88.7	88.9	86.7	82.6	83.4	79.5	74.4	58	61.9	346

Table 4.9 Vaccination by Background Characteristics (Mother Recall))

Mother Recall	BCG	HB1	IPV1	HB2	dpt1	ipv2	opv1	dpt2	opv2	dpt3	opv3	HB3	Measles	DPT4	TOPV 4	MMR	Total Coverage without MMR	N
Male	98.3	100	99	98	98	97	97	99	98	99	96	95	96.5	96.6	88.8	74.2	85.7	178
Female	97.5	100	99	99	98	98	96	97	97	99	99	93	94.1	88.5	85.1	71.3	79.3	168
Total	97.9	100	99	99	98	98	97	98	97	99	97	94	95.4	92.6	86.9	72.7	82.5	346
None Refugee	98.2	100	98	98	97	97	96	97	95	98	96	94	97.3	94.7	89.4	72.3	83.9	173
Refugee Camps	97.6	100	100	100	99	98	98	99	99	99	99	94	93.5	90.2	84.1	73.2	80.8	173
Total	97.9	100	99	99	98	98	97	98	97	99	97	94	95.4	92.6	86.9	72.7	82.5	346
Birth Order																		
1	100	100	100	100	100	88	100	100	100	100	100	86	100	100	75	100	50	8
2-3	96.9	100	100	100	97	97	94	97	97	96	96	96	100	100	90	70	89.5	32
4-5	97.9	100	99	98	99	98	97	100	99	99	97	93	100	95.5	90.9	80.3	87.5	147
6-7	100	100	100	100	99	99	99	95	95	100	98	96	95.6	84.2	81.6	65.8	73	68
8+	96.6	100	99	99	97	98	95	97	96	97	97	94	86.4	91.7	85.4	66.7	81.8	91
Total	97.9	100	99	99	98	98	97	98	97	99	97	94	95.4	92.6	86.9	72.7	82.5	346

Mother Recall	BCG	HB1	IPV1	HB2	dpt1	ipv2	opv1	dpt2	opv2	dpt3	opv3	HB3	Measles	DPT4	TOPV 4	MMR	Total Coverage without MMR	N
Number of Sibling																		
0	100	100	100	100	100	88	100	100	100	100	100	86	100	100	75	100	50	8
1	90.9	100	100	100	96	91	91	100	100	100	100	94	100	92.9	85.7	85.7	78.6	22
2	100	100	100	96	100	100	96	100	100	95	95	91	100	100	91.7	75	83.3	25
3	100	100	100	100	100	100	100	100	100	100	100	100	87.5	100	100	57.1	100	10
4	100	100	100	100	100	100	100	100	100	100	100	93	100	100	100	88.9	88.9	16
5	100	100	100	100	100	100	96	100	96	100	96	100	100	100	100	75	100	27
6 +	97.8	100	99	99	97	98	97	97	97	98	97	94	93.8	89.8	83.9	69.5	80.2	238
Total	97.9	100	99	99	98	98	97	98	97	99	97	94	95.4	92.6	86.9	72.7	82.5	346
Mother Education																		
No Education	100	100	100	100	100	100	100	100	100	100	100	100	66.7	100	66.7	66.7	66.7	6
Some Primary	100	100	100	100	100	100	100	100	100	100	100	93	92.3	90	90	80	75	20
Primary	100	100	99	100	97	95	97	95	95	100	96	96	88.9	86.1	86.1	69.4	79.4	66
Preparatory school	97.5	100	99	98	98	98	97	99	99	98	98	92	100	98.4	87.3	73	83.3	124
Secondary school +	96.8	100	99	98	98	98	96	98	96	98	97	95	96.1	90.6	87.5	73.4	85.2	130
Total	97.9	100	99	99	98	98	97	98	97	99	97	94	95.4	92.6	86.9	72.7	82.5	346

