

**FAMILY PLANNING USE AND CHILD HEALTH IN THE
ARAB REPUBLIC OF EGYPT**

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ABSTRACT

The 1978 Nutrition Survey of the Arab Republic of Egypt (ARE) provides a chance to look at the prevalence of contraceptive use in that country. Moreover, the survey provides an unusual opportunity to link anthropometric and medical measurements of the nutritional status of children with the contraceptive practice of their mothers. In the ARE Nutrition Survey about 1 in 3 mothers interviewed were current contraceptive users; there was wide variation in use by area of residence and socioeconomic status. A positive association was found between current contraceptive use and measures of child health, an association that was maintained when residence, social status, and other background variables were controlled statistically. Although a fully developed causal model cannot be evaluated from these data, the data suggest that contraceptive use and child health are related, and that the connection could be evaluated further in future studies.

INTRODUCTION

The 1978 Nutrition Survey of the Arab Republic of Egypt (ARE) provides a chance to look at the prevalence of contraceptive use in that country. Moreover, the survey provides an unusual opportunity to link anthropometric and medical measurements of the nutritional status of children with the contraceptive practice of their mothers. These data, then, allow us to address an important question in the evaluation of family planning programs: whether the use of family planning can be said to exert a positive influence on the health of children--a goal which is often stated as an important objective of family planning programs.

THE ARE NUTRITION SURVEY

The Nutrition Survey was performed in the ARE between December 1977 and mid-April 1978 by the Nutrition Institute, Ministry of Health, with the technical assistance of AID/Cairo and the Center for Disease Control, Atlanta, Georgia. The purposes of the survey were to provide an estimate of nutritional status of children of preschool age in Egypt; to compare the nutritional status of the populations of selected regions in Egypt as measured by simple anthropometric indices and hemoglobin determinations; to provide information on the prevalence of anemia in the selected preschool children and their mothers; and to determine the frequency of selected social, demographic, health, and dietary characteristics and their interrelations with the nutritional status of the children. The survey consisted of separate samples in 11 "universes" or strata of Egypt. These strata essentially covered all of the Egyptian population outside of Cairo-Giza and Alexandria, and the lowest-status districts of these two large cities. The very sparsely settled region west of the Nile was excluded. Within each stratum, 30 sample sites were selected, and

questionnaires and measurements completed for 30 children aged 6 to 71 months, yielding a total sample of 9,794. For one-fifth of the children a supplemental questionnaire was completed for the mothers, resulting in 1,980 cases with data for both children and mothers. Data for these 1,980 cases are reported here.

The contraceptive-use data analyzed here, then, are for a sample of mothers of children between 6 months and 6 years of age. The characteristics of these women will be somewhat different than those of a sample of all women of childbearing age. The totals presented for the whole sample are weighted to represent the population distribution by strata from the most recent census. Note that in the tables the 11 strata have been collapsed into 4 groups: rural areas, urban places less than 50,000, larger urban places excluding Cairo and Alexandria, and the lower socioeconomic areas of these cities. Because the higher-status areas of Cairo and Alexandria, the two largest cities, have not been included, the results refer only to the area sampled and may not be representative of all of Egypt. Because the subgroup differences found in these data appear to be clear-cut and internally consistent, we feel that the relationships found have validity and are worth examining. The reader needs to bear in mind, however, the special nature of this sample.

CONTRACEPTIVE USE

The percentage of current users found for the whole survey was 19.6% (Table 1), compared with an overall rate of use of 20.5% for married women 15-44 years of age in 1974 reported by one source (Freedman and Berelson, 1976, p. 6). Although these levels of contraceptive use are approximately the same, the two numbers are not directly comparable for the reasons cited earlier.

There is a steep gradient of contraceptive use with area of residence from rural areas (11.7%) to smaller urban places (15.5%) to larger urban places (50.6%). The lower-socioeconomic areas of Cairo and Alexandria have a contraceptive prevalence intermediate between the prevalence for small cities and that for large cities. While there is some difference between areas in the percentage of non-users who are pregnant, this difference is not large enough to account for the widely different levels of contraceptive use.

The methods employed by women in the survey (Table 2) are dominated by oral contraception (84.2%), a finding that does not vary much by area of residence. (There does appear to be more use of intrauterine devices (IUDs) in the lower-status urban areas.) The predominance of oral contraception is in contrast to data published elsewhere, which indicate in recent years orals account for about 50% of all contraceptive users, with IUDs more prevalent than found here (Nortman and Hofstatter, 1978, p. 78). There may be valid reasons for this discrepancy, since, among other reasons, the survey population consists of relatively recent mothers who may be younger and more likely to use orals.

