DETERMINANTS OF FERTILITY AND CHILD SURVIVAL IN KUWAIT

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DECLARATION

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ABSTRACT

This study is concerned with an analysis of bio-demographic determinants of fertility and child survival in Kuwait. The study is based on data derived from the 1987 Kuwait Child Health Survey.

The study first examines current levels and differentials in nuptiality, fertility and family planning at the aggregate level. This is followed by an individual analysis of demographic and socio-economic determinants of fertility using multiple regression analysis. The results indicate that fertility is high in Kuwait although there is indication that it has declined from the very high level prevailing until the recent past. The implied long-term trend suggests a recent reduction in fertility of between one and two live births per woman, from over 7.8 to about 6.5 children. The results also show significant areal differentials in fertility and an inverse association between level of maternal education and both completed and incomplete fertility.

The analysis also reveals significant reductions in infant and child mortality in Kuwait since the early 1970s. The analysis suggests that the availability and accessibility of excellent maternal and child health services in Kuwait have negated the possible adverse effects of the prevailing reproductive and breastfeeding patterns.

CHAPTER 1

POPULATION CHARACTERISTICS

1.1 Introduction

This study is concerned with an analysis of the bio-demographic determinants of fertility and infant and child mortality in Kuwait. The main source of data for this study is the 1987 Kuwait Child Health Survey.

In this introductory chapter, a brief description of the main characteristics of the population of Kuwait is given. Chapter 2 gives an outline of the 1987 Kuwait Child Health Survey which is the main data source for the present study.

Part II of the study includes two chapters dealing respectively with an analysis of the patterns of nuptiality, fertility and family planning followed by a multiple regression analysis of the determinants of fertility in Kuwait.

Part III of the study includes two chapters dealing with an analysis of levels and differentials in infant and child mortality followed by an analysis of data relating to some of the major factors affecting maternal and child health.

1.2 Population Characteristics

The State of Kuwait occupies an area of nearly 18,000 square kilometres and is located at the north-west corner of the Arabian Gulf, between latitudes 28 and 30 degrees north and between longitudes 46 and 48 east. It is bordered on the west and north by Iraq and on the south and south-west by Saudi Arabia.

The principal physical feature of the country (other than its rich oil deposits) is the deep indentation in the coastline which forms the Bay of Kuwait City, and other places on this shoreline to

attain a position of great maritime importance in the region. About 40 kilometres south of the capital is the port town of Al-Ahmadi, located on a 400 foot high ridge. This, and the hills in the interior break the flatness of the desert sand. A further feature are the islands of Kuwait; Failaka is the most important and the only inhabited one. The others are Bubiyan, Warba, Miskan-Kubbar, Karo, Um-Al-maradem, Um-Alnamel and Oahah. The largest is Bubiyan, uninhabited because it is so low-lying.

During the past three decades, the population of Kuwait has rapidly increased. Table 1.1 provides data from the first census, of 1957, to the last census, of 1985. The increase in the size of the native Kuwaiti population is primarily due to natural increase i.e. high fertility and low mortality. Among non-Kuwaitis, the high growth is explained by the great influx of considerably large numbers of foreign workers who migrated to Kuwait to fulfil labour requirements necessary to implement development plans.

Table 1.1 Population size by nationality, Kuwait, 1957-1985

Census Year	Kuwaiti	Non-Kuwaiti	Total	Percentage Kuwaiti
1957	113622	92851	206473	55.0
1961	159448	162173	321621	49.6
1965	220059	247280	467339	47.1
1970	347396	391266	738662	47.0
1975	472088	522749	994837	47.5
1980	565613	792339	1357952	41.7
1985	681288	1016013	1697301	40.1

Source : Kuwait Ministry of Planning, Central Statistical Office,
Population Censuses for 1957 to 1985

This high fertility of Kuwait is desired and encouraged by the State's pro-natalist policies since Kuwaitis constituted only 40 percent of the total population in 1985. However, between 1970 and 1980, the crude birth rate, for Kuwaitis, dropped from 49.2 per

thousand to 47.1 per thousand, and the total fertility rate fell from 7.2 to 6.6 per Kuwaiti woman.

The Kuwaiti population is young with the majority of them in very young age groups. For example, in 1985 about 48.5 percent of Kuwaitis were below 15 years of age. The age distribution implies a high dependency ratio (inactive persons per 100 economically active). The dependency ratio for Kuwaitis was 414 in 1975, and this had increased to 451 in 1985.

Kuwait's age structure is typical for developing countries in the second stage of the demographic transition - i.e., high fertility and low mortality countries (Kuwait Ministry of Planning, 1983). High dependency ratios are frequently considered to be an obstacle to a nation's development. Youth populations are viewed as consumers, not producers of goods, and require large expenditures for social services. In Kuwait, however, national youths are viewed as a primary means of diminishing the demand for migrant labour in the future, and as "a huge potential for continued population increase as the young population grows up into the childbearing years" (Hartley, 1982).

The sex distribution of Kuwaitis was nearly equal between 1970 and 1975. However, in 1980, the ratio changed to 98.5 males per 100 females. This increase of women in comparison to men was probably due to a rise in the number of marriages of Kuwaiti men to non-Kuwaiti women, who then acquired Kuwaiti nationality. The trend towards mixed marriages and subsequent naturalisation has led to an increase in the number of Kuwaiti females in the ages 20-35 years.

The marital status of the population has also had an influence on population growth. In Kuwait the demand for education, entry into the labour force and urbanisation have led to a decline in the proportion of the population that is married. Table 1.2

illustrates the marital status of Kuwaiti males and females over two decades. In 1965, only 34.1 percent of Kuwaiti men above age 15 were never married; in 1975, the proportion never-married increased to 38.8. The rise in Kuwaiti single men has been much slower in the past decade, reaching 39.3 percent in 1985.

Table 1.2 Kuwaiti Population by marital status 1965, 1975 and 1985 (Percentage)

Marital Status	1965		1975		1985	
	Males	Females	Males	Females	Males	Females
Single	34.1	15.7	38.8	24.0	39.3	28.5
Married	62.5	66.6	59.4	64.0	58.9	60.0
Divorced	1.1	2.7	0.6	2.6	0.8	2.6
Widowed	2.3	15.0	1.2	10.4	0.9	8.9
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source : Kuwait, Ministry of Planning, Human Resources Department, The Demographic Features of Kuwait, 1980 (Kuwait, 1986).

Among Kuwaiti women, there has also been a significant rise in the proportion never married, from 15.7 percent in 1965 to 24.0 percent in 1975 and 28.5 percent in 1985. The entry of women into the labour force and higher educational attainment have led to a change in women's roles. Women are now more likely to select their marriage partners and, if necessary, delay marriage. In addition, as may be observed in Table 1.2, the proportion of widows and widowers has declined. Among Kuwaiti women, the factor that is believed to be most significant in reducing widowhood is the increasing social acceptability of and opportunities for remarriage.

While marital status affects population growth through fertility, the educational attainment of Kuwaitis affects the indigenous labour supply and thus exerts an influences on the demand for imported labour. In Kuwait, the availability of free education up to the university level has led to higher educational attainment among the entire population. Furthermore, eight years

of compulsory education (or up to the intermediate degree) has prompted illiterate workers to enrol in evening schools.

Table 1.3 gives the educational qualifications of nationals from 1965 to 1985. In 1965, more than half (56.3 percent) of Kuwaitis above age 10 were illiterate, and 28.3 percent were able to read and write but had not completed primary school. Therefore, 84.6 percent of Kuwaitis had no or little educational training in 1965. By 1975, however, tremendous improvements in the educational levels of Kuwaitis had occurred, and only 59 percent were without primary school education. Furthermore, by 1985 the proportion of illiterates had fallen to 26.3 percent.

Table 1.3 Kuwaiti population, 10 years and above, by educational attainment, 1965 and 1985 (percentage).

Educational attainment	1965	1975	1985
Total uneducated	84.6	59.3	38.2
Illiterate	56.3	44.6	26.3
Read and write	28.3	14.7	11.9
Primary	8.8	22.1	23.6
Intermediate	4.6	11.8	21.3
Secondary and below University	1.5	5.5	9.4
University	0.3	1.3	7.5
Total	100.0	100.0	100.0

Sources : For 1965 and 1975 : Kuwait Ministry of Planning, Human Resources Development Department, The Demographic Features of Kuwait, 1980 (Kuwait, 1983), P. 45 for 1985 : Kuwait Ministry of Planning, 1985 National Census of Kuwait vol. I (Kuwait, 1986).

In 1965, less than 2 percent of Kuwaitis had high school certificates or a university education. The 1985 census shows that 9.4 percent have high school certificates and 7.5 percent have completed university degrees. This rapid improvement in the educational status of nationals is expected by the State to have a

significant impact on the future development of the society. For the present, however, free education has led to a rise in the proportion of full-time students, particularly at the university level, and therefore a delay in their entry into the labour force. With the length of time spent in educational institutes by nationals increasing markedly, the number of years in the labour force is decreasing accordingly.

In Kuwait, the system of free education through the university level has eliminated the cost of obtaining an education. Furthermore, the State has now "forbidden" students to work in the government sector, viewing part-time work as delaying the completion of their education. One important consequence of free education has been the upgrading of the educational level of the indigenous labour force. While in 1975, only 40.7 percent of the Kuwaiti labour force had an academic degree, in 1980, 58 percent had some qualifications, with 17.3 percent having at least a secondary school degree and 7.6 percent university degrees (Kuwait Ministry of Planning, 1980).

Since increasing numbers of married Kuwaiti women are becoming actively employed, the State has attempted to reconcile female careers with child-bearing. Kuwaiti women may apply for child-care leave from work, varying from six months to four years. The leave is without pay, but the woman can return to the same position without loss of seniority. As social pressures mount against small families, such leave is becoming a significant factor for women.

Another benefit provided by the Ministry of Education are Kindergartens. In the 1960's, pre-schoolers had to be at least four years old. Since the 1970's, however, the age for enrolment has been reduced to three years. Since Kindergartens are free, with meals and recreational facilities provided, working mothers with children between three and five years of age are relieved of maternal responsibilities during working hours.

1.3 Health Infrastructure

In Kuwait, the Ministry of Public Health provides health services to all residents, Kuwaitis as well as expatriates, free of charge. Health services are organised on the basis of population density and distribution. The services are provided through a system of three levels of health care; primary, secondary and tertiary.

- Primary Health Care

Primary health care, or the first level of care, is provided at the health centres. Each health centre provides primary health care for about forty thousand inhabitants who are registered through the national health registration system. Health centres provide curative, preventive, and rehabilitative services. The centres implement the regional health plans and programmes as they pertain to preventive health, nutrition, school health, health education, selected training activities, and immunisation against specific diseases. The services offered include general practitioner services, maternal and child health services, and dental services. Simple laboratory tests and X-Rays are carried out at some of the centres. The centres refer the patients to specialised clinics and hospitals. Furthermore, the centres provide services to the psychiatric patients at their homes, and social and rehabilitative care for the needy individuals and families.

- Secondary Health Care

Secondary health care is provided through six general hospitals, each having both outpatient and inpatient departments. Each hospital provides internal medicine, general surgery, paediatrics, and orthopaedics services. However, some hospitals also provide traumatology, ENT, ophthalmology, psychiatric, dermatology, physical medicine, and dental services. Obstetrics and Gynaecology services are provided in three general hospitals: Al Farwania, Al Adan, and Al Jahra.

The health care services provided through the six general hospitals are supplemented by speciality clinics. The rationale behind the establishment of these clinics is to minimise the patient load on the hospitals' outpatient clinics. The speciality clinics serve the useful purpose of making speciality services more readily available and providing an important link between the primary and secondary health care. Besides, they ensure technical cooperation between these two levels.

The speciality clinics are outside the hospital premises but they are managed by the respective departments of hospitals. They provide services in the fields of internal medicine, general surgery, gynaecology, high risk pregnancies, paediatrics, ophthalmology, ENT, orthopaedics, and dermatology.

- Tertiary Care

Tertiary care, or the third level, is provided by the following speciality hospitals: Maternity Hospital; Hospital for Psychiatrist Medicine; Chest Diseases Hospital; Ibn Sina Hospital for Specialised Surgeries; Al Razi Orthopaedic Hospital; Infectious Diseases Hospital; Sulaibikhat Hospital for Physical Medicine and Rehabilitation.

The following centres cater for additional tertiary care needs: Chest diseases clinic and tuberculosis prevention unit; Kuwait Centre for Cancer Control; Kuwait Centre for Allergic Diseases; Kidney Centre; Kuwait Dermatology Centre; Genetic Centre.

- Maternal and Child Health

The major aims of the Division of Maternal and Child Care at the Ministry of Public Health are:

a) To provide primary health care to married women at the following four stages: pre-conception, pregnancy, delivery and post natal.
b) To provide comprehensive medical care to children under 5 years

of age. This includes preventive (through vaccination) and curative services as well as health education. In addition, continuous monitoring of physical, mental and psychological development of pre-school children is also conducted in these centres.

The MCH services are offered through 22 centres in the country. The Maternity Clinics also provide post-delivery check-up, perform minor surgeries, advise on family planning and coordinate cytologic screening. Abortion and sterilisation are permitted only for medical or health reasons. In 1984, the highest religious authority in Kuwait gave approval to test-tube fertilisation for married couples.

CHAPTER 2

KUWAIT CHILD HEALTH SURVEY: METHODOLOGY AND CHARACTERISTICS OF RESPONDENTS

2.1 Introduction

The Kuwait Child Health Survey (KCHS) was conducted in 1987 by the Ministry of Health, as part of the Gulf Child Health Survey programme.

The KCHS was a household sample survey. A nationally representative probability sample of 3740 households was drawn from a sampling frame which was developed at the General Statistical Organization/ Ministry of Planning. The sample was a probability, stratified, multi-stage sample, with equal probability of selection.

The survey included a basic household survey, a maternal care survey and a child health survey. Field work for the main survey was conducted during March-April 1987.

2.2 SAMPLE DESIGN AND IMPLEMENTATION

2.2.1 Sampling Plan

The sample for the Kuwait Child Survey was a probability, stratified, multi-stage sample with equal probability of selection. The sample was restricted to Kuwaiti households. It was designed to provide separate estimates of all major parameters for the national level and each of the four governorates of the state: Capital, Hawalli, Ahmadi and Jahra. The sampling frame for the survey was based on data collected on Kuwaiti households in the 1985 population census.

2.2.2 Selection of Primary Sampling Units

The sampling plan called for the KCHS sample to be selected in two stages. The sampling units at the first stage were 'squares' in the four governorates. The country is divided into 1750 squares of various number of households. These squares were grouped into ten categories according to the number of households residing in each. A sampling fraction was then calculated for each of these ten categories. In view of the wide variation in the numbers of Kuwaiti households in these squares, some form of probability proportionate to size (PPS) sampling was appropriate for them. Thus, on the basis of the sampling fractions and the number of 'squares' in each category, the number of squares to be selected from each category was determined. The selection of squares was then made by systematic sampling. This procedure resulted in the selection of 168 squares from a universe of 1750 squares.

2.2.3 Sample of Households

The second stage of selection consisted of drawing a sample of Kuwaiti households from the selected squares. A complete listing of all the Kuwaiti households residing in the selected sample areas was furnished by the Central Statistical Organization. Using the households lists, a systematic random sample of households was chosen with probability proportional to size. All ever-married women under 50 years of age, reported as usual residents in the sample households, were eligible for the individual maternal care interview. All Children under six years of age who were enumerated in the household survey were eligible for the child health interview.

2.2.4 Coverage of the Sample

A total of 3740 Kuwaiti households were selected for the KCHS sample. Of these, 3411 households, or 91.2 percent of the target sample, were successfully interviewed. Most of the remaining 329 households could not be contacted either because no competent

respondent was at home or because the household was outside the country.

A total of 32.951 persons were enumerated in the household survey. This figure included 2,889 persons who were reported as non-Kuwaiti domestic staff; no further information was collected on them and hence they were excluded from all tabulations.

Within the 3411 households successfully interviewed for the household survey, a total of 4233 ever-married women under 50 years of age were identified as eligible for the individual maternal care interview (i.e. an average number of eligible women per household equal to 1.22). The number of ever-married women successfully interviewed for the maternal care survey was 4175, or 98.6 percent of the possible maximum.

A total of 7687 children under six years of age were enumerated in the household survey; they were all successfully covered in the child health survey.

2.3 Development of the questionnaires

From the outset, it was recognized that child mortality should be studied more as a chronic disease process with multifactorial origins that as an acute, single-cause phenomenon. The framework adopted was based on the premise that social and economic determinants of child health necessarily operate through a common set of biological mechanisms, or 'proximate determinants' to exert an impact on mortality. The framework incorporated both biological and socio-economic determinants and integrated research methods employed by both medical scientists and demographic statisticians.

With these considerations in mind, it was decided that the KCHS will utilize the following four questionnaires:

1. The Household Schedule
2. The Household Utilities Module

3. The Maternal Care Questionnaire

4. The Child Health Questionnaire.

These questionnaires were phrased in simplified classical Arabic. A description of the contents of the questionnaires is given below.

2.3.1 The Household Schedule

The household schedule consisted of two blocks of questions:

BLOCK A: Which contained all the information on the identification of the sample household, the number of visits required to obtain the interview, details of field and administrative controls, summary data on the number of eligible women.

BLOCK B: Which included the following items for members of the household

* Name
* Relationship to head
* Residence (de jure)
* Sex
* Age
* Educational level (for persons aged 10 or more years)
* Marital Status (for persons aged 14 or more years)
* Identification of women eligible for the maternal care interview
* Identification of children eligible for the child health interview.

2.3.2 The Household Utilities Module

The household utilities module was designed to yield information on environmental conditions in the child's surroundings which can influence levels of morbidity and mortality. The module covered the following environmental conditions:

* Crowding
* Flooring material
* Source and storage of drinking water
* Type of toilet facilities

* Means of garbage disposal
* The module also included questions on ownership of consumer durables (television, video, refrigerator, telephone, Car).

2.3.3 The Maternal Care Questionnaire

This questionnaire was administered to all eligible women in the sample households successfully interviewed for the household survey. Eligibility for the individual maternal care interview depended on three criteria. First, the women had to be ever-married currently or previously. Secondly, she had to be under 50 years of age. Thirdly, she should be a usual member of the household, i.e. she should belong to the de jure population.

The maternal care questionnaire was divided into four sections, with cover sheet which contained information on identification of the sample household, the number of visits required to obtain the interview, the duration of the interview, and details about field and administrative controls. These sections are described below.

Section 1 - Respondent's Background

In this section information was obtained on three items: residential status, literacy and educational level and current work status. The respondent was first asked if she had always lived in "this town/city"; and if not, the duration of present residence was obtained. This was followed by asking if the respondent could read and write, and if so, whether she ever attended school, whether earned any educational certificate and highest certificate earned. The respondent was also asked if she was currently working, and if so, whether she was working "one shift" only (i.e. daytime or evening) or "two shifts" (daytime and evening).

Section 2 - Demographic Characteristics

In this section information was obtained on the following items:

* Current age,
* Current marital status
* Age at first marriage
* Blood-relationship and type of relation, if any, between the respondent and her current or last husband
* Numbers of living children, by sex and whether living at home or away
* Numbers of dead sons and dead daughters, if any
* Number of still births (if any)
* Number of abortions (if any)
* Date of birth of last live birth
* Sex of last live birth
* Survival status of last live birth
* If last live birth is dead, age at death
* Current pregnancy status
* Distance to nearest health centre.

Section 3 - Breast-feeding

Breast-feeding can affect child survival by its role in nutrient intake, in birth spacing, and its anti-infective properties. Through the principal interest in breast-feeding is usually its effect on child health, there are also physiological effects on the mother. In particular, breast-feeding a child is associated with a delay in the return of ovulation and hence in the biological capacity to conceive. In the absence of any other form of fertility regulation, therefore, breast-feeding may extend the interval to the next conception and ultimately affect a woman's total fertility. Breast-feeding also represents one of the mechanisms through which infant mortality may influence fertility, since the effect of an infant death before it is weaned may be a reduction in the period of non-susceptibility to conception.

In this section of the maternal care questionnaire, information was collected on the following items:

* Prevalence of breastfeeding
* Interval between delivery and initiation of breastfeeding
* Duration of breastfeeding
* Frequency of breastfeeding
* Reasons for not breastfeeding
* Timing of introduction of supplementary foods
* Weaning patterns
* Current feeding patterns
* Source of advice on feeding

Section 4 - Maternal Care

This section focused on the care a mother receives during pregnancy, at the delivery and in the post-natal period. Adequate care before, during and after childbirth is crucial in reducing the risks of infant and maternal mortality, in promoting child and maternal health and development and also indirectly in promoting the health and development of other living children as well as those yet to be born.

A series of questions pertaining to ante-natal care were asked in relation to current pregnancy and the last live birth where this had occurred five years or less prior to the survey. Questions about care at the delivery and post-natal care also were asked of women whose last live birth had occurred during the five year period preceding the survey. These questions covered the following aspects of maternal care:

Ante-natal care:

* Coverage
* Number of pregnancy checks
* Nature of pregnancy checks
* Accessibility of service
* Medication during pregnancy

* Reason for not having a pregnancy check

Care at the delivery:

* Place of delivery
* Attendance at delivery
* Reason for not having last delivery in a health facility

Post-natal care:

* Coverage
* Nature of care
* Preference for type of care at next delivery

Family Planning:

* Ever-use of contraception
* Current use of contraception

2.3.4 The Child Health Questionnaire

This questionnaire was designed to collect information on all children, under six years of age, enumerated in the household schedule. The questionnaire was divided into two sections, with a cover sheet which contained information on identification of the sample household; name,age and line number of each child under six years of age enumerated in the household schedule; date and duration of the interview, and details about field and administrative controls. The two sections of the questionnaire are described below.

Section 1 - Immunisation

One of the primary mechanisms for improving child survival is increasing the proportion of children immunized against the major preventable childhood diseases. Information on the immunization status on children, under six years of age, was obtained in the KCHS in the following way. For each eligible child it was asked whether the child had an immunization record or a birth certificate that includes an immunization record. If the answer was yes, the interviewer asked to see that record and copied from it the dates

on which that child had received immunizations against: tuberculosis (BCG); polio; diphtheria, whooping cough and tetanus (DPT); and measles. One dose each of BCG and measles vaccines and three doses of polio and DPT vaccines are needed to establish immunity to the disease.

If the immunization record was not available at the interview or if the child did not have an immunization record, the respondent was asked if the child had received drops or an injection to protect against disease.

Section 2 - Diarrhoeal Disease and Treatment

Diarrhoeal Disease is one of the leading causes of infant and child mortality in Kuwait. It is one of the most frequent causes of childhood illness. In the KCHS, information was collected on whether children under six years of age had experienced an episode of diarrhoea during the two weeks preceding the interview. If an eligible child was reported to have had diarrhoea, questions were asked to establish how it was identified, the duration of the episode, what treatment(s) were administered, who proffered advice on treatment, whether there were any changes from normal feeding, and the feeding pattern followed during the episode.

2.4 AGE-SEX STRUCTURE

A total of 3,411 Kuwaiti households with a population of 30,062, were successfully interviewed for the household survey. Listing of household members was done on a *de jure* (usual resident) basis. The average household size based on the *de jure* population was 8.81.

Table 2.1 shows the distribution of the survey households and the population enumerated in the household survey according to region of residence. As may be seen, over 70 percent of the sample reside in the two governorates of Hawalli and Jahra. The regional

distribution of the survey population is not much different from that shown by the 1985 census. The average household size is the highest in Ahmadi and Jahra (9.5 persons), and this drops to 8.1 for Hawalli and 7.3 for the Capital.

Table 2.1 Distribution of the survey households and population by region of residence, KCHS 1987

Region of residence	KCHS 1987					Population 1985 Census
	Households		Population		Average Household size	
	No.	%	No.	%		
Capital	299	8.8	2182	7.3	7.3	8.9
Hawalli	1303	38.2	10589	35.2	8.1	38.0
Ahmadi	695	20.4	6601	22.0	9.5	21.7
Jahra	1114	32.6	10690	35.5	9.6	31.4
Total	3411	100	30062	100.0	8.8	100.0

The percent distribution of the population enumerated in the household survey according to age and sex, is shown in Table 2.2. The same information is shown in Table 2.3 but for broader age groupings. The figure shows a very young population for Kuwait and conform to the pattern observed in most developing countries. Thus, about 53 percent of the population enumerated in the survey are less than 15 years of age, while the percentage of persons aged 65 or more years is only two percent. About 41 percent of the female population are in the childbearing age range 15-49 years. The survey population included 7,687 children who were under 6 years of age. The age-sex distribution of those children is shown in Table 2.4.

Table 2.2. Percent distribution of the de jure population enumerated in the household survey by age and sex, KCHS 1987.

Age	Male	Female	Total
0 - 4	21.5	20.9	21.2
5 - 9	17.1	17.1	17.1
10 - 14	15.5	14.6	15.0
15 - 19	10.7	10.0	10.3
20 - 24	6.5	7.5	7.0
25 - 29	5.4	7.6	6.5
30 - 34	5.1	6.4	5.7
35 - 39	4.7	5.2	5.0
40 - 44	3.6	2.8	3.2
45 - 49	2.8	1.6	2.2
50 - 54	2.0	2.3	2.1
55 - 59	1.5	1.2	1.4
60 - 64	1.2	1.1	1.2
65 - 69	0.9	0.6	0.8
70 - 74	0.7	0.6	0.6
75 & >	0.8	0.5	0.7
Total	100.0	100.0	100.0
No.of persons	14903	15159	30062

Table 2.3 Percent Distribution of the de jure population enumerated in the household survey in broad age groups, KCHS 1987.

Sex	Age in Years				Total
	< 15	15 - 49	50 - 59	60 +	
Males	54.1	38.8	3.5	3.6	100.0
Females	52.6	41.1	3.5	2.8	100.0
Total	53.3	39.9	3.5	3.3	100.0

Table 2.4 Distribution of children under six years of age, enumerated in the KCHS household survey by age and sex, KCHS 1987.

Age in months	Male	Female	Total
< 12	615	592	1207
12 - 23	618	594	1212
24 - 35	676	652	1328
36 - 47	675	691	1366
48 - 59	622	644	1266
60 - 71	640	668	1308
Total	3846	3841	7687

2.5 EDUCATIONAL LEVEL

In the KCHS, for all household members ten years and older, questions were asked to determine what level of education they had completed. Table 2.5 shows the percent distribution of the population aged 10 years or more by level of education, according to age and sex.

Broadly speaking, the education system in Kuwait has four tiers: primary (4 years) intermediate or preparatory (4 years), secondary (4 years) and higher education. The figures in Table 2.5 show that 15 percent of men were illiterate, 9 percent could read and write but had no formal education, 31 percent completed primary school, 26 intermediate school and 13 secondary school, while the percentage of men who attained higher education was over 6 percent. The substantial improvement in educational attainment overtime can be seen in the fact that younger males have attained much higher levels than older men. The proportion of men with no education declines sharply as we approach the more recent and younger cohorts; from 72 percent among men aged 60-64 years, to 25 percent among men 40-44 years and to less than two percent among those at ages 10-19 years.

Table 2.5 Percent Distribution of the KCHS household population

by level of education, according to sex and age, KCHS 1987

Age	Illiterate	Incomp primary	Primary	Inter mediate	secondary	University	Total	No. of persons
Males								
10-14	1.5	22.6	69.7	6.1	-	-	100.0	2316
15-19	1.7	1.1	20.7	66.9	9.6	-	100.0	1591
20-24	2.6	1.6	12.0	38.9	37.6	7.3	100.0	972
25-29	4.7	3.7	13.1	32.2	28.2	18.1	100.0	808
30-34	9.2	4.1	16.7	26.6	23.2	20.2	100.0	753
35-39	16.1	5.6	19.9	20.9	20.8	16.6	100.0	697
40-44	25.0	7.1	26.1	17.7	11.7	12.4	100.0	532
45-49	38.4	8.7	26.2	16.3	5.0	5.4	100.0	424
50-54	55.0	8.8	18.9	10.5	4.4	2.4	100.0	296
55-59	62.7	13.6	12.3	7.7	2.7	0.9	100.0	220
60-64	72.4	10.5	9.9	3.3	1.7	2.2	100.0	181
65-69	84.7	10.2	3.6	0.7	0.7	-	100.0	137
70-74	87.4	807	2.9	1.0	-	-	100.0	104
75 +	91.0	5.0	3.0	1.0	-	-	100	101
Total	14.5	9.3	30.6	26.4	12.8	6.4	100.0	9132

Table 2.5 (Continued)

Age	Illiterate	Incomp primary	Primary	Intermediate	secondary	University	Total	No of persons
Females								
10-14	4.7	24.0	64.5	6.7	-	-	100.0	2206
15-19	8.2	3.4	23.2	55.8	9.4	-	100.0	1515
20-24	20.3	4.4	13.1	24.9	30.8	6.5	100.0	1141
25-29	34.8	4.1	11.5	18.3	18.1	13.1	100.0	1152
30-34	45.0	4.0	9.8	12.3	18.3	10.6	100.0	964
35-39	60.5	3.9	10.2	8.8	9.6	7.0	100.0	795
40-44	75.5	4.8	11.0	5.3	1.7	1.7	100.0	417
45-49	80.5	8.5	4.9	5.3	-	0.8	100.0	246
50-54	89.0	4.6	4.0	1.7	0.6	-	100.0	346
55-59	92.0	3.2	3.7	0.5	0.5	-	100.0	187
60-64	95.2	3.0	-	1.2	0.6	-	100.0	168
65-69	96.7	2.2	1.1	-	-	-	100.0	93
70-74	100.0	-	-	-	-	-	100.0	89
75 +	95.8	2.8	-	1.4	-	-	100.0	71
Total	33.7	8.9	24.6	18.3	10.3	4.2	100.0	9390

Women in Kuwait are, however, less educated than men. About 34 percent women at ages ten and over in the KCHS household survey were illiterate, 9 percent could read and write, 25 percent completed primary school, 18 percent intermediate school, 10 percent secondary school and 4 percent attained university education. As with men, there has been a steady improvement in women's educational attainment over time. Women have advanced in education at all levels, but the gains are most marked at the higher levels. For example, among women aged 60-64, only less than two percent got as far as intermediate or higher level of education. Among women aged 20-24, however, about 62 percent had post-primary education and 37 percent had completed at least the secondary level of schooling.

2.6 ENVIRONMENTAL CONDITIONS

The Government of Kuwait has adopted a comprehensive housing policy that aims at organising the growth of residential areas, reducing overcrowding and replacing, in a planned way, unsanitary settlements with modern dwellings. Newly wed couples receive governmental financial assistance to own their houses. Information from KCHS on household amenities conveys a very favourable picture of the environmental conditions and the socio-economic status of the population under study.

