

FINAL REPORT

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## ACKNOWLEDGEMENTS

This project was undertaken jointly by the Department of Statistics of the Hashemite Kingdom of Jordan and the Carolina Population Center of the University of North Carolina at Chapel Hill. The project was supported by the Research Triangle Institute through a grant from USAID under the project, Task Order #11.

Several people have worked on this project. Mr. Fathi Al-Nsour and Mr. Hikmat Al-Khader Yousef from the DOS worked very diligently on the preparation of data files for analysis. Ms. Judy Kovenock and Ms. Carolyn Smith of the computer services section of the Carolina Population Center supervised the training of DOS staff at Chapel Hill and assisted in the computer processing of data for this report.

We are grateful to Dr. Borhan Shrydeh, the Director General of Statistics of the Hashemite Kingdom of Jordan for his official approval to use the JFS 1976 data and for his continued support in all the project activities. Our thanks also to Dr. Jim Knowles and Elizabeth Heilman of Research Triangle Institute, and Jack Thomas of USAID Amman for their support of this project.

## Patterns of Contraceptive Use in Jordan

### Introduction

In Jordan, as in every other nation in the world, some women who are exposed to the risk of pregnancy use contraception and others do not. There is now an extensive research literature on the subject of determinants of contraceptive behavior which covers both a large number of populations and a large number of independent variables. However, there are two significant gaps in this literature which we address in this study using the 1976 Jordan Fertility Survey. The first is the pattern of contraceptive use in Jordan. While this is not the first study to examine contraceptive behavior, it is the most thorough and hence reveals more clearly what is happening (as of 1976) in this high-fertility country. The second goal of this study is to examine the effect of contextual variables upon contraceptive use. As noted by Ronald Freedman (1974:6):

There are relatively few instances in which measures of some aspect of the community or social milieu as ecological or collective properties have been related to measures of fertility and family planning for individuals.

The examination of differential contraceptive use by characteristics of individuals is quite straightforward. Does contraceptive use increase as individuals have more living children or more living sons? Do the higher educated use contraception more than the less educated? Do Christians use contraceptives more often than Muslims? etc. The effect of these and other individual characteristics are examined in this study. But beyond the characteristics of the individual, is contraceptive use also affected by characteristics of the environment in which a woman lives? This question of contextual effects is a central concern of this study.

At one level, almost all studies recognize the importance of the environment upon behavior since they distinguish between nations and between rural and urban segments within the populations. Sometimes regions within a country are also recognized as distinctive and hence receive special attention. Making such distinctions implicitly shows a concern that the area in which a person lives influences behavior. The ecological level of primary interest here, however, is the immediate neighborhood within which a woman resides. How do the characteristics of the local community affect the behavior of those who reside in it?

We must first ask why one might expect the local environment to influence a woman's decision to use or not use contraception. It could be that it is through neighbors that a woman learns about various methods of contraception, but this will not explain much of the variance in use in Jordan. Virtually all ever-married women in Jordan have some knowledge of contraceptive methods, and fully 96% report knowledge of the pill as a method. But beyond knowledge, the neighborhood can influence contraceptive behavior by legitimating family planning for women. We can reasonably expect that the acceptability of this particular behavior for an individual woman is affected by the prevalence of this behavior among those in her reference group. Further, neighborhoods may vary significantly with respect to the degree of access they provide to contraceptives. In general, one expects that contraceptives are more readily available in urban areas than in rural ones, but there may also be substantial differences between areas within the rural or urban contexts.

Before proceeding to examine the pattern of contraceptive use it is useful to review briefly the demographic and social setting in Jordan. We also describe the Jordan Fertility Survey and the methods used in analyzing the data before reporting the findings. Following the discussion of the findings, we explore the implications of these findings for social policy in Jordan.

## Part 1. General Overview

### 1.1 Introduction

Data presented in this part highlights some socio-economic conditions in Jordanian society. They cover subjects which are considered relevant to the objectives of the present research. In general, they cover the years of 1972 and 1976 in which the two Jordanian Fertility Surveys were conducted. The main sources of these data are the findings of the above mentioned two surveys, and those of the 1976 Multi-purpose Household Survey.

### 1.2 Socio-economic Background

The Hashemite Kingdom of Jordan gained its independence from the Ottoman Empire in 1923. In 1950, following the Arab-Israeli War of 1948, the West Bank of Jordan was officially declared part of the Kingdom. As a result of the June War in 1967, the West Bank was entirely occupied by Israeli forces. Consequently, the data presented in this background as well as in the rest of this report, refer only to the East Bank of Jordan, which hereafter will be called Jordan.

In 1975 the population of Jordan was estimated to be 1.8 million, persons living in an area of about 56,000 square miles, of which about 89 percent is Badia (semi-desert).

As in many other developing countries, the population of Jordan is very young. Over 50 percent of the total population are less than 15 years of age. The widening gap between high birth rate (estimated to be about 48 per thousand population in 1975) and a declining death rate (about 13 per thousand in the same year) contributed to both the young age distribution and a large average household size. Even apart from the positive immigration, the current rate of natural increase of about 3.5 percent would double the population in about 20 years.

Jordanian society is characterized as being a homogenous community. Three main social groups are urbanites, rurals and semi-nomads. Most of the semi-nomads live in the Badia area of eastern Jordan and the majority of these are now settled in permanent dwellings in scattered villages of that area. The social and economic changes leading to settlement of the semi-nomads have largely occurred during the last decade and are attributed to development programs launched by the government including sedentarization plans aimed at changing the life of the Badia inhabitants. Hence, it could be safely stated that the pattern of beduin life is gradually diminishing in the Jordanian society.

Jordan is a Muslim country, with about 96 percent of its total population Muslim. The remaining 4 percent are mainly Christians and concentrated in certain areas of the country. Ethnicity is virtually non-existent, with about 0.7 percent Circassians who are entirely Muslims and a negligible minority of Durzis and Armans.

Affected by Islamic teachings, family structure in Jordan is characterized by strong bonds. Social life, family relationships, social events, and behavioral norms are highly valued, respected and maintained. The average size of a private household is large by Western standards (6.6 persons for the entire country, 6.4 in urban areas and 6.7 in rural areas). The 1976 Multi-purpose Household Survey indicated that almost half of all households, both urban and rural, consist of 7 or more persons.

In general, the illiteracy ratio in Jordan is low compared to many countries in the region. The above mentioned survey indicated that the illiteracy rate among those 12 years old and older amounted to 29.3 percent. Vast differences in illiteracy rates do exist between males and females (17.8 and 40.9 percent respectively) and illiteracy is much lower in urban areas

than in rural areas (26.0 compared to 44.3 percent). An indicated 61.4 percent of rural females are illiterate.

Medical and health services are generally considered satisfactory. More attention and concentration are being given to preventive medical measures and related services. Controlling epidemics as well as progress achieved in public health and sanitary services have resulted in a decline in death rates, especially infant and early childhood mortality. In this regard, Jordan is thought to rank first in the region. Medical services, rendered by the public sector, are provided free for all military personnel and their families, as well as for civil servants. Other segments of society are treated according to a nominal-pay basis, and sometimes the poor are treated free.

Immigration to the East Bank from occupied Palestine in 1948, and from the West Bank and Gaza Strip in 1967, as well as internal migration from rural to urban areas have contributed to a high rate of urban growth. The proportion of the population living in urban centers has almost doubled during the past 24 years, jumping from 32 percent in 1952 to over 58 percent in 1975. This situation is aggravated due to the concentration of public administration, services, and industrial and commercial activities in certain cities, especially Amman (the nation's capital), Zarqa and Irbid. In 1975 the combined population of these three largest cities comprised about 54 percent of the total population of Jordan.

The rate of participation in economic activity is very low in Jordan. The 1976 Multi-purpose Household Survey indicated that only 20 percent of the total population are in the labor force, thus increasing the ratio of economically inactive to economically active to a remarkably high 4:1. Both the low rate of female labor force participation (about 8.5 percent of total females aged 15-64) and the high proportion of the population younger than 15 contribute to this.

The proportion of the population working in agricultural activities is noticeably decreasing and now does not exceed 13 percent. Drawn by attractions of the cities and big towns, many people left work on farms and, either with or without their families, went to urban areas seeking better and more profitable jobs. The proportion of those working in industrial activities is gradually increasing and a strikingly large porportion (about 50 percent of the total labor force in the country) is now engaged in the public administration and services sector. Clearly, Jordanian society has become more consumptive than goods-productive. Fully aware of the adverse implications of this change, the government has, in recent years, started to direct more attention to agricultural productivity through specially designed development programs. In addition, it is encouraging the private sector through several procedures and facilities for investment in the agricultural sector.

