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UTILIZATION OF MOTHER AND CHILD HEALTH
SERVICES IN JORDAN

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Introduction

Health services in Jordan are provided through multiple health organizations: Public, private, international and charitable.

The Ministry of Health (M.O.H) is the main provider of health services including mother and child health (MCH) services. It is estimated that about 60% of health services in the country are provided by M.O.H.

The M.C.H Services in the M.O.H are provided through 98 M.C.H clinics which provide an organized, comprehensive care, including preventive and curative forms. The target population eligible to these services are all pregnant women and children 0-5 years old in the whole country. These both groups constitute about 40% of the population. Other health providers, provide some of the services related to mother and child health such as immunization, initial examination of the new-born or treatment of the sick, but not all services especially the outreach activities.

A few studies on mother and child care services utilization have been conducted in Jordan. Some of these studies have concentrated on M.O.H services only, while others included all health providers in the country.

However, failure of country-wide studies to differentiate between visits intended for prevention, follow-up and treatment, and visits for treatment only-especially to private sector- gave estimates about utilization of doubtful value.

In 1983, A Jordan Fertility & Family Health Survey" was conducted by the Jordan Department of statistics with assistance from POPLAB and C.D.C.

A sample of 6000 household was used for survey purposes. This represents five replicates of the sampling frame developed for the Multipurpose Household survey programme which consists of 14 replicates of approximately 1000 household each. Eligible respondents are ever-married women 15-49 age group.

One of the survey objectives is to obtain information on use of maternal and child health care services including prenatal care, tetanus immunization for pregnant women, place of last birth and child care.

Data obtained from the survey about mother and child health services are:

- A. Data on mother care: These include:
 - A.1 Prenatal examination of pregnant woment distributed according to the following variables:
 - A.1.1 Residence of mother: The residence of the mother has been divided into:
 - Three major urban cities: Amman, Zerka and Irbid.
 - Other urban settings.
 - Rural Residence.
 - A.1.2. Level of education of the mother: Mother's education has been divided into 3 main levels:
 - Illiterate (None): don't read or write.
 - 1-6 years of education.
 - 7+ years of education.

A.1.3. Source of prenatal examination: The providers of prenatal examination included the following:

- Private physicians.
- MCH clinics of the M.O.H.
- Public Hospitals.
- UNRWA.
- Village clinics of M.O.H.
- Private Hospitals.
- University Hospital.
- Other providers.

A.1.4. The time of first prenatal examination: The period during which first prenatal examination was carried out was divided into the following:

- First trimester (1st-3rd month).
- Second trimester (4th-6th month).
- Third trimester (7th + month).

A.2 Tetanus Immunization of pregnant women:

The coverage of tetanus vaccination to pregnant women was studied according to the following variables:

A.2.1 Tetanus vaccination coverage by residence of the mother (3 cities, other urban & rural).

A.2.2 Tetanus vaccination coverage by level of mother's education (None, 1-6, 7+).

A.3. Delivery of last born child: The delivery of last birth was studied according to the following variables.

A.3.1. Place of delivery:

The places of delivery defined in the survey are:

- Public Hospital.
- Private Hospital.
- Home.

The place of delivery of last birth has been studied according to following variables:

A3.1.1. Place of delivery of last birth by residence of mother.

A3.1.2. Place of delivery of last birth by the level of mother's education.

A.3.2. Attendant of delivery: The types of attendants specified in the survey are:

- Physicians
- Registered Midwives.(R.M).
- Traditional birth attendants (TBA).
- Others.
- No attendants (No assistance).

The deliveries by type of attendant have been studied according to the following variables:

A.3.2.1 Delivery attendant by mother's residence.

A.3.2.2 Delivery attendant by mother's level of education.

B. Data on infant and child care: The data on infant and child care included the following:

B.1. Infant medical examination: Well and sick-baby examinations were studied according to the following variables.

B.1.1. Infant examination by residence and mother's education.

B.1.2. Type of infant examination by residence and level of mother's education.

B.1.3. Age of first examination: The following infant ages were used:

- < 1 month.
- 1-3 months.

- 4-6 months.
- 2-12 months.

The ages of infants', first examinations were studied according to the following variables:

- Residence of infand.
- Mother's education.

B.1.4. .Place of infant's first examination: The places of infants', first examinations were studied by the following variables:

- Places of infants' first examinations by residence.
- Places of infants' first examinations by level of mother's education.

B2. Vaccination coverage of children: The vaccines included in the study survey are:

- Trivalent Oral Poliovirus (TOPV).
- Diphtheria, Tetanus, Pertussus(D.P.T).
- Measles Vaccine.

Vaccination coverage of children was studied according to following variables:

- B2.1. Type of vaccine by residence.
- B2.2. Type of vaccine by mother's education.
- B2.3. Drop-outs(those who didnot complete schedule).
were studied according to:
 - Type of vaccine and residence..
 - Type of vaccine and level of mother's education.

The objectives of this report are:

- a. Measuring the coverage of target population by M.C.H services.
- b. Evaluation of M.C.H services currently provided by all health providers.
- c. Recommending practical ways to ensure maximum possible coverage of population at risk with M.C.H services-within the available resources for the purpose of contribution to reduction in high infant, childhood and maternal mortality and morbidity in Jordan.

Results And Analysis

Mother Care

1. Pre-natal medical examination:

2800 women reported at least one live birth in the past five years preceding survey initiation. 58.1% (1627) of them had had a prenatal examination during their most recent pregnancy.

