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Comparative Study of Mortality Measures in Bangladesh During 1961-1991

[1]Md. Rafiqul Islam, [2]M. Korban Ali and [3]Md. Nurul Islam
[1]Department of Population Science and Human Resource Development, Rajshahi University, Bangladesh,
[2]Department of Information communication Technology, Southeast University,Banani,Dhaka-1213, Bangladesh.
[3]Department of Statistics, Rajshahi University, Bangladesh

Abstract: The mortality measures such as Infant Mortality Rate (IMR), iIfant Death Rate (IDR), Crude Death Rate (CDR) and life expectancy at birth for male, female and both sexes of Bangladesh have been estimated using indirect techniques. It is observed that IMR and IDR are showing increasing trend during 1961-1974 and then started to decrease rapidly up to 1991. It is also seen that CDR for male, female and both sexes are showing decreasing trend during 1961-1991. On the other hand life expectancy at birth for male, female and both sexes are showing increasing trend during 1961-1991.

Key words: Infant mortality rate (IMR) Crude death rate (CDR) Life expectancy at birth Infant death rate (IDR)

INTRODUCTION

Bangladesh is a developing country with an accelerated population growth. The population of Bangladesh has increased from 42 million in 1941 to 129 million in 2001[1]. It is also important to note that Bangladesh is one of the most densely populated country in the world containing 129.25 million citizens of which 65.84 million are males and 63.41 millions are felmales[1]. It is the ninth most populous country in the world having population density 834 persons per square k.m. The population is growing at a rate of 1.47 percent per year[2]. The government of Bangladesh has long been trying to control its population and has introduced various programs after its independence. But the government has got a little success to control its population. It is perhaps for the lack of reliable information about the national based demographic parameters. Many researchers tried to provide the information about the demographic parameters of Bangladesh but, very few of these provided national based information. Some of these have been concentrated in the area of fertility, some are in the mortality. Thus, the national planners are undertaking their development plan and program with the limited reliable national based demographic information. Someone should make an attempt to provide reliable demographic parameters using national based data for national plan and program of the country. Keeping these points in view an attempt has been made in this study to provide some measures of mortality of Bangladesh based on national data.

As there is no national based complete vital registration system in Bangladesh, So, direct estimation of mortality and fertility of Bangladesh is almost impossible. The census data is the only source which can be used to provide the information of national based demographic parameters. Again in the developing countries, like Bangladesh, the census data is incomplete and inaccurate. So indirect techniques are thought to be appropriate to estimate the demographic parameters. Thus, an attempt has been made here to estimate some demographic (mortality) parameters of Bangladesh applying indirect techniques using the census data of 1961, 1974, 1981 and 1991.

The main objectives of this study are:

- to estimate IMR, IDR, CDR, e_0^0 of Bangladesh for male, female and both sexes using the census data of 1961, 1974, 1981 and 1991.
- to study the trends of IMR, IDR, CDR e_0^0 and of Bangladesh during 1961-1991.

MATERIAL AND METHODS

The marital status data for males, females & both sexes of Bangladesh for the census years 1961, 1974, 1981 and 1991 have been used in the present study without any modification and adjustment[3-6]. Eight Abridged life tables have been constructed using Widowhod method[7] and these information are used for mortality estimation. The age structures C(x) values have been taken from the

above censuses and these values have been adjusted before using for estimation.

Infant mortality rate is a probability-based measure. It is approximately the probability of death among infants in a calendar year. It is defined as the number of infant deaths per 1000 live births during the year. That is

$$IMR = \frac{D_0}{B} \times 1000$$

where, D_0 represents death of infants during a calendar year and P_0 is the mid-year population under age 1 year during the same year. These rates have been estimated using the above life table information.

Infant death rate is the death among infants per 1000 mid-year population under age 1 year. It is defined as

$$IDR = \frac{D_0}{P_0} \times 1000$$

where, D_0 represents death of infants during a calendar year and P_0 is the mid-year population under age 1 year during the same year. These rates have been estimated using the above life table information.

CDR is the simplest measure of mortality. It is defined as the number of deaths in a year per 1,000 mid-year population and its traditional formula is

$$CDR = \frac{D}{P} \times 1000$$

This formula is applicable for those countries where the vital registration data is available. But in this study we have estimated CDR using the estimated ASDR from the constructed life tables by Islam[7] and adjusted age structure of census data as follows: $CDR = \sum ASDR_x C_x$ where, $ASDR_x$ is the age specific death rates in the age group x and C_x is the adjusted age structure at the time of census years.