Table 4.10 Agreement on individual children's up-to-date vaccination status: parental recall versus medical records and vaccination cards versus medical records

	n	Vaccination card vs. Mother Recall	Mother Recall	Kappa
BCG	334	306	28	0.400
HB1	346	327	19	0
IPV1	334	311	23	0.415
HB2	333	305	28	0.450
dpt1	322	301	21	0.665
ipv2	321	291	30	0.584
opv1	318	293	25	0.655
dpt2	297	275	22	0.780
opv2	295	269	26	0.753
dpt3	266	240	26	0.802
opv3	263	233	30	0.773
HB3	254	223	31	0.785
Measles	210	181	29	0.831
DPT4	171	145	26	0.849
TOPV	156	132	24	0.852
MMR	129	102	27	0.826

Appendix Four

Biographical Sketch

C. Carol McCormick was born in New Orleans, April 3, 1950, and was raised in Apalachicola, Florida. She graduated from Chapman High School and received her Bachelors of Science Degree in Nursing from Florida State University in 1972. Her career has been devoted to Pediatric Nursing primarily in community health settings. In 1984, she developed the Tallahassee Pediatric Foundation (TPF) Primary Care Program as a pilot, nurse case-managed, private sector based, medical home model for indigent children. The Program, which is contracted through the Department of Health, Children's Medical Services, now serves over 8200 children, and has been replicated in many other areas of the state.

She looks forward to finishing her career at TPF, resuming hobbies like fishing and fly tying and spending more time at the beach with her family and new grand-niece, the most beautiful baby in the world, Emily.

Appendix Five Request for UNRWA Approval

To: UNRWA director of operation –West Bank

From: Dr. Suleiman Ghosheh
Obstetrician Jerusalem Area \ Field office

Subject: Request for Thesis Approval

Dear Sir,

As you know, I was sent by the health department for a master degree in public health, reports about my performance were submitted regularly to the training committee.

Now I am in the thesis phase, the previous topic chosen by me about the periodic report appraisal did no get a positive answer. Now and after consultation with the health department my thesis is going to be about adherence rate for Palestinian children at 2 years of age, comparison between refugee and non-refugee.
This is going to be a post facto survey with comparison between the mother recall, child record and UNRWA clinical records, with additional data collection.

I need your approval to use the UNRWA facilities in the three areas of operation and to be allowed to use the clinical records available in the clinics.

Wish to have your approval,

With respect….

Dr. S. Ghosheh

10.05.2005
C.C: Training Committee

الملخص التنفيذي:

مقارنة مدى التزام الاطفال الفلسطينيين اللاجئين وغير اللاجئين حتى عمر السنتين بالثطعيمات

هذة الدراسة تقارن في نسبة الالتزام بالتطاعيم، وتبين الخصائص الاجتماعيه لـ346 طفل لاجىء وغير لاجىء في الضفة الغربية وقطاع غزة.

فرضية هذة الدراسة كانت بان صفة اللاجىء ليست السبب الاولي قي عدم الالتزام بالتطعيم لدى هذة الفئه.

ان عملية التزود بالمعلومات لاثبات هذة الفرضية ضروري جدا من اجل تحسين نسبة الالتزام بالمطاعيم لدى هذة الفئه.

تثبت هذة الدراسة الفرضية المذكورة وذلك باظهار ان الاطفال غير اللاجئين ليسوا اقل بكثير التزاما من الاطفال اللاجئين، كما وتظهر مدى اهمية التركيز على المشورة من اجل جلب العدد الاكبر من غير الملتزمين

تم في هذة الدراسة استخدام نموذج بندل للتعزيز والتثقيف الصحي(بندل 1997) كاطار لهذة الدراسة، وهذا يؤدي بالضرورة لفهم سلوكيات التوعية الصحية والوقاية لدى الافراد في هذة الدراسة، ان التركيز في هذة الدراسة كان على سلوكيات الاهل في طلب التطاعيم للاطفالهم.وكما اثبتت هذة الدراسة فان اهل الاطفال غير اللاجئين هم الذين ينجحون اكثر قي التغلب علي المعيقات امام حصول اطفالهم علي التطعيمات.