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Aging in Bangladesh and its Population Projections

Md. Ripter Hossain
Department of Statistics, Rajshahi University, Rajshahi-6205, Bangladesh

Abstract: The present strives to investigate the issues relating to population aging in Bangladesh and the global trend of elderly population 60+ as well as discusses the share of less developed countries. The study also presents the trend of elderly population in the selected Asian countries and addresses the basic issues of threshold of old age, measurement of the rate of aging and the oldness of the old. The projected figure of elderly population in Bangladesh shows that the size of the elderly population is expected to increase from nearly 7.51 million in 2001 to 9.39 million in 2011. It is also evident that there is a consistent increase in the proportion of the aged 60+ compared to the population in those of young and adult groups. Thus the older population of Bangladesh is going to increase remarkably during the next four decades 2021 to 2051.

Key words: Aging, Bangladesh, population, projections

Introduction

Research interest on population aging is a very recent origin and still a lot of research endeavor is needed to address the different issues relating to the same and inter-relation of those issues. International community first debated the question of aging at the United Nations at the initiative of Argentina in 1948. The issue was again raised by Malta only in 1969. In recognizing that longevity was becoming one of the major challenges of the twentieth century, the United Nations organized World assembly on Aging, in Vienna, in 1982. In the same year the United Nation General Assembly endorsed the International Plan of Action on Aging. In 1990 the Assembly designated 1 October as the International Day for the Elderly, later renamed the International Day of the Older Persons. The United Nation General Assembly decided in 1992 to observe the International Year of Older Persons in 1999 with an objective to raise awareness of the first changing demographic picture of older persons, to stimulate debate, promote action strategies and encourage research and information exchange. The theme of the year have been "towards a society for all ages" (Karkal, 2000).

The population of the world will continue to grow older in the immediate future. The median age of the world population will increase rapidly during the twenty-first century. It must be assumed that disease control will be improved especially in those countries which currently have relatively high rates of infant and childhood mortality. It also seems that there will be increased use of contraceptive techniques, which will tend to moderate the worldwide birth rate. Each of these factors will have the effect of increasing the median age of the world population and producing increasing proportions of older people in many societies. However, in the coming decades, many Asian countries including Bangladesh will experience population aging and the aging population will be large in absolute terms. Bangladesh has been experiencing a major change in the age composition of its population, becoming a much more mature society than it was only a few years ago. The median age of the society has decreased from about 21.6 years in 1950 to 18.5 years in 1990 and again increased from about 18.5 years in 1990 to 20.9 years in 2000 and it is expected to go up to about 37.8 years by 2050.

Aging is one of the emerging problems in Bangladesh. This problem has been gradually increasing with its far reaching consequences. With the advancement of medical science and public health care services and other technological developments, the average span of life has become more than double in the present century. Although the aged population in Bangladesh was not very high in 1990. In this year the numbers of aged population of 60 years and above was 5.2 million(about 5 percent of the total population). This number will reach 14.6 million(about 9 percent of the total population) by the year 2025. In the past two decades, the mortality improvements in Bangladesh is remarkable resulting in the extension of life. This is expected to have effects on the retirement plans of the elderly people in near future. Moreover, fertility has also been declining. As a result of these demographic changes, Bangladesh will also experience rapid growth in elderly population.

The present study is an attempts to investigate the issue relating to population aging in the Bangladesh. This study have been explores the growth of the elderly population of 60 years and above. The study based on secondary data and the same have been collected from United Nations publications and Bangladesh Bureau of Statistics.