The examination status of the 2800 women was examined according the following variables:

- Residence of the mother.
- The level of education of the mother.

The women who had had such an examination were distributed according to the following variables:

- The source (Provider) of examination .
- The period at which examination was conducted.

1.1 Distribution of mothers by examination status and area of residence:

70.8% of women living in the three big cities (Amman, Zarka and Irbid) had a prenatal medical examination in their more recent pregnancy, while the percentage drops to 57.8% and 40.3% in other urban and rural women. As for women who were not examined, the percentage raises from 29.1% in the three cities to 42.2% and 59.7% in the other urban and rural areas. Table-1-.

To test the association between the examination status of pregnant women and the area of residence, the qui-squared test of significance is used. As seen in Table- 2 - , there is an association between pre-natal examination status and the area of residence of mother -P < 0.005.

1.2 Distribution of examination status of pregnant women by the level of mother's education.

Among illiterate mothers, 43.8% only had been examined during pregnancy, while 60.9% of women of 1-6 years of education had been examined, and 73.5% of mothers of 7 + years of education, Table - 3.

Table - 4 - shows an association between prenatal examination and the level of mother's education.

P < 0.005.

1.3 Distribution of mothers who had a prenatal examination during their most recent pregnancies by source of care:

The private health sector (Private physicians and private hospital) Constitutes the main provider of prenatal examination service for all women (45.1%) followed by the public sector 44.1%. Of the public sector, the ministry of health provides 42.9% and the Jordan university hospital 1.5%.

The United Nations Relief And Works Agency (UNRWA) provides the services for only 1.5% - Table - 5.

1.3.1 Distribution of examined mothers by provider and residence - Table- 6 -

The private sector is the main provider of prenatal examination for pregnant women living in the three main cities (54.3%) followed by the public sector (35.3%), while for other urban and rural residents, the public sector is the main provider followed by the private sector (57%, 27%) and (52%, 43.2%) respectively.

UNRWA Services are mainly concentrated in the other urban (12.9%) than in urban (3.5%) or rural (2.6%).

The qui-Squared test of significance shows an association between mother's residence and the source of prenatal examination Table- 7.

1.3.2 Distribution of examined mothers by provider and level of mother's education:

The private sector is the main provider of pre-natal examination for mothers of 7 + years of education (53.9%) followed by the public sector (37.4%), while for illiterate mothers and mothers of 1-6 years education, the public sector is the main provider (50.6%, 48.4%), followed by the private sector (38.4, 38.9%). Table- 8 -.

An association exists between the level of mother's education and the utilization of different health sectors- $P < 0.005$ Table - 9 .

1.4. Distribution of examined mothers by month of first examination:-

940 women (57.8%) of the total (1627) had their first prenatal examination during the first trimester of pregnancy, 584 (35.9%) in the second trimester and the rest- 103 (6.3%) in the third trimester- Table- 10.

1.4.1 Distribution of examined mothers by month of first prenatal examination and residence of mother:

63.5% of examined mothers living in the three main cities had their first prenatal examination in their first trimester of pregnancy, 31.7% in the second trimester and 4.6% in the third trimester.

In the other urban and rural residents, 46.9%, and 57.3% were examined in the first trimester, 47.5% and 32.3% in the second and 6.6%, 9.8% in the third trimester respectively . Table- 11.

Table - 12 shows an association between the mother's residence and the month of first prenatal examination.

- $P < 0.005$.

1.4.2. Distribution of examined mothers by month of first prenatal examination and mother's education:

The percentage of mothers who had their first prenatal examination during the first trimester is higher in mother with 7+ years of education than in mothers with none or 1-6 years of education. Table- 13.

Table 14 shows an association between the level of mother education and the month of first prenatal examination.

2. Tetanus vaccination to pregnant women:-

Of the total 2800 women who had been pregnant in the last five years, only 5.3% received tetanus toxoid during their most recent pregnancy, while out of 1626 women who had been examined during their last pregnancy, 9.3% of them received tetanus toxoid - Table 15.

2.1. Distribution of tetanus immunization status of examined women by residence:

The coverage of examined women living in the three big cities by tetanus toxoid is 9.6% compared to 10.3% and 9.6% in the other urban and rural residents respectively. Table 16.

The application of qui-squared test of significance to test the association between tetanus immunization and the residence of pregnant women did not show association between the two variables..

This may be explained by the inability of the pregnant women to differentiate between tetanus toxoid injections and other medicinal injections especially in rural areas.

2.2 Distribution of tetanus immunization of examined mothers by level of education:

Data from the survey showed that the percentage of examined women immunized by tetanus toxoid is higher among illiterate (11.1%) than in educated mothers-

being 7.7% among mothers of 1-6 years of education and 8.8% among 7+ years of education Table 18.

The chi-squared test showed no association between the level of education of the mother and tetanus toxoid immunization Table- 19.

Again, this result can be interpreted by failure of pregnant women to differentiate between toxoid injection and other injections especially among illiterate mothers.

3. Deliveries:

The 2800 women who had had birth in the last five years preceding the survey are distributed according to the following variables:

- Place of last birth by area of residence of the mother.
- Place of last birth by level of education of mother.
- Birth attendant by mother's residence.
- Birth attendant by mother's level of education.

3.1 Distribution of deliveries by place of delivery and mother's residence:

In the three big cities - (Amman, Zarka and Irbid) - public hospital is the first place of delivery (42.4%) followed by private hospital (30.5%), and the home as the last place (26.9%). In other urban and rural areas, home is the first choice as place of delivery (45.7%, 52.6%) followed by public hospital (41.6%, 40.3%), and the private hospital as the last choice (8.7%, 6.9%) Table- 20.

