Famine Mortality and Sex Differentials in Rural Bangladesh: The Case of the 1974 Famine

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Abstract

It is widely accepted that during times of famine, mortality of adult males increases more than that of females. However, it does not necessarily imply that the mortality of female children increases less proportionally in those crisis years. This paper shows, by focusing on the Bangladesh famine of 1974, that in societies where gender biases are deeply embedded the female the female disadvantage begins to manifest itself soon after the neonatal periods ends, so that the overall infant mortality as well as early childhood mortality rates could have been higher for female than for male children in famine years.

Keyword: Bangladesh, famine, mortality, infant mortality, gender biasness, children mortality

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INTRODUCTION

Demographic response to famine has been given much attention in the field of crisis mortality. A large number of studies have examined the mortality responsesin terms ofsex differentials. Excess death is the norm during famine. The greater excess in deaths is more likely to be observed for males, especially for adult males as exemplified by Tim Dyson's work on the Indian famines of 1876-1878, 1896-1897, and 1899-1900, the Bengal famine of 1943 and the

Bangladesh famine of 1974-1975 (Dyson 1991). Similar results are found forSudan in 1986, the Great Irish famine, the Tenpo famine of 1833-36 in Japan, and the Dutch Hunger Winter of 1941-1942 (Pitkänen 2002). It is often suggested that the male vulnerability in famine crisis was influenced by more or less biological factorssuch as men's comparatively thinner body fat and higher risk behaviour, which implies a greater risk of contracting infectious diseases.

However, the sex differentials in mortality are an issue which is far from simple, andcan alsobe culturally determined. In South Asian contexts, for example, it is widely accepted that there exists a sharp north-south divide in terms of female autonomy and, hence, the degree of gender biases against women in society: female autonomy is unambiguously higher in the south than in the north (Dyson and Moore 1983). In their paper on Madras and Punjab in the colonial period, Osamu Saito and others have demonstrated that in the north Indian province of Punjab, the lower the level of estimated life expectancy the greater the difference between male and female life expectancy. This implies that in a year of mortality crisis the male-female gap in mortality became greater (Saito and Takahama 2005). And Bangladesh is a society of the 'north' type. In such a society where gender biases are embedded, female mortality tendsto become higher as soon as the neonatal period is over,and this female disadvantage is likely to be more marked at the time of famine. This paper, therefore, aims to explore the sex differentials in mortality from this perspective at the time of the Bangladesh famine of 1974. This famine has already been studied by many scholars such as Dyson, Chen and Chowdhury, Watkins and Menken (Dyson 1991, Chen and Chowdhury1977, Watkins and Menken 1985) but by focusing on the sex differentials, it is hoped to shed fresh light onfamine mortality. I would like to show that as far as infant and child mortality is concerned, the Bangladesh famine of 1974-75 did not reduce gender inequality; more specifically, that the female disadvantage started right after the neonatal period.

Unlike other parts of the Indian subcontinent where drought caused severe famines in history, most of Bangladesh's famines, including these two, were occasioned by floods as the country with huge rivers and canals in flat alluvial plains, is often hit by tropical monsoon. Correspondingly cause-specific death patternsare different: cholera and diarrhoeal diseases have been more prevalent in this flat countrythan malaria. On the other hand, like other South Asian areas, Bangladesh has displayed gender disparities in mortality as in other socioeconomic areas such aseducation, economic status, urban residence and employment status.

Mortality estimates from all survey data and with the national census data or the vital registration data indicatethat there exist sex differentials in mortality. After 1947, two nation

wide surveys, PGE (Population Growth Estimation experiment), 1962-1965 and Bangladesh Retrospective survey in 1974,were conducted, both suggestingconsistently higher female than male mortality ratesin certain age groups. The retrospective survey found slightly higher female mortality at ages 40 and over, (Bangladesh Retrospective Survey on Fertility and Mortality 1974) where as the PGE (Population Growth Estimation) indicated a higher female mortality in childhood (1-4 years) and in the whole range of ages from 10-44 years and, 55 and above(UN 1981). The typical Bangladeshi family has strong son preference as the male household head is always the decision maker. Literacy and school enrollment rates are higher for boys; male members of the family are more economically active than females, although the female rate of labor force participation and other indicators have been markedly increasing in recent years.For that country where age specific mortality rates show noticeable disparities even today, this study aims to examine how sex-specific mortality rates respondedto famine in the crisis year of 1974-1975.

