



Southern and Eastern Africa Consortium
for Monitoring Educational Quality

Pupil and Teacher Knowledge about HIV and AIDS in Botswana

www.sacmeq.org

Introduction

The HIV and AIDS pandemic presents a major challenge for the social and economic development of nations located in Sub-Saharan Africa. The Joint United Nations Programme on HIV and AIDS (UNAIDS, 2010: 180) has estimated that in this region there are more than 20 million people living with HIV, and that around 10 percent of these people are below the age of 15 years.

In 2009 governments and international donors together provided US\$ 15.9 billion for the global AIDS response (UNAIDS, 2010: 146). At this point of time there is no known cure for AIDS, and a vaccine for HIV still appears to be in a development phase.

The first case of HIV infection in Botswana was diagnosed in 1985. In 2009 around 320,000 Botswana were living with HIV and around 20,000 of them were children under the age of 15 years (UNAIDS, 2010: 180).

AIDS is widely accepted as being one of the main causes of a dramatic increase in the number of orphans. The estimated number of orphans aged 0-17 years due to AIDS in Botswana rose from 56,000 in 2001 to 93,000 in 2009 (UNAIDS, 2010: 186).

The UNAIDS organization has reported that the HIV prevalence rate in Botswana for adults aged 15-49 years in 2009 was 24.8% (UNAIDS, 2010: 181). This represented a small improvement on estimated rates from earlier years. This trend has been partly attributed to reductions in high-risk behaviour – but may also have been influenced by changes in the methodology for estimating HIV infection rates that occurred during 2007 (UNAIDS, 2007: 3).

The United Nations has recognized that the education sector has a critical role to play in terms of the delivery of effective HIV and AIDS prevention education programmes.

The Education Sector Response

The Botswana Ministry of Education and Skills Development has responded to challenges in this area by implementing education initiatives that aim to ensure that all young people possess the basic knowledge that is required to make decisions about HIV and AIDS that will protect and promote health.

The primary school level has been identified as a crucial access point for HIV and AIDS prevention education programmes because most children attend these schools, and because of the importance of improving the knowledge of children about HIV and AIDS before they become sexually active and/or involved in high-risk behaviours.

The SACMEQ Research Programme

The Southern and Eastern Africa Consortium for Monitoring Educational Quality (SACMEQ) is a network of 15 Ministries of Education: Botswana, Kenya, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, Tanzania (Mainland), Tanzania (Zanzibar), Uganda, Zambia and Zimbabwe.

SACMEQ's main mission is to undertake integrated research and training activities that: (a) provide educational planners with the technical skills required to monitor and evaluate the quality of their own education systems, and (b) generate information that can be used to plan the quality of education.

The SACMEQ Consortium has undertaken three large-scale cross-national studies of the quality of education in Southern and Eastern Africa: the SACMEQ I Project (1995-1999), the SACMEQ II Project (2000-2004), and the SACMEQ III project (2007-2011).

The SACMEQ III Project included an additional data collection concerned with a detailed assessment of pupil and teacher knowledge about HIV and AIDS.

A New HIV and AIDS Knowledge Indicator

In 2006 SACMEQ's Governing Body (the SACMEQ Assembly of Ministers of Education) expressed concern about the need for a well-designed indicator that could be used to guide informed debate about the effectiveness of HIV and AIDS prevention education programmes. The one indicator that has been widely used to judge these programmes (known as the "United Nations General Assembly (UNGASS) HIV-AIDS Knowledge Indicator for Young People") was considered to lack validity because it was based on a short list of five test questions that were problematic in terms of wording complexity, content coverage, and reliability.

The SACMEQ Ministers asked the SACMEQ III Project Research Teams to address information needs in this area by developing a valid SACMEQ HIV-AIDS Knowledge Test that would be suitable for administration to Standard 6 pupils (who have average ages of 13.5 years across the SACMEQ countries and 12.8 years in Botswana) and their teachers.

The SACMEQ HIV-AIDS Knowledge Test (HAKT)

The SACMEQ HIV-AIDS Knowledge Test (HAKT) was designed to provide a valid assessment of pupil and teacher knowledge about HIV and AIDS with respect to the topics specified in official school curriculum frameworks, textbooks, and teaching materials used by the SACMEQ countries.

The 86 HAKT test items covered 43 curriculum topics, and they were focused on an assessment of "the basic knowledge about HIV and AIDS that is required for protecting and promoting health". These topics were grouped into five main areas: definitions and terminology; transmission mechanisms; avoidance behaviours; diagnosis and treatment; and myths and misconceptions.

