

WORLD FERTILITY SURVEY



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The Sudan Fertility Survey 1979 A Summary of Findings

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The World Fertility Survey is an international research programme whose purpose is to assess the current state of human fertility throughout the world. This is being done principally through promoting and supporting nationally representative, internationally comparable, and scientifically designed and conducted sample surveys of fertility behaviour in as many countries as possible.

The WFS is being undertaken, with the collaboration of the United Nations, by the International Statistical Institute in co-operation with the International Union for the Scientific Study of Population. Financial support is provided principally by the United Nations Fund for Population Activities and the United States Agency for International Development. Substantial support is also provided by the UK Overseas Development Administration.

This summary is one of a series containing the salient findings of the First Country Reports of the countries participating in the WFS programme. A copy of the report itself, *The Sudan Fertility Survey 1979*, is available for reference at all WFS depository libraries, or may be obtained from the International Statistical Institute, 428 Prinses Beatrixlaan, PO Box 950, 2270 AZ Voorburg, Netherlands, on payment of US \$10 postage, and also from the Department of Statistics, PO Box 700, Khartoum, Sudan.

For information on Country Reports, WFS publications, and WFS depository libraries, write to the Publications Office, International Statistical Institute, 428 Prinses Beatrixlaan, PO Box 950, 2270 AZ Voorburg, Netherlands. For information on the WFS generally, write to the Information Office, World Fertility Survey, International Statistical Institute, 35-37 Grosvenor Gardens, London SW1W 0BS, UK.

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THE SUDAN FERTILITY SURVEY 1979

A SUMMARY OF FINDINGS

1. THE SETTING

The Sudan is the largest country in Africa covering an area of about 2.5 million square kilometres or nearly one-tenth of the total area of Africa. It has lengthy borders with eight other African countries: Egypt and Libya to the north, Chad, Central African Republic and Zaïre to the west, Uganda and Kenya to the south and Ethiopia to the east. The Sudan also has 480 kilometres of coastline along the Red Sea.

The Sudan consists primarily of an extensive plain rising gradually to mountains in the north-east near the Red Sea coast, and plateau and low mountains near the southern and western borders. The climate ranges from tropical in the extreme south to that of arid desert in the north. Temperatures are high in most areas throughout the year.

A principal economic and geographic feature of the country is the Nile River and its tributaries. The heart of the country in terms of population lies at the confluence of the Blue Nile and White Nile.

The Sudan is predominantly rural and sparsely populated with an enumerated population of 14.1 million in 1973 and an estimated population of over 19 million in 1981. The 1973 population was 19 per cent urban, 65 per cent rural settled, 11 per cent nomadic and 5 per cent cotton pickers. The current population density is 8 persons per square kilometre. The population of the Sudan is very young, with nearly 46 per cent of the population aged under 15 and only 3 per cent aged 65 and over. The current rate of natural growth is estimated to be around 3.2 per cent annually.

There has been in recent years a rapid expansion of the educational system and about one-half of boys and more than one-third of girls aged 7-12 are currently enrolled in primary schools. The educational level of the adult population is lower, however, reflecting the less intense schooling in the past. In 1973, among persons 10 years of age and older, about 32 per cent of males and 12 per cent of females were literate.

The economy of the Sudan is largely based on agriculture. In 1973, about 66 per cent of the economically active population were occupied in the agricultural sector which provided only 41 per cent of the gross domestic product and as much as 95 per cent of all exports. In 1978, the per capita gross national product was estimated at US\$ 320. The Sudan does, however, have large unexploited reserves of agricultural land and mineral resources.

2. THE SURVEY

The Sudan Fertility Survey (SUDFS) was carried out during the period December 1978-April 1979 by the Department of Statistics (DOS) of the Government of the Democratic Republic of the Sudan as part of the World Fertility Survey (WFS). Financial support was provided by the Overseas Development Administration of the Government of the United Kingdom.

The SUDFS was originally designed as a two-phase survey covering the North and the South of the Sudan but, for operational reasons, the survey was conducted only in the North of the Sudan which represents about 80 per cent of the total population.

The SUDFS consisted of two components. First, a large-scale household survey with an expanded Household Schedule designed to obtain certain characteristics of the household's members together with information on nuptiality, fertility and mortality. The household survey has also provided data on housing and environmental conditions and on the presence in the household of modern durables. The second phase of the SUDFS was an individual survey based on a subsample of the households covered in the first phase. Within these households, all ever-married women under the age of 51 years were eligible for interview using the Individual Questionnaire which was based on the WFS Core Questionnaire and incorporated the WFS Module on Factors Other Than Contraception Affecting Fertility. In addition, a Community Questionnaire was used in the SUDFS in the rural areas to collect information on community level variables likely to affect reproductive behaviour on the level of mortality. These questionnaires were drawn up in Arabic.