METHODS

In order to examine sex differentials in mortality at the time of famine, this paper employs a technique used by Dyson, which compares age-specific mortality rates in the famine year with those recorded in the reference year. This method enables me to check if female children were not necessarily disadvantaged in the famine year in proportional terms.

However, since the paper intends to focus on the very early periods of children's life, it is desirable for us to be able to separate the post-neonatal from the neonatal period even within the time-frame of infancy. As Jean Bourgeois-Pichatdemonstrated in 1951, infant mortality rate (IMR) can be divided into endogenous and exogenous components. He showed this by plotting cumulative deaths within the first year on a diagram with the horizontal axis subjected to a logarithmic transform ($P_n = \log^3 (n+1)$, where n is the age in days) (Bourgeois-Pichat 1951).According to this exposition, 'exogenous' deaths are concentrated in the post-neonatal period. A very much similar idea had been developed by a Japanese medical scientist, Hiroshi Maruyama, who had plotted cause-specific cumulative death data for USA 1934 on a diagram with both axes logged(he took logarithms to the base 10). According to this transformation, the slope of each graph on the diagram corresponds to the rate of change in deaths from period n to period n+1, and his diagram pointed to virtually the same tendencies: that graphs for prematurely, birth trauma and inherited genetic defects tended to become flatter, while those for infectious diseases and other causes started increasing only after the first month with much steeperslopes (Maruyama 1936, 1938).One important implication of their expositions is that in the neonatal period sex differentials in

mortality cannot be substantial as 'endogenous' factors are sex neutral, whereas in the post-neonatal and subsequent periods culturally and socially determined gender biases may affect the probability of death between male and female children. Of the two, the Maruyama method will be utilized later since it allows us to compare the male and female graphs in terms of the rate of change over the period concerned.

For those exercises the DSS data will be exploited.They werecollected through the vital registration and also census systems, under the project of International Centre for diarrhoeal Diseases Research, Bangladesh (ICDDR,B) in Matlab, a rural areaof Bangladesh. Matlab is alow-lying deltaic plain crisscrossed by numerous rivers and canals situated about 70 km southeast of Dhaka. Both census and vital registration data arebeing taken there since 1966 under this project and quality and coverage are good enough as the field workers are sent to the households in villages in regular basis.

OVERVIEW OF MORTALITY IN BANGLADESH AND MATLAB

Overall mortality trend in Bangladesh is a declining process. All the sources of demographic study suggest that mortality patterns are characterized by sex differentials as well as age selectivity. Usually females in Bangladesh experience higher mortality. Post neonatal and child deaths are more numerous for female than for male children. These patterns are found not only in Matlab but also at national level (see Table 1)[1].

Table 1.Age-sex specific death rates of Bangladesh

Age	PGE		Retrospective		DSS		BBS		DSS	
	1962-64		survey 1974		1974		1985-88		1985-88	
	M	F	M	F	M	F	M	F	M	F

[1]All the estimates of Bangladesh Bureau of Statistics(BBS) support to the higher female mortality in Bangladesh as age specific death rates during 1981-2001 is showing higher death rates of female at (1-11)months and at (1-4) years of age. At age (5-9) years, adolescent period and also in child bearing age female have higher death rates in compare to male during these periods but not consistently though the probability of dying reduces faster for female than male over the years.

0	161.1	127.5	179	160	142	133	118.1	107.4	93.5	90.48
1-4	22.6	27.4	47.5	45.4	18.2	32.6	12.84	15.13	11.2	19.98
5-9	6.8	6.3	5.6	5.4	4.8	6.4	3.21	3.47	2.5	2.95
10-14	2.1	2.6	2.9	2.9	1	1.8	1.45	1.37	1.05	1.08
15-19	1.9	6.8	4	3.9	1.1	3.5	1.9	2.48	0.98	1.85
20-24	3.2	6.6	7.4	7.3	1.2	3	2.04	2.95	1.45	2.2
25-29	3.1	8.8	7.7	7.6	2.3	2.8	2.47	3.67	1.95	2.73
30-34	5.4	8.3	7.6	7.6	3	4.3	2.75	3.97	2.15	2.25
35-39	6.2	9.8	8.3	8.3	5.6	4.2	3.36	5.22	2.78	3.23
40-44	8.1	9.5	9.6	9.7	6.5	6.9	4.94	6.72	4	2.58
45-49	12	9.7	11.9	12	10.7	6.8	8.26	8.84	6.55	5.65
50-54	17	15.5	15.2	15.5	15.7	11	12.18	10.44	12.6	8.05
55-59	21.3	25.8	20.5	21	21.8	19.8	15.8	16.09	20.3	12.58
60-64	33.4	40.3	28.7	29.6	33	37.4	28.05	22.06	28.6	25.18
65-69	49.9	54.8	41.2	42.9	77.8	103	48.57	41.57	75.2	69.55
70-74	76.3	85.7	61.1	63.9			63.23	63.38		
75+	111.3	136	92.4	97.1			142.9	151.4		

