Population Aging in Botswana : Trends and Prospects

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Abstract

In 2001, Botswana had 36.6 percent of the total population below 15 years while the 65+ population is only 5 percent. The proportion of the economically age group stands at 58 percent. The median age has increased from 15.7 years in 1971 to 20.1 in 2001. The tempo of aging is rather slow. Botswana is favourably placed in terms of the so-called 'demographic bonus'. The proportion of economically active population now is more than half of the population – 58.4 percent which is likely to increase to 70.1 percent in 2051. Although, there is the prospect of a retarded aging process, HIV/AIDS affects the intergenerational transfer payments substantially and hence a threat to the care of the aged. A sigh of relief is that it will take several years for Sub-Saharan Africa to become an aged society.

1. Introduction

At the time of independence in 1966, the population of Botswana stood around half million. It has grown to 1,680,863 in 2001 compared to 1,326,796 in 1991 (CSO, 2001). This implies an average annual population growth rate of 2.4 percent during 1991-2001. During 1981-1991 and 1971-1981, the growth rates were 3.5 and 4.5 respectively. In Sub-Saharan Africa, Botswana is well known on two counts; first as a fast growing economy due to the discovery of a vast reserve of diamonds in 1967 and second, as a country with the highest prevalence of HIV/AIDS. The national HIV prevalence rate is estimated at 17.1 percent in 2004 (Republic of Botswana, 2005). In spite of the high death rates in the country, interestingly, there has been a notable decline in the total fertility rate (TFR) from 6.6 in 1981 to 3.3 in 2001. As we know, the fertility and mortality transitions in particular bring in, inevitably, the age structural transition – a process and consequence of shifting age structure from a young-aged population to old-aged population. This phenomenon, pioneered by the western industrialized nations since

the dawn of the twentieth century, has been witnessed in developing countries as well including Sub-Saharan Africa since the last quarter of the last century. However, Sub-Saharan Africa is characterized by declining fertility and a stable or increasing mortality due to the high prevalence of HIV/AIDS and tuberculosis.

Under these peculiar circumstances, the process of age structural transition in Sub-Saharan region is deemed to exhibit a strange pattern with no similarity with the West where development had a direct and positive bearing. In this backdrop, an attempt is made in this paper to portray the age structural transition in Botswana since 1971 with special emphasis on population aging.

2. The demographic trends

In 1971, the Crude birth Rate was estimated at about 45.3 births per thousand and the total fertility rate was around 7. Comparatively, this was the typical figure for the continent, where the level of fertility is thought to be higher than anywhere else.

Table 1: Demographic Indicators of Botswana

Population Characteristic	**1971**	**1981**	**1991**	**2001**
Enumerated Population	574,094	941,027	1,326,796	1,680,863
Sex Ratio	84	89	92	94
Crude Birth Rate	45.3	47.7	39.3	28.9
Crude Death Rate	13.7	13.9	11.5	12.4
Natural Rate of Increase (%)	3.1	3.4	2.7	1.7
Mean age at Child Bearing	30.5	30.6	30.0	30.3
Total Fertility Rate	6.5	6.6	4.2	3.3
Infant Mortality Rate	97.0	71.0	48.0	56.0
Child Mortality Rate	56	35	16	19
Under 5 Mortality	152	105	63	74
Life expectancy at Birth	55.5	56.5	65.3	55.6
Males	52.5	52.3	63.3	52.0
Females	58.6	59.7	67.1	57.4

The overall Sex Ratio of Botswana then stood at 84 males per 100 females. This deficit of males was largely attributable to the absence of male migrant workers in South Africa and elsewhere. The crude death rate was 13.7, the infant mortality rate 97 and life expectancy 55.5 years.