Table 3 shows that only about half of all users in all areas obtain their contraceptives from government maternal and child health (MCH) or other public clinics. This contrasts with other information that over 80% of users obtain supplies from public clinics (Freedman and Berelson, 1976, p. 6). Again, the difference may be due, in part, to reasons that have been discussed or to definitional differences. Pharmacies were found to be very important, accounting for 38% of users.

The percentage of mothers using contraception in this group (19.6%) falls within the rather wide range of percentages of married women of

childbearing age using contraception reported for 5 Asian countries (Korea-35%; Malaysia-33%; Nepal-2%; Pakistan-5%; Thailand-33%) (Westoff, 1978) and is similar to those found for 2 Latin American countries (Paraguay-25.7%; El Salvador-21.8%) (Anderson, Morris, and Monteith, 1978). Of course, the degree of contraceptive use of mothers of young children may be different from that of all married women of childbearing age, but in the case of one country, Paraguay, the percentage of users was almost exactly the same for all married women 15-44 and for married women with children under 6. Perhaps, then, 19.6% can be considered a rough estimate of contraceptive prevalence in Egypt. No doubt, the percentage of women using contraception would increase to some extent if the higher-status areas of Cairo and Alexandria were included in the sample.

SOCIOECONOMIC DIFFERENCES IN CONTRACEPTIVE USE

The data indicate that differences exist in the use of contraception by various indicators of social status; these differences are apparently independent of urban or rural residence. For example, in the ARE 30% of women with literate husbands used contraception, compared with 12% of those with illiterate husbands (Table 4). Even wider differences exist by type of water supply, whether or not the home has electricity, and type of cooking facility. These measures of social status are, to an extent, associated with residence, so it is possible that differences observed are due to urban and rural differences. However, when residence is controlled using multiple classification analysis in Table 4, the socioeconomic differences are only slightly changed. The association of literacy and family planning use, for example, is measured by an eta of .21; when residence is controlled beta, a measure of the net association, is .18.

The pattern is similar for the other socioeconomic variables. Thus, differences by social status in family planning use appear to be largely independent of residence. (In using multiple classification analysis to control background variables, we have assumed that variables are related in the simplest possible way, in linear relationships. We have not attempted to test for interaction among the variables since we are not interested in analyzing in detail multivariate models, but rather in seeing the effect on bivariate relationships of controlling for background variables. Such effects should be evident assuming a linear relationship.)

One might ask to what extent the differences in family planning use by residence are due to urban and rural levels of social status. As Table 5 shows, controlling for socioeconomic variables reduces the family planning-residence association by about 40% ($\eta = .36$, $\beta = .21$). Use varies from 12% in rural areas to 51% in large cities; if socioeconomic variables were controlled this range would be from 17% to 40%.

The greater use in urban areas may be due to a more traditional orientation in rural areas, or to the greater availability of family planning services in urban areas. In any case, the relationship observed is relevant to the current debate in family planning circles, since it suggests that contraceptive use is related to both development (measured by socioeconomic variables) and availability (assuming this is related to location).

MEASURING CHILD HEALTH

Two measures of a child's nutritional status will be used in this analysis: low height for age and low blood hemoglobin levels. Low height for age is a sensitive indicator of long-term nutritional deprivation. A special subsample of high-status children measured as part of the ARE Nutrition Survey was found to be distributed similarly to a reference

population developed by the National Center for Health Statistics (NCHS, 1977). As a measure of chronic undernutrition, then, we have used a height for age of less than 90% of the median of that reference population as indicating chronic undernutrition.

For measuring anemia blood samples were drawn from the children selected in the survey. Since hemoglobin levels normally increase with age for children under 6, the level used to designate anemia was set at 10 grams for children under 2, and at 11 grams for those 2 to 6 years. Those with lower hemoglobin levels were considered anemic for this analysis.

By these criteria about 23% of the children in the sample were chronically undernourished, and 27% anemic. These measures of child health vary by residence; 11% were chronically undernourished in the larger cities, and 26% in the rural areas; anemia affected 14% and 32% of children, respectively, in these areas.

Child health indicators were also related to socioeconomic variables. For example, 13% of children with a water supply in the house were chronically undernourished, compared to 27% of those without water in the home. The percent anemic for these two groups was 18% and 31% respectively.