M:-Male and F:-Female in the table

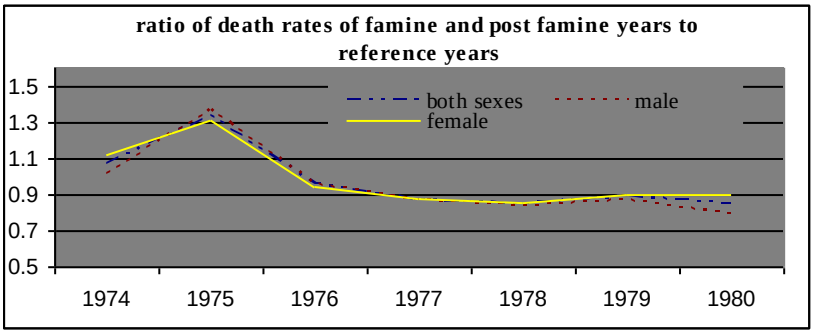
Source: Population of Bangladesh, country monograph series-8, New York, 1981; Report on the 1974 Bangladesh Retrospective Survey of Fertility and Mortality (Dhaka, 1977); Report of Demographic Surveillance System Matlab, 1974, ICDDR,B and Vital registration data, 1985-88, Bangladesh Bureau of Statistics

Matlab is a rural area which is very flat and crisscrossed by the rivers and canals. Cholera anddiarrhoea were more common in the past though it has become cholera proved in 1974. It was part of the Comilla district during famine period which is highly agricultural, and occupiesthe fifth position in the ranking of districts according to population size with population growth rate being 2.2 % per annum in the 1961-1974 periods (2.6% for overall Bangladesh). Comilla was severely affected in 1974 as its rice production was disrupted greatly and thus per capita food availability declined substantially (Sen 1999).

The famine in 1974 started at the end of the year. Its effect was reflected in the death rates for that year, but the mortality peaked inmid 1975, after whichit declined but slowly partly because of the outbreak of measles in 1976. Figure 1 shows how the male and female crude death rates (CDRs) changed from 1974 to 1980. In 1974 the female CDR was higher than the male one; in 1975 the male rate increased more than the female one; then in 1976both rates

declined but did not return to the 1974 pattern. It was during the 1977-1980 period that the pattern of the female disadvantage was reestablished.

Figure 1. Change in mortality rate by sex due to famine of 1974



The age-specific death rates for both sexes are presented in table 1. In Bangladesh the sample vital registration report of 1999-2001 provided by the Bangladesh Bureau of Statistics (BBS) has found that female mortality is higher during the post neonatal and early childhood periods, and also in the late childhood period (5-9 years) at national level as well as in both rural and urban levels,although there are some cases in which it is only slightly higher for femalesor years when it is not consistent with the general pattern. However, as shown in Table 1, which sets out age-sex specific mortality ratesfor 1962-1988 from various estimates, IMR (i.e. the combined rate of neo-natal and post-neonatal mortality)as well as old age mortality ratesare consistently higher for females than for males. This, on the face of it, suggests that in the Bangladesh famine of 1974 too, what Dyson regarded as a stylized fact holds.

However, in order to determine whether the stylized fact holds or not, it is crucial to see if the infant and child mortality rates increased in the famine period in comparison with the normal period, to which I shall now turn.

