USE OF CENSUS AGE DISTRIBUTION FOR ESTIMATING BASIC DEMOGRAPHIC PARAMETERS OF SOME ARAB GULF COUNTRIES

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I. INTRODUCTION

The main purpose of this paper is to establish a consistent set of demographic parameters from the available data. By providing the regional picture and comparisons between countries, one is able to see the consistency of the data of all the following five countries: Saudi Arabia, Kuwait, Bahrain, Qatar, and Iraq.

II. AVAILABILITY OF DATA

The five countries vary considerably with respect to availability and accurancy of the data. At one extreme there is Qatar, which is an example of a country which had very little demographic data recorded until recently. One census taken in recent years provided information on size and age-sex structures of the population. The registration of births and deaths in Qatar is virtually non-existent.

On the other extreme, there is Bahrain, with the longest history of census taking of all the Arab Gulf countries. Beginning in 1941, Bahrain has undertaken five census over the last 38 years. The most recent being 1978. In addition to its national census Bahrain conducts a vital registration system which was initiated in 1970 under the Registration of Births and Deaths Law.

Saudi Arabia, in comparison with the other Arab Gulf countries, could be considered to have limited demographic information. Since its creation, it has conducted two national population censuses. The first of those occurred in 1962, but was later discounted due to the belief that the enumeration was considered to be inaccurate and incomplete. In 1974 the government conducted its second census and the results obtained were considered to be the first truly complete national enumeration of the population. Although vital statistics were available for a number of years, they are not sufficient enough to be used. The annual number of births have been published with regularity since 1969 and are classified by sex.

Iraq has undertaken four censuses since World War II but due to the system of registration it is not considered to be a useful source of demographic data.

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Kuwait, with regard to availability of statistical data, is the most prolific. During the past 23 years a series of six censuses have been undertaken. Vital statistics are of recent origin in Kuwait. The total number of annual births and deaths for the Kuwaitians and non-Kuwaitians are available for every year since 1957. Births are classified by age of mother and deaths by age and sex of the deceased. Such data is available for the more recent years.

A summary of the availability of data for the five countries is show in Table 1.

III. ACCURACY OF DEMOGRAPHIC DATA

The Arab Gulf countries differ widely with respect to the accuracy of their data. In this section, the accuracy of the census data from the point of view of growth rate and age-sex structure is discussed.

1. Growth Rate:

The observed growth rates of five countries during recent years are shown in Table 2 along with total population according to censuses taken since 1941. In some of the Arab Gulf countries the reflected rates of growth display a large degree of consistency while in others, one finds considerable irregularities. For example, in Iraq the growth rates jump from 2.7 during 1947 - 1975 to 3.3 during 1965 - 1977. Yet in the other Arab Gulf countries the fluctuations of growth rates is not necesarily due to errors in the enumeration of population but could be considered to be due to shifts in international migration. In the case of Kuwait, it was thought that the decrease in growth rate is due entirely to a decrease in the rate of migration.

Although international migration was great in most Arab Gulf countries, an approximate estimate of the natural increase in population could be obtained by calculating the growth rate of the citizens (natives).

2. Age-Sex Structure:

The age-sex distribution of all five countries suffers from the so-called African-Asian pattern of age misreporting. When this occurs there is under-enumeration of children aged 0-4 and 10-14. The inflation of the 5-9 age group is presumably caused by age shifting and some double counting of children in this age group. Girls 10-14 are often reported as either 5-9, if they have not reached puberty, or as 15-19 if they have. There is also an exaggeration of age occurring in the older groups, particularly for men, while women tend to report themselves as in the midst of child-bearing ages, that is 25-35.

The age structure by 5-year age groups in the census of the five Arab Gulf countries was tested by using the United Nations Secretariat method (U.N. Mannual IV, 1955). The calculation of the U.N. age-sex accuracy index is shown in Table 3 for citizens of the five countries. Kuwait exhibits the best age data, Qatar the least accurate. With the exception of Iraq, the male age distribution seems to be better than that of female distribution.

Census age-sex data were described by the United Nations to be "accurate", "inaccurate" or "highly inaccurate" depending on whether the U.N. index was under 20, 20 to 40, or over 40. (Shroyock, 1975). By comparing indexes shown in Table 3 we concluded that the age distribution in all five countries are highly inaccurate.

