Blood Screening in Kenya

- The National Blood Transfusion Service collects and screens about 135,000 units of blood per year. Public hospitals collect another 20,000 units but may not screen all of them completely.

- Screening all of the blood collected is an immediate priority, as blood donors at hospitals may have higher levels of transfusion-transmissible infections.

- Based on norms set by the World Health Organization, Kenya may need to collect and screen a total of 410,700 units per year.

- Kenya needs to consider cost-efficient choices for expanding the total supply of screened blood.

Context

Ensuring a screened supply of blood for transfusion is an essential component of preventing HIV as well as other transfusion-transmissible infections (TTIs) such as syphilis, hepatitis B, and hepatitis C. The total volume of screened blood in Kenya is not known precisely, but the National Blood Transfusion Service (NBTS) currently collects and screens about 135,000 units (entirely from voluntary blood donors). Approximately 20,000 additional units per year are collected by public hospitals from family replacement donors. Though practices are improving, screening for TTIs in public hospitals is neither guaranteed nor complete. Practices in private hospitals are not tracked. Collection and screening of blood is an ongoing activity because of the persistent need for transfusions and the expiry of screened blood products after a period of time in storage.

Where the blood comes from makes a difference. The 2007 Kenya AIDS Indicator Survey collected data on TTIs among blood donors and asked whether they were voluntary donors or family replacement donors. Family replacement donors were three times as likely to be infected with HIV as voluntary donors and twice as likely to be infected with herpes simplex virus type 2, a surrogate marker for sexually transmitted infections. Such findings parallel those from other studies in Africa. Over time, voluntary blood donors have become the major source for blood transfusion in Kenya, in contrast to the rest of sub-Saharan Africa.

Kenya faces two steps in expanding the total supply of screened blood: (1) make investments to fully screen the current blood supply, especially the blood collected from family replacement donors, and (2) invest in increasing the total volume of collected and screened blood per year. The World Health Organization suggests collecting and screening 10 units per 1,000 citizens, which implies 410,700 units per year. This is 255,700 units more than what is collected now.

Methodology

Staff of the Health Policy Project consulted stakeholders in NBTS to define research questions. Cost data from a recent study on the NBTS were used. Data on the levels of TTIs among voluntary blood donors were available from NBTS for 2006–11. Comparable recent data for family replacement donors in Kenya were not available for any TTIs except HIV; thus, information from various East African studies was combined to compute factors, which help yield the likely levels among these donors. Family replacement donors are 1.4 times more likely to test positive for hepatitis B as voluntary donors, 1.5 times for hepatitis C, and 2.7 times for syphilis. Overall, they were 2 times as likely to test positive for any TTI as voluntary donors. While this is not based on a formal meta-analysis, the results accord with the Kenya AIDS Indicator Survey (2007) findings on herpes simplex type 2 (a proxy for sexually transmitted infections).

Fully Screening the Current Blood Supply

NBTS regional centers screen blood, but the satellite centers only assist with collection. In public hospitals, the current screening rate for HIV, hepatitis B, and hepatitis C is about 60 percent and higher for syphilis. Figure 1 illustrates the reduction in TTIs if hospitals were to increase screening of the blood collected from family replacement donors.
Our results suggest that a complete screening of blood already collected from family replacement donors represents a good investment and will help in further reducing TTIs.

This analysis was limited by a lack of data on the screening rates for TTIs at the hospital level. Detailed unit cost information at the facility level would enable a more robust analysis.

**Increasing the Volume of Screened Blood**

The gap of 255,700 units could be met by scaling up production through NBTS, through hospital-based collection and screening, or through a mix of both. We compare the options by examining cost per unit of blood (see Figure 2).

![Figure 1: Screening rate of family replacement blood in hospitals, and impact on TTIs](image)

<table>
<thead>
<tr>
<th>Screening rate</th>
<th>Additional costs to reach 100% screening</th>
<th>Averted TTI treatment costs</th>
<th>Benefit-cost ratio</th>
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</table>

*Based on 1,800 Kenyan shillings per unit screened (US$22), comprising lab and overhead costs at 100 blood units screened per hospital/month.

**References**