RESULTS

Proportional change over the years

Tim Dyson's analysis of the South Asian famines, including the Bangladesh famine, was conducted in terms of proportional rises in the age-specific death rates at the time of famine calculated in relation to the rates inthe reference period. For the Bangladesh famine of 1974-1975 he chose 1976-1977 as the reference year. However, as I suggested above,

measles was prevalent in that year 1976, which may well have had an impact on the calculated sex differentials in early childhood mortality. I therefore regard 1966-68 as the reference period and the average of mortality rates in those years as the baseline rates.

Table 2 sets out actual age-specific rates in Matlab for the reference period and the famine and post-famine period of 1974-1977, and proportional rises for the latter. The baseline mortality pattern resembles those for national rates in table 1: IMR is higher for males, but since age 1 the mortality rate becomes higher for females all the way to the age group 65 and over. The 1974 and, to a lesser extent, the 1976 and 1977 patterns are similar, but the 1975 pattern differs in that the female IMR exceeds the male one, and also in that the male rate exceeds the female one from the age group 25-29 upwards. The latter is an expected finding, while the former is not, probably a consequence of the change in the reference period.

Table 2.Age-Sex specific death rates and ratios of death rates, in respect of reference period.

MALE	base periods	Death rates					Ratio(death rate of particular year/1966-68)			
age	1966-1968	1974	1975	1976	1977		1974	1975	1976	1977
0	125.03	142.5	165.1	113.6	113.3		1.14	1.32	0.91	0.92
1-4	22.37	18.2	28.8	25.5	14.5		0.81	1.29	1.14	0.43
5-9	4.2	4.8	4.9	4.6	3.4		1.14	1.17	1.1	0.67
10-14	1.43	1	1.5	1.1	1		0.7	1.05	0.77	0.38
15-19	1.9	1.1	1.9	1	0.9		0.58	1	0.53	0.26
20-24	3.17	1.2	3.1	2.2	2.2		0.38	0.98	0.69	0.56
25-29	3.13	2.3	4.7	2.1	1.8		0.73	1.5	0.67	0.4
30-34	3.77	3	4.6	3.6	2.9		0.8	1.22	0.96	0.62
35-39	3.87	5.6	8.6	3.7	3.5		1.45	2.22	0.96	0.7
40-44	7.33	6.5	14.8	7.9	5		0.89	2.02	1.08	0.65
45-49	9.97	10.7	22.3	8.4	10.8		1.07	2.24	0.84	1.38
50-54	15.77	15.7	34.9	18.8	15.2		1	2.21	1.19	1.02
55-59	18.63	21.8	44.5	19.8	21.8		1.17	2.39	1.06	0.87
60-64	24.57	33	60.9	40.7	31.9		1.34	2.48	1.66	1.07
65+	68.8	77.8	113.4	74	76.2		1.13	1.65	1.08	0.94
FEMALE										
0	115.1	132.9	184.1	110.3	114.2		1.15	1.6	0.96	0.99
1-4	29.57	32.6	41.3	33.8	25.2		1.1	1.4	1.14	0.85
5-9	4.43	6.4	6.8	6	4.6		1.44	1.53	1.35	1.04

10-14	2.27	1.8	2	1.5	1.3		0.79	0.88	0.66	0.57
15-19	3.63	3.5	2.8	2.5	2.8		0.96	0.77	0.69	0.77
20-24	4.17	3	3.9	3.1	3.1		0.72	0.94	0.74	0.74
25-29	4	2.8	3.7	2.6	2.5		0.7	0.93	0.65	0.63
30-34	4.53	4.3	4.5	2.6	2.6		0.95	0.99	0.57	0.57
35-39	4.37	4.2	6.9	4	4.7		0.96	1.58	0.92	1.08
40-44	7.03	6.9	6	3.6	2.5		0.98	0.85	0.51	0.36
45-49	8.8	6.8	11.7	7.1	6.7		0.77	1.33	0.81	0.76
50-54	14.9	11	13.7	12	11.4		0.74	0.92	0.81	0.77
55-59	20.17	19.8	35.9	17.4	19		0.98	1.78	0.86	0.94
60-64	32.47	37.4	49.2	42.2	33.6		1.15	1.52	1.3	1.03
65+	81.77	103.1	111.5	75.5	76.2		1.26	1.36	0.92	0.93