### 1.3 Family Planning Services

Birth control is a very sensitive issue in Jordan. Religious and other societal-cultural values make it difficult to deal with family planning matters openly and explicitly. Organized family planning in Jordan is a new phenomenon. "The first private family planning association in the East Bank of Jordan was established in 1971 in the city of Irbid. This was followed by few others established during 1972-1975 in the city of Amman itself" (El-Asad, 1978). There exist so far only five private family planning clinics.

Jordan has no explicit formal population policy. Nevertheless, based on the findings of the 1972 Fertility Survey, the government became more aware of interrelationships between population factors and socio-economic development planning. In March, 1973 the government established the National Population Commission to take over the responsibility of planning and promoting a

national population policy. Yet, so far, no definite policy has been established.

Although the government fully recognizes the right of parents to determine freely and responsibly the number and timing of their children, the official position of the government in recent years has tended to support family planning, with services offered through fifty Maternal and Child Health (MCH) Centers run by the Ministry of Health. This is apart from ten MCH Centers run by UNRWA to provide medical services for the Palestinian refugees.

Furthermore, through its development programs, the government modifies factors associated with high fertility such as education, health, nutrition and status of women.

#### 1.4 Marital Stability

Marriage is relatively early and virtually universal among women in Jordan. According to marriage records, about 59 percent of the females married in 1976 were less than 20 years of age. Also, the 1976 JFS (Table 4.7, p. 31) indicated that 79 percent of all ever-married women were married before they reached the age of 20. A tendency for rural women to marry earlier than their urban counterparts is reflected in the fact that age at marriage among ever-married women was less than 20 for 84.4 percent of the rural women and for 74.5 percent of urban women (Table 4.6, p. 29).

Another clear phenomenon is that marriage is relatively stable in Jordan. The above mentioned survey (Table 4.7, p. 31) indicated that, of all ever-married women, only about 7 percent of first marriages had been dissolved, with 3.8 percent due to death of husband, and 2.9 percent due to divorce. Moreover, about half of the women whose first marriages were dissolved had remarried.

## 1.5 Fertility Behavior

1.5.1 Fertility Levels. The two Jordanian Fertility Surveys conducted in 1972 and 1976 indicated that Jordanian women have a very high fertility level, possibly one of the highest in the world. The total fertility rate observed in 1976 was as high as 7.3 live births (JFS, 1976, Table 5.20, p. 52). Furthermore, the figures in Table 1 below show that the overall mean number of children ever born to all ever-married women is 5.4. This is a high average, since the sample includes many young women who still anticipate long reproductive lives. This average is less than the overall mean observed in the 1972 Fertility Survey (6.1) which may be due in part to different age compositions in the two surveys.

1.5.2. Fertility Differentials. The findings of both 1972 and 1976 JFSs indicated a clear inverse relationship between fertility and level of education. In 1976, the mean number of children ever born was 6.3 for women with no schooling compared to means of 3.7, 3.0, and 2.7 for women with elementary, preparatory, and secondary or more education, respectively (Table 5.5, p. 42).

Slight differences in mean live births were observed between urban (5.3) and rural (5.6) areas (Table 5.10, p. 46) but differentials within urban and within rural areas (e.g., those associated with education) seem stronger. It is important to note, however, that different age distributions may significantly influence these findings.

Muslim women tend to have relatively high fertility (a mean of 6.1 live births) compared to about 4.8 for non-Muslim women (Table 5.4, p. 41).

There are also some differences in fertility by wife's pattern of work. Women who are currently working have a mean number of 4.8 live births, while those who worked earlier have a mean of 5.1, and those who never worked have a mean of 5.5 live births (Table 5.9, p. 45).

Table 1. Mean Number of Children Ever Born to Ever-Married Women in the 1972 and 1976 Fertility Surveys

| Age      | 1972<br>Fertility<br>Survey | 1976 Fertility Survey |                      |
|----------|-----------------------------|-----------------------|----------------------|
|          |                             | Household<br>Survey   | Individual<br>Survey |
| 15-19    | 0.8                         | 1.0                   | 0.9                  |
| 20-24    | 2.4                         | 2.5                   | 2.4                  |
| 25-29    | 4.4                         | 4.1                   | 4.2                  |
| 30-34    | 6.1                         | 6.0                   | 5.9                  |
| 35-39    | 7.5                         | 7.5                   | 7.3                  |
| 40-44    | 8.3                         | 8.3                   | 8.6                  |
| 45-49    | 8.2                         | 8.6                   | 8.8                  |
| All Ages | 6.1                         | 5.6                   | 5.4                  |

Source: JFS, Principal Report 1979, Table 5.1, p. 37.

Some differences in fertility have been observed when husband's occupation was considered. Women whose husbands are working in technical and clerical occupations have a mean of 4.9 live births compared to 5.5 for wives of skilled workers and 5.8 for those whose husbands are working in household and other services (Table 5.7, p. 43).

In marked contrast to the apparent similarities in overall mean live births, estimates of total fertility rate which takes differences in age structure into consideration showed substantial differences between urban and rural areas. The rate increases from 6.5 live births for women living in cities, to 7.0 for those living in towns, and to 9.1 for rural women. Differences in current fertility by region and by level of education are also substantial (See Table 2).

Table 2. Total Fertility Rate By Selected Background Variables, 1975-1976

| Variable                 | Total Fertility Rate |
|--------------------------|----------------------|
| All Women                | 7.34                 |
| Type of Place            |                      |
| Urban (cities)           | 6.45                 |
| Urban (towns)            | 7.02                 |
| Rural                    | 9.07                 |
| Region                   |                      |
| Amman                    | 5.95                 |
| Zarqa and Irbid          | 7.37                 |
| Other Towns..            | 7.02                 |
| Large Villages           | 3.97                 |
| Medium Villages          | 8.83                 |
| Small Villages           | 9.65                 |
| Level of Education       |                      |
| No Schooling             | 9.01                 |
| Incomplete Primary       | 8.40                 |
| Primary                  | 6.07                 |
| Preparatory              | 5.02                 |
| Secondary                | 3.17                 |
| Institute and University | 2.39                 |
| Religion                 |                      |
| Muslim                   | 7.62                 |
| Catholic and Other       | 3.10                 |

Source: JFS, Principal Report 1979, Table 5.21, p. 52.

1.5.3. Fertility Trends. The total fertility rates for the 15 years preceding the survey (1961-1976) have been estimated from the JFS data. This rate has declined from 9.04 live births for 1961-1966, to 8.54 for 1966-1971, and to 7.70 for 1971-1976. Thus the level of fertility during 1971-1976 was about 15 percent below that for the period 1961-1966. This decline of 1.34 live births per woman over the past 15 years has come from almost all age groups.

## 1.6 Contraceptive Prevalence

The primary aim of this section is briefly and broadly to highlight the knowledge and use of contraceptives among women in Jordan. A detailed multi-variate analysis of the determinants and differentials of contraceptive use, being the primary objective of this study, will be presented in Chapter 3 of this report.

1.6.1. Knowledge of Contraceptives. Due to the definition of knowledge of contraceptives as simply "heard of," it was found that about 97 percent of all ever-married women had "knew" at least one efficient contraceptive method (Table 8.5, p. 79). The most commonly and widely known method was the pill (known by 96 percent of all ever-married women), followed by female sterilization and the IUD (known by 79 and 76 percent respectively). Knowledge of other methods varied and ranged between 19.1 percent (male sterilization) and 54.2 percent (the douche). Slight differences in familiarity with contraceptive methods were observed among women of different ages and/or levels of education.

1.6.2. Use of Contraceptives. Contraceptive use is considered relatively high among women in Jordan. The proportion of ever-married women who ever used any contraceptive method was 46.4 percent (Table 8.7, p. 80).

Furthermore, 39.1 percent of all ever-married women were reported to have used efficient methods at one time or another (Table 8.6, p. 80).

Of all exposed women, the proportion who are currently contracepting is 37.2 percent, with 25.6 percent using efficient methods. As well as being best known, the pill was the most commonly used method (Table 8.10, p. 82).