The sample was a probability sample with a three-stage design, the probability of selection in the urban areas being twice that in the rural areas. To compensate for these unequal probabilities, the sample cases were assigned appropriate weights. All the results presented here are based on the weighted frequencies.

For the two-thirds of the sample to which only the Expanded Household Schedule was administered, the interview was conducted by male interviewers. For the remaining one-third, both the household and the individual interviews were conducted by female interviewers, generally during a single visit to the sample household. The team approach was used, each team usually consisting of two male interviewers, four female interviewers, one (female) field editor and one (male) supervisor.

The application in the field of the sampling design yielded a sample of 12 638 households for the household survey. Household schedules were completed in 12 028 or 95.2 per cent of the total household sample. The number of households selected for the individual survey was 3923. Among those households, 3204 ever-married women aged 50 or less were identified as eligible for the individual survey. The number of individual questionnaires successfully completed was 3115 or 97.2 per cent of the possible maximum.

This document is a summary of the main survey findings contained in the First Country Report, published in April 1982. A summary table of the major results of the survey appears in the centre pages. It is expected that results from more detailed analyses of the data will be available shortly and will shed further light on the findings presented in the first report.

3. FINDINGS

3.1 GENERAL CHARACTERISTICS

The figures on the age and sex composition of the survey population show a very young population for the Sudan and conform to the pattern observed in most developing countries; thus, over 47 per cent of the population enumerated in the household survey are less than 15 years old. About 44 per cent of the females are in the age group 15-49 (table 1). Substantial differences in the age-sex composition are also observed between the urban and rural areas. The percentage of the population under 15 years of age is 50 per cent in rural areas compared to 43 per cent in urban areas. The sharp excess of males in urban areas and of females in rural areas is mainly due to the male-dominated migration from rural to urban areas.

TABLE 1

PER CENT DISTRIBUTION OF THE DE FACTO POPULATION ENUMERATED IN THE SUDFS HOUSEHOLD SURVEY BY AGE, SEX, AND PLACE OF RESIDENCE

	Age			All
	< 15	15-49	50+	
Urban				
All	42.9	48.0	9.1	100
Males	41.6	48.9	9.5	100
Females	44.3	47.2	8.5	100
Rural				
All	49.5	39.7	10.8	100
Males	51.8	36.6	11.6	100
Females	47.5	42.8	9.7	100

The average household size is 5.3 for the whole sample, and about 6.0 and 5.0 for the urban and rural areas, respectively. About 90 per cent of the sample urban households had piped water inside or outside the house but only 24 per cent of rural households had access to piped water. Electric lighting was used by 44 per cent of the urban households and by 3 per cent of the rural households. About two-thirds of the households in urban areas had radios and 22 per cent had television sets, against 27 per cent and less than 1 per cent, respectively, in

rural areas. Thus, urban areas and in particular Khartoum had living conditions far superior to those in other areas with the availability of sewage disposal, the provision of piped water and electricity, and the presence in the household of some of modern durables.

As may be seen from table 2, the majority of the individual survey sample of ever-married women lived in rural areas (73 per cent), had no formal education (82 per cent), had been circumcised (96 per cent), never worked (56 per cent), and had been married to husbands engaged in the agricultural sector (42 per cent) or in manual occupations (23 per cent).

3.2 NUPTIALITY

In the Sudan, conception is confined almost exclusively to women in the married state. For this reason the detailed Individual Questionnaire was administered only to women currently married at the time of the survey or married some time prior to the survey. A woman's exposure to conception over the reproductive ages will be influenced by a variety of factors: age at first marriage; duration of the first marriage and, if dissolved, length of the interval until remarriage, if it occurs; and, while married, factors such as temporary separation of spouses, adolescent sterility, primary and secondary sterility, post-partum amenorrhoea and contraceptive use. The SUDFS obtained detailed information which sheds light on the importance of most of these factors.

Age at Marriage

First marriage is a relatively early and virtually universal experience among women in the Sudan. The survey data indicate a clear trend towards later marriage. The singular mean age at marriage for females has risen from 19.3 years in 1973 to 21.3 years in 1978. The percentage of women ever married by exact age 20 has decreased from 79 per cent for the cohort aged 30-34 to 74 for those aged 25-29 and to 57 for women aged 20-24. The decline in first marriage at very young ages has been equally striking. Among the oldest women (aged 45-49), 36 per cent first married before their fifteenth birthday; among the youngest (aged 15-19), only 8 per cent did so.

