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Statistical Bulletin

Botswana: Health

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Measuring Service Delivery in Southern Africa Project

Study 3: Developing measures and methods for measuring progress towards service delivery targets

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Progress towards health goals

Key targets and indicators from the Millennium Development Goals (MDGs), which are also contained in the Regional Indicative Sustainable Development Plan (RISDP) have been clustered to review progress in the health sector in the four countries included in the study: Tanzania, Botswana, Malawi and South Africa. These include quality of service indicators such as skilled attendance at birth and a wide range of outcome indicators such as infant and child mortality rates.

The following Goals from the MDG and the RISDP are included:

Goal 4: Reduce child mortality;
Goal 5: Improve maternal health;
Goal 6: Combat HIV/AIDS, malaria and other diseases.

Table 1 below illustrates progress made towards goals related to the health sector and health outcomes drawn from the MDGs.

Table 1. Botswana Health MDGs

Goal 4: Reduce child mortality	Target 4.1Children <5 mortality rate	
Goal 5: Improve maternal health	Target 5.1 Maternal mortality ratio	
	Target 5.2 Births Attended by Skilled Health Staff	
Goal 6: Combat HIV/AIDS, malaria and other diseases	Target 6.1 HIV Prevalence Rate (15-49 years old)	
	Target 6.6 Reported Cases of Malaria	
	Target 6.9 Tuberculosis prevalence rate	

KEY

0	No Progress in meeting target (0/10)
5	Some progress but will not meet MDG target (5/10)
10	Target will be met in 2015(10/10)
	Insufficient Data

Projections from the data available on each of the 6 indicators reveal that only one of the targets (births attended by skilled staff) will be met in 2015. Two of these indicators (the maternal mortality ratio and tuberculosis prevalence rate) showed no progress being made in meeting the target. Some progress has been made in reducing the child mortality rate and reducing the prevalence of HIV/AIDS. However, progress is not at a sufficient pace to meet the MDG target. There has been insufficient data on reported cases of malaria in the country. Hence, this indicator has not been measured. In summary, on the basis of the projections of present trends, none of the three MDG relating to health and the health sector will be met by 2015.

Political and Socio-Economic Conditions

Botswana is a landlocked, semi-arid country with an approximate area of 582, 000 square km with a population of 1.9 million.

Political and economic conditions: The Botswana Democratic Party (BDP) government has been in power since 1966. Over the last three decades diamond mining and tourism have provided considerable economic growth resulting in Botswana being classified as an upper middle income country. Over the last three decades there has been fairly consistent growth in the countries economy. The recent global economic downturn has resulted in the economy entering a considerable decline in Gross Domestic Product (GDP).

Political will to achieve goals

The Long Term Vision of Botswana, popularly known as Vision 2016, has now become a reference point in the development of the country. It aims to achieve prosperity for the whole country by 2016. Since April 2009 the government has adopted MDG-based district development planning in an effort to intensify the level of implementation required to achieve the MDGs and the pillars of Vision 2016. This is an important indicator of political will to achieve the MDGs. The 2004 MDG Status Report had been undertaken and concludes that Botswana was on track to achieve many of the MDGs.

After independence, Botswana had a rudimentary formal health care system with most citizens relying heavily on indigenous health care systems. The government subsequently committed itself to rapidly expanding the health care system by encouraging citizens to assist in the provision of infrastructure through community self reliance, whilst government provided needed resources. Over the past four decades, the health sector has been increasingly prioritized in the national budget.

The primary health care approach was then adopted to guide health care delivery. In 2006, there were numerous mobile health stops, 342 health posts, 263 health clinics, and 17 hospitals with 23.3 beds per 10,000 facilities. The ratio of nurses in 2006 was 28.8 per 10,000 while that of doctors was 3.3 per 10,000 population (Central Statistics Office, 2010).

Currently, government is focusing on improving the quality of health care services to ensure that citizens in small rural and remote settlements receive good quality health care as those in larger rural and urban areas.

Health and human development

This bulletin reviews progress made in selected indicators of health services and health outcomes in Botswana. To achieve cross-country comparability, indicators commonly

available and that are captured in the MDGs are used, although not all related indicators for each country are available. These are then related to the goals and objectives set out in the MDGs. This study begins with an overall sense of human development and thereafter examines the range of health indicators available.

