Notes on Adult Mortality Levels and Trends in Botswana

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Abstract

This paper uses the data from 2011 Population and Housing Census (PHC) to examine levels and trends in adult mortality in Botswana using information on the distribution of deaths and population by age. Estimates of mortality indicate that mortality levels in Botswana have gone down between 2001 and 2011 nationally and across all districts. The data also shows that gains in life expectancy favoured urban areas to rural areas. The gains in life expectancy experienced in the 1980s and reversed in 2001 have been regained, may be as a result of scaling up access the provision of antiretroviral treatment since 2001 (Avert 2012, WHO 2014). The sex differentials in mortality are still observed.

Introduction

The author recognises the fact that both morbidity and mortality are influenced by socio-economic and health conditions that prevail at a particular time and are influenced by national policies and intervention programmes. The paper uses the number of deaths during the twelve months preceding the 2011 population census. Life tables for the whole country, rural, urban area, cities/towns and urban villages were constructed using the reported age specific death rates by gender. First the numbers of deaths were multiplied by 1.083 to adjust for the fact that the reference period used to collect deaths was 11 months as opposed to 12 months. It is assumed that the deaths taking place twelve months before the population census were accurately reported.

Botswana has experienced declines in both mortality and fertility levels since the 1980s, and from the mid-1990s the country started experiencing an increase in the level of mortality. Between 1991 and 2001 the level of mortality went up mainly as a result of the increased number of deaths associated with HIV/AIDS epidemic. As a result of the introduction of free ARVs mortality declined over the intercensal period 2001 to 20011. This demographic change has resulted from socio-economic change and investment in public health, and other social services by the government of Botswana.

The estimates from the recent population censuses indicate that the crude death rate declined from 13.7 deaths per 1000 in 1971 to 11.5 in 1991 and increased to 12.4 in 2001 (CSO 2001) and declined to 6.35 in 2011. While infant mortality rate dropped from 97.1 infants per 1000 live births in 1971 to 48.0 per 1000 live births in 1991 and increased to 56 per 1000 live births in 2001 and declined to a low level of 17.2 infants deaths per 1000 live births in 2011. The life tables constructed based on information on deaths during the 12 months preceding the survey shows that the probability that a one-year-old child will die before reaching age five has declined from 0.0358 in 1981 to 0.0160 in 1991 and increased to 0.039 in 2001 and declined again to 0.0281 in 2011. Life expectancy at birth (the average number of years a newly born baby would expect to live) has increased from 55.5 in 1971 to 56.5 in 1981 increased to 65.3 years in 1991, declined to 55.6 in 2001 and increased to a record high of 68 years in 2011.

National Adult Mortality Patterns

The two main objectives of the 2010 Revised National Population Policy was to reduce AIDS deaths, infant, child and adult mortality especially maternal mortality including high-risk pregnancies (Republic of Botswana 2010). The data from the 2011 PHC indicates that the aforementioned objectives are being met. Figure 1 below shows the age pattern of mortality by age calculated from the age distribution of