IV. STABILITY OF AGE DISTRIBUTION

Saudi Arabia, Kuwait, Qatar, Bahrain and Iraq do not have a history of accurate age data recording in order to demonstrate that age composition has been stable in recent years. We can assume that the age distribution of the citizens of the five countries is quasi-stable because it is no doubt that mortality has declined in these countries over the past few years.

A comparison of the age distribution in some censuses take in these countries indicate a slight increase in the proportion of young children (see Table 4) and a slight decrease in the proportion of older persons. The increase in the proportion of children may be explained in terms of increased fertility or decreased mortality or both. A decrease in the proportion of older persons is generally due to increase in fertility. Likewise, a decrease in the tendency to shift to older ages in the case of adult persons can easily explain the decrease in the proportion of older persons. While we do not discount entirely any short-term increases in fertility rates a sustained increase in fertility is considered to be improbable and the observed increase in the proportion of children may be attributed to improruments in reporting and the effects of declines in mortality.

V. ESTIMATION OF FERTILITY AND MORTALITY RATES BY STABLE POPULATION ANALYSIS

The main problem in the case of the Arab Gulf countries is deriving a set of consistent demographic parameters from available but partly inconsistent data.

Demographic parameter estimates were made for the five Gulf countries using the methods described in U.N. Manual IV and the "South" Family Model of stable population from Coal and Demeny tables. The male age distribution was chosen for all countries, with the exception of Iraq since it was found to be more accurately reported due to its being estimated during conditions when the population was considered to be stable. To take into account the declining mortality, these estimates must be adjusted. For this purpose the adjustments listed in Table III.1, PP. 199, U.N. Manual IV were used.

Therefore, as an estimate of the birth rate, the average rate calculated after excluding the two biggest and the two smalles values may be taken. These are shown in the last column of Tables 5 and 6.

The female birth rate and the birth rate for total population are calculated by assuming a sex ratio at birth of 1.06 and by accepting the reported sex ratio of the population as a whole, from the U.N. formula (U.N. 1967).

$$\text{Male B.R.} = \text{Female B.R.} \times \frac{\text{Sex ratio at birth}}{\text{Sex ratio of population}}$$

Death rates were obtained by subtracting the rates of growth from the appropriate birth rate estimates. The expectation of life or any other index of mortality is determined by reading the level of mortality in the "South" stable populations (one for the males, one for the females).

Values for the gross reproduction rate (GRR) uncorrected were estimated by using the rate of growth of the female population and the accepted birth rate, an estimate of the uncorrected GRR was obtained which was then corrected for mortality decline. The total fertility is obtained from the GRR by taking into account the sex ratio at birth. We consider the estimate value of the U.N. in the absence of reliable direct information on the sex ratio at birth, a value of 1.05. We have simply adopted the sex ratio as being equal to 105 and multiplied the estimated GRR by 2.05 to get total fertility (number of children per woman). The principle parameter values derived by the above mentioned stops of calculation are shown in Table 7.

VI. SUMMARY

Throughout the above paper the demographic characteristics of the five Arab Gulf Countries: Saudi Arabia, Kuwait, Bahrain, Qatar, and Iraq, have been estimated using available census data.

The accuracy of the estimate depends upon the accuracy of the available data. Mortality conditions were found to differ among the countries while the fertility conditions proved to be comparable.

TABLE 1

AVAILABILITY OF DEMOGRAPHIC DATA
FOR ESTIMATING BASIC DEMOGRAPHIC MEASURES
OF FIVE ARAB GULF COUNTRIES FOR RECENT PERIODS

Type of Data	Kuwait	Iraq	Saudi Arabia	Bahrain	Qatar
Total population	1957 1961 1965 1970 1975 1980	1947 1957 1965 1977	1962 1974	1941 1950 1959 1965 1971	1970
Age distribution	1975 1970 1965 1961	1977 1957 1947	1974	1971	1970
Marital status by age and sex	1975	1977	1974	1971	1970
Fertility:					
No. of children by age of mother	1957	1957 1974	xxxx	1971	xxxx
Birth registration totals	1958-1966	xxxx	1969-1978	xxxx	xxxx
Mortality:					
Registered deaths	1958-1970	xxxx	1973-1975	xxxx	xxxx
Deaths by age	1965-1966	xxxx	1973-1975	xxxx	xxxx
Migration:					
Foreign-born enumerated	1957 1965	1947 1957	xxxx	xxxx	xxxx
Immigration	1961-1966	1960-1964	1974	1959 1971	1970