FAMILY PLANNING USE AND CHILD HEALTH

Family planning and child health are related through a series of closely interrelated factors: nutrition, lactation, and fertility. Fertility has been seen as related to nutritional status of mothers; nutritional deprivation can affect fertility through later age at menarche, longer postpartum amenhorrea, and earlier menopause (Butz and Habicht, 1976). Breastfeeding, in a high mortality population, enhances the probability of child survival, while prolonged lactation in a population tends to depress fertility through

its negative effect on ovulation (Knodel, 1978; Jain, et al, 1970).

Further, Wolfers and Scrimshaw (1975) have found, for example, in a study in Ecuador, that short intervals between pregnancies are related to greater rates of miscarriage, stillbirth, and neonatal and post-neonatal mortality. Survival chances of the first of two children in a family were found to be less if the second conception took place soon after the initial birth. The presumed mechanism for these findings, especially in the case of post-neonatal deaths, is through nutrition and environmental factors. Presumably nutrition-related morbidity will follow a pattern similar to that for mortality.

Contraceptive use, then, can affect child health through increasing the intervals between pregnancies. By spacing and limiting births, more of a mother's time, breast milk, solid food, and other resources can be given to each individual child. The data from the ARE Survey do not allow for the examination of pregnancy intervals, but we can examine the association between contraceptive use and the health of children aged 6 months to 6 years. In this case current contraceptive use can be considered a proxy for past use and its effect on lengthening birth intervals.

According to Table 6, there is a positive association between family planning and child health. Fourteen percent of current family planning users have chronically undernourished children compared with 25% of non-users. Seventeen percent of the children of users are anemic compared with 29% of the children of non-users. On the basis of these comparisons, contraceptive users can be said to have healthier children. When residence, socioeconomic variables, and age of child are controlled for, these associations are reduced somewhat, but the difference remains.

The data in Table 6 suggest that there is a net association of contraceptive use and child health but do not indicate how these factors are causally related. The survey does not have the necessary data items to develop a satisfactory causal model of child health. Table 7 presents a first step in that direction. This regression contains "length of breastfeeding" as an independent variable under the assumption that contraception lengthens the time of breastfeeding by postponing future births and, thereby, has a positive effect on child health. The regression model is for weaned children only, since for those still breastfeeding the total length of breastfeeding is not known.

According to this regression, two items have strong enough net effects on anemia and chronic undernutrition to be considered "significant" (using the arbitrary level of the regression coefficient's being twice its standard error). These variables are age of child, and current contraceptive use.

Length of breastfeeding, while not significant, has a positive net association with anemia. In a population such as that of ARE, prolonged breastfeeding can indicate insufficient supplemental sources of nutrition. After about 6 months, supplemental food is needed in order for the child to receive adequate iron. Those who are weaned later may be those who have less access to other sources of nutrition. Thus, simply measuring the length of time a child is breastfed does not provide an adequate intervening variable in developing a causal model relating the use of contraception and child health.

DISCUSSION

According to the data from the 1978 Nutrition Survey of the ARE, current contraceptive use is positively related to child health, an

association that holds up when numerous other factors are controlled statistically. It might be argued that contraceptive use is simply evidence of rational attitudes and behavior toward health care, which also affect the health of children. However, there is a definite hypothetical causal relationship between family planning use and child health, which could be analyzed more thoroughly in future surveys. In order to obtain the data necessary, more detailed information on pregnancy intervals and contraceptive use is needed. While it is important not to encumber a nutrition survey with a large amount of demographic detail, a small number of items could be developed which would greatly enlarge the ability to analyze the contraception-child health relationship. For example, one could ask for each child the length of time since previous birth (pregnancy), length of time until subsequent pregnancy, and the mother's use of contraception and/or abortion in this interval. While previous demographic studies have linked birth intervals, breastfeeding, and child survival, the inclusion of these items on a nutrition status survey would have the advantage of using accurately measured indicators of child morbidity as dependent variables, not child mortality which can be subject to bias and under-reporting. Such a study could help demonstrate the effectiveness of family planning programs in achieving one of their main goals--improved child health.