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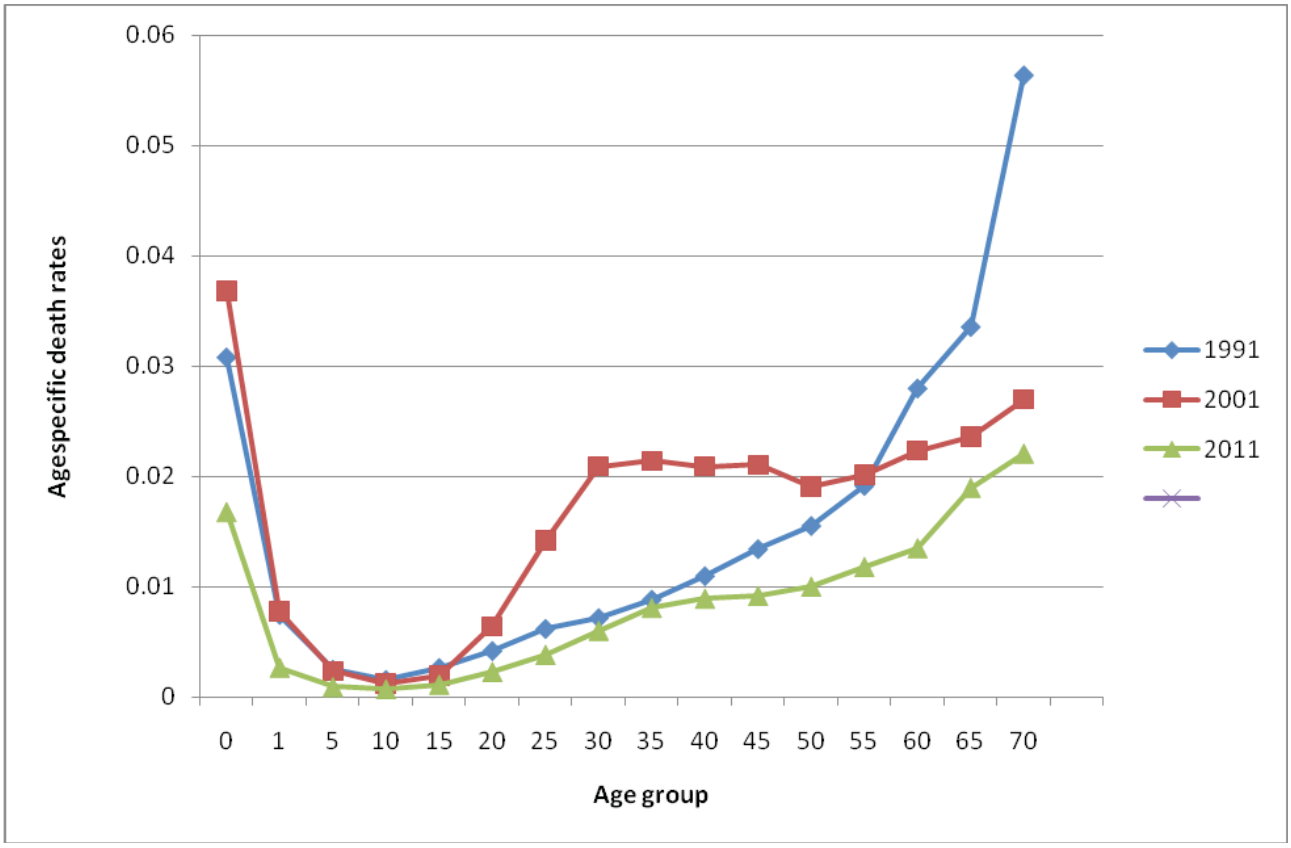
deaths by age from the 1991, 2001 and 2011 population census of Botswana.

The age pattern of mortality shows that mortality during the first year of life was very high in 2001 compared to 1991 and 2011. There is very clear evidence that infant mortality declined drastically over the period 2001 to 2011. This can be explained by the success of the provision of the ARV medication and prevention of mother to child transmission programmes (PMCTP). The gains in avoiding life wastage in infancy, which were achieved in 1991 and reversed between 1991 and 2001, have been gained by 2011 and the country is now experiencing the lowest infant mortality in the history of the country.

Figure1: Age Specific Death Rates Botswana: 1991, 2001 and 2011



Source: Botswana 1991, 2001 and 2011 Population and Housing Census data sets

The age pattern of mortality shows that the epidemiological transition in Botswana spear-headed by the HIV/AIDS epidemic have generally led to high mortality in the 1990's and it is clear that introduction of free ARVs it is now bringing about positive results (Avert 2012) this may have contributed to mortality decline over the decade 2001 to 2011. Figure 1 above shows that from age 15 to age 50 (highly sexually active population), mortality n 2001 was extremely high compared to both 1991 and 2011. This shows the impact of HIV/AIDS among persons in childbearing ages in 2001 and the reduction in AIDS related deaths between 2001 and 2011 as per the objectives of the Revised National Population Policy. Generally mortality at all ages was reduced between 2001 and 2011.