Table 21 shows association between place of delivery and the residence of mother.

3.2 Distribution of deliveries by place of delivery and level of education of the mother.

For illiterate women, more than half of deliveries (53.9%) are conducted at home, 38.6% at public hospital and only 3% at private hospital.

For mothers with 1-6 years of education, public hospital is the place of delivery of 42.9%, home deliveries 41.1%, and the private hospital for 15.8%.

Among mothers with 7+ years of education, public hospital is the place of delivery for 44.3%, private hospital for 31.9% and home deliveries 23.7% Table 22.

There is an association between place of delivery and the level of mother's education, table 23.

3.3 Distribution of deliveries by type of attendant and mother's residence.

The types of attendants specified in this report are:

- Qualified personnel: Physicians and registered midwives (RM).
- Traditional Birth Attendants.
- Others- unspecified and unassisted deliveries.

In the three big cities 85.5% of deliveries are conducted by qualified personnel and 13.4% by TBA.

In the other urban areas, 75.8% of deliveries are conducted by qualified personnel and 22.3% by T.B.As.

Deliveries by T.B.A's amount to 29.9% of deliveries in rural areas, while 62.9% by qualified personnel table 24.

Table 25 shows an association between type of delivery attendant and the residence of mother.

3.4 Distribution of deliveries by attendant and mother's level of education:

About 30% of deliveries among illiterate women are conducted by T.B.A's compared to 23.1% among mothers of 1-6 years of education and 10% in mothers of 7+ years of education. Deliveries under medical supervision constitute about 90% in women of seven years of education or more, 75.6% in women of 1-6 years of education and 61.8% in illiterate women.

Table 26.

Table 27 shows an association between the level of mother's education and type of birth attendant.

Child Care: The services included under Child Care are:

1. Infant medical examination.
2. Child vaccination against poliomyelitis, Diphtheria, pertussus and measles.

1. Infant medical examination:

Out of 2800 infants born within the last five years preceding the survey, 1193 (42.6%) have been medically examined during their first year of life-table 28.

The examination status of infants are studied according to the following variables:

- Residence : 3 cities, other urban and rural.
- Mother's level of education: None, 1-6 and 7+ years.

1.1 Infant examination by residence:

Infants living in the three big cities have 82.1% of them examined during their first year of life compared to 42.3% of infants of other urban, and only 29.6% of rural infants.

Tabel - 29 .

Chi-Squared significance test shows an association between infant examination and residence- Table 30.

1.2 Infant examination by level of mother's education:

Among illiterate women, 31.9% of their infants had been examined compared to 44.3% and 54.8% of infants born to women of 1-6 years and 7+ years of education. Table 31.

Table 32 shows an association between infant examination and level of mother's education

2. Type of infant medical examination:

Infants who were examined medically are either sick or well.

Well-baby examination is intended for purpose of monitoring growth and development and for early detection and early treatment of diseases. It is an important indicator of M.C.H utilization in contrast to sick-baby examination which is intended for treatment of child when he is sick, and it is not as an important indicator of M.C.H care utilization as a well- baby examination.

The type of infant examination is distributed according to the following variables.

- Area of residence.
- The level of mother's education.

2.1 Distribution of type of baby examinations by residence.

In the three main cities, 58.8% of infants were examined for the purpose of checkup (use of well-baby clinic) while 41.8% were sick and examined for treatment. In other urban areas, 44.8% visited well-baby clinic and 55.2% the sick-baby clinic. In rural areas, only 32.5% visited the well-baby clinic - Table 33.

Table 34 shows an association between area of residence and type of infant examination.

2.2 Distribution of type of infant examination by the level of mother education.

Utilization of well- baby clinic is lower among infants of illiterate women than among infants of educated mothers. Only 38.1% of infants born to illiterate mothers were examined for the purpose of medical check-up, compared to 48.1% and 58.7% of infants born to mothers of 1-6 years and 7+ years of education respectively, table 35.

Chi-squared test of significance shows an association between mothers level of education and type of infant examination- Table- 36.

3. Age of first examination of infant:- Early examination of infants helps in early detection of congenital anomalies and hidden diseases and facilitates early treatment and prevention of handicaps. The ages-in months-at which first examination of infant has been carried, as specified in the survey is as follows:

- < 1 month of age.
- 1-3 months of age.
- 4-6 months of age.
- 7-12 months of age.

3.1 Distribution of age of first examination of infant by area of residence:

As seen in table 37, about two thirds of infants in the three areas of residence had their first examination between first and third month of age (68.6%, 67.6% & 69%) Infants examined below one month of age constitute 7.6% of total infants in the three cities, 5.3% in the other urban and 4.7% in rural infants - Table 37.

The chi-squared test of significance shows no association between the age of first examination of infant and the residence- table 38.

3.2 Distribution of age of first examination by the level of mother's education:

The percentage of infants who had their first examination before the first month of age is 7.5% of infants born to mothers of 7+ years of education, 6.5% of infants born to mothers of 1-6 years of education and only 4.9% of infants born to illiterate mothers.

More than two thirds of infants born to each group of mothers have been examined for the first time between 1-3 months of age - Table 39.

Table 40 shows no association between age of first examination of infants and the level of mother's education.

4. The place of first examination of infant:

The places of infant examination are grouped as follows:

- Private sector.
- Public sector.
- UNRWA
- Others.