2.6.1 Crowding

In the household survey, information was collected on the number of rooms available for the exclusive use of the household. This number included bedrooms, dining/drawing rooms and diwaniyas; it excluded servant's quarters, kitchen store rooms, bathrooms and garages. Table 2.6 shows the percent distribution of households by number of rooms and by number of bedrooms, according to region of residence.

Table 2.6 Percent distribution of the sample households by number of rooms and number of bedrooms according to region of residence, KCHS 1987.

	Region of Residence				Total
	Capital	Hawalli	Ahmadi	Jahra	
A.Number of rooms					
1-2	4.3	2.9	4.2	5.6	4.2
3-4	14.7	15.8	36.1	62.6	35.1
5-6	18.4	16.3	22.6	16.8	17.9
7-8	27.4	34.3	18.8	10.4	22.7
9-10	14.0	16.1	8.9	2.4	10.0
11-12	8.7	8.7	5.9	1.2	5.7
13 +	12.3	5.8	3.5	1.1	4.4
Average Number of Rooms per household	7.6	7.4	6.0	4.5	6.2
Average number of Persons per room	0.9	1.1	1.6	2.1	1.4
B.Number of bedrooms					
1-2	26.8	22.3	39.7	45.9	33.9
3-4	39.1	50.1	37.0	41.9	43.8
5-6	22.7	21.0	17.4	10.2	16.9
7-8	7.7	4.7	4.0	1.4	3.8
9 +	3.7	1.9	1.8	0.6	1.5
Total	100.0	100.0	100.0	100.0	100.0
Average Number of bed rooms per household	4.0	3.8	3.3	2.9	3.4
Average number of persons per bedroom	1.8	2.2	2.9	3.3	2.6

At the national level, the distribution of households by number of rooms is bi-modal with peaks at 3-4 rooms and 7-8 rooms. For each region, however, the distribution is uni-modal.

For the Ahmadi and Jahra governorates, the peak occurs at 3-4 rooms whereas it occurs at 7-8 rooms for the Capital and Hawalli governorates. Hence, the bimodality of the distribution at the national level.

More than one-third of households reside in dwellings with 3-4 rooms and about one-quarter have 7-8 rooms. The average number of rooms per household comes to 6.2. Households living in the Capital and Hawalli have the largest number of rooms and bedrooms while households in Jahra live in the smallest dwellings.

The crowding index-defined as the average number of persons per room or per bedroom shows the privileged position of households residing in the Capital and Hawalli in comparison with that enjoyed by households living elsewhere.

2.6.2 Housing Characteristics

Table 2.7 shows the percent distribution of households by selected housing characteristics. About 94 percent of the sample households are supplied with drinking water from public network, 89 percent have flush toilets, and 56 percent have floors covered with fitted carpets while nearly one-third of the households have more than one type of flooring material (fitted carpets, tiles and wooden floors).

Table 2.7 Percent distribution of households by selected housing characteristics, KCHS 1987.

Environmental Characteristics	Percent	Environmental Characteristics	Percent
Source of drinking water		Flooring material	
Piped	93.7	Carpet	56.1
Water tanker truck	6.3	Cement tiles	8.7
Type of water storage tank		Wood	2.3
Fiber-glass	83.5	More than one type	32.4
Metallic	14.9	Other	0.5
Other	1.6	Toilet facilities	
		Flush	88.7
		Other	11.3

2.7 PRESENCE OF DURABLE GOODS

Table 2.8 shows the percentage of households with durable consumer goods by region of residence. Overall, more than 98 percent of households have a television, a refrigerator and a car, and more than 77 percent have a video and a telephone. Ownership of television, refrigerator or a car does not vary much by residence. The percentage of households with a telephone, however, is highest in the Capital and Hawalli (over 95 percent), and it declines to 79 percent in Ahmadi and to only 51 percent in Jahra.

Table 2.8 Percentage of households with specific durable consumer goods by region of residence, KCHS 1987.

	Region of residence				Total
	Capital	Hawalli	Ahmadi	Jahra	
Television	99.3	99.5	99.6	99.6	99.5
Video	94.3	91.3	76.5	64.9	79.9
Refrigerator	99.7	99.8	99.3	99.7	99.6
Telephone	97.0	94.9	79.0	50.7	77.4
Car	97.7	99.2	97.1	97.7	98.1

2.8 BACKGROUND CHARACTERISTICS OF EVER-MARRIED WOMEN

The main findings of the maternal care survey are presented in this report not only for the sample as a whole but also for different sub-groups of the sample. These sub-groups are defined by a number of geographic and socio-economic variables, which will be referred to as the "background characteristics". Table 2.9 shows the percent distribution of ever-married women and currently married women, interviewed in the maternal care survey, by selected background characteristics.

As expected, the distribution of ever-married and currently married women increases from ages 15-19 to ages 25-29, then declines as age increases. The distribution of ever-married women and that of the currently married are similar for all background characteristics. Among the currently married women, almost two in

five are either under 20 years of age or in the age range 35-49.

About three-quarters of the respondents live in two regions: 38 percent in the Hawalli governorate and 34 percent in Jahra; about 20 percent live in the Ahmadi governorate and the remaining 8 percent live in the Capital governorate.

Table 2.9 Percent distribution of ever-married and currently married women, interviewed in the maternal care survey by selected background characteristics, KCHS 1987.

	Ever-married women		Currently married women	
	Percent	No.of women	Percent	No.of women
Age				
15-16	4.1	172	4.3	171
20-24	16.0	670	16.2	641
25-29	24.5	1024	24.8	982
30-34	21.9	914	22.0	870
35-39	18.3	762	18.3	727
40-44	9.7	406	9.4	374
45-49	5.4	227	5.0	197
Region of residence				
Capital	8.1	341	8.2	324
Hawalli	37.7	1573	37.8	1499
Ahmadi	20.3	846	19.9	790
Jahra	33.9	1415	34.5	1349
Education				
Illiterate	47.3	1973	47.2	1871
Incomplete primary	5.7	237	5.6	222
Primary	11.4	477	11.1	438
Intermediate	14.5	607	14.6	580
Secondary	14.0	584	14.2	563
University	7.1	297	7.3	288
Total	100.0	4175	100.0	3962

About 53 percent of ever-married women in the individual survey are literate. The level of literacy is much higher among younger cohorts; it increases from 19 percent among ever-married women aged 45-49, to 54 percent among women aged 30-34, and to 72 percent among ever-married women under 25 years of age (Table 2.10). Among the ever-married women at ages 20-24, about 52 percent received post-primary education and 29 percent completed high school. Among the cohorts currently at ages 25-29 and 30-34, nearly 11 percent have completed university education. These figures reflect the concerted efforts of the government to raise levels of educational attainment in the country and to improve the status of women.

Table 2.10 Percent distribution of ever-married women interviewed in the maternal care survey, by age according to level of education, KCHS 1987.

Age	Illiterate	Incomplete primary	Primary	Preparatory	Secondary	University	Total	No of women
15-19	28.5	5.8	16.3	39.5	9.9	-	100.0	172
20-24	28.4	4.9	15.1	22.8	23.9	4.9	100.0	670
25-29	38.6	3.8	12.0	18.1	16.8	10.7	100.0	1024
30-34	46.5	3.7	9.8	12.0	16.9	11.1	100.0	914
35-39	62.2	3.9	10.4	7.7	9.6	6.2	100.0	762
40-44	76.4	4.4	11.1	5.4	1.7	1.0	100.0	406
45-49	80.6	8.8	5.3	4.4	-	0.9	100.0	227
Total	47.3	5.7	11.4	14.5	14.0	7.1	100.0	4175

In the maternal care survey, information was also collected from ever married women about their current work status. As may be seen from Table 2.11, about 18 percent were working at the time of the survey. Very few ever-married women at ages under 20 or over 40 were working. The percentage working reaches nearly 15 percent among ever-married women at ages 20-24 and 33-39, and increases to 24 percent and 27 percent among women aged 25-29 and 30-34 respectively.

Table 2.11 Percent distribution of ever-married women by current work status according to age, KCHS 1987.

Age	Currently working	Not working	Total
15 - 19	2.3	97.7	100.0
20 - 24	14.8	85.2	100.0
25 - 29	24.4	75.6	100.0
30 - 34	27.0	73.0	100.0
35 - 39	15.2	84.8	100.0
40 - 44	5.2	94.8	100.0
45 - 49	4.0	96.0	100.0
Total	17.9	82.1	100.0

CHAPTER 3

MARRIAGE, FERTILITY AND FAMILY PLANNING

3.1 Introduction

In Kuwait, fertility forms the basis of, and is itself a product of social and economic organisation. The primary social unit, the family, is to a varying extent formed for the reproduction, or perpetuation, if itself. The family and the relations based upon it symbolize a principal valid focus and forum of emotional expression, of concern and responsibility, and of security.

Over the past two decades or so, the great improvement in health status and living conditions of the population of Kuwait has resulted in relatively low mortality rates, while fertility rates seem to have remained more or less stable. As a result, fertility level has become the main factor affecting the growth of the native population of Kuwait.

This chapter is concerned with an investigation of the reproductive patterns of Kuwaiti women as revealed by the 1987 KCHS. The development of this chapter is basically in three sections dealing respectively with marriage patterns, fertility patterns and family planning.

3.2 MARRIAGE PATTERNS

3.2.1 Introduction

In Kuwait, the family is the unit in which reproduction is authorised and expected, and to which the responsibility for child care is assigned. Marriage and fertility are, therefore, viewed as interrelated, as social and demographic processes and as sequential phases in the life cycles of women. Marriage is a primary indicator of women's exposure to the risk of pregnancy. Thus, a

study of nuptiality patterns is essential to understanding reproductive patterns.

In this section, attention will be focused on the patterns and levels of first marriage. It should be pointed out that information on date of marriage refers to the date when marriage was consummated, *Zifaf* and not the earlier date on which the marriage contract was signed, *Katb El-Kitab*.

3.2.2. Current Marital Status

Table 3.1 shows the distribution of the population enumerated in the household survey by current age and sex, according to marital status. The figures give an overview of the relative frequency of the various possible statuses.

Table 3.1 Percent distribution of the population enumerated in the KCHS 1987 household survey by age, sex and marital status, KCHS 1987.

Age	Male					Female				
	Single	Married	Widowed	Divorced	Total	Single	Married	Widowed	Divorced	Total
10-14	99.0	1.0	-	-	100	99.1	0.9	-	-	100
15-19	99.0	1.0	-	-	100	88.3	11.4	-	0.3	100
20-24	74.5	24.9	0.1	0.5	100	40.1	57.4	0.7	1.8	100
25-29	23.3	75.2	0.1	1.4	100	10.3	85.9	0.5	3.2	100
30-34	6.0	93.2	0.3	0.5	100	4.5	91.0	1.5	3.0	100
35-39	2.9	96.7	0.3	0.1	100	3.1	92.8	2.4	1.7	100
40-44	2.1	97.6	-	0.4	100	2.4	91.1	4.6	1.9	100
45-49	2.1	97.9	-	-	100	1.6	85.8	9.3	3.3	100
50-54	3.4	95.6	0.7	0.3	100	1.4	71.7	21.7	5.2	100
55-59	2.3	96.4	0.9	0.4	100	1.6	55.6	38.0	4.8	100
60-64	1.7	97.2	1.1	-	100	1.8	43.4	50.0	4.8	100
65-69	-	92.7	7.3	-	100	2.2	41.9	52.7	3.2	100
70-74	3.8	89.4	5.8	1.0	100	1.1	13.5	77.5	7.9	100
75 +	1.8	80.9	16.4	0.9	100	2.6	15.4	79.5	2.5	100

As may be seen, very few women under age 15 are married. The proportion of the population that is single declines very rapidly with increasing age. By ages 25-29, only about 10 percent of women are single, compared with 23 percent of men. By about age 50 the percentage remaining single is less than three percent for women and about two percent for men. These very low proportions show that marriage is almost universal in Kuwait.

As the proportion of single persons declines with increasing age, the proportion of the population that is ever married rises by a corresponding amount. The proportion of currently married women increases rapidly up to ages 35-39 and then starts to decline due to the effects of widowhood and divorce. Between ages 25 and 50, the proportion divorced among women ranges between 2 and 3 percent. The percentage of women who are widowed climbs steadily with age but is not substantial until about ages 50-54 where it reaches 22 percent. Among women in the age range 15-49, less than one-third have never been married, 65 percent are currently married, while the remaining 3 percent are either widowed or divorced. The net effect of the three factors of first marriage, dissolution of marriage and remarriage on the current marital status of the female population is shown in Table 3.2. The term marital status as used here classifies ever-married women into three categories: currently married, widowed, and divorced.

Table 3.2 Percent distribution of all ever-married women by current marital status, according to : (a) current age, and (b) years since first marriage , KCHS 1987.

	Current marital status			Total
	Married	Widowed	Divorced	
A: Current age				
15-19	99.4	0.6	-	100.0
20-24	95.7	1.5	2.8	100.0
25-29	95.9	1.3	2.8	100.0
30-34	95.2	2.0	2.8	100.0
35-39	95.4	2.5	2.1	100.0
40-44	92.1	5.4	2.5	100.0
45-49	86.8	9.7	3.5	100.0
B: Years since first marriage				
< 5	96.6	0.7	2.7	100.0
5-	95.9	1.0	3.1	100.0
10-	95.8	1.8	2.4	100.0
15-	95.4	2.7	1.9	100.0
20-	94.7	3.5	1.8	100.0
25+	88.2	8.3	3.5	100.0
Total	94.9	2.5	2.6	100.0

As may be seen, at the time of the survey, 94.9 percent of all ever-married women at ages 15-49 were married, about 2.6 percent widowed and 2.5 percent divorced. The proportion currently married decreases from over 95 percent among women less than 40 years of age, to 92 percent for those aged 40-44 and to 87 percent for women aged 45-49 years, mainly due to the higher incidence of widowhood at older ages.

3.2.3 Age Patterns of First Marriage

Recent trends in the tempo and level of female nuptiality may be analysed by linking data on date of first marriage obtained in the individual maternal care survey with data on current marital status from the household survey. Any analysis of age patterns of

first marriage must take into account the fact that the data on age at marriage are censored, i.e. the data are incomplete since information on the age at marriage is available only for women who have ever been married.

Table 3.3 Percent distribution of all women by marital status and age at first marriage, according to current age, KCHS 1987.

Age	Never married	Age at first marriage						Total
		< 15	15-17	18-19	20-21	22-24	25-49	
15-19	88.3	1.5	8.0	2.2	-	-	-	100.0
20-24	40.1	4.3	21.6	18.3	11.5	4.3	-	100.0
25-29	10.3	9.2	28.1	20.3	15.1	13.8	3.2	100.0
30-34	4.5	10.1	32.8	17.8	13.2	12.9	8.7	100.0
35-39	3.1	13.8	36.5	16.1	12.8	8.8	8.9	100.0
40-44	2.4	19.4	39.4	15.2	12.5	5.8	5.3	100.0
45-49	1.6	26.1	35.9	15.8	10.2	5.1	5.1	100.0
Total	32.1	8.4	24.9	14.1	9.8	7.1	3.6	100.0

Table 3.3 shows the distribution of "all" women in the sample by marital status and age at first marriage, according to current age. About 8 percent of all Kuwaiti women aged 15-49 married for the first time before age 15, about one-third before age 18 and about 57 percent married before age 22 years.

Cohort trends in age at marriage can be examined by comparing the distribution of the proportion of women ever-married by age for successive age cohorts (Table 3.4). The figures in Table 3.4 show a clear trend towards later marriage, and a concomitant tendency for first marriage to become spread over a wider age range, as evidenced by the substantial decreases in the proportions of young marriages. Thus, the proportion ever-married before reaching age 25 has decreased from 93 percent among women currently in their forties, to 87 percent for women currently at ages 25-29. Likewise, the proportion has declined - but more rapidly - for

those marrying before age 20; from about 79 percent among the cohorts of women currently at ages 40 and over, to 44 percent among the cohorts aged 20-24.

Table 3.4 Cumulative proportion of women ever-married (1000) by age (exact years) for five year cohorts, as implied by the KCHS 1987.

Current age of cohort (as of 1987)	Age (exact years)											
	15	16	17	18	19	20	22	25	30	35	40	45
15-19	21											
20-24	43	113	172	259	361	442						
25-29	92	192	284	372	494	575	726	868				
30-34	99	232	318	421	533	591	747	872	913			
35-39	135	298	402	497	607	659	788	881	948	966		
40-44	185	359	468	568	679	784	861	929	961	972	981	
45-49	242	390	494	598	682	789	865	930	962	974	980	981

The downward trend in teenage marriages has been even more striking. About 58 percent of women currently at ages 40 and over had entered first marriage before reaching age 18, whereas the figure was 42 percent for women currently 30-34 years, 37 percent for women currently 25-29, ;and only 26 percent for those aged 20-24. There has also been a very sharp decline in the very early marriage. The proportion of women ever-married by exact age 15 was about 22 percent among the women currently at ages 40-49. This proportion continued to decline gradually with every succeeding cohort until it reached a low of 2 percent among women currently aged 15-19.

This important transformation in the tempo of female nuptiality in Kuwait reflects, of course, an upward trend in age at first marriage. This may be illustrated by an examination of the trend in the median age at first marriage, i.e. the age by which half of the women of any given cohort had entered into a first

marriage. The figures in Table 3.5 show that the median age at first marriage has risen from about 17 years for the cohorts of women currently at ages 40 and over, to 18.7 for women at ages 30-34, and 19.1 for women currently at ages 25-29. Information on women in their late teens suggests that the upward shift in age at first marriage and the tendency for first marriages to be spread over a wider age range was continuing in the late 1980's.

Table 3.5 Median age at first marriage for females as implied by the KCHS 1987.

Current age of cohort (as of 1987)	Medium age at first marriage
15 - 19	--
20 - 24	--
25 - 29	19.1
30 - 34	18.7
35 - 39	18.0
40 - 44	17.3
45 - 49	17.1

3.2.4 Differentials in Age at Marriage

Age at first marriage is a product of various socio-economic and demographic factors. Although cultural as well as other social systems may encourage and maintain a young age pattern of marriage, differentials by various social characteristics have usually been observed in different societies. Attention, therefore, is turned here to the question: 'Does the place where people live or their educational background make a difference to age at marriage?'. Data from the household survey permit the investigation of group variation in age at marriage separately for males and for females, by two background variables: region of residence and level of education. Table 3-6 - based on the household survey - shows the proportions ever-married for males and for females by age according to region of residence and level of education.

The table shows significant differences in the timing of first

marriage for both men and women according to region of residence. Thus, men and women in the Jahra region exhibit the youngest age pattern of marriage while those living in the Capital governorate have by far the oldest marriage pattern. The table also shows a positive relationship between level of education and age at first marriage particularly for women. At ages 20-24, the percentage of women ever-married decreases from about 82 percent for women who are illiterate, to 70 percent for those with primary school education and to 56 and 46 for women with intermediate and senior school, respectively.

Table 3.6 Percentage ever-married among males and females, according to age and selected background characteristics, KCHS 1987.

	Age						
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
A. MALES							
Region							
Capital	-	15.5	63.4	92.5	92.6	99.0	92.6
Hawalli	0.4	23.4	72.6	90.8	98.3	97.7	99.9
Ahmadi	1.4	26.6	85.0	96.9	98.3	97.1	95.1
Jahra	1.5	30.5	33.1	96.7	96.3	98.4	97.9
Education							
Illiterate	3.2	(17.9)	80.0	88.5	93.9	99.9	98.6
Incomplete primary	4.5	38.5	81.8	95.0	98.1	96.0	99.9
Primary	0.7	40.2	84.9	96.0	96.0	98.6	98.2
Preparatory	1.1	24.6	82.3	94.5	99.3	96.8	97.1
Secondary +	0.7	21.4	70.2	95.4	95.2	93.5	95.2
Total	1.0	25.5	76.7	94.0	97.1	97.9	97.9
B: FEMALES							
Region							
Capital	3.7	53.0	78.7	88.7	83.6	87.5	96.4
Hawalli	7.9	51.5	86.5	93.6	96.8	98.1	99.1
Ahmadi	8.9	64.2	92.5	96.9	97.6	97.8	94.7
Jahra	12.1	69.5	95.1	99.3	99.2	98.6	99.9

Table 3.6 (continued).

	Age						
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Education							
Illiterate	32.8	81.5	96.7	99.7	99.5	98.7	99.5
Incomplete primary	19.2	75.0	94.4	91.5	95.1	99.9	96.0
Primary	4.5	70.5	95.5	96.8	97.5	97.8	(91.7)
Preparatory	7.6	56.0	87.7	92.4	87.1	95.5	(99.9)
Secondary +	13.4	46.2	81.8	90.3	96.1	(100.0)	(100.0)
Total	11.7	59.9	89.7	95.5	96.9	97.6	98.4

One of the useful tools of analysing these differences in the tempo of nuptiality is provided by condensing the information on the proportions ever-married into a single statistic measuring the centre or location of the distribution. One such measure, introduced by Hajnal in 1953, is termed the singulate mean age at marriage (SMAM). It is interpreted to be the mean age at first marriage of those persons who marry by age 50; i.e. SMAM measures the mean number of years spent single among persons ultimately marrying. In this report, as is usual, it is calculated by adding the proportion currently single at successive ages as though they referred to a single real cohort of men and women. The SMAM thus calculated summarises the experience of all the persons enumerated in the different ages at a given point in time and does not refer to any real cohort.

Table 3.7 Singulate mean age at marriage (SMAM) for males and for females according to residence and education, KCHS 1987.

	Males	Females
Region		
Capital	27.2	23.9
Hawalli	25.8	22.9
Ahmadi	24.0	21.3
Jahra	23.8	21.2
Education		
Illiterate	24.3	19.3
Incomplete Primary	24.3	21.2
Primary	24.5	22.0
Preparatory	25.6	22.3
Secondary +	25.1	23.6
Total	24.5	21.7

Table 3.7 gives the values of the singulate mean age at marriage for men and for women according to region of residence and level of education. As may be seen, women and men living in the Capital and Hawalli marry later, on average, than those living in Ahmadi and Jahra. The values of SMAM for females by level of education confirm the positive relationship between age at marriage and education, with a difference between the mean age at first marriage for women who are illiterate and those with post-primary education amounting to about three years.

3.2.5 Consanguinity

Marriage between first cousins and, in general, between men and women who have a blood relation is quite common in Kuwait. Among ever-married women under 50 years of age, about 53 percent reported having a blood relationship with their husbands (30 percent were 'first cousins' and 23 percent 'other relation').

Table 3.8 shows that consanguineous marriage is least common in the Capital and among university graduates where less than one-

third of spouses are related, and most common in Jahra and among women who are illiterate where more than two-thirds of spouses have a blood relation.

Table 3.8 Percent distribution of ever-married women by blood relation between spouses, according to selected background characteristics, KCHS 1987.

	First cousin	Other relation	No relation	Total Percent
Years Since First Marriage				
< 5	28.8	19.6	51.6	100
5 - 6	28.2	19.5	52.4	100
10 - 14	29.6	24.0	46.4	100
15 - 19	31.6	26.0	42.3	100
20 - 24	35.7	26.9	37.4	100
25 +	31.7	23.9	44.3	100
Region				
Capital	17.3	14.3	68.4	100
Hawalli	25.7	17.9	56.4	100
Ahmadi	33.8	23.2	43.0	100
Education				
Illiterate	36.9	30.5	32.6	100
Incomplete primary	33.3	21.4	45.3	100
Primary	24.3	16.7	59.0	100
Preparatory	27.9	16.5	55.6	100
Secondary	23.2	14.6	62.2	100
University	16.6	14.2	69.3	100
Total	30.4	22.9	46.7	100

3.3 Fertility Patterns

3.3.1 Introduction

Fertility is the main factor affecting the growth of the native population of Kuwait. Traditionally, fertility in Kuwait was characterized by an early start to childbearing, by short

intervals, lengthened primarily by prolonged breast-feeding, and by an ultimately high parity. High mortality in infancy and childhood generally featured in this process.

Kuwait, however, features many of the characteristics which have been associated in other societies with fertility reduction. These include a major increase in the proportion of children who survive to adulthood, continuing urbanization, and modernization in respect of education, health and housing, and the possession of consumer durables, as well as an upward shift in the age patterns of first marriage. The KCHS allows the fertility implications, if any, of these to be assessed.

The bulk of the analysis in this section is oriented around age cohorts and marriage cohorts. Age cohorts identify women who were in particular age range at the time of the survey. Marriage cohorts identify the women who occupy the same interval of years since first marriage. The term 'marital duration' will refer to years since first marriage, even if marital dissolution, remarriage, etc, has occurred since that initial event.

Women of about the same age will tend to have shared certain socializing experiences, such as the prevailing level of education, health conditions, etc. Age is also a commonly applied classificatory variable in census and other survey work.

Marital duration is also useful variable because, by and large, it measures the accumulated years of exposure to the risk of childbearing. Women in the same marriage cohort also tend to share common attitudes towards family size and fertility regulation.

3.3.2 Current Parity

Current parity is a measure of achieved fertility at the time of the survey and is simply the accumulated number of live births that a woman has had to date. The data on current parity or the

number of children ever born from the KCHS are cross-sectional and do not refer to the reproductive behaviour of a cohort of women as it grows older. Thus, for the younger women current parity will reflect their fertility during a limited period only, while for older women this measure comes close to their life-time fertility.

Table 3.9 Percent distribution of ever-married and currently married women according to the number of children ever-born, KCHS 1987.

No. of children ever-born	Ever-married women		Currently married women	
	All ages < 50	Age 45-49	All aged < 50	Age 45-49
0	6.0	2.2	5.7	2.0
1	8.3	1.8	7.9	2.0
2	12.1	2.2	11.7	1.0
3	12.5	3.5	12.8	4.1
4	11.9	6.2	12.0	4.6
5	10.8	4.0	11.0	4.1
6	9.0	8.8	9.1	8.6
7	7.6	7.9	7.6	7.6
8	7.3	15.4	7.4	15.7
9	5.7	15.4	5.8	17.3
10 +	8.0	32.6	9.0	33.0
Total	100.0	100.0	100.0	100.0
Mean parity	4.9	8.0	4.9	8.2
No. of Women	4175	227	3962	197

First, however, consider the sample as a whole. Table 3.9 shows that the mean parity for all ever-married women and for currently married women is identical (4,9), indicating that the effect of marriage dissolution on the fertility of the whole sample is negligible. The overall mean parity of 4.9 children per woman reflects a high level of fertility, since the sample includes women who still expect long reproductive lives.

The parity distribution for the whole sample shows considerable dispersion with a skew toward the high parities. Thus, about 6 percent of all ever-married women are childless. Of the rest, 20 percent have had either one or two live-births; 24 percent three or four; 20 percent five or six; 15 percent seven or eight; and the remaining 15 percent nine or more.

The distribution of the sample according to age of the woman, age at first marriage duration will, however, have a profound effect on the mean parity. This is evident from the proportion of women childless, which reaches 6 percent for all ever-married women in the sample but only about two percent for those aged 45-49. Therefore, it is necessary to study parity in conjunction with controls for age and age at first marriage to gain further insight in the pattern of fertility.

3.3.3 Completed Fertility

The cumulative fertility or mean number of children ever born to women aged 45-49 can be taken as indicative of the level of completed fertility provided the data for these women are not subject to bias arising from misreporting of the age of woman and from recall lapse which affects the reporting of the number of children.

As shown by Table 3.9, the average woman of age 45-49 at the date of the survey who had ever been married had eight live births. However, the distribution of these women by parity still exhibits a great deal of dispersion. Roughly speaking, out of every ten of these women four are within one child of this mean (i.e. 7,8 or 9 children), three are below this range (6 or less births), and three are above (10 or more births). One woman in 16 has had a family below "replacement" level (0,1 or 2 live births), but at the other extreme, one woman in two had 9 or more children and one woman in five had 11 or more children.

The fertility of currently married women aged 45-49 is also shown in Table 3.9. As may be seen so significant differences exist between the distribution of ever-married and currently married women by the number of children ever-born.

One reason, however, for examining the group of currently married women aged 45-49 is that it gives an estimate of the level of primary sterility. Only two percent of these women had no children at all. This figure may be taken as the percentage of couples in which either the husband or the wife is incapable of having any children at all. It provides norms do not support voluntary childlessness. In international terms, this low level of primary sterility implies a level of general health in excess of the thresholds below which fertility is inhibited.

3.3.4 Parity within Age Groups

Having considered the level of completed fertility, attention now shifts to those women whose families are still being formed. A detailed picture of current parity by age groups as shown by the KCHS is given in Table 3.10. As may be seen, the proportion of childless women declines rapidly between ages 15 and 25. Among ever-married women aged 25 or more years, less than four percent are childless. The data also show high level of fertility by women of all ages. Among women aged 20-24, the mean number of children ever born is 2.0 and 34 percent of these women have had three or more live births. Among women aged 25-29, who have had on average 3.6 children, 32 percent have already had five or more children, and among women aged 35-39, 55 percent have had seven or more children. Thus, as age increases, the distribution of women by current parity becomes more spread and the modal parity tends to occur at a higher number with lesser magnitude. These data indicate that fertility in Kuwait must be considered very high.

Table 3.10 Percent distribution of ever-married women according to the number of children ever-born, KCHS 1987.

Age	Number of children ever-born											Total	Mean	No. of women
	0	1	2	3	4	5	6	7	8	9	10 +			
15-19	46.2	35.7	15.2	2.9	-	-	-	-	-	-	-	100	0.7	171
20-24	13.0	24.9	29.4	19.2	10.6	3.3	1.2	0.1	0.3	-	-	100	2.0	670
25-29	3.8	8.1	18.4	21.7	15.6	15.2	9.1	5.2	1.6	1.1	0.2	100	3.6	124
30-34	2.2	2.0	5.5	13.1	16.4	17.6	12.7	11.7	9.7	5.4	2.7	100	5.2	914
35-39	1.4	1.4	2.8	5.6	10.4	10.0	13.0	11.2	13.6	11.5	19.1	100	6.9	762
40-44	2.0	0.2	2.2	2.5	5.4	6.4	9.6	12.8	14.3	13.1	31.5	100	8.0	406
45-49	2.2	1.8	2.2	3.5	6.2	4.0	8.8	7.9	15.4	15.4	32.6	100	8.0	226
Total	6.0	8.3	12.1	12.5	11.9	10.8	9.0	7.6	7.3	5.7	8.8	100	4.9	4175

Finally, one important goal of maternal and child care programmes is to prevent infant and maternal deaths by assisting women to avoid high risk pregnancies. Evidence suggests that pregnancies among women who have already had five or more births are associated with increased mortality and morbidity got both the mother and the child. The results in Table 3.10 show that many Kuwaiti women, particularly those in the older age groups, are in this high parity risk category. Overall, about one in two Kuwaiti women has had five or more births. By age, the proportion with five or more births increases from about 22 percent among women under 30 to as much as 60 percent in the 30-34 group. Among women at ages 35 and over, who already are at greater pregnancy risk because of their age, the proportion in the high parity risk group increases to nearly 78 percent in the 35-39 cohort and to 84 percent among women 45-49.