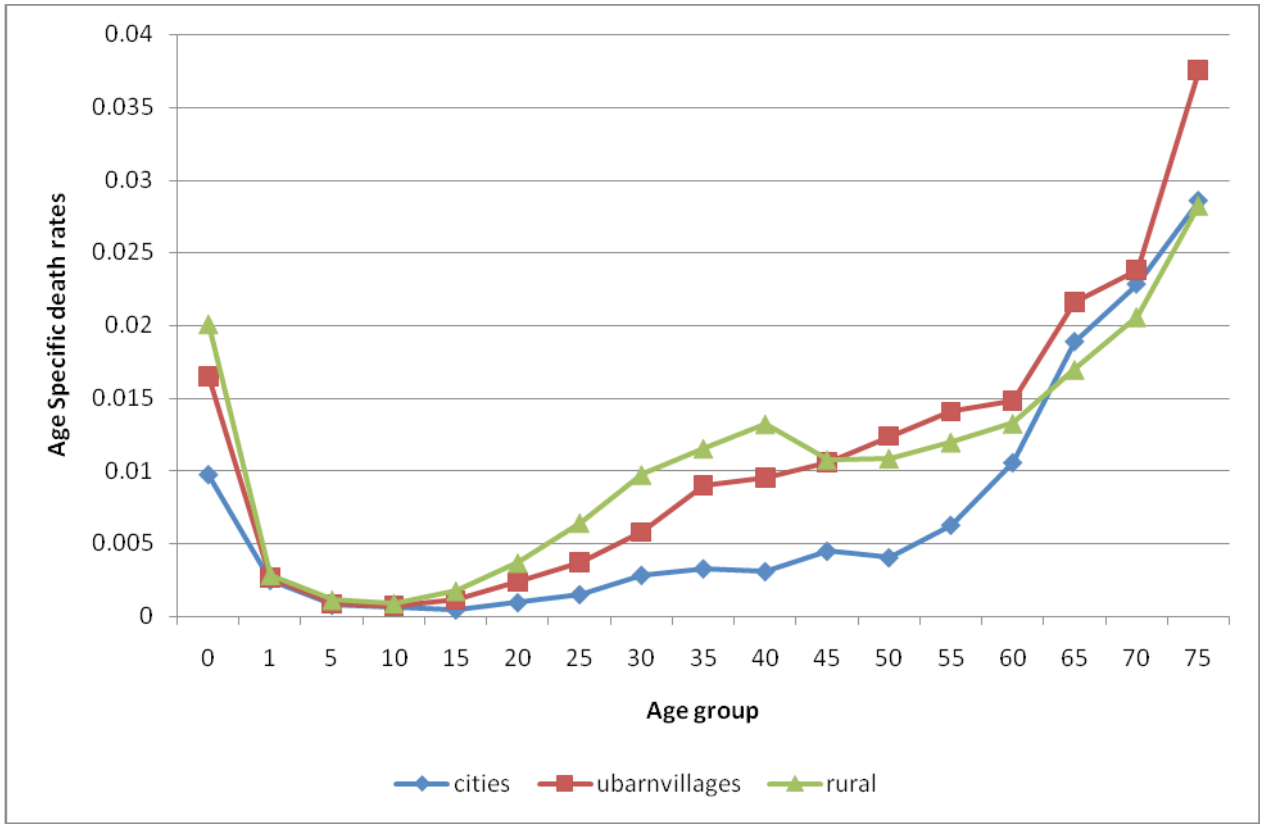
Age Patterns of Mortality by Type of Residence

The age patterns of mortality in 2011 differed by type of residence, namely cities/towns, urban villages and rural. Generally speaking, mortality is high in rural areas, followed by urban villages and very low in cities and towns. The age pattern of mortality also differs by type of locality. The rural areas

show relatively high infant mortality (under one year) compared to urban villages and cities and towns. Childhood mortality (ages one to five years) is almost the same for all three types of residence. During the childbearing ages (15 to 45 years) mortality in rural areas is very high followed by urban villages and very low in towns and cities. From age 50 the urban villages experienced the highest mortality compared to rural areas, cities and towns. From age 65 cities have high morality than rural areas.