The Human Development Index (HDI) emerged as an attempt to put people in the centre of development discussions and action plans. It has the advantage of being a simple composite measure to evaluate both economic development and improvements in human well-being. The HDI includes the following:

- Life expectancy at birth, as an index of population health and longevity;
- Knowledge and education, as measured by the adult literacy rate (with two-thirds weighting) and the combined primary, secondary, and tertiary gross enrollment ratio (with one-third weighting); and
- Standard of living, as represented by GDP per capita at purchasing power parity.

Figure 1. Human Development Index for Botswana

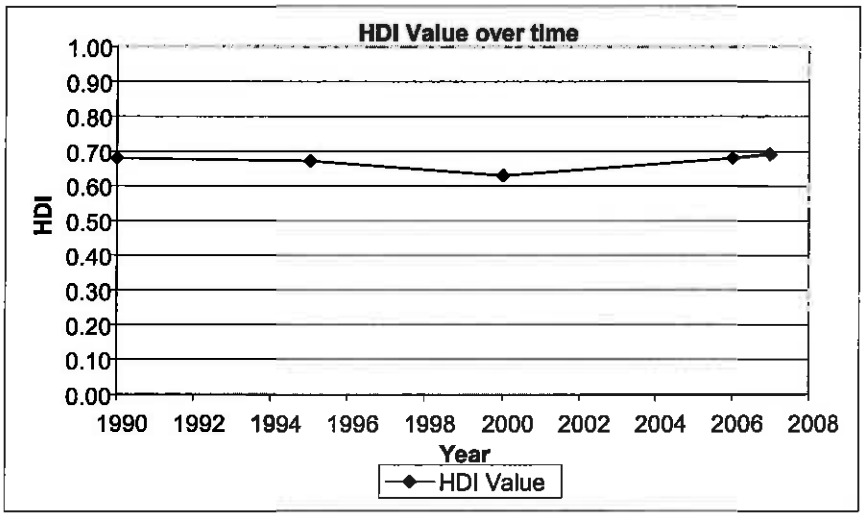

Table 2. Assessment of HDI over time

	1990	1995	2000	2005	2006	2007
Botswana	0.68	0.67	0.63	0.67	0.68	0.69

Source: Human Development Reports, 2009

The progress towards full development would be indicated by an increase in the values of the HDI towards 1, which represents achieved development in life expectancy, education, and standard of living.

The HDI is measured over a total period of 1990-2007. The HDI has declined by 0.68 to 0.63 in the period 1990-2000 and subsequently increased from 0.67 to 0.69 in the period 2005-2007.

Life Expectancy

The international benchmark for life expectancy has been set at 60 years. All countries participating in United Nations (UN) programs include the acceptance of a target of increasing life expectancy to 60 years.

Figure 2. Life Expectancy at Birth

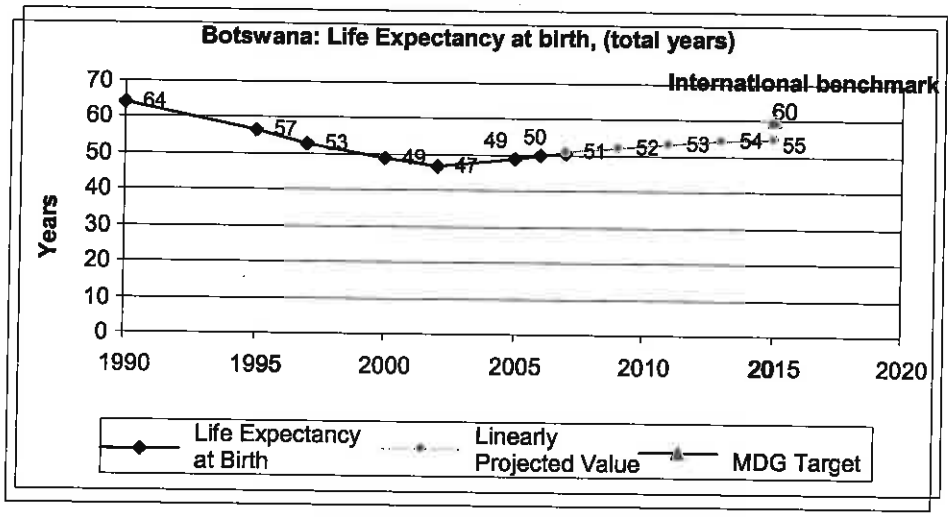

Table 3. Life expectancy at birth, total (years)

	1992	1995	1997	2000	2002	2005	2006	2007
Life expectancy at birth, total (years)	62.7	56.6	52.5	48.9	46.5	49.0	49.8	50.6

Source: Millennium Development Goals Indicators and World Health Organisation
URL: http://millenniumindicators.un.org/unsd/mdg/Data.aspx

Analysis and comment:

Life expectancy is considered over the period from 1990, the MDG baseline to 2007. There has been a decrease in life expectancy in Botswana over the period since 1992 from 62.7 years to 46.5 years in 2002. Since that point there has been an increase to 50.6 years in 2007.