Expectation of Life at Birth (e_0^0) is the average number of years a new born baby under one year is expected to live. It is given by $e_0^0 = \frac{T_0}{l_0}$

where T_0 is the total person-years lived at age zero (0) and l_0 is the radix of a life table[8].

RESULTS AND DISCUSSION

For the lack of sufficient data indirect methods have been used to estimate the parameters as mentioned before. Here, IMR and IDR for male, female and both sexes have been estimated using the information from abridged life tables constructed by Islam[7]. The estimated IMR and

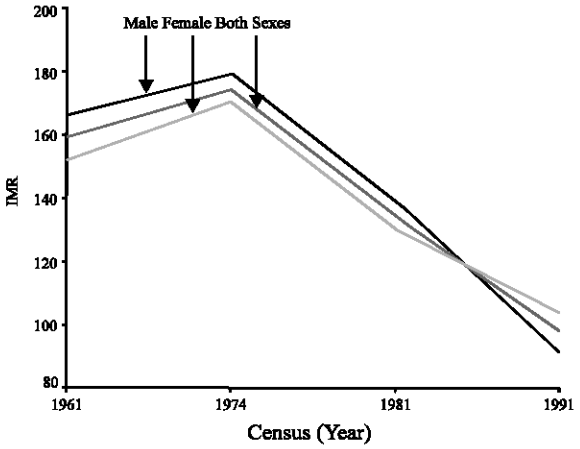

Fig. 1: Infant Mortality Rate (IDR) for male, female and both sexes of Bangladesh during 1961-1991

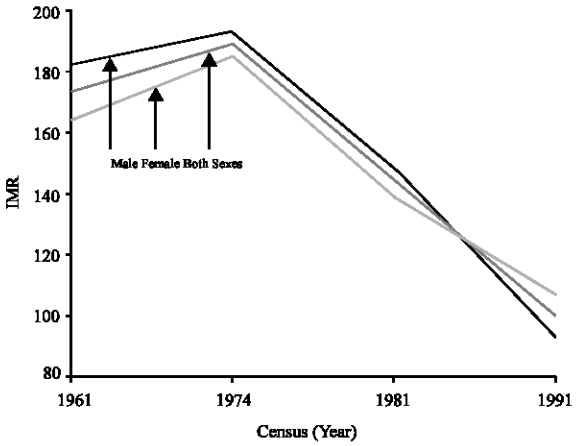

Fig 2: Infant Death Rate (IDR) for male, female and both sexes of Bangladesh during 1961-1991

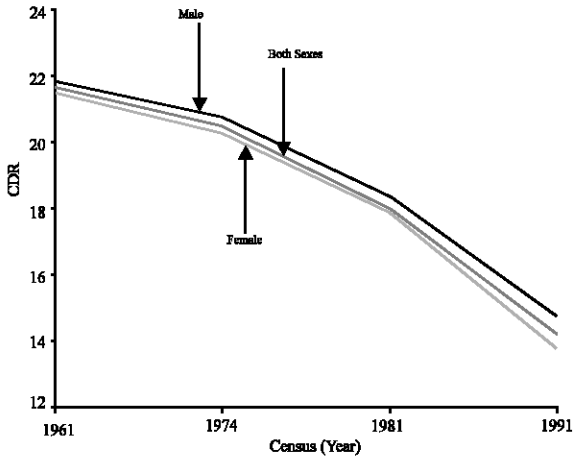

Fig. 3: Crude death rate (CDR) for male, female and both sexes of bangladesh in the census year 1961, 1974, 1981 and 1991

IDR are shown in Table 1. These rates have been plotted in graph papers and shown in Fig. 1 and 2, respectively. From this table and figures, it is observed that both IMR and IDR exhibited increasing trend during 1961 to 1974 and then declined sharply after 1974.