This finding clearly indicates that the intervention programmes aimed at promoting population health and mortality had different impacts on the aforementioned types of residence. The rural areas did not gain as well as urban residence from the population health intervention programmes more especially the national ARV programmes (see Figure 2 below).

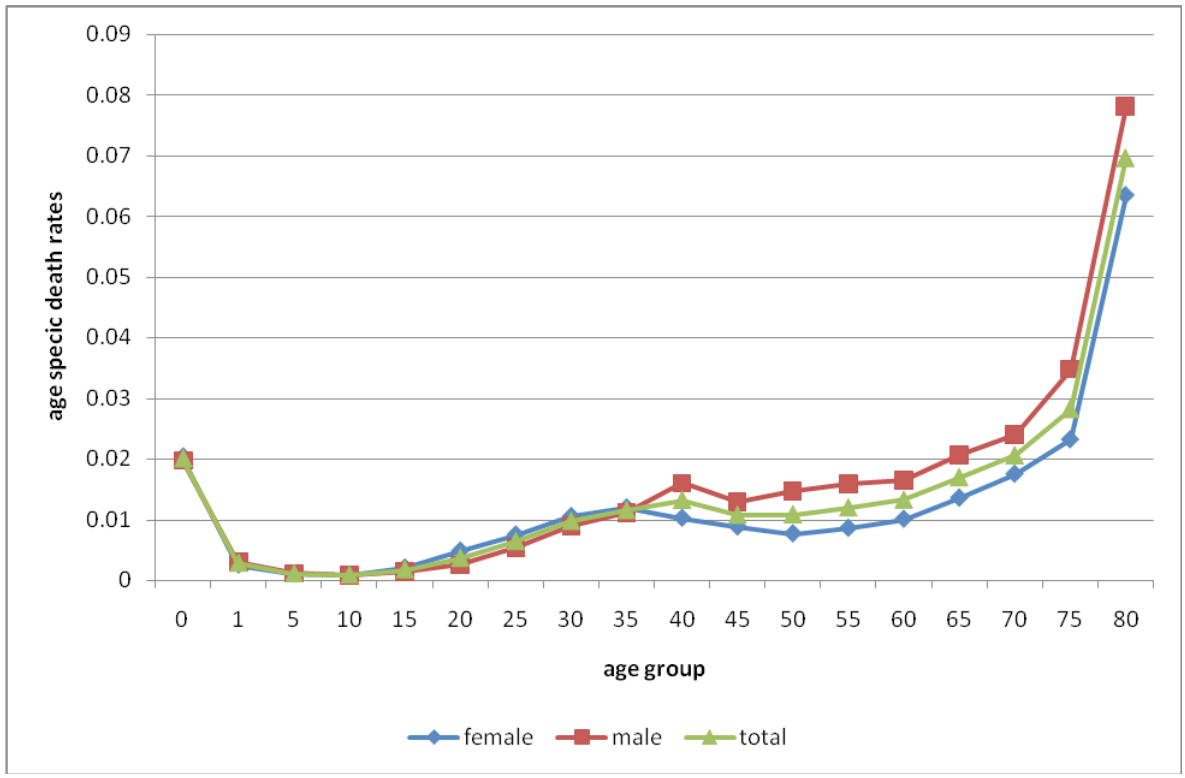
Figure 2: Age specific Death Rates for Cities/Towns, Urban Villages and Rural Areas Botswana 2011



Source: Statistics Botswana (2011)

The data on the distribution of deaths by age in 2011 shows that levels of mortality between males and females are almost identical up to age 35 with males experiencing slightly high mortality before age 15. Between age 15 and age 35 females experienced slightly higher mortality which can be explained by high maternal mortality associated with HIV/AIDS (see Figure 3 below). From age 35 men experience relatively high mortality than women (see Figure 3 below).