The data as represented in Figure 2 shows a considerable reduction in public health over the time. A detailed examination of the dramatic changes in life expectancy has been

made[1] and demonstrates reduction in life expectancy from about 60 years in the early 1990s to 50.6 years in 2007 and ascribes this to the HIV&AIDS pandemic. This marks a pronounced decline in life expectancy in the country.

The forward projection of the current trend demonstrates that the level of the early 1990s (60 or more years) will not be returned to by 2015 as life expectancy is projected to reach 55 years in 2015. The factors identified in leading to this decrease are mainly due to the high HIV/AIDS prevalence rate and related diseases such as pulmonary TB and pneumonia.

Health indicators

There are a limited range of reliable indicators directly measuring health services across Southern African countries although there are more indicators of broad outcomes such as infant mortality. The latter indicates broad progress over the entire range of services, directed towards human development and include the health services examined here, as well as other resources beyond these, such as housing. In a very board sense these are key indicators of human development, which is measured (among other factors) in terms of longevity and health.

For a number of reasons the output indicators are not directly related to specific inputs although studies have drawn associations between, for instance, child mortality and unimproved sanitation and maternal mortality and maternal health services. A full schedule and definitions of indicators is available in the Appendix 1. The relationship, however, between the broad range of services and these indicators will be explored in terms of trends.

Supplementary data collection from national health statistical sources provides information on specific goals, as well as sources from the WHO website. This data may pose challenges in terms of disaggregation at different levels e.g. urban/rural, at district levels, etc.

Projections are developed from existing trends (based on available data) against the measured health goals. These will be checked against other sets of data.

The indicators, which are sought to measure progress, are as follows:

- Births attended by skilled health, a proxy for universal access;
- Prevalence over the years HIV/AIDS as a proportion of the population;
- Prevalence over the years of HIV/AIDS as a proportion of young men/young women;
- Children with fever receiving anti malarial drugs;

[1] Siddharth Krishnaswamy December 2006 Field Exchange, Nutrition Network (ENN), the effects of HIV on Botswana's development progress. http://fex.ennonline.net/29/effectsofhiv.aspx

- Infant Mortality Rate;
- Children under Five Mortality Rate;
- Maternal Mortality Rate;
- Life expectancy at birth.

Child mortality and life expectancy

Both the Millennium Declaration and the RISDP identify child and maternal health as key indicators of potential improvement in human development..

MDGs in infant/child and maternal mortality and life expectancy

Selected MDG & RISDP Goals and Indicators
Goal 4, Target 5: Reduce child mortality. Reduce by two thirds the mortality rate among children under five.
Goal 5, Target 6: Improve maternal health. Reduce by three quarters the maternal mortality ratio.

Child mortality rate

The MDG seeks to reduce the mortality rate among children under five by two thirds.

