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Prevalence of HIV infection in school based and other young donors during the 2002 and 2003 period

¹AR Mandisodza ¹H Charuma, ²A Masoha, ³Z Musekiwa, D Mvere and ³A Abayomi
Department of Medical Laboratory Sciences, College of Health Sciences, National Blood Transfusion services and University of West Indies Medical College, Avondale, Harare, Zimbabwe

Summary

The majority of donor blood in Zimbabwe comes from school-based donors. Zimbabwe has one of the highest HIV prevalences in the world and the age at which the infection is acquired is decreasing. This is a serious threat to the safety of blood supply. The prevalence of HIV has been low among the youth the majority of whom are still going to school and between the ages of sixteen and nineteen years. However, due to the changing socio-economic environment, sexual behavioural patterns have also changed. It is now necessary to evaluate these changes in order to guarantee safe blood transfusion. To determine the prevalence of HIV among adolescent donors during the period between 2002 and 2003. Cross-sectional retrospective study. National Blood Transfusion Service (NBTS). All school based donors and others between 16 and 19 years of age. The number of donors who were HIV positive in this age group. Data on donors was collected from computer files at the National Blood Transfusion Service (NBTS) Information Technology (IT) department. Prevalence of HIV was determined and categorised according to gender, age and the type of school the donor attended. The prevalence of HIV in 2002 and 2003 were 0.48% and 0.38%, respectively. Sixty-six per cent (66%) of HIV positive donors had donated for the first time. The prevalence in both periods was much higher in female donors than male donors. In 2002 males and females had prevalence of 0.28% and 0.66%, respectively. In 2003 males and females had prevalence of 0.18% and 0.55%, respectively. The overall highest prevalence (0.90%) was found between the 16-19 year age group who were not going to school (others). In 2002 female day schools had the highest (0.87%). The lowest prevalence (0%) was found in male boarding schools. In 2003 the highest prevalence (1.61%) was found in the 16-19 year age group who were not going to school (others). The lowest prevalence (0) in the same year was found in male boarding scholars. It can be concluded that the majority of HIV positive school based donors are first time donors. Female scholars and those of the same age group who are not going to school have the highest risk of donating HIV positive blood than male donors. The prevalence of HIV in adolescent blood donors decreased with age. It is recommended that active donor recruitment should be in favour of the low prevalence groups.

Keywords: Donor, blood, Zimbabwe prevalence, HIV, infection youth

Résumé

La majorité des donneurs de sang au Zimbabwe viennent des collégiés. Le Zimbabwe est l'un des pays du monde où la prévalence du VIH est très élevée et l'âge de l'acquisition de l'infection est très réduit. La prévalence du VIH demeure faible parmi les écoliers qui partent encore à l'école entre l'âge de 16-19 ans. Cependant, les changements socio-économiques de l'environnement ont changé la fréquence du comportement sexuel. Il est nécessaire d'évaluer ces changements dans l'ordre de garantir la parfaite transfusion sanguine. Pour déterminer la prévalence du VIH parmi les donneurs adolescents entre l'âge de 16 à 19 ans pendant la période de 2002 à 2003 au Service National de Transfusion. Les données étaient collectées de fichiers informatisés au département de technologie informatique. La prévalence du VIH était déterminée et caractérisée en fonction du genre, âge et le type d'école atteint. Le taux du VIH entre 2002 et 2003 était de 0,48% et 0,38% et plus élevée aux filles qu'aux garçons (0,28% & 0,66%; 0,18% & 0,55%) respectivement. 66% des donneurs séropositifs au VIH donnaient leur sang pour la première fois. Le taux le plus élevé (0,90%) était entre l'âge de 16-19 ans n'étant pas des écoliers. En 2002, les femmes écoliers avaient le taux plus élevé (0,87%) avec la plus faible prévalence chez les garçons vivant dans les dortoirs. Il peut être conclu que la majorité des séropositifs étaient des donneurs pour la première fois et les autres n'allant pas à l'école étaient plus en risque de donner un sang séropositif que les garçons. La prévalence du VIH chez les donneurs de sang adolescent décroit avec l'âge. Il est recommandé que le recrutement des donneurs actif soit en faveur du groupe moins prévalent.