3.3.5 Parity and Age at Marriage

In Kuwait, where deliberate fertility regulation is not widely practised, age at first marriage can be an important determinant of achieved fertility. On one hand, in conjunction with current age, it defines the length of the risk of exposure to pregnancy. On the other hand, women marrying at very young ages will experience an initial period of low fertility due to adolescent subfecundity, while women marrying at 30 or more likely to less fecund.

Table 3.11 Mean number of children ever-born to ever-married women, by current age and age at first marriage, KCHS 1987.

Age	Age at first marriage							Total
	< 15	15-17	18-19	20-21	22-24	25-29	30-39	
< 20	1.8	0.7	0.1	-	-	-	-	0.8
20-24	3.7	2.8	1.7	1.1	0.5	-	-	2.0
25-29	5.8	4.6	3.5	2.8	2.0	0.8	-	3.6
30-34	7.1	6.4	5.3	4.3	3.5	2.5	0.8	5.2
35-39	8.4	8.0	6.7	6.0	4.8	3.8	2.5	6.9
40-44	8.6	8.5	8.7	7.2	6.7	4.5	2.3	8.0
45-49	8.4	8.3	8.2	7.4	7.5	5.9	3.3	8.0
Total	6.9	5.6	4.3	3.8	3.1	2.9	2.2	4.9

Table 3.11 provides information on the mean number of children ever-born to ever-married women by current age and by age at first marriage. For all ever-married women, the mean parity is 6.9 for women married below age 15; this declines to 5.6 births for women married at ages 15-17, to 3.8 for women married at ages 20-21, and to 3.1 for those married at ages 22-24.

Within age group, the mean parity tends to decline steadily with increasing age at marriage. For example, among women currently at ages 30-34, the mean parity declines gradually from 7.1 births for women married under age 15, to 3.5 for those married at ages 22-24. This strong negative relationship between age at marriage and fertility is caused by the fact that the length of the risk of pregnancy decreases with increasing age at marriage.

A different picture, however, of the effect of age at marriage on fertility is shown by the figures in Table 3.12 which give the mean parities according to age at first marriage and years since first marriage. A steady increase is clear from any cohort to the one which preceded it in date of marriage. Clearly the women who have been married fro 25, 30 or more years will have very high fertility. The coverage of the survey was confirmed to women under

age 50. Thus, all women with 30 or more years of marital duration will have been married before age 20. A woman who married at age 25, say, must appear in a marriage cohort (or marital duration group) no greater than 20-24 years because after 24 years of marital duration she will be 50 years old and excluded from the sample.

Table 3.12 Mean number of children ever-born to ever-married women, by age at first marriage and by years since first marriage, KCHS 1987.

Years since first marriage	Age at first marriage							Total
	< 15	15 - 17	18 - 19	20 - 21	22 - 24	25 - 29	30 - 39	
< 5	1.6	1.0	1.1	1.2	1.1	1.1	0.9	1.1
5 - 9	3.4	3.2	2.9	3.0	3.0	2.8	2.8	3.0
10 - 14	5.6	5.0	4.8	4.4	4.3	3.9	4.0	4.8
15 -19	6.8	6.9	6.3	6.1	6.1	5.3	6.0	6.6
20 - 24	8.4	8.2	8.0	7.3	7.3	6.2	-	8.1
25 - 29	8.5	8.6	8.1	7.2	6.0	-	-	8.4
30 +	8.6	8.2	12.2	-	-	*	-	8.6
Total	6.9	5.6	4.3	3.8	3.1	2.9	2.2	4.9

The figures in Table 3.12 show the absence of any strong relationship between age at marriage and fertility in the first ten years of marriage, and that the tempo of fertility similar within this period no matter at what age a woman marries. The effect of age at marriage becomes apparent, however, at longer durations of marriage. But even for the cohort of women with 20-24 years marital duration, the effect of increasing age at first marriage on achieved fertility becomes evident only for those who married after their twenty fifth birthday.

3.3.6 Current Fertility

So far attention has been focused on completed fertility, and on cumulative fertility for certain segments of the women's reproductive period. In this section attention will be focused on

the pattern and level of current fertility, ie fertility in the 12 month period preceding the survey. Three measures of current fertility will be presented: the proportion of women currently pregnant, age-specific fertility rates and total fertility rates.

Proportion of Women Currently Pregnant

The percentage of currently married women reporting a current pregnancy is shown in Table 3.13 according to current age and residence. Overall, 19 percent of currently married women report a current pregnancy. The percentage decline monotonically and rapidly with age from 33 percent from women under 20 years if age, to 14 percent for those aged 35-39 and to 3 and 2 percent for those at ages 40-44 and 45-49, respectively.

Table 3.13 Percentage of currently married women reporting a current pregnancy, by current age and region of residence, KCHS 1987.

	Current Age							Total
	15 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 49	
Region								
Capital	50.0	29.0	21.1	17.4	6.8	0.0	0.0	17.6
Hawalli	30.2	22.1	25.2	14.3	12.8	2.6	3.2	16.3
Ahmadi	25.0	25.7	23.4	19.3	8.8	2.6	0.0	17.6
Jahra	37.8	34.4	27.2	25.4	18.5	4.0	3.6	23.8
Total	32.7	27.8	25.2	25.4	13.6	2.9	2.5	19.2

The proportion of women reporting a current pregnancy is, in a sense, the most "current" measure of all since it actually anticipates the level of fertility during the next nine months or so. However, as a measure of current fertility, this proportion can be subject to inaccurate reporting due to uncertainty, especially during the first trimester of pregnancy, deliberate concealment, or for other reasons.

Level of Current Fertility

Two measures of fertility in the 12-month period preceding the

survey are employed in this section: age-specific fertility rates and total fertility rate. An age-specific fertility rate (ASFR) is the ration of births occurring to a group of women of a particular age in a specified time period, usually a year, and the total number of woman-years spent in that age group during the specified time interval. The total fertility (TFR) is the sum of age-specific fertility rates over the childbearing ages. The TFR represents the number of live births that would occur to a woman if she were to experience throughout her reproductive years that level of childbearing represented by the schedule of age-specific fertility rates of a given period. The estimation of these rates from a retrospective sample survey could be subject to sampling fluctuations as well as non-sampling errors resulting from omission of births or misstatement of ages and dates.

The estimation of ASFRs from the survey is based on a relatively simple procedure. First, the most recent births to the ever-married women who were enumerated in the survey were classified by the age of mother at maternity. These births constituted the numerators in the calculation of ASFRs. The number of births thus obtained for any given age group was divided by the number of woman-years lived in the same age group. This rate was then multiplied by the proportion of ever-married women in the same age group, which was obtained from the household survey data, to give a rate for all women regardless of marital status.

Age-specific marital fertility rates (ASMFR) are similar to ASFRs, except that the denominator is confined to women-years spent in the married state. The total marital rate (TMFR) is the sum of age-specific marital fertility rates over the age range 20-49 years. It may be interpreted as the mean number of births to a woman who remained married during the age range 20-49 and who experienced the observed within-union fertility schedule.

The rates thus obtained from the KCHS are shown in Table 3.14.

As may been seen, the KCHS data yield a total fertility rate of 6.51 live births per woman for 1986-87. The survey data also yield a crude birth rate equivalent to 42 live births per 1000 persons for 1986-87.

Table 3.14 Age-specific fertility rates and age-specific marital fertility rate, per 1000 women, for 12-month period preceding the survey, KCHS 1987.

Age	Age-specific fertility rates (ASFR)	Age-specific marital fertility rates (ASMFR)
15 - 19	42.4	362.6
20 - 24	254.8	425.4
25 - 29	325.9	363.3
30 - 34	299.9	314.0
35 - 39	231.4	238.8
40 - 44	103.4	105.9
45 - 49	43.4	45.1
	Total fertility rate (TFR) age 15 - 49	Total marital fertility rate (TMFR) ages 20-49
	6.51	7.46

Both the total fertility rate and the age pattern of current fertility indicate that fertility in Kuwait is very high. Nevertheless, current fertility as measured by the TFR is about 17 percent lower than the cumulative fertility of women currently at the end of the childbearing ages, as represented by the mean number of children ever born (CEB) to 'all' women aged 40-49 (see Table 3.17). This difference could signify a reduction in fertility, or it may be due to reporting errors. Commonly, errors in dating of the last live birth result in either an under- or overestimate of current fertility according to whether the interval since that last live birth is over - or understated.

Assuming that dating errors may well exist, and to resolve the discrepancy between completed and current fertility estimate and derive an adjusted estimate of current fertility for dating errors

is the P/F ration technique. The procedure involves assuming that reported mean parities for women aged 20 to 34 years are reasonably accurate and that current live births are not differentially misreported by age. A correction factor is calculated and used as a reweighing factor for the reported age-specific fertility rates. The technique assumes unchanging fertility, an assumption often violated if only as a direct consequences of increasing age at marriage.

The application of this technique yields an unreasonably high estimate of total fertility of about 8.5 live births per woman. A more detailed evaluation of the data, however, suggested that the reported total fertility rate of 6.5 should be taken as a minimum estimate of the current level of fertility. A comparison of estimates of current fertility with measures of completed family size suggests that, although fertility remains high in Kuwait, there is indication that it has declined from the very high levels prevailing in the past.

3.3.7 Differentials in Current Fertility

The analysis of differentials in the current level of fertility will be based on age specific rates and age-specific marital fertility rates, for the 12-month period preceding the survey, by region of residence and literacy. These rates are shown in Tables 3.15 and 3.16.

Table 3.15 Age-Specific fertility rates, per 1000 women, for the 12-month period preceding the survey by region of residence and literacy, KCHS 1987.

	Current Age							Total fertility rate
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	
Region								
Capital & Hawalli	14.3	195.5	257.5	258.6	197.2	65.8	22.7	5.06
Ahmadi	32.6	268.2	312.7	373.6	225.7	147.8	88.9	7.25
Jahra	59.7	342.8	431.6	328.9	282.3	123.3	63.5	8.17
Literacy								
Illiterate	157.4	382.2	392.4	349.8	278.9	116.6	43.6	8.55
Literate	25.4	224.4	289.0	262.1	165.4	72.3	42.3	5.40
Total	42.4	254.8	325.9	299.9	231.4	103.4	43.4	6.51

Table 3.16 Age-specific marital fertility rates, per 1000 ever-married women, for the twelve month period preceding the survey, by region of residence and literacy, KCHS 1987.

Background characteristics	Age							Total marital fertility rate ages 20-49
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	
Region								
Capital & Hawalli	193	376	304	279	208	68	23	6.29
Ahmadi	366	418	338	386	231	151	94	8.09
Jahra	493	493	454	332	284	125	64	8.76
Literacy								
Illiterate	455	469	405	353	280	119	46	8.13
Literate	339	411	336	283	178	75	44	6.64
Total	363	425	363	314	239	106	45	7.46

As may be seen, the level of current fertility is lowest in the Capital and Hawalli regions (5.1 births); this level rises to 7.2 in the Ahmadi region, and to about 8.2 in the Jahra region. These figures suggests that the Capital and Hawalli regions have experienced the fastest fertility decline as evidenced by the fact that the total fertility rate (TFR) for these two regions is almost one-third lower than the mean number of children ever-born (CEB) among women 40-49 years of age (Table 3.17). In contrast in the

Ahmadi region, the difference between the TFR and the mean CEB is only 17 percent, while in the Jahra region current fertility is about five percent higher than lifetime fertility, possibly due to under-reporting among older women living in Jahra.

The figures in Tables 3.15 and 3.16 also show that the current level of fertility among literate women is significantly lower than that among iliterate women, with a difference of more than three children observed in the total fertility rate between literate women (5.4 births) and illiterate women (8.6 births). The magnitude of the fertility differential according to literacy seems quite plausible. A yardstick for appraising this variation may be the differential in current parity according to literacy, for women at ages 30-40 which is equal to more than two births. This age group is chosen because it reflects the level of cumulative fertility up to an old enough age; its reporting is likely to be of a better quality than older ages and its experience relates to a relatively more recent past.

Table 3.17 Total fertility rate for 12 month period preceding that survey, the mean number of children ever-born to "all women 40-49 years of age, by region of residence and literacy, KCHS 1987.

	Total fertility rate	Mean number of children to all women aged 40-49	Implied long term change in fertility
Region			
Capital & Hawalli	5.06	7.38	-31
Ahmadi	7.25	8.72	-17
Jahra	8.17	7.78	+5
Literacy			
Illiterate	8.55	8.23	+4
Literate	5.40	6.49	-17
Total	6.51	7.83	-17

Among literate women, the total fertility rate for the 12 month period prior to the survey is 17 percent lower than the mean

number of children ever born for women 40-49 years of age, while for illiterate women, the figures imply an increase in fertility of about four percent, (Table 3.17). This apparent increase in fertility should be discarded because of clear indications that estimates of current parity at ages 40-49 years, for illiterate women and for those living in Jahra have suffered from significant under-reporting of the number of children ever born. It is clear, however, that women living in the Capital and Hawalli regions and those who were literate have been leading the initial transition to lower fertility in Kuwait.

3.4 FAMILY PLANNING

3.4.1 Introduction

The use of modern methods of contraception is of recent origin in Kuwait. There is no organised family planning programme in the country and the Government has a policy to boost fertility rates among the native population. Family planning methods are, however, widely available in the country for couples who want to use them. This section will examine the levels of ever and current use of contraception, with particular emphasis on the method mix among current users, and the demographic and socio-economic differentials in these variables.

3.4.2 Ever-Use of Contraception

In the KCHS, all ever-married women interviewed for the maternal care survey were asked if they had ever used any family planning method. Table 3.18 shows the percentage of ever-married and currently married women who have ever used a method of contraception, classified by current age, years since first marriage and number of living children. Overall, 56 percent of ever-married women have used a method to regulate their fertility at some point in their lives. Currently married women have a slightly higher level of ever-use (57 percent) than ever-married women.

The age differentials for ever-use show that among currently married women, the lowest rate of ever-use (18 percent) occurred among the youngest women, those at ages 15-19; the highest rate (64 percent) was found among women at ages 30-34. Almost half of the women in their forties have had some experience with family planning. Passing over the early ages and small families, the age pattern of ever use shows little variation. More than 60 percent of currently married women between ages 25 and 39, or with marital duration between 5 and 19 years, or with a family size between 2 and 6 living children reported ever use of some contraceptive method.

Table 3.18 Percentage of ever-married women and currently married women who have ever used a contraceptive method by current age, years since first marriage and number of living children, KCHS 1987.

Age	Ever-married	Currently married	Years since first marriage	Ever-married	Currently married	No. of living children	Ever-married	Currently married
15-19	18.1	18.2	< 5	42.2	42.5	0	12.3	11.7
20-24	51.3	51.6	5 - 9	62.0	62.9	1	47.9	49.5
25-29	59.3	60.3	10 - 14	60.2	61.9	2	61.1	64.1
30-34	62.5	64.1	15 - 19	59.0	60.6	3	64.8	66.2
35-39	59.2	60.8	20 - 24	54.5	56.1	4	66.5	67.3
40-44	52.0	54.3	25 - 29	52.6	55.7	5	60.9	62.7
45-49	45.8	48.2	30+	49.2	50.1	6	61.2	62.4
Total	55.5	56.9				7	54.7	55.5
						8	48.1	48.8
						9+	51.3	51.7

Ever use of contraception, however, varies substantially between socio-economic groups of the population. The proportions of ever-married women who had ever used contraception according to current age and selected background characteristics, are given in

Table 3.19 Percentage of ever-married women who have ever used a contraceptive method by current age and background characteristics, KCHS 1987.

	Current age							Total
	<20	20-24	25-29	30-34	35-39	40-44	45-49	
Region								
Capital	25.0	73.0	89.4	90.9	84.8	65.0	65.4	82.1
Hawalli	26.0	59.4	73.7	74.0	75.0	69.9	53.8	68.7
Ahmadi	12.2	46.2	47.2	48.4	46.9	34.9	21.9	43.3
Jahra	15.1	40.9	44.3	46.2	44.2	41.0	36.5	41.9
Education								
Illiterate	14.0	28.5	39.7	45.2	46.9	44.8	39.8	41.7
Incomplete primary	10.5	55.2	62.3	67.5	72.5	71.4	71.9	61.9
Preparatory	27.9	55.6	69.2	77.3	76.3	72.7	70.0	63.4
Secondary +	-	66.3	77.3	82.8	86.6	72.7	-	76.4
Work status								
Currently working	-	61.6	77.6	83.8	82.8	66.7	55.6	77.8
Not working	16.8	49.7	53.3	54.7	55.0	51.3	45.4	50.8
Total	18.1	51.3	59.3	62.5	59.2	52.0	45.8	55.5

Region of residence, maternal education and mother's work status are strongly associated with ever-use of contraception. Women with no schooling are much less likely to have tried any method than those who have attended school. Ever-use also increases from 51 percent among women not currently working to 78 percent among those currently working. Regional differences are, however, more pronounced than the other differentials. Women living in the capital governorate report a level of ever-use of 82 percent. Next come the women living in Hawalli, 69 percent. Women residing in Ahmadi and Jahra report much lower level of ever-use of around 42 percent.

This pattern of differentials suggest that most of the regional variation in current fertility in Kuwait can be accounted for variations in both age at marriage and contraceptive use.

3.4.3 Current Use of Contraception

One of the most important indicators of reproductive health in a society is the level of current use of contraception. In the KCHS, all women who had reported ever-use of contraception and were currently married and non-pregnant were asked if they were using any contraceptive method at the time of the survey, and if so, what method.

The KCHS findings indicate that 35 percent of currently married women are practising family planning. Almost all users rely on modern methods and the pill is the most widely used method.

Table 3.20 Percentage of currently married women who are currently using a contraceptive method, including sterilisation, by current age and number of living children, KCHS 1987.

Age	Number of living children						All
	0	1	2	3	4	5 +	
15 - 19	-	11	19	-	-	-	8
20 - 24	-	26	42	11	-	-	29
25 - 29	-	23	35	45	36	29	33
30 - 34	-	-	44	50	60	36	42
35 - 39	-	-	-	43	58	37	39
40 - 44	-	-	-	-	-	39	37
45 - 49	-	-	-	-	-	30	28
All	-	22	38	43	43	35	35

Table 3.20 shows the contraceptive prevalence rate among currently married women according to age and number of living children. There appears to be an inverted U-shaped pattern with respect to age. Use is lower among young women (because they are in an early stage of family building) among older women (some of whom are no longer fecund) than among women at intermediate ages. Among women with less than five children, current use tends to be highest in the 30-34 age group, reaching 60 percent among women with four children.

The association between number of living children and contraceptive practice is curvilinear. The figures in Table 3.20 show that virtually no women in Kuwait adopt contraception prior to their first birth, but that sizeable proportions begin to practice family planning when they have at least one living child. The contraceptive prevalence rate increases sharply with the number of living children, from less than one percent among currently married women with no children to 22 percent among those with one child. The current use rate peaks at 43 percent among women with three or four children, before declining to 35 percent among those with five or more children. The lower level of contraceptive prevalence among couples with 5 or more children compared to those with 4 or 3 children probably reflects a selection process whereby couples who do not practice contraception are more likely to achieve larger family sizes than those who do practice. In addition, higher parity women are likely to be older and higher proportions may be at ages where they no longer perceive a need for contraception.

Table 3.21 shows the percent distribution of currently married women by contraceptive method currently used according to selected background characteristics. Further details on current users of contraception are given in Table 3.21 which shows the percent distribution of current users by the method used. As with ever-use, region of residence, level of education and current work status emerge as background variables most closely associated with current use.

The Capital has the highest level of contraceptive prevalence, with 54 percent of married women using a method, followed by Hawalli (45 percent), Ahmadi (28 percent) and Jahra (23 percent).

The figures also show a uniform positive relationship between level of education and current contraceptive use. The proportion of married women using contraception increases dramatically from 23 percent among illiterate women, to 36 and 38 percent among women

with incomplete primary and those with primary education, respectively, and then rises to 43 percent for women with preparatory education and to 51 percent for women with secondary or higher education. Contraceptive prevalence also increases from 31 percent among women not currently working to 52 percent for those currently working.

Among current users the dominant position of the pill, which comprises 70 percent of all use, can be clearly seen. The IUD is the next most prevalent method, being used by 11 percent of all current users. All other modern methods account for only 11 percent, while the traditional methods - mainly rhythm and withdrawal, account for the remaining 8 percent of current use.

The method mix, however, varies by background characteristics. Thus, the percentage of current users who are using the pill decreases as age increases. Among women under 35 years, the IUD is the second most prevalent method (used by 9 percent), followed by the condom (4 percent). For women at ages 35-39, both the IUD (used by 11 percent) and female sterilisation (used by 10 percent) are more or less equally prevalent, followed by the condom (6 percent). Among women in their forties (who represent about 14 percent of all current users), female sterilisation is the second most prevalent method (used by 20 percent of women 40-44 years and 34 percent of those 45-49 years of age).

Table 3.21 Percent distribution of currently married women by contraceptive method currently used, according to background characteristics, KCHS 1987.

	Any method	Any modern method						Any tradl method	Traditional method			Not curren tly using	Total %
			Pill	IUD	Vaginal method	Condom	Female sterilisa tion		Rhy thm	With-drawal	Other		
Age													
15-19	8.2	7.6	7.6	-	-	-	-	0.6	-	-	0.6	91.8	100
20-24	28.6	26.9	23.9	2.5	-	0.5	-	1.7	0.5	0.3	0.9	71.4	100
25-29	33.3	30.6	25.5	3.3	0.5	1.1	0.2	2.7	1.3	0.6	0.9	66.6	100
30-34	42.2	39.0	29.5	6.0	0.6	2.3	0.6	3.2	2.3	0.5	0.5	57.8	100
35-39	39.1	35.3	24.2	4.1	0.8	2.5	3.7	3.8	2.5	0.7	0.6	60.9	100
40-44	36.7	32.4	21.4	2.1	0.3	1.1	7.5	4.3	2.7	0.8	0.8	63.3	100
45-49	28.4	26.9	12.2	3.6	0.5	1.0	9.6	1.5	0.5	0.5	0.5	71.6	100
Region													
Capital	54.4	48.2	33.6	7.4	1.9	3.4	1.9	6.2	2.2	2.8	1.2	45.6	100
Hawalli	44.8	40.8	29.6	5.1	0.5	2.9	2.7	4.0	1.9	0.6	1.5	55.2	100
Ahmadi	27.5	24.0	19.0	2.9	0.4	0.3	1.4	3.5	3.2	0.3	0.0	72.5	100
Jahra	22.6	22.1	18.6	1.6	0.1	0.1	1.7	0.5	0.3	0.1	0.1	77.4	100

Table 3.21 (Continued).

	Any method	Any modern method						Any trad'l method	Traditional method			Not currently using	Total %
			Pill	IUD	Vaginal method	Con dom	Female sterilisa tion		Rhy thm	With-drawal	Other		
Education													
Illit-erate	23.2	21.5	17.0	1.2	0.1	0.5	2.7	1.7	1.1	0.2	0.3	76.8	100
Incomp. Primary	35.6	30.7	26.6	1.4	0.4	1.4	0.9	4.9	4.0	0.4	0.5	64.4	100
Primary	38.8	35.9	28.3	2.3	0.7	1.4	3.2	2.9	1.4	0.9	0.7	61.2	100
Preparatory+	43.4	39.5	29.7	5.5	0.5	2.2	1.6	3.9	1.9	0.9	1.1	56.6	100
Secon-dary+	50.8	46.4	32.7	9.0	0.9	3.2	0.6	4.4	2.1	0.9	1.4	49.2	100
Work status													
Working	51.8	47.9	34.6	8.7	1.3	2.4	0.9	3.9	1.9	0.9	1.1	48.2	100
Not working	30.9	28.2	21.8	2.6	0.2	1.3	2.3	2.7	1.6	0.5	0.6	69.1	100
Total	34.6	31.7	24.0	3.7	0.5	1.5	2.0	2.9	1.6	0.6	0.7	65.4	100

Table 3.22 Percent distribution of currently married women using contraceptive method by the method used, according to background characteristics, KCHS 1987.

	Pill	IUD	Vaginal method	Condom	Female Sterlisation	Rhythm	Withdrawal	Other	Total %	No. of current users
Age										
15-19	92.9	-	-	-	-	-	-	7.1	100	14
20-24	83.6	8.7	-	1.6	-	1.6	1.1	3.3	100	183
25-29	76.2	9.8	1.5	3.4	0.6	4.0	1.8	2.7	100	328
30-34	70.0	14.2	1.4	5.4	1.4	5.4	1.1	1.1	100	367
35-39	62.0	10.6	2.2	6.3	9.5	6.3	1.8	1.4	100	284
40-44	58.4	5.8	0.7	2.9	20.4	7.3	2.2	2.2	100	137
45-49	42.9	12.5	1.8	3.6	33.9	1.8	1.8	1.8	100	56
Region										
Capital	61.9	13.6	3.4	6.3	3.4	4.0	5.1	2.3	100	176
Hawalli	66.0	11.3	1.2	6.6	6.1	4.2	1.3	3.3	100	671
Ahmadi	69.1	10.6	1.4	0.9	5.1	12.0	0.9	-	100	217
Jahra	82.3	7.2	0.3	0.3	7.5	1.3	0.3	0.7	100	305

Table 3.22 (Continued).

	Pill	IUD	Vaginal method	Condom	Female Sterlisation	Rhythm	Withdrawal	Other	Total %	No. of current users
Education										
Illiterate	73.3	5.3	0.5	2.1	11.9	4.9	0.7	1.4	100	436
Incomplete primary	74.7	4.0	1.2	3.8	2.5	11.4	1.2	1.1	100	79
Primary	72.9	5.9	1.8	3.5	8.2	3.5	2.4	1.8	100	170
Preparatory	68.3	12.7	1.2	5.2	3.6	4.4	2.0	2.8	100	432
Secondary+	64.4	17.8	1.9	6.2	1.2	4.1	1.9	2.5	100	432
Work status										
Working	66.9	16.9	2.5	4.7	1.7	3.6	1.7	2.2	100	362
Not working	70.6	8.3	0.9	4.1	7.4	5.2	1.5	2.0	100	1007
Total	69.6	10.6	1.3	4.2	5.9	4.7	1.5	2.0	100	1369

Educational differences in the method mix are also apparent. Among current users, the greatest differences are observed in the percent using the IUD, which increases from 5 percent of women with primary or less education, to 13 percent among users with preparatory education and to 18 percent of those with secondary or higher education.

Thus, differentials in current contraceptive use across socio-economic variables are, generally, in the same direction as differences in current fertility levels across these groups.

CHAPTER 4

DETERMINANTS OF FERTILITY

4.1 Introduction

The childbearing process in a society is influenced by many demographic, socioeconomic, and cultural factors, in addition to institutional and community-level developmental factors.

Accordingly, the childbearing process should be monitored over time to provide policy makers with the most significant determinants of fertility, and allow them to direct efforts toward achieving the required changes in fertility and reproductive behaviour. This chapter discusses micro-level determinants of fertility, in so far as the data collected in the 1987 Kuwait Child Health Survey (KCHS) permit. It is unfortunate that the KCHS did not collect community-level data. As a result, the analysis will be restricted to individual-level data.

Recent theories and methodologies of the childbearing process stress the interactions between the family's decisions relating to (1) children ever born, (2) age at first marriage, (3) the wife's characteristics (e.g., education, work, occupation, etc.), (4) the husband's characteristics, (5) childhood mortality, and (6) family wealth and assets. Other intermediate determinants of the childbearing process such as the use of contraceptive methods and breast-feeding are also stressed as factors with direct impact on fertility behaviour. These intermediate determinants will be considered in the latter part of the study using a macro-level methodology, because of the absence of micro-level data required for the direct estimation of these determinants.

The analysis presented in the preceding chapters has clearly demonstrated wide differentials in fertility behaviour among Kuwaiti women with different characteristics. The number of

children ever born reaches a high number of 18 and 24 children for some respondents. While 47 percent of the respondents are illiterate, 7 percent have a university degree, and only 18 percent of the respondents are currently working. In addition, regional differences are wide. The KCHS results indicate that while only 25 percent of all ever-married women aged 15-49 were married before reaching 18 years of age in the Capital, about 57 percent did so in Jahra. Only 10 percent of all ever-married respondents aged 15-49 are illiterate in the Capital, compared to 71 percent in the Jahra region. Women's participation in the labour force is 43 percent and 7 percent in these two regions, respectively. The figures for the other two regions lie between these two extremes.

It thus seems appropriate to consider these factors simultaneously and in a format that draws out the interrelationships among them. While these variables may be interactive, our statistical analysis will focus on single equation models. The multivariate approach provides estimates of the net effects of particular variables on the number of children ever born. All of the regressions presented herein use the entire survey sample of Kuwaiti ever-married women. Other models may be estimated with the sub-sample of intact marriages. However, because 3962 women of the total 4175 ever-married women (95 percent) are currently married, the intact marriage regressions are not analyzed separately and are expected to be broadly the same as those for the ever-married-women sample.

4.2 STATISTICAL METHODOLOGY

The basic multivariate model considered in this study assumes that a linear relationship exists between the children ever born (CEB) as the dependent variable and a number of independent variables representing individual demographic-socioeconomic characteristics of ever-married women. These characteristics are often considered proxies for a number of possible cultural, social, and economic factors which cannot be directly measured. Accord-

ingly, the number of children ever born (CEB) is assumed to depend upon: (1) the mother's characteristics (current age, age at first marriage, level of education, whether currently working for wage, blood relation to her husband, and ever use of family planning), (2) the number of child deaths, and (3) region of residence. Comments justifying the selection and interpretation of these variables can be postponed until an examination of the specific empirical results is made later. Unfortunately, other variables proven to be important in the literature on determinants of fertility, such as husband's characteristics (e.g., level of education, occupation, etc.) and household's income and wealth, are not available and their impact on fertility cannot be examined here.

The basic form of the model is

$$Chidren\ ever\ born = b_0 + \sum_{i=1}^{K} b_i X_i + \varepsilon \qquad (1)$$

where b_o is the number of children ever born when all independent variables, X_i's, are equal to zero. For the categorical variables, namely, region of residence, level of education, work for wage, blood relation to husband, and ever use of family planning, a set of binary indicators for each variable was created. Each binary indicator represents one category of the variable and depends on whether or not the respondent belongs to that category (1=in category, 0=not in category). The indicator of the reference category is omitted from estimation. The regression coefficient b_i represents the effect on the number of children ever born (the dependent variable) of the membership in the corresponding category of the X_i explanatory (independent) variable compared to the reference category, adjusted for other variables in the equation, and ε is the error term. Thus, the following discussion of the multivariate results will be in terms of differences in number of

children ever born between each category of the explanatory variable and the omitted reference category, net of other factors.