Figure 3. Children under five mortality rate per 1,000 live births

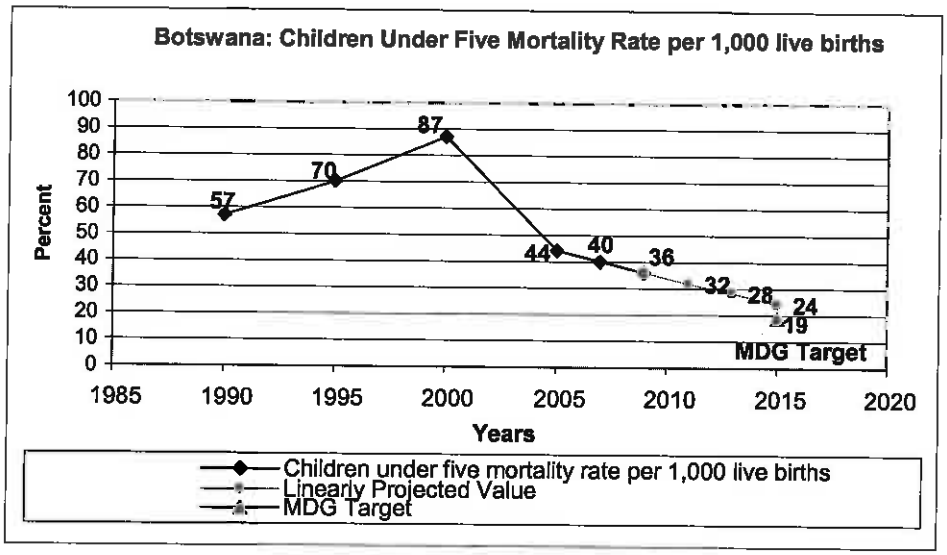

Table 4. Children under five mortality rate

	1990	1995	2000	2005	2007	2015
Children under five mortality rate per 1,000 live births	57	70	87	44	40	
MDG Target =(57*2/3)-57						19

Source: Millennium Development Goals Indicators
URL: http://millenniumindicators.un.org/unsd/mdg/Data.aspx

Analysis and comment:

The under-five mortality rate (U5MR) is the probability (expressed as a rate per 1,000 live births) of a child born in a specified year dying before reaching the age of five if subject to current age-specific mortality rates. The MDG target is to reduce child mortality rates by two thirds; more specifically this sets a target of 19 deaths per 1,000 live births by 2015. The child under five mortality rate peaked at 87 per 1,000 live births in 2000 and has been declining since then to 40 per 1,000 live births in 2007.

An assessment on infant mortality (not reported in this bulletin) is that there had been a significant reduction between 1970 and 1990. In the period between 1996 and 2000, there was a sharp increase, with figures rising from 50 to 74 deaths per 1,000 in 2002. The more recent upward trend has impacted on achievements in the under-5 mortality rate as well.[2]

The forward projection of the data from 2007 onwards does indicate that at the current pace of change the MDG target of 19 per 1,000 live births will be met by 2015.

[2] Siddharth Krishnaswamy December 2006 Field Exchange, Nutrition Network (ENN), The effects of HIV on Botswana's development progress. http://fex.ennonline.net/29/effectsofhiv.aspx

Although there is a persistent decline in the under five mortality rate the effort to reduce the rate does not quite reach the target (see Figure 3). In conclusion it can be seen is that there has been an appreciable decline in the child under-five morality rate but the projections indicate that the target will not be reached by 2015. Progress has thus been made but at an insufficient pace to reach the MDG target of reaching infant mortality of 19 per 1,000 live births.

Maternal Mortality Rate

The MDG Target which sets out to reduce the rate by three-quarters during the period 1990-2015.

Figure 4. Maternal Mortality Ratio

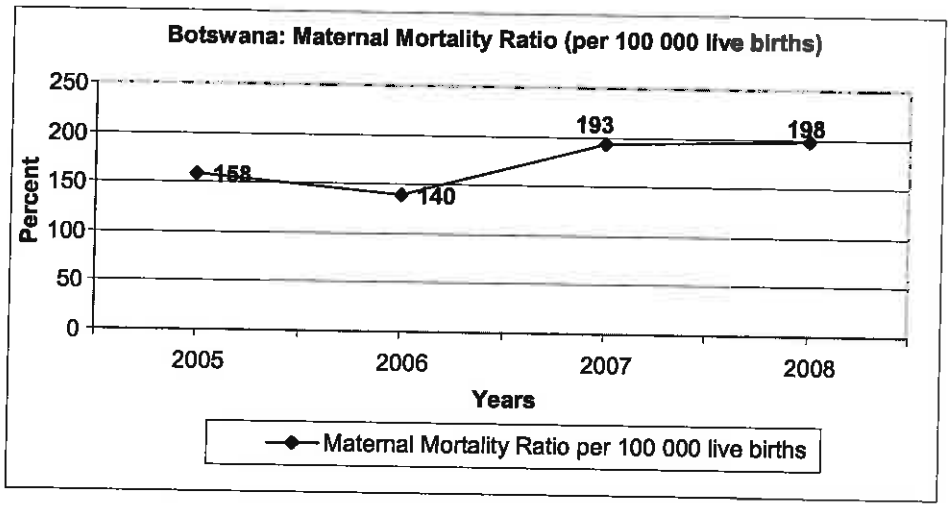

Table 5. Maternal mortality ratio

Maternal Mortality	2005	2006	2007	2008
Ratio per 100 000 live births	158	140	193	198