It is noteworthy that the 53.6 percent of all ever-married women who had never used contraception included 10.1 percent who were not fecund or not married at the time of the survey, and 15.9 percent who intended to use contraceptives in the future. Thus, some 27.6 percent of those most likely to be in need of birth control had never used contraceptives and did not intend future use (Table 8.16, p. 86).

1.6.3. Differentials in Current Contraceptive Use. Little will be stated in this regard, since this subject will be dealt with in detail in Chapter 3 of this report. However, substantial differences in current use of contraception were observed in relation to differences in age, number of live births, level of education, religion, husband's occupation, region, and place of residence (Table 8.11, p. 83, and Table 8.14, p. 85).

## Part 2. Methodology and Data

### 2.1 The Jordan Fertility Survey (JFS)

Data analyzed in this study were collected in the 1976 JFS, which was a part of the larger World Fertility Survey. The JFS was implemented in two stages. First a Household Survey, which included 14,493 households scattered across 231 primary sample units (PSUs), was conducted in June-July. This was approximately a 5 percent sample of the households in the East Bank. Second, 1 out of 4 of these households was selected as a subsample, and all ever-married women aged 15 to 49 in the subsample (3,610 women) were interviewed for the Individual Survey during July-September. Information from these two surveys were merged to form the data set being analyzed here. The response rate was excellent (above 90 percent) and the individuals are weighted to provide a sample that is representative of the population of ever-married females aged 15 to 49 living in Jordan in 1976.

Since we are interested in the current pattern of contraceptive use, attention will generally be focused upon women who are exposed to the risk of pregnancy or who have chosen sterilization as a contraceptive technique. Among the women included in the Individual Survey, 4.3 percent were not currently married, 20.3 percent were pregnant, and 10.8 percent reported that they were not fecund. Removing these women from the sample, we have 2,337 women aged 15 to 49 who are currently "exposed" (i.e., who might be using contraception to prevent an unwanted pregnancy).

### 2.2 Methodology

Our analysis of contraceptive use patterns begins by examining a number of cross-tabulations. There are clear limitations to how complex the analysis can be using only cross-classifications of variables, nevertheless there is much to be gained by starting with this technique. Basic

relationships between variables can be explored, and a general familiarity with the data can be gained. Through examination of tables of cross-classifications it is possible to discover variables that show little or no relationship with the dependent variable. It is also possible to discover variables that may have a non-linear effect or that have interaction effects. For example, the relationship of various variables to current use of a contraceptive differs between rural and urban populations.

The multi-variate method of analysis used in this study is multiple linear regression, using dichotomous response variables of "current use of any contraceptive" (CUSE) or "current use of an efficient method" (CUSEF). By coding the dependent variable 0 for non-use and 1 for use, the mean response is equivalent to the proportion who currently use contraception (or use an efficient contraceptive). When the overall mean of the response variable is not too close to either 0 or 1, which is the case for urban areas, the problem of having a dichotomous dependent variable is not overly serious.

Independent variables which are continuous and are expected to have a linear effect are introduced directly into the regression, while categorical variables are introduced by using dummy variables (or sets of dummy variables if there are more than two categories). In either case, the regression coefficients of the variables represent the increases in the response variable when the independent variable is increased by one unit, holding the other variables in the regression fixed.

To examine the significance of adding a particular regressor variable to the equation, it is important to control the fashion in which the variables are added. A hierarchical order is predetermined, based upon a theoretical perspective of how variables affect use and/or an analytical concern for seeing the effect of one variable after other variables have been taken into account. We use a stepwise regression in which the variables are forced into

the equation in the desired order. At each step an F-statistic with its degrees of freedom can be calculated, which gives some indication of whether or not the variable has a significant effect (although violations of the assumptions regarding the model and the data suggest that interpretations of an F-test should be approached cautiously). The incremental increase in proportion of total variance explained ( $R^2$ ) can also be calculated at each step, and this is reported as the partial  $R^2$ .

Since there is clearly an interaction effect between rural-urban residence and several of the other regressor variables, this variable needs special attention. The most straightforward method for dealing with first-order interactions in such a case is to disaggregate the data into an urban and a rural sample. Multiple regression analysis is then applied to the urban population. For the rural population, the unit of analysis will be the village. Each village has a percentage of exposed women who are using contraception. This continuous variable is then used as the dependent variable for rural areas.

### 2.3 Variables

The variables used in this study may be divided into three categories: dependent variables, individual independent variables, and contextual variables. Through preliminary examination of cross-tabulations it was evident that some variables were of no importance in explaining contraceptive behavior in Jordan. Unless the lack of significance of a variable is especially interesting, it is dropped from consideration and not discussed further.

2.3.1. Dependent variables. The major interest throughout this study concerns whether or not exposed women are currently using some form of contraception. Knowledge of contraception is not an interesting variable

since, as noted above, virtually all women know of modern contraceptive techniques. Whether or not a woman has ever used contraception is somewhat redundant after exploring current use, and it is a less precise measure. When "ever-use" was used as a dependent variable in several multiple regression equations, the results were very similar to those obtained when "current-use" was used. Since the characteristics of individuals and communities at past times when ever-users were using contraception are not available, the link between the independent variables and "ever-use" is not logically tight.

The distinction between those who are currently using efficient methods and those using inefficient methods is of some importance, so current use of an efficient method is used as a second dependent variable in urban areas. About 48 percent of the exposed women in urban areas of Jordan report that they are currently using a contraceptive method, but about 30 percent of these are using an inefficient method (e.g., rhythm, douche, folk method, etc.).

### 2.3.2. Individual Independent Variables

A. Number of Living Children. The median number of living children per woman in the sample is approximately four. Since the number of children does not have a linear effect upon use, this variable is divided into four categories and entered into the regression equation by using three dummy variables.

|               |                       |         |
|---------------|-----------------------|---------|
| no children   | - 0 living children   | (8.2%)  |
| one child     | - 1 living child      | (9.2%)  |
| medium family | - 2-4 living children | (32.4%) |
| large family  | - 5+ living children  | (50.2%) |

B. Living Sons. A preference for sons over daughters exists in Jordan--42 percent prefer their next child to be a son, 13 percent prefer a daughter, 44 percent have no preference. Hence an indicator variable is used for presence of more sons than daughters in the family (0 if number of boys is less than or equal to number of girls, 1 if more boys than girls).

C. Desire for Additional Births. A dichotomy is used to distinguish women who want additional births from those who do not or are undecided (no more--42.0 percent, desire more--58.0 percent).

D. Religion. Overwhelmingly the population of Jordan is Muslim (94.2 percent), but the Christian minority has lower fertility and is expected to use contraception more often. Because of the small numbers involved, no distinction is made between Catholic and other Christians. No religion other than Muslim and Christian is reported in the survey.

E. Education. Although the educational level in Jordan has been increasing in recent years, the level for women aged 15-49 in 1976 was still very low--68 percent had not completed an elementary education. Three categories of educational attainment are used:

|                      |         |
|----------------------|---------|
| less than elementary | (68.4%) |
| primary              | (19.4%) |
| preparatory +        | (12.2%) |

F. Occupation of Husband. A trichotomous variable for occupation of husband is used:

|                        |         |
|------------------------|---------|
| technical and clerical | (19.6%) |
| sales and skilled      | (42.5%) |
| other                  | (37.9%) |

G. Place of Birth. Two types of birthplace for women are distinguished:

|                   |         |
|-------------------|---------|
| desert or village | (46.3%) |
| town or city      | (53.7%) |

H. Household Density. The number of persons per room in the household is calculated from the household interviews by dividing number of persons in the household by the number of rooms. This is entered as a continuous variable in the regression, and otherwise is categorized in this way:

< 1  
1 - 1.99  
2 - 2.99  
3 - 3.99  
4+

I. Family Structure. The sample for analyzing contraceptive use... consists only of women who are currently married and living with their husbands. These families are divided into nuclear families (87.4 percent) and extended families (12.6 percent).

J. Building Material. Housing is divided into three categories based upon the quality of the material used:

|                             |         |
|-----------------------------|---------|
| cut stone (highest quality) | (15.3%) |
| cement                      | (59.5%) |
| other (lowest quality)      | (25.1%) |

K. Modernity. A scale from 0-7 on modernity is constructed from the household interview where respondents were asked whether or not the household owned a number of particular objects. The seven objects selected to measure modernity of the household are ownership of (1) bicycle, (2) car, (3) refrigerator, (4) washing machine, (5) television, (6) gas-cooker, (7) telephone. The mean number of modern objects per household in Jordan is 3.0.