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TABLE 1

Egypt: Percent of Mothers by Contraceptive Status and Area of Residence, 1978 Nutrition Survey

	Area				<u>Total</u>
	<u>Rural</u>	<u>Urban <50,000</u>	<u>Urban 50,000+ Except Cairo & Alexandria</u>	<u>Low Socioeconomic Areas, Cairo & Alexandria</u>	
Current Users	11.7	15.5	50.6	26.0	19.6
Non-Users	87.1	83.8	46.7	72.7	79.1
Pregnant	16.1	16.4	11.7	19.0	15.7
Lactating (Not pregnant)	53.2	48.7	22.2	36.4	46.1
Other Non-Users	17.8	18.7	12.8	17.3	17.2
Unknown	<u>1.2</u>	<u>0.7</u>	<u>2.8</u>	<u>1.3</u>	<u>1.3</u>
TOTAL	100.0	100.0	100.0	100.0	100.0
Unweighted No. of Cases	1080	358	180	362	1980

TABLE 2

Egypt: Percent of Contraceptive Users, by Method and Area,
1978 Nutrition Survey

Method	Area				Total
	Rural	Urban <50,000	Urban 50,000+ Except Cairo & Alexandria	Low Socioecon- omic Areas, Cairo & Alexandria	
Oral	81.3	84.3	87.9	77.5	84.2
IUD	11.1	4.8	6.6	19.5	8.7
Condom	1.4	2.4	1.1	3.0	1.6
Other	6.2	7.2	4.4	0.0	5.2
Unknown	0.0	1.2	0.0	0.0	0.3
TOTAL	100.0	100.0	100.0	100.0	100.0
Unweighted No. of Cases	126	66	91	93	376

TABLE 3

Egypt: Percent of Contraceptive Users by Source of Contraception
and Area, 1978 Nutrition Survey

Source of Contraception	Area				Total
	Rural	Urban <50,000	Urban 50,000+ Except Cairo & Alexandria	Low Socioecon- omic Areas, Cairo & Alexandria	
MCH Clinic	42.8	42.2	40.7	38.8	41.5
Other Public Clinic	16.5	8.4	6.6	11.7	10.4
Private Clinic or MD	5.0	2.4	2.2	2.1	3.1
Pharmacy	29.8	39.8	41.8	44.8	38.0
Other	4.9	4.8	8.8	1.3	6.1
Unknown	1.0	2.4	0.0	1.3	0.9
TOTAL	100.0	100.0	100.0	100.0	100.0
Unweighted No. of Cases	126	66	91	93	376

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TABLE 4

Egypt: Percent of Mothers Using Contraception by Selected Socioeconomic Indicators, 1978 Nutrition Survey

	<u>Percent Using Contraception</u>				<u>Unweighted No. of Cases</u>
	<u>Unadjusted</u>	<u>Adjusted for Residence^a</u>	<u>Eta</u>	<u>Beta</u>	
Total	19.6				1980
<u>Literacy of Husband</u>					
Literate	29.8	27.8	.21	.18	830
Illiterate	12.3	13.9			1086
<u>Water</u>					
In House	36.3	32.2	.29	.22	622
Not in House	11.8	13.8			1358
<u>Electricity in House</u>					
Yes	32.7	29.9	.31	.24	924
No	8.1	10.6			1056
<u>Cooking</u>					
Kerosene or Bottle Gas	29.9	27.5	.30	.22	1169
Open Fire	5.8	9.2			806

^aAdjusted using multiple classification analysis

TABLE 5

Egypt: Percent of Mothers Using Contraception by Area of Residence, 1978 Nutrition Survey

<u>Area of Residence</u>	<u>Percent Using Contraception</u>		<u>Unweighted No. of Cases</u>
	<u>Unadjusted</u>	<u>Adjusted for Socioeconomic Variables^a</u>	
Rural	11.7	17.1	1080
Cities <50,000	15.5	15.4	358
Cities 50,000+ excluding Cairo & Alexandria	50.6	40.1	180
Lower Socioeconomic Areas of Cairo & Alexandria	26.0	19.3	362
Eta		.36	
Beta		.21	

^aAdjusted for Literacy, Electricity, Plumbing, Cooking Facilities
in multiple classification analysis

TABLE 6

Egypt: Percent of Children with Chronic Undernutrition and Anemia
by Contraceptive Use of Mothers, 1978 Nutrition Survey

A. <u>Chronic Undernutrition</u> ^a	<u>Unadjusted Percent</u>	<u>Adjusted Percent</u> ^b	<u>Unweighted No. of Cases</u>
TOTAL	22.7	--	1945
Using Family Planning	13.8	18.6	375
Not Using	24.7	23.5	1541
Eta		.11	
Beta		.05	
B. <u>Anemia</u> ^a			
TOTAL	26.7	--	1967
Using Family Planning	17.3	22.7	374
Not Using	29.4	28.0	1530
Eta		.11	
Beta		.05	

^aChronic undernutrition less than 90% of the median of reference population; anemia, defined as hemoglobin less than 10.0 grams for children under 2 years, less than 11.0 grams for children 2 years and older

^bAdjusted for area of residence, plumbing, literacy, cooking, age of child in multiple classification analysis