The 1981 population was typified by a high growth that was due to the prevailing high fertility rate by then and declining mortality and emigration rates. The Natural Rate of Increase was recorded as 3.4 percent per annum, slightly higher than the 1971 estimate of 3.1 percent. Infant Mortality Rate was estimated at 71 per 1000 live births, a significant decrease from the 97 recorded in 1971. Child mortality decreased from 56 deaths to 35 whilst under-five mortality had fallen from 152 to 105. Life expectancy at birth was estimated at 52.3 years for males and 59.7 years for females. It was only the Crude Death Rate and Life Expectancies at birth that showed some small increases from 1971.

The estimated Crude Birth Rate in 1971 was 47.7 births per thousand, compared with 48.7 in 1981. Figure 2 gives the trends of Crude Death Rate and Crude Birth Rate since 1971. The figure shows an interesting pattern of births during the period 1971 and 1981. The Crude Birth Rate then came down from above forty to less than 30 in 2001. On the other hand, mortality peaks a bit before going down in 1991, and then rises again in 2001.

In 1991, all the mortality indicators have gone down and the Life expectancy has significantly increased from around 56 years to 65 years. The level of fertility was also going down, with a Total Fertility Rate of 4.2 children per woman, down from 6.6 children in 1981. During that period, the country was experiencing impressive gains in the economic front. There was an improvement in the health conditions, which led to declining death rates. A comprehensive family planning program also contributed to low family sizes and subsequently low fertility.

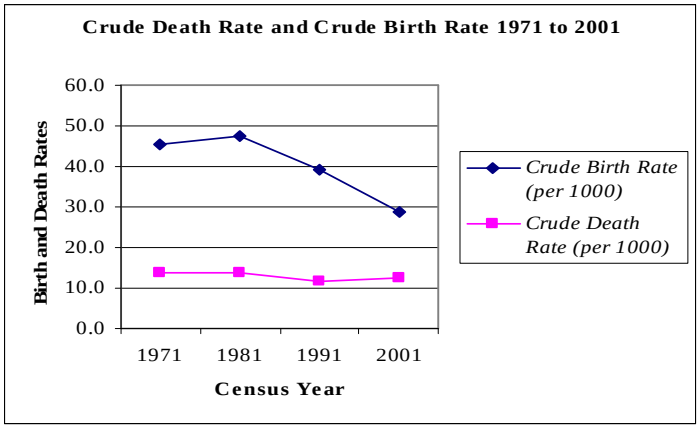
In 2001, Infant mortality had risen to 56 and the Total Fertility Rate has fallen from 4.2 in 1991 to 3.3 . Child mortality increased from 16 deaths per 1000 to 19, Under-five mortality rose from 63 per thousand to 74, Life expectancy at birth declined from 65.3

years to 55.6 years. Crude Death Rate rose from 11.5 to 12.4. Another noteworthy aspect of the 2001 population is the high levels of age specific mortality in the middle ages. Starting from age group 20-24, the level of mortality picked so viciously when compared to the level of mortality for the same age groups ten years ago.

Table 2 : Fertility and Mortality Indicators for Botswana; 1971-2001.

Indicator	1971	1981	Change (%) (1971-81)	1991	Change (%) (!981-91)	2001	Change(%) (1991-01)
TFR	6.5	6.6	+1.54	4.2	- 36.36	3.3	-21.43
CBR	45.3	47.7	+5.30	39.3	- 17.61	28.9	-26.46
CDR	13.7	13.9	+1.46	11.5	-17.27	12.4	+ 7.83
Life Exp.	55.5	56.5	+1.80	65.3	+ 15.86	55.6	-14.85
Life Exp (F)	58.6	59.7	+1.89	67.1	+12.39	57.4	-14.46
Life Exp (M)	52.5	52.3	+0.38	63.3	+21.03	52.0	-17.85
IMR	97.1	N.A	--	48.0	--	56.0	+16.67