2.3.3 Contextual Variables. Two variables (rural-urban and governorate) are properly considered ecological variables since they reflect something of the environment in which an individual lives. The urban population of Jordan (70 percent of the total) includes all persons living in cities or towns with a population of 10,000 or more. About 54 percent of the population of Jordan reside in the three largest cities--Amman, Zarqa, and Irbid. The rural population is divided into three categories: small villages (less than 1,000 population) medium villages (1-4,999 population), and large villages (5-10,000 population). The five governorates are divided into three regions:

north (Irbid)  
middle (Amman and Balqa)  
south (Karak and Ma'an)

Seven additional contextual variables are constructed by aggregating the characteristics of households or individuals within primary sample units (psus). The psus for this survey consist of blocks in urban areas and whole or parts of villages in rural areas. An average psu has about 50 households. A score on each contextual variable is calculated for each individual woman by aggregating the values for all households or individuals in her psu, excluding the woman herself. For example, if a woman lives in a psu that has 50 households, then her score for the proportion of households with running water is the number with running water (excluding her household), divided by 49. While not reported in the discussion of each variable, the score for the psu in each case excludes the person of interest in order to avoid contaminating the contextual with the individual variables. The score obtained from the psu is then attributed to the individual woman as an indicator of the neighborhood within which she lives.

The variables constructed to tap the ecological context are:

A. Running Water. The proportion of households in the psu that have running water. This variable is an indicator of the level of sanitation in the community. About 68 percent of the households in Jordan have running water, but they are distributed differentially across neighborhoods. The range is from 0 to 1, with a median of .79.

B. Proportion Literate. The proportion of all ever-married women living in the psu who report that they are literate. The scores range from 0 to 1, with a median of .345.

C. Muslim. The proportion of households who report their religion as Muslim. About half of the psus are 100 percent Muslim, while in only five percent do Christians comprise as much as half of the population.

D. Wanted Children. The mean number of children desired by ever-married women in the psu. This may indicate the degree of pro-natalist pressure exerted by one's neighbors. The (range) of values is from 2.5 to 15, with a median of 6.5.

E. Modernity. The mean number of modern objects (based upon the seven discussed earlier) per household in the psu. The range is from 0 to 7, with a median of 2.6.

F. Current Contraceptive Use. The proportion of exposed women in the psu who currently use any contraceptive method. This indicates the availability and acceptability of contraceptives within the neighborhood. The range is from 0 to 1, with a median of .33

G. Ever Used Contraceptive. The proportion of ever-married women who ever used a contraceptive. The range is from 0 to 1, with a median of .42.

#### 2.4 Data Limitations

In this study we have used some contextual/ecological variables created by aggregating data from the Individual and Household Questionnaires. In addition, village was used as unit of analysis for the rural portion of analysis. Consequently, this poses certain problems in the interpretation of results due to small cell sizes.

Furthermore, findings obtained from the aggregated/community level analysis cannot be presumed to hold among individuals without certain statistical problems of interpretations. Several authors have treated the subject of "ecological fallacy," the most notable being Robinson's work on "Ecological Correlations and Behaviour of Individuals" (1950).

It may be safely stated that, at least, part of the explained variance in the data could be attributed to the small sample sizes and to the aggregation procedures. In addition, these could be problems of over-reporting in the contraceptive use, a phenomenon commonly attributed to the "Middle-Eastern politeness," and courtesy of the respondents. Consequently, the analysis and findings that follow should be viewed in the light of the above-mentioned limitations.

## Part 3. Analysis of Findings

### 3.1 Analysis of Cross-Classification

The potential exists for greatly expanding use of contraception in Jordanian society. While the majority of women still desire large families (65 percent want 5 or more children), 46 percent of all currently married, fecund women indicate that they already have all the children they want. However, among these women who desire no more births, 41 percent are not using any contraception to prevent additional births, 17 percent are using inefficient methods, and only 42 percent are using an efficient method. Thus a large number are already in the "target" population of women who should be responsive to beginning use of efficient contraceptive methods. In addition, we can anticipate that desired family size will decline rapidly in coming years, since women with characteristics associated with smaller family size desires (higher education, urban residence, later age at marriage) will become an increasingly large proportion of the childbearing population. Also, it is possible for government policy to encourage smaller family size ideals. The combination of these several conditions suggests that rapid expansion of fertility control may occur in Jordan in the near future, and that a well-informed government policy can facilitate this movement. The starting place for formulating such a policy is a clear understanding of the current state of contraceptive use.

3.1.1 Age, Living Children, and Desire for Additional Births. How is use of contraception affected by the age of a woman, the number of living children that she has, and her desire for additional children? Table 3 provides information to answer these questions: First, it is clear that not many women in Jordan are using contraception for birth spacing--only 18 percent of the women who want additional births are using any contraceptive

methods. As in most countries in the early stages of fertility decline, contraception is used primarily to prevent births after the desired number has already been obtained.

Table 3. Percent of Exposed Women Using Contraception by Age, Desire for Additional Births, and Number of Living Children

*Effective?*

| Age and Desire for Additional Births |                | Number of Living Children |    |    |    |    |    |
|--------------------------------------|----------------|---------------------------|----|----|----|----|----|
|                                      |                | 0                         | 1  | 2  | 3  | 4  | 5+ |
| < 20                                 | Desire More    | 0                         | 16 | 23 | *  | *  | *  |
|                                      | Desire No More | *                         | *  | *  | *  | *  | *  |
| 20-24                                | Desire More    | 9                         | 26 | 23 | 20 | 15 | 13 |
|                                      | Desire No More | *                         | *  | *  | 69 | 43 | *  |
| 25-29                                | Desire More    | 27                        | 30 | 32 | 23 | 27 | 22 |
|                                      | Desire No More | *                         | *  | 59 | 60 | 45 | 41 |
| 30-34                                | Desire More    | *                         | 38 | 52 | 30 | 19 | 12 |
|                                      | Desire No More | *                         | *  | *  | 85 | 62 | 56 |
| 35-39                                | Desire More    | *                         | *  | *  | *  | 20 | 12 |
|                                      | Desire No More | *                         | *  | *  | 60 | 71 | 55 |
| 40-44                                | Desire More    | *                         | *  | *  | *  | *  | 11 |
|                                      | Desire No More | *                         | *  | *  | *  | *  | 48 |
| 45-49                                | Desire More    | *                         | *  | *  | *  | *  | 10 |
|                                      | Desire No More | *                         | *  | *  | *  | *  | 47 |

\* Fewer than ten cases.

Second, the highest use of contraception occurs among women with three or four living children who desire no more. These tend to be women who have adopted a more modern attitude toward childbearing and who are prepared to work actively toward accomplishing their goal of having no more children. Among high parity women, on the other hand, the desire to stop bearing

children is less salient and only results in active attempts to prevent unwanted pregnancies in about half of the cases. These high parity women form the largest pool of target women--women who need assistance to actualize their desire to cease childbearing.

Third, controlling for number of children and desire for additional children, there is no consistent effect of age upon contraceptive use. The highest frequency of use occurs among women aged 30-34 who want to stop with 3 children (85 percent of these women are contracepting). It is likely that women who are this old and have only 3 children are already practicing effective contraception. Among higher parity women age has little effect. A similar lack of consistent age differentials appears when additional control variables are introduced.

3.1.2 Desire for Sons. In Jordan, as in other Muslim countries, there is a traditional preference for sons over daughters. Among those who want an additional child, three times as many prefer that child to be a son as prefer it to be a daughter. Further, at any given parity there is a higher probability of not desiring additional birth if there are no living daughters compared to no living sons. For example, 44.5 percent of the women who have no daughters but 4 sons want no additional births, compared to 18 percent of the women who have 4 daughters but no sons. Therefore one might expect contraceptive use to increase with the presence of living sons in the family. Curiously, this is not the case. As shown in Table 4, the difference in contraceptive use between those with more sons relative to those with more daughters is very slight. Looking just at families with no sons or no daughters, it appears that the absence of any son depresses contraceptive use, but not very significantly. A preference for sons may linger on as a widely shared value in Jordanian society, but it is not generally of sufficient personal importance to affect fertility behavior.