4.1 Distribution of the place of infant examination by residence:

In the three main cities, 55.8% of infants were examined by the private sector, 32.4% by public and 4.7% by UNRWA. In the other urban and rural areas, the public sector is the main provider of service (50.1%, 50.2%) followed by private sector-37.1% and 44.7% respectively. UNRWA provides service, mainly, in the other urban area. Table 41.

Table 42 shows an association between infant's residence and the place of first examination
--P < 0.005.

4.2 Distribution of place of first examination by level of mother's education:

Among illiterate women's infants, 46.6% of them utilized the public sector, 40.8% private sector and 6.9% used UNRWA services. Among infants born to educated women, the private sector was the main source of service followed by public sector- Table 43. Qui-Squared test shows an association between level of mother's education and place of first examination of infants, table 44.

5. Vaccination against polio, Diphtheria, pertussus and measles:

5.1 Distribution of children's vaccination by area of residence and type of vaccine:

In the three cities: 81% of children below 5 years of years have been covered by TOPV vaccine, 80% by D.P.T and 70.1% by measles vaccine.

In other urban area, 75.5% had TOPV , 74.3% D.P.T and 66.1% measles vaccine. In rural areas, the coverage percentages are 75.5%,74.3% and 66.1% for the three vaccines respectively - Table 45.

5.2 Distribution of vaccination by type of vaccine and level of mother's education:

Children below five years of age of illiterate women have 73.6%, 72.9% and 65.6% coverage of TOPV, D.P.T and Measles vaccines. These percentages increase to 77.7%, 77.1% and 66.7% among children of mothers of 1-6 Years of education, and to 83.8%, 83% and 73% among children of mothers of 7+ years of education - Table 46.

5.3 Distribution of vaccination status of children by residence:

Among children living in the three cities , 77.2% have been vaccinated by mentioned vaccines, in other urban 73.5% and in rural areas 71.9% - Table 47.

Table- 48- shows an association between the vaccination status of children and their residence.

5.4 Distribution of vaccination status of children < 5 years of age and level of mother's education.

Table - 49 shows higher percentages of vaccination coverage among children of educated mothers; and table 50 shows an association between the two variables i.e child's vaccination and level of mother education.

5.5 Distribution of children below 5 years of age who did not complete the vaccination schedule:

In Jordan the scheme of vaccination with TOPV and D.P.T. is three doses of each vaccine given at ages of 3,4,5 months with a fourth dose at age of 13 months. The maximum interval between the first and second, and the second and the third dose is two months. Children who do not comply to this scheme-three doses with maximum of two months between the one and another dose-is considered a drop-out and should be revaccinated again.

5.5.1 Distribution of drop-outs by residence:

In the three cities, 1.8% of vaccinated children did not complete TOPV schedule and 2% the D.P.T, compared to 2.4%, 2.7% in suburban area and 3.4%, 3.7% in rural areas table-51.

The application of qui-square test of significance for the association between drop-outs and residence of child showed no association table 52.

5.5.2 Distribution of drop-out by level of mother's education:

The percentage of drop-outs from both vaccines is higher in illiterate women than in educated ones-table 53.

The qui-square test shows no association between drop-outs from vaccines and the level of mother education.

Conclusions And Recommendations

The survey data provide information on the coverage of population at risk-mothers and children-by mother and child health services as well as information on the pattern of utilization of those services.

The increase in I.C.H. care coverage should be associated with increase in utilization of services in order to improve the health status of mothers and children and to avoid the waste use of scare resources.

The utilization of MCH services- as shown in analysis of survey data- is affected by many factors; and the improvement in utilization can be achieved by manipulation of those factors.

The factors affecting each MCH service and the recommendations for improvement are:

1. Pre-natal medical examination:

Healthy pregnancy is a pre-requisite to a future healthy life of the mother and her child. Diseases associated with pregnancy can have serious effects on the health of mother and the child during any of its ages- foetal; infancy, childhood; and some effects may not appear except later in adult life.

The factors that affect the prenatal examination as shown in the survey are:

- 1.1 The residence of the mother: The use of service is higher among mothers living in the three big cities than among mothers living in other urban areas.

This is due to the fact that health services are mal-distributed. The private health sector is concentrated in these three big cities, while the ministry of health is the only provider of health care in rural areas.

Thus, residents of the three big cities have access to all health sectors, private, public, and international, while rural residents have the ministry of health as the only provider, and they have to travel long distance for sake of other sector's service if they can afford to pay for it.

Recommendation:

Equitable redistribution of health services among all geographical areas and increase in service coverage from 58% to 80% by 1990 in all areas.

1.2 The level of mother education:-

High utilization of ante-natal examination is associated with high level of mother's education. Illiterate women are low utilizers. A better awareness of importance of healthy life and better income among educated mothers contribute of this pattern of utilization.

However, poverty and illiteracy should not stand as barriers against use of service.

Recommendation:

The ministry of health is the government agency responsible for "Health Policies" formulation. The total coverage of population by health care is one of its objectives. The barriers against utilization of the service should be removed by M.O.H through:

- Providing basic health services including MCH, free-of charge to all population especially to the poor.
- Health education: The health messages should reach all people in their areas of residence by all possible means-mass media, home visits, health fairs and community participation.

1.3 The quality of care: Although the cost of health care in the private sector is high, this sector is the main source of MCH care in the whole country.

This is partly explained by inavailability of public service. But, in many instances, the available public service is inaccessible to and/or unacceptable by the public.

The long waiting hours, the attitude of public service staff and the unsatisfaction of users are factors that drive women from utilization public health service.