Introduction

The National Blood Transfusion (NBTS) of Zimbabwe gets the bulk of its blood from school-based donors. Other sources of blood for the NBTS are work-based donors, home-based donors and walk-in donors. The latter alone is unable to sustain national blood needs because of high prevalence of the Human Immunodeficiency Virus (HIV) in the adult population.

Zimbabwe has a very high prevalence of HIV/AIDS, which has negatively impacted on the safety of blood transfusion. The prevalence of HIV among school-based blood donors has been relatively low before 2000 resulting in this group becoming the major source of blood [1,2]. In order to improve on blood safety NBTS has diverted to the school-based donors. But, these may need informed consent if under the le-

Correspondence: Mr. A.R. Mandisodza, University of Zimbabwe, College of Health Sciences, P.O. Box A178, Avondale, Harare, Zimbabwe

gal age of majority [2,3]. The criterion used by NBTS for selection of donors is usually by site or group (school-based, work-based, home-based and walk-in donors) [4,5].

HIV/AIDS transmission, like other infectious diseases, is controlled through social behaviour, among other measures [6,7]. Besides sexual transmission, donors are likely to be infected through direct exposure to infected blood by contaminated needles or transfusion [6,7,8,9].

While sexual activities among the school-based donors is minimal, the sero-incidence of HIV among the female youths has been increasing [7]. Females are exposed to sexual activity earlier than their male counterparts because of early interaction with large cross section of adult males. This exposes them to risks of sexually transmitted infections (STI) particularly HIV [2] threatening the safety of the blood supply. While NBTS carries out pre-donation and post donation screening tests it is also necessary to evaluate behavioral changes and characteristics of the school based donors and their effect on the observed trends in HIV infection. It is also important to evaluate the effectiveness of the current screening programme [5,10,11, 12].

Young donors come from different backgrounds and are exposed to different risks. The onset of sexual activity among youths coincides with the lower limit for blood donation of 16 years of age [13]. Social, cultural, political and economic forces increase the risk of HIV infection among the youths in developing countries. Prevailing economic conditions in the country have allowed the young girls to resort to prostitution in order to survive [14,15].

Sexually transmitted diseases are now common in the 15-24 year age group. Women in developing countries bear the highest risk to HIV infection because they are more biologically susceptible to the transmission of infection than men. As a result girls are more likely to contract the virus through sexual activity than the male counterparts. But, there is increasing peer pressures on young men to be sexually active and have several different partners. A growing number of younger adolescents are sexually active, thereby threatening the very donor base of interest [17,18].

It is now important that the prevalence of HIV among school-based donors is known to ascertain the HIV transmission risks since the NBTS gets its blood these donors¹. The main objective of this study is to determine the prevalence of HIV among school based blood donors and to ascertain the disease transmission risks associated with these donors. It is also intended to understand the social and demographic distribution of HIV prevalence among the young donors. Knowledge of the prevalence of HIV in school based donors will complement the pre-donor screening car-

ried out by the NBTS. There is currently no documentary evidence in Zimbabwe that has looked at the demographic prevalence of HIV in the school-based donors and those of the same age who not going to school.

Method and materials

Fifty-three thousand two hundred and ten (53210) data on HIV serology results for 2002 and forty nine thousand and three (49003) for the year 2003 were obtained from the computer files of the NBTS IT department. In total there were 104594 donors between January 2002 and December 2003. All the results were from school based and other of the same age who not going to school. The number of positive donors was noted on the basis of age, gender (male, female or coeducational) and demographic distribution (boarding or day school). The number of donations by individuals was also noted. The data were then analyzed for HIV prevalence statistically with the confidence interval test, with the level of significance set at 5% in all calculations. The differences in prevalence were compared using the significance testing between two proportions with the p - value set at 0.025.