Turning to the proportional-rise figures, there are also expected and unexpected findings. What is expected is that adult males were more affected than their female counterparts in proportional terms. In 1974 and 1976-77 male mortality from age 25 upwards increased, with a few exceptions more than female mortality. In 1975, the worst famine year, the male ratio substantially exceeded the female one from age 10 up to old age. This therefore confirms what Dyson and others have already found. On the other hand, the results for the younger age groups differ from his findings. Proportional rise under age 1 and also in the 5-9 age group is greater for female infants throughout the 1974-1977 period. In the 1-4 age group, the female ratio exceeds the male one for 1974, 1975 and 1977 while even in 1976 the male ratio fails to exceed the female one. Three facts merit special attention. First, in the famine period there seems to have been acceleration in the worsening of female mortality relative to male mortality during the childhood period: the level of proportional rise in female mortality increased from early to late childhood. Second, proportional rise in IMR was consistently greater for female than for male infants. Third, in the year 1975 while famine effect heightened, the female ratio increased substantially in both infant and childhood periods, cumulatively the girl's chance of survival worsened enormously. These are the points not necessarily consistent with the stylized facts.

Infant and Child Death: The Bourgeois-Pichat/Maruyama Method

For any deeper analysis of infant death, however, it is crucial to separate the neonatal from the post-neonatal period when examining IMR. In the neonatal period, endogenous factors determine the probability of death; so that there can be no deliberate discrimination against girls, while in the post-neonatal period cultural and social norms may well intervene. Indeed, Bangladesh's recent statisticsreveal that the female death probability is consistently higher

than the male one for the period after the first month while the reverse is the case during the first month after birth.Such differencesin male-female mortality in the post-neonatal and childhood periods are said to be explained by differential practices favoring boys over girls in child rearing and/or in treatment of illness (Mitra et al 1997). And, fortunately, it is possible to divide infant deaths into sub-periods for Matlab too (see appendix).

As we have already seen, there are two slightly different methods of analyzing infant mortality: one is Bourgeois-Pichat'sand the other Maruyama's. Bourgeois-Pichat uses thetransformation P (n) =log3 (n+1) for the horizontal axis while the vertical axis is kept on the ordinary scale. Maruyama, on the other hand, plotted the cumulative death totals (or rates) on a log-log plane. I have plotted out 1966-1967 data on these two diagrams, from which sex-specific death rates are available for one-week-olds, one-month-olds, nine-month-olds, four-year-olds and nine-year-olds. Figure 4 and Figure 5 are on the Bourgeois-Pichat's and Maruyama's log-log plane respectively, and it is easier for us to compare the male and female death curves on the Maruyama plane as the slope of each curve corresponds exactly to the rate of change in the cumulative number (or rate) of deaths from one point to another in time. Given the uneven nature of subdivision of the infant period in the original data (length of period varied from time to time), I will adopt the Maruyama method in the analysis below.

Figure 2. Change in Infant and Child mortality over the age by Bourgeois-Pichat method

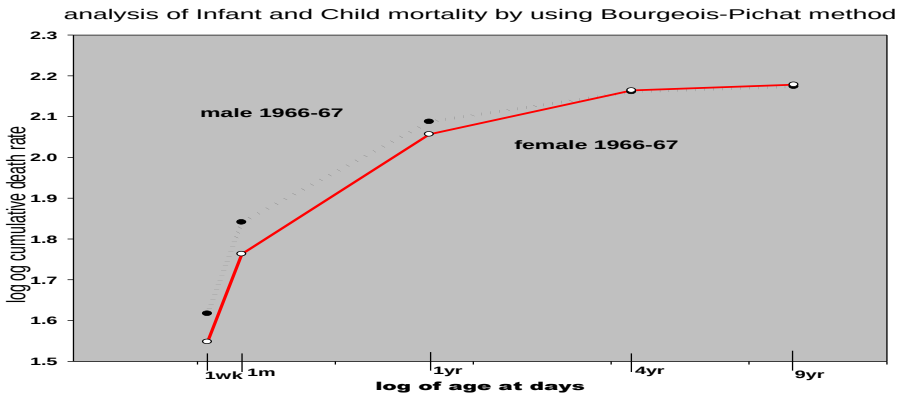


Figure 3(a). Change in Infant and Child mortality over the age by Maruyama's technique in 1966-1967

