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Urbanisation, Fertility and Mortality in Bangladesh

THE rapid pace of urbanization and its significance for social and economic conditions in most developing countries of the third world emphasizes the need to consider the role of population distribution in the urbanization process and the relation between it and social, economic and demographic development. A frequent generalization about urbanization in most developing countries of the third world is that it is very rapid (UNO, 1970, Goldstein *et al.*, 1981). The rapid urbanization is considered to be a direct consequence of high population growth in developing countries. The major problem of overurbanization has been reflected in the rapid growth of primate cities, associated with population pressures on their social infrastructure. The rapid growth of urban population in many developing countries resulted in policies of squatter eviction and urban renewal. Most population redistribution policies evolve in response to these and other specific problems, which relate to social and economic structures (UNO, 1969). The problems of rural poverty is met by shifting population to land settlement projects for the landless poor, while the problem of urban poverty involves slum clearance programs and public housing. In Bangladesh, urbanization is assuming increased importance. Urbanization here is essentially a process of migration from rural to urban areas (Chowdhury, 1980). Concurrently, a growing body of census and survey data are becoming available with which to study the urbanization process and role of fertility and mortality in it. Although still one of the least urbanized country, Bangladesh has begun to experience rapid urban growth. At the same time, its rural population also continues to grow at a high rate. Much less attention has been given, however, to the differential pace of population growth in urban and rural places, or to the volume and character of movement between urban and rural places or to the implications and consequences of urban and rural differential population growth.

The aim of this paper is to examine the pattern of urban population growth since 1951 and then to investigate the fertility and mortality levels and trends. The study attempts to provide some insights into recent changes in the level and the rates of urbanization.

TABLE 1- GROWTH OF URBAN AND RURAL POPULATION IN BANGLADESH

<i>Census Year</i>	<i>Urban Population</i> (in 000)	<i>Percentage</i> <i>Change</i> <i>Index</i> (1951=100)	<i>Rural Population</i> (in 000)	<i>Percentage Change</i> <i>Index</i> (1951 = 100)
1951	1820	100	40112	100
1961	2641	145	48199	120
1974	6275	265	65206	163
1981	9268	509	77785	194

SOURCE: Statistical Year Book of Bangladesh, 1981.

Degree of Urbanization in Bangladesh

The degree of urbanization usually refers to the absolute or relative number of people who live in urban areas. Two kinds of indices have been developed for measuring the degree of urbanization. This includes those based on the per cent of people living in urban areas, and those relating to the absolute size of the cities of a particular country. The per cent of population in urban places has been the most commonly used index for measuring the degree of urbanization. This index gives the relative number of persons in a country living in urban areas. For instance the national level of urbanization in Bangladesh in 1961 can be estimated at 5.2 per cent. The gradual increase in urbanization from 1951 to 1961 was no doubt related to socio-economic development during the period. Urbanization during the 1970s appears to be rapid. By 1981, about 11 per cent of the *population* was urban. During *1961-74*, the average annual rate of urban population growth was 7.0 percent compared to 5.7 per cent between 1974-81. The corresponding total population growth for the period 1974-81 was 2.6 per cent.

Very often the ratio of urban to rural population is used to measure the urbanization since it takes into account another dimension of the urbanization process. This index has a lower limit of zero in which the entire population is rural; it is unity when 50 per cent of the population is urban, thus indicating the existence of one urbanite for each rural person.

The impact of urban rural ratio on national urban growth was about 12 per cent for the most recent period, 1974-81, a finding which accords with slow urbanization.

TABLE 2—DEGREE OF URBANIZATION MEASURED AS THE PER CENT OF POPULATION IN URBAN PLACES

<i>Census Year</i>	<i>Percentage of Urban Population</i>	<i>Ratio of Urban-rural Population</i>
1951	4.3	4.5
1961	5.2	5.5
1974	8.9	9.6
1981	10.6	11.9

Size of Locality of Residence of the Median Inhabitant

This index establishes the size of the locality where the median inhabitant lives (Shryock and Siegel, 1971). Table 3 shows the median inhabitant for Bangladesh at two time points. Unlike other indices, this measure of urbanization takes into account the actual size of a locality and it indicates the degree of urbanization. In 1974 median inhabitant lived in a settlement of 238000; this figure had increased to 634000 in 1981, more than double the size in 1974. However, this index can be affected by the peculiarities of the urbanization process in a country.