Source: Millennium Development Goals Indicators and World Health Organisation
URL: http://millenniumindicators.un.org/unsd/mdg/Data.aspx
URL:http://www.who.int/whosis/mort/profiles/mort_afro_bwa_botswana.pdf

Analysis and comment:

There has been a decrease in the maternal mortality rate between 2005 and 2006. However, from 2007 onwards the rate has increased. The trend is thus generally rising over the period except between 2005 and 2006 in which there was a decrease.

Despite this the conclusion has to be made that the MDG target, which sets out the reduction of the maternal mortality rate by three-quarters is not being met. Indeed the trend overall is in the wrong direction.

Births attended by skilled health staff

The MDG Target 5.2 sets out to achieve all births being attended by skilled health personnel by 2015.

Figure 5. Births Attended by Skilled Health

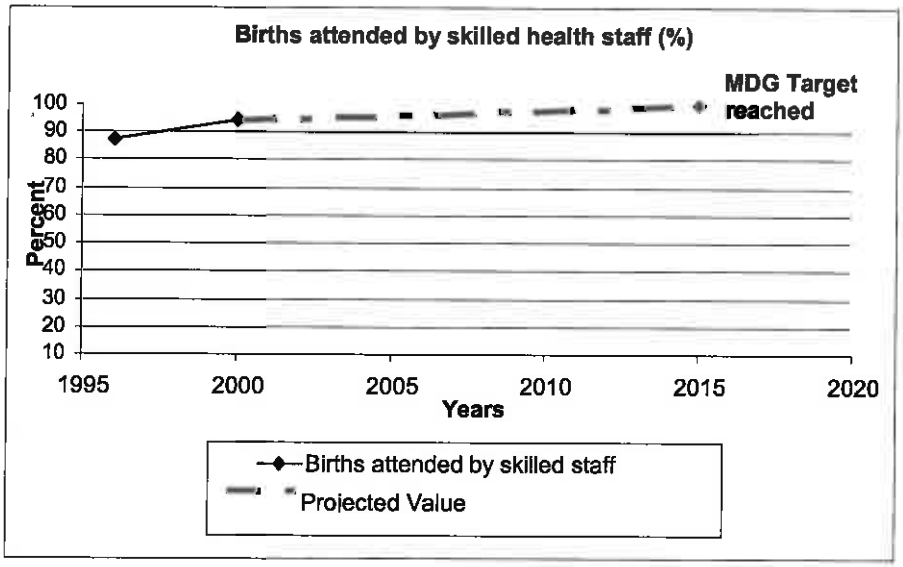

Table 6. Births attended by skilled health

	1996	2000
Births attended by skilled health staff (%)	87	94.2

Source: World Development Indicators
URL: http://ddp-ext.worldbank.org/ext/DDPQQ/report.do?method=showReport

Table 4 above, presents data that shows an increase of births attended from 87 percent in 1996 to 94.2 percent in 2000. The projection shows that the 100 percent target will be likely to be achieved in 2015.

In conclusion it can be said as indicated by the existing trend the MDG target that all births could be attended by skilled health staff by 2015 will be reached.

Goals in access and action on specific diseases

The MDG are set out in Table 2 and highlight the following questions: universal access, HIV/AIDS, malaria, and tuberculosis.

Goals in access and specific diseases

Selected MDG Targets and Indicators
Goal 6, Target : Have halted by 2015 and begun to reverse the spread of HIV/AIDS
Goal 6, Target 8. Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases

In the following section progress towards the reduction of HIV/AIDS, malaria and tuberculosis are reviewed.

Reduction in HIV/AIDS

The MDG Goal 6 sets out to halt and reverse the spread of HIV/AIDS by 2015.