The age at first marriage varies among socio-economic strata of the population as well as among age groups. Women residing in urban areas appear to marry later: among women aged 20-24 included in the household survey, for example, the percentage ever married is 51 per cent in urban areas and 70 per cent in rural areas. There are also significant differences in the timing of first marriage according to region of residence. Thus, the median age at first marriage for females rises from 18 years for Darfur to about 20 for the Kordofan, Central and Eastern regions and to over 21 for the Khartoum and Northern regions. There is also an inverse relationship between level of education and age at marriage, with a difference between the median age at first marriage for women who never attended school and those with primary or more education amounting to as much as seven years.

TABLE 2

PER CENT DISTRIBUTION OF EVER-MARRIED WOMEN INTERVIEWED IN THE INDIVIDUAL SURVEY,
ACCORDING TO BACKGROUND CHARACTERISTICS

Total Number of Ever-Married Women		3114	
Background Characteristics	Per Cent	Background Characteristics	Per Cent
Place of Residence		Current or Last Occupation Since Marriage	
Urban	27.0	Prof., Tech. & Clerical	1.7
Rural	73.0	Sales	1.4
Region		Agriculture	22.8
Khartoum	13.0	Service	1.0
Northern	8.0	Manual	7.0
Eastern	15.0	Did Not Work	65.5
Central	28.8	Not Stated	0.6
Kordofan	12.3	Work Status Before Marriage	
Darfur	22.9	Family: Paid in Cash	1.1
Literacy		Family: Paid in Kind	0.5
Literate	18.4	Family: Unpaid	15.6
Illiterate	81.6	Other: Paid in Cash	3.8
Level of Education		Other: Paid in Kind	0.1
No Schooling	81.6	Other: Unpaid	0.0
Incomplete Primary	13.3	Self Employed	10.4
Primary and Over	5.1	Did Not Work	68.5
Pattern of Work		Last Work Status Since Marriage	
Before & After Marriage	22.4	Family Farm	18.6
After Marriage Only	12.2	Family: Paid in Cash	0.2
Before Marriage Only	9.0	Family: Unpaid	0.3
Never Worked	56.4	Other: Paid in Cash	5.0
Occupation before First Marriage		Other: Paid in Kind	0.5
Prof., Tech. & Clerical	1.7	Other: Unpaid	1.5
Sales	0.5	Self Employed	8.4
Agriculture	23.0	Did Not Work	65.5
Service	0.6	Place of Work Since Marriage	
Manual	5.2	Family Farm	18.5
Did Not Work	68.5	Other Farm	4.2
Not Stated	0.5	At Home	8.4
		Away from Home	3.4
		Did Not Work	65.5
		Background Characteristics	Per Cent
		Type of Circumcision	
		Not Circumcised	4.1
		Pharaonic	79.4
		Sunna	16.5
		Childhood Place of Residence	
		Urban	31.4
		Rural	68.6
		Husband's Childhood Place of Residence	
		Urban	27.8
		Rural	72.2
		Husband's Literacy	
		Literate	51.8
		Illiterate	48.2
		Husband's Level of Education	
		No Schooling	64.0
		Incomplete Primary	23.0
		Primary and Over	13.0
		Husband's Occupation	
		Prof., Tech. & Clerical	8.7
		Sales	12.3
		Agriculture	41.8
		Service	10.8
		Manual	22.6
		Never Worked	3.8
		Husband's Work Status	
		Family: Paid in Cash	1.1
		Family: Paid in Kind	0.2
		Family: Unpaid	1.0
		Other: Paid in Cash	39.4
		Other: Paid in Kind	0.4
		Self Employed	54.1
		Never Worked	3.8

The interaction between these three factors has the effect of reinforcing certain differentials, so that those women who marry later in life tend also to be better educated and to live in urban areas and in the Khartoum region.

Marital Stability

The survey results indicate a moderate level of marital instability in the Sudan produced by a relatively high incidence of divorce at all durations of marriage and a high incidence of widowhood at longer marital durations. Overall, 82.5 per cent of ever-married women are still in their first marriage. Of the remaining 17.5 per cent, 5.8 per cent had their first marriages dissolved by death of husband, and 11.7 per cent by divorce or separation.

Of the 17.5 per cent of women whose first marriages were dissolved, about three-fifths have remarried. At the time of the survey, 92 per cent of all ever-married women were currently married.