TABLE 3 POPULATION DISTRIBUTION BY CATEGORIES OF LOCALITY SIZE, BANGLADESH, 1974

<i>Locality Size Categories</i>	<i>Population</i>	<i>Percent</i>	<i>Per cent Cumulative Distribution</i>
<50000	1728663	27.93	27.93
50001-99999	10514002	16.98	44.91
100000-149999	132909	2.15	47.06
150000-299999	270680	4.37	51.43
300000-649999	437314	7.06	58.49
650000 and above	2569332	41.51	100.00

Median Inhabitant: 237994

In fact there is no ideal index for measuring the degree of urbanization. The indices discussed above have their limitations. For example, the per cent of urban population, and the urban-rural ratio, although easy to demonstrate, do not give any insight into the absolute size of urban areas. The city size of the median inhabitant, although it takes into consideration the size of cities, is

affected by the distribution of cities, particularly when the number of cities is rather small (Goldstein *et al.*, 1981).

Tempo of Urbanization

The concept of tempo of urbanization refers to change in the degree of urbanization during a period of time. When the degree of urbanization is measured in terms of the per cent urban, the tempo can be measured either as the absolute change in percentage points or as the rate of change in the per cent of population urban between two dates. If the growth rates of the urban and total population are available, the tempo of urbanization is simply the difference between the urban and total population growth rates. Table 4 gives the annual population growth rates and tempo of urbanization in Bangladesh. The index suggests that tempo of urbanization between 1961-74 was fast and since then the tempo of urbanization has been slow. If the degree of urbanization is measured by the index of place of residence of the median inhabitant, the tempo of urbanization is considered to be the annual average rate of exponential change in that index.

TABLE 4—ANNUAL POPULATION GROWTH RATES AND TEMPO OF URBANIZATION

<i>Period</i>	<i>Total Population Growth Rates</i> r	<i>Urban Population Growth Rates</i> r_u	<i>Tempo of Urbanization</i> $TRe = r_u - r$
1951-61	1.93	3.72	1.79
1961-74	2.62	6.65	4.03
1974-81	2.82	5.57	2.75

City Size Distribution

Since cities in a country have different population sizes, they can be ranked from the largest to the smallest. Once this is done, it is possible to adjust the distribution of cities with a function which relates the population size of any city to its rank and to the population size of the largest city (Shryock and Siegel, 1971; Zipf, 1949). The relationship between the rank of any city and the size of the largest city can be expressed as $C_k = C_1 K^{-Z}$, where C_k represents the population of the city ranked in place k from the largest to the smallest in size. C_1 is the largest city, Z is a constant, and K is the rank order. The value of the constant, Z , can be obtained by using the least square method as

$$Z = \frac{\sum \log_e \frac{C_1}{C_k} \cdot \log_e K}{\sum (\log_e K)^2}$$

The procedure for calculating Z is shown in Table 5. For Bangladesh Z = 1.44 indicating concentration of population in the largest city. Each value of Z characterizes a city distribution; the greater the value of Z, the greater the concentration of population in the largest cities relative to the smallest cities.

TABLE 5-DEGREE OF URBANIZATION MEASURED AS THE SIZE OF LOCALITY OF RESIDENCE OF THE MEDIAN INHABITANT

	<i>Urban Popul- ation in 1981 (in 000)</i>	<i>Rank K</i>	C_1/C_K	$\text{Log}_e \frac{C_1}{C_K}$	$\text{Log}_e K$	$6 = (4)(5)$	$(\text{Log}_e K)^2$
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>
Dhaka	3459	1	1	0	0	0	0
Chittagong	1388	2	2.492	0.913	0.6931	0.6328	0.4805
Khulna	623	3	5.552	1.714	1.0986	1.8830	1.2069
Demra	326	4	10.610	2.362	1.3863	3.2744	1.9218
Narayangonj	196	5	17.648	2.871	1.6094	4.6206	2.5903
Rajshahi	172	6	20.110	3.001	1.7916	5.3766	3.2104
Sylhet	166	7	20.837	3.037	1.9459	5.9097	3.7866
Barisal	159	8	21.757	3.080	2.0794	6.4056	4.3241
Rangpur	156	9	22.173	3.099	2.1972	6.8091	4.8278
Jessore	149	10	23.215	3.145	2.3026	7.2417	5.3019
Saidpur	128	11	27.023	3.297	2.3979	7.9059	5.7499
Comilla	126	12	27.452	3.312	2.4849	8.2299	6.1748
Scrājgonj	105	13	32.943	3.495	2.5549	8.9294	6.5790
Pabna	101	14	34.248	3.534	2.6391	9.3266	6.9646
						76.5443	53.1186

$$Z = \frac{76.5443}{53.1186} = 1.441$$

Fertility, Child Mortality Levels and Trends in Urban Areas

Bangladesh is a country where fertility and mortality levels are still considerably higher than in many other developing countries. Because of the limited availability of the requisite data and of the poor quality of data that are available, very little is known about either trends in fertility or the level of fertility

