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## Transfusion Medicine in Sub-Saharan Africa: Conference Summary



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### ABSTRACT

In November 2014, a 3-day conference devoted to transfusion medicine in sub-Saharan Africa was held in Kampala, Uganda. Faculty from academic institutions in Uganda provided a broad overview of issues pertinent to transfusion medicine in Africa. The conference consisted of lectures, demonstrations, and discussions followed by 5 small group workshops held at the Uganda Blood Transfusion Service Laboratories, the Ugandan Cancer Institute, and the Mulago National Referral Hospital. Highlighted topics included the challenges posed by increasing clinical demands for blood, the need for better patient identification at the time of transfusion, inadequate application of the antiglobulin reagent during pretransfusion testing, concern regarding proper recognition and evaluation of transfusion reactions, the expanded role for nurse leadership as a means to improve patient outcomes, and the need for an epidemiologic map of blood usage in Africa. Specialty areas of focus included the potential for broader application of transcranial Doppler and hydroxyurea therapy in sickle cell disease, African-specific guidelines for transfusion support of cancer patients, the challenges of transfusion support in trauma, and the importance of African-centered clinical research in pediatric and obstetric transfusion medicine. The course concluded by summarizing the benefits derived from an organized quality program that extended from the donor to the recipient. As an educational tool, the slide-audio presentation of the lectures will be made freely available at the International Society of Blood Transfusion Academy Web site: <http://www.isbtweb.org/academy/>.

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## Transfusion in Sub-Saharan Africa: Past, Present and Future

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Dr Walter "Sunny" Dzik opened the conference with data from the World Health Organization (WHO) indicating that the greatest growth in world population during the century would occur in Africa. Africa's growing population will bring increased health care demands that will depend upon transfusion services supported by a well-educated transfusion medicine professional community. Dr Dzik reviewed the history of transfusion in sub-Saharan Africa, which was characterized by a series of expansions and contractions [1]. Transfusion practice grew gradually between World War I and the period of African national independence in the 1960s. After independence, blood services grew dramatically with collections peaking in the late 1970s. Then, as a consequence of the tragedy of HIV and regional civil strife, a decade of struggle and decline followed. A period of dramatic, robust recovery began in the 1990s and continues to this day. With support through both national and international investment, a growing professional force devoted to transfusion care has raised blood services in sub-Saharan Africa to the highest levels in history. Despite this achievement, demand still outstrips supply, and ample opportunity for progress remains.

Currently, West Africa faces an extreme crisis from the devastation of an epidemic of the Ebola virus (Fig 1). While a shocked and saddened world looks on, West Africa struggles to adjust. Health care workers on the front lines have been especially courageous. Transfusion of convalescent plasma has received considerable attention as a possible therapy for Ebola. The rationale derives, in part, from an experience in the 1995 Ebola outbreak in Kikwit, Democratic Republic of the Congo. Five individuals each donated 150 to 450 mL of blood, which was transfused to 8 recipients who were seriously ill at the time of transfusion. Although the overall mortality of the 316 cases was 80%, the mortality of the transfused recipients was only 12% [2]. Although the outcomes were encouraging, a careful look at the clinical report demonstrates that the recipients may have naturally seroconverted before the transfusions were given.

Dr Dzik completed his remarks focusing on a bright future for transfusion medicine in sub-Saharan Africa, signaling 3 forces that would promote progress [3]: First, "leap frog" technology will undoubtedly advance African transfusion care in unforeseen ways. For example, the recent development of a noninvasive measurement of hemoglobin using a smart phone [4] could have an obvious impact on red blood cell (RBC) transfusion. Second, clinical research will advance patient outcomes, and Dr Dzik pointed to several active clinical trials underway in Africa that would be discussed by subsequent speakers. Finally, education would be key to building the profession of the future. Addressing those in attendance, he expressed the hope that the bright future of sub-Saharan transfusion medicine would begin now.



**Fig 1.** Ebola virus (photo credit: Cynthia Goldsmith, PHIL ID# 1832, Public Health Image Library [<http://phil.cdc.gov>], Centers for Disease Control and Prevention [<http://www.cdc.gov>]).

## Donor Mobilization and Blood Collection

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The conference formal presentations appropriately began with a detailed review of the progress made and the challenges still confronting the collection and distribution of an adequate national supply of safe blood in developing nations. Recent data suggest that 100 000 000 U of blood are collected globally each year. Although high-income nations use half of this blood, they account for less than 20% of the global population. High-income countries collect 37 donations per 1000 population, whereas low-income nations are able to collect only one-tenth this amount, 3.9 donations per 1000 population [5].

Dr Dorothy Kyeyune, an international leader in this field, provided a detailed description of the blood supply in Uganda. She began by endorsing voluntary, repeated, nonnumerated blood donations. She drew a contrast between voluntary donations and family replacement donations or paid commercial donations. In developing nations, where the risk of transfusion-transmitted infections is particularly high, building a stable national blood supply rests upon the foundation of repeated donations by safe donors.

In Uganda, demand for blood is substantial due to the high birthrate and the prevalence of malaria. National statistics suggest that 45% of blood is used to treat children younger than 5 years, most with severe malaria anemia. Thirty percent of blood is used for women at the time of childbirth. To keep up with this demand, the Uganda Blood Transfusion Service has 7 regional blood banks and 22 mobile collection teams distributed throughout the nation. See Figure 2.

Blood collections have nearly doubled in the last decade and reached 200 000 annual collections in 2011. Dr Kyeyune detailed a broad range of strategies that have been used to attain the blood collection goals. These strategies have included targeting low-risk donor populations; collaborating with media outlets for education; and securing funding to provide the needed infrastructure, staff, and supplies required for sustained growth. Despite the measurable success, blood shortages still remain in Uganda. In the most recent year, the supply fell short of demand by approximately 10%. Seasonal shortages, for example, when schools and colleges are not in session, place greater strain on the system. To meet demands, additional donor sources are needed, and Dr Kyeyune described the process used to mobilize new donors in northern Uganda. The collaborative efforts of blood services and community leaders resulted in thousands of additional donations such that in March and April 2014, for the first time, blood demands in the northern Ugandan city of Gulu were met completely by the local supply.

Dr Kyeyune closed her presentation with a view to the next decade. She noted that a single unit of blood was more expensive than a 1-week course of even the most expensive antibiotic. Funding is, therefore, essential for a sustainable national blood supply. Advances in blood services in Uganda have been supported in part through the President's Emergency Plan for AIDS Relief. Reduction in President's Emergency Plan for AIDS Relief support, expected to occur in the future, will need to be replaced by other sources of funding if progress is to be sustained. She expressed hope for continued development of new financial partnerships to bring the message of the importance of blood donation even closer to the population of her country. She anticipated greater reach and efficiency of existing teams and looked forward to a future when all Ugandan patients would have full access to a ready supply of safe transfusion care.

## Blood Component Preparation

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