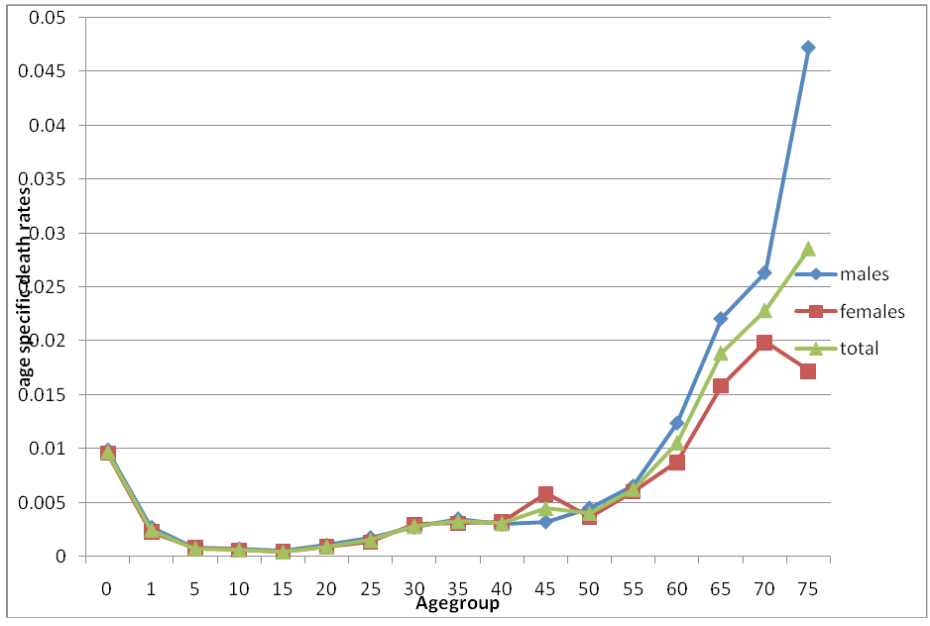
Figure 3: Age Specific Death Rates Botswana 2011



Source: Statistics Botswana (2011)

The sex differentials in the age pattern of mortality are more pronounced when we disaggregate the data by type of residence (see Figures 4 to 6).

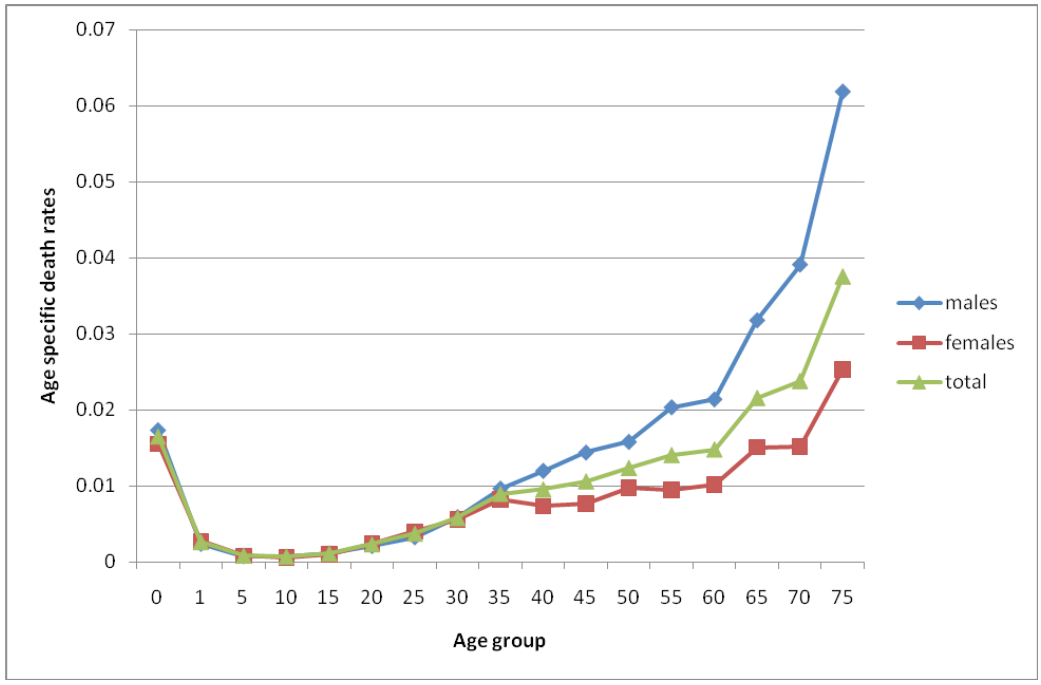
Figure 4: Age Specific Death Rates by Sex Cities and Towns, 2011