Marital dissolution appears to be less common among educated than uneducated women, among inhabitants of Khartoum and the Eastern regions than in other regions, and among the wives of farmers and of men engaged in sales occupations than other wives.

Remarriage is higher in rural than in urban areas, and is also higher in Darfur, Kordofan and Khartoum than in the Northern, Eastern or Central regions. Remarriage is also much higher among non-educated women than among women with primary or more education.

Despite the relatively high rate of dissolution of first marriage, the relatively high rate of remarriage suggests that marital instability is likely to have only a very minor depressing effect on the overall level of marital fertility.

Polygamy

All currently married women were asked whether their husbands had other wives and, if so, how many. About 16.8 per cent of these women reported having one or more co-wives. The prevalence of polygamous marriages rises steadily with the current age of the woman. While just 11 per cent of currently married women aged under 25 years are in a polygamous marriage, this proportion is nearly twice as high for those aged 35 and over. This age pattern may reflect a decline in the popularity of such marital unions among the younger cohorts, though it may also reflect life-cycle effects whereby polygamy more commonly involves older women.

Differences in Ages of Husbands and Wives

The overall mean difference in ages of husbands and wives is almost 10 years. In only 13 per cent of cases, the wife was reported to be less than five years younger than her husband, but in nearly 55 per cent

of cases, the wife was 10 or more years younger than her husband. There is no indication of any significant convergence over time in the ages of husbands and wives. This wide age difference reflects the fact that while Sudanese women tend to marry at young ages, Sudanese men show a relatively late age pattern of marriage.

3.3 FERTILITY

Information on fertility was obtained through the use of a detailed birth and pregnancy history. This information permits examination of levels and differentials in several measures of fertility which are of interest: (1) cumulative fertility at the survey date; (2) fertility in the first five years after marriage; and (3) fertility in the period immediately preceding the survey.

Cumulative Fertility

Since ever-married women in households included in the household survey were asked to report their total number of live births, both the household survey and the individual survey provide data on the average number of children ever born to ever-married women. The two sources of data reveal very similar mean numbers of births for women classified by age at the survey dates, as may be seen from table 3.

TABLE 3
MEAN NUMBER OF CHILDREN EVER BORN TO EVER-MARRIED WOMEN BY CURRENT AGE

Survey	Current age							All
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	
Household	0.8	2.1	3.5	5.0	5.8	6.3	6.3	4.3
Individual	0.7	2.2	3.4	5.0	5.9	6.0	6.0	4.2

The means in excess of 6.0 for women over age 40 and the means already in excess of 2.0 for women aged 20-24 both indicate a pattern of high fertility. A more detailed picture of cumulative fertility by age groups as shown by the individual survey is given in table 4. About 11 per cent of all ever-married women are childless. At ages 30 and over, the percentage still childless fluctuates between 5 and 9 per cent which is a little higher than would be expected in a healthy population. Of the rest, 23 per cent have had either one or two live births; 23 per cent three or four; 19 per cent, five or six; and the remaining 23 per cent, seven or more. Among women aged 25-29, the mean number of births is 3.4, and 29 per cent of these women have had five or more children. Among women aged 30-34, about 28 per cent have had seven or more children; and among women aged 35-39 about 21 per cent have had nine or more children.

SUMMARY TABLE

MAJOR INDICATORS: SUDAN FERTILITY SURVEY 1979

BACKGROUND CHARACTERISTICS	NUPTIALITY				FERTILITY				Total fertility rate (TFR) (1974-1979)
	Median age at first marriage	Of all women aged 20-24 % ever married	% of women whose first marriage was dissolved	% re-married among women whose first marriage was dissolved	Mean Number of Children ever born				
					To women at ages 15-49	To women at ages 45-49	In first five years of marriage	In the past five years	
(1)	(2)	(3)	(4)	(5)*	(6)	(7)	(8)*	(9)	
All	19.6	63.6	17.5	60.1	4.2	6.0	1.5	1.4	6.0
PLACE OF RESIDENCE									
Urban	21.4	50.9	16.3	53.2	4.2	6.3	1.7	1.2	5.1
Rural	19.4	69.6	18.0	62.4	4.2	5.9	1.5	1.4	6.4
REGION									
Khartoum	21.5	52.7	12.7	61.7	4.3	7.2	1.7	1.3	4.9
Northern	21.4	49.0	24.2	45.3	4.1	4.9	1.5	1.5	5.4
Eastern	20.1	69.4	13.9	45.1	4.2	6.2	1.6	1.4	6.0
Central	19.7	63.1	17.0	51.0	4.7	6.7	1.6	1.5	6.6
Kordofan	19.6	60.1	19.4	68.4	4.0	5.1	1.5	1.3	5.9
Darfur	18.1	80.6	20.0	78.1	3.7	5.4	1.4	1.3	6.3
LEVEL OF EDUCATION									
No schooling	17.2	77.2	19.3	62.0	4.2	6.1	1.5	1.4	6.3
Incomplete primary	19.8	58.0	11.1	48.6	4.4	5.3	1.8	1.4	4.5
Primary and over	24.0	33.6	6.3	18.8	3.0	4.7	1.9	1.1	