Results

In 2002, 255(0.48%) of the school-based donors were HIV positive. Seventy-three (28.6%) of these were males and 182 (71.4%) were females. In 2003, 184 (0.38%) were HIV positive. Forty-one (22.3%) were male and 143 (77.7%) were females. Sero-prevalence among male and female students was 0.28% and 0.66%, respectively in 2002. It was 0.18% and 0.55%, respectively in 2003. The mean HIV prevalence for two years (2002-2003) were: boarding (0.13%), day (0.37%), day and boarding (0.32%) and others (1.13%). The lowest (0%) was recorded from male boarding schools for the two years. The highest prevalence was in female boarding schools (0.87%) and the lowest (0%) was in male boarding schools in 2002. The highest prevalence (1.61%) was in other donors of the same age group who were not going to school and the lowest (0%) was found again in the male boarding schools in 2003. There was a decrease in the number of HIV positive donors with age during the two years (Figures IV and V). In 2002 and 2003, 169 (66%) and 127 (69%) of the HIV positive candidates were first time donors, respectively. The differences in prevalence were tested for significance using the STRATA statistical program at 95% confidence interval ($P = 0.05$) among the corresponding school types in the two different years. For significance testing the schools were classified into the broader groups i.e. Boarding, Day and Day and Boarding. The p - values for the two years are shown in Table I.

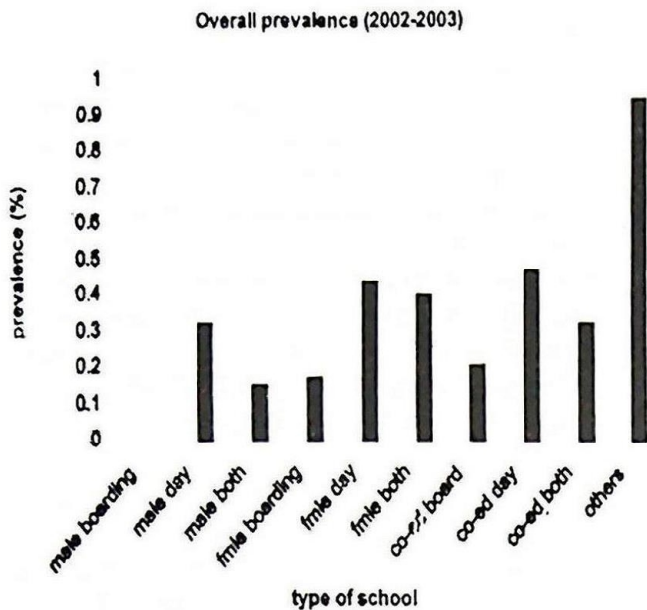


Fig. 1: The overall prevalence of HIV according to the type of school between 2002 and 2003

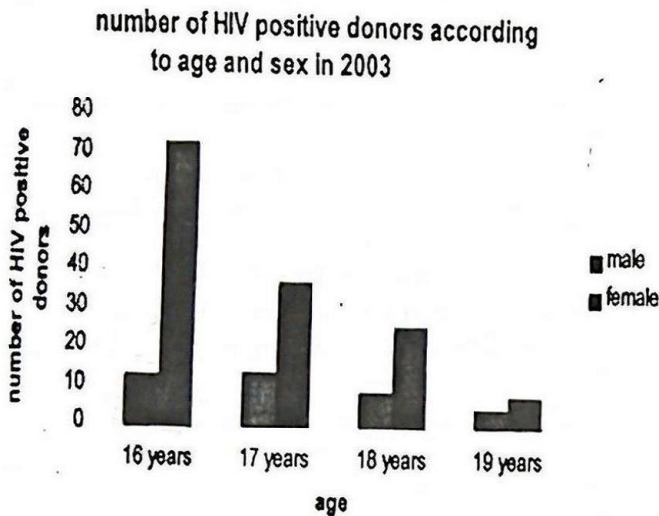


Fig. 2: The decreasing number of HIV positive donors according to age and sex in 2002