Source: Statistics Botswana (2011)

In the cities and towns there are no gender differentials in mortality by age up to age 40. Between ages 40 and 50 females experienced higher mortality and from age 55 males mortality was high compared to that of females. The sex differential in urban villages is slightly different from that of cities and towns (see figure 4 above). There is very little mortality differentials below age 35 and after age 35 males shows high mortality compared to females.

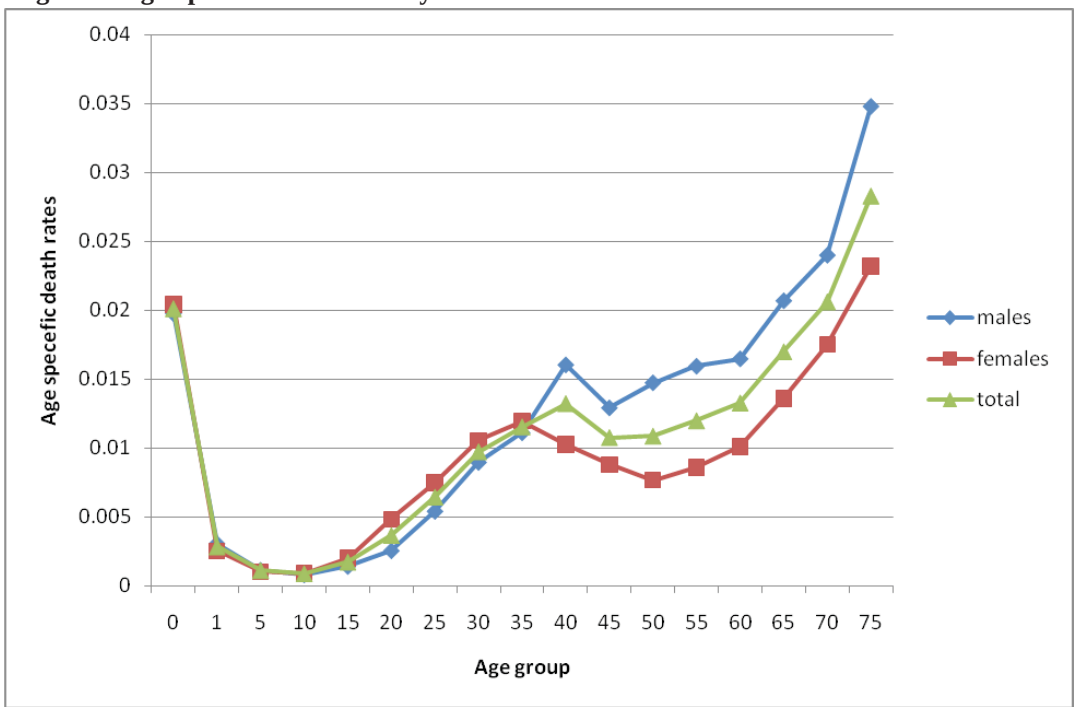
Figure 5: Age Specific Death Rates by Sex Urban Villages, 2011



Source: Statistics Botswana (2011)

For the rural areas (see Figure 6 below) there is yet another distinct sex differential of mortality by age. Infant mortality is higher than the national average and is the same for both males and females. From age 15 to age 35 females have slightly higher mortality and from age 35 males consistently have high mortality.