NOTE:

- Figures in columns 1-5, 8-9 and 13-14 refer to all ever-married women aged 50 or less years
- Figures in columns 10-11 refer to currently married fecund women
- Figures in column 12 refer to all currently married women
- Figures in column 15 refer to currently married exposed women

* Figures in columns 5 and 8 by background characteristics are standardised for differences in age structure of ever-married women

FAMILY SIZE PREFERENCES		FAMILY PLANNING			BREAST-FEEDING	HOUSEHOLDS CHARACTERISTICS			BACKGROUND CHARACTERISTICS
% wanting no more children	Mean total desired family size	% heard of family planning	% ever used family planning	% currently using any method	Mean length of breast-feeding in last closed interval (in months)	Average household size	% of households with piped water	% of households with electric lighting	
(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	
16.8	6.4	50.6	12.3	6.4	16.2	5.3	41	13	All
									PLACE OF RESIDENCE
24.6	5.9	75.3	27.5	16.4	14.2	6.0	90	44	Urban
14.0	6.6	41.5	6.6	2.7	16.9	5.0	24	3	Rural
									REGION
27.0	5.6	82.3	31.6	19.6	14.3	6.1	79	51	Khartoum
19.8	6.0	71.2	11.7	3.3	16.8	5.5	51	11	Northern
18.1	6.4	38.3	9.2	3.2	15.5	4.9	49	8	Eastern
19.8	6.1	64.4	13.3	8.2	15.4	5.7	45	16	Central
16.7	6.8	39.4	5.5	2.5	16.9	4.9	24	1	Kordofan
6.5	7.0	22.2	5.8	2.3	17.9	4.7	17	3	Darfur
									LEVEL OF EDUCATION
15.8	6.7	42.7	6.2	2.5	16.8				No schooling
19.9	5.7	82.6	30.0	14.9	13.9				Incomplete primary
22.7	4.7	93.3	62.3	41.6	10.8				Primary and over

TABLE 4

PER CENT DISTRIBUTION OF EVER-MARRIED WOMEN ACCORDING TO THE NUMBER OF CHILDREN EVER BORN (CEB), AND CHILDREN SURVIVING, BY CURRENT AGE

Current age	Number of children ever born						Total	Mean (CEB)	Mean surviving
	0	1-2	3-4	5-6	7-8	9+			
<20	52.5	43.7	3.8	-	-	-	100	0.69	0.59
20-24	14.5	46.7	31.8	6.4	0.7	-	100	2.18	1.83
25-29	7.5	27.0	36.5	23.4	5.0	0.7	100	3.40	2.98
30-34	5.4	12.3	23.4	31.1	23.4	4.4	100	4.97	4.26
35-39	5.3	10.3	15.4	24.3	24.0	20.7	100	5.87	4.96
40-44	6.5	12.1	13.8	16.2	26.8	24.6	100	6.00	5.00
45+	8.6	11.5	14.0	17.4	23.0	25.5	100	6.03	4.90
All	11.3	23.3	23.2	18.8	13.8	9.6	100	4.19	3.55

Early Marital fertility

The average number of live births during the first five years of marriage is 1.5 for women who have been married for at least five years (see table 5). By the end of the fifth year of marriage, as many as 22 per cent of the women had no children at all. This indicates a relatively high incidence of adolescent subfecundity. But a very sharp reduction in the proportion of women still childless after five years of marriage is shown by the more recent marriage cohorts. The magnitude of this reduction is, however, suggestive of reporting errors in the date of marriage or first birth or omission of first births, particularly on the part of older women.