Figure 1: CDR and CBR - 1971 to 2001



3. Age Structural Transition

As observed in Table 3, we see a systematic decline in the proportion of 0-14 years, the young dependents over the years. The pace of decline was marginal, only less than 1 percent, during 1971-1981. During that period, changes in fertility and mortality were also not significant. However, the proportional decline was substantial during the next two decades, 8.7 percent and 15 percent respectively. As seen in Table 2, fertility declined considerably since then despite an increased mortality level especially during the last decade 1991-2001 mainly due to the increase in infant and child mortality. The gains in the chances of survival of infants experienced in the Nineties have apparently been lost due to HIV/AIDS. Also, the gains in life expectancy did not sustain mostly due to the rapid increase in the HIV/AIDS epidemic. Life expectancy has declined to 55.6 years in 2001 (CSO, 2001). If we eliminated this hike in death rates due to HIV/AIDS, the proportional change in mortality during 1991-2001 would have been less.

Table 3. Age Structure of Botswana, 1971,1981,1991 and 2001.

Age	**1971**	**1981**	**1991**	**2001**
0-4	19.8	18.5	14.6	11.7
5-9	15.2	16.0	14.8	12.4
10-14	12.6	12.8	13.8	12.5
0-14	**47.6**	**47.3**	**43.2**	**36.7**
15-19	9.8	9.9	11.5	12.2
20-24	7.0	8.4	8.8	10.2
25-29	5.9	6.7	7.5	8.8
30-34	5.2	5.0	6.1	6.8
35-39	4.6	4.0	5.0	5.7
40-44	4.1	3.6	3.6	4.6
45-49	3.6	3.1	2.9	3.8
50-54	3.1	2.6	2.5	2.7

55-59	2.6	2.4	2.1	2.0
60-64	2.1	1.8	1.7	1.7
15-64	**48.1**	**47.6**	**51.8**	**58.4**
65-69	1.6	1.6	1.5	1.5
70-74	1.2	1.3	1.1	1.3
75+	1.5	2.2	2.3	2.2
60+	**6.4**	**6.9**	**6.6**	**6.7**
65+	**4.3**	**5.1**	**4.9**	**5.0**
Total	**100.0**	**100.0**	**100.0**	**100.0**
Median Age	**15.75**	**15.86**	**17.44**	**20.09**
Index of Aging	**16.05**	**14.76**	**15.37**	**18.22**

There was no appreciable increase in the proportion of 0-14 during the 10- year period of 1971-1981 due to a stagnant high fertility. The same trend was observed in the young and adult age groups as well. Since 1991, there has been dramatic changes in the proportions of 0-14 and 15-64 age groups. The proportion of 0-14 age group now stands at 37 percent while that of the economically age group 15-64 at 58 percent.

In 1981, the age composition also revealed a very young population, with 47.3 percent aged less than 15 years and only 47.6 percent within the working age group (15-64), 5.1 percent were aged 65+. The mean age of the population in 1981 was 22.7 years (22.0 years for males and 23.4 for females). This was a slight decline of 0.7 years from the 1971 estimate.

The 2001 age structure portrays a very different picture from the rest of the previous censuses. It has a narrowing base, of the age group 0-4 and its proportion stood at 11.7 percent, quite a pronounced decline from the 1981 and 1991 proportions of 18.5 percent and 14.6 percent respectively. There could be several factors that can be associated with this fall of the proportion of the young age group. Infant mortality had risen from 48.0 in 1991 to 56 in 2001, as well as a declining Total Fertility Rate that has fallen from an average of 4.2 in 1991 to 3.3 in 2001. The age group that has experienced a significant

growth is the broad age group of 15-49 years. It has experienced a growth of about 6.5 percentage points (from 45.5 percent in 1991 to 52 percent in 2001). The median age has increased to 17.4 in 1991 and 20.1 in 2001. It is encouraging to note that during 1971-2001, the proportion 15-64 years has increased substantially, from 48 to 58 percent.