Figure 6. Prevalence rate of Adults ages 15-49

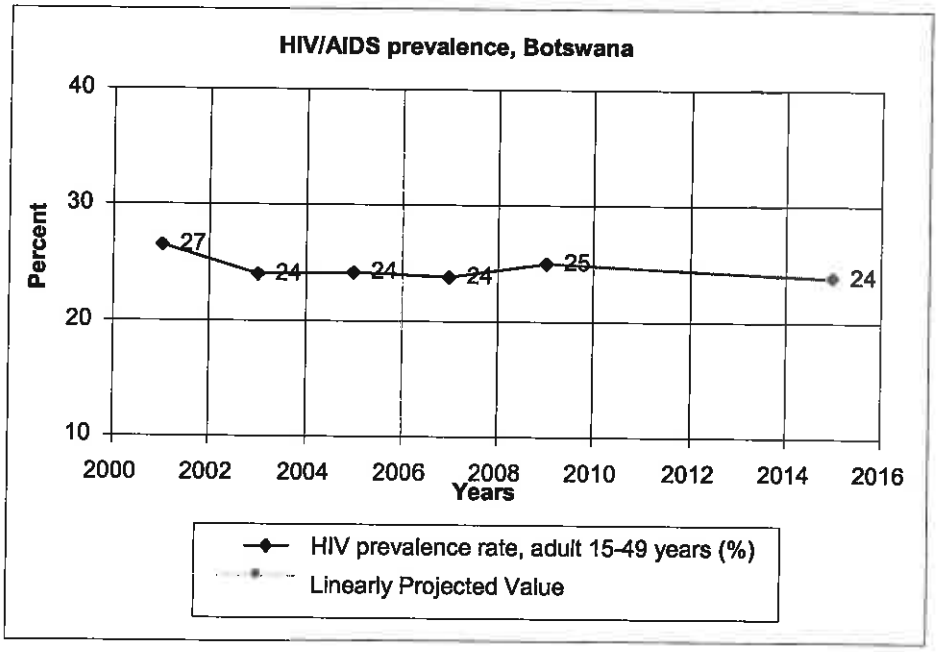

Table 7. Prevalence over the years of HIV/AIDS as a proportion of the population

	2001	2003	2005	2007	2009
HIV prevalence rate, adult 15-49 years (%)	26.5	24.0	24.1	23.9	25.0

Source: World Development Indicators
URL: http://ddp-ext.worldbank.org/ext/DDPQQ/report.do?method=showReport
Botswana AIDS Impact Survey III (2009)

Analysis and comment:

In Botswana there has been a slight decline in the HIV/AIDS prevalence rate among those 15-49 years old during the period 2001-2007 but this is followed by an increase to 25 percent in 2009. Although government has developed many interventions to address the rapid spread of HIV/AIDS, these do not yet appear to be yielding the anticipated results.

The HIV prevalence for the 15-29 age cohorts has decreased due to national HIV/AIDS interventions. An indication of change can be found in the prevalence rate amoiung youg people: there has been a decrease among the 15-19 years from 6.5 percent to 3.7 percent; from 19 percent to 12.3 percent for the 20-24 year group; and from 33 percent to 25.9 percent for the 25-29 year group during the period 2004-2008. The HIV prevalence then *rises* for the upper age cohorts from 35.9 percent to 40.5 percent for the 35-39 age group; from 30.3 percent to 40.6 percent for the 40-44 age group; and 14 percent to 22.8 percent for the 55-59 age group during the period 2004-2008 (BAIS III, 2009).

This data shows that HIV/AIDS prevalence increases as age increases. However, the HIV/AIDS prevalence amongst young men and woman over a period of time shows another dynamic as presented below.

Table 8. Prevalence of HIV/AIDS as a proportion of young men/woman

	2005	2009
Prevalence of HIV, female (% ages (15-24)	15.3	10.7
Prevalence of HIV, male (% ages (15-24)	5.1	4.8

Source: World Development Indicators
URL: http://ddp-ext.worldbank.org/ext/DDPQQ/report.do?method=showReport
Botswana AIDS Impact Survey III (2009)

Analysis and comment:

The trend shows a consistent reduction in the rate of infection among younger women and less evidently among young men.

There is a slight reduction in the HIV/AIDS prevalence rate among those aged 15-49 years as shown in Table 5 from 26.5 percent in 2001 to 25 percent in 2009. The MDG target is to halt and reverse the progress of the disease. In this study "halt" is regarded as a direction which is in doubt vacillating between alternative courses rather than a permanent cessation of movement.

An evaluation of the trend in HIV/AIDS indicates there are the following possible three alternatives: a return to a rising rate of infection, continuation on a straight line, or the start of a declining rate of infection. In Botswana the levels of new infections are declining as is evident in the lower infection rates among those 15-24 years old (Table 6). It appears that "halt" here is represented by no consistent increase rather than a steady decline in proportion of people aged 15-49 infected. If there was a decline in this group this would indicate a "reverse" in the trend.