TABLE 5

MEAN NUMBER OF CHILDREN BORN WITHIN FIRST FIVE YEARS OF MARRIAGE, PER CENT CHILDLESS AND MEAN INTERVAL BETWEEN FIRST MARRIAGE AND FIRST BIRTH AFTER FIVE YEARS OF MARRIAGE (CONFINED TO WOMEN WHO FIRST MARRIED AT LEAST FIVE YEARS AGO)

Years since first marriage	Mean number of children	Per cent childless	Mean interval between first marriage and first birth in months
5-9	1.7	12.5	24.6
10-19	1.6	18.0	32.7
20+	1.3	32.9	49.5
All	1.5	21.6	36.3

There is also a trend towards a shorter interval between marriage and first birth which may partly be related to the decline in very early marriage. An apparent increase in early marital fertility is also evident. However, when women who remained childless throughout the first five years of marriage are excluded from the calculation of the mean number of births, an average of 1.94 births per fertile woman in the first five years of marriage is obtained for each of the three marriage cohorts considered. This suggests that the apparent rise in early marital fertility has been caused mainly by an increase in the proportion of women having a first birth, whereas the speed of child-bearing among fertile women has undergone little, if any, change.

Current Fertility

One of the main objectives of the SUDFS was to obtain estimates of the current levels and trends in fertility in Sudan. Information obtained in both the household survey and the individual survey on births in the 12-month period preceding the survey date permit calculation of age-specific fertility rates (defined as the number of births to women in five-year age groups divided by the number of all women in that age group). The summation of these rates multiplied by five yields a 'total fertility rate'. The total fertility rate may be interpreted as the total number of live births that would occur to a woman if she were to go through her reproductive years bearing children at the age-specific rates currently prevailing.

TABLE 6
AGE-SPECIFIC FERTILITY RATES PER 1000 WOMEN AND REPORTED
AND REVISED TOTAL FERTILITY RATES AT THE 1973 CENSUS AND
THE 1979 SUDFS HOUSEHOLD AND INDIVIDUAL SURVEYS

Age	Household Survey 1979	Individual Survey 1979	Census 1973 (North)
15-19	55.0	90.2	109
20-24	224.2	274.9	259
25-29	273.7	324.6	273
30-34	249.7	272.4	213
35-39	173.8	155.4	150
40-44	62.1	109.9	55
45-49	40.8	17.7	28
Total Fertility Rate (TFR)	5.40	6.23	5.44
Correction Factor*	1.400	1.107	1.300
Adjusted Total Fertility Rate	7.56	6.89	6.76

* Based on P/F ratios for age groups 20-24, 25-29 and 30-34

The rates thus obtained from the individual survey and the household survey are shown in table 6. The observed total fertility rate is 6.2 births from the individual survey and 5.4 births from the household survey. At the 1973 Census the total fertility rate was 5.4. A preliminary evaluation of these data showed that at the 1973 Census both lifetime fertility and current births were seriously under-reported and that omission of live births was greater the older the woman, and that dating of the most recent birth in the SUDFS household survey had suffered from serious reference period error by which most recent births tended to be displaced backwards in time.

A standard demographic procedure for dealing with this problem - known as the P/F ratio method - involves the calculation of a correction factor for the reported fertility rates. Total fertility rates were revised by this method to 6.8 for the North in 1973 and to 7.6 and 6.9 in the 1979 SUDFS household and individual surveys, respectively. Pending a full evaluation of the data, the adjusted total fertility rate for the individual survey of 6.9 seems to be a plausible estimate of the level of current fertility at the time of the survey. This suggests that very little, if any, change in the level of fertility in Sudan has taken place during the recent past.

Fertility Differentials

Socio-economic differentials in fertility are generally narrow. The only groups of women whose recent fertility is significantly lower than the national average are those living in urban areas, those who have primary or more education, those who have worked since marriage and women whose husbands are engaged in professional and technical occupations. These groups of women constitute a small proportion of the total and these differentials, therefore, have had no appreciable impact on the overall level of fertility.

3.4 MORTALITY

The SUDFS household survey incorporated a mortality module in order to obtain information on levels of mortality at all ages. Information obtained in the detailed maternity histories of the individual survey provides an additional basis for deriving estimates of infant and child mortality.

The question of levels, trends and differentials in infant and child mortality in Sudan is of particular interest because of the relatively high rates which are believed to have hitherto prevailed. The data suggest that more than 100 out of every 1000 live births die within the first year of life and that a further 65 die before the age of five. There is some indication of a fall in infant and child mortality.

There are substantial differentials in child mortality; it is considerably lower for women with some education than for those with none and for women living in urban areas than for those in rural areas.

Recent trends in adult mortality indicate that men currently have a roughly 75 per cent chance of surviving from age 25 to age 60, compared with around 80 per cent for women.