The HAKT was administered in late 2007 to 61,396 Standard 6 pupils and 8,026 teachers in 2,779 schools across the 15 SACMEQ countries. In Botswana the HAKT was administered to 3,868 Standard 6 pupils and 386 Standard 6 teachers in 160 schools. The advanced psychometric analyses applied to these data indicated that the HAKT had a high level of reliability, and that it was suitable for placing pupils and their teachers on a common scale of knowledge about HIV and AIDS.

The performance of pupils and teachers on the HAKT was assessed by applying two complementary scoring procedures:

(a) "HAKT Scores" – these were Rasch-scaled scores on the HAKT that were transformed to a SACMEQ Standard 6 pupil average of 500 and standard deviation of 100.

(b) "HAKT Minimal Knowledge Scores" – these were dichotomous scores that indicated whether pupils or teachers reached (score=1) or did not reach (score=0) SACMEQ's "minimal" HIV and AIDS knowledge benchmark (defined as mastery of half of the official curriculum that was assessed by the HAKT).

Table 1 contains summarized information about these two scores for Standard 6 pupils and teachers in Botswana's 7 education regions and the SACMEQ countries. Two sets of figures have been presented in the table for these groups of respondents: (a) the Average HAKT Scores, and (b) the Average HAKT Minimal Knowledge Scores (these proportions were expressed as percentages in the table).

For example, the second row of figures in **Table 1** indicated that: (a) the average HAKT Scores for pupils and teachers in Botswana's Gaborone Region were 567 and 784, respectively, and (b) the percentages of pupils and teachers in Gaborone Region that reached the minimal level of knowledge on the HAKT were 61% and 100%, respectively.

Table 2 contains the average HAKT Scores for groups of Botswana's Standard 6 pupils defined by four demographic variables: Socioeconomic Status, Location, Gender, and Age.

For example, the first row of figures in **Table 2** indicated that pupils from high socioeconomic status families had a higher average HAKT Score (544.5) than pupils from low socioeconomic status families (462.0), and that the difference between these two averages (82.5) exceeded two standard errors of sampling (12.6).

Note that SACMEQ Projects use pupils as the units of analysis. Therefore, teacher statistics such as means refer to teacher characteristics associated with the average pupil.

Pupil Knowledge Levels

(a) SACMEQ Countries

The average HAKT Scores for Standard 6 pupils provided a means of making relative comparisons of knowledge levels among SACMEQ countries.

The results presented for countries in the first column of **Table 1** showed that: (a) Standard 6 pupil averages ranged from a low of 453 in Mauritius to a high of 576 in Tanzania, and (b) the Botswana pupil average of 499 was very close to the SACMEQ overall average of 500.

These average HAKT Scores for SACMEQ countries were dangerously deceptive. For example, they suggested that Standard 6 pupil knowledge levels about HIV AND AIDS in Botswana were “satisfactory” because the average score for Botswana was fairly close to the average for all SACMEQ countries. However, an examination of average HAKT Minimal Knowledge Scores suggested the need for a different conclusion!

The average HAKT Minimal Knowledge Scores for Standard 6 pupils provided a means of making normative comparisons of knowledge levels among SACMEQ countries. (*NOTE: It was expected that 100% of pupils in all SACMEQ countries should reach the minimal knowledge level.*)

The results presented for countries in the second column of **Table 1** showed that: (a) the percentages of pupils with minimal knowledge ranged from 17% in Mauritius to 70% in Tanzania, and (b) the percentage of Botswana’s pupils that reached the minimum knowledge level was a low value of 32%. That is, the percentages of pupils reaching the minimal knowledge level in Botswana and all other SACMEQ countries were far below the expected level of 100%.

The results described above indicated that major alarm bells should be ringing in Botswana because more than two thirds of the Standard 6 pupils (68%) lack the minimal knowledge about HIV and AIDS that is required for protecting and promoting health. In all other SACMEQ countries the situation was also very serious - with a majority of Standard 6 pupils in most countries lacking minimal knowledge.

(b) Botswana’s Education Regions

The figures for Botswana’s education regions presented in the first column of **Table 1** showed large

regional variations in average Standard 6 pupil knowledge about HIV and AIDS.

The high average HAKT Score for Gaborone Region (567) placed it just below the highest scoring SACMEQ country (Tanzania). In contrast, the low average HAKT Score for Western Region (471) placed it just above the two lowest scoring SACMEQ countries (Mauritius and Lesotho) - and around 100 score points below Gaborone Region.

The average HAKT Minimal Knowledge Scores for Botswana’s education regions in the second column of **Table 1** also illustrated regional variations in Standard 6 pupil knowledge about HIV and AIDS. The percentage of pupils in Gaborone Region (61%) that reached SACMEQ’s minimal knowledge benchmark was three times higher than the percentage observed for Western Region (20%).