Table 4. Percent of Exposed Women Currently Using Contraception by Sex Distribution of Children and Number of Living Children

| Sex Distribution | Number of Living Children |      |      |      |      |
|------------------|---------------------------|------|------|------|------|
|                  | 1                         | 2    | 3    | 4    | 5+   |
| More Sons        | 26.3                      | 41.5 | 37.8 | 34.8 | 46.8 |
| Balance          | ----                      | 35.2 | ---- | 40.2 | 44.2 |
| More Daughters   | 26.8                      | 36.6 | 34.2 | 34.1 | 39.0 |

3.1.3 Social and Economic Influences. Moving beyond demographic influences, there are several social and economic factors that we expect to be related to fertility and contraceptive behaviors. The variables examined here are education of the woman, occupation of her husband, modernity of the household, quality of the house, and religion. Table 5 contains data relevant to discussing the relationship between these variables and current use of contraceptives.

Worldwide no social variable is more strongly related to fertility and contraceptive behavior than the level of education attained by a woman. With higher education comes an increasing interest in activities that compete with childbearing and child care, and, at the same time, an increasing knowledge of how to control fertility effectively. Therefore it is not surprising to find that more highly educated women in Jordan are more likely to use contraception than are the less educated. But the overall significance of the strong correlation between education and contraceptive use is substantially weakened because so few women have experienced higher levels of education--two thirds

Table 5. Percent of Exposed Women Using Contraception by Selected Social and Economic Factors and Number of Living Children

|                              | Number of Living Children |      |      |
|------------------------------|---------------------------|------|------|
|                              | 0-2                       | 3-4  | 5+   |
| <u>Education</u>             |                           |      |      |
| < Primary                    | 9.1                       | 16.5 | 36.6 |
| Primary                      | 28.5                      | 52.1 | 64.9 |
| Preparatory +                | 53.0                      | 74.2 | 89.3 |
| <u>Occupation of Husband</u> |                           |      |      |
| Technical-Clerical           | 50.6                      | 59.6 | 69.3 |
| Sales-Skilled                | 23.9                      | 35.4 | 47.2 |
| Other                        | 11.4                      | 22.6 | 29.4 |
| <u>Modernity*</u>            |                           |      |      |
| Low                          | 8.4                       | 15.7 | 21.5 |
| Medium                       | 27.5                      | 32.6 | 47.9 |
| High                         | 51.0                      | 66.0 | 66.2 |
| <u>Housing Material</u>      |                           |      |      |
| Cut Stone                    | 56.4                      | 61.5 | 60.1 |
| Concrete                     | 20.9                      | 30.8 | 37.3 |
| Other                        | 9.6                       | 16.8 | 31.6 |
| <u>Religion</u>              |                           |      |      |
| Muslim                       | 23.9                      | 32.7 | 40.8 |
| Christian                    | 68.2                      | 70.4 | 92.9 |

\*Low = 0-2 modern objects owned, Medium = 3-4 modern objects, High = 5-7 modern objects.

of the married women aged 15-49 have not completed a primary education, and only two percent have progressed beyond the secondary level.

As seen from Table 5, contraceptive use increases very rapidly with level of education at each parity. Over half (53 percent) of the women with a preparatory or higher level of education who have small families are using contraception, while just over one-third (36.6 percent) of the women with less than a primary education who already have very large families are users. Among highly educated women who have large families, contraceptive use is nearly universal. Clearly the increasing level of education now being gained by younger cohorts of women suggests that as they enter the childbearing years the overall level of use should accelerate rapidly. Investments in education for females have multiple long-term consequences, one of them being a reduction in future population growth.

A similar, although somewhat less striking, differential in contraceptive use is observed when occupation of a woman's husband is used as an independent variable. The higher the occupational status of the husband, the greater the likelihood that a woman at any parity will be using contraception. Using alternative indicators of social class or modernity confirm the strong influence of socio-economic status. Women in households with more modern objects (such as cars, televisions, and washing machines) use contraceptives more often than women in less modern households. The higher the quality of the housing (as measured by the building material) the higher the proportion of users. Taken together, these various indicators of socio-economic status all lead one to expect that as economic conditions in Jordan improve the rate of family planning will also increase.

One further comparison of differential use by social background is noteworthy. Christians (both Catholics and others) are much more likely to

use contraception than are Muslims. This differential persists when controls for social class and family size are introduced. While neither the Koran nor Islamic teachings speak against the use of contraception for regulating family size, it appears that something within the prevailing religious norms have a depressing effect upon its use.

3.1.4 Household Characteristics. Couples living in nuclear families may be expected to be more modern in their approach to fertility control than those living in extended families, and couples with greater privacy within the house may better be able to practice contraception. Both of these expectations are supported by the data presented in table 6. Controlling for education, women in nuclear families are more likely to be practicing contraception. Among several possible reasons, perhaps the most important is that the pressure from other kin to have many children is reduced when they do not reside in the same household. With regard to household density, it is difficult to know in which direction the causality operates: do those who use contraception have fewer children and therefore experience lower density; or do those who have more privacy because of lower density practice contraception more often? Whatever the explanation, a relatively strong relationship exists between these variables.

3.1.5 Residence. How significant are regional and rural-urban differences in contraceptive use in Jordan? Since the governorates differ in their rural-urban distributions of population, it is best to consider these two questions simultaneously. As seen in Table 7, there are striking rural-urban differences in each region of Jordan, and these differences within each region are far more important than the differences between regions. For the country as a whole, the proportion of women in urban areas who are using contraception is nearly four times larger than the proportion in rural areas.

Table 6. Percent of Exposed Women Using Contraception by Household Characteristics and Education

|                                      | Education |         |             |             |
|--------------------------------------|-----------|---------|-------------|-------------|
|                                      | < Primary | Primary | Preparatory | Secondary + |
| <u>Family Structure</u>              |           |         |             |             |
| Nuclear                              | 27.1      | 49.7    | 61.7        | 74.4        |
| Extended                             | 20.9      | 21.3    | 47.0        | 51.7        |
| <u>Household Density<sup>1</sup></u> |           |         |             |             |
| < 1                                  | 37.7      | 50.2    | 76.5        | 75.0        |
| 1-1.99                               | 30.7      | 56.8    | 70.5        | 72.8        |
| 2-2.99                               | 25.4      | 44.6    | 64.2        | 65.4        |
| 3-3.99                               | 22.8      | 38.6    | *           | 76.8        |
| 4+                                   | 23.4      | 34.0    | 44.8        | *           |

\*Fewer than ten cases.

<sup>1</sup>Household density is measured by number of persons in the household divided by total number of rooms.

In fact, the practice of contraception in villages is still rare, with only 12.5 percent of the exposed women using any method to prevent an additional pregnancy. In the cities and towns, on the other hand, about half of the exposed women are currently using contraceptives. And the difference cannot be explained by the desire for more births by women in villages. Restricting the sample to women who state that they do not want any more births, 58 percent of the women in Amman are using contraceptives compared to only 18 percent of the women in villages. One factor that almost certainly contributes to this large difference is the differential access to contraceptives in urban and rural areas.

Table 7.. Percent of Exposed Women Using Contraception by Governorate and Rural/Urban Residence

| Governorate | Urban       | Rural      |
|-------------|-------------|------------|
| Irbid       | 38.3        | 11.9       |
| Amman       | 49.7        | 20.5       |
| Balqa       | 48.6        | 8.1        |
| Karak       | 43.7        | 8.1        |
| Ma'an       | <u>44.8</u> | <u>---</u> |
| Total       | 47.8        | 12.5       |

Comparing urban areas in the five governorates in Jordan, it is seen that the middle ones (Amman and Balqa) have the highest percent of women using contraception, while Irbid in the North has the lowest usage rate and Karak and Ma'an in the South are intermediate. Rural areas in Amman governorate have rates double those of other rural areas, reflecting a spillover effect from the large and modern city of Amman to the surrounding countryside. Still, the urban population in each governorate is much more similar to the population of Amman city than it is to the rural population within the same governorate. Because of the large rural-urban difference, the remainder of the analysis will examine these two populations separately.

3.1.6 Ecological Influences. In urban areas a "neighborhood" is defined as the other households living on the same block, while in rural areas the whole village constitutes a "neighborhood." Obviously the characteristics of others living in a woman's neighborhood are highly correlated with her own socio-economic characteristics since a high degree of residential homogeneity

is common, particularly in cities. Determining the net effects of the environment, after the individuals' personal and household characteristics are accounted for, requires a multivariate analysis. Thus the cross-classifications in Table 8 simply give the gross effect of neighborhood characteristics.