4.3 MULTIVARIATE ANALYSIS OF DEMOGRAPHIC AND SOCIOECONOMIC DETERMINANTS OF FERTILITY

4.3.1 National Patterns

The analysis in this section is carried out in two stages. At the first stage, all demographic and socioeconomic factors are controlled. At the second stage, control for age at first marriage was eliminated in order to discuss and test specific hypotheses related to the interaction between education and the timing of marriage and the level of fertility. Categorical variables were entered into the equation as a set of dummy variables. For region of residence, the Capital is the omitted reference category, with Hawalli, Ahmadi, and Jahra regions as the other three categories. Illiterate women category is considered as the reference category for the woman's level of education. Women not currently working for wage and women who never used family planning were the two reference categories for their respective variables. The results of the multivariate regressions are summarized in Table 4.1.

The partial regression coefficients presented in Table 4.1 are in general in line with expectations. Model 1, with all demographic and socioeconomic factors considered, explains about 71 percent of the variations observed in the number of children ever born. This value is reasonably high for this type of data set and for the CEB. The F-statistic indicates that the overall relationship between the number of children ever born and the selected independent variables is significant at the one percent level.

It is useful first to take a general view across all factors, in order to assess which variables are truly important in determining fertility levels in Kuwait. All demographic and

socioeconomic variables included in the model show significant effects on the number of children ever born. The largest net effects for ever-married fertility are the net negative impacts of the respondent with a secondary certificate (-1.12), with a preparatory certificate (-1.04), and with a university degree (-1.00), and the net positive effect of child deaths (0.96).

Table 4.1 Multivariate regressions for children ever born, ever-married women, KCHS 1987.

Model No.	(1)	(2)
AGE OF RESPONDENT:		
Age	.8049**	.6869**
Age at First marriage	-.2833**	-
REGION OF RESIDENCE:		
Capital	Reference	Reference
Hawalli	.2344*	.4069**
Ahmadi	.7447**	.9350**
Jahra	.5300**	.6771**
LEVEL OF EDUCATION:		
Illiterate	Reference	Reference
Literate no schooling & incomplete primary	-.4773**	-.5251**
Primary	-.7074**	-.8741**
Preparatory	-1.039**	-1.390**
Secondary	-1.123**	-1.974**
University	-.9991**	-2.122**
CURRENTLY WORKING FOR WAGE	-.4063**	-.6626**
EVER USE OF FAMILY PLANNING	.5370**	.7333**
RELATED TO HUSBAND	.2374**	.3841**
CHILD DEATHS	.9595**	1.1026**
Constant	-6.720**	-9.828**
R Square	0.705	0.630
Number of cases	4090	4170

\+ statistically significant at 10% level
* statistically significant at 5% level
** statistically significant at 1% level
\- indicates variable not included in model.

It is clear that achieving an education level of at least a preparatory certificate and reducing the occurrence of child deaths are the most important fertility determinants, after controlling for various demographic and socioeconomic factors. Lower levels of education are also significant, however, their net negative effects are smaller compared to the impacts of higher levels of education, (Farid, 1987).

For the demographic factors, the age variables enter as expected and are highly significant at the 1 percent level. The CEB increases with age, but the rate of childbearing diminishes at older ages.

Age at first marriage has a highly significant impact on CEB, a finding that is consistent with much of the demographic literature. For each year of marriage delayed, CEB decreases by 0.28 children.

The CEB is significantly lower in the Capital (3.4 children) than in Hawalli (4.5 children), and this in turn is lower than in Ahmadi or Jahra regions (5.3 children). However, controlling for other demographic and socioeconomic factors, the net positive effect is 0.23, 0.74, 0.53 child more for women residing in Hawalli, Ahmadi, and Jahra regions compared to women residing in the Capital.

Number of child deaths is highly significant determinant of the childbearing process in Kuwait as shown in Model 1. Higher occurrences of child deaths are expected to result in higher figures for CEB. For each child death avoided, CEB decreases by almost one child (0.96).

For socioeconomic factors, women's level of education depicts a statistically net negative impact on CEB, with a general increasing trend in the net effect as the level of education

increases until the secondary certificate after which the net effect decreases slightly. As mentioned earlier, among those factors considered in this study, education seems to be the most significant determinant of the childbearing process in Kuwait. Compared to illiterate women, the combined category of literate women with no schooling and those with incomplete primary education have, on average, 0.48 less children. The difference increases systematically with the increasing level of education, to 0.71 child for women with primary education, 1.04 children for women with preparatory education, 1.12 children for women with secondary education, and then to decrease slightly to 1.00 child for women with university education. The largest net negative effect occurs for women with a secondary certificate, which suggests that a greater impact on altering the number of children ever born is achieved for women acquiring the secondary certificate.

With education and other demographic and socioeconomic factors present in the model, women currently working for wage still have fewer numbers of children ever born than nonworking women. On average, working women have 0.41 child less than nonworking women.

The Kuwaiti and the Arab traditions, customs, and culture, in general, support and encourage marriage between first cousins and immediate relatives. Decisions about whom to marry traditionally were made by the parents and other family members of the potential mates. The process of arranged marriage is under the control of the male members of the two families for whom spouses' blood relationship and family name, status, and wealth are of great importance. The effect of spouses' blood relationship was found to be a significant determinant of the age at first marriage in Egypt (Sokona and Casterline, 1988). To investigate the effect of this phenomenon on CEB, the model included a variable representing the relationship of the respondent to her husband. Model 1 indicates that consanguineous couples tend to have, on average, 0.24 child more than unrelated couples.

While no national family planning programme exists in Kuwait, contraceptive supplies are available commercially. The KCHS results for the ever use of family planning variable are interesting. Two measures of contraceptive use are available: women who have ever used contraceptive methods and those who are currently using contraceptives. Some researchers feel that the response reliability in survey data is greater for the current-use measure. But for some types of analysis, the CEB variable, for example, where ever born is the time frame, ever use of contraceptive methods may be the more appropriate variable to include in the model. Model 1 reveals a strong, highly significant positive impact of ever use of contraception on CEB. However, the exclusion of the family planning variable causes little reduction to the total variance of the model (R^2 decreases by less than 1 percent); moreover, the remaining parameter estimates are largely stable.

Ever users have, on average, 0.54 children more than never users after controlling for other factors. These results apparently demonstrate reverse causation. A similar relationship has been observed for rural Egypt in the early 1980s (Kelley, et al., 1982). The implication is that those women most likely to use contraceptive methods are those who already have achieved high parities. The results also imply that contraception is used mainly for stopping rather than spacing of children. The reverse causation problem may be compounded by yet other factors. The positive impact of contraceptive use on CEB may be related to the relative efficiencies of alternative modes of contraception. For some families contraceptive methods may represent a substitute for extended breast-feeding as a means of family size control. However, unless modern contraceptives are used regularly and properly, the overall impact on CEB could be positive when the effect of reduced breast-feeding is accounted for. In addition, contraceptive methods may be used for short durations, which implies very low continuation rates. The data collected in the KCHS do not permit the investigation of this matter in detail.

Accordingly, there is no evidence to support or refute these possibilities, but the issue looms as a critical area for future research.

At the second stage, we turn our attention to investigate the education/age-at-first-marriage/CEB interaction. Age at first marriage may be delayed by women who take advantage of higher levels of education. To discuss the education/age-at-first-marriage interaction, which is not controlled in the above model, an additional regression is presented. The new model estimated the basic CEB model without the age at first marriage variable (Model 2). The value of R^2 decreased from 71 percent for Model 1, to 63 percent for Model 2. In Model 2, the education variables capture the impact on CEB of a delay in age at first marriage due to higher levels of education. The value of partial regression coefficients of education increased dramatically in Model 2, especially for higher education levels. The education effect revealed in Model 2 appears to be the result of pure education impacts, such as changes in the desire for large family size and in giving women the opportunity to participate in the labour force.

In addition, comparisons between the multiple regression coefficients for other socioeconomic variables, more specifically, region of residence, currently working for wage, ever use of family planning, and blood relationship of the respondent to her husband terms calculated with (Model 1) and without the control of the age at first marriage (Model 2) were conducted. The results indicate roughly the extent to which the CEB differentials by these four socioeconomic factors are due to differences in the age at first marriage variable. The magnitude of the regression coefficients in Model 2 are higher than the corresponding coefficients in Model 1 for the four factors. As expected, adjustment for age at first marriage resulted in a reduction of the socioeconomic differentials.

4.3.2 Regional Patterns

It is suggested that important interactions exist between the region of residence and other variables included in children ever born models. Table 4.2 presents the KCHS results, without controlling for other factors, by region of residence according to selected socioeconomic factors. The mean CEB for the Capital is 3.4 children per woman, compared to 4.5 children in Hawalli, and 5.3 children in Ahmadi and Jahra regions. Child deaths are lower in the Capital (0.10 children per woman) than in Hawalli (0.16), Ahmadi (0.20), and Jahra (0.21) regions. Multivariate regressions presented in section 4.3.1 show statistically significant differences between the four regions, net of other factors. Thus, in this section, the model will be fitted for each region separately.

Table 4.2 Mean number of children ever born and age first marriage by region of residence according to selected socioeconomic factors, ever married women, KCHS 1987.

Selected socio economic factors	Capital	Hawalli	Ahmadi	Jahra	Total
	1. Children Ever Born				
LEVEL OF EDUCATION:					
Illiterate	6.00	6.93	6.59	6.13	6.43
Literate no schooling	7.50	5.44	5.77	5.00	5.51
Incomplete primary	5.50	5.60	6.02	4.56	5.36
Primary	4.44	4.76	4.37	3.94	4.42
Preparatory	2.73	3.46	3.16	2.75	3.19
Secondary	2.58	2.72	2.30	2.38	2.61
University	2.67	2.72	3.40	2.77	2.74
CURRENTLY WORKING FOR WAGE:					
Working	2.66	3.01	3.54	3.72	3.09
Not working	3.92	5.11	5.44	5.46	5.25
RELATION TO HUSBAND:					
Related	3.45	5.15	5.45	5.61	5.33
Unrelated	3.35	4.07	5.04	4.81	4.34
EVER USE OF FAMILY PLANNING:					
Ever users	3.55	4.77	5.43	5.76	4.98
Never users	2.61	4.05	5.15	5.05	4.73
Total	3.38	4.54	5.27	5.34	4.87

Table 4.2 (Continued)

Selected socio economic factors	Capital	Hawalli	Ahmadi	Jahra	Total
	1. Age at First marriage				
LEVEL OF EDUCATION:					
Illiterate	17.31	17.01	16.82	17.17	17.06
Literate no schooling	17.50	18.06	16.50	16.35	17.00
Incomplete primary	18.33	17.58	16.94	16.97	17.25
Primary	17.97	17.77	17.43	17.15	17.52
Preparatory	19.30	18.01	18.23	18.04	18.19
Secondary	20.67	20.48	19.96	19.73	20.38
University	22.51	21.74	21.47	21.40	21.92
CURRENTLY WORKING FOR WAGE:					
Working	21.68	20.64	19.57	20.04	20.65
Not working	18.92	17.88	17.33	17.20	17.56
RELATION TO HUSBAND:					
Related	19.75	18.03	17.09	17.14	17.53
Unrelated	20.26	19.10	18.13	17.95	18.79
EVER USE OF FAMILY PLANNING:					
Ever users	19.97	18.66	17.68	17.42	18.35
Never users	20.67	18.56	17.43	17.40	17.82
YEARS SINCE FIRST MARRIAGE:					
0 - 4	21.36	20.41	19.11	19.07	19.86
5 - 9	21.21	20.34	18.60	18.05	19.40
10 - 14	19.80	18.86	17.45	17.54	18.14
15 - 19	19.25	17.61	16.72	16.81	17.21
20 - 24	17.21	16.67	16.17	16.46	16.50
25 - 29	16.68	16.31	15.65	15.61	15.99
30 +	15.07	14.54	14.83	14.92	14.74
Total	20.10	18.63	17.64	17.41	18.12

The results of bivariate frequency tabulations, not adjusting for other demographic and socioeconomic factors, also indicate wide disparities among regions. While only 25 percent of the respondents in the Capital were married before age 18, the percentage increases to 41 percent in Hawalli, to 55 percent in Ahmadi, and 57 percent in Jahra regions. With respect to the blood relationship, consanguineous couples represent 31 percent, 44 percent, 57 percent, and 67 percent in the four regions, respectively. Ever use of family planning is 82 percent of the respondents in the Capital, 69 percent in Hawalli, 43 percent in

Ahmadi, and 42 percent in Jahra regions.

High levels of education are observed in the Capital compared to other three regions. The results reveal that the percentage of respondents with at least a secondary certificate is 55 percent in the Capital, compared to 33 percent, 10 percent, and 6 percent in Hawalli, Ahmadi, and Jahra regions, respectively. The percentage illiterate is about 10%, 31%, 52%, and 71% of the respondents in the Capital, Hawalli, Ahmadi, and Jahra regions, respectively. Consequently, more women are working in the Capital (43%) than in all other regions (27%, 9%, and 7% in Hawalli, Ahmadi, and Jahra regions, respectively).

It is believed that the childbearing process differs fundamentally among these four regions of residence. As mentioned earlier, women residing in the Capital have, on average, about two children less than women residing in the Jahra region. Table 4.2 shows that blood relationship between couples does not have significant effect on the number of children ever born as in the other three regions. In addition, the figures for mean ages at first marriage are the lowest among literate women with no schooling in Jahra (16.4 years) and Ahmadi (16.5 years) regions, and highest among women with a university degree in the Capital (22.5 years).

In order to examine how the childbearing process in Kuwait differs among various regions of residence while controlling for demographic and socioeconomic factors simultaneously, the basic model (Model 1) shown in Table 4.1 was applied (without a region-of-residence variable) for the four regions. Relevant regressions are presented in Table 4.3. Models 3, 4, 5, and 6 for the Capital, Hawalli, Ahmadi, and Jahra regions, respectively, with all demographic and socioeconomic factors considered, explain 69%, 71%, 76%, and 66% of the total variance in the CEB in the four regions, respectively. The F-statistics indicate that the overall

relationship between the CEB and the selected demographic and socioeconomic factors for the four regions are highly significant at the 0.001 level. Comparisons of the results for the four regions indicate that for demographic factors (age, age at first marriage, and child deaths), the net impacts vary. The CEB increases at a faster rate with age in the Capital and Jahra regions than in Hawalli and Ahmadi regions. The net negative effect of a delayed age at first marriage on CEB is smaller in the Capital (-0.22) than in the other three regions, especially Ahmadi (-0.33).

The results for the net impacts of socioeconomic factors on CEB paint different pictures, with regard to their magnitude and/or direction, in the four regions. The net effect of education on reducing the number of children ever born is more important for women living in Hawalli region and least important for women living in Jahra region. While the net effect of holding a university degree on CEB is about -1.36 children for Hawalli women, it is only -0.75 children for Jahra women. The net effect for literate women with no schooling or incomplete primary education on the CEB is positive for women residing in the Capital. These results indicate some evidence of a curvilinear relationship between CEB and education. However, this nonlinear relationship might vanish if variables describing the family's wealth and assets are accounted for, especially as this net positive effect is not statistically significant. It is impossible, though, to test this hypothesis as the data on income and wealth are not collected in the KCHS.

Women working for wage have fewer numbers of children ever born than nonworking women in all four regions. The net negative effect of participating in the labour force on CEB increases from -0.29 children in the Capital, to -0.34 in Hawalli, to -0.52 in Ahmadi, and to -0.56 in Jahra.

Ever use of family planning has a larger net positive effect on CEB for women living in the Capital (0.81) than for women living

in the other three regions. As mentioned earlier, this positive impact might be a result of one of three possibilities (1) irregular and/or improper use of contraceptive methods, (2) the use of birth control as a substitute for prolonged breast-feeding, or (3) contraceptive methods used for short periods of time, i.e., very low continuation rates. As expected, being related to her husband, the net positive effect on CEB for a woman residing in all regions, except the Capital. There is no significant difference between consanguineous couples and unrelated couples in the Capital with regard to the number of children ever born, after controlling for various demographic and socioeconomic factors.

4.3.3 Work, Consanguineous Marriage, and Family Planning

We now turn our attention to other factors that are acquired later in life, such as work, marriage to blood kin, and practice of birth control. These characteristics are amenable to change either by the individual's conviction or as a result of peer and/or environmental pressures. These three factors, thus, are of critical importance if changes in the childbearing process are sought.

We first consider the bivariate results before tackling various demographic and socioeconomic factors simultaneously. The means and the patterns are consistent with expectations. There is a great disparity between working and nonworking women, as shown in Table 4.2. To begin with, the mean CEB is 5.3 children for nonworking women, compared to only 3.1 children for working women. Working women marry over three years older than nonworking women (20.65 vs. 17.56 years). In addition, while 78 percent of working women are ever users of family planning, only 51 percent of nonworking women are ever users. More consanguineous couples are observed among nonworking women (58%) than among working women (35%). And, of course, higher education levels are recorded among working than nonworking women.

Table 4.3 Multivariate regressions for children ever born, by region of residence , KCHS 1987.

Region and Model	Capital (3)	Hawalli (4)	Ahmadi (5)	Jahra (6)
AGE OF RESPONDENT:				
Age	.8034**	.7220**	.6323**	.9160**
AGE AT FIRST MARRIAGE	-.2175**	-.2643**	-.3304**	-.2937**
LEVEL OF EDUCATION:				
Illiterate	Reference	Reference	Reference	Reference
Literate no schooling & incomplete primary	.4575	-.7594**	-.4800**	-.1917
Primary	-.6702**	-.8721**	-.4780**	-.5506**
Preparatory	-1.149**	-1.311**	-.7620**	-.7805**
Secondary	-.9981**	-1.437**	-.8370**	-1.111**
University	-1.055**	-1.359**	-.7693+	-.7456+
CURRENTLY WORKING FOR WAGE	-.2921+	-.3368**	-.5191*	-.56186*
EVER USE OF FAMILY PLANNING	.8059**	.5339**	.4267**	.6487**
RELATION TO HUSBAND	-.0407	.2786**	.2606*	.2020+
CHILD DEATHS	1.1372**	.9425**	1.0130**	.9100**
Constant	-7.139**	-5.126**	-3.385**	-7.878**
R Square	0.690	0.712	0.758	0.658
Number of cases	336	1549	820	1386

\+ statistically significant at 10% level
* statistically significant at 5% level
** statistically significant at 1% level
\- indicates variable not included in model.

With respect to blood relationship, the KCHS results indicate that women of consanguineous couples, on average, have one child more, marry 15 months younger, practice birth control less, and are less educated than women of unrelated couples.

Differentials between ever and never users of family planning

are wide. While the mean CEB among ever users is slightly higher than never users (5.0 vs. 4.7 children), never users marry about six months younger than ever users. About 29 percent of ever users have at least a secondary certificate, compared to only 11 percent among never users, and 25 percent of ever users are working, compared to only 9 percent of never users.

We turn now to the multivariate analysis. The basic regression equation (Model 1) was applied to the three factors. Models restricted to the subpopulation of women currently working for wage (Model 7) or not working (Model 8), consanguineous couples (Model 9) or unrelated couples (Model 10), and ever users of family planning (Model 11) or never users (Model 12) are shown in Table 4.4. Almost all demographic and socioeconomic variables, with the exception of some region-of-residence and education variables, are highly significant in affecting the number of children ever born. The childbearing process among these subpopulations are assumed to be different and warrant an investigation.

Comparison of the childbearing process for women currently working for wage or not (Models 7 and 8), reveals that education has a larger net negative effect on the number of children ever born among nonworking mothers, especially in the two extreme levels of education (i.e., literate with no schooling or those with incomplete primary and those with university degree). The differences between working and nonworking women are about 0.55 children for the lowest education level and 0.21 children for the highest education level.

Consanguineous couples are expected to have a larger positive net effect on the CEB than unrelated couples if the wife is not working for wage (0.27) than in the case when the wife is working (0.06).

The net effect of a delayed age at first marriage is larger

among nonworking women (-0.30) than among working women (-0.22). Nonworking females usually get married at very young ages. Thus, a delay in age at first marriage is expected to have a large impact on the number of children a woman has. No significant differences are observed between working and nonworking women with respect to the net effects of child deaths or ever use of family planning.

The analysis of blood relationship among couples is represented by models 9 and 10 shown in Table 4.4. While the net effect of a delayed age at marriage is very similar in the two groups (-0.29 and -0.28 for consanguineous and unrelated couples, respectively), the net effect of child deaths on the CEB is larger among unrelated couples (1.09) with relatively lower rates of child mortality (one in seven children) than among consanguineous couples (0.88) with higher rates of child mortality (one in five).

Comparisons of the net effects of education and use of family planning showed either nonsignificant or inconsistent differences between consanguineous and unrelated couples. One exception that is worth mentioning is that the net negative impact of women who are literate with no schooling or with incomplete primary education on the CEB among consanguineous couples is highly significant and larger (-0.53) than the net effect among unrelated couples (-0.14). Thus, the net effect of little education on the number of children ever born is larger among couples who are blood related than among couples who are not.

Acquiring education, working, and then eventually getting married, a woman is faced with the "choice" of practising birth control. There are no significant differences between ever users and never users of family planning with respect to the net effects of a delayed age at first marriage and child deaths on the CEB. The net positive effect of consanguineous marriage on the number of children ever born among never users (0.27) is larger than that among ever users (0.22).

Table 4.4 Multivariate regressions for children ever born, by work, consanguineous marriage and family planning, KCHS 1987.

Characteristic and model	Working (7)	Not working (8)	Consang. Couples (9)	Unrelated couples (10)	Ever users (11)	Never users (12)
AGE OF RESPONDENT:						
Age	.6214**	.8267**	.7918**	.8080**	.7284**	.8882**
AGE AT FIRST MARRIAGE	-.2156**	-.2973**	-.2915**	-.2756**	-.2701**	-.2957**
REGION OF RESIDENCE						
Capital	Reference	Reference	Reference	Reference	Reference	Reference
Hawalli	.0861	.33940**	.3775*	.1491	.1475	.4884+
Ahmadi	.4812**	.9127**	.8868**	.6668**	.6146**	1.008**
Jahra	.3853*	.6862**	.6247**	.5070**	.5310**	.6797*
LEVEL OF EDUCATION:						
Illiterate	Reference	Reference	Reference	Reference	Reference	Reference
Literate no schooling & incomplete primary	.0897	-.4620**	-.5477**	-.2871+	-.7784**	-.1707
Primary	-.6702**	-.8721**	-.4780**	-.5506**		
Preparatory	-1.149**	-1.311**	-.7620**	-.7805**		
Secondary	-.9981**	-1.437**	-.8370**	-1.111**		
University	-1.055**	-1.359**	-.7693+	-.7456+		
CURRENTLY WORKING FOR WAGE	-.2921+	-.3368**	-.5191*	-.56186*		
EVER USE OF FAMILY PLANNING	.8059**	.5339**	.4267**	.6487**		
RELATION TO HUSBAND	-.0407	.2786**	.2606*	.2020+		
CHILD DEATHS	1.1372**	.9425**	1.0130**	.9100**		
Constant	-7.139**	-5.126**	-3.385**	-7.878**		
R Square	0.690	0.712	0.758	0.658		
Number of cases	336	1549	820	1386		

\+ statistically significant at 10% level
* statistically significant at 5% level
** statistically significant at 1% level
\- indicates variable not included in model.

The net negative impact of education on the CEB is much higher among ever users than never users, for all levels of education, especially at the highest level (i.e., university degree) and the

lowest level (i.e., literate women with no schooling or with incomplete primary education). Women currently working for wage who never used family planning are expected to have a larger and highly significant negative net effect on the CEB (-0.71) than ever users (-0.27), a result of a smaller impact of education on the CEB among never users.

These results imply that the target population for achieving healthy population is illiterate women and women living in Ahmadi and Jahra regions. Awareness and monitoring of these determinants of fertility are important for gaining insights useful to population and health policies.

4.4 AGE AT FIRST MARRIAGE

Nuptiality plays a major role in fertility levels and differentials, when compared to other intermediate determinants, especially in societies such as Kuwait where it determines exposure to the risk of childbearing, since the childbearing process is entirely confined to married women. The main factors in this respect are the level of marriage and its timing. While in the Kuwaiti and the Arab societies marriage is universal because of traditions and customs, the age at first marriage becomes the most important determinant of childbearing and deserves a special attention, (Farid 1993).

To investigate how various demographic and socioeconomic factors affect the timing of marriage, multivariate regression models are fitted for the age at first marriage as a function of different subsets of these factors. The model and the notations are similar to those presented by equation 1 in section 4.2, replacing the number of children ever born by the age at first marriage as the dependent variable. In this case, the regression coefficient, b_i, is the incremental effect on the age at first marriage over b_o of having the characteristic X_i, for all characteristics included in the model. Thus, the following

Table 4.5 Multivariate regressions for age at first marriage, ever-married women, KUWAIT 1987

Model No.	(13)	(14)	(15)	(16)	(17)
REGION OF RESIDENCE:					
Capital	-	Reference	Reference	Reference	Reference
Hawalli	-	-.5594**	-.5336**	-.5186**	-.4796**
Ahmadi	-	-.7826**	-1.1326**	-.6419**	-.9871**
Jahra	-	-.6657**	-1.1661**	-.5071*	-1.0053**
LEVEL OF EDUCATION:					
Illiterate	Reference	Reference	Reference	Reference	Reference
Literate no schooling & incomplete primary	.1214	.0838	-.2235	.0168	-.2987
Primary	.4513**	.3795*	-.3202*	.1912	-.5284**
Preparatory	1.1192**	1.0462**	-.1113	.7553**	-.4413**
Secondary	3.3089**	3.1567**	1.6908**	2.5743**	1.0382**
University	4.8481**	4.6127**	3.1862**	3.7188**	2.1947**
CURRENTLY WORKING FOR WAGE	-	-	-	1.0093**	1.1063**
RELATED TO HUSBAND	-	-	-	-.5604**	-.5821**
YEARS SINCE FIRST MARRIAGE	-	-	-.1418**	-	-.1438**
Constant	17.0709**	17.7288**	20.3433**	17.9594**	20.6166**
R Square	0.205	0.208	0.292	0.223	0.309
Number of cases	4095	4095	4095	4095	4095

\+ statistically significant at 10% level
* statistically significant at 5% level
** statistically significant at 1% level
\- indicates variable not included in model.

discussion of the multivariate results will be in terms of differences in ages at first marriage between each category of the demographic and socioeconomic explanatory variables and the reference category, net of other variables. Table 4.5 presents a summary of the results. In Model 13, only the five education variables are included. This specification of the model allows testing of the hypothesis that ages at first marriage may be delayed by women who take advantage of higher levels of education. The results indicate that, when it comes to the age at first marriage, there is no significant difference between literate women with no schooling or those with incomplete primary education and illiterate women. However, women with primary education delay their marriages by an average of about one-half year, compared to illiterate women. Postponement of marriage increases to 1.2, 3.3, and 4.8 years for women with preparatory, secondary, and university education, respectively. Thus, education, especially at higher levels, does exert a negative impact on CEB when the education parameter incorporates the age at first marriage effect. The models are interpreted as recursive, especially since the age at first marriage is greater than age at completion of education in Kuwait. The age at first marriage is a function of education. Ages at first marriage, in turn, influence the level of CEB.

Model 14, incorporates, in addition to the education variables, the region-of-residence variables. One can see that, after controlling for the effect of education, the three region-of-residence variables still show net negative and significant impacts on the age at first marriage. Ages at first marriage are significantly lower in Hawalli, Ahmadi, and Jahra regions, when compared to the Capital. The difference ranges between six and nine months for the three regions. The impact of education, though still highly significant, decreased slightly in Model 14, after controlling for the region of residence. The two models explain about 21 percent of the variations in the age at first marriage - a considerable proportion for this type of analysis.

Considering marriage cohorts, Model 15 includes years since first marriage as a control variable. The term "marital duration"

will refer to years since first marriage, even if marital dissolution, remarriage, etc., has occurred since that initial event. This inclusion resulted in enhancing the net negative effects of regions of residence, while detracting from the effect of low levels of education prior to the secondary level. Once region and marriage cohorts are accounted for, education below he secondary certificate does not show a significant net effect on the age at first marriage.

The next two models control for currently-working-for-wage and consanguineous-marriage variables, in addition to region and education, without (Model 16) and with (Model 17) the inclusion of marital duration. The results regarding region of residence and level of education are very much similar to those of Models 14 and 15, respectively. In addition, working women marry, on average, one year later than nonworking women, after controlling for various socioeconomic factors. On the other hand, women who marry to their relatives, do so at younger ages (about seven months younger, on average) than those who marry to non-relatives. Once marital duration (years since first marriage) is controlled for, the model explains higher proportion of the variation in the age at first marriage. Models 15 and 17 explain about 29 percent and 31 percent, respectively, of the variance. Apart from some level-of-education variables, at lower levels, all other demographic and socioeconomic factors which are assumed to affect the age at first marriage show highly significant effects. The F-statistic indicates that the overall relationship between the age at first marriage and the selected demographic and socioeconomic factors is highly significant at the 0.001 level. The final model (Model 17) provides a useful summary of the relative importance of the explanatory variables on the age at first marriage. Among these

demographic and socioeconomic factors, it appears that education, work, and region of residence are the main determinants of ages at first marriage, and, in turn, of the number of children ever born.

CHAPTER 5

INFANT AND CHILD MORTALITY

5.1 Introduction

This chapter examines the level and recent trends in infant and child mortality in Kuwait. It looks at the mortality decline among children nationally and among subgroups of the population, defined mainly by region of residence and level of maternal education.

The interest in the level of mortality in childhood is twofold. First, it is a key indicator of health and living conditions, and one of the yardsticks by which to judge the effectiveness of health programmes and of social and economic development policies.

The second interest is in the fertility implications of the transition form high to low mortality. The conditions which bring about mortality reduction also result in improved maternal health and nutritional status. A consequence of this may be an increase in number of full-term pregnancies ending in a live birth. This along with raised economic aspirations for the parents and each individual child, can stimulate a desire to regulate fertility and a demand for effective means to do so.

The development of this chapter is basically in four sections dealing with prevalence of child loss, estimation of mortality, levels and trends in mortality, and socio-economic differentials in mortality.

5.2 Child survivorship

The analysis of infant and child mortality begins by focusing on the prevalence of child loss among children ever born to women during their entire reproductive period from the date of first

marriage to the date of the survey. The prevalence of child loss and the impact of mortality on family size will be analysed in two ways. First the differences are examined between lifetime fertility, defined as the average number of live births per women, and family size, defined as the average number of children living at the time of the survey. There follows a survey of the concentration of the experience of losing a child through death. This shows the extent to which the death of a child has been a common feature of Kuwaiti women's childbearing experience.