4. Demographic Bonus

The nature of the changing age structure of the population during demographic transition has various social and economic implications. Economic demographers observe that the decline in the dependency ratio and increase in the labour force population during the age structural transition brings in a "demographic bonus" or "window of opportunity" brought in by the demographic transition. During the period of window of opportunity, social sector expenditures are reduced due to lesser demand for health care services by the smaller young and old aged population as well as reduced demand for educational services due to declines in the growth of school aged population. Therefore, the demographic bonus is likely to contribute partly to the growth of the national economy if favourable and adequate policies are pursued. The report of the Symposium on Population and Economic development held in Italy in 1998 characterises the window of opportunity as (a) more workers producing more total output, if they are productively employed; (b) greater accumulation of wealth, if savings occur and are productively invested and (c) a large supply of human capital , if appropriate investments are made in its formation (Birdsall and Sinding, 1998). . The 'demographic bonus' had a positive impact on the economic growth in all Southeast Asian countries except in the Philippines (Navaneetham .K. 2002).

Botswana is favourably placed in this context (Nair P.S and R. G. Majelantle, 2005). The proportion of economically active population now is more than half of the population – 58.4 percent which is likely to increase to 59.6 percent in 2011, 62.1 percent in 2021 and 70.1 percent in 2051(CSO, 1997). The high quality of human capital in terms of education, a stable and vibrant democratic political system, scope for infrastructure development and the assured flow of economic capital present an encouraging picture for

Botswana to fruitfully utilise the "window of opportunity" invoked by the demographic transition

3. Indicators of Aging

In Botswana, the process of aging has been occurring from the bottom; but it is not translated in the old ages . In other words, the ripple or cohort flow effect of the aging process from the bottom ends up in middle ages. There has been a slight increase in the proportions 60+ as well as 65+during 1971-1981; since then it appears stalled. The proportion of female population aged 60+ has not declined significantly. This is corroborated with the female advantage in life expectancy. Therefore, the overall reduction or stalling in the proportion of old is mainly due to the male factor, i.e. the a reduction from 7.5 percent in 1971 to 5.9 in 2001. There is no doubt that the cohort flows needed for the process of population aging at the top is seriously hampered by AIDS related deaths. Again, it appears that the impact of HIV/AIDS is comparatively higher among males. The index of aging, i.e, ratio of population 60+ and population less than 15 years, is only around 15-18 percent which is indicative of slow aging process.

The clear impact of HIV/ AIDS prevalence is seen in the transition of age 65+ years. In Table 3, we find that the proportion has increased slightly during 1971-1981 , the pre-HIV/AIDS period. Afterwards, it has stagnated emphatically. This implies a lowered magnitude of cohort flows from the adult age groups to older age groups due, most likely, to the HIV/AIDS related deaths in the economically active age group. If one considers the positive socio-economic changes Botswana has registered during the last 20 years, one would obviously expect a higher proportion of 65+ in the country. But, it has not happened. To that extent, HIV/AIDS has retarded the pace of aging at the upper end of the age structure. Nonetheless, it is encouraging to note that HIV/ AIDS does not impact the proportion of labour force significantly

There was no appreciable increase in the median age during the 10 year period of 1971-1981 due to a stagnant high fertility. However, due to decline in fertility, the median age has increased to 17.4 in 1991 and 20.1 in 2001. The same trend is observed in the young

and adult age groups as well. Since 1991, there has been dramatic changes in the proportions of 0-14 and 15- 59 age groups. The proportion of 0-14 age group now stands at 37 percent while that of the economically age group (15-64 years) at 58 percent.

4. HIV Prevalence

Table 4 provides the latest HIV prevalence rates by age according to the Botswana AIDS Impact Survey II – a nationally representative survey conducted in 2004 (Republic of Botswana, 2005). The overall prevalence rate measured 17.1 percent. For the very young, ages 18 months to 4 years old, 6.3 percent were HIV positive. For those between the ages of 30 and 34, 40.2 percent were HIV positive. In general, the highest prevalence rates are for those between 25 to 44 years old; roughly between 30 and 40 percent. Among the young aged 19 and under and among the old, aged 65 and above, prevalence rates are typically below 10 percent. The exception is the 70-74 year old cohort where the prevalence rate was 13.1 percent.