Recommendation:

Attention should be paid to the quality and quantity of care in the public sector for the purpose of improving it to become available, accessible and acceptable. This can be achieved through building more facilities, staffing the facilities with qualified and lacking personnel such as social workers and conduct continuing education courses for all personnel in health and social sciences.

2. Tetanus vaccination to pregnant women:

The survey data on pre-natal tetanus vaccination show a very low coverage even among the highly educated women and the residents of the three big cities. There is no association between the immunization status of pregnant women and the level of mother education or her residence.

Immunization of pregnant women by Tetanus Toxoid can prevent tetanus neonatorum. Although data about incidence of tetanus neonatorum are not available, some cases of disease are reported.

Recommendation:

In order to control tetanus neonatorum, increase in coverage of pregnant women by tetanus toxoid vaccine to at least 60% is desired. The ministry of health should utilize all of its resources to improve the coverage through M.C.H centres, EPI programme and Health Education Programme. The other health sectors, public and private can play a major role in this field.

3. Deliveries:- The main points in the "deliveries" issue are:

3.1 The Traditional Birth Attendants (T.B.A's) are a major source of delivery care in the country. More than one fifth of all deliveries in the country, and about 30% of deliveries in rural areas are attended by T.B.A's.

3.2 Home delivery is a common practice in the country. About 40% of all deliveries and more than 50% of deliveries in rural areas are conducted at home.

Both "T.B.A" attended and Home deliveries are associated by the level of mother's education and her area of residence; they are higher among illiterate and rural resident mothers.

Recommendation: A positive and constructive approach towards the TBA's should be adopted for the sake of health of mothers and children. The training, retraining, follow-up and providing incentives for TBAs to work in close contact with the M.C.H Centres of the M.O.H is a useful approach. This approach can lessen,

to a great degree, possible complications that may occur to the mother and her child.

Health education programme should play a major role in this field by educating mothers about all possible hazards if attended by unqualified health personnel during delivery.

5. Infants' Medical Examination:-

Every New-born should be examined just after birth to detect any congenital defect that may affect growth or development of the child. Medical examination is a common practice for all children born at hospitals but not at home. Infants delivered at home are usually examined later in life, unless they develop a disease. The number infants' medical examinations-per se-is not a good indicator of utilization of M.C.H services, it may only reflect the degree of spread of diseases in infants community. The main objective of child care is the early detection of disease through initial and periodic check-up of infants well-baby clinic.

So, the time of initial examination of infant and number of return visits to a well-baby clinic are better indicators of child care utilization.

The information from survey data indicates that less than half of all infants have been examined during their first year of life and still, less than half of examined infant visited the well-baby clinic. More than two thirds of infants examined for both purposes, were examined during the first three months of age.

Both factors-the level of mother education and her residence-are associated with use of infant care services. Mothers of higher level of education and mothers living in the three big cities have higher utilization rate.

Recommendation:

Due to importance of infant medical examination, especially the well-baby examination very early in life in early detection and treatment of hidden diseases, and the importance of subsequent visits for monitoring growth and development of infants; health education programmes in the M.O.H and other sectors should pay more attention towards mothers' education by all possible means in utilization the well-baby care.

In addition, a well-baby clinic service should be made available for all communities in all health sectors and be provided free of charge or at a minimum fee afforded by all users.

6. Vaccination Coverage:-

Although the two traditional children's vaccines-TOPV and D.P.T-where introduced to the country in the early 1960's, yet, the total coverage is not as it should be- 78% and 77% respectively. Cases of poliomyelitis, diphtheria, pertussis and Tetanus are still occurring, some times, in epidemic form. The measles vaccine was introduced in late 1970's and has better coverage average than the other two vaccines (68%) compared to the date of its use in the country.

In the developed countries, control of diseases preventable by vaccination has been achieved with more 95% coverage of children by vaccine. Only few sporadic cases are reported, and epidemics of poliomyelitis, diphtheria or tetanus are now part of the past.

In Jordan, the level of mothers' education and their area of residence are associated with the vaccination status of their children. The mothers of higher educational level and mothers living in the three big cities have higher vaccination rates of their children than illiterate and rural residents mothers.

Recommendation: A more aggressive approach should be adopted by health authorities to achieve a better coverage of vaccination to - at least- 90% of children below 5 years of age by 1990.

Expanded programme on Immunization and the Health
Education programmes carry the highest burden
towards achieving this objective.

Table -1- Percentage distribution of Pre-natal examination status of pregnant women in each area of residence.

		Residence		
		AMMAN ZARKA IRBID	Other Urban	Rural
Prenatal examination	Yes	70.8%	57.8%	40.3%
	No.	29.1%	42.2%	59.7%
	Total	100 %	100 %	100 %

Table -2- Distribution of the examination status of Pregnant women by areas of residence.

		Residence			
		AMMAN ZARKA IRBID	Other Urban	Rural	Total
Examination Status	Yes	869	411	347	1627
	No.	358	300	515	1173
	Total	1227	711	862	2800

$$\chi^2 = 68.536$$

$$df = 2$$

$$P < 0.005$$

Table -3- Percentage distribution of Prenatal examination status of women of each level of education.

		Level of Mother's education		
		None	1-6Y	7+
Prenatal Examination	Yes	43.8%	60.9	73.5
	No	56.1%	39.1	26.5
	Total	100%	100%	100%

Table -4- Distribution of Pregnant women by Pre-natal examination and level of mother's education

		Level of Mother's Education			Total
		None	1-6	7+	
Pre-natal Examination	Yes	502	442	684	1628
	No.	642	284	246	1172
	Total	1144	726	930	2800

$$\chi^2 = 188$$

$$d = 2$$

$$P < 0.005$$

Table -5- Distribution of Prenatal examination by source of care.