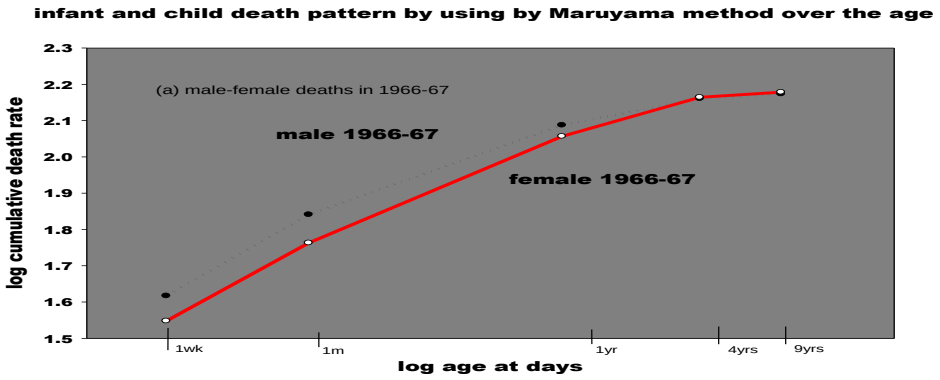


Figure 3(a), which is forthe normal years of 1966-1967, merits attention. The graph indicates that the rate of increase in the cumulative death rate between the first week and the first month was a little steeper for the male than the female group, while after the first month the female curve became steeper and steeper, so that the male and female curves crossed over in the late childhood. This picture of normal years suggests that female disadvantage began soon after the neo-natal period was over, although it was in the 5-9 age group when the level of female mortality exceeded that of male mortality.

Figure 3(b). Change in Infant and Child mortality over the age by Maruyama's technique in 1974

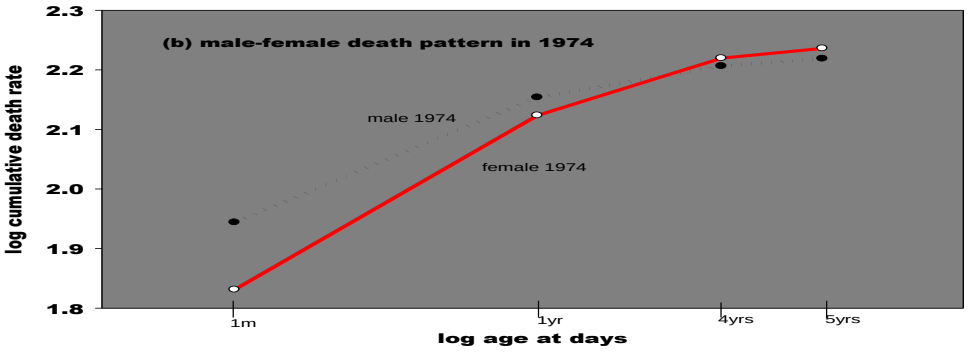
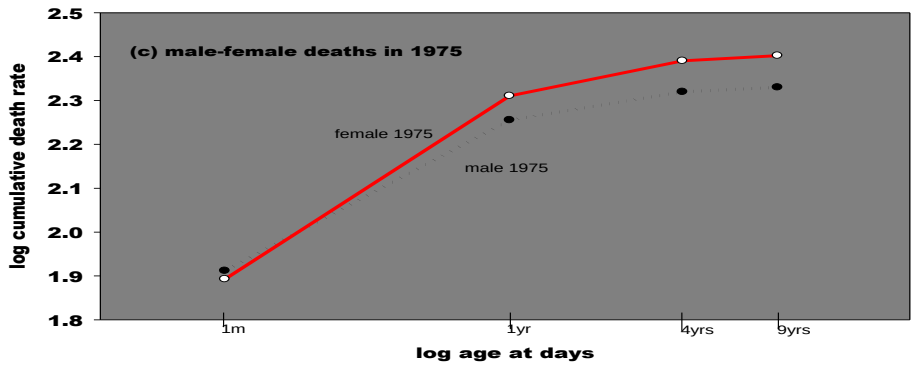


Figure 3(b) is for 1974 when the famine started. Data do not allow us to see what happened during the neonatal period, but it is probably not unrealistic to assume that the male-female pattern was very much similar to that in figure 3(a). For the post-neonatal and childhood periods too, a similar pattern is observed. The only difference is that the cross-over point moved from late to early childhood.