Growth of Elderly Population of the World, Regions, and Some Selected Asian Countries: The distribution of the aged persons is not uniform. Table-1 indicates that the concentration of the aged persons in the developing countries which accounts 57.6 percent of the total aged as well as in the low and lower middle income countries which accounts 62.5 percent of the total aged persons was much higher than that of the developed which

Table 1: Percentage and distribution of population 60+ for the world, major economic and geographic regions, 1990-2050

Region /Economy	1990		2000		2025		2050	
	a	b	a	b	a	b	a	b
World	9.3	100	9.9	100	14.4	100	20.3	100
Developing	6.9	57.6	7.6	60.6	12.0	69.1	18.8	79.2
Developed	17.0	42.4	18.7	39.4	26.6	30.9	29.6	20.8
Regions								
Asia	7.8	50.5	8.7	53.3	13.9	57.9	21.2	61.6
Africa	2.5	6.1	4.8	6.6	8.1	7.6	19.0	11.5
Oceania	12.6	0.6	12.8	0.6	19.9	0.6	24.3	0.5
Americas	10.8	15.8	11.0	14.9	18.2	16.3	24.0	14.6
Europe	18.1	26.0	20.1	24.5	23.2	14.7	30.8	11.4
Economy								
Low income	7.1	44.5	7.7	46.5	11.8	51.3	15.3	57.8
Lower middle	9.7	18.0	10.4	18.1	14.1	17.0	15.3	18.0
Upper middle	8.1	7.7	8.9	7.9	14.7	9.0	20.6	9.7
High income	17.8	29.6	19.1	27.4	28.6	22.5	31.0	14.4

Source: World population projection 1994, Oxford University Press.
a. Percentage of elderly population in respect to total population of that country.
b. Percentage of elderly population in respect to total elderly population of the world.

accounts 42.4 percent of the total aged or higher and upper middle income groups countries.
By the end of the 2025, the projected contribution of developing economy will touch the limit of 70 percent. It will take another 25 years to touch the target of 80 percent. Three-fourths of this increase will be contributed by the Asian and Latin American countries. Asia alone will be home of 60 percent of the World's aged population. Thus, the problem of aging will become a feature of Asian countries in the near future.
Most of the countries of the region are experiencing population aging resulting in rapid increase in both the number and the proportion of population 60 and over as well as their life expectancy at birth. The number and percentage of population aged 60 and over of selected countries are shown in table-2. It reveals that during the period from 1970 to 1995, the male population in China aged 60+ increased from 25.4 million to 54.9 million and their female counterpart increased from 31.4 million to 59.3 million. By the year 2025, this number is expected to increase to 129.9 million for males and 144.2 million for females. Similarly change is also expected for Indonesian population. These corresponding figures are 2.9 million and 3.3 million in 1970, 6.2 million and 7.1 million in 1995 and 16.0 and 19.0 million in 2025. In Bangladesh population, the corresponding figures are 2.2 million and 1.8 million in 1970, 2.9 million 2.9 million in 1995 and 9.1 million and 9.1 million in 2025. Similarly for India, the corresponding figures are 17.0 million and 16.2 million in 1970 and 32.8 million and 34.5 million in 1995 and 84.3 million and 88.9 million in 2025.
The proportions of elderly population in Eastern Asian and South Asian countries are also experiencing considerable change. The proportion of males for 60+, for China, increased from 5.9 percent in 1970 to 8.7 percent in 1995 and it will increase to 16.5 percent by the year 2025. The proportion of their female counterpart is changed from 7.8 percent in 1970 to 10.0 percent in 1995 and it will be 19.2 percent by the year 2025. Similarly for Japan, the corresponding figures for males increased from 9.8 percent in 1970 to 17.6 percent in 1995 and it will be 28.9 percent in 2025. The proportion of their females rose from 11.5 percent in 1970 to 22.4 percent in 1995 and it will be 33.7 percent in 2025. In Bangladesh, the proportion of male population 60+, is decreasing from 6.5 percent in 1970 to 4.7 percent in 1995 and further increase 9.1 percent by the year 2025.
The proportion of their females counterpart is changing from 5.6 percent in 1970 to 5.0 percent in 1995 and further to 9.5 percent by 2025. In India, the proportion of males population 60+ is increasing from 5.9 percent in 1970 to 6.8 percent in 1995 and 11.8 percent by the year 2025. The proportion of their females counterpart is changing from 6.0 percent in 1970 to 7.6 percent in 1995 and further to 13.1 percent by 2025.