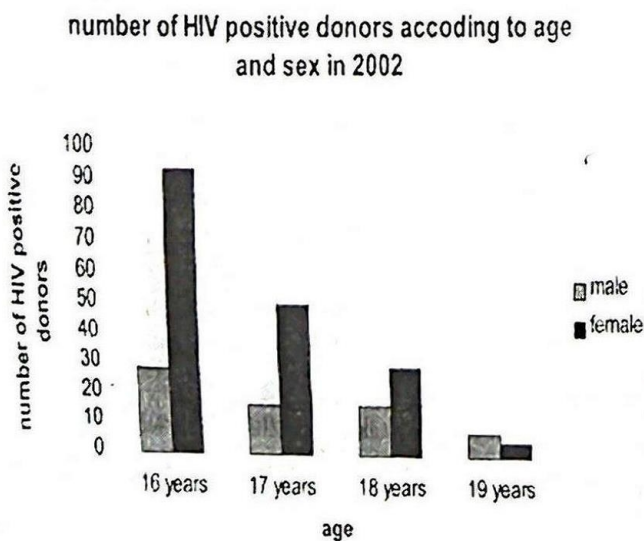


Fig. 3: The decreasing number of HIV positive donors according to the age and sex in 2003.

Table 1: Comparison of the prevalence of HIV in the different types of schools in 2002 and 2003.

Type of school	Prevalence (%) 2002	Prevalence (%) 2003	P-value (reject when P>0.025)
Boarding	0.23	0.13	0.0009
Day	0.53	0.40	0.0006
Day and Boarding	0.39	0.25	0.0007
Other	0.64	1.61	0.0037

Discussion

The overall prevalence of HIV among the school-based donors was 0.42% due to the rigorous screening that is carried out by the NBTS, the government and other organizations. There was a drop in the prevalence in 2003 (0.38%) from the previous year (0.48%). The Ministry of Health and Child Welfare, WHO and the UNAIDS reports also indicated a drop in the incidence of HIV in Zimbabwe during the same year to 26% from well over 30% during the previous years [1,2]

Exclusively male schools had an overall lower prevalence for both periods compared to exclusively female ones because females tend to engage in sexual activities earlier than male. The current economic problems are forcing young females to engage in prostitution for survival [14, 17,18] There was no HIV infection among the male donors from boarding schools. This could be attributed to less sexuality and general discipline instilled in pupils by the school authorities. Donors from coeducational schools exhibited the highest prevalence of HIV among strictly boarding pupils. This could have been due to greater interaction between students of different sexes thereby increasing the chances of sexual intercourse among them [15]. Females in schools with both boarding and day facilities had the highest prevalence.

Prevalence of HIV in female day schools was higher than in boarding ones. The majority of day scholars are from the economically disadvantaged groups and girls are likely fall prey to sexual inducements for monetary gains. General discipline among day scholars is not up to expectation compared to boarders.

The overall highest prevalence for both years was found among donors between the ages of 16 and 19 years (others) who were not going to school. Unemployment and inability to go to school may increase the of HIV infection for the majority of this group of donors. They have access to the popular entertainment areas were there may engage in alcohol abuse [16,17,18].

This prevalence is low because the selected group is unrepresentative of the population [20]. Due to the pre donor screening, unhealthy individuals are deferred and

therefore under-represented. Another group that is not represented is the uninterested individual who sees no benefit in donation. This therefore limits the study to only legible donors.

The prevalence of HIV decreased with an increase in age among youths. The largest numbers of HIV positive donors were 16 year olds while there was progressive drop at 17, 18 and 19 year of age. The minimum age for donation is 16 years and most interested youths are recruited around this age. Some will eventually drop out because of self-deferral and decreased confidence in their status leaving the safe donors [16].

Conclusion

Overall HIV prevalence among the donors was very low. The highest prevalence was found in donors of the same age group who were not going to school, here referred to as *others*. This was followed by school girls and the lowest prevalence was found in males. Among the adolescent donors, the youngest exhibited the highest prevalence which decreased with age. Prevalence was lower in 2003 compared to 2002. Active donor recruitment be done taking into account high risk groups of donors.

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