Figure 3(c): Change in Infant and Child mortality over the age by Maruyama's technique in

1975



A totally different pattern appeared in 1975, whenthe famine mortality peaked. Figure 3(c) reveals that the levels of male and female mortality came much closer in the first month, and soon after that period the female curve exceeded the male one. In 1976-1977, the pattern in figure 3(d) returned to the 1974 pattern, whileas shown figure 3(e), which is for 1978-1983, again higher female mortality started earlier, i.e. from the post neonatal period. From October 1977, ICDDR,B provided Maternal and Child Health Care in Matlab,but ironically it seems to have made female children even more vulnerable from age below one upwards[2].

Figure 3(d). Change in Infant and Child mortality over the age by Maruyama's technique in 1976-1977

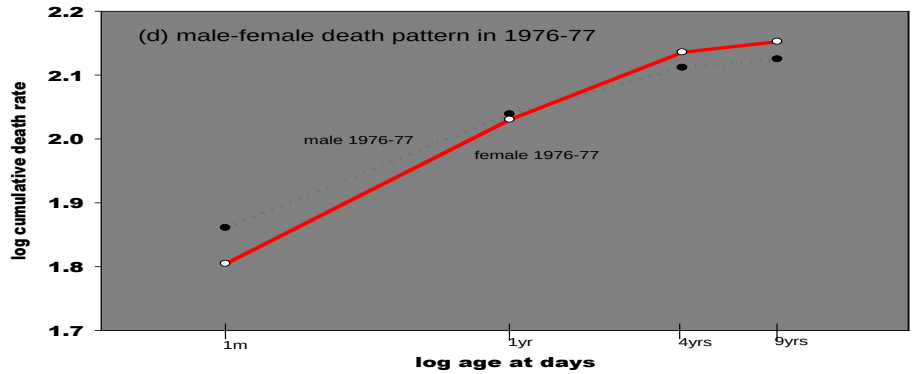


Figure 3(e). Change in Infant and Child mortality over the age by Maruyama's technique in 1978-1983

[2]The difference between 1966-67 and 1978-83 is interesting but not unaccountable. ICDDR,B started their program in 1966. Before thatyear cholera and diarrhoeal diseases had accounted for huge deaths in Matlab. In the absence of enough treatment and health care many children had died irrespective of their sex. Under such conditions deaths in neonatal and post neonatal periods were less sex-selective. But from age fouron, disparity in mortality became clear.

Despite all these differences from year to year, however, it is worth noting that the female curve in all the Maruyama diagrams becomes steeper than the male one in the post-neonatal period. This means that the female disadvantage began right after the first month. In 1975, the peak year of famine mortality, the slope of the female curve became so steep that it overtook the male one well before the first birthday, which in turn increased the total number of female deaths more than that of male deaths in the first year of life, allowing the female IMR overtaking the male IMR in 1975.

DISCUSSION AND CONCLUSION

In most historic famines, infants and young children were proportionally less affected than adults and it was male adults who were most affected. However, this paper has found that in 1974 through 1977 the proportional rise in female mortality relative to that in male mortality was pronounced in childhood, especially in the 5-9 age group, suggesting that the later the greater the female disadvantage. Also found is that in 1975, the peak year of the Bangladesh famine, female IMR tended to rise more than male IMR and the magnitude of proportional rise in IMR leveled with that for the 5-9 age groups. I have argued that it was because the female disadvantage started soon after the neonatal period, and that it was heightened, rather than lowered, during the most disastrous year of the famine period.

How can this female disadvantage be explained? Is it biological, bacteriological, cultural or any thing else?One thing that is worth mentioning here is that in the Bangladesh famine there was no outbreak of any acute infectious disease. Unlike many other famines on the Indian sub-continent, it was free from malaria outbreaks. The case fatality of infectious diseases such as malaria is so high that their impact is unlikely to be sex selective. In other words, there must have been more room for gender-related factors to operate in this case of the Bangladesh famine.