The overall prevalence rate for males is 13.9 percent and for females 19.8 percent. Hence, prevalence for males is less than the national average. The prevalence rates are highest for men between the ages of 30 and 49, while for females, the prevalence rates are high between the ages 25-39. The cohort with the highest prevalence rate among males is the 30-34 years old group for which the prevalence rate is 36.2 percent. Prevalence rates in urban areas exceeded those for rural areas. Females 25-29 years have a prevalence rate of 41 percent and for females 30-34 years; the prevalence rate is 43.7 percent. After the age of 34, rates begin to slowly decline, although the cohort of females 50-54 years old still reports a prevalence rate of 19.3 percent.

Table 4. HIV Prevalence by Age group, Botswana, 2004.

Age	**Rate**	**Age**	**Rate**
1.5- 4	6.3	45-49	29.4
5-9	6.0	50-54	20.9
10-14	3.9	55-59	14.0

15-19	6.6	60-64	12.0
20-24	19.0	65-69	9.0
25-29	33.0	70-74	13.1
30-34	40.2	75-79	3.9
35-39	35.9	80-84	6.0
40-44	30.3	85-89	2.2
Total			**17.1**

5. Discussion and Conclusions

An attempt is made in this paper to examine the process of population aging vis-à-vis HIV/AIDS in Botswana. Although there has been a notable decline in the total fertility rate (TFR) from 6.6 in 1981 to 3.3 in 2001, there is evidence of increasing mortality rates in the recent times due to the high prevalence of HIV/AIDS. Botswana ranks among the hardest hit with an HIV prevalence of 17.1 percent.

The sharp decline of fertility along with an oscillating mortality has brought in an inevitable age structural transition since the last quarter of the last century. The population of Botswana has a relatively young age structure with 37 percent of the total population below 15 years while the 65+ population is only 5 percent . The median age has increased form 15.7 years to 20.1 years during 1971 and 2001. The index of aging and the tempo of aging are indicative of slow aging process in the country.

What is the role of HIV/AIDS on the aging process in Botswana ? Does it retard the process ? During 1991-2001, fertility declined considerably although mortality level has picked up substantially during the same period mainly due to the HIV related increase in infant and child mortality. The gains in the chances of survival of infants experienced in the Nineties have apparently been lost mainly due to HIV/AIDS. This is attributed to mother to child transmission of HIV/AIDS. Unfortunately, the gains in life expectancy did not sustain mostly due to the rapid increase in the HIV/AIDS epidemic. Life expectancy has declined to 55.6 years in 2001.

It is encouraging to note that HIV/ AIDS did not impact the proportion of labour force significantly. However, the HIV induced burden of diseases in the labour force affects the intergenerational transfer payments substantially. Also, the middle aged persons will face simultaneous demands from their teenage children and aging parents. Also, HIV/AIDS poses a threat to effective(qualitatively) labour supply resulting in reduced productivity and output. Depletion of skilled labour will also increase the cost of training and replacement. Increased expenditure and care of infected and affected persons will affect savings and investments such that the overall economy is adversely affected and hence a threat to the care of the aged . The modernization induced family structure transition underway in the country adds fuel to the existing levels of despondency. From ages 45 and above, older people are expected to live longer in 2001 compared to 1991 because they are not affected by the increase in adult mortality as a result of HIV/AIDS. The major impact of HIV/ AIDS prevalence is seen in the transition to age 65+ years. HIV/AIDS has retarded the pace of aging at the upper end of the age structure due reduced cohort flows from middle age groups.

Increased expenditure and care of infected and affected persons will affect savings and investments such that the overall economy is adversely affected and hence a threat to the care of the aged (Golini, 2003). This appears true for Sub-Saharan Africa and here comes the relevance of gerontechnology in the region. The current priorities of the governments do not appear to give any focus on the use of technology for the sustainability of the aged. It will take several years for Sub-Saharan Africa to become an aged society. Until then, demographers and social scientists are expected to play a significant role by way of giving early warnings to the policy makers on the ongoing age structural transition and population aging.

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