3.5 FAMILY SIZE PREFERENCES

Another of the aims of the SUDES was to consider Sudanese women's attitudes and ideals which might help to explain different patterns of family formation. Four principal attitudinal dimensions of childbearing were considered, namely: desire to cease childbearing, number of additional children wanted, desired family size, and preferences regarding the sex of children.

Desire to Stop Childbearing

Sudanese women prefer large families. Among currently married fecund women, 77 per cent expressed a wish to have more children, 17 per cent wanted no more children and the remaining 6 per cent were undecided or gave ambiguous answers. The proportion of women wanting no more children increases consistently with current family size, but even among women with nine or more living children, only 59 per cent desire to stop childbearing.

Additional Number of Children Wanted

Women who answered 'yes' to the question on desire for more children, were subsequently asked how many more children they wanted. The mean number of additional children wanted is 3.0. As the current family size increases, this mean decreases. Thus women with no living children desire an average of 5.2 children, while women with 4 living children desire a mean of 2.5 additional children. A pro-natalist climate is evident even among women with 8 living children, who desire an average addition of 1.5 children.

Desired Family Size

The question regarding desired family size is a delicate one to ask in the Sudan, because of the traditional attitude that children are a gift of God. All ever-married women were asked: 'If you could choose exactly the number of children to have in your whole life, how many children would that be?'. About 81 per cent gave numerical answers. For these women, the average desired number of children is 6.4. Out of every 10 women, 6 desire to have between 4 and 7 children, 3 desire to have 8 or more and only 1 desires to have 3 or fewer.

The great majority of women, 82 per cent, stated a desired number of children in excess of their actual number of children, though this proportion shows a rapid decline with increases in the number of living children. Moreover, the so-called 'rationalization effect' - where a woman adjusts her desired number so that it equals or comes close to the number of children she actually has - does not seem to be valid for Sudanese women.

The results also show that the desire to cease childbearing is lowest and the number of additional children and the desired family size are highest among the rural residents, the less educated and women whose husbands are engaged in agricultural occupations.

Preferences Regarding the Sex of Children

Sudanese women consider it important to have at least one child of each sex; however, the expressed preferences reflect two distinct factors: a preference for a 'balanced' sex composition and a preference for males. Where the sex composition of the family is already balanced evenly, a sizeable proportion express no preference.

The data on the preferred sex of the next child among women who want to have more children suggest the following:

- when there are no children, the dominant preference is for a boy;
- when there are more boys than girls, the preference in most cases is for a girl;
- when there are more girls than boys or equal numbers, the dominant preference is for a boy;
- when there are no boys and one girl, the desire for a son is much greater than the corresponding desire for a daughter when there is one boy and no girl;
- the desire for a boy is even stronger when there is one boy and one girl than when there are no children at all.

Thus, the optimal family building pattern suggested by the data is that: the first child should be a son; the second child a daughter; the third child a son; and the fourth child a son or daughter.

3.6 FAMILY PLANNING

Knowledge of Contraceptive Methods

Women were asked in the SUDFS whether they knew or had heard of ways or methods to avoid pregnancy. Any method mentioned was considered to be 'known' to the woman. 'Knowledge' of a method is, therefore, not indicative of an understanding of the efficiency and proper use of that method.

Among all ever-married women, only 51 per cent have heard of some method of family planning. The pill is the most widely known method (known by 48 per cent) followed by injection (25 per cent), female sterilization (24 per cent), and the IUD (6 per cent). Male contraception is mentioned by very few women (6 per cent).

Substantial variations in awareness of contraception exist between various socio-economic groups of women. The proportion of women who have heard of family planning methods is 76 per cent in urban areas against 41 per cent in rural areas. Residents of Khartoum (predominantly urban) have the highest level of knowledge (32 per cent), while women living in Darfur (predominantly rural) have the lowest (23 per cent). The Northern and Central regions have 72 and 64 per cent of women reporting knowledge of contraception, while the Eastern and Kordofan regions have a lower level of knowledge (38 and 39 per cent, respectively).

Use of Contraception

Of all ever-married women in the sample, only 12 per cent have used contraception at some time in their lives. Among the currently married fecund women, only 6 per cent are currently using contraception.

The data also indicate that the vast majority of the women who never used contraception do not have a favourable attitude towards family planning. Only 9 per cent of the currently married fecund women who had never used a method of contraception indicate their intention of using contraception in the future. Further, over 80 per cent of the women who want to cease childbearing are not currently using contraception.