Table 5.1 Mean number of children ever-born, surviving and dead per ever-married woman, by age of mother, according to region of residence and education, KCHS 1987.

Region	Mean number of children	Age of mother							Total
		15-19	20-24	25-29	30-34	35-39	40-44	45-49	
Capital									
	Ever-born	0.50	1.68	2.48	3.40	4.76	6.20	6.54	3.38
	Surviving	0.50	1.63	2.44	3.37	4.63	5.85	6.12	3.28
	Dead	0.00	0.05	0.04	0.03	0.13	0.35	0.42	0.10
Hawalli									
	Ever-born	0.51	1.63	3.07	4.57	6.17	7.81	8.25	4.54
	Surviving	0.51	1.58	2.98	4.44	6.01	7.54	7.55	4.38
	Dead	0.00	0.05	0.09	0.13	0.16	0.27	0.70	0.16
Ahmadi									
	Ever-born	0.78	2.16	4.07	6.25	7.44	8.78	9.53	5.27
	Surviving	0.76	2.08	3.91	6.03	7.19	8.41	9.06	5.09
	Dead	0.02	0.08	0.16	0.22	0.15	0.37	0.47	0.18
Jahra									
	Ever-born	0.92	2.49	4.28	6.04	7.73	8.04	7.51	5.34
	Surviving	0.92	2.38	4.15	5.84	7.42	7.61	7.00	5.13
	Dead	0.00	0.11	1.26	0.20	0.31	0.43	0.51	0.21

Table 5.1 (Continued)

Education	Mean number of children	Age of mother							Total
		15-19	20-24	25-29	30-34	35-39	40-44	45-49	
Illiterate									
	Ever-born	0.98	2.79	4.62	6.42	7.89	8.38	8.27	6.43
	Surviving	0.98	2.68	4.44	6.18	7.59	8.01	7.69	6.15
	Dead	0.00	0.11	0.18	0.24	0.30	0.37	0.58	0.28
Incomp.Primary									
	Ever-born	0.86	2.30	4.57	6.18	7.48	7.45	7.81	5.40
	Surviving	0.86	2.18	4.41	5.93	7.18	7.21	7.14	5.16
	Dead	0.00	0.12	0.16	0.25	0.30	0.24	0.67.	0.24
Primary									
	Ever-born	0.57	2.24	4.10	5.19	6.18	7.09	7.58	4.42
	Surviving	0.57	2.15	4.00	5.01	6.06	6.84	6.75	4.27
	Dead	0.00	0.08	0.10	0.18	0.12	0.25	0.83	0.15
Preparatory									
	Ever-born	0.76	1.84	3.09	4.36	5.64	7.50	5.40	3.19
	Surviving	0.75	1.80	2.98	4.25	5.51	7.00	4.90	3.09
	Dead	0.01	0.04	0.11	0.11	0.13	0.50	0.50	0.10
Secondary									
	Ever-born	0.35	1.35	2.49	3.56	4.11	3.42	-	2.61
	Surviving	0.35	1.30	2.44	3.49	4.03	3.42	-	2.55
	Dead	0.00	0.05	0.05	0.07	0.08	0.00	-	0.06
University									
	Ever-born	-	1.55	2.15	3.25	3.66	5.75	2.00	2.74
	Surviving	-	1.48	2.15	3.25	3.62	5.25	2.00	2.72
	Dead	-	0.07	0.00	0.00	0.04	0.50	0.0	0.02
Total									
	Ever-born	0.75	2.05	3.65	5.21	6.89	8.02	8.03	4.87
	Surviving	0.74	1.97	3.53	5.05	6.66	7.67	7.44	4.69
	Dead	0.01	0.08	0.12	0.16	0.23	0.35	0.59	0.18

The reported mean numbers of children ever born, surviving and dead, by age of mother according to region of residence and level of maternal education are presented in Table 5.1. The percentages of children who have died, by age of mother, according to residence

and maternal education, are shown in Table 5.2. The accuracy of these data is usually affected by under-reporting of dead children, especially by older women. As may be seen, about one in 27 children (3.7 percent) born to ever married women aged 15-49 years has died, indicating that infant and child mortality levels in Kuwait have generally been low during the period in which these women have been bearing children.

Table 5.2 Among children ever-born, the percentage who have died, by age of mother, according to region of residence and education, KCHS 1987.

	Age of mother							Total
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	
Region								
Capital	-	2.8	1.7	0.7	2.7	5.6	6.5	2.9
Hawalli	-	2.5	2.9	2.7	2.6	3.4	8.6	3.5
Ahmadi	3.2	3.8	4.0	3.6	3.4	4.2	4.9	3.8
Jahra	-	4.3	2.9	3.4	4.0	5.4	6.8	4.0
Education								
Illiterate	-	4.0	3.8	3.5	3.7	4.4	7.0	4.2
Incomp.Primary	-	5.4	3.6	4.0	4.0	3.2	8.5	4.5
Primary	-	4.0	2.3	3.5	1.8	3.4	11.0	3.2
Preparatory	1.9	1.8	3.3	2.5	2.4	6.6	9.2	3.2
Secondary	-	3.7	2.1	2.2	2.0	-	-	2.3
University	-	3.9	-	-	1.2	8.7	-	0.7
Total	0.8	3.6	3.1	3.0	3.3	4.4	7.3	3.7

The high lifetime fertility among Kuwaiti women is seen to be translated through the effects of this relatively low level of mortality into a marginally smaller family size. Women aged 30-34 years reported an average of 5.21 live births and 5.05 living children, while those in the oldest age groups reported that out of 8.03 live births there were 7.44 children still alive. Only around 3 percent of all children born to women under 35 years of age had died by the time of the survey and just over 4 percent of those born to women aged 35 and over had died as well.

Despite the successful control of many infectious diseases of childhood through public health measures and the great expansion of child health services, the pattern of child loss is characterised by a diversity according to region of residence and maternal education. Thus, the prevalence of child loss is lowest in the Capital governorate and highest in the Jahra Governorate; and among illiterate mothers it is almost twice as much as the level shown for women with secondary education.

While Table 5.1 demonstrated the effect of mortality on average family size, it gives no indication of the extent to which the loss of a child is a common experience. This becomes a little clearer in Table 5.3, which presents child survivorship data by parity according to region of residence.

Over 14 percent of ever-married women have experienced the death of at least one child, and 23 percent of these women have lost two or more children through death. This experience is more common among women living outside the Capital; the proportion who lost at least one child is 8 percent for mothers living in the Capital but as much as 15 percent for those living in the Ahmadi and Jahra governorates.

As may be expected, the percentage of women whose children have all survived declines with parity. About 99 percent of women with only one live birth reported the child to be still alive; 86 percent of women with five births reported a family size of five living children, and 73 percent of women with eight live births have not lost a child through death. Only 64 per cent of women with nine or more live births reported all of the children to be still alive. The majority of mothers who have lost a child through death, reported that they have lost only one child. Even in Jahra where the level of child loss is highest, only 15 percent of mothers who had nine or more births have experienced the death of two or more children.

The picture that emerges from these data is one in which infant and child mortality plays only a marginal role in the family building process. For the vast majority of mothers, all children survive to adulthood, though it is still the case that about 49 percent of all ever-married women in the sample had five or more live births and that upwards of 24 percent of those women have lost at least one child through death.

Table 5.3 Percent distribution of ever-married women in the individual maternal care survey, by number of deceased children and partly according to region of residence, KCHS 1987.

Region	No.of dead children	Children ever-born									Total
		1	2	3	4	5	6	7	8	9 +	
Capital											
	0	100.0	100.0	94.7	96.7	79.2	92.3	62.5	54.5	60.0	92.4
	1	-	-	5.3	3.3	16.7	7.7	37.5	36.4	26.7	6.5
	2	-	-	-	-	4.2	-	-	9.1	6.7	0.9
	3+	-	-	-	-	-	-	-	-	6.7	0.3
	All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Hawalli											
	0	99.3	98.5	95.5	92.2	86.5	84.1	78.1	66.0	62.6	87.3
	1	0.7	1.5	4.5	7.3	11.2	12.7	20.0	29.8	25.3	10.3
	2	-	-	-	0.5	1.7	3.2	1.0	4.3	7.9	1.8
	3+	-	-	-	-	0.6	-	1.0	-	4.2	0.6
	All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Ahmadi											
	0	98.2	95.3	93.3	95.5	85.9	86.8	72.6	73.8	68.5	85.1
	1	1.8	4.7	6.7	4.5	12.8	9.2	21.9	18.5	23.0	11.7
	2	-	-	-	-	1.3	2.6	2.7	6.2	4.8	2.0
	3+	-	-	-	-	-	1.3	2.7	1.5	3.6	1.2
	All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 5.3 (Continued)

Region	No.of dead children	Children ever-born									Total
		1	2	3	4	5	6	7	8	9 +	
Jahra											
	0	99.0	95.9	95.1	90.1	85.9	83.8	83.1	78.4	63.1	84.7
	1	1.0	4.1	4.1	9.2	10.6	12.5	12.3	16.4	22.0	10.9
	2	-	-	0.8	0.7	2.9	3.1	4.6	3.0	11.2	3.5
	3+	-	-	-	-	0.6	0.6	-	2.2	3.7	1.0
	All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total											
	0	99.1	97.4	94.8	92.7	85.8	84.8	78.5	72.7	64.3	86.4
	1	0.9	2.6	5.0	6.9	11.6	11.7	17.7	21.7	23.4	10.5
	2	-	-	0.2	0.4	2.2	2.9	2.8	4.3	8.3	2.3
	3+	-	-	-	-	0.4	0.5	0.9	1.3	3.9	0.8
	All	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

5.3 ESTIMATION OF MORTALITY

5.3.1 Definitions of Infant and Child Mortality

The KCHS data permit the direct and indirect estimation of infant and child mortality. In the analysis of mortality among children under five, the age group is conventionally sub-divided into categories which roughly reflect changes in the probability of dying and changes in the main causes of death which occur during the first months and years of life. The probability of dying is at its peak at the time of birth, including the period immediately before birth, and declines thereafter, except perhaps for a minor peak when the child is weaned. Broadly speaking, between the twenty-eighth week of gestation and the end of the first week of life, the underlying causes of death are principally complications of the pregnancy and delivery, and poor maternal health and nutritional status. After the first week of life, diarrhoeal disease and respiratory infections become leading causes of mortality, with malnutrition often an underlying cause. The

infectious diseases of childhood begin to appear in the second half of the first year of life and combined with poor hygiene, they may result in high case fatality rates. Deaths of children aged one to four years are mainly a product of environmental factors, including nutrition. As such they provide a sensitive indicator of the social and economic conditions under which people live, and it is among them that the most striking effect of the decline from high mortality levels are observed.

Two sub-groupings of the period between birth and age five years are used in this chapter, the choice dictated by considerations of the availability and accuracy of the data as well as the mortality level and principal causes of death. Before presenting the results, the subdivisions and the measurements of mortality that will be used are described.

Infant mortality, ($_1q_0$), is defined as the probability that a live-born child will die before reaching its first birthday. Here it usually takes the form of a rate per 1000 live births.

In contrast to 'infant mortality', the term child mortality lacks a uniform definition. It has been used to refer variously to the probability of dying between birth and the exact age 5- usually known as "under-age- 5 mortality" - or to mortality at ages 1-4, and sometimes to the probability that a child will die in its first two years of life. The measure of child mortality used in this chapter is the probability of dying between birth and exact age 5 (the under-5 mortality rate).

5.3.2 Estimation of Infant and Child Mortality

The KCHS collected information on the date of occurrence of last live birth, whether the child is still alive and, if dead, age at death. Using this information of those ' last live births' born within the year preceding the survey, it is possible to derive an estimate of infant mortality prevailing during that year.

Direct estimates of mortality from this type of information are subject to large sampling variation. Further, omission of dead children and misdating of events greatly underestimate the level of mortality. The direct estimate of infant mortality derived from the survey data reflected a rather low level of mortality that was inconsistent with other pieces of information available on infant and neonatal mortality. Direct estimation of infant mortality was, therefore, disregarded and more reliability was placed on estimates derived indirectly.

Indirect estimates of infant and child mortality can be inferred from information on the proportion of children dead among those ever born to women of different age groups. In the KCHS, ever-married women were asked about their number of children who were living at home, living elsewhere, or who had died. From the proportions of children dead and under certain fertility and mortality assumptions, indirect estimates of the level and trends in infant and child mortality over the 13-15 years prior to the survey may be obtained.

Model life tables, which represent expected age patterns of mortality, play a crucial role in the estimation of mortality in childhood. A number of mode-life-table systems exist; the most widely used to date are the Coale-Demeny regional model life tables. These tables consist of four sets of models, each representing a distinct mortality pattern. The four underlying mortality patterns of the Coale-Demeny models are called 'North', 'South', East' and 'West'. They were identified through statistical and graphical analysis of a large number of life tables of acceptable quality, mainly for European countries.

Different versions of the technique for the indirect estimation of mortality in childhood allow for alternate age patterns of mortality to be assumed. The original formulation developed by Brass features the logit relational life-table system.

Subsequent versions of the Brass method differ mostly in the type of models used to simulate mortality. The two most widely used versions are those proposed by Trussel and by Palloni and Heligman. They differ in that the former uses the Coale-Demeny regional model life tables to simulate the quantities of interest, while the latter uses the United Nations Model life tables for developing countries. The Trussell version has four different applications, one for each of the four Coale-Demeny regional models. The United Nations models encompass five distinct mortality patterns, known as "Latin American", "Chilean", "South Asian", "Far Eastern", and "General". The Trussell version and the Palloni-Heligman version produce estimates both of probabilities of dying from birth to different ages in childhood and the time point to which each probability refers (United Nations, 1990).

These estimates of probabilities of dying can be produced from data classified by age of women or by duration of marriage.

The Trussel and Palloni-Heligman versions of the Brass method were both applied to data from KCHS using the two programs for micro-computers named MORTPAK-LITE and QFIVE which have been developed by the United Nations. The application was done for both the age model and duration model.

For any given mortality index, application of these estimation procedures yields a total of 63 estimates for the age model and a similar number for the marital duration model. However, it was found that no matter which mortality model is chosen in applying the Brass estimation method, the errors that may affect the resulting estimates of q(5) are likely to be smaller in both absolute and relative terms than those affecting q(1). Thus, for the Brass method, the estimates obtained of under-five mortality are more 'robust' to the choice of mortality model than the estimates of infant mortality (United Nations, 1990).

In the analysis of levels and trends of mortality in childhood in Kuwait, it has been assumed that infant mortality and child mortality have changed according to the relationship between the infant and child mortality given in model 'West'. It should be noted that the mortality estimates obtained from model 'South' were, generally, higher than those obtained from model 'West' for the 1970's while the two sets of estimates were very close for the 1980's. The estimates from the South and West models display a similar trend and are usually within 0.01 points of one another.

As already mentioned, the Trussell method produces estimates both of probabilities of dying from birth to different ages in childhood and the time point to which each probability refers. For example, infant mortality estimates for Kuwait are given for the following 'reference dates': March 1973, March 1976, January 1979, June 1981, August 1983, May 1985 and June 1986. However, estimates for various sub-groupings do not necessarily refer to identical time points.

To facilitate the examination of mortality differentials, it was decided to present mortality estimates for mid-year point of 1973, 1975, 1980 and 1985. For each of these time points, estimates were obtained by interpolating between values shown for the nearest two adjacent reference dates.

5.4 Levels and Trends in mortality

Until recently, both infant and child mortality in Kuwait were relatively high and the death of a child was not an uncommon feature of the family building process. The large scale socio-economic development and the great expansion of health services, particularly in the areas of maternal and child care, have enabled Kuwait to achieve impressive declines in its infant and child mortality rates during the past decades or so. This may be seen from Table 5.4 which shows the indirect estimates of infant and under-5 mortality rates by sex of child. The rates describes a

fairly steep decline in mortality from the early 1970's to the early 1980's followed by a gentler decline thereafter. Infant mortality declined from around 45 per 1000 per live births in 1973, to 26 in 1980 and 24 in 1985.

Table 5.4 Indirect estimates of infant and under-five mortality rates, per 100 live births, using the age model, KCHS 1987.

	Years				
	1973	1975	1980	1985	1987
A: Infant mortality rate					
Both Sexes	45	36	26	24	23
Male	50	39	30	26	25
Female	41	32	23	21	21
B. Under-five mortality rate					
Both Sexes	58	46	32	29	28
Male	65	50	38	31	31
Female	54	42	27	27	26

An even steeper decline is shown for child mortality. The table shows a reduction in the under-5 mortality rate of more than 30 deaths per 1000 live births, from 58 in 1973, to 32 in 1980 and 29 in 1985.

Thus, mortality between ages one and five declined faster than mortality in infancy during the 1970's about one-quarter of deaths under age 5 are estimated to have occurred between ages 1 and 5 has declined to 18 percent. It may be of interest to note that in the developed countries, on average, more than 80 percent of deaths under age occur before age 1, and less than 20 percent at ages 1-4 years.

The decline in infant and child mortality is expected to continue in the future, although at a slower pace. It should be noted that the steep decline recorded in the early years may itself

be an understatement; overstatement of age into the age group 45-49 years would yield an underestimated mortality and hence, understate the scale of the reduction. Omission of births by older women, especially of births that occurred some considerable time ago and were followed by an early death would produce the same effect.

The rates in Table 5.4 also indicate a noticeable mortality differential by sex of child. As a general rule, mortality in infancy and childhood is higher among boys than girls at all ages, except where maternal mortality is important. Detailed results show excess male infant mortality in all regions of the country. At the national level infant mortality is some 12 percent higher among males than females. There is, however, no relationship between the level of mortality and the infant mortality differential by sex. The sex ratio of mortality tends to be more balanced in later childhood where, in general, neither sex enjoys a notable advantage between the ages of one and five.

5.5 Socio-Economic differentials in mortality

The demography of Kuwait is characterised by a wide regional diversity. As was shown in Chapter 3, the total fertility rate of 6.5 live births per woman, for example, observed for the whole country during the year preceding the survey, includes regional variation ranging from 5.1 births per woman in the Capital and Hawalli regions to 8.2 in the Jahra region, and from 8.5 births for women with no education to 5.4 births for literate women. The results of the survey also reveal significant residential differentials in various indicators of maternal care and child health. Similar variations in infant and child mortality may be anticipated. They are inspected in this section.

Indirect estimates of infant and under-5 mortality rates according to region of residence and literacy are shown in Table 5.5. The figures reveal that past and present survival chances are higher in the Capital region than among those born in other

regions. The Capital region has the lowest levels of mortality in infancy and at ages 1-4. Infant mortality is higher in the Ahmadi and Jahra region. The regional differentials seem to have narrowed considerably since 1980.

Table 5.5 Indirect estimates of infant and under-five mortality rates, per 1000 live-births, by region of residence, using the age model, KCHS 1987.

	1973	1975	1980	1985
A. Infant mortality rate				
Capital	19	16	13	12
Hawalli	53	41	26	23
Ahmadi	34	32	28	26
Jahra	54	44	28	26
Total	45	36	26	24
B. Under-five mortality rate				
Capital	23	19	17	15
Hawalli	69	52	32	28
Ahmadi	44	40	35	31
Jahra	71	56	35	32
Total	58	46	32	29

All regions, however, have shared in the long term decline in infant and child mortality. In the Jahra region, infant mortality decreased from 54 per 1000 live births in 1973, to 26 per 1000 births in 1985, a drop of nearly 52 percent.

The momentum of the mortality decline during the 1970's in comparison with the 1980's varied between the regions. Thus, the percentage of the total decrease in infant mortality during the period of 1973-85 that took place during the period 1973-80 was over 90 percent in the Hawalli and Jahra regions, about 86 percent in the Capital, and only 66 percent in the Ahmadi region. The regional differentials in infant and child mortality in Kuwait can be attributed to differences in living standards and health

conditions, and to other important behavioral determinants of child survival such as parental education.

The indirect estimates of infant and child mortality according to mother's literacy show an unexpected positive relationship between mortality and mother's literacy for the 1970's and the expected inverse relationship between mortality and education for the 1980's. For 1973, the infant mortality rate is higher among children to literate mothers, estimated at 36 per 1000 live births. Similarly, the under-5 mortality rate for 1973 increases from 44, per 1000 live births, for illiterate mothers to 74 for literate mothers.

This pattern suggests that considerable omission of births that were followed by an early death has occurred on the part of older women. This reinforces the suggestion made earlier that the decline in infant and child mortality in Kuwait since the early 1970's was steeper than that suggested by the figures presented in Table 5.4.

The mechanism through which possession of an education results in lower child mortality is generally assumed to be associated with the greater autonomy of the educated women in an urban setting. She has more control within the household over decisions affecting the welfare of her children; and outside the household, is able to manipulate resources to their advantage. As education is universalized and mortality is reduced to low levels, the educational advantage in child survival becomes more associated with the level of education attained, though it is still through the privileged awareness and knowledge of, and access to the means of child survival that education has its effect.

CHAPTER 6

INTERVENING DETERMINANTS OF CHILD SURVIVAL

6.1 Introduction

The 1987 KCHS results show considerable improvement in levels of child survival in Kuwait since the early 1970s. The transition to lower mortality has been shared by almost all socio-economic groups. The results, however, show important differentials in levels of infant and child mortality, most notably according to region of residence and maternal education.

These differentials may be due to the operation of socio-economic, biological and environmental forces (Mosley and Chen, 1984). The KCHS data allows the investigation of four major intervening determinants that have a biological link to child health, namely:

- Reproductive pattern:
  Age at first marriage, blood relation between spouses, age of mother at birth, birth spacing and parity are all factors that can affect levels of infant and child mortality

- Feeding pattern:
  Many studies have demonstrated that breast-feeding is significantly related to infant mortality (WHO, 1981).

- Environmental contamination:
  Levels of environmental contamination translate into biological risks. An indirect measure of environmental hazards is provided by the prevalence of diarrhoeal disease during the two-week period preceding the survey.

- Health care utilisation:
  Utilisation of health care by mothers (ante-natal, delivery and post-natal) and by children (immunisation and treatment

of infectious diseases) have direct influences on the health of children.

The aim of this chapter is to investigate the patterns of these major intervening determinants of child survival and to identify the risk factors associated with the experience of child loss in Kuwait.

6.2 BREAST-FEEDING AND WEANING PRACTICES

6.2.1 Prevalence of breast-feeding

Of 3,415 most recent live births which had taken place five years or less before the survey, 88.7 percent were reported to have been breast-fed. Thus just over one in ten children were not breast-fed. This figure appears to fall just a little short of that which is desirable and achievable to provide optimal advantage in respect of nutrition and immunity from infectious diseases in early life. The figures display a small variation with mother's age, rising steadily from 82 percent of infants whose mothers were under 20 years of age, to a peak of 91 percent for mothers aged 30-34 years, falling to 87 percent for mothers aged 35-39 years, and rising again to above average levels of breast-feeding among infants whose mothers were aged forty years or more (Table 6.1).

First born infants were least likely (81%) and second and later born infants much more likely to have been breast-fed; 87% of second births rising marginally to 91% of those of fifth and higher order.

Table 6.1 Percentage of last live-births in the five years preceding the survey who were breast-fed according to mother's age, KCHS 1987.

Percent ever breast-fed	Mother's age							All ages
	<20	20-24	25-29	30-34	35-39	40-44	45-49	
	81.7	87.0	89.0	90.0	87.2	89.8	90.3	88.7
Total number of live-births	93	377	948	828	651	246	72	3415

On the whole there appears to be separate effects of birth order and mother's age which persist after controlling for each other although there is a good deal of overlap between the two (Table 6.2). Least likely to have been breastfed were first births to women aged 25-34 years, 74 percent . The same age group of mothers also featured the highest recorded likelihood of breast-feeding, between 92 and 93 percent of fifth and later order births. Women aged 35-44 years were consistently less likely than those aged 25-34 years to have breast-fed their last live birth.

Table 6.2 Percentage of last live-births in the five years preceding the survey who were breast-fed according to mother's age and birth order, KCHS 1987.

Birth order	Mother's age				
	< 25	25 - 34	35 - 44	45 - 49	All ages
1	82.7	74.7	*	*	80.5
2	86.9	87.2	*	*	87.1
3-4	91.1	89.0	82.6	*	88.6
5-6	76.7	92.9	87.8	*	90.9
7+	*	92.3	89.2	90.2	90.3
Total	86.3	89.9	88.0	90.3	88.7

* Based on less than 20 live births

6.2.2 Current Status

The percentages of children still being breastfed by age may

be seen in Tables 6.3 and 6.4. The percentages decline on the whole, from nine in ten of those under one month of age to around one in two of those aged seven months, one in three of those aged one year and one in twenty-five of children in the two to four year age group. Data such as this are often distorted by age misstatement as displayed, for example, by heaping on preferred digits. Fluctuation in the numbers of children by age do not provide consistent evidence of misreporting, there appearing to be heaping on age eight months but not noticeably elsewhere in infancy. Though there are quite considerable fluctuations in the percentages still breast-feeding by age, they do not appear to be readily attributable to age misreporting.

Table 6.3 Percentage of last live-births in the five years preceding the survey who were still breast-feeding according to age of child, KCHS 1987.

Age of child in months	Percentage who were still breast-feeding	Total number of children
0	88.9	45
1	83.7	104
2	62.5	104
3	70.9	110
4	46.4	112
5	58.0	112
6	59.1	88
7	48.9	90
8	52.5	122
9	60.6	99
10	47.5	101
12-23	31.4	1008
24+	3.8	1218
All ages	31.2	3412

Table 6.4 Percent distribution of current breast-feeding status and age distribution of last live-births according to mother's age and to child's birth-order, for last live births in the five years preceding the survey, KCHS 1987.

	Never breast fed	still breast feeding	stopped breast-feeding	Total percent	Percent aged			Total
					0-5	6-11	12+	
Mother's age								
< 20	18	47	35	100	37	30	33	100
20 - 29	12	31	57	100	20	21	59	100
30 - 39	11	32	57	100	20	21	59	100
40 +	10	23	67	100	6	9	85	100
Birth order								
1	19	24	57	100	20	24	56	100
2	13	22	65	100	16	19	65	100
3 - 4	11	27	62	100	17	17	67	100
5 - 6	9	34	57	100	17	16	67	100
7 +	10	39	51	100	17	16	67	100
Total	11	31	58	100	17	18	65	100

The current status data indicate that the younger the mother the more likely the infant is to be still breast-feeding; 47 percent of those aged under twenty years of age falling to 23 percent of those aged forty years or more. Were all births in the preceding five years included, then the proportions still breastfed among children with younger mothers would undoubtedly be lower and probably lower than that among children with older mothers; the appearance of increasing breast-feeding duration with younger age of mother presented by the current status data is thus grossly misleading.

6.2.3 Early Weaning

It was shown earlier that children born to the youngest mothers, and first-born children, were less likely than others to have enjoyed the benefits of their mother's milk. Even those who

did enjoy the benefits were less likely than other infants to have enjoyed the full nutritional advantage, on account of their being weaned early, that is within the first three months, (Table 6.5). Among children already weaned, the likelihood of being weaned before age three months declines steadily with mother's age, from 59 percent in the case of mothers under 20 years of age to 20 percent of those aged 40 years or more. The difference is even more striking in respect of birth order, 67 percent of first-born infants who had stopped breast-feeding having stopped before age three months, falling to 22 percent of seventh or later born infants.

Table 6.5 Percentage of infants who stopped breast-feeding under three months of age according to mother's age and birth order, among those last live-births in the five years preceding the survey who had stopped breast-feeding, KCHS 1987.

	Mother's age				Birth order					All births
	<20	20-29	30-39	40+	1	2	3-4	5-6	7+	
Of those weaned,										
% weaned under three months	59	48	39	20	67	53	49	34	22	41

6.2.4 Duration of Breast-feeding

A median duration may be estimated from the current status data which was presented in Table 6.3. In this case the percentages breastfed are converted into three month moving averages to smooth random fluctuations. A second measure is one which is commonly used in epidemiology; the mean duration of an illness may be derived by dividing its prevalence by its incidence. In the application to breast-feeding, prevalence is defined as the number of children who are still being breastfed at the time of the survey. Incidence is defined as the average number of births per month. In this case the number of births per month was estimated

from the number of live births in the year prior to the survey.

The estimates of breast-feeding duration are reasonably consistent; a median of 9.1 months according to current status data, and - as Table 6.6 shows - mean durations of 8.6 months and 10.3 months respectively according to the estimates based on children already weaned and on prevalence/incidence.

Table 6.6 Estimates of duration of breast-feeding in months according to mother's age, KCHS 1987.

Mother's age	Mean duration among those who had stopped breast-feeding	Mean duration estimated from prevalence/ incidence
Under 20	4.3	8.5
20 - 29	6.6	8.7
30 - 39	9.3	12.1
40 - 49	15.0	16.5
All	8.6	10.3

The duration of breast-feeding increases notably with mother's age (Table 6.6). On account of the very small numbers involved in respect of the percentages of infants still breast-feeding by mother's age, the median is excluded from the table and only the two estimates of the mean are presented. The mean duration among children already weaned rises sharply, from 4.3 months among children with mother's under twenty years of age to 15.0 months among those with mothers aged 40 years or more. The prevalence/incidence equivalents were 8.5 and 16.1 months respectively.

Hence, the older the mother, the more likely were infants to have been breastfed, to have been breastfed for a longer time, and they were less likely to have been weaned in the first three months of life.

6.2.5 Differentials by Residence and Education

Residence and mother's education are associated with differentials in the extent and duration of breast-feeding, (Table 6.7). Region of residence identified a range of two percent in the likelihood of being breastfed. It was lowest in Hawalli, 88 percent, followed by Ahmadi and then Jahra. The Capital was surprisingly the residence with the highest proportion of children breastfed, almost 90 percent.

Aside from the Capital, the greater the likelihood of being breastfed, the later the age of weaning. Thus according to the prevalence/incidence estimates infants living in Hawalli were weaned on average at age 8.1 months, three and a half months earlier than their counterparts living in Ahmadi, and they in turn were weaned half a month earlier than infants living in Jahra, whose average age at weaning was 12.2 months. In the Capital, infants were estimated to have stopped breast-feeding on average at only four months of age. The alternative estimates of the mean duration of breast-feeding, though lower than the prevalence/incidence estimates, support these differentials.

Table 6.7 Percentage of last live-births in the five years preceding the survey who were ever breast-fed and estimates of mean duration of breast-feeding according to residence and mothers education, KCHS 1987.