This allows us to turn to the issues of nutrition, lactation and health care. Nutritional surveys in Bangladeshfrom 1985 to 2000have found the prevalence of underweight, wasted and stunted children amonggirls far greater than boys. Severe or moderate malnutrition is also higher for femalechildren (Child Nutrition Survey, Bangladesh 2000). Per-head food intake of boys consistently exceeds that of girls in all age groups. Male caloric consumption in Matlab exceeded female consumption by an average of 16 percentamong children, 11 percent among 5-14 years, 29 percent for 15-44 years, and it exceeded most at ages over 45 years by 61 percent(Chen et al. 1981). Malnutrition is one of the major causes that accounted for high infant and child mortality rates. About 9 and 17 percent of live births result in death from severe malnutrition in the first month and the first year respectively, while 26 percent die before reaching the age of 3(Rosenberg 1973).Bairagi (1986)notes that during the famine, severely malnourished children increased by 68 or 100 percent depending on the definition of'severe malnutrition', but children of all socioeconomic status groups were adversely affected by the famine. Food crisis during the famine period can be afactor for this bias in nutrition level according to sex at these ages, but in the period before age one, it should be noted,that factor must be less important as breast feeding is common for both girls and boysin this post neonatal agegroup.

Despite breast feeding, however, female children and children of lower socioeconomic statuses were more seriously affected. In another study, one-third of the total deaths in 1986-87 ofchildren between 6 and 36 months of age were found associated with severe malnutrition, and 79 percent of those deaths were associated with diarrhea. Moreover the risk of dying from severe malnutrition was more than twice as high among girls as among boys. Also important is that mortality due to severe malnutrition was found significantly lower in a surveillance area covered by an intensive mother-child health and family planning (MCH-FP) programme than in the other half covered by the regular national health services(Fauveau 1990).

Treatment of illness or health care seeking behaviour in Bangladesh is also biased. Work on neonatal morbidity and care seeking behaviour illustrates that seeking care from a trained provider is associated with the gender of neonate, birth order, and antenatal care of the mother from trained providers, father's education and monthly expenditure of the family(Ahmed et al.2001). Vaccination coverage or treatment of illness provided by trained doctor or through pharmacy are better forboys. Male children are more likely to be taken to a health facility or medically trained provider than female children while ill with acute respiratory infection, fever or with diarrhea (Bangladesh Demographic and Health Survey, 1993-1994, 1999-2000, and 2004). Larson suggests that the care taker practice tends to favor malechildren and higher income households in diarrhea management (Larson et al. 2006). Of

the three factors considered, it is probably safe to assume, breast feeding is least sex-selective. As the child grows, the importance of food intake and treatment increases. Thus the compound effect of differential feeding of food and differential treatment must result in higher mortality risk for girls, explaining the tendency that the later in the childhood period the greater the female disadvantage.

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APPENDIX

Table 3. Infant and Child Mortality Rate

Year	IMR	0-7 days	8-29 days	1-12 months	1-4years	5-9years
Male						
1966	117.4	37.9	27.6	52	20	3.7
1967	126.7	44.9	28.3	53.9	25	5
Female						
1966	104	29.1	24.5	50.5	30	4.5
1967	124	41.5	20.8	61.5	34	5.1
Year	IMR	<1month	1-11 months	1 year	1-4years	5-9years
Male						
1974	142.5	87.9	54.6	22.6	18.3	4.7
1975	165.1	81.6	98.4	38.4	28.8	4.9
1976	113.6	72	33.3	40.9	25.5	4.6
1977	113.3	73.1	40.2	23.8	14.5	3.4
1978	116.6	73	43.6	24.2	16.9	2.2
1979	118.7	77.2	41.4	26.1	16.1	4.5
1980	90.2	61.8	28.4	24.4	16.5	2.9
1981	104.8	68.6	36.2	24	16.2	2.4
1982	115.8	68	47.8	24	24	3
1983	100.9	64.2	36.6	35.2	21.9	3.2
Female						
1974	132.9	67.8	65.1	44.8	32.9	6.4
1975	184.1	78.1	126.3	56.8	41.3	6.8
1976	110.3	58.1	42.1	55.9	33.8	6
1977	114.2	69.4	44.8	26.6	25.2	4.6
1978	124.3	75.3	49.1	44	28.2	4.9
1979	114	68.5	45.5	40.8	27.6	5.2
1980	118.5	71.6	46.8	33.6	28	3.4
1981	113.7	67.6	46.1	44.4	28.3	4.3
1982	108.9	58.6	50.2	42.6	42.6	4.5
1983	111.5	63.8	47.7	48.7	37	4.8