3.7 SOME NON-CONTRACEPTIVE FACTORS AFFECTING FERTILITY

The SUDS individual survey incorporated questions on some non-contraceptive factors which might affect fertility. Most of these questions were restricted to the last closed interval and the open interval. The last closed interval refers to the period between the last two pregnancies, whereas the open interval refers to the time since the end of the most recent pregnancy. The questions asked concerned breastfeeding, amenorrhoea, post-partum abstinence, temporary separation of spouses and self-perceived fecundity status of the respondents.

The results indicate that post-partum abstinence and temporary separation of spouses do not have any major influence on fertility.

Breastfeeding

In addition to its importance for the health of the child, breastfeeding delays the return of ovulation and therefore can have a great influence on the woman's exposure to the risk of pregnancy.

Among the 2054 women (66 per cent of the sample) with at least two past pregnancies, only 17 had not breastfed their children. The mean duration of breastfeeding is 16 months, and the duration of full lactation (breastfeeding without any supplementary food) is about 7 months. Thus, breastfeeding is universal and quite prolonged; 83 per cent of children are weaned after at least 12 months and 50 per cent after at least 18 months. On average, the length of breastfeeding is shorter among women under 30 years of age (15 months) than among women aged 30 or over (17 months).

Certain socio-economic factors are associated with the length of breastfeeding during the last closed interval. Thus the period of lactation is shorter among the women living in urban areas, the literate and those whose husbands are engaged in professional occupations than among other women.

Post-Partum Amenorrhoea

Post-partum amenorrhoea refers to the interval between pregnancy termination (live or non-live birth) and resumption of menstruation and has a direct bearing on fertility because of the fact that conception does not usually occur during this period.

The data indicate that Sudanese women have long durations of amenorrhoea with a mean amenorrhoeic period of 11 months and little variation across age groups. A positive relationship between the length of breastfeeding and duration of amenorrhoea is observed. The mean length of amenorrhoea rises steadily from 9 months for women who breastfed for one year to 17 months for those who breastfed for two years. It should be added, however, that the length of amenorrhoea may be influenced by other biological factors, apart from lactation, such as nutrition and health status of the mother.

Length of Exposure

The interval to conception refers to the duration between the beginning of the last closed interval and the date of the next conception. This interval is made up of two components: (i) the period of non-exposure to risk of conception due to amenorrhoea, abstinence and temporary separation of spouses; and (ii) the period of exposure to risk of conception.

The mean length of the interval to conception is 27 months, and this varies with age from 15 months for women under 20 years of age to about 30 months for women over 35 years of age. The mean length of non-exposure is 11 months and that of the period of exposure is 16 months.

The effect of contraception in lengthening the period of exposure is significant. The mean length of the period of exposure is 20 months for the small minority of women who used contraception compared with 15 months for women who did not use any method of contraception in the last closed interval. The length of exposure is much longer than expected. However, these results must be regarded as preliminary, pending more detailed analysis.

4. POLICY IMPLICATIONS

Certain major themes have emerged from the results of the Sudan Fertility Survey:

- marriage is universal but age at first marriage is rising and very early marriage is declining;
- marriage is relatively unstable with divorce being the more important cause of marital dissolution, but the incidence of remarriage is relatively high;
- fertility is high, and a rise in early marital fertility is evident;
- very little, if any, change in the level of fertility is indicated during the recent past;
- both infant and child mortality are relatively high;
- Sudanese women prefer large families;
- the most common type of sex preference of children is a combination of a 'balanced' sex composition of boys and girls and 'male preference';
- knowledge of family planning is moderate and use of contraception is very low;
- only a small minority of women who never used contraception intend to use it in the future;
- breastfeeding is almost universal and prolonged, and acts as a major constraint on fertility.

There are significant differences in the levels and patterns of nuptiality, fertility, knowledge and use of contraception, fertility preferences and mortality as between the groups of women who are better educated, living in urban areas and married to men engaged in professional, technical and clerical occupations, and the groups of women with no schooling, living in rural areas, and married to men engaged in agricultural occupations. The former groups of women constitute a small proportion of the total, and these differences have, therefore, no appreciable impact on the overall picture.

These various aspects of the demography of the Sudan have created a situation by which the size of Sudan's population is increasing very rapidly. At the current rate of annual population growth of about three per cent, the population of Sudan will double in 23 years, rising from 19 million in 1981 to 38 million in the year 2004.

The very young age structure of the population in the Sudan means that on average each adult has to support one child. With such a large dependent population, a higher share of the country's resources is devoted to the direct needs of the young. Population is, therefore, one element of very special importance in the development process and this needs to be recognized in planning for the future benefit of the Sudanese people.