Teacher Knowledge Levels

In the third and fourth columns of figures in **Table 1** the average HAKT Scores and average HAKT Minimal Knowledge Scores have been presented for teachers in the SACMEQ countries and Botswana’s education regions. The figures showed that the average HAKT Score for teachers exceeded 700 for most SACMEQ countries, and for SACMEQ overall it reached 746 – almost 250 points above the Standard 6 pupil average of 500.

In Botswana, the average HAKT Score for teachers was 782 at the national level, and was in the range of around 770 to 805 for all education regions. The percentages of teachers that reached SACMEQ’s minimal knowledge benchmark of mastering at least one half of the official school curriculum were around 100% for all SACMEQ countries and all Botswana education regions.

The major contrast between the high knowledge levels of teachers and the low knowledge levels of their Standard 6 pupils came as a complete surprise to Botswana’s SACMEQ Research Team. They had assumed that teachers with high levels of basic knowledge about HIV and AIDS should be able to transmit this important information to their pupils.

This assumption was obviously faulty and certainly requires further research in order to provide an explanation for the substantial “knowledge gap” between pupils and teachers.

Demographic Differences in Knowledge

In **Table 2** some research results have been presented in order to examine demographic differences in the HIV and AIDS knowledge of Botswana's Standard 6 pupils. Differences in group averages were greater than two standard errors (**) for the Socioeconomic Status, Location, Gender, and Age variables - with pupils from wealthier homes, pupils from urban locations, younger Standard 6 pupils, and girls having greater knowledge about HIV and AIDS.

Four Research-Based Conclusions

1. Low Pupil Knowledge Levels

Knowledge levels about HIV and AIDS among over two-thirds (68%) of Botswana's Standard 6 pupils in 2007 were below SACMEQ's "minimal" knowledge benchmark (which was defined as mastery of at least half of the official school curriculum). The Ministry of Education and Skills Development should acknowledge that HIV and AIDS prevention education programmes need to be evaluated to ensure they are working effectively.

2. Large Regional Differences in Knowledge

There were large differences in average Standard 6 pupil HIV and AIDS knowledge levels among education regions in Botswana. The Ministry of Education and Skills Development should: (a) investigate the reasons for these differences, and (b) find out why knowledge levels were so low in the Western Region.

3. A Pupil-Teacher "Knowledge Gap"

There was a large HIV and AIDS "knowledge gap" between Botswana's Standard 6 pupils and their teachers. The Ministry of Education and Skills Development should investigate why well-informed teachers were not able to transmit this important knowledge to most of their pupils.

4. Demographic Differences in Knowledge

There were significant differences in knowledge about HIV and AIDS within groups of Botswana Standard 6 pupils defined by Socioeconomic Status, Location, Gender, and Age. The Ministry of Education and Skills Development should: (a) expand and intensify the delivery of HIV and AIDS prevention education programmes in poor and isolated communities, and (b) investigate why younger Standard 6 pupils and girls appeared to know more about HIV and AIDS.

A Concluding Comment

The SACMEQ III Project research results presented above indicated that the time has come to take stock of the impact of current HIV and AIDS prevention education programmes for young people in Botswana. These research results showed that more than two-thirds of the Standard 6 pupils in Botswana in 2007 did not have the minimal level of knowledge about HIV and AIDS that is required to preserve and promote health.

This was indeed alarming because Standard 6 pupils in Botswana (with an average age of 12.8 years) are entering a stage of mental and physical development where they may become sexually active, and/or may choose to become involved in high-risk behaviours.

The Ministry of Education and Skills Development should therefore take immediate action to: (a) address the research-based conclusions presented above, and (b) facilitate the development and implementation of more effective HIV and AIDS prevention education programmes that focus on the upper levels of primary school.

Authors

Boikhutso Monyaku
Ministry of Education and Skills Development
Division of Planning, Statistics, and Research
(bmonyaku@gov.bw)

Onkabetse Mmereki
Ministry of Education and Skills Development
Division of Planning, Statistics, and Research
(oammereki@gov.bw)

References

- UNAIDS (2007). AIDS Epidemic Update: December 2007. New York: Joint UN Programme on HIV-AIDS
- UNAIDS (2010). Global Report. New York: Joint UN Programme on HIV-AIDS.

SACMEQ wishes to acknowledge the financial assistance provided by the Ministry of Foreign Affairs of the Government of the Netherlands in support of SACMEQ's research and training programmes.