The conclusion is that the early beginnings of a turn in the course of HIV/AIDS has been reached and that *some progress* has been made towards this MDG. Projections on the basis of the existing trend show that there will be a 24 percent HIV/AIDS prevalence rate in 2015, which is 2.5 percent lower than the 2001 prevalence rate. The decrease indicates signs of the trend slowly being reversed.

Malaria

Malaria has been described as one of the major contributors to infant and adult mortality in Africa. Malaria cases are concentrated in the north western part of the country and rarely occur elsewhere in the country. However, sufficient data on the prevalence of malaria has been difficult to locate. Based on this, this indicator cannot be measured in the country.

Tuberculosis

The MDG sets out the target of halting and reversing the incidence of tuberculoses by 2015.

Figure 7. Tuberculosis Prevalence Rate

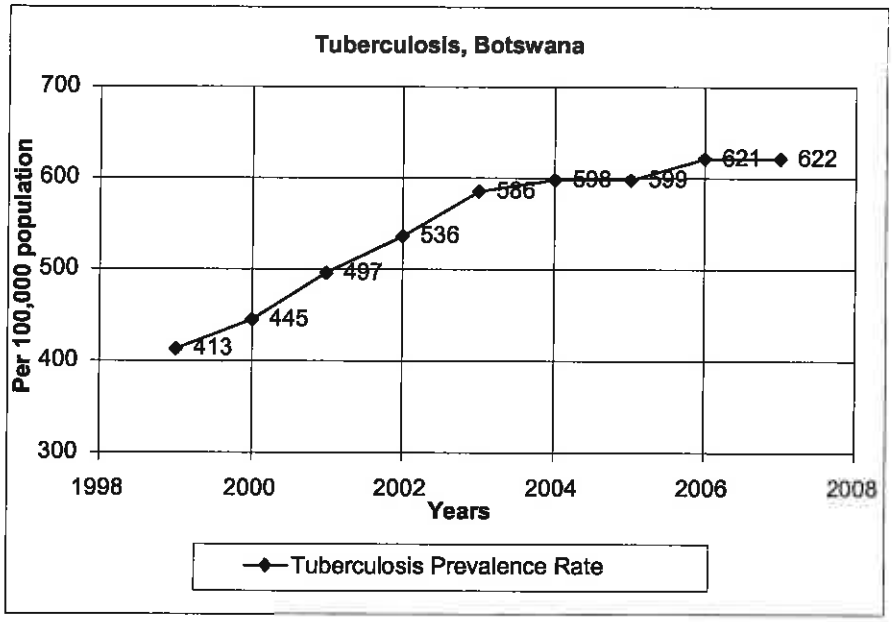

Table 9. Tuberculosis Prevalence Rate per 100,000

	1999	2000	2001	2002	2003	2004	2005	2006	2007
Tuberculosis prevalence rate per 100,000 population	412.8	445.3	496.7	535.5	585.8	598.2	598.9	620.8	622.2

Source: World Development Indicators
URL: http://ddp-ext.worldbank.org/ext/DDPQQ/report.do?method=showReport

Data presented in Figure 7, shows an increase in tuberculosis in the period 1999 to 2007. The data for 1990 is, however, unknown and as such makes it difficult to draw out the future trajectory for the prevalence of TB. The increase in TB is mainly associated with the prevalence of HIV&AIDS in the country and people living with HIV&AIDS are most likely to suffer from tuberculosis.

The conclusion is thus that the trend in the MDG target is not yet in the right direction and that the target of reducing new infections to insignificance (to "halt" the disease) and to lower infection levels significantly ("reverse" the trend) has not been met and not in reach.

Projections on the basis of the rapid increase in tuberculosis prevalence show that the upward trend is gradually slowing. The MDG target is to halt and reverse the progress of the disease; and this trend shows an approach to "halting" the disease where "halt" is regarded as a direction which is in doubt vacillating between alternative courses rather than a permanent cessation of movement. If there was a decline in the trend this would indicate a "reverse" in the course of the disease. Overall, tuberculosis will not be halted and reversed by 2015.

The conclusion is that there has not yet been "some progress" towards reaching this MDG.