	Percentage ever breast-fed	Mean duration among those who had stopped breast-feeding	Mean duration estimated from prevalence/ incidence
Region of residence			
Capital	89.6	3.7	4.3
Hawalli	88.0	6.8	8.1
Ahmadi	88.7	10.9	11.7
Jahra	89.2	11.7	12.2
Mother's literacy			
Illiterate	90.0	13.1	13.4
Literate	87.6	5.7	7.6
Level of education in literate mothers			
None/No certificate	86.3	10.4	10.2
Primary	88.4	7.5	9.9
Preparatory	86.8	5.7	7.6
Secondary	87.7	4.4	5.2
University	88.4	3.2	6.6
Total	88.0	8.6	10.3

Women who were illiterate were more likely than those who were literate to have breastfed their last child, 90 compared with 88 percent. Among literate women there were variations in the percentage who ever breastfed their last child according to level of education. Excluding primary education, the likelihood of being breastfed increased with mother's educational level, from 86 percent for literate women with no education or no certificate, to 88 percent in the case of university educated women. Primary educated women were reported to be as likely as university educated women to have breastfed their infants, though in both cases the likelihood remains slightly lower than that among illiterate women.

Infants whose mothers were illiterate were not only more likely to have been breastfed than those whose mothers were literate, they were also breastfed for six months longer on average, 13.4 months compared with 7.6 months. Among infants whose mothers were literate, the duration of breast-feeding fell with increasing level of education, from 10.2 months in the case of mothers with no education or no certificate to 5.2 and 6.6 months respectively for mothers with high and university education. Once again the mean durations estimated from those who had stopped breast-feeding were lower on the whole than the prevalence/incidence estimates though they mirrored the differentials, and in fact featured a monotonic decline with mother's educational level.

6.2.6 Introduction of Supplementary Foods

A prevalence/incidence estimate of the mean duration of unsupplemented breast-feeding, or mean age of supplementation with solids, can be obtained using the method already described; the number of women breast-feeding without supplementation of solids replaces the number of women still breast-feeding in the numerator. In this case the prevalence/incidence estimate of the mean age at supplementation with solids is 4.9 months, which indicates there to be an interval of 5.4 months on average between the introduction of solids and weaning.

Table 6.8 shows the percent distribution for all children of the pattern of breast and bottle feeding, currently for children not yet weaned and prior to weaning other-wise; those children who were never breastfed comprise the category "bottle only". The percentage of children still breast-feeding are indicated in the table to assist in evaluation.

Infants less than two months of age comprise six percent who were never breast-fed and fed by bottle only, 56 percent who were breast-fed only and 38 percent whose feeding included breast and

bottle. Hence around 40 percent of infants under two months of age who were breast-fed had been bottle-fed also, rising to 55 percent of those aged two to three months. Thus while the percent of infants breastfed is fairly high, this would not appear to be equated with high rates of completely unsupplemented breast-feeding on demand in the first months of life. Not surprisingly perhaps, as mean age at weaning increases with mother's age so does the mean age at supplementation with solids.

Table 6.8 Percent distribution of last live-births in the last five years, who were breast-fed, by age at supplementation with solids, and patten of feeding according to age of child, KCHS 1987.

								All
	0-1	2-3	4-5	6-7	8-9	10-11	12+	
Age at introduction of solids								
No solids	100	97	63	31	23	14	10	25
0 - 1	-	-	-	-	-	-	-	-
2 - 3		3	10	6	5	6	6	6
4 - 5			27	44	41	39	35	32
6 - 7				19	26	31	29	23
8 - 9					5	8	10	7
10 - 11						3	2	1
12 +							8	6
Total Percent	100	100	100	100	100	100	100	100
No. of children	139	181	189	146	199	180	1979	3013
Current or last pattern of feeding								
Breast only	56	40	25	34	34	12	33	34
Breast & bottle	38	48	61	48	57	59	56	55
Bottle only	6	12	14	18	9	9	11	11
Total Percent	100	100	100	100	100	100	100	100
No. of children	149	214	224	178	221	200	2226	3412
Percent still breast feeding	85	67	52	54	56	47	16	31

Note : Children still alive or survived 12 months.

As in respect of mother's age, residence and maternal education differentials in mean ages at weaning are mirrored in respect of the mean age at supplementation with solids, (Table 6.9). Supplementation was later than average among infants living in Ahmadi and Jahra, 6.6 months and 5.6 months post-partum, respectively, and it was earlier than average among those living in Hawalli, 3.5 months, and especially among infants living in the Capital who were introduced to solids on average at age 1.7 months. Earlier supplementation signified a shorter interval before weaning. Thus infants living in the Capital were weaned on average 2.6 months after the introduction of solids, compared with 4.6 months in Hawalli, 5.1 months in Ahmadi and 6.6 months in Jahra.

Figures on the pattern of feeding according to mother's age are also included in Table 6.9. Taking into account differences in the age of the children, it would seem that older mothers, those aged forty years or more, supplement later, or not at all, with other liquids than those aged under forty.

Infants whose mothers were illiterate were introduced to solids two and a half months later on average than those whose mothers were literate, 6.3 compared with 3.7 months. The corresponding intervals between supplementation and weaning were 7.1 and 3.9 months. Mothers with primary education or below signified later than average supplementation with solids, though still earlier than illiterate mothers, and mothers with an intermediate education or above signified a younger than average age at supple- mentation. In particular infants whose mothers had a higher education or university education were introduced to solids at ages 2.3 and 2.6 months, respectively. The mean intervals between supplementation and weaning according to level of education were again positively related to the age at supplementation, ranging from 2.9 months in the case of mothers with a high education to 4.9 months for those with no education or no certificate.

Table 6.9 Mean age at supplementation with solids for last live births, in last five years, according to mother's age, residence and literacy, KCHS 1987.

	Mean age at supplementation with solids	Mean interval between supplementation and weaning
Mother's age		
< 20	4.5	4.0
20 - 29	4.2	4.5
30 - 39	5.7	6.4
40 - 49	5.7	10.8
All	4.9	5.4
Region of residence		
Capital	1.7	2.6
Hawalli	3.5	4.6
Ahmadi	6.6	5.1
Jahra	5.6	6.6
Mother's literacy		
Illiterate	6.3	7.1
Literate	3.7	3.9
Literate mother's level of education		
No certificate	5.3	4.9
Primary	5.4	4.5
Preparatory	3.7	3.9
Secondary	2.3	2.9
University	2.6	4.0
Total	4.9	5.4

6.2.7 Reasons for Not Breast-feeding

The most common single reason for not breast-feeding was that the mother had no milk. Thirty-two percent of mothers gave this as the most important reason why they did not breast-feed their child, (Table 6.10). Nipple problems and the infants refusal were each given as the reason in respect of 11 percent of infants who were

not breastfed. The mother 'being sick' accounted for 26 percent of infants not breast-fed, and the infant 'being sick' for 13 percent, and in less than one percent of cases the infant had died.

Table 6.10 Percent distribution of children who were not breast-fed by reason given for not breast-feeding, KCHS 1987.

Reasons for not breast-feeding	Percent	Number of children
No milk	32	124
Mother sick	26	98
Child refused	11	40
Child sick	13	51
Nipple problem	11	43
Child died	1	2
Other	6	24
Total	100	382

6.2.8 Reason for Weaning

Mothers who stopped breast-feeding their last child were asked to give the "most important reason for weaning the child". The responses are summarized in Table 6.11.

As in respect of reasons for not breast-feeding, insufficient milk was given as the commonest reason for weaning, though accounting for less, 34 percent, of all infants who had been weaned than of those weaned in the first three months. Its importance declined with age at weaning, from 50 percent of those weaned in the first six months, to 38 percent of those weaned at age 6-11 months, 15 percent of those weaned at age 12-17 months, nine percent of those weaned at age 18-23 months and three percent of those who were two years or more when they were weaned.

Table 6.11 Percent distribution of last live-births in the five years preceding the survey who stopped breast-feeding, by reason given for weaning, according to age at weaning, KCHS 1987.

Reasons for weaning	Age at weaning in months					All ages
	< 6	6 - 11	12 - 17	18 - 23	24 +	
No milk	49	38	15	5	3	34
Mother sick	7	6	5	5	2	6
Child sick	5	6	1	1	0	4
Nipple problem	6	4	3	4	-	4
Milk upsets child	3	3	1	-	-	2
Mother pregnant	2	15	26	20	3	8
Wants another child	1	2	2	1	0	1
Child old enough	2	8	38	60	91	23
Use of pill	9	10	4	1	-	7
Work	9	4	1	1	-	6
Other	7	4	4	2	1	5
Total	100	100	100	100	100	100
Number of children	1035	270	216	153	253	1958

The child "being sick", the mother "being sick" and nipple problems each accounted for around five percent of children who were weaned, and the "child being upset by the milk" for two percent. The child "being sick" or "being upset by the milk" were most significant during infancy and negligible thereafter. The mother "being sick" and "nipple problems" displayed a very slight reduction between ages 0-5 months and 18-23 months, and were negligible thereafter. This group of factors accounted for 20 percent of infants weaned in the first six months, 19 percent weaned at age 6-11 months, 10 percent at age 12-17 months, six percent weaned at age 18-23 months and falling to two percent of those who were aged two years or more when they were weaned.

Mother's pregnancy was given as the main reason in respect of eight percent of children who had been weaned. It was most prominent between ages six months and two years, peaking at 26 percent of those weaned at age 12-17 months. Not only does this reason for weaning signify a short birth interval with its attendant adverse effects on the mother and subsequent child, it also signifies a sudden weaning with possible detrimental effects on the child. A very small percentage, one to two percent, of mothers stopped breast-feeding because they wanted another child.

Desire to use the contraceptive pill was given as the reason for weaning seven percent of those children who had been weaned. It was a factor that was most prominent in infancy.

The mother's desire to return to work accounted for almost the same number of children who had been weaned as the pill percent. In this case it was most significant in the first six months, declining to a negligible figure thereafter.

The child "being old enough" accounted for just under one in four of those who had been weaned. It was not surprisingly a factor that became increasingly important as a reason for weaning as the age at weaning increased. Hence this entirely voluntary reason for weaning accounted for three percent of those weaned in infancy, rising to 38 percent of those aged 12-17 months, 60 percent of those aged 18-23 months and the vast majority, 91 percent of children who were two years or more when they were weaned.

Thus the results describe a number of reasons for weaning, closely related to the ages at weaning and at the introduction of solids. In early infancy are featured insufficient milk, often an intended or unintended consequence of feeding patterns and supplementation, the group of entirely involuntary reasons for weaning, namely poor health of mother or child, nipple problems and

'milk upsets infant', and mother's use of the contraceptive pill and mother's desire to work. In later infancy, mother's pregnancy becomes significant. Between twelve and eighteen months, the primary reasons for weaning are mother's pregnancy, the child being old enough and reduced proportion weaned on account of insufficient milk, and between eighteen months and two years mother's pregnancy and the child being old enough are the significant factors. Finally are those children aged two years or more when they are weaned who stop breast-feeding almost entirely on account of their being old enough.

6.3 DIARRHOEAL MORBIDITY

6.3.1 Introduction

Diarrhoeal disease has been singled out for detailed investigation in the KCHS for several reasons. In many countries, it is a major contributory cause of death in infancy and childhood. Diarrhoea is also one of the most frequent causes of childhood illness and it is amenable to treatment by oral rehydration (Black, 1984; Feachem et al., 1983).

Diarrhoea is only the common symptom of a large number of intestinal diseases. Susceptibility to diarrhoea is associated with environmental factors and with nutritional status. The sources of infection may be a virus, a bacteria, or a parasite, or often, a combination of these. They all share the ability to alter intestinal function, increasing fluid loss from the body and decreasing the retention of nutrients (Huttly et al., 1987).

In the KCHS, information was collected on whether children under age 6 years had experienced an episode of diarrhoea during the two weeks preceding the interview. For children who had diarrhoea, information was collected on form of treatment; whether advice was sought outside of the household and if so, from whom; and mode of feeding during episode. The accuracy of this

information is, of course, affected by the mother's subjective evaluation of whether the child experienced diarrhoea.

6.3.2 Diarrhoeal Period Prevalence

The survey data allow the estimation of the two-week period prevalence, that is the number of children who had diarrhoea during the two week period preceding the survey divided by the total number of children.

There were only 3.8 percent of children under six years of age who were reported to have had at least one diarrhoeal episode in the two weeks preceding the interview. This figure varies markedly by age, 7.7 percent of infants and 6.8 percent of children aged one year, falling sharply to 3.4 percent of children aged two years, 2.1 percent of those aged three and four years, and 1.1 percent of children who were five years of age, (Table 6.12).

Diarrhoea was thus, as expected, most common in the first two years of life, with a two week period prevalence of 7.3 percent; two out of every twenty-seven children under two years, the age group most susceptible to its adverse consequences, had at least one diarrhoeal episode in the two weeks preceding the survey.

There were 4.1 percent of boys and 3.5 percent of girls under six years of age who were reported to have had diarrhoea, a small difference but one that conforms with results found elsewhere.

Table 6.12 Percentage distribution of children under six years of age reported to have had diarrhoea in last two weeks by age of child, according to selected background characteristics, KCHS 1987.

	Age in Years							No of child -ren
	<1	1-	2-	3-	4-	5-	all< 6	
Region								
Capital	(6.5)	(8.6)	5.2	2.9	(6.7)	(0.0)	4.8	541
Hawalli	6.4	6.8	3.4	2.0	1.6	0.9	3.4	2492
Ahmadi	11.3	10.3	4.4	1.1	2.7	1.4	5.1	1662
Jahra	7.2	4.8	2.3	2.5	1.4	1.2	3.2	2992
Education								
Illiterate	7.4	5.6	3.4	2.0	1.6	1.0	3.3	3992
Incomplete primary	(10.4)	(10.3)	(4.9)	(2.9)	(1.4)	(6.8)	5.9	408
Primary	13.1	9.6	3.7	2.7	3.4	0.7	5.4	828
Preparatory	7.8	9.0	3.4	1.8	2.2	0.0	4.2	985
Secondary+	4.6	6.0	2.4	1.9	2.8	0.5	3.0	1483
Current working status								
Not working	8.6	6.8	3.2	2.4	2.0	1.2	4.0	6348
Working	4.1	7.7	3.9	0.4	2.4	0.5	3.1	1242
Total	7.8	6.8	3.4	2.1	2.1	1.1	3.8	7687

* Note : Figures in parentheses are based on less than 100 children

Differentials in reported diarrhoeal prevalence by age according to residence, mother's level of education and mother's current work status my be seen in Table 6.12. Diarrhoeal period prevalence was reported to be highest among children living in Ahmadi, 5.1 percent of children under six years of age, or one in twenty of them reported to have had at least one diarrhoeal episode in the previous two weeks. Among children under two years of age it was the residence with the highest rates, 11.3 percent of infants and 10.3 percent of one year old reported to have had diarrhoea compared with generally seven percent or less elsewhere. At ages two years and more, prevalence in Ahmadi was higher on the

whole than it was in Hawalli and Jahra.

Higher prevalence in Ahmadi than elsewhere is - as will be shown later - consistent with immunization levels being lowest there and also with its featuring the slowest accessibility to primary health care facilities. It is not consistent, however, with other indicators of maternal and child health which would lead one to expect Jahra to have the highest rates, nor is it consistent with Ahmadi being second only to Jahra in respect of ages at supplementation and weaning.

The Capital exhibited the most advantaged status according to most indicators of health status and primary health care. Surprisingly it ranks second highest in respect of diarrhoeal prevalence, 4.8 percent of children under six years of age. Though sharing the lowest figure in infancy, it was second highest at age one year and highest at ages two, three and four years. The figures, however, were based on small numbers and may be attributable to sampling errors; there were less than 100 children in each age group so that one child makes a difference of more than one percent in the rate. The relative consistency, however, of the Capital's ranking makes it difficult to dismiss the figures on this account. The results may simply derive from better reporting in the Capital which gives the impression of higher rates there than elsewhere. It is also possible that the early age at the introduction of solids and at weaning among children living in the Capital denotes genuinely higher diarrhoeal prevalence, though this is contradicted by the absence of such a relationship in other places of residence.

Hawalli and Jahra displayed similar levels of diarrhoeal prevalence, respectively 3.4 and 3.2 percent of children under six years of age were reported to have had at least one episode in the two weeks prior to the survey. The Hawalli figure was the higher among children aged one and two years, 6.8 percent and 3.4 percent

compared with 4.8 percent of one year old and 2.3 percent of two year old living in Jahra. Feeding patterns would suggest higher prevalence in Hawalli, children living in Jahra being breastfed almost twice as long as those living in Hawalli. Most other indicators of health status would suggest higher prevalence in Jahra. Together these might account for equivalence between the two places. A difference in the completeness of reporting would, however, denote a real difference in diarrhoeal prevalence; a greater degree of under-reporting in Jahra than in Hawalli would denote higher Jahra prevalence and vice-versa.

Among children whose mothers were literate, diarrhoeal prevalence declined with increasing level of mother's education; 5.9 percent of children under six years of age whose mothers had a primary education, falling to 4.2 percent of children whose mothers had a preparatory education and 3.0 percent of children whose mothers were educated at least to secondary level. The contrast was most pronounced in the first year of live, 12.2 percent of infants whose mothers had at least a secondary education were reported to have had at least one diarrhoeal episode in the two weeks prior to the survey. Among children aged one year the equivalent figures were 9.8 percent; and at age three years, 4.2 percent of children whose mothers had a primary education or less had diarrhoea in the preceding two weeks, falling to 1.9 percent of children whose mothers had a secondary education.

The differentials in diarrhoeal prevalence for children whose mothers were literate are consistent with those observed in respect of other indicators of health status and levels of primary health care; increasing education denotes increasing advantage. Ages at weaning and supplementation were exceptions to this, though clearly any mitigating effect that these might have had were outweighed by other factors.

Reported diarrhoeal prevalence among children whose mothers

were illiterate was much lower than would have been expected on the basis of other measures of health status. There were 3.3 percent of children under six years of age who were reported to have had at least one diarrhoeal episode in the preceding two weeks, which is comparable with the figure for children whose mothers had a secondary education. In infancy and at age two years, reported diarrhoeal prevalence among children whose mothers had preparatory education, and at age one year it was comparable with those mothers who had a secondary education. These results appear to be another manifestation of the factors at play in respect of higher than expected prevalence in the Capital and lower than expected prevalence among those living in Jahra. Whilst relatively extended breast-feeding among children whose mothers were illiterate might have lowered the incidence of diarrhoea it is unlikely to have rendered equivalence with those whose mothers had a secondary education and all the health status advantages associated with it. Again small numbers of children, and differential completeness of reporting probably biassed the results.

Reported diarrhoeal prevalence was a little higher among children whose mothers were not in the workforce than among whose mothers were, 4 percent compared with 3 percent. Only in infancy was there a plausible and sufficiently pronounced difference recorded, 9 compared with 4 percent.

6.3.3 Dietary response to diarrhoea

An association between the onset of diarrhoea and feeding patterns has already been mentioned. In particular was described the enhanced susceptibility caused by the introduction of solid food and weaning, notably affecting children aged between six and eighteen months. A change in feeding patterns may also be a response to diarrhoea, as a means of alleviating or stopping it. Restriction to a liquid diet, for example, may be advised in some cases.

Mothers of children who had diarrhoea in the two weeks preceding the survey were asked whether they had continued normal feeding or had changed the feeding pattern. Irrespective of their response, they were also asked about the child's diet during the diarrhoeal episode.

Table 6.13 Mode of feeding among children under six years of age who had diarrhoea in the two weeks prior to the survey by age of child, KCHS 1987.

Age	Mode of feeding	
	Changed feeding	Continued normal feeding
< 6 months	43	57
6-11 months	59	41
12-17 months	55	46
18-23 months	62	39
2 years	49	51
3 years	50	50
4 years	58	42
5 years	57	43
Total	54	46

Table 6.14 Percent distribution of children who had diarrhoea in the last two weeks by feeding pattern according to age and dietary response during episode, KCHS 1987.

	Liquids	Breast fed	Breast +bottle	Bottle	Breast liquids solids	Bottle liquids solids	Liquids solids	Total
Under one year								
Changed	20	12	4	14	14	30	6	100
Continued	9	16	9	33	7	5	21	100
One year								
Changed	16	6	2	10	8	58	-	100
Continued	3	9	6	20	22	40	-	100
2-5 years								
Changed	24	-	-	3	-	73	-	100
Continued	6	2	2	6	6	71	7	100

Table 6.13 shows that about 46 percent of children who were reported to have had diarrhoea continued with normal feeding, leaving 54 percent whose feeding pattern was changed. Whilst there were quite large variations with age, they were not systematic, and did not provide evidence of a trend with an immediately plausible explanation.

A comparison by age of the feeding patterns of children who continued normal feeding and those who did not is afforded by Table 6.15. In every age group the most conspicuous change in feeding pattern was to a liquid only diet; 20 percent of infants, 16 percent of those aged one year and 24 percent of those aged two to five years, compared with nine, three and six percent, respectively, of those who continued normal feeding. Among infants especially, and to a much lesser extent among one year old, there appeared also to be a change to a bottle, liquid and solids diet.

There were differentials in the likelihood of a dietary response to a diarrhoeal episode according to residence and education (Table 6.15). Women living in the Capital and Hawalli

were most likely to have changed from normal feeding, 62 percent, falling to 52 percent of those in Jahra and 46 percent in the Ahmadi region. Children whose mothers were illiterate were least likely to have had their feeding pattern changed, 49 percent. This compares with 53 percent of the group of children whose mothers were literate or with primary education, 61 percent and 67 percent of those whose mothers had preparatory and secondary or higher education, respectively.

Table 6.15 Percent distribution of children under six who had diarrhoea in the two weeks prior to the survey by dietary response during episode, according to residence and education, KCHS 1987.

	Mode of feeding		Total
	Changed feeding	Continued normal feeding	
Region			
Capital	62	38	100
Hawalli	63	37	100
Ahmadi	46	54	100
Jahra	52	58	100
Education			
Illiterate	49	51	100
Incomplete primary	54	46	100
Primary	53	47	100
Preparatory	61	39	100
Secondary +	67	33	100
Total	54	46	100

6.4 HEALTH CARE UTILISATION: MATERNITY CARE

6.4.1 Introduction

The KCHS provides information which can be used to examine the care a mother receives during pregnancy, at the delivery and in the post-natal period. Adequate care before, during and after childbirth are crucial in reducing the risks of infant and maternal mortality, in promoting infant and maternal health and development

and also indirectly in promoting the health and development of other living children (Favin et al., 1984; WHO, 1985).

A series of questions pertaining to ante-natal care were asked in relation to current pregnancy and the last live birth where this had occurred five years or less prior to the survey. Information was collected in respect of 762 pregnant women and 3,402 live births. The group of pregnant women comprised ten percent who were in the second month, 43 percent in the third to fifth months and 47 percent in the sixth to ninth months of their pregnancy. Questions about care at the delivery and post-natal care also were asked of women whose last live birth had occurred five years prior to the survey. In this section are explored in turn the most recent levels of, and variation in maternal care before, during and after the birth.

6.4.2 Ante-Natal Care

Seventy-seven percent of currently pregnant women were reported to have had a pregnancy check; 44 percent of women who were in their second month, 69 percent in their third to fifth months and 92 percent of women who were in their sixth to ninth months of pregnancy. These figures compare with 95 percent of women who had a pregnancy check by the end of the pregnancy relating to their last live birth, where this had occurred five years prior to the survey.

The likelihood of a pregnant woman having had a pregnancy check declines slightly though steadily with age, from 84 percent for women under 20 years of age to 73 percent for women aged thirty years or more (Table 6.17). The difference is largest among women in their third to fifth months of pregnancy, 84 percent of those under 20 years of age having had a check falling to 63 percent of those aged 35 years or more. The corresponding figures for women in the sixth to ninth months of pregnancy are 92 percent of women under 20 years of age and 86 percent of those aged 35 years or

more, there being an intermediate rise to 96 percent among women aged 25-29 years. The likelihood of a pregnancy check by the end of the pregnancy, reported by women in respect of their last live birth, features a small decline, from 97 percent for women aged under twenty years to around 95 to 96 percent for women aged 20-39 years, and 92 percent for women aged forty years or more.

A pregnancy check was most likely in respect of first live births, and of pregnancies which, assuming a live birth outcome, would culminate in the first live birth, (Table 6.16). Thus, 98 percent of women had been checked at some stage prior to the birth of their first child, and 88 percent of corresponding pregnant women. The likelihood of a pregnancy check according to birth order declines thereafter, though not systematically, to 93 percent for ninth or later live births and 71 percent for corresponding pregnancies (pregnant women with eight or more live births).

Table 6.16 Percentage of women who reported having a pregnancy check according to birth-order, separately for current pregnancies and last live-births, KCHS 1987.

Birth order	Currently pregnant women		Last live-births	
	% with pregnancy check	No. of women	% with pregnancy check	No. of women
1	88	88	98	312
2	79	97	95	454
3	79	107	95	479
4	82	91	94	443
5	86	86	94	398
6	64	86	97	328
7	72	73	94	252
8	66	50	96	249
9 +	71	84	93	487
Total	77	762	95	3402

Thus the results show separate effects of mother's age and

birth order on the likelihood and timing of ante-natal care. One may be determined by the other; lower order births are more commonly to be found among younger women, and higher order births among older women, so that the age effect may derive from the birth order one, or vice versa, or each may separately and independently have an effect on the level of ante-natal care. The separate effects can be appraised from Table 6.17 in which are presented the percentages of women who had a pregnancy check according to age and birth order, for last live births and current pregnancies.

Table 6.17 Percentage of currently pregnant women and of women who had their last live-birth in the five years preceding the survey who received an ante-natal check by current age and birth order, KCHS 1987.

	Children ever-born										Total
	0	1	2	3	4	5	6	7	8	9+	
Current pregnancy											
< 20	86	*	*	*							84
20 - 24	90	76	87	78	78	*	*				82
25 - 29	*	86	75	82	88	63	71	*	*	*	77
30 - 34	*	*	*	*	*	64	78	70	*	*	73
35 +	*	*	*	*	*	*	65	*	*	71	75
Total	88	79	79	82	86	64	73	66	73	70	77
Last live-birth											
< 20	-	98	92	*							97
20 - 24	-	99	96	93	93	91	*		*		96
25 - 29	-	96	96	96	94	95	97	94	*	*	95
30 - 34	-	*	93	94	93	92	98	96	96	96	95
35 - 39	-	*	*	97	99	98	95	94	97	90	91
40 - 44	-		*	*	*	*	100	83	97	90	91
45 - 49	-	*		*	*	*	*	*	*	93	93
Total	-	98	95	95	94	94	97	94	96	93	95

* Figures based on less than 20 women

On the whole the highest order births within each age group include a lower likelihood than others of receiving ante-natal care at some time during the pregnancy, fifth births to women aged 20-24 years for example, seventh births to women aged 25-29 years and ninth and later births to women aged 35 years or more, after taking into account mother's age. Comparison with the pregnancy figures suggests the differential in respect of timing of the first check to be maintained also.

The age effect observed in respect of all births tends to become reversed when birth order is taken into account; the oldest women within each birth order were the ones most likely to have had a pregnancy check. Within the group of first and second births, for example, women aged 20-24 years were more likely than those aged under 20 years to have had a pregnancy check, while it was women under 20 years who displayed the greatest likelihood when birth order was not identified.

Residence denotes differential access to ante-natal care. (Table 6.18). Eighty-one percent of pregnant women living in the Capital had received a pregnancy check, 80 percent of those living in Hawalli, 77 percent of those living in Ahmadi and the lowest likelihood, 75 percent, was to be found among pregnant women living in Jahra. The differentials were reflected in respect of the last live birth, 97 percent in the Capital, 95 percent in Hawalli and Ahmadi and 94 percent in Jahra.

Table 6.18 Percentage of currently pregnant women by pregnancy duration and of women who had their last live-births in the last five years who had pregnancy check according to residence and mother's education, KCHS 1987.

	Duration of pregnancy (months)			All durations	No of Women	Last live births	No of Women
	< 3	3-5	6-9				
Region of residence							
Capital	(33)	73	100	81	57	97	269
Hawalli	29	73	96	80	244	95	1228
Ahmadi	(41)	75	90	77	140	95	697
Jahra	58	61	90	75	321	94	1208
Mother's literacy							
Iliiterate	53	69	90	77	363	94	1578
Literate	37	68	96	77	396	96	1812
Literate mother's level of education							
No certificate	20	57	84	71	35	95	182
Primary	40	51	92	69	87	94	385
Preparatory	50	70	96	79	110	97	482
Secondary	33	79	100	85	118	98	496
University	25	72	100	81	43	98	267
Total	44	69	92	77	762	95	3402

Literate women were a little more likely than illiterate women to have had a pregnancy check before their last live birth, 96 compared with 94 percent. Among pregnant women, those in their third to fifth months displayed no difference according to literacy, while in the sixth to ninth months there were 96 percent of literate women and 90 percent of illiterate women who reported a pregnancy check. Assuming it cannot be attributed to differential live birth outcomes, these figures suggest that none of the women who were literate, and three percent of those who were

illiterate, had their first check between the sixth to ninth months and the end of the pregnancy. Hence not only were illiterate women slightly less likely than literate women to have a pregnancy check, they were a little more likely also to have a very late first check.

The number of women who have a pregnancy check and the date of their first check are key indicators of the level of ante-natal care. Next is the number of pregnancy checks, which is of course dependent on the date of the first one. Table 6.19 shows that while the number of pregnancy checks not surprisingly rise with pregnancy duration, it is noteworthy that almost one in five women in their sixth to ninth months of pregnancy had received only one or two checks. At the other extreme were just over one in five women in their third to fifth months who had received four or more checks. Other than the group of women whose first check was late in the pregnancy, and the group with very frequent checks, the distribution of the number of checks is one that reflects a situation in which the majority of those women who receive ante-natal care do so on the regular basis after their first check.

Table 6.19 Percent distribution of currently pregnant women who had a pregnancy check by number of pregnancy checks, according to duration of pregnancy, KCHS 1987.

Duration of pregnancy (months)	Percent with no check	Of those with a check % by number of checks							Total
		1	2	3	4	5	6	7+	
< 3	56	61	27	9	-	-	3	-	100
3 - 5	31	33	31	15	15	3	1	2	100
6 +	8	8	9	13	12	14	13	31	100
Total	23	21	18	13	13	9	8	18	100

Effectively all pregnancy checks were carried out by a doctor. Of 589 currently pregnant women who reported having had a pregnancy check, 587 or 99.7 percent, saw a doctor and the remaining two

pregnant women saw a trained nurse. Identical results were reported in respect of 3,231 last live births, 99.7 percent having been checked during the pregnancy by a doctor and of the remaining nine women, eight were checked by a trained nurse and one by a traditional nurse.

Eighty-nine percent of pregnant women went to a government health centre and 11 percent to a private clinic for their pregnancy check. The same figures were reported in respect of the last live birth, there being less than 0.5 percent of women whose check took place at home or elsewhere.

Table 6.20 Percent distribution of pregnancy checks according to type of facility and mother's age, KCHS 1987.