TABLE 2

TOTAL POPULATION OF FIVE ARAB GULF COUNTRIES
ACCORDING TO CENSUSES TAKEN SINCE 941 AND INTERCENSAL GROWTH RATES

Country	Total Population Year	Population	Annual Growth Rate Period	Rate per 1,000
Saudi Arabia	1962	4,717,816	1962-1974	30.0
	1974	6,726,477		
Kuwait	1957	206,473	1957-1961	104.8
	1961	321,621	1961-1965	95.0
	1965	467,339	1965-1970	92.0
	1970	738,662	1970-1975	60.0
	1975	994,847	1975-1980	66.0
	1980	1,355,827		
Iraq	1947	4,816,185	1947-1957	27.0
	1957	6,298,976	1957-1965	31.0
	1965	8,047,415	1965-1977	33.0
	1977	12,000,497		
Qatar	1970*	111,133	1970-1975	72.9*
	1975	158,000		
Bahrain	1941	89,970	1941-1950	22.2
	1950	109,650	1950-1959	30.0
	1959	143,135	1959-1965	41.0
	1965	182,203	1965-1971	28.8
	1971	216,078		

*Based on estimates of total population in 1970

TABLE 3

AGE RATIO SCORE, SEX RATIO SCORE,
AND JOINT SCORE OF SOME ARAB GULF COUNTRIES

Country	Age Ratio Score Males	Females	Sex Ratio Score	Joint score U.N. age-sex accuracy index
Saudi Arabia (1974)	10.55	16.27	12.63	64.71
Kuwait (1975)	7.75	9.09	8.08	41.08
Qatar (1970)	15.93	20.73	26.09	114.93
Bahrain (1971)	16.46	17.25	8.24	58.43
Iraq (1977)	14.47	10.92	9.05	52.54

TABLE 4

PERCENTAGE OF PERSONS
IN SELECTED AGE GROUPS IN FIVE ARAB GULF COUNTRIES

Country		Age Under 15	Over 65
Saudi Arabia	1962	44.1	3.7
	1974	58.7	3.9
Kuwait	1970	43.2	1.7
	1975	44.3	1.6
Qatar	1970	44.9	2.5
	1975	44.4	2.6
Bahrain	1971	44.3	2.7
	1975	46.4	2.4
Iraq	1965	47.3	4.1
	1975	48.9	3.3

TABLE 5

ESTIMATES OF CRUDE BIRTH RATE
BY STABLE POPULATION METHODS USING
CUMULATIVE AGE DISTRIBUTION AND GROWTH RATES (UNADJUSTED)

Country		Growth Rate for Citizens	Age 5	10	15	20	25	30	35	40	Average of Middle 4 Values
Saudi Arabia	M	30.0	41	53	55	52	46	40	37	36	45
Bahrain	M	35.0	40	40	51	54	48	43	40	40	43
Kuwait	M	45.0	46	51	51	48	48	47	46	48	48
Qatar	M	30.0	52	72	70	55	53	45	40	40	51
Iraq	M	31.0	50	59	58	51	50	49	47	44	50

TABLE 6

ESTIMATES OF CRUDE BIRTH RATE
BY STABLE POPULATION METHODS USING
CUMULATIVE AGE DISTRIBUTION AND GROWTH RATES (ADJUSTED)

Country	Growth Rate for Citizens	Age 5	10	15	20	25	30	35	40	Average of Middle 4 Values
Saudi Arabia	30.0	41	54	56	53	47	41	40	40	46
Bahrain	35.0	50	40	52	56	51	46	42	42	47
Kuwait	45.0	46	51	51	49	49	48	47	49	48
Qatar	30.0	50	70	71	56	54	47	42	42	52
Iraq	31.0	49	57	59	53	54	50	49	47	51

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