HIV infection in children: literature review

Background
This literature review was written in preparation for expert meeting on HIV infection in children in South Africa in March 2008, involving UNICEF, UNAIDS, the Human Sciences Research Council.

Literature review
HIV-related research, programmes and surveillance activities have largely targeted youth aged 15-24 years, pregnant women, and the general population aged 15-49 years. As focus has been on these population segments, children in the age group of 5–14 years have remained outside of most initiatives.

Measuring HIV infection among children has only recently been integrated into national HIV surveys conducted in Southern Africa. The 2002 Nelson Mandela/HSRC survey was the first study to assess the HIV status of children at the national level. It was also the first time that data were available to suggest that HIV prevalence among South African children was high -- 6.2% in children aged 2-9 years. The findings of a 2005 national HIV household survey conducted by the HSRC confirmed the high levels of HIV prevalence among male and female children, with HIV prevalence of 4.9% and 5.3%, respectively, among male and female children aged 2-4 years. Among male and female children aged 5-9 years, the prevalence was 4.2% and 4.8%, respectively. This compares favourably with similar findings of high HIV prevalence among children in this age group in Botswana and Zimbabwe. In Botswana, the 2004 national HIV prevalence among boys and girls aged 18 months to 4 years was 6.0% and 6.8%, respectively. The figures for boys and girls aged 5-9 years were 5.9% and 6.2%, respectively. In a district survey in Zimbabwe, the HIV prevalence among children aged 6-8 years was 5.8%. These observed prevalence levels among children are higher than would be expected based on assumed mother-to-child transmission rates and child survival curves among HIV infected newborns in these settings.

More conclusive evidence that a substantial number of new HIV infections occur among children who are not yet sexually active came from the 2005 South African national household survey, which included HIV incidence testing in its survey protocol for the first time. Almost 16,000 specimens tested for HIV provided an unparalleled large sample to estimate the HIV incidence on a national scale for South Africa. The detection of recent infections was performed on confirmed HIV-positive samples, using the BED capture enzyme immunoassay, and applying an adjusted incidence calculation recommended for HIV-1 subtype C specimens (Centre for Disease Control, 2006; Rehle et al. 2007a; 2007b).

Table 1 presents HIV incidence estimates for South Africa in both relative (% per year) and absolute terms (number of new infections per year). HIV incidence amongst persons aged two years and older is calculated at 1.4%, with 571,000 new HIV infections estimated for 2005. The incidence of HIV in children aged 2-14 years is of particular concern -- a relative incidence of 0.5% translates to an estimated 69,000 new infections in this age group. The majority of those new HIV infections (71%) were found in children aged 5-9 years, with an incidence rate of 1.1% and 49,000 new infections estimated for 2005. Children aged 5-9 years are presumably not yet
sexually active; yet, new HIV infections accounted for 23% of the prevalent infections found in this age group.

The incidence data suggest that a substantial number of new infections have occurred among children in South Africa; thus, confirming the HIV prevalence findings in this age group. These new infections in children aged between 2 and 14 years are most likely not linked to mother-to-child transmission. This suggests that the infections would have occurred through other modes of transmission, potentially including child sexual abuse, scarification practices, and health care services – a research topic that needs urgent attention.

Table 1: HIV incidence (%) and number of new infections by age group, South Africa 2005

<table>
<thead>
<tr>
<th>Age group (years)</th>
<th>Weighted sample (n)</th>
<th>HIV incidence per year (%)</th>
<th>Estimated number of new infections per year (n)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; 2</td>
<td>44,513,000</td>
<td>1.4</td>
<td>571,000</td>
</tr>
<tr>
<td>2-14</td>
<td>13,253,000</td>
<td>0.5</td>
<td>69,000</td>
</tr>
<tr>
<td>5-9</td>
<td>4,820,000</td>
<td>1.1</td>
<td>49,000</td>
</tr>
<tr>
<td>15-24</td>
<td>9,616,000</td>
<td>2.2</td>
<td>192,000</td>
</tr>
<tr>
<td>15-49</td>
<td>24,572,000</td>
<td>2.4</td>
<td>500,000</td>
</tr>
</tbody>
</table>