Mother's age	Government hospital / clinic	private hospital / clinic	Home	Total percent	Number of women
< 20	98	2	-	100	48
20 - 24	89	11	-	100	145
25 - 29	86	14	-	100	190
30 - 34	89	10	1	100	120
35 +	90			100	86
Total	89	11	0	100	589

Table 6.20 shows that women under 20 years of age were most likely to have had their pregnancy checks in a government health centre, 98 percent of them compared with two percent whose checks took place in a private health facility. The oldest women also were most likely than average to have used a government hospital or clinic, just over 90 percent. Thus it would seem that a greater likelihood of using government health facilities is associated with a greater likelihood of receiving ante-natal care among the youngest women and with a lower likelihood of receiving ante-natal care among older women. As shown earlier the likelihood of a pregnancy check among the youngest women was inflated by the first

birth effect while the underlying tendency associated with an early start to childbearing was a lower likelihood of a pregnancy check. The figures on location of the check would seem to be consistent with this underlying tendency. Least likely to have used government facilities were women aged 25-29 years, 85 percent of whom received antenatal care in a government and 14 percent in a private health facility.

6.4.3 Care at the delivery

Women whose last child was born five years or less preceding the survey were asked about where the child was born and who attended the birth.

The vast majority of women, 97 percent, gave birth in a hospital or clinic and three percent gave birth to their last child at home. Eighty-one percent of all births, or 84 percent of all hospital births, were delivered in a government, and 16 percent in a private, hospital or clinic. These figures compare with 89 percent of pregnancy checks carried out in a government, and 11 percent in a private, health centre. A slightly-greater utilization of private health care facilities for deliveries than for pregnancy checks is thus indicated.

The likelihood of a hospital rather than a home birth and of its being in a government rather than a private hospital displayed some variation with birth order and mother's age (Table 6.21). First and second births were less likely than others to have been delivered at home, one percent compared with three percent of third or higher order births. There appeared to be no systematic variation in the likelihood of a home birth with mother's age; women aged 40 - 44 years, for example, reported four percent home births and women aged 45-49 years none, the former perhaps conforming with expectation, but called into question by the latter. The birth order effect is preserved after taking mother's age into account. In addition, after controlling for birth order,

there appears to be an age effect in respect of first births, the youngest mothers reporting two percent home births, falling to one and nought percent, respectively, of first births to women aged 20-24 years and 25-29 years.

Table 6.21 Percent distribution of women who had their last child in the last five years of delivery, according to mother's age and birth order, KCHS 1987.

	Health facility		Home	Other	Total	No. of births
	Government	Private				
Mother's age						
< 20	94	4	2	-	100	92
20 - 24	83	15	1	1	100	575
25 - 29	79	17	3	1	100	945
30 - 34	78	19	3	0	100	825
35 - 39	84	14	2	0	100	651
40 - 44	81	15	4	0	100	242
45 - 49	92	8	-	-	100	71
Birth order						
1	77	21	1	1	100	312
2	81	18	1	0	100	454
3 +	82	15	3	0	100	2636
Total	81	16	3	0	100	3402

Note: There were 13 births for which place of delivery was not stated.

Residence and education differentials in the proportion of hospital births and in the relative use of government and private health facilities can be appraised in Table 6.22. There were no home births in the Capital, two percent in Hawalli and Ahmadi, and three percent in Jahra. Around three-quarters of women who were living in the Capital and Hawalli delivered their last live birth in a government hospital or clinic, slightly more, 79 percent, of those living in Ahmadi and the vast majority, 93 percent, of those living in Jahra. Irrespective of residence, a government health

facility correspondingly less likely to have been the venue of a pregnancy check in relation to the last live birth than of its delivery. The difference was smallest in Jahra, four percent, compared with eight, 11 and 10 percent respectively, in the Capital, Hawalli and Ahmadi.

Table 6.22 Percent distribution of women who had their last child in the last five years by place of delivery, according to residence and education, KCHS 1987.

	Health facility		Home	Other	Total	No. of births
	Government	Private				
Region of residence						
Capital	76	23	0	1	100	269
Hawalli	73	25	2	0	100	1228
Ahmadi	79	18	2	1	100	697
Jahra	93	4	3	0	100	1208
Mother's literacy						
Illiterate	88	7	4	1	100	1583
Literate	75	24	1	0	100	1820
Literate mother's educational level						
None	78	17	5	-	100	40
No certificate	83	11	4	2	100	142
Primary	84	15	1	0	100	385
Secondary	68	32	-	0	100	496
University	67	33	-	0	100	268
Total	81	16	3	0	100	3402

Home births were more common among women who were illiterate than among those who were literate, four compared with one percent. Among the group of literate women, the likelihood of a home birth declined with increasing educational level, from four percent of those with less than primary education to one percent of those with

primary or intermediate education and none of those women who had a secondary or university education. The likelihood of a government hospital or clinic birth fell and of a private hospital or clinic birth rose, between illiterate and literate women and according to educational level. Thus, there were 88 percent of women who were illiterate who delivered their last live birth in a government hospital compared with around 83 percent of literate women with up to primary education, 78 percent of those with an intermediate education and only around 67 percent of women with a secondary or university education. Again, government facilities were more likely to have been used for ante-natal care than for delivery of the last live birth, with difference ranging between six percent and 12 percent.

The results also indicate that 57 percent of deliveries were attended by a doctor, 41 percent by a trained nurse, one percent by a relative, 0.2 percent by a traditional nurse,0.5 percent by no-one and there were 0.3 percent of deliveries with attendance described as "other" (Table 6.23). Thus almost all births, 98 percent, were attended by a doctor or trained nurse and out of every ten deliveries there were just under six attended by a doctor and just over four attended by a trained nurse.

Attendance by a doctor was slightly more likely than average among women living in the Capital and Hawalli, 62 percent. Jahra featured on average likelihood of attendance by a doctor while a much lower than average figure, 43 percent of deliveries to women living in Ahmadi had a doctor in attendance. Attendance by a trained nurse was correspondingly higher in Ahmadi than elsewhere, 53 percent compared with 36 and 38 percent in Hawalli and the Capital and 40 percent in Jahra.

The proportion of deliveries attended by neither a doctor nor a trained nurse was very small, four percent in Ahmadi, falling to three percent in Jahra, two percent in Hawalli and less than one

percent in the Capital. These included two percent attended by a relative in Ahmadi and Jahra and one percent in Hawalli and 0.4 percent, 0.3 percent and 0.1 percent, respectively, attended by a traditional nurse.

Table 6.23 Percent distribution of women who had their last child in the last five years by person assisting with delivery, according to residence and education, KCHS 1987.

	Doctor	Trained nurse	Relative	Other	Total	No. of births
Region of residence						
Capital	62	32	-	0	100	269
Hawalli	62	36	1	1	100	1228
Ahmadi	43	53	2	2	100	697
Jahra	57	40	2	1	100	1207
Mother's literacy						
Illiterate	49	47	2	2	100	1577
Literate	63	37	0	0	100	1812
Literate mother's educational level						
None	58	38	2	2	100	40
No certificate	61	35	2	2	100	142
Primary	51	48	0	1	100	385
Intermediate	57	43	-	0	100	482
Secondary	71	29	-	-	100	496
University	77	23	-	-	100	268
Total	57	41	1	1	100	3401

Attendance by a doctor was about average or just above among literate women with up to an intermediate education, while much higher figures, 71 and 77 percent, were to be found among women with a secondary or university education. Deliveries to women with primary education were most likely to have been attended by a trained nurse, 48 percent, just higher than the figure for illiterate women. Beyond primary education the likelihood of

attendance by a nurse fell with increasing educational level from 43 of those with an intermediate education to 29 and 23 percent, respectively, of those with a secondary and university education. Deliveries to literate women with less than primary education were less likely than average to have been attended by a trained nurse, and they displayed the largest proportion that were attended by no-one, 2.5 percent of those with no education and 1.4 percent of those with incomplete primary education.

6.4.4 Post-natal care

Two out of three women whose last child was born five years or less prior to the survey had a post-natal check-up. The likelihood of a post-natal check displays no systematic variation with parity, ranging around the average figure between first and seventh order births, (Table 6.24). If anything, the highest parity births were associated with the greatest likelihood of a post-natal check, 69 percent of women reporting a post-natal check in respect of their eighth, and 71 percent of women in respect of their ninth or later live births. Women were thus much more likely to have received ante-natal care than post natal-care in respect of their last live birth, 95 compared with 66 percent. Further, it would appear that the special attention given to pregnancy checks and delivery of first births is one confined to the infant and not followed through in respect of the mother's complete physical and nutritional recovery from her first birth.

Table 6.24 Among women who had their last child in the last five years, the percentage who had post-natal check according to birth order, KCHS 1987.

	Birth order									Total
	1	2	3	4	5	6	7	8	9+	
Ante-natal Check	98	95	95	94	94	97	94	96	93	95
Post-natal check	65	66	61	65	66	69	63	69	71	66

Ninety-four percent of post-natal checks were carried out by

a doctor, compared with almost 100 percent of ante-natal checks.

Residential differentials in ante-natal care are not mirrored in respect of post-natal check-ups, in fact they appear to be reversed, (Table 6.25). Thus women living in Jahra were the ones most likely to report a post-natal check after their last live birth, 83 percent, falling significantly to 63 percent of women living in Ahmadi, 60 percent in the Capital, and 52 percent of those living in Hawalli. The discrepancy between the numbers of women who had ante-natal and post-natal care was much smaller in Jahra than elsewhere, 11 percent, rising to 32 percent in Ahmadi, 37 percent in the Capital and 43 percent in Hawalli.

Table 6.25 Among women who had their last child in the last five years, the percentage who received post-natal check and type of care, according to residence and education, KCHS 1987.

Characteristic	Percentage who received		% of post-natal checks carried out by doctor
	Post-natal check	Ante-natal check	
Region of residence			
Capital	60	97	93
Hawalli	52	95	94
Ahmadi	63	95	93
Jahra	83	94	95
Mother's literacy			
Illiterate	71	94	92
Literate	62	96	96
Literate mother's educational level			
None	78	93	97
No certificate	63	95	93
Primary	60	94	94
Preparatory	60	97	97
Secondary	62	98	97
University	63	98	98
Total	66	95	94

A similar picture emerges with respect to mother's literacy, there being 71 percent of illiterate women compared with 62 percent of literate women who reported a post-natal check after their last live birth, reversing the differential that was observed in respect of ante-natal care and care at the delivery. The difference is not so striking in respect of literacy as it was between residence in Jahra and elsewhere.

Educational level among literate women appears to differentiate little in the likelihood of having a post-natal check; the level was always below average, falling from 63 percent of women with the least education to 60 percent of women with primary or intermediate education , and rising again to 63 percent of women with the highest education. Thus in this case the differentials observed in respect of ante-natal care and care at the delivery were cancelled out but not reversed.

6.5 HEALTH CARE UTILISATION: IMMUNIZATION

6.5.1 Introduction

The percentage of children immunized against the major infectious diseases of childhood is one of the key indicators of primary health care coverage and of child health status.

The immunization schedule currently adopted in Kuwait is based on factors such as epidemiological situation, immunological effectiveness, operational feasibility and social acceptability. The Expanded Programme of Immunization (EPI) in Kuwait seeks to immunize children against tuberculosis (BCG), diphtheria, pertussis (whooping cough) and tetanus (DPT), polio and measles. To achieve this, children are to receive one dose of BCG and measles vaccines and three doses of DPT and polio vaccines.

For each child under six years of age it was asked whether they had a health card. If the answer was yes, the interviewer asked to see the health card and copied from it the child's immunization record. If the health card was not available at the interview or if the child did not have a health card, the only question that was asked was whether the child had ever been given any injections or drops in the mouth to prevent him/her getting the disease. There was no attempt to ascertain how many injections/drops or against which diseases, the rational being that the uneven quality of the information obtained would render it of little use.

6.5.2 Health Card coverage and availability

Virtually every child under six years of age was reported to have a health care, 99.4 percent. Four out of five health cards were available at the interview, and thus complete immunization records were collected in respect of 79.2 percent of children. For the remainder of children only minimal information could be collected. Most of these,20.2 out of 20.8 percent, were reported to have a health card which was not available at the interview. Practically universal health card coverage in years prior to the survey is evidenced by there being no discernible trend by age in possession of a health care, (Table 6.26).

There were, however, variations by age in health card availability. About 24 percent of infants were reported to have a health card that was not available, failing to 19 percent of four year-olds and rising again to 21 percent of five year-olds. While these may simply reflect sampling fluctuations, it is possible that the higher figure for infants may be associated with the processing of cards in infancy and the lower figure among children aged four years may be linked to requirements to produce health card in the pre-school period.

Table 6.26 Percent distribution of children under six years of age by health card status according to selected background characteristics, KCHS 1987.

Characteristics	Health Card status				No. of children
Age in months	Seen	Not seen	None	Total	
< 12	74.7	24.1	1.2	100.0	1209
12 - 23	80.1	19.5	0.4	100.0	1215
24 - 35	80.7	18.8	0.4	100.0	1335
36 - 47	80.3	19.2	0.4	100.0	1357
48 - 59	81.1	18.5	0.4	100.0	1262
60 -71	77.9	21.4	0.6	100.0	1306
Region					
Capital	85.8	13.5	0.7	100.0	541
Hawalli	71.3	23.3	0.4	100.0	2492
Ahmadi	82.9	16.7	0.4	100.0	1661
Jahra	82.5	16.7	0.8	100.0	2290
Education					
Illiterate	81.0	18.3	0.7	100.0	3919
Incomplete Primary	77.0	22.3	0.7	100.0	408
Primary	79.2	20.2	0.6	100.0	828
Preparatory	77.8	21.5	0.7	100.0	985
Secondary +	76.3	23.5	0.3	100.0	1483
Current Work Status					
Not working	80.1	19.2	0.6	100.0	6345
Working	75.0	24.6	0.4	100.0	1242
Total	79.2	20.2	0.6	100.0	7684
Number of Children	6085	1554	45	7684	

Note: There were three children for whom health card status was not stated.

Differentials in health card possession were hardly detectable but differentials in health card availability were not always in the direction that might have been expected. Health cards were predictably most likely to be seen for children living in the

Capital, 86 percent, followed by Ahmadi and Jahra, 83 and 82 percent, respectively. In Hawalli, where a figure close to the Capital might have been expected, health card availability was much lower than elsewhere, 71 percent.

Aside from the small group of children whose mothers were literate and had less than primary education, increasing mother's educational level was associated with a lower likelihood of a health card being seen. Immunization records were available for 81 percent of children whose mothers were illiterate, falling to 79 and 78 percent, respectively, of those whose mothers had a primary and preparatory education, and to 76 percent of children whose mothers were educated to secondary level or beyond. Mother's work status displayed a similar differential, not altogether surprising since the group of mothers who were working disproportionately included the better educated. Thus immunization records were collected for 80 percent of children whose mothers were not working and 75 percent of those whose mothers were currently in the workforce.

6.5.3 Initial vaccination coverage

About 93 percent of children whose health cards were seen were reported to have had some form of immunization. More than 84 percent of children whose health card were not seen, and 69 percent of those with no health card, were reported to have been given an injection or drops in the mouth to prevent them getting a disease. Altogether there were 91 percent of children under six years of age who were reported to have been vaccinated, or at least to have commenced a course of vaccination, against one of the major infectious diseases of childhood.

Table 6.27 Percentage of children under six years of age who have any immunization according to availability of health card, by selected background characteristics, KCHS 1987.

	Health card seen	Health card not seen	All*
Region			
Capital	97	85	95
Hawalli	94	89	92
Ahmadi	90	79	88
Jahra	94	79	92
Education			
Illiterate	92	81	90
Incomplete Primary	94	77	90
Primary	94	89	93
Preparatory	95	87	93
Secondary +	95	90	94
Current work status			
Not working	93	82	91
Working	95	94	95
Total	93	84	91

* Includes forty-five children who had not health card, 69% of whom reported to have any immunization

Residence, maternal education and mother's current work status were each associated with differences in the likelihood of being immunized, (Table 6.27). Children living in the Capital were most likely to have been immunized, 95 percent, followed by those living in Hawalli and Jahra, each 92 percent, and in Ahmadi there were 88 percent of children who had been vaccinated or at least had been given the first dose in a course of vaccinations. The pattern is replicated when the comparison is restricted to children whose immunization records were available, not surprising since they were the majority. In this case the levels were about two percent higher, ranging from 97 percent in the Capital to 90 percent in Ahmadi.

Regional differentials in reported immunization levels among children whose health card were not seen are not altogether consistent with the differentials portrayed by immunization records. Hawalli was the region with the greatest number of children reported to have had a vaccination, 89 percent compared with 85 percent in the Capital and 79 percent in Ahmadi and Jahra. The difference between health card records and mother's reports was consequently smallest in Hawalli, five percent compared with upwards of ten percent elsewhere. Hawalli was the area with the highest percentage of children whose health card were not seen, and these results would seem to confirm that availability of health card was at least in part attributable to factors which were independent of immunization behaviour. Reported immunization levels for children whose health cards were not seen were lower everywhere, however, than they were for children whose health cards were seen, and it must be concluded that there was a real difference which may have been exaggerated, if not totally determined, by under-reporting.

Mother's educational level was associated with a slight advantage in respect of immunization. About 90 percent of children under six years of age whose mothers were illiterate, or had less than a primary education, had been immunized or had commenced a course of immunizations against one of the major infectious diseases of childhood. The figure rises to 93 percent of those whose mothers were educated to secondary level or beyond. Immunization record estimates denoted similar differences within marginally higher levels, the number of children who had been given a vaccination rising from 92 percent of those whose mothers were illiterate to 95 percent of those whose mothers were illiterate to 95 percent of those whose mothers had a preparatory or higher education.

Educational differentials in reported immunization levels for children whose health cards were not seen are consistent in their

ranking with those based on immunization records. The reports denote a larger educational differential, 81 percent of children whose mothers were illiterate reported to have been given a vaccination compared with 90 percent of those whose mothers had a secondary or higher education. As in respect of residence a larger proportion of unavailable health cards denotes a smaller discrepancy between the two estimates, and in this case it denotes the highest immunization level also. Again differentials in the combination of factors responsible for non-availability of a health card, and also in the extent of under-reporting are indicated.

About 91 percent of children whose mothers were not currently in the workforce compared with 95 percent of those whose mothers were currently working had been immunized, or had commenced a course of immunization against at least one of the infectious diseases of childhood. Among the group of children whose health cards were available, the figures were respectively, 93 and 95 percent. Reports of immunization levels for children whose health cards were not seen, as for education, denote a bigger differential, there being 82 percent of children whose mothers were not in the workforce reported to have been given a vaccination compared with 94 percent of those whose mothers were currently working. Again, lower health card availability was accompanied by higher immunization levels and a smaller discrepancy between the two sets of estimates; in this case there was a difference of only one percent for children whose mothers were currently working compared with 11 percent otherwise.

6.5.4 Disease-specific immunization coverage

The results presented so far have been deficient in their being neither age-specific nor vaccine-specific. The figures for all children under six years of age can obscure the true picture. Understatement of achieved levels is caused by the inclusion of infants still too young to be immunized. Information about older children too may understate current immunization by virtue of their

not having been the prime target in immunization programmes or else as a result of under-reporting due to the greater lapse of time since they were immunized. Perhaps the more important deficiency is that the figures on any vaccination preclude an assessment of full protection against specific infectious diseases, especially against diphtheria, pertussis and tetanus (DPT), and polio which require three doses to be effective.

In Table 6.28 are presented separately by age the percentages immunized by type of vaccine for children whose health cards were available, and the percentages given an injection or drops, to prevent them getting an infectious disease, for children whose health cards were not available or who had no health card.

The triple vaccine, which protects the child against diphtheria, pertussis (whooping cough) and tetanus and the polio vaccine are each, as denoted, administered in three doses. Ages recommended are ones which preclude an interval of susceptibility after the period of maternally derived immunity and which also ensure prolonged effectiveness. The recommended age for the first dose of DPT and polio vaccines is three months, the second and third doses following at intervals during infancy so that the full course should be completed before the child's first birthday.

The percentage of children who had been given DPT and polio vaccines were almost identical, not surprising since they would usually be given at the same time. About 72 percent of infants had been given the first dose of DPT and polio vaccines, a figure which accords with there being around 75 percent of infants aged three months or more. Nearly 59 percent of infants had been given the second dose, and 47 percent the third, which suggest a fairly speedy completion of the full course. The vast majority of children aged 12-23 months whose health cards were seen had been immunized against DPT and polio, 95 percent having been given the first dose, 92 percent the second and 89 percent the third dose of

the vaccines.

Table 6.28 Among children under six, the percentage receiving various immunizations by age of child and availability of health cards, KCHS 1987.

	Age of child						All ages
	<12	12-23	24-25	36-47	48-59	60-71	
Of those whose health card was seen the % who had							
DPT1	72	95	96	96	97	96	93
DPT2	59	92	94	94	95	94	89
DPT3	47	89	92	91	93	92	85
Completion, DPT*	65	94	96	95	95	96	92
Polio1	72	95	96	96	97	96	93
Polio2	59	92	94	94	95	95	89
Polio3	46	89	93	91	93	92	85
Completion, Polio*	64	94	96	95	95	96	91
Measles	10	82	90	91	93	93	78
BCG	6	12	12	23	40	44	23
DPT+Polio+ Measles	9	79	89	88	89	89	75
DPT + Polio + Measles + BCG	1	11	12	22	38	41	21
of those whose health card was not seen the % reported to have had							
Injection	54	86	90	88	87	90	82
Drops	61	90	91	91	88	93	85
All children, the % estimated to have been immunized against							
DPT+Polio+Measles	9	78	88	87	88	89	74

* The percentage of children administered the first dose who completed the course with the third dose.

Immunization levels against DPT and polio were marginally higher among children aged two to five years than among those aged 12-23 months, between 96 and 97 percent having been given the first dose, 94 and 95 percent the second and between 91 and 93 percent the third doses. This suggests there to have been a small number of children who were immunized later than recommended, in the second rather than the first year of live. The percentage of

children aged two to five years who had been given all three doses also denotes a good completion rate.

As may be seen from Table 6.28, the drop out rates for the various antigens and doses are low. For children aged 12-23 months, the drop out rates between DPT1 and DPT3, OPV1 and OPV3 and measles are around 6,6 and 8 percent, respectively.

The age pattern of the percentage given drops among children whose health cards were not available was the same as the age pattern of polio and DPT immunizations among children whose health cards were seen; lower in infancy than at age one year, and ranging around a slightly higher level between ages two and five years. About 61 percent of infants whose health cards were not available were reported to have been given drops, which may be compared with 72 percent of infants whose health cards were available who were given a first dose of polio vaccine. At age one year, the figures were respectively 90 percent and 95 percent and, thereafter, there were between 91 and 93 percent of children whose health cards were not seen who were reported to have been given drops compared with between 96 and 97 percent recorded as having the first polio vaccine among children whose health cards were seen.

The percentages immunized against measles of the children whose health cards were seen conform roughly to the recommendation; 10 percent of infants were immunized, rising steeply to 82 percent of children aged 12-23 months, 90 and 91 percent of those aged two and three years and 93 percent of children aged four and five years.

Measles vaccination levels among children aged three years or more were about the same as they were for all three doses of DPT and polio. They were a little lower at age two years and larger difference at age one year accords with measles vaccine being given at an older age than DPT and polio.

The BCG vaccination against tuberculosis can be carried out soon after birth. In Kuwait it is recommended at age three years. The age pattern conforms with this, reaching a maximum among children aged four to five years. The maximum of 40-44 percent falls far short, however, of complete coverage at the age recommended. Since it is often recommended that BCG vaccination be given at a much older age it is possible that older children and young people display higher immunization levels than portrayed here. On the other hand the recorded figures may reflect a lack of commitment to achieving universal protection against this particular infectious disease.

Only about 9 percent of infants whose health cards were seen were fully immunized against diphtheria, whooping cough, tetanus, polio and measles, rising to 79 percent of children aged 12-23 months and around 88 percent of children aged two to five years. If the crude assumption is made that the ratio between the percentages given the first dose of polio vaccine according to mothers reports and health card records is one that holds for all doses of the polio vaccine, as well as DPT and measles vaccines, an estimate of the percentage fully immunized of children whose health cards were not seen may be obtained. Combined with the figures for children whose health cards were seen this yields a crude estimate of the percentage of all children fully immunized against polio, DPT and measles. The estimates are included also in Table 6.28. On account of the large majority whose health cards were seen, inclusion of the estimate for children whose health cards were not seen only slightly reduces the health card figure; nine percent of all infants, 78 percent of children aged 12-23 months and between 87 and 89 percent of children aged two to five years were estimated to have been fully protected through immunization against the five diseases.

6.5.5 Differentials in ultimately achieved immunization coverage

Not only were children who were living in the Capital more

likely to have been given the first dose of polio vaccine, they also displayed higher completion rates and a larger advantage in respect of full protection. First dose figures were 99 percent in the Capital, falling very slightly to 98 percent in Jahra, 96 percent in Hawalli and 93 percent in Ahmadi. By the third dose the gap had widened on account of differentials in completion rates. Almost 99 percent of children living in the Capital had received all three doses, 100 percent completion, falling to 94 percent of children living in Jahra and Hawalli, completion rates of 96 and 97 percent respectively. Finally in Ahmadi, only 85 percent of children aged between two and six years were fully immunized against DPT and polio, representing the lowest completion of 91-92 percent.

Measles immunization levels were either the same or just below full immunization levels against polio and DPT, falling from 98 percent in the Capital to 94 and 92 percent, respectively, in Jahra and Hawalli and 85 percent in Ahmadi.

The percentages of children aged two to five years who were reported to have been given drops display a different pattern by residence to that observed among children whose health cards were seen, just as they did in respect of children of all ages.

Ignoring the Capital, based on less than 50 children, the highest level was reported for children living in Hawalli, 93 percent and the lowest for children living in Ahmadi, 87 percent, with Jahra in between, 90 percent. Again, the smallest discrepancy between health card and reported immunization levels coincided with the residence in which the smallest proportion of health cards were seen, Hawalli.

Those children afforded full protection through immunization against all five infectious diseases, namely diphtheria, tetanus, whooping cough, polio and measles are also shown in Table 6.29,

both the health card figure and also the estimate for all children. It would seem that protection is ultimately extended to cover the large majority of the Capital's children, 98 percent of those whose health card were available and an estimated 96 percent of all children. The figures for Ahmadi were much lower, 85 percent and 79 percent, respectively, falling short of the "Health for All" targets which are in excess of 95 percent. Levels of full protection achieved in Hawalli and Jahra were 90 and 91 percent of children with available health cards, falling slightly to an estimated 89 and 90 percent of all children.

Smaller, though still consistent, differentials in achieved immunization levels among children aged two to five years were observed according to mother's level of education. For children whose health cards were available the likelihood of having received a first dose of polio vaccine increased with mother's education, rising from 95 percent of those who were illiterate to 99 percent of children whose mothers had preparatory or higher education. Completion rates also improved with mothers education, 93 percent in the case of mothers who were illiterate and 100 percent of mothers with secondary or higher education. Hence, just as with residence, the advantage observed in respect of the first dose widened slightly in respect of the number of children fully protected. Measles vaccination levels rose with mother's education too, from 89 percent for children whose mothers were illiterate to 97 percent of those with a secondary education.

Table 6.29 Percentage of children aged two of five years who were immunized according to type of vaccine, by selected background characteristics, KCHS 1987.

	Health Card seen					Health card not seen		All
	Polio & DPT			Comple tion	Measles	DPT+ Polio+ Measles	Drops	DPT Polio + Measles
	1	2	3					
Region								
Capital	99	99	99	100	98	98	88	96
Hawalli	97	95	94	97	92	93	93	92
Ahmadi	93	88	85	91	85	80	87	79
Jahra	98	96	94	96	94	91	90	90
Education								
Illiterate	95	92	88	93	89	85	88	84
Incomplete Primary	97	96	91	93	93	89	88	87
Primary	97	96	95	98	94	92	91	91
Preparatory	99	98	97	98	94	93	94	92
Secondary+	99	99	99	100	97	97	96	96
Current work status								
Not working	96	94	91	95	91	88	89	86
Working	98	98	98	100	96	95	97	95
Total	97	94	92	95	88	89	91	88

Among children whose health cards were not available there was a similar maternal education advantage in reported immunization levels, there being 88 percent of children whose mothers were illiterate reported to have been given drops, rising to 96 percent of those whose mothers had a secondary or higher education. And once again the discrepancy between the two estimates fell with an increasing proportion of unavailable health cards.

Ultimate levels of full protection against the five infectious

diseases displayed a clear gradient with mother's education according to health card and reported figures; 85 percent of children aged two to five years with available health cards and whose mothers were illiterate, rising to 97 percent of those whose mothers had a secondary education, the estimated figures for all children being, respectively, 84 and 96 percent.

Mother's current work status denoted a similar pattern of advantage in respect of achieved immunization levels . A small difference of two percent in the first polio vaccine and by implication DPT also, increased to seven percent in respect of the third vaccine on account of a higher completion rate for mothers currently in the workforce. Measles vaccination levels were almost the same as the third polio vaccine for mothers not in the workforce, and just below for mothers who were. The smaller discrepancy between the two sets of first polio vaccine figures was among children whose mothers were currently in the workforce, this coinciding with the highest proportion of unavailable health cards. Finally, the ultimately achieved levels of full protection against DPT, polio and measles according to the health card records were 88 percent for children whose mothers were not working and 95 percent for those who were, the estimates for all children being, respectively, 86 and 95 percent.

6.6 HEALTH CARE UTILISATION: TREATMENT OF DIARRHOEA

6.6.1 Forms of treatment

The diarrhoeal prevalence rates, to some extent, are indicative of the failure or absence of preventive measures and they also indicate ongoing susceptibility. Appropriate treatment of diarrhoea when it occurs radically reduces the worst consequences of an individual episode. Increasing attention has been given to the problem of diarrhoea since the development of a simple technique to combat dehydration, which is the principal cause of diarrhoeal death. The technique is oral rehydration

therapy or ORT (Hirschhorn, 1987; WHO, 1989). In this section , attention will be focused on forms of treatment of diarrhoea.

Table 6.30 Percent distribution of children who had diarrhoea in last two weeks according to treatment status, by age of child, KCHS 1987.

Age in months	Some treatment given	No treatment given	Total	No.of children having diarrhoea
< 12	70.2	29.8	100	94
12 - 33	86.7	13.3	100	83
24 - 35	77.8	22.2	100	45
36 - 47	82.1	17.9	100	28
48 - 59	69.2	30.8	100	26
60 - 71	85.7	14.3	100	14
Total	77.9	22.1	100	290

As may be seen from Table 6.30, about 78 percent of children under six years of age who had diarrhoea in the two weeks preceding the survey were given some treatment. The proportion of cases in which no action was taken was highest among infants, 30 percent and lowest among children at ages 12-23 months, 13 percent.