As expected, there are large differences in the prevalence of contraceptive use between neighborhoods in urban areas. For example, in neighborhoods with many "modern" households or with high rates of literacy among women, over two-thirds of the exposed women are practicing family planning. In contrast, where modernity is low or illiteracy is high, only about one-fourth of the exposed women are contracepting. Access to running water within the house, which is an indicator of both neighborhood economic conditions and level of sanitation, is positively related to use rates. Furthermore, women living around other women who desire smaller families or who are using contraception are much more likely to practice contraception themselves than are women in other neighborhoods.

Differences in use by ecological characteristics of villages are much smaller. Women in less modern villages and in villages where fewer other women are contracepting are less likely to use contraception than women in other villages. But in no category within villages does contraceptive use among exposed women reach as much as 20 percent. It seems that contraception has not yet penetrated the rural areas of Jordan to any significant extent.

### 3.2 Multiple Regression Analysis for Urban Areas

The analysis of current use of contraception and current use of efficient contraception is restricted to the sample of 1,399 exposed women living in urban areas who had no missing data on relevant variables. Among these women, 47.8 percent were using some contraceptive method and 33.1 percent were using

Table 8. Percent of Exposed Women Using Contraception by Selected Neighborhood Characteristics and Rural/Urban Residence

| Neighborhood Characteristics                   | Urban | Rural |
|--|-------|-------|
| <u>% Households with water<sup>1</sup></u>     |       |       |
| Low  | 38.6  | 9.4   |
| Medium   | 47.5  | 12.7  |
| High   | 57.2  | 14.6  |
| <u>Modernity<sup>2</sup></u>                   |       |       |
| Low  | 26.9  | 7.2   |
| Medium   | 49.3  | 8.8   |
| High   | 67.4  | 19.3  |
| <u>Percent Literate<sup>3</sup></u>            |       |       |
| Low  | 26.5  | 8.8   |
| Medium   | 47.9  | 16.6  |
| High   | 67.9  | 10.9  |
| <u>Fertility Desires<sup>4</sup></u>           |       |       |
| Low  | 64.8  | 17.2  |
| Medium   | 44.9  | 11.9  |
| High   | 32.3  | 8.6   |
| <u>Percent Using Contraception<sup>5</sup></u> |       |       |
| Low  | 26.8  | 9.1   |
| Medium   | 51.0  | 14.8  |
| High   | 66.0  | 12.9  |

1. For Urban, Low is 0- .825, Medium is .826- .935, High is .936-1.0  
For Rural, Low is 0- .205 Medium is .206- .655 High is .656-1.0
2. For Urban, Low is 0-2.896 Medium is 2.896-4.055 High is 4.056-7.0  
For Rural, Low is 0-1.265 Medium is 1.266-1.855 High is 1.856-7.0
3. For Urban, Low is 0- .425 Medium is .426- .665 High is .666-1.0  
For Rural, Low is 0- .205 Medium is .206- .265 High is .266-1.0
4. For Urban, Low is 0-5.445 Medium is 5.446-6.475 High is 6.476-15.0  
For Rural, Low is 0-6.725 Medium is 6.726-7.405 High is 7.406-15.0
5. For Urban, Low is 0- .36 Medium is .37 - .56 High is .57 -1.0  
For Rural, Low is 0- .05 Medium is .06 - .14 High is .15 -1.0

an efficient contraceptive. Since the percent of users among rural women was only 12.5 percent, it is not appropriate to use multiple regression analysis with current use as a dichotomous dependent variable. A separate analysis of rural women is presented in the next section.

Eleven variables are entered into the regression model being used to explain current use of contraception. These were selected from the somewhat larger set of variables discussed in the preceding section by deleting those variables that are largely redundant, that is, that are indicators of the same factors measured by this set of 11 variables. The variables are entered step by step in the order desired for analytical purposes. The variables are organized in the following way: First are the relevant demographic factors for the women--number of living children (four categories), the sex balance of children (1 if more sons than daughters, 0 otherwise), and age of the woman (4 categories). Second is the variable indicating whether or not the woman desires additional children. Third are the variables measuring the socio-economic status of the woman--her education (three categories), modernity of the household, her husband's occupation (three categories), and density within the household. Fourth is the place of residence in which the woman spent her childhood, which distinguishes migrants to urban areas from those who grew up in urban environments. Finally, two community level variables are added--the overall modernity of the neighborhood and the proportion of other exposed women in the neighborhood who are using contraception.

Table 9 presents the analysis of variance for the regressions of this set of variables on current contraceptive use. The multiple  $R^2$  of 28.6 percent indicates that this set of variables explains a relatively large proportion of the variance in contraceptive use in urban areas. The magnitude of the F

values suggests that all of the variables introduced in the regression equation are highly significant. The partial  $R^2$  value associated with each variable indicates the addition to the total  $R^2$  (explained variance) made by the variable, after the effect of all preceding variables is accounted for.

It is interesting to examine the predictive power of each of the eleven variables in this model. Whether or not a woman desires additional children

Table 9. Heirarchical Analysis of Variance from Regressions on Current Use of Contraception

| Step and Variable Added | Sum of Squares Added at Step | D.F. Added at Step | Mean Square | F     | Partial $R^2$ |
|-------------------------|------------------------------|--------------------|-------------|-------|---------------|
| 1. No. Children         | 17.10                        | 3                  | 5.70        | 31.6  | .049          |
| 2. Sex Balance          | 1.48                         | 1                  | 1.48        | 8.2   | .004          |
| 3. Age                  | 5.40                         | 3                  | 1.80        | 10.0  | .015          |
| 4. Desire for More      | 32.06                        | 1                  | 32.06       | 177.5 | .092          |
| 5. Education            | 23.21                        | 2                  | 11.60       | 64.3  | .067          |
| 6. Modernity of HH      | 9.97                         | 1                  | 9.97        | 55.2  | .029          |
| 7. Husband's Occupation | 2.67                         | 2                  | 1.33        | 7.4   | .008          |
| 8. Density of HH        | 3.32                         | 1                  | 3.32        | 18.4  | .002          |
| 9. Childhood Residence  | 1.32                         | 1                  | 1.32        | 7.3   | .004          |
| 10. Community Modernity | 3.04                         | 1                  | 3.04        | 16.8  | .009          |
| 11. Community Use       | 2.78                         | 1                  | 2.78        | 15.4  | .008          |
| Residual                | 249.40                       | 1,381              | .181        |       |               |
| Total $R^2 = .286$      |                              |                    |             |       |               |

and the social status of the woman and her family stand out as particularly important. The two contextual variables included are also significant in their contribution to the explained variance, after taking into account all of the personal characteristics. The preference for sons, childhood place of residence, and household density are the least useful predictors of use.

It is also important to note that the additional contextual variables (proportion of women literate, proportion of households with running water, and mean desired family size) do not significantly contribute to explaining differential contraceptive use. Perhaps the measure of modernity of the community captures the basic influence of the surrounding social conditions, while proportion of other women who use contraception captures the normative influences. Unfortunately, no direct measure of availability of contraceptives nor presence of family planning programs in the community is included in the survey data.

When our interest is in the analytical importance of particular variables, their strength in predicting the response variable may not be the primary issue. For example, if a variable has a particularly skewed distribution, it may not have a large partial  $R^2$  even if it is strongly related to contraceptive use. Thus we turn to the regression coefficients to get an indication of the substantive significance of variables of interest. The complete regression equation for this model is:

$$\begin{aligned} \text{Percent using} = & 12.6 - 23.4 \text{ NO CHILD} - 7.2 \text{ ONE CHILD} - 3.8 \text{ MED FAMILY} \\ & + 3.8 \text{ MORE SONS} - 4.3 \text{ AGE 0} - 2.8 \text{ AGE 1} - 2.0 \text{ AGE 2} \\ & + 26.9 \text{ DESIRE NO MORE} - 14.5 \text{ NO EDUC} - 2.4 \text{ ELEM EDUC} \\ & - 2.6 \text{ MODERN HH} + 10.3 \text{ OCCUP 1} + .2 \text{ OCCUP 2} \\ & - .9 \text{ DENSITY} + 5.7 \text{ CHILD RES} + 1.8 \text{ MODERN COMM.} \\ & + 24.4 \text{ COMM. CONTRA.} \end{aligned}$$

When each variable assumes its mean value for the population, the percent who are users is 47.8. To determine the effect of changing the value of a particular independent variable to a different level, we proceed in the following way: the mean value of each of the control variables is entered, and the relevant value for the variable of interest is entered. The equation then predicts a specific level of contraceptive use for women in this particular category. Subtracting this predicted value from the overall mean level of use (.478) gives an indication of the net deviation from the mean produced by this change. Results of the above analysis are presented in Table 10. Of course these results answer only hypothetical questions that are not necessarily realistic possibilities. For example, it is unreasonable to assume that educational levels can be changed without also changing the distribution of the population on each of the other variables. Nevertheless, we can gain a sense of the net effects of particular changes in specific variables.