Source	Number examined	Percentage
1. Private Sector	734	45.1%
2. Public Sector	722	44.1%
- M.O.H	698	42.9%
- JUH	25	1.5%
3. UNRWA	93	1.5%
4. Others	75	4.6%
5. Unknown	33	0.2%

Table -6- Percentage distribution of examined women in each area of residence by health provider.

		Residence		
		Amman Zerka Irbid	Other Urban	Rural.
Health Sector	1. Private Sector	54.3%	27 %	43.2%
	2. Public Sector	35.3%	57 %	52 %
	3. UNRWA	3.5%	12.9%	2.6 %
	4. Other	6.8%	2.2%	2 %
	5. Unknown	0.1%	0.2%	0.3%
	6. Total	100 %	100%	100 %

Table -7- Distribution of source of prenatal examination by Provider.

		Residence			
		3 cities	Other Urban	Rural	Total
Source of Pre-natal examination	Private Sector	471	111	150	732
	Public Sector	306	234	180	720
	UNRWA	30	53	7	90
	Total	807	398	337	1542

$$\chi^2 = 179.78$$

$$df = 4$$

$$P < 0.005$$

Table -8- Percentage distribution of examined women of each level of education by source of health care.

Source	Level of Education		
	None	1-6Y	7+
Private	38.4%	38.9%	53.9%
Public	50.6%	48.4%	37.4%
UNRWA	8%	7.5%	2.8%
Other	3%	4.7%	5.7%
Unknown	0	0.5%	0.1%
Total	160	100%	100%

Table -9- Distribution of source of care by level of education of women.

Source of care	Levels of Education			
	None	1-6	7+	Total
Private	154	172	369	684
Public	202	214	256	672
UNRWA	32	33	55	120
Total	388	419	680	1477

$\chi^2 = 30.8$

df = 4

P < 0.005

Table - 10- Distribution of examined women by month of first examination.

Month of 1st Exam.	Number	%
1-3	940	57.8%
4-6	584	35.9%
7+	103	6.3%
Total	1627	%100

Table -11- Percentage distribution of prenatal examination in each area of residence by month of first examination.

Month of 1st Examination.		Residence		
		Amma Zarka Irbid	Other Urban	Rural
Month of 1st Examination.	1-3	63.5%	46.9%	57.3%
	4-6	31.7%	47.5%	32.9%
	7+	4.8%	6.6%	9.8%
	Total	100	100	100

Table -12- Distribution of month of first prenatal examination by residence.

	Residence.				
	Amman Zerka Irbid	Other Urban	Rural	Total	
Month of 1st examination	1-3	551	191	199	941
	4-6	275	194	114	583
	7+	42	26	34	102
	Total	868	411	347	1626

$$\chi^2 = 43.9$$

$$df = 4$$

$$P < 0.005$$

Table - 13- Percentage distribution of examined of each level of education by month of first examination.

		Level of Education		
		None	1-6	7+
Month of first pre natal examination	1-3	50.7%	54.1%	65.1%
	4-6	40.9%	38.9%	30.3%
	7+	8.4%	6.6%	4.7%
	Total	100	100	100

Table - 14 - Distribution of month of first prenatal examination by level of education of mother.

		Level of education			
		None	1-6	7+	Total
Month of 1st examination	1-3	440	222	226	888
	4-6	355	160	105	620
	7+	73	29	16	118
	Total	868	411	347	1626

$\chi^2 = 2^2$

df = 4

P-- 0.005

Table -15- Number and percentage of tetanus immunization status of examined pregnant women

Tetanus Immunization	Number	Percentage from examined mothers
Yes (1,2,3+injections)	150	9.3%
No	1476	90.7%
Total	1626	100 %

Table - 16- Percentage distribution of women in each area of residence by status of tetanus immunization.

		Residence		
		Amman, Zarka Irbid	other urban	Rural
Tetanus Immunization	Yes	9.6%	10.3%	9.6%
	No	90.4%	89.7%	90.4%
	Total	100	100	100

Table - 17 - Distribution of Tetanus immunization status of examined pregnant women by residence.

		Residence			
		Amman Zarka Irbid	Other Urban	Rural	Total
Tetanus Vaccination	No	793	369	314	1476
	Yes	75	42	33	150
	Total	868	411	347	1626

X = 0.92

df = 4

P < 0.05

Table - 18 - Percentage distribution of women of each level of education by tetanus immunization status.

		Level of education		
		None	1-6	7+
Tetanus Immunization	No	88.9%	92.3%	91.1%
	Yes	11.1%	7.7	8.8
	Total	100	100	100

Table - 19- Distribution of tetanus immunization status of examined women by level of education.

		Level of education			
		None	1-6	7+	Total
Tetanus Examination	Yes	356	408	623	1387
	No	44	34	61	139
	Total	400	442	684	1526

$X^2 = 2.936$

$df = 2$

$P < 0.05$

No association between Tetanus immunization & education level.

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Table - 20 - Percentage distribution of deliveries in each area of residence by place of delivery.

		Residence		
		Amman, Zarka, Irbid	Other urban	Rural
	Public Hospital	42.4%	41.6%	40.3%
	Private Hospital	30.5%	8.8%	6.9%
	Home	26.9%	45.7%	52.6%
	Total	100	100	100

Table - 21 - Distribution deliveries by place of delivery and residence of mothers.