in urban areas. With the introduction of population policy program, in recent years more emphasis has been stressed on the levels and trends in fertility and mortality by urban and rural areas in Bangladesh. In the absence of any vital registration system, the estimation of fertility and mortality is done from the information obtained from the surveys. The 1974 Retrospective Survey of Fertility and Mortality includes information on children ever born and children dead by age of women by urban/rural areas and this provides an opportunity for comparing the fertility levels by urban and rural areas. This information can be utilized for deriving the fertility and mortality levels to a reasonably approximate level by indirect means. Over the last few years many indirect techniques have been developed to make use of incomplete but defective data (Brass, 1975, 1980; Coale and Trussell, 1974, 1975). The basic idea underlying indirect estimation is to get away from the collection of information of uncertain quality from which demographic parameters could be directly obtained. There are however serious limitations of the retrospective information. Traditionally retrospective information suffers from many errors. The direction and magnitude of the errors involved in estimating level and trend in Fertility are influenced by the type of errors involved in the data.

Fertility Level in Urban Bangladesh

Table 6 shows the average children ever born by age of women derived from the 1974 Retrospective Survey of Fertility and Mortality and from the 1981

TABLE 6—ESTIMATED OF TOTAL FERTILITY AND AGE SPECIFIC FERTILITY RATES BY RATIO GOMPERTZ MODEL

<i>Age of Women</i>	<i>Number of Children Everborn</i>		<i>Age Specific Fertility Rates*</i>		
	<i>BRSFM</i> <i>P_i</i>	<i>BDS</i> <i>P_i</i>	<i>1974</i>	<i>1981</i>	<i>Per cent change</i> <i>1974-1981</i>
15-19	0.362	0.345	.184	.166	-9.8
20-24	1.726	1.547	.319	.290	-9.1
25-29	3.325	3.016	.312	.273	-12.5
30-34	4.125	4.521	.258	.218	-15.5
35-39	5.871	5.562	.190	.154	-18.9
40-44	5.728	6.210	.092	.069	-25.0
45-49	5.646	6.595	.013	.010	-23.0
TFR			6.84	5.90	-13.7

* $a_R = -.024$

$\beta = .973$

$a = .025$

$\beta = -1.01$

Demographic Survey. There is clear evidence that number of births reported by the older age groups of women are omitted from reporting. This is particularly so for the 1974 survey data. The general effect of omission is an understatement of the level of fertility (Brass, 1980). Table 6 also shows the estimation of total fertility and age specific fertility rates derived from the ratio Gompertz method (Zaba, 1981). The total fertility estimated for the two time points indicates that total fertility declined from a level of 6.8 in 1974 to 5.9 in 1981 a decline of about 14 per cent. The level of total fertility reported here for the 1974 is more or less consistent with the estimate derived from the Coale-Trussell model by Hill and Blacker (Hill and Blacker, 1977). The total fertility estimated by Hill and Blacker was 6.6. For the corresponding period the total fertility for (the rural areas was obtained as 7.1. Although the data clearly point to differential fertility between urban and rural areas, the difference was not particularly large.

Infant and Child Mortality in Urban Areas

Like fertility, mortality level can be obtained from retrospective information using indirect techniques. Table 7 displays the proportion of children dead by age of women by sex obtained from the 1974 survey. The proportion dead among children ever born reported by women in an age group is an index of mortality in the sense that it reflects the outcome of exposure to risk of death to which all children born to these women were subject during their life. Thus the figures in Table 7 are indices of an average mortality experience, the mean-

TABLE 7—PROPORTION OF CHILDREN DEAD BY AGE OF WOMEN OBTAINED FROM THE 1974 SURVEY

<i>Age</i>	<i>Proportion Dead</i>		<i>Female</i>
	<i>Total</i>	<i>Male</i>	
15-19	.184	.210	.156
20-24	.190	.202	.177
25-29	.159	.167	.150
30-34	.199	.215	.182
35-39	.227	.245	.207
40-44	.251	.264	.237
45-49	.267	.279	.252

ing of which is difficult to guess. Various techniques have been developed to translate the proportion of children into probability of survival or probability of dying (Brass, 1975; Sullivan, 1972; Trussell, 1975). Table 8 shows the infant

TABLE 8-ESTIMATED INFANT AND CHILD MORTALITY BY SULLIVAN TECHNIQUE AND IMPLIED INFANT MORTALITY AND LIFE EXPECTANCY IN THE SOUTH ASIAN MODEL LIFE TABLE