Table 10. Predicted Level of Contraceptive Use, and Net Deviation from the Overall Mean Level of Use, for Selected Values of Particular Variables

| Variable and Value                | Predicted Level of Use | Net Deviation From Mean |
|-----------------------------------|------------------------|-------------------------|
| 1. Desire no more children: 69%   | .525                   | +.047                   |
| 2. Education: Prep. + for all     | .566                   | +.088                   |
| 1/2 Elem., 1/2 Prep. +            | .554                   | +.076                   |
| 3. Childhood Residence: All Urban | .495                   | +.017                   |
| 4. Modernity of Households: 5     | .508                   | +.030                   |
| 7                                 | .561                   | +.083                   |
| 5. Modernity of Community: 5      | .504                   | +.026                   |
| 7                                 | .541                   | +.063                   |

If half of the women with 2-4 children wanted no more, and all of the women with 5+ children wanted no more, than 69 percent of the exposed, urban women in Jordan would desire to stop childbearing (in contrast to the 51 percent who currently desire no more children). If this modest change in "desires" was to occur, without any other changes, the rate of contraceptive use would increase by 4.7 percent. An even stronger increase in contraceptive use would be achieved if educational levels were somehow rapidly increased. The fact that many of the residents of urban places come from rural backgrounds has little effect on contraceptive behavior. If all of the women came from urban backgrounds, the percent using contraception would increase by less than two percent. An implication of these findings is that aspects of life which can be changed in the future by government policies (promoting smaller family ideals and providing greater educational opportunities) can significantly increase the use of contraception.

Comparing the effect of increasing the modernity of a woman's household relative to the modernity of the neighborhood within which she lives suggests that changes within the household are slightly more significant than changes outside the household. Nevertheless, it is important to note that the neighborhood does play a part in determining how likely it is that women will practice contraception.

Since special interest is attached to the influence of neighborhood, one further step is taken to monitor how the percentage of exposed women who use contraception is affected by the modernity of the community and by the prevalence of use in the community as various controls for individual characteristics are added. We begin with row 1 in Table 11, which simply indicates the difference in mean level of use for women who are living in communities with different levels of modernity or contraceptive use (in each

Table 11. Percent of Exposed Women in Urban Areas Who Are Using Contraception by Modernity of Neighborhood and Prevalence of Contraceptive Use in Neighborhood, Controlling for Selected Variables

| Control Variables  | Modernity of Neighborhood <sup>1</sup> |        |      | Prevalence of Use <sup>2</sup> |        |      |
|--|--|--------|------|--------------------------------|--------|------|
|  | High                                   | Medium | Low  | High                           | Medium | Low  |
| 1.   | 67.0                                   | 49.2   | 26.9 | 64.1                           | 50.0   | 28.4 |
| 2. No. of Children   | 67.2                                   | 49.2   | 26.7 | 64.3                           | 49.6   | 28.5 |
| 3. No. of Children, Age  | 66.4                                   | 49.4   | 27.4 | 63.5                           | 50.0   | 29.1 |
| 4. No. of Children, Age, Desire for More                       | 63.7                                   | 49.4   | 30.0 | 60.6                           | 49.7   | 32.2 |
| 5. No. of Children, Age, Desire for More, Education            | 59.7                                   | 49.7   | 33.8 | 57.1                           | 49.4   | 36.4 |
| 6. No. of Children, Age, Desire for More, Education, Modernity | 56.5                                   | 50.0   | 36.7 | 54.7                           | 49.0   | 39.3 |

<sup>1</sup>High is mean number of modern objects per household: 4.05+  
 Medium is mean number of modern objects per household: 2.9 - 4.04  
 Low is mean number of modern objects per household: less than 2.9

<sup>2</sup>High is proportion of users: > .56  
 Medium is proportion of users: .37 - .56  
 Low is proportion of users: 0 - .36

case the woman's own characteristics are excluded from the neighborhood score). But we know that women living in different types of communities vary with respect to demographic and social characteristics which also affect level of use. What differences in percent users remain as we successively control for these characteristics? The answer can be found in the various rows of Table 11, where control variables are successively added. From the last row it can be seen that controlling for demographic characteristics, socio-economic characteristics, and desire for additional children greatly reduces the extent of the differences between women living in different types of communities. Nevertheless, the prevalence of use varies substantially by type of neighborhood even after controlling for these various characteristics. Thus the nature of the social environment is seen to play an important part in determining whether or not women use contraceptives. In addition, the much bigger difference between low and medium neighborhoods than between medium and high ones suggests that the biggest payoff in increasing use will result from improving conditions within the least modern neighborhoods.

An analysis with use of efficient contraception as the independent variable (see Table 12) shows a similar pattern to the analysis for use of any method, although the explanatory power of the model for this independent variable is much lower ( $R^2 = .192$ ). Just as for the first model, the desire for more children and social status of the woman are the most important predictors of use of an efficient method. Three of the contextual variables turn out to be significant--modernity of the neighborhood, proportion using contraception, and the mean number of children desired by one's neighbors. On the other hand, a woman's age and whether or not she is an urban migrant do not turn out to be significant.

Table 12. Hierarchical Analysis of Variance from Regressions on Current Use of Efficient Contraception

| Step and Variable Added     | Sum of Squares Added at Step | D.F. Added at Step | Mean Square | F     | Partial R <sup>2</sup> |
|-----------------------------|------------------------------|--------------------|-------------|-------|------------------------|
| 1. No. of Children          | 9.38                         | 3                  | 3.13        | 17.3  | .030                   |
| 2. Age                      | 1.42                         | 3                  | 0.47        | 2.6   | .005                   |
| 3. Desire for More          | 24.28                        | 1                  | 24.28       | 134.4 | .078                   |
| 4. Education                | 11.36                        | 2                  | 5.68        | 31.4  | .037                   |
| 5. Modernity of HH          | 5.27                         | 1                  | 5.27        | 29.15 | .017                   |
| 6. Childhood Residence      | 0.82                         | 1                  | 0.82        | 4.5   | .003                   |
| 7. Modernity of Community   | 2.90                         | 1                  | 2.90        | 16.1  | .009                   |
| 8. Community Use            | 2.20                         | 1                  | 2.20        | 12.2  | .007                   |
| 9. Community No. Desired    | 1.88                         | 1                  | 1.88        | 10.3  | .006                   |
| Residual                    | 250.09                       | 1,384              | .181        |       |                        |
| Total R <sup>2</sup> = .192 |                              |                    |             |       |                        |

### 3.3 Analysis for Rural Areas

The rural portion of the JFS came from a sample of women living in 63 villages throughout Jordan. All of the information available for urban women and households is available for these rural women. In addition, for 55 of these villages supplementary information on certain community characteristics is available: whether or not the village has a family planning clinic, a maternal and child health (MCH) clinic, a secondary school, a hospital, and an outpatient clinic. Unfortunately, data on these variables collected by the community module of the JFS are not particularly useful as explanatory variables for the following reasons:

- 1) none of the villages has a hospital.
- 2) only one village has a family planning clinic (and none of the 13 exposed women from that village included in the survey was using contraception).
- 3) presence of an outpatient clinic is highly correlated with village size, and is not correlated with percent of women using contraception.
- 4) presence of a secondary school or MCH clinic depends upon the size of the village--the large villages have them and the small ones do not. Hence the effect of having these institutions cannot be separated from the effect of village size (and, further, village size is not significantly correlated with use of contraception). Seven villages have both a secondary school and MCH clinic, one has MCH clinic but no school, and three have schools but no clinic. Because of the high correlation of these two variables, only the presence of one or the other can be used in the multiple regression analysis.