		Residence			
		Amman Zarka Irbid	Other Urban	Rural	Total
Place Of Delivery	Hospital	897	359	407	1663
	Home	330	352	455	1137
	Total	1227	711	862	2800

$\chi^2 = 168$

$P < 0.005$

Table - 22 - Percentage distribution of deliveries among mothers of each educational group by place of delivery.

		Level of Education		
		None	1-6	7+
Place of delivery	Public Hospital	38.6%	42.9%	44.3%
	Private Hospital	3%	15.8%	31.9%
	Home	53.9%	41.1	23.7
	Total	100	100	100

Table - 23 - Distribution of deliveries by place of delivery and the level of mother education.

		Level of education			
		None	1-6	7+	Total
Place of Delivery	Hospital	527	427	709	1663
	Home	617	299	221	1137
	Total	1144	726	930	2800

χ^2 + 190

Table - 24 - percentage distribution of deliveries in each area of residence by attendant.

		Residence		
		Amman , Zarka Irbid	Other urban	Rural
Attendant	Qualified (Physician third- wives	85.5%	75.8%	62.9
	T.B.A	13.4%	22.3%	29.9
	Others	0.9	18%	7.2
	Total	100	100	100

Table - 25 - Distribution of deliveries by attendant and area of residence.

		Residence			Total
		Amman Zarka Irbid	Other urban	Rural	
Attendant	Qualified	1049	539	542	2130
	T.B.A	164	159	258	581
	Total	1213	698	800	2711

χ^2 = 78.74
 df = 2
 P < 0.005

Table - 26 - Percentage of deliveries to each group of women of educational level of attendant.

		Level of Education		
		None	1-6 Y	7+
Attendant	Qualified Person	61.8%	75.6%	89.4%
	T.B.A	29.7%	23.1%	10%
	Other	8.4	1.2	0.5%
	Total	100	100	100

Table - 27 - Distribution of attendant by level of mother's education.

		Level of Education			
		None	1-6Y	7+	Total
Attendant	Qualified person	707	540	831	2087
	T.B.A	96	168	93	357
	Total	803	717	924	2444

$\chi^2 = 65.3$
 $df = 2$
 $P < 0.005$

Table- 28 - Frequency distribution of infants by examination status.

Examination Status	Frequency	R.F
Yes	1193	42.6%
No	1579	56.3%
Don't know	28	0.1
Total	2800	100 %

Table - 29 - Distribution of infants examination in each area of residence.

		Residence		
		Amman Zarka Irbid	other urban	Rural
Examination status	Yes	52.1%	42.3%	29.6%
	No	47.5%	57.6%	70.3%
	Don't know	1.9%	00%	00%
	Total	100	100	100

Table - 30 - Distribution of infants by examination status and residence.

		Residence:			
		Amman Zarka Irbid	Other urban	Rural	Total
Examination status	Yes	639	301	255	1195
	No	583	409	606	1598
	Total	1222	710	861	2793

χ^2 = 80.55
 df = 2
 P = .005

Table - 31 - Percentage distribution of examined infants in each group of women of certain educational level

		Level Of education		
		None	1-6	7+
Infant Examination	Yes	31.9%	44.3%	54.8%
	No	67.9%	55.5%	45%
	Don't know	0.1	0.1	0.1
	Total	100	100	100

Table-32- Distribution of infants by examination status and level of mother education

		Level of Mother's Education			
		None	1-6	7+	Total
Infant Examination	Yes	365	321	510	1196
	No	777	403	419	1599
	Total	1142	724	929	2795

$$\chi^2 = 110.85$$

Table -33- Percentage of sick & well-baby ex
in each area of residence.

	Residence			
		Amman Zerka Irbid	Other Urban	
Type of examination	Sick baby	41.2	55.2	67.5
	well baby	58.8	44.8	32.5
	Total	100	100	100

Table -34- Distribution of examined infants by type of
examination and residence.

	Residence.				
		Amman Zerka Irbid	Other Urban	Rural	Total
Tye of examination	Sick baby	264	164	172	600
	Well baby	377	133	83	593
	Total	641	297	255	1193

$$X^2 = 44.2$$

$$P < 0.005.$$

Table -35- Percentage of sick and well-baby examination for infants of each group of women of certain education level.

		Level of education		
		None	1-6	7+
Type of examination	Sick baby	61.4%	51.9%	41.3%
	Well baby	38.6%	48.1%	58.7%
	Total	100	100	100

Table -36- Distribution of examined infants by type of examination and level of mother education.

		Level of education			
		None	1-6	7+	Total
Type of examination	Sick baby	224	167	209	600
	Well baby	141	154	298	593
	Total	365	321	507	1193

$\chi^2 = 34.6$

Table - 37- Percentage distribution of examined infants
ineach area of residence by month of first
examination.

		Residence.		
		Amman Zerka Irbid	Other Urban	Rural
Age of first examination of infants.	1	7.6%	5.3%	4.7
	1-3	68.6%	67.6%	69%
	4-6	17.6%	18.8%	20%
	7-12	6%	8%	6.2%
	Total	100	100	100

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Table -38- Distribution of examined infants by month of first examination and residence.

		Residence			
		Amman Zerka Irbid	Other Urban	Rural	Total
Age of first examination of infants.	<1	49	16	12	77
	1-3	440	201	176	817
	4-6	113	56	51	220
	7-12	38	24	16	78
	Total	641	297	255	1193

$\chi^2 = 6.99$

df = 6

$P > 0.005$

No association.