Figure 6: Age Specific Death rates by Sex Rural 2011



Source: Statistics Botswana (2011)

Levels, Trends and Variations in Adulthood Mortality by Districts

The 2010 Revised National Population Policy has the following Demographic targets:

1.1.1 Increase life expectancy at birth for both sexes from 50.7 in 2001 to at least 67.5
1.1.2 Increase life expectancy at birth for males from 52.5 in 2001 to at least 65.5
1.1.3 Increase life expectancy at birth for females from 57.4 in 2001 to at least 70.5 (Republic of Botswana 2010).

The main objective of this paper is to come up with indictors which will show how far the country is from meeting the aforementioned targets. The index of mortality which is commonly used is the 'expectation of life at birth'. This measure is the average number of years that a newly born baby expects to live if the current risks of dying at each age are to remain unchanged. Looked at from a slightly different perspective, life expectancy at birth can be defined as the average age at death in a population or simply the number of years that a person born and living under particular socio-economic and mortality conditions expects to live. It is a useful measure of both mortality and health conditions in a population.

Using information of the number of deaths during the 12 months preceding the 2011 censuses, life tables were constructed for at national, cities and towns, urban villages, rural localities and different districts in Botswana. The estimates from the 2011 census indicate that the targets stipulated in the Revised National Population Policy have been met.

The 2011 census shows that nationally life expectancy at birth for both sexes stands at 68 years, for females it is 70 years and 66 years for males showing a gap of 4 years. The sex differentials in life expectancy at birth are more pronounced in urban areas, females expects to live for 72 years while males expects to live for 67 years, showing a gap of 5 years. In cities and towns life expectancy at birth is 74 years, the gap between female life expectancy and male life expectancy is only 2 years, 75 for females and 73 for males. In urban villages female's life expectancy is estimated at 67 years, 70 for females and 64 for males, showing a gap of 6 years.

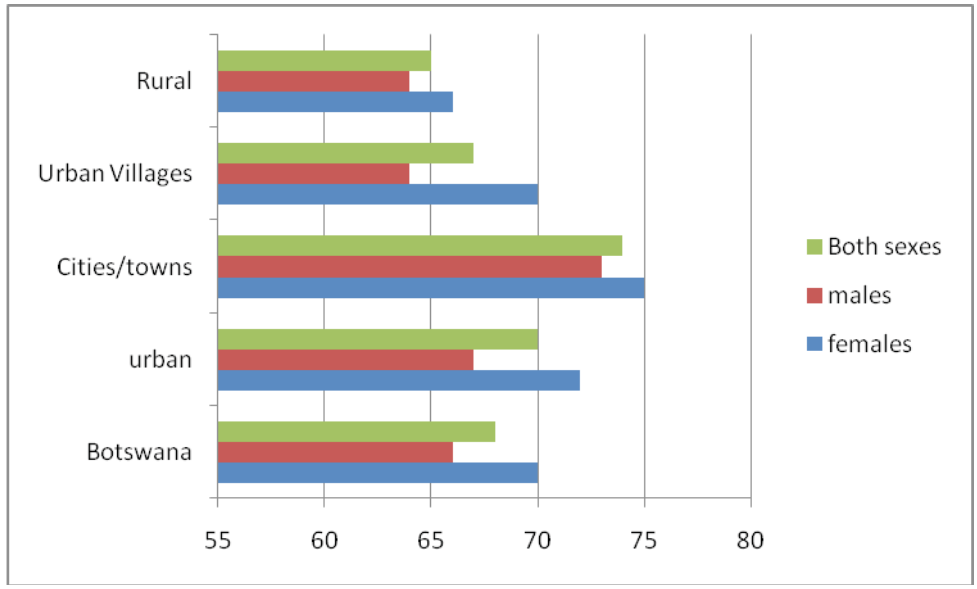
In the rural areas life expectancy at birth is estimated at 65 years, at birth males expects to live for 64 years while a female expects to live for 66 years showing a gap of 2 years (see Table1 and Chart1).