The CDR have been estimated using census age structure C(x) and ASDR of abridged life tables and shown in Table 2 and Fig. 3. CDR for male, female and both sexes are showing strictly decreasing trend with passing of time. The rate of decrement of CDR for male during 1961-1974 is 4.82% which is slower and it decreases at a greater speed of 11.28 and 20.04% during 1974-1981 and 1981-1991, respectively. The rate of decrement of CDR for female is 5.5% during 1901 to 1974 which is slower and it decreases at a faster speed of 11.74 and 23.03% during 1974-1981 and 1981-1991, respectively. Again, the rate of decrement of CDR for both sexes during 1961-1974 is 5.32% which was slower and it

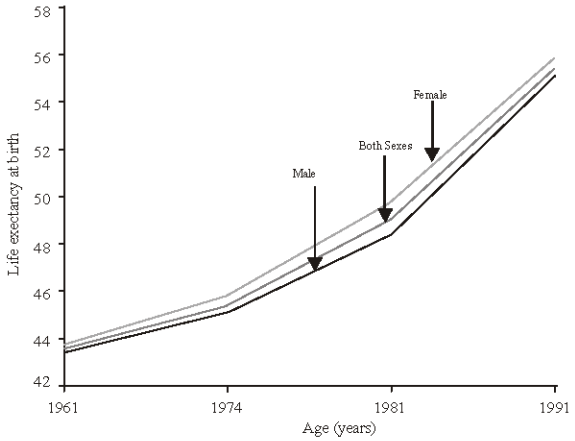

Fig. 4: Life expectancy at birth for male, female and both sexes of bangladesh during 1961 to 1991

Table 1: Infant Mortality Rate (IMR) and Infant Death Rate (IDR) for male, female and both sexes of Bangladesh during 1961-1991

	Infant mortality rate (per thousand)			Infant death rate (perthousand)		
Census years	Male	Female	Both sexes	Male	Female	Both sexes
1961	166	152	159	182	164	173
1974	179	170	174	193	185	189
1981	139	130	134	148	139	144
1991	91	104	98	93	107	100

Table 2: Crude Death Rate (CDR) for male, female and both sexes of bangladesh in the census years 1961, 1974, 1981 and 1991

	Census years				% Decrement (Intercensal periods)		
Rates	1961	1974	1981	1991	1961-197	41974-1981	1981-1991
Male	21.80	20.75	18.41	14.72	-4.82	-11.28	-20.04
Female	21.45	20.27	17.89	13.77	-5.5	-11.74	-23.03
Both sexes	21.61	20.46	18.01	14.18	-5.31	-11.58	-21.27
sexes							

Table 3: Estimated life expectancy at birth (e_0^0) for male, female and both sexes in the censuses 1961, 1974, 1981 and 1991

	Census Years				% Increment(Intercensal Periods)		
Life expectancy at birth	1961	1974	1981	1991	1961-1974	1974-1981	1981-1991
Male	43.43	45.15	48.34	55.13	3.96	7.07	14.05
Female	43.75	45.80	49.86	55.84	4.69	8.87	11.99
Both sexes	43.59	45.47	49.08	55.48	4.31	7.94	13.04
Sexes							

decreases rapidly at a faster speed of 11.58 and 21.27% during 1974 1981 and 1981-1991 respectively. It indicates that in recent times the decrement of CDR is faster for male, female and both sexes than in previous periods.

To observe the time trends of expectation of life at birth for male, female and both sexes those rates have been estimated and shown in Table 3 and Fig. 4. It is seen that the curves of expectation of life for male, female and both sexes are showing strictly increasing trend with the increase of time. The rate of increment of (e_0^0) for male during 1961-1974 was 3.96% which was relatively slower and increased at a greater speed at 7.07 and 14.05% during 1974-1981 and 1981-1991, respectively. Also, the rate of increment of life expectancy at birth for female was 4.69% during 1961-1974 which was slower than that of the faster speed at 8.87 and 11.99% during 1974-1981 and 1981-1991, respectively. Again, the rate of increment of for both sexes during 1961-1974 was 4.31% which was slower and it rapidly increased at a speed at 7.94 and 13.04% during 1974-1981 and 1981 to 1991, respectively.

CONCLUSIONS

IMR and IDR for male, female and both sexes have been estimated using the census data of Bangladesh for the years 1961, 1974, 1981 and 1991. It is found that they were showing an increasing trend during 1961-1974 and then, they started to decrease up to 1991. This may be due to the improvement of overall health facilities. It is also seen that CDR for male, female and both sexes are showing decreasing trend over time. Moreover, life expectancy at birth for male, female and both sexes are showing increasing trend over time. It is expected that these results of our work will be useful to the researchers and academicians as well as the government planners to provide sound basis for comprehending any future plan of action for the socio-economic development and health care programs in the country.

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