Table 39- Percentage distribution of examined infants of each group of mothers by month of first examination.

		Level of Mother's education		
		None	1-6	7+
Age of first examination of infants.	<1	4.9%	6.5%	7.5
	1-3	66.7%	69.3%	69.4
	4-6	21 %	18.9%	16.3
	7-12	7.4%	5.3%	6.9
	Total	100	100	100

Table -40- Distribution of age of first infant examination by level of mother education.

		Levele of mother's education			
		None	1-6	7+	Total
Age of first infant examination.	1	18	21	38	77
	1-3	243	222	351	816
	4-6	77	61	83	221
	7-12	27	17	35	79
	Total	365	321	507	1193

$\chi^2 = 4.58$

df = 6

P > 0.05.

Table 41- Percentage of infants examined in each area by health provider.

		Residence.		
		Amman Zerka Irbid	Other Urban	Rural
Place of Infant's first examination	Privat	53.8%	37.1	44.7
	Public	32.4	50.1	50.2
	UNRWA	4.7	7.7	2
	Other	12.1	5.3	3.5
	Total	100	100	100

Table 42- Distribution of examined infants by place of examination and residence.

		Residence.			
		Amman Zerka Irbid	Other Urban	Rural	Total
Place of infant's First examination	Private	345	110	114	569
	Public	208	149	128	485
	UNRWA	30	23	5	58
	Total	560	281	246	1112

$$\chi^2 = 86.43$$

$$df = 4$$

$$P < 0.005.$$

Table -43- Percentage of examined infants of each group of women by place of examination.

		Level of education		
		None	1-6 Ys	7+
Place of first examination	Private	40.8%	4.3.3	52.8
	Public	46.6	39.7	23.8
	UNRWA	6.9	5.9	3
	Other	5.8	7.5	12.1
	Total	100	100	100

Table 44- Distribution of examined infants by place of examination and level of mother education.

		Level of Mother education			
		None	1-6Ys	7+	Total
Place of first examination.	Private	149	139	268	556
	Public	170	127	121	418
	UNRWA	25	189	15	229
	Total	344	297	446	1087

$X^2 = 392$

df = 4

$P < 0.005$

Table 45- Vaccination coverage of children unders by type of vaccine in each area of residence.

		Residence.			
		Amman Zerka Irbid	Other Urban	Rural	Total
Type of Vaccine	TOPV	81%	75.5%	75.5	78%
	D.P.T	80%	74.3%	74.3	77%
	Measles	70.1	66.1	66.1	68%

Table 46- Vaccination coverage of children under 5 b' type of vaccine in children of each group of wmen of certain educational level;

		Level of Education			
		None	1-6Y	7+	Total
Type of Vaccine	TOPV	73.6%	77.7%	83.8%	78%
	D.P.T	72.9	77.1	83	33
	Measles	65.6	66.7	73	73

Table 47- Distribution of children unders by vaccination status in each area of vesidence.

		Residence.		
		Amman Zerka Irbid	Other Urban	Rural
Vaccination status (Polio, D.P.T, Measles).	Yes	77.2%	73.5%	71.9%
	No.	22.8	26.5%	28.1%
	Total	100%	100	100

Table 48- Distribution of children under under 5 by vaccination status and residence.

		Residence.			
		Amman Zerka Irbid	Other Urban	Rural	Total
Vaccination (Polio, D.P.T, Measles).	Yes	1725	1011	1335	4071
	No.	544	363	500	1407
	Total	2269	1373	1835	5478

$$x^2 = 6.08$$

$$df = 2$$

$$0.025 < P < 0.05.$$

sk

Table 49- Percentage of children of each group of women covered by vaccination.

		Level of Mother's Education		
		None	1-6	7+
Immunization Status.	Yes	70.7%	73.8%	79.9%
	No.	29.3%	26.2%	20.1%
	Total	100	100	100

Table 50- Distribution of children by vaccination status and level of mother education.

		Level of Mother's Education			
		None	1-6Ys	7+	Total
Vaccination Status.	Yes	1568	1087	1428	4083
	No.	650	386	359	1395
	Total	2218	1473	1787	5478

$\chi^2 = 33.35$

df = 2

P < 0.005.

- 51 - Percentage of drop-out by type of vaccine in each area of residence.

		Residence		
		Amman Zarka Irbid	Other urban	Rural
Type of vaccine	TOPV	1.8%	2.4%	3.4%
	D.P.T	2%	2.7%	3.7%
	Total	3.8%	5.1%	7.1%

Table - 52 - Distribution of dropouts by type of vaccine and residence.

		Residence			
		Amman Zarka Irbid	Other Urban	Rural	Total
Type of Vaccine	TOPV	.33%	.26%	50	109
	DPT	36	30	54	120
	Total	69	56	104	229

$$X^2 = 0.024$$

$$df = 4$$

$$P > 0.05$$

Table - 53 -Percentage of drop-out each by level of mother education,

		Level of Education		
		None	1-6	7+
Type of Vaccine.	TOPV	3.2%	2.2%	1.9%
	D.P.T	3.5%	2.6%	2.1%
	Total	6.7%	4.8%	4%

Table - 54 -Distribution of drop-outs by level of education of mother.

		Level of education			
		None	1-6	7+	Total
Type of Vaccine	TOPV	59	32	26	117
	D.P.T	64	38	29	131
	Total	123	70	55	248

$$x^2 = 0.089$$