Trend in Population Aging: It is of interest to consider an indicator that tells about the numbers that are old as well as the extent of oldness in the population. Such a composite index, is obviously an improvement over the conventional measure of proportion aged or the head-count ratio. The advantages of the former index over the latter were discussed elsewhere(Basu and Basu, 1987; Kulkarni, 1988; Chakravarty and Chakravarty, 1993).
We describe only the first approximation of this composite index of aging for the present purpose. Moreover, consideration of further refinements does not make much difference in the result.

The commonly used aging index is then given simply by

$$H = \frac{M}{N}$$

Where N is the size of the total population and M is the number of people aged 60 and over.
By analogy with the "Income cap" measure, another indicator, called the "age-difference Index" is given as

$$D = \frac{1}{M}\sum_{i=1}^{M}\left(\frac{P_i - 60}{60}\right)$$

Where p_i is the age(sixty plus) of the ith person. Since the index D is concerned only with the extent of oldness among the old, a good measure of aging is derived by some kind of reconciliation of H and D. The improved index is defined as

$$I = \frac{1}{N}\sum_{i=1}^{M}\left(\frac{P_i - 60}{60}\right)^2$$

Based on the Index, the trend in population aging in Bangladesh is illustrated with reference to sex-age distributions of the population estimated by the United Nations(1994). The data used as the input for the index are presented in Table 3.

Table 2: Number and Percentage of Population aged 60+ of Selected Countries 1970, 1995 and 2025

Country	Number in thousand						Percentage					
	1970		1995		2025		1970		1995		2025	
	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female	Male	Female
China	25432	31353	54870	59289	129859	144219	5.9	7.8	8.7	10.0	16.5	19.2
Japan	4997	6114	10837	14262	17191	21528	9.8	11.5	17.6	22.4	28.9	33.7
Indonesia	2901	3310	6206	7109	15987	19036	4.9	5.5	6.3	7.2	11.6	13.7
Bangladesh	2247	1795	2930	2934	9084	9117	6.5	5.6	4.7	5.0	9.1	9.5
Pakistan	1798	1503	3313	3270	11006	11209	5.3	4.7	4.5	4.8	7.5	8.0
India	17044	16180	32801	34499	84274	88847	5.9	6.0	6.8	7.6	11.8	13.1
Sri Lanka	415	328	775	811	1838	2330	6.4	5.4	8.4	8.8	14.8	18.5

Sources:- The Sex and Age Distribution of the World Population , the 1994 Revision and World Population Prospects : the 1994 Revision (Annex Table).

Table 3: Estimated sex-age distribution of population of Bangladesh in the old age range: 1950, 1980-2030(population in 000)

Age group	1950	1980	1990	2000	2010	2020	2030
Male							
Total	22227	45492	58785	69305	83713	95220	106061
60-64	600	822	958	1251	1718	2882	4209
65-69	390	654	685	904	1237	1812	3076
70-74	215	466	463	592	829	1200	2094
75-79	105	288	292	341	490	719	1111
80+	50	131	226	276	375	566	880
60 and over	1350	2361	2624	3364	4649	7179	11370
Female							
Total	19556	42729	52333	65113	78787	89970	100893
60-64	457	796	921	1291	1725	2672	4195
65-69	340	662	685	935	1310	1902	3036
70-74	230	447	467	600	902	1280	2077
75-79	134	267	304	356	533	812	1262
80+	50	122	200	262	367	604	975
60 and over	1211	2294	2577	3444	4837	7240	11545

Source: The sex and age distribution of world populations, The 1994 Revision, United Nations, NewYork, p.178-179.

The commonly used aging index H, and the Improved index I are presented in Table 4. While both indicators reveal a clear trend towards further aging in Bangladesh, well into the next century, the I- index seems to be more sensitive, and registers a steeper and larger increase in the number of ild people and the oldness of the old compared to the commonly used index, H. The sex differential in aging is also brought out more sharply by the new index than does the traditional index.