Antimicrobial/antibiotics and anti-diarrhoeal drugs were by far the most widely used form of treatment. About 46 percent of children who had diarrhoea were treated with anti-diarrhoeal syrup (pedialyte) and a further 11 percent were given tablets or injections. Thus, a total of 57 percent of children having diarrhoea, or 73 percent of those who were treated for it, were given antimicrobial or anti-diarrhoeal drugs.

Smaller numbers were given a range of other treatments. More than 8 percent of children were given oral rehydration therapy(ORT), with seven percent given a pre-packed ORT and one percent a home prepared one. About seven percent were treated with

intra-venous fluids, five percent were given other home-made solutions and almost 20 percent were given various traditional remedies.

There being only 290 children under six years of age who were reported to have had diarrhoea in the two weeks preceding the survey, it is difficult reliably to detect differences in treatment by age. It seems that infants who had diarrhoea were less likely than those aged 12-23 months to have been given some treatment for it, 70 percent compared with 87 percent. The figures for children aged two years or more fluctuate above and below the figures for children aged under two years, but the small numbers on which they were based render them of little use in establishing differentials. As for the specific treatments, children aged 12-23 months appear to have been the ones most likely to have been given anti-diarrhoeal drugs, 67 percent, compared with 55 percent of infants. Otherwise there were no discernible and consistent age differentials in treatment.

Diarrhoeal treatment according to region of residence, mother's education and current work status may be seen in Table 6.31. Once again small numbers preclude the reliable identification of differentials in specific treatments. There do, however, appear to be some fairly consistent differences, especially in respect of residence. With the exception of the Capital, which was based on only 26 children having diarrhoea the likelihood of being treated appears to have been highest in Hawalli, 84 percent, falling to 82 percent in Ahmadi and 72 percent in Jahra. Anti-diarrhoeal drugs were favoured in Hawalli, 67 percent, falling to 58 percent in Jahra and 51 percent in Ahmadi. The Ahmadi region featured the largest proportion of "other home-made solutions" and "other traditional remedies", 11 and 29 percent, respectively.

Table 6.31 Among children under six years of age having a diarrhoeal episode in last two weeks, the percent receiving various treatments by selected background characteristics, KCHS 1987.

Characteristic	Pre packed ORS	Home made ORS	Syrup	Tablets Injections	I.V fluid	Other home made solutions	Other trad. remedies	Any treatment
Age in months								
< 12	9	1	48	7	9	4	15	70
12-23	5	0	60	7	5	10	24	87
24-35	9	2	29	18	9	2	20	78
36-47	4	7	43	14	7	0	21	72
48-59	8	0	23	12	4	4	19	69
60-71	0	0	50	29	14	0	21	86
Region								
Capital	12	0	27	15	4	4	19	65
Hawalli	7	4	60	7	10	5	14	84
Ahmadi	7	0	46	5	7	11	29	82
Jahra	4	1	39	19	6	0	17	72
Education								
Illiterate	8	2	47	12	7	5	24	82
Incomp. Primary	0	0	58	21	8	0	4	83
Primary	7	4	33	13	13	0	11	69
Preparatory	2	0	46	5	2	5	32	76
Secondary +	11	0	49	7	7	13	13	73
Current work status								
Not working	6	2	46	12	7	4	21	78
Working	11	0	47	5	8	13	11	74
Total	7	1	46	11	7	5	20	78

6.6.2 Advice on treatment of diarrhoea

It might be expected that differences in the form of treatment

administered were associated with the source of advice on treatment. Respondents were asked whether they had sought advice outside of the household about treatment, and if so they were asked to indicate who from: relative/friend, untrained nurse, a pharmacist, a trained nurse or doctor, or some other person. The distribution of their responses may be seen in Table 6.32, according to selected background characteristics.

Table 6.32 Among children under 6 years of age having diarrhoea in last two weeks, the percent distribution according to source of advice on diarrhoea treatment, by selected background characteristics, KCHS 1987.

	Relative /friend	Untrained nurse	Trained nurse/ doctor	Other	No one	Total
Sex						
Male	4	–	62	3	31	100
Female	2	2	60	4	32	100
Region						
Capital	19	4	38	8	31	100
Hawalli	1	–	82	1	16	100
Ahmadi	1	1	53	4	41	100
Jahra	2	–	56	4	38	100
Education						
Illiterate	2	–	64	1	33	100
Incomplete Primary	–	–	71	4	25	100
Primary	2	2	53	7	36	100
Preparatory	5	–	58	5	32	100
Secondary +	7	2	60	7	24	100
Current work status						
Not working	2	1	63	3	31	100
Working	8	–	50	8	34	100
Total	3	1	61			

Advice about treatment was sought of someone outside the

household in respect of 68 percent of those children who were reported to have had diarrhoea in the two weeks preceding the survey. Given that there were 22 percent of children who were given no treatment for diarrhoea, and 32 percent of children for who advice outside the household about treatment was not sought, this means that there were at least 10 percent of children who had diarrhoea in the two weeks preceding the survey who were treated without seeking advice outside of the household.

In the vast majority (89 percent) of cases where advice was sought, it was sought from a trained nurse or doctor. Five percent of those who sought advice sought it from a relative, one percent from a traditional health worker and five percent from some other person.

Advice was most likely to have been sought outside the household in Hawalli, 84 percent, compared with around 60 percent in Ahmadi and Jahra. A comparison with the percentage treated suggests that treatment without advice from outside the household was more likely in Ahmadi than elsewhere, at least 23 percent compared with 10 percent in Jahra. In Hawalli it was more likely that advice was sought from a trained nurse or doctor than in Ahmadi and Jahra.

There was no education differential between mothers who were illiterate and those who had a preparatory education in the likelihood of seeking advice outside the household about the treatment of diarrhoea. Advice, however, seemed more likely to have been sought about treatment on account of children whose mothers had a secondary or higher education, 76 percent compared with 67 to 68 percent otherwise. Treatment without seeking advice outside the household appeared to have been most common in respect of children whose mothers were illiterate. A trained nurse or doctor was more likely to have been the advice provider on

treatment of children whose mothers were illiterate or with incomplete primary education.

There was practically no difference in the likelihood of seeking advice according to the mother's current working status. It seemed that children whose mothers were not in the workforce were likely to have had treated without advice and that when advice was sought it was more likely to have been sought from a trained nurse or doctor than in the case of children whose mothers were currently working.

6.7 PATTERNS OF CHILD LOSS

In this final section we take the analysis a step further by considering the profile of intervening determinants of child survival for two distinct groups. The first group is composed of ever-married women who had not experienced any child loss, and the second includes those women who have experienced one or more child loss. The underlying question is whether child loss occurrence is more of a random event (i.e. the occurrence of death in the two groups is similar regardless of the level of intermediate variables) or whether child loss exhibits clear features that require further manipulation.

Table 6.33 Distribution of Ever-married Women by duration since first marriage, Education and child loss experience, KCHS 1987.

Duration	No Child Loss				With Child Loss			
	< Prim.		Prim. +		< Prim.		Prim. +	
	%	n	%	n	%	n	%	n
0-4	23. 0	149	77.0	504	26.7	4	73.3	11
5-9	32.3	287	67.7	607	52.9	37	47.1	33
10-14	49.7	382	50.3	384	67.6	73	32.4	35
15-19	64.5	363	35.5	199	80.7	88	19.3	21
20 +	80.1	522	19.9	130	87.3	214	12.7	31
All Durations	48.3	1703	51.7	1824	76.1	416	23.9	131

Table 6.33 presents the distribution of child loss experience according to educational status of women for different durations of marriage. It shows that more than three-quarters of women experiencing a child loss are not educated and that women not experiencing a child loss have a much lower percentage of uneducated women. Thus women experiencing child loss are more likely to be uneducated than those not experiencing a child loss. The relative risk of being uneducated for those exposed to child loss is statistically significant.

Older women are more likely to experience a child loss than younger ones, and older women are more likely to be uneducated. Thus, it is important to adjust for the age distribution bias by comparing educational status of the two groups for fixed married durations. For each marriage duration considered, the likelihood of being uneducated is higher for those experiencing a child loss. The relative risk of being uneducated for those exposed to child loss is statistically significant in most duration-of-marriage categories.

Table 6.34 Distribution of Ever-married Women by duration since age at first marriage, and child loss experience, KCHS 1987.

Duration	No Child Loss						With Child Loss					
	< 15		< 18		18 +		< 15		< 18		18 +	
	%	n	%	n	%	n	%	n	%	n	%	n
0-4	2.6	17	26.6	175	73.4	483	-	-	26.7	4	73.3	11
5-9	4.4	9	32.4	290	67.6	606	1.0	4	38.6	27	61.4	43
10-14	10.0	77	47.1	362	52.9	406	12.0	13	52.8	57	47.2	51
15-19	14.7	83	58.4	329	41.6	234	19.2	23	63.3	76	36.7	44
20 +	26.7	175	75.0	491	25.0	164	28.3	70	77.7	192	22.3	55
All Durations	10.2	361	46.5	1647	53.5	1893	19.6	110	63.6	356	36.4	204

Table 6.35 Distribution of Ever-married Women by duration since age at first marriage, Relation to husband and child loss experience, KCHS 1987.

Duration	No Child Loss						With Child Loss					
	1st cousin		Any relation		No relation		1 st cousin		Any relation		No relation	
	%	n	%	n	%	n	%	n	%	n	%	n
0-4	28.3	186	48.0	316	52.0	342	53.3	8	66.6	10	33.3	5
5-9	27.8	249	46.7	418	53.3	478	32.9	23	60.0	42	40.0	28
10-14	29.0	223	52.3	403	47.5	365	33.3	36	61.1	66	38.9	42
15-19	31.1	175	56.4	318	43.5	245	34.5	38	63.6	70	36.4	40
20 +	33.7	221	58.6	384	41.4	271	47.8	85	86.5	154	13.5	24
All Durations	29.8	1054	51.9	1839	48.1	1701	39.5	190	71.1	342	28.9	139

Table 6.36 Mean number of children ever born per ever married woman by duration since first marriage and child loss experience, KCHS 1987.

Duration	No Child Loss		With Child Loss	
	Mean	n	Mean	n
0 - 4	1.08	658	2.67	15
5 - 9	2.93	896	4.30	70
10 - 14	4.65	768	6.13	108
15 - 19	6.34	563	7.82	110
20 +	7.60	721	9.42	266

Table 6.37 Distribution of Ever-married Women by duration since first marriage, age at first marriage and child loss experience (among EMW with less than primary education and CEB > 0), KCHS 1987.

Duration	No Child Loss						With Child Loss					
	< 15		< 18		18 +		< 15		< 18		18 +	
	%	n	%	n	%	n	%	n	%	n	%	n
0-4	10.9	11	41.6	42	58.4	59	-	-	25.0	1	75.0	3
5-9	8.6	24	51.8	145	48.2	135	13.5	5	43.2	16	56.8	21
10-14	14.4	54	57.2	215	42.8	161	12.3	9	58.9	43	41.4	30
15-19	18.4	66	66.3	238	33.7	121	19.3	17	72.7	64	27.3	24
20-24	23.6	72	72.5	221	27.5	84	18.6	19	72.5	74	27.5	28
25-29	24.0	35	73.3	107	26.7	39	27.3	21	79.2	61	20.8	16
30-34	53.1	34	96.9	62	3.1	2	45.7	16	91.4	32	8.6	3
All Duration	18.2	298	36.8	1032	36.8	601	21.3	89	70.1	293	29.9	125

Turning to the intermediate determinants, Tables 6.34, 6.35 and 6.36 provide information on reproductive pattern of women. The three tables indicate that women experiencing child loss tend to marry younger, they are more likely to be married to their cousins and have much higher parity than women not experiencing a child loss.

The unfavourable reproductive pattern is usually strongly associated with educational status. Since women experiencing a child loss are more likely to be uneducated, it is possible that the unfavourable reproductive pattern portrayed in Tables 6.34-6.36 is a reflection of educational status. To investigate whether unfavourable reproductive pattern is a risk factor associated with mortality, the analysis is repeated for females with less than primary certificate (i.e. controlling for educational status). The results are shown in Tables 6.37-6.39.

The three tables indicate that in general those experiencing a child loss are more likely to have entered marriage at younger ages and to have higher parity, but that the consanguinity factor is not associated with child survival. Furthermore, if we restrict the analysis to the more recent experience (those married less than 15 years ago), age at first marriage does not appear as a risk factor. Parity remains a risk factor that is associated with child loss. It should be emphasised that the direction of the relation is not clear: parity may have influenced child loss but also child loss itself influences parity.

Controlling for education, the analysis does not show that young ages at marriage and consanguinity act as risk factors of survival in the Kuwaiti context. Parity may be a risk factor, but to confirm that more information is needed (parity prior to death of a child).

Table 6.38 Distribution of Ever-married Women by duration since first marriage, age at first marriage and child loss experience (among EMW with less than primary education and CEB > 0), KCHS 1987.

Duration	No Child Loss						With Child Loss					
	1st cousin		Any relation		No relation		1st cousin		Any relation		No relation	
	%	n	%	n	%	n	%	n	%	n	%	n
0-4	37.6	38	68.3	69	31.7	32	75.0	3	100.0	4	-	-
5-9	35.4	99	61.4	172	38.6	108	35.1	13	64.9	24	35.1	13
10-14	36.2	136	67.3	253	32.7	123	37.0	27	65.8	48	34.2	25
15-19	36.5	131	70.5	253	29.5	106	37.5	33	65.9	58	34.1	33
20-24	38.4	117	69.5	212	30.5	93	38.2	39	67.6	69	32.4	33
25-29	33.6	49	59.6	87	40.4	59	44.2	34	72.7	56	27.3	21
30-34	32.8	21	56.3	36	43.8	28	17.1	61	42.9	15	57.1	20
All duration	36.1	609	66.3	1117	33.7	569	37.6	163	65.8	285	34.2	148

Table 6.39 Mean number of children ever born per ever married woman with at least one live birth by duration since first marriage, education status and child loss experience, KCHS 1987.

Duration	No Child Loss		With Child Loss	
	< Prim.	Prim +	< Prim.	Prim +
0 - 4	1.70	1.48	3.25	2.45
5 - 9	3.41	2.80	4.57	4.00
10 - 14	5.44	4.05	6.58	5.20
15 - 19	7.04	5.25	7.95	7.27
20 - 24	8.10	6.36	9.56	8.91
25 - 29	8.45	7.46	9.35	7.36
30 - 34	8.09	6.60	10.5	8.82

To allow further refinement of the prior analysis, an investigation is performed on the joint interaction force of the three reproductive factors. An index of reproductive pattern is constructed and the risk of child loss for those with favourable pattern is compared with the risk for those with unfavourable pattern and statistically tested for significance. The analysis is confined to uneducated women (to control for the effect of education on risk of death through other routes), with less than 15 years of marriage (to reflect recent experience of child loss), and classified by duration of marriage (to offset the duration of exposure effect on child loss).

The index is constructed as follows:

- Unfavourable reproductive pattern: age at first marriage less than 18, first-cousin marriage and parity greater than the mean for each duration group considered;
- Favourable reproductive pattern: age at first marriage 18 or more, no blood relation to husband and parity less than the mean for each duration group considered.

Table 6.40 shows the percentages of ever-married women by type of reproductive pattern, duration of marriage and child loss

experience for those ever married women with less than primary education and at least one live birth.

Table 6.40 Percentage of ever married women according to type of reproductive pattern, duration of marriage and child loss experience (among those with less than primary education and at least one live birth), KCHS 1987.

Duration of Marriage	Reproductive Pattern				Odds Ratio
	Favourable Age at marriage>18, No relation, Parity < Mean		Unfavourable Age at marriage<18, 1st cousin, Parity > Mean		
	No child loss	Child Loss	No child Loss	Child Loos	
0 - 4	5	-	7	1	-
5 - 9	35	3	31	6	2.26
10 - 14	34	3	40	13	3.68

The odds ratios of the 5-9 and 10-14 duration-of-marriage groups are 2.26 and 3.68, respectively. The interpretation of the first ratio is that uneducated women married for 5-9 years with unfavourable reproductive pattern have more than double (2.26) a chance of experiencing a child loss compared to women with favourable characteristics. Those with duration of marriage 10-14 years have more than triple (3.68) a chance of experiencing a child loss. These ratios appear rather large, but as the numbers of cases are too small their variability are also quite large and the statistical test indicates that their values are within normal variation. Thus the hypothesis that the odd ratio is equal to 1 is not rejected and the data does not confirm that the recent unfavourable reproductive pattern is a risk factor for death.

The justification for this rather unexpected conclusion is related mainly to the existence and utilisation of an excellent reproductive health care system. Tables 6.41 and 6.42 provide information on maternal care and breast-feeding patterns for women with less than complete primary education, who had their last live

birth less than 5 years ago, by duration since first marriage and child loss experience.

Both tables do not indicate that women experiencing child loss are more likely (than those not experiencing child loss) to have an unfavourable maternal care or breast-feeding pattern.

Table 6.41 Maternal care for uneducated women (< Prim) with last live birth less than 5 years ago by duration since first marriage and child loss experience, KCHS 1987.

Duration	Antenatal Care		Delivery in H.Establ.		Post-Natal check-up	
	No child loss	1+child loss	No child loss	1+child loss	No child loss	1+child loss
0 - 4	93.0	100.0 (4)	94.0	100.0 (4)	75.0	75.0
5 - 9	93.8	82.9	94.9	94.3	68.1	80.0
10 - 14	93.6	92.5	92.0	95.5	75.7	76.1

Table 6.42 Breast-feeding pattern for uneducated women with last live birth less than 5 years ago by duration since first marriage and child loss experience, KCHS 1987.

Duration	% Breast-feeding LLB		% Breast-feeding more than 12 months among those breast-feeding calculated for LLB born 1-4 years prior to the survey who are alive at survey or survived at least 12 months	
	No child loss	1+child loss	No child loss	1+child loss
0 - 4	74.0	100.0	29.4	33.3
5 - 9	91.7	80.0	34.7	51.7
10 - 14	90.6	89.6	48.3	57.1

Thus, this analysis does not indicate that fertility and breast-feeding patterns acted as risk factors for child loss in Kuwait. It also shows universal favourable antenatal and delivery practices in Kuwait.

Other routes which can affect child survival are related to personal illness control practices. It has already been shown that illiterate women were less likely to immunize their children and less likely to report diarrhoea. The figures thus suggest that further improvements in child survival can be achieved if more efforts were to be directed to improving child care programmes.

CHAPTER 7

SUMMARY AND CONCLUSIONS

This study is concerned with an analysis of the bio-demographic determinants of fertility and child health in Kuwait. The main source of data for this study is the 1987 Kuwait Child Health Survey (KCHS). This final chapter provides a summary of the main findings of the study and identifies the main features of reproductive and child health patterns in Kuwait.

KUWAIT CHILD HEALTH SURVEY

The Kuwait Child Health Survey was conducted in 1987. A nationally representative probability sample of 3,740 Kuwaiti households was drawn from a master sampling frame. The sample was a stratified, multi-stage sample, with equal probability of selection. Four questionnaires were utilised in the survey, namely: the household questionnaire, the household utilities module, the maternal care questionnaire and the child health questionnaire.

MARRIAGE PATTERNS

The data from the KCHS show significant shifts in the age pattern of first marriage in Kuwait as we move from the oldest to the more recent cohorts. The net effect has been a change in first marriage pattern from an early sharp peak to an early broader and lower peak pattern.

The remarkable shifts in the tempo of nuptiality reflect, of course, an upward trend in age at marriage. The results indicate that over the last 15 years or so, average age at marriage has risen by more than three years; for example, the median age at first marriage has increased from about 17.2 years for women at ages 40-45 to 18.7 years for women at ages 30-34 and to 19.1 years for women aged 25-29 years. Accompanying the trend toward later

marriages has been a tendency for first marriages to become spread over a wider age range.

The decreases in first-marriage rates have been substantial at ages under 22. In fact, the decline in teenage marriages explains a large part of the recent changes in nuptiality in Kuwait.

Age at marriage is also associated with region of residence and level of education. The youngest marriage pattern is found in the Jahra and Ahmadi regions and the oldest in the Capital region. It may be inferred that increasing educational opportunities for young Kuwaiti women is largely responsible for the recent decline in early marriage and the upward trend in age at marriage particularly in the Capital and Hawalli governorates.

FERTILITY PATTERNS

The average number of children ever born for all ever-married women is 4.9, and for those aged 45-49 is 8.0. About 6 percent of all ever-married women are childless; 20 percent have had one or two live births; 24 percent three or four; 20 percent five or six; 15 percent seven or eight; and the remaining 15 percent nine or more.

The KCHS data suggests that primary sterility is low (about 2 percent). Among women aged 45-49, one woman in 16 has had a family below replacement level (0, 1 or 2 live births), but at the other extreme, one woman in two had 9 or more children, and one woman in three had 11 or more children.

The picture that emerges from the analysis indicates that fertility in Kuwait is high, with a reported total fertility rate of about 6.5 live births per woman. There are, however, significant differences in recent and current fertility according to region of residence and maternal education. The results show an inverse association between level of education and both completed

and incomplete fertility. Variation in recent and current fertility by region of residence is quite substantial.

FAMILY PLANNING

The results of the KCHS indicate that about 56 percent of ever-married women have used a method to regulate their fertility at some point in their lives. Region of residence, level of education and current work status are the characteristics most associated with ever-use. The Capital and Hawalli governorates show the highest levels of ever-use, 82 and 69 percent, respectively, while the Ahmadi and Jahra regions show a rate of around 42 percent.

The percentage of current users among all currently married women is 35 percent. Almost all users rely on modern methods. The pill comprises 70 percent of all current use, followed by the IUD (11 percent) female sterilisation (6 percent) and other efficient methods (5 percent), while traditional methods account for the remaining 8 percent of all current use. Differentials in current use of contraception by socio-economic variables follow very closely the differentials with respect to ever-use. They are also in the same direction as differences in current fertility levels.

The pattern of contraceptive practice revealed by the KCHS suggests that most of the regional variation in current fertility in Kuwait can be accounted for by variations in both age at marriage and contraceptive use. The KCHS findings suggest that with increasing levels of education and modernization, a growing number of Kuwaiti women will use contraception not only for spacing purposes but also as a method of fertility control.

DETERMINANTS OF FERTILITY

A multivariate analysis of KCHS data on reproductive patterns has revealed that age at first marriage has a highly significant

impact on the number of children ever born, a finding that is consistent with much of the demographic literature. For each year of marriage delayed, CEB decreases by 0.28 children.

A clustering of the regions puts the Capital region in the category with the lowest fertility, followed by the Hawalli region with a fertility level below or close to the national average. The Ahmadi and Jahra regions are the clear extreme in terms of high fertility.

Maternal education depicts a statistically net negative impact on CEB with a general increasing trend in the net effect as the level of maternal education increases. The largest net negative effect occurs for women with a secondary education, which confirms that advanced female education is a crucial factor linked to lower fertility. The analysis also shows that female education is strongly associated with later age at first marriage.

The analysis, however, shows an unexpected significant positive impact of ever use of contraception on the number of children ever born. Ever users have, on average, 0.54 children more than never users after controlling for other factors. This positive impact of contraceptive use on fertility may be due to one or more of the following factors: (i) irregular and/or improper use of contraceptive methods; (ii) the use of contraception as a substitute for prolonged breast-feeding; and/or (iii) contraceptive methods used for short periods of time, i.e. for low continuation rates.

INFANT AND CHILD MORTALITY

The KCHS results indicate that significant progress has been made in reducing infant and child mortality since the early 1970s, when at least 45 out of ever 1,000 children born alive had died in infancy and at least 58 out of every 1,000 live births died before their fifth birthday. This compares with an infant mortality rate

of 24 and an under-5 mortality rate of 29, per 1,000 live births, according to the mortality conditions of the mid-1980's. The results also show lower female than male infant and child mortality throughout the period considered. The reduction in mortality appears to have been especially pronounced during the 1970s. Thereafter, a much more gradual decline in mortality, especially in infancy, is observed. The transition to lower mortality has been shared by almost all socio-economic groupings. There are, however, differentials in infant and child mortality, most notably according to region of residence and maternal education.

The spread of the mortality decline was faster in the Capital region than in the remaining governorates. In 1985, infant mortality in the Hawalli, Ahmadi and Jahra regions was about twice as much as the level shown for the Capital. Further, the level of infant mortality in these three regions was higher than the level of under-5 mortality in the Capital. This calls for further health interventions in these regions, particularly in Jahra.

BREAST-FEEDING PATTERNS

Almost ninety percent of children were reported to have been breastfed, with a relatively short estimated mean duration of breast-feeding between nine and ten months. The mean age at supplementation with solids is around five months, leaving about five and a half months between the introduction of solids and final weaning.

A sizeable number of infants who were already weaned had been weaned under three months of age. One in two of these had been weaned on account of there being insufficient milk. The analysis, however, suggests that there is scope for increasing levels of breast-feeding so as further to maximise the infant's physical and emotional well-being.

There were significant differences in breast-feeding behaviour

according to residence and mother's education. These appear to reflect differential access in the broadest sense to maternal and child health facilities including family planning and also differential access to work.

Residence in the Capital was associated with the youngest mean age at supplementation with solids and the earliest weaning, and the shortest interval between the introduction of solids and final weaning. Next was residence in Hawalli, followed by Ahmadi and, finally, Jahra which on the whole featured the latest supplementation, longest duration of breast-feeding and longest interval between the introduction of solids and weaning.

Maternal education differentiated significantly in respect of breast-feeding behaviour, illiterate mothers featuring the greater likelihood of breast-feeding, later introduction of solids and later weaning, longer interval between supplementation with solids and weaning, and the greater likelihood of weaning on account of involuntary physiological factors or mother's pregnancy. Within the group of literate mothers, the duration of breast-feeding, the age at supplementation with solids and the interval between the introduction of solids and weaning all fell with increasing level of education.

DIARRHOEAL MORBIDITY

Diarrhoeal disease is a major contributory cause of death in infancy and childhood. Just under 4 percent of children under six years of age were reported to have had at least one diarrhoeal episode in the two weeks preceding the survey. It was most common among children under two years of age (7 percent), falling sharply thereafter. The small number of children who were reported to have had diarrhoea made it difficult reliably to detect differentials.

HEALTH CARE UTILIZATION

MATERNITY CARE

The KCHS data indicates that about 95 percent of women whose most recent live birth had occurred in the past five years had a pregnancy check. It was estimated that almost two thirds of pregnancies are checked in the first three months, and nine in ten in the first five months, of the pregnancy. This leaves a not inconsiderable number of women who either have no pregnancy check, or whose first check is delayed until late in the pregnancy. The reported number of pregnancy checks indicates that there is to be about a fifth of women who have very few checks, the remainder depicting ante-natal care on a regular basis subsequently to their first check. Effectively, all pregnancy checks were carried out by a doctor.

All but three percent of women gave birth in a hospital or clinic. Almost six in ten deliveries were attended by a doctor and four in ten by a trained nurse, leaving only two percent attended by a relative, a traditional nurse or no-one. A doctor was thus much more likely to have carried out a pregnancy check than to have attended a delivery.

Two out of three women whose last child was born five or less years prior to the survey had received a post-natal check, considerably less than the number who had received an ante-natal check. A slightly lower proportion of post-natal than of ante-natal checks were carried out by a doctor.

Family building patterns were associated with consistent differences in maternal care. Women who started childbearing later than average appeared to be the ones most advantaged in respect of the level and timing of ante-natal care and of attendance at the delivery.

IMMUNIZATION

Virtually every child under six years of age had a health card, and four out of five of these cards were available at the interview so that immunization records could be extracted from them. Nine out of ten children were reported to have been immunized, or at least to have commenced a course of immunization; 93 percent of those whose health cards were available, 84 percent whose health cards were not available and 69 percent of those with no health card.

Immunization levels against diphtheria, pertussis (whooping cough), tetanus and polio, among children whose health cards were seen, were high, 96-96 percent of children aged two to five years having received the first dose, a completion rate of around 95 percent. Marginally lower figures among children aged 12-23 months implied that recommended ages were not quite adhered to. The figures for children whose health cards were not available or who had no health cards suggested there to have been up to five percent fewer children who had been given the first dose of polio vaccine.

About 93 percent of children aged four and five years whose immunization records were available had been vaccinated against measles, this being very slightly higher than the two and three year figures.

Immunization against tuberculosis was much less common, reaching a maximum of 40-44 percent among children aged four and five years whose health cards were seen, far short of complete coverage at the age recommended.

There were fairly consistent differentials in immunization levels according to residence and maternal education. Children living in the Capital were more likely to have been immunized, and they displayed higher completion rates of the triple vaccines.

Ahmadi featured the lowest immunization coverage and the lowest completion rates.

Immunization coverage and completion rates increased with mother's education. An estimated 84 percent of children aged two to five years whose mothers were illiterate, rising to 96 percent of those whose mothers had at least a secondary education had been fully immunized against diphtheria, pertussis, tetanus, polio and measles. Only one in four children aged five years whose mothers were illiterate had been vaccinated against tuberculosis, rising to four out of five children whose mothers had a secondary education.

DIARRHOEA TREATMENT

About 78 percent of children having diarrhoea were given some treatment for it. The proportion of children who were not given any treatment was highest among infants, 30 percent, and lowest among children aged 12-23 months, 13 percent. About 57 percent of children having diarrhoea, or 73 percent of those who were treated for it, were given antimicrobials or anti-diarrhoeal drugs. Only 8 percent of children having diarrhoea were treated with oral rehydration therapy (ORT), while 7 percent were treated with intravenous fluids, 5 percent with other home-made solutions and almost 20 percent were given various traditional remedies.

CONCLUDING REMARKS

The analysis of KCHS data suggests that the unfavourable reproductive and breast-feeding patterns prevailing among Kuwaiti women do not seem to have resulted in high levels of mortality in childhood. Excellent utilization of reproductive health care has negated the adverse effects of the current reproductive pattern. Further, the universal availability of safe drinking water and good sanitation seem to have reduced the infectious hazards associated with the change from breast-feeding to bottle feeding. It is also to be expected that economic resources must have allowed families to offset some of the other negative impacts of unfavourable

reproductive and feeding patterns through the provision of care and domestic help for the mother and the provision of suitable diet for both mother and child.

The forces that managed to reduce infant and child mortality in Kuwait are all macro forces dependent on wealth and governmental concerns for health. These forces have overcome the usual constraints posed by social resources of women and managed to minimize the adverse effects of unfavourable reproductive and breast-feeding patterns.

Nevertheless, awareness and monitoring of the various determinants of fertility and child survival are important for gaining insights useful to population and health policies. It is obvious that policies aimed at improving the availability and accessibility of child health care services, particularly immunization and treatment of infectious diseases, and of maternal health care services, particularly those related to post-natal care and birth spacing, would in all likelihood lead to further improvements in maternal health and child survival in Kuwait. The target groups for achieving healthy population are illiterate women and those living in Ahmadi and Jahra regions.

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