Table 1
Pupil and Teacher Scores on the
SACMEQ HIV-AIDS Knowledge Test (HAKT)

	PUPILS		TEACHERS	
	HAKT Score	Reached Minimal Level (%)	HAKT Score	Reached Minimal Level (%)
TANZANIA	576	70	724	99
Botswana: Gaborone	567	61	784	100
SWAZILAND	531	52	759	100
Botswana: Northern	516	38	770	100
MALAWI	512	43	714	99
Botswana: Central North	510	36	795	100
KENYA	509	39	793	100
MOZAMBIQUE	507	40	741	99
SOUTH AFRICA	503	35	781	100
NAMIBIA	502	36	764	99
ZANZIBAR	501	38	657	94
BOTSWANA	499	32	782	100
Botswana: Southern	492	30	795	100
UGANDA	489	33	708	98
ZAMBIA	488	35	744	98
SEYCHELLES	488	25	789	99
Botswana: Central South	486	28	767	98
Botswana: South Central	481	23	772	100
ZIMBABWE	477	30	785	99
Botswana: Western	471	20	804	100
LESOTHO	465	19	751	98
MAURITIUS	453	17	698	98
SACMEQ	500	36	746	99

Figure 1
Variation in pupil knowledge about HIV and
AIDS among SACMEQ school systems
and among regions in Botswana

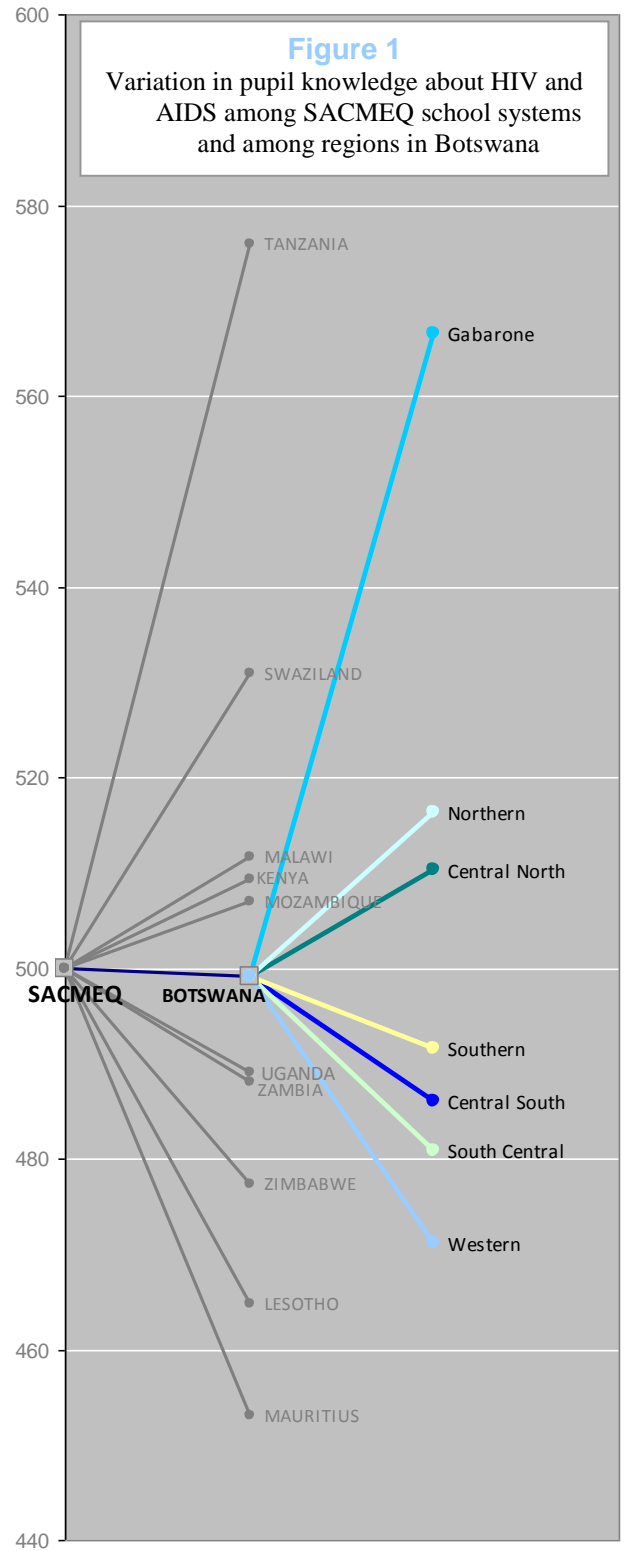


Table 2
Average HAKT Scores for Botswana Pupils
across Four Demographic Variables

DEMOGRAPHIC VARIABLE	1st Group	2nd Group	Diff (SE)
Socioeconomic Status (Low/High)	462.0	544.5	82.5 (6.3)**
Location (Isolated-Rural-Town/City)	484.4	533.4	48.9 (9.9)**
Gender (Males/Females)	490.9	507.2	16.3 (6.8)**
Age (Younger/Older)	521.2	467.7	-53.5 (6.4)**

Diff = Difference