Appendix 1

MDG targets related to health

Health	Health	Potential	Additional indicators
1	Target 4a: Reduce by two thirds the mortality rate among children under five	10	Human Development Index
2	Target 5a: Reduce by three quarters the maternal mortality ratio	10	Life expectancy
3	Target 5.2 Births attended by skilled health personnel	10	
4	Target 6a: Halt and begin to reverse the spread of HIV/AIDS	10	
5	Target 6c: Halt and begin to reverse the incidence of malaria and other major diseases	10	
6	Target 6.9 Tuberculosis prevalence rate	10	

Definitions:

1. Children (under five) Mortality Rate

The under-five mortality rate (U5MR) is the probability (expressed as a rate per 1,000 live births) of a child born in a specified year dying before reaching the age of five if subject to current age-specific mortality rates.

A live birth is the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life—such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles—whether or not the umbilical cord has been cut or the placenta is attached. Each product of such a birth is considered a live birth.

Source: Millennium Development Goals Indicators

URL:http://millenniumindicators.un.org/unsd/mdg/Metadata.aspx?IndicatorId=14&SeriesId=0

2. Infant Mortality Rate

The infant mortality rate is the probability (expressed as a rate per 1,000 live births) of a child born in a specified year dying before reaching the age of one if subject to current age-specific mortality rates.

A live birth is the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of the pregnancy, which, after such separation, breathes or shows any other evidence of life—such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles—whether or not the umbilical cord has been cut or the placenta is attached. Each product of such a birth is considered a live birth.

Source: Millennium Development Goals Indicators

URL:http://millenniumindicators.un.org/unsd/mdg/Metadata.aspx?IndicatorId=14&SeriesId=0

3. Life Expectancy

Life expectancy at birth is the average number of years a newborn infant would be expected to live if health and living conditions at the time of its birth remained the same throughout its life. It reflects the health of a country's people and the quality of care they receive when they are sick.

Source: The World Bank Group

URL: http://www.worldbank.org/depweb/english/modules/social/life/index.html

4. Maternal Mortality Ratio

The maternal mortality ratio (MMR) is the annual number of female deaths from any cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes) during pregnancy and childbirth or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, for a specified year (expressed per 100,000 live births).

Source: Millennium Development Goals Indicators

URL:http://millenniumindicators.un.org/unsd/mdg/Metadata.aspx?IndicatorId=14&SeriesId=0

5. Prevalence Rate for HIV adults (15-49)

An estimate of the percentage of adults (aged 15-49) living with HIV/AIDS. The adult prevalence rate is calculated by dividing the estimated number of adults living with HIV/AIDS at yearend by the total adult population at yearend.

Source: NationMaster
URL: http://www.nationmaster.com/graph/hea_hiv_aid_adu_pre_rat-hiv-aids-adult-prevalence-rate

6. Proportion of births attended by skilled health personnel

Births attended by skilled health staff are the percentage of deliveries attended by personnel trained to give the necessary supervision, care, and advice to women during pregnancy, labor, and the postpartum period, to conduct deliveries on their own, and to care for the newborns.
Source: The World Bank Group
URL:http://extfeeds.worldbank.org/extfeedbuilder/ContentMdk?mdk=21543411&source=DEC&format=HTML

7. Tuberculosis Prevalence Rate

Tuberculosis prevalence refers to the number of cases of TB (all forms) in a population at a given point in time (sometimes referred to as "point prevalence"). It is expressed as the number of cases per 100,000 population. Estimates include cases of TB in people with HIV. TB is an infectious bacterial disease caused by Mycobacterium tuberculosis, which most commonly affects the lungs. It is transmitted from person to person via droplets from the throat and lungs of people with the active respiratory disease. In healthy people, infection with Mycobacterium tuberculosis often causes no symptoms, since the person's immune system acts to "wall off" the bacteria. The symptoms of active TB of the lung are coughing, sometimes with sputum or blood, chest pains, weakness, weight loss, fever and night sweats. Tuberculosis is treatable with a six-month course of antibiotics.

Human Immunodeficiency Virus (HIV) is a virus that weakens the immune system, ultimately leading to AIDS, the acquired immunodeficiency syndrome. HIV destroys the body's ability to fight off infection and disease, which can ultimately lead to death.

Source: Millennium Development Goals Indicators
URL: http://mdgs.un.org/unsd/mdg/Metadata.aspx?IndicatorId=0&SeriesId=617