Age of Women	Exact Age of Child	Estimated			Fitted			Implied Mortality in the South Asian Model Life Table		
		Both	Male	Female	Both	Male	Female	Sex	IMR/1000	e ^x
20-24	2	.194	.207	.181	.162	.173	.151	Male	134	51.0
25-29	3	.153	.161	.145	.179	.191	.167	Female	118	54.0
30-34	5	.191	.207	.175	.195	.209	.172	Both	125	52.5

and child mortality estimated by the Sullivan technique. The child mortality estimate so derived shows irregularity in the pattern. In order to remove these fluctuations, graduated mortality (graduated by logit system) is also shown. The results suggest that male children are experiencing higher mortality than female children. Infant mortality and life expectancy at birth as implied in the South Asian model life table are also displayed in Table 8. The overall infant mortality in the urban areas according to the 1974 survey was 125 per thousand live births and the life expectancy was 52.5 years. The corresponding estimates of infant mortality and life expectancy in rural areas were 153 per thousand births and 46 years respectively (BRSFM, 1977). Sex differentials in infant mortality and life expectancy are also evident from the Table 8.

Family Planning Pattern in Urban Areas

Bangladesh is now often considered among developing countries in terms of its strong population policy and comprehensive family planning program. The Bangladesh family planning program has made considerable progress in increasing the knowledge of family planning program but there is a tremendous gap between knowledge and practice of contraception in Bangladesh. The information on family planning use in this study comes from the 1981 Contraceptive Prevalence Survey (CPS) conducted by the Management Information Service (MIS) of the Ministry of Population Control and Health, Government of Bangladesh (MIS, 1981). The high priority given to population policies in Bangladesh has brought into sharper focus on the need for regular measurement and monitoring of the population program. Although considerable efforts have been made to identify changes in vital rates through the periodic conduct of population surveys, there has been little progress towards the establishment of an effective reporting system. According to the 1981 contraceptive Prevalence Survey (CPS), the current use of contraception in urban areas was

about 29 per cent. Of this about 8 per cent were users of traditional methods. The comparative figures for the rural areas were about 18 and 8 per cent respectively. Surprisingly, the use of traditional method of contraception were same in both the areas. Among the users, the pill is the most commonly used method (28 per cent) followed by male and female sterilization (22 per cent) and condom (14 per cent) (see Table 9). This commonly observed pattern reflects the fact that the pill is used more often as a method for spacing between births while the IUD and sterilization are used as a method for limiting the family size.

TABLE 9—PERCENTAGE DISTRIBUTION OF CURRENT USER BY FAMILY PLANNING METHODS IN URBAN AREAS, CPS, 1981

<i>Method</i>	<i>Percent User</i>	<i>Per cent Distribution</i>
Pill	8.2	28.1
Condom	4.1	14.1
IUD	0.8	2.8
Sterilization	6.4	22.0
Injection	1.3	4.5
Foam	0.7	2.4
Traditional	7.7	26.3
Total	29.2	100.0

Conclusion

Detailed investigation of available census data allow us to have an assessment of tempo of urbanization process in Bangladesh. A detailed study of the demographic aspect of urbanization is hampered by the lack of data. Confining urban growth analysis to natural increase and urban-rural ratio tends to exaggerate the role of the former, unless initial urban boundaries are hold constant. In recent years the role of urbanization has been over emphasized because of tremendous growth of metropolitan cities. This implies that the demographic and socio-economic characteristics of the urban areas have been appreciably affected by rapid urbanization. Unlike some other Asian countries in Bangladesh rapid urbanization did not occur. The phenomenon of primacy, whereby urbanization is concentrated in metropolitan Dhaka is evident. This primacy can be understood as the cumulative consequence of historical demographic and economic trends, coupled with the long tradition of interest in the

metropolies and neglect of elsewhere which have been carried forward into the period of independence.

The information provided here suggest that fertility differentials by urban-rural areas arc not much. If fertility control becomes widespread in urban areas of Bangladesh as a general effort to make family planning program a success, the fertility differentials between urban and rural women are likely to increase. If, as a result of the general effort to develop rural areas and the more specific efforts to introduce family planning there, fertility control becomes wide spread in rural areas of Bangladesh, the fertility differentials between urban and rural women are likely to narrow down. There is a large difference in infant mortality between urban and rural areas (123 as against 153). The life expectancy ranged from 53.5 years in urban areas to 46.0 years in rural areas. The difference in infant mortality between urban and rural areas can be explained in terms of improvements in medical care; public hygiene tend to affect urban areas earlier than rural ones and consequently death rates decline faster in urban areas. The interrelationship between fertility, mortality and family planning in Bangladesh may be attributed to differences in knowledge of and attitude towards and practices of birth control. Perhaps an in-depth study is required to substantiate the influence of background variables such as education, literacy, labor force status, occupation, and religion on the fertility differentials between urban and rural areas. Additional information on characteristics of migrants and non-migrants will provide insight into relationships among fertility, migration and urbanization.

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