Restricting attention to the 44 villages that have at least 9 households included in the survey, a rather clear picture of differential use patterns emerges. Table 13 summarizes the differences between villages when they are grouped by level of contraception being practiced. In the 5 villages where at least one-fourth of the exposed women are using contraception, a majority of the households have electricity and the level of household modernity is very high by rural standards. To a disproportionate extent these villages are located in Amman governorate and have secondary schools and MCH clinics. At the other extreme, the 19 villages with very little contraceptive use had few (or no) households with electricity, low levels of modernity, and they lacked

Table 13. Percent of Villages<sup>1</sup> Having Selected Characteristics, By Level of Contraceptive Use in the Village

| Characteristic                                    | Level of Use <sup>2</sup> |          |       |
|---|---------------------------|----------|-------|
|   | <5%                       | 5% - 25% | >25%  |
| 50% or more of households have electricity        | 0.0                       | 15.8     | 100.0 |
| Mean number of modern objects per household > 2.5 | 0.0                       | 0.0      | 100.0 |
| Located in Amman governorate                      | 10.0                      | 15.8     | 40.0  |
| Has a secondary school                            | 10.0                      | 26.3     | 40.0  |
| Has MCH clinic                                    | 10.0                      | 21.0     | 40.0  |
| N   | 20                        | 19       | 5     |

1. Restricted to villages which had 9 or more households included in the survey

2. Percent of exposed women currently using contraception

secondary schools and MCH clinics. As expected, villages with intermediate levels of contraceptive use are also intermediate on measures of the various explanatory variables.

To examine the combined effect of the independent variables upon contraceptive behavior, a multiple regression equation with four variables was estimated. The results are presented in Table 14. Being in Amman governorate has a small positive effect, but it is not statistically significant. The two variables of significance are level of electrification of the village and level of modernity in the village. Together these two

Table 14. Results of Multiple Regression of Proportion of Exposed Women in Villages Currently Using Contraception and Ever Using Contraception Upon Selected Village Characteristics

| Village Characteristic        | <u>Current Use</u><br>Regression Coef. | <u>Ever Use</u><br>Regression Coef. |
|-------------------------------|--|-------------------------------------|
| Governorate <sup>1</sup>      | -.02                                   | -.02                                |
| Electric <sup>2</sup>         | .17*                                   | .17                                 |
| Modernity <sup>3</sup>        | .05*                                   | .05                                 |
| Secondary School <sup>4</sup> | -.04                                   | .00                                 |
| Adjusted R <sup>2</sup>       | .57                                    | .33                                 |
| N                             | 44                                     | 44                                  |

\*Regression coefficient more than twice its standard error

1. 0 = Amman governorate, 1 = other
2. Proportion of households with electricity
3. Mean number of modern objects per household
4. 0 = no secondary school, 1 = presence of school

variables account for a large proportion of the variance between villages in contraceptive use. Net of the other variables, whether or not a village has a secondary school has no influence upon level of use (the same result occurs when presence of an MCH clinic is used instead of presence of a secondary school).

An examination of contraceptive prevalence among rural women in Jordan leads to two straightforward conclusions. First, contraceptive use among rural women is still uncommon. Only 12.4 percent of all rural women who are exposed to the risk of pregnancy are contracepting. Second, the villages in which a sizeable proportion of women are contracepting are the relatively more modern villages, as measured by presence of electricity and ownership of modern consumer goods. Selected individual women in traditional villages may be using contraceptives, but only in the few villages most closely resembling urban areas is it possible to detect any genuine acceptance of contraception by the population.

#### Part 4. Conclusions

At this time in history the nation of Jordan is confronted with many significant challenges as it seeks to improve the living conditions of its population. Advances in public health and medical care have reduced death rates far below their historical levels, but fertility rates remain very high. This imbalance of births and deaths produces an exceedingly young population, a population in which more than half of the members are under the age of 15. The imbalance also produces extraordinarily rapid population growth. If current birth and death rates were to persist, the population of Jordan would double in size in less than 20 years due to natural increase alone. The social and economic demands of caring for and educating a rapidly expanding population of children places severe restrictions upon the country's ability to make other investments which could stimulate more rapid economic development. Therefore it is important to inquire into the extent of contraceptive prevalence in Jordan.

There are signs pointing to an expanding use of contraception and declining rates of fertility. Between 1972 and 1976 the proportion of ever-married women who reported that they were using contraception increased from 21 percent to 24 percent, and the greatest increase occurred among women who still had few (0-2) children. The total fertility rate in Jordan declined from 9.0 in 1961 to 7.7 in 1976, and estimates around 1980 place it at 7.3. Furthermore, evidence presented in this paper suggests that further increases in contraceptive use could be expected in the coming years. Three factors are strongly and positively correlated with higher use of contraception in Jordan: level of education of a woman, level of household modernity, and urban residence. Since levels of education, modernity, and urban residence are all increasing over time, cohorts entering the childbearing years in the

future will have much higher proportions of women with characteristics leading to use of contraceptives. In addition to wider use of contraception, the increasing age at marriage now occurring among younger cohorts will also tend to lower fertility levels, since these women will be exposed to the risk of childbearing for fewer years.

Several factors commonly found to impede the use of contraception in other countries do not seem to be problematic in the case of Jordan. First, the women in Jordan are not ignorant about contraceptive methods. While further education about particular methods may be desirable, the women already have considerable knowledge about efficient techniques. Second, the preference for sons, which might be expected to push overall levels of fertility upward, does not have much impact upon contraceptive use in Jordan. Having a couple of living sons is not a prerequisite to the initiation of contraception. Third, the influence of a rural background is not very significant. Women who have migrated to urban areas practice contraception at about the same rate as urban-born women, and at a much higher rate than women who continue to live in rural areas.

The study of contextual effects confirms the expectation that the behavior of neighbors makes a difference. If two groups of women are matched on a large number of relevant factors (e.g. age, number of children, education, modernity, husband's occupation, migration status, and household density) but differ with respect to the type of neighborhood within which they live, it is found that their contraceptive behavior differs. Those women living around others who are more modern or who are users of contraception are more likely to be using contraceptives themselves. Thus, increasing the level of modernity in the society has an effect upon contraceptive behavior both by raising the average level of modernity of individual women and by raising the

modernity of the neighborhoods within which women live. Further, there is a kind of momentum built into use--increasing the level of use itself encourages even higher use.

Despite the encouraging signs regarding future use, we are nevertheless confronted with a situation in Jordan where fertility is extremely high (TFR over 7), the average number of children desired remains high (6.3 per woman), and a majority of fecund women (63 percent) are not contracepting. Even among exposed women who want no more children, only 42 percent are using an efficient contraceptive method (see Table 15). The failure to use contraception to cease childbearing after the total number desired has been reached cuts across all ages, so efforts to reach the "target" population cannot be restricted to any particular age category. In rural areas the population has hardly been touched by use of efficient methods--fewer than 10 percent of all fecund women use such contraceptives. Only 5 percent of the married women aged 15 to 49 in rural areas are in the category of being exposed to the risk of pregnancy, wanting no more, and using efficient contraceptives to prevent additional births. Under such conditions, fertility is going to continue to be very high.

Table 15. Percent of Exposed Women Wanting No More Children Who are Using an Efficient Contraceptive, By Rural/Urban Residence and Age

| Residence | Age  |       |       |      | Total |
|-----------|------|-------|-------|------|-------|
|           | <25  | 25-34 | 35-44 | 45+  |       |
| Urban     | 56.2 | 49.7  | 48.1  | 38.4 | 47.8  |
| Rural     | 13.5 | 15.8  | 21.8  | 16.9 | 18.4  |
| Total     | 39.1 | 43.2  | 42.9  | 35.5 | 41.9  |

The government of Jordan has an opportunity to design and implement certain policies which could encourage the further spread of family planning. Advantages of such programs to individuals and the nation are obvious: individuals could better avoid having unwanted children and the rate of population growth for the nation could decline. Expansion of family planning efforts, modelled after successful programs in other countries, could meet the needs of the many women who already have all of the children they desire. Different programs may be needed for rural and urban women, with special attention directed to the rural areas where the pattern of contraceptive use has not yet become firmly implanted. A continued emphasis upon providing education for females also appears to be crucial--with more education women are more likely both to desire fewer children and to take measures to prevent unwanted pregnancies.

Beyond family planning programs and educational efforts, it is important to consider the desirability of pursuing additional policies to discourage men and women from forming large families. Of course, this moves into sensitive areas since such policies will conflict with important traditional values of the culture. Nevertheless, unless the population as a whole adopts a small family orientation, no family planning program designed to prevent unwanted births will produce a balance between birth rates and death rates. Examples of countries opting for policies to restrict fertility (e.g. China and Singapore) should be carefully examined to determine their relevance for the situation in Jordan. The challenge facing Jordan is both to provide contraceptives to those who desire it and to motivate more women to stop their childbearing at lower parities.

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