Numbers rounded off to the nearest thousand
Rehle et al. (2007b)

The burning questions are, what are the major sources of infection for these children? What can be done to address the situation? Researchers have indicated the problem of unexplained infection in children, and suggested a need for identifying possible risk factors (Hiemstra et al, 2004; Brewer et al, 2003). Gisselquist and colleagues, for example, have suggested that HIV transmission through unsafe medical care may be of more importance in Africa’s HIV epidemic than previously envisaged (Gisselquist et al, 2002). If this is true, it implies that improvement of the medical care delivery system will go a long way in reducing HIV infection, especially among children. But, there is a need for sufficient empirical evidence that supports this hypothesis before further interventions aimed at reducing HIV infection in children.

There have been several studies conducted to establish a link between child sexual abuse and HIV/AIDS. Tarakeshwar et al. (2005) conducted a qualitative study with 28 HIV-positive women who had been sexually abused during childhood. The study revealed that child sexual abuse raised challenges in four areas: disclosure of the abuse, sexual problems, relationship difficulties, and psychological distress. Although the women reported that they were able to accept their HIV illness and social support, find alternative sources of significance, and use spirituality to sustain their growth, they continued to suffer psychological distress related to their sexual trauma.

Paediatricians who see sexually abused children are often asked whether or not an “AIDS test” should be performed (Mok, 1998). Sexually transmitted infections (STIs) are contracted following sexual contact, which, in children, is often abusive. While most paediatricians would screen for
the presence of STIs, there is a reluctance to mention that HIV infection might result. For adult
victims of sexual assault, HIV testing forms part of the STI screen. Mok identified a significantly
large number of survivors of child sexual abuse among teenage runaways, the homeless, and
people with chronic depression. The study found that the characteristics of abuse survivors –
sexual compulsivity, revictimisation, chronic depression and alcohol/ drug abuse – are behaviours
which put individuals at risk of HIV infection.

When a cohort of children with HIV infection were assessed for possible modes of HIV
transmission, 14 (14.6%) were confirmed to have been sexually abused. All of the 11 girls had
genital findings which indicated sexual abuse, while two of the three boys had abnormal anal
signs. Three children had other STIs (Gutman et al., 1991). This indicates that the role of child
sexual abuse as a cause of HIV infection in children is, perhaps, underestimated, and needs
further research, especially in countries with high HIV prevalence (Schaaf, 2004).

Scarification, especially facial scarification, is another way through which children are infected
with HIV. Facial scarification is a process of engraving marks on selected portions of the face at
infanthood for various cultural reasons. It is a common practice in Africa, especially in Nigeria.
The induction is associated with severe fever and crying in infants (Uwaezuoke and Nneli, 2007).
An unhygienic environment and the use of the same unsterilized tools for the induction in different
children are possible means of contracting HIV infection. The following excerpt from Uwaezuoke
and Nneli can be used to illustrate the relationship between HIV and scarification:

A two-year old male child at the time of first presentation in the clinic had facial marks engraved
at extreme corners of both eyes and the cheeks and he was already circumcised when he was
less than one year old. After 6 months the child had lost weight remarkably with poor nutritional
status and increasing morbidity. HIV screening was requested for and he was tested HIV positive.
A month later, he died. The mother was immediately screened for HIV, but she was tested
negative.

They concluded that HIV infection contracted from facial scarification in the presence of G-6-P-D
deficiency caused the child’s death. Malnutrition due to the parent’s socioeconomic status could
have worsened the already depressed immune system of the patient. Education of traditional
engravers, circumcision experts, and rural dwellers on the consequences of HIV/AIDS is
suggested, because of the high risk of contracting HIV infection through contamination of
patients’ blood and body fluids in their practices (Uwaezuoke and Nneli).
References