Population Estimates and Projections: For any policy formulation on welfare and social security measures for our senior citizens, it is essential to know the size of the sub-population of elderly. In view of this need, we estimate the population aged 60 years and above by demographic cohort-component method.
In the formula of Hamilton and Perry (1962) cohort-change rates for a given area between the two censuses are assumed to remain constant in future years:-

$$nP^{t+k}_{a+k} = \frac{nP^{t}_{a+k}}{nP^{t-k}_{a}} \times nP^{t}_{a}$$

Where P is population, a is the initial age of the age interval at the second census, n is the size of the age interval, t is the year of the second census and k is the intercensal interval in years (a multiple of n, usually 5 or 10 years). For the ages under 10 in projected year; we have employed the following ratios:-

$$P^{p}_{0-4} = \frac{P^{1991}_{0-4}}{P^{1991}_{15-59}} \times P^{p}_{15-59}$$

$$P^{p}_{5-9} = \frac{P^{1991}_{5-9}}{P^{1991}_{20-59}} \times P^{p}_{20-59}$$

Where p is the projected year.
The population of Bangladesh by age group during 1981-2051 have been projected in table-5 by applying cohort component method.

Table 4: Expected trend in aging of population according to two indicators for Bangladesh: 1950, 1980-2030

Year	Improve Ix100		% change of I		Hx100		% change of H	
	Male	Female	Male	Female	Male	Female	Male	Female
1950	0.53	0.39	-	-	6.12	6.19	-	-
1980	0.71	0.72	33.96	84.62	5.19	5.37	-15.2	-13.3
1990	0.72	0.73	1.41	1.39	4.70	4.93	-9.5	-8.2
2000	1.02	1.15	41.67	57.53	4.85	5.29	3.2	7.3
2010	1.66	1.89	62.75	64.35	5.55	6.14	14.4	16.1
2020	3.80	3.88	128.92	105.29	7.54	8.08	35.9	31.6
2030	8.44	8.89	122.11	129.12	10.72	11.44	42.2	41.58

Source: Computed from Table 3

Table 5: Projected population of Bangladesh by age group, 1981-2051(in thousand)

Age group	1981	1991	2001	2011	2021	2031	2041	2051
0-4	15333	18695	23389	29026	35838	43977	54403	67205
5-9	14544	18391	22957	28455	35103	43025	53331	65833
10-14	11872	13443	16391	20507	25449	31422	38558	47699
15-19	8739	9500	12013	14996	18587	22930	28105	34837
20-24	7074	9364	10603	12928	16174	20072	24783	30411
25-29	6332	9472	10297	13021	16254	20146	24853	30462
30-34	5282	6797	8997	10187	12421	15540	19285	23811
35-39	4458	6149	9198	9999	12644	15783	19562	24133
40-44	3743	4734	6092	8064	9131	11133	13929	17286
45-49	3069	3626	5002	7482	8134	10286	12840	15914
50-54	2500	3224	4078	5248	6947	7866	9591	11999
55-59	1971	2015	2381	3285	4914	5342	6755	8432
60-64	1913	2316	3068	3881	4995	6612	7487	9129
65+	3082	3666	4437	5507	6889	8721	11252	13752

For further calculation table-6 has been constructed with the figure of table-5. In shaping the result, the age group categorizes into three broad age groups, namely, 0-14, 15-59, and 60+ according to the projected population of Bangladesh. Population size variations have been observed in the following years but the size shows increasing tendency in the first category of the age group 0-14. In the age group 15-59 and 60+ there are uninterrupted increasing trends. In the age group 15-59 the population was 43.17 million in 1981 while the same will be increased to 197.29 million (or 4.57 times) by the year 2051. In case of age group 60+ it is observed that the population was 4.99million in 1981 and the same will increase to 22.88 million (or 4.59 times) by the end of 2051. This shows that the old population of Bangladesh is going to increase gradually upto year 2021 and thereafter remarkably increase between the decades 2021 to 2031, 2031 to 2041 and 2041 to 2051. In both the cases, the population will increase but the increase is more pronounced incase of 60+ group.