Table 1: Life Expectancy at Birth by Sex for National and Type of Residence

	Females	Males	Both sexes
Botswana	70	66	68
Urban	72	67	70
Cities/towns	75	73	74
Urban Villages	70	64	67
Rural	66	64	65

Source: Statistics Botswana (2011)

Chart 1: Life Expectancy at Birth by sex for National and Type of residence



Source: Statistics Botswana (2011)

Adult Mortality Levels by District

According to the 2001 census data life expectancy at birth for both sexes combined was 63.9 and 68.9 years in Gaborone and the South East district respectively while all other districts in Botswana were experiencing life expectancy at birth below 60 (Majelanlte 2003). According to the 2001 data life expectancy at birth was worse for North East, Central, Ngamiland, and Southern Districts where a newly born baby expected to live for less than 50 years. Estimates of life expectancy at birth were 45, 46, 47 and 48 years respectively for the aforementioned districts.

Table 2 below shows some districts and sub-districts ranked by the level of life expectancy at birth. The level of life expectancy at birth for both sexes combined is now 70 years for four districts in Botswana. The estimated life expectancy is as high as 76 years in Gaborone followed by the South East with life expectancy at birth of 74 years, Francistown with 72 years and Kweneng East with 71 years. All districts and sub-districts where data permitted recorded estimates of life at birth expectancy at birth of

above 60 years. This was a drastic improvement from 2001 when only two districts, namely Gaborone and the South East, had life at birth expectancy of more than 60 years. Only two districts recorded estimated life expectancy at birth of less than 65 years; Central Tutume (64), Central Mahalapye (63) and Ngamiland East (61).

Generally females expect to live longer than their male counterparts in all districts with the exception of Kweneng West, where males expect to live longer than females.

Table 2: Life expectancy at Birth by Sex and District

District	Males (2011)	Females (2011)	Both Sexes
Gaborone	75	77	76
South East	71	76	74
Francistown	71	73	72
Kweneng East	68	73	71
Lobatse	67	70	69
Selebi Phikwe	68	69	69
North East	66	69	68
Ngamiland West	64	70	67
Kgalagadi	66	68	67
Kgatleng	63	70	67
Central Serowe/ Palapye	65	68	67
Kweneng West	70	63	67
Central Boteti	63	68	66
Central Bobonong	61	69	65
Borolong	63	67	65
Ngwaketse	62	67	65
Central Tutume	61	67	64
Central Mahalapye	60	65	63
Ngamiland East	59	62	61

Source: Statistics Botswana (2011)

Conclusion

Substantial regional differences in mortality have been shown by both the 2001 and 2011 census results, with relatively low mortality in Gaborone and the South East district. The differentials in mortality between districts are usually associated with differing levels of social and economic development between districts, differentials in individual living standards and their socio-economic characteristics but it appears that the HIV/AIDS epidemic that distorted everything has now been contained.

The derived parameters of mortality can give great encouragement and aspirations to planners and policy makers for further efforts in the reduction of mortality levels because it is clear that all the

mortality indicators targets set in 2010 have been met. These findings are sufficient indicators of the health transition in Botswana which shows that with proper and intervention programmes the HIV/AIDS related mortality can be contained. The question is; how long can AIDS related mortality without a serious reduction on HIV/AIDS incidence and prevalence be contained? Another question which should worry all the stakeholders is whether Botswana is likely to experience a significant resurgence in mortality when ARVs cease to save lives of those who are on them.

The other persistent character of mortality patterns in Botswana is the gap in life expectancy between males and females in favour of the later. It is therefore, necessary that studies be carried out to determine what should be done to improve the survival of men in order to bring them at par with that of females.The mechanisms that affect the differentials in mortality by sex and districts are not quite clear and they need to be investigated, using both macro and micro level approaches.

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