Table 7, our estimate, BBS estimate and UN estimate have been shown in broad age groups of Bangladesh during 1981-2021. The table indicates that the population size of Bangladesh increases alarmingly in the age group 0-14. On the other hand, slightly increasing tendency observed in the same age group in case of BBS estimate. Again the UN estimate also increases in the same pattern. Again table shows that in the age group 15-59, population sizes among our estimates and BBS estimates are increasing in the same way. But in case of UN estimate the population size increase rapidly than other two estimates. In case of aged population (60+), they demonstrate the same situation. Our estimate and BBS estimate all most same during the whole period of study. While UN estimates show highest growth rate than other two estimates.

Finally, mean deviation and chi-square statistic are shown in Table 8. It is to be noted that in the age groups 0-14 and 15-59, UN estimate provides smaller mean deviation as well as chi-square statistic value than our estimated results. However, in the age group 60 and above, our estimate provides smaller mean deviation as well as chi-square statistic value than UN estimate.

Table 6: Projected population of Bangladesh by broad age group, 1981-2051 (in million)

Year	Age group		
	0-14	15-59	60+
1981	41.75	43.17	4.99
1991	50.74	54.88	6.05
2001	62.74	68.66	7.51
2011	77.99	85.21	9.39
2021	96.39	105.21	11.89
2031	118.42	129.10	15.33
2041	146.29	159.70	18.74
2051	180.74	197.29	22.88

Table 7: Projected mid-year population of Bangladesh by broad age groups, 1981-2021(Population in million)

Year	Age group								
	0-14			15-59			60+		
	Our estimate	BBS estimate	UN estimate	Our estimate	BBS estimate	UN estimate	Our estimate	BBS estimate	UN estimate
1981	41.75	40.60	40.73	43.17	41.61	42.92	4.99	4.91	4.57
1991	50.53	50.82	50.73	54.88	55.19	59.53	6.05	6.08	5.33
2001	62.74	50.37	61.13	68.66	79.63	82.57	7.51	6.95	6.89
2011	77.93	51.69	68.05	85.21	101.31	109.84	9.39	9.28	9.31
2021	96.39	52.35	69.09	105.21	119.15	137.13	11.89	13.29	17.90

Table 8:Calculated mean deviation and Chi-square statistic

Methods	Mean deviation			Chi-square statistic		
	0-14	15-59	60+	0-14	15-59	60+
Our estimate	16.82	8.58	0.44	31.46	6.69	0.21
UN estimate	8.82	7.02	1.16	9.88	3.48	0.94

Conclusion

The expected trend in aging population of Bangladesh according to two indicators such as Commonly used aging index and Improved index reveals a clear increasing trend in aging population both in case of males and females. The factors like under age marriage, malnutrition, more births, social in advancement etc. might be related to the sex differential in aging pattern in Bangladesh.

Estimate and projection of the aged population reveal that in next 20 years their number will exceed nearly one crore and in the mid of the 21st century the elderly(older persons) is expected to increase nearly 2.05 times over 1981. The aged population of Bangladesh will increase gradually upto 2021 and thereafter it will increase remarkably between 2021 and 2051. For it will increase about 4.6 times by the end of 2051 from the figure of 1981. Thus we have clear evidence that the aging of population that is taking place in the country can be accounted for the transition of both fertility and mortality i.e. the demographic transition vis-a-vis changes in the age structure.

In view of growing number of elderly in Bangladesh, the aged population gradually emerges as a vulnerable group in our society. The well-being of the older person requires formulation of appropriate polices and programmes through a clear understanding of the problems, needs, and demands of this vulnerable group, their status and functions in the family and society, their living arrangement, support systems, economic activity, potentiality and so on.

Population aging in Bangladesh is becoming a serious concern for the development agendas. The issue should be dealt with much care. The rapid rate of aging of population and the growing cohorts of older persons have particular implications for the development of the country including increasing economic dependency and rising incidence of care giving to older persons by the traditional social unit, the family.

Policy makers and planners need to think of long run programmes for the welfare of the elderly in terms of social security, economic benefits, employment, health and nutrition facilities, family and individual assistance etc. The occurrence of physical disabilities is another aspect of the aging process. Measures should be taken to help the disabled elderly. Maintenance of joint family system could be a policy option.

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