WEEKLY EPIDEMIOLOGICAL REPORT

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Blood safety and donation—Part II

Part I of this article was published in the last issue of the Weekly Epidemiological Report

4. Testing of all donated blood

The first step in reducing the risk of transmission of infectious diseases through blood is to select voluntary non-remunerated donors from low-risk populations who give blood on a regular basis as these individuals are at a lower risk of transmitting transfusion-transmissible infections than are family/replacement donors, or paid donors. However, even with the most careful selection, some donors may be seropositive for HIV or other infectious agents. Therefore, rigorous screening of all donated blood is required to ensure the safety of the blood supply.

Unfortunately, not all donations in all countries are screened. GDBS data from 1998–1999 indicated that, globally, 13 million tests were not performed for HIV, hepatitis B (HBV), hepatitis C (HCV) and syphilis. Data for 2000–2001 indicate an improvement in the number of tests performed for these markers, largely because a number of countries had introduced testing for HCV since the previous collection of data. Nevertheless, more than 6 million tests were not performed on donated blood for either HIV, HBV, HCV and syphilis. The donated blood should also be tested for ABO and RhD to ensure safety and compatibility of the transfusion for the patient.

In order to ensure safety of the blood supply, several key activities must be implemented:

- the development and implementation of a national strategy for the screening of all donated blood for transfusion-transmissible infections, using the most appropriate and effective assays to test for HIV, hepatitis viruses, syphilis and other infectious agents, such as Chagas disease;
- Training of blood transfusion service laboratory technical staff in all aspects of blood screening and processing including blood grouping, compatibility testing, component preparation and storage and transportation of blood products;
- Maintenance of quality assurance systems and good laboratory practice, including the use of standard operating procedures, in all aspects of blood screening and processing;
- Compatibility testing of all whole blood and red cells with the patient to be transfused must always be performed even if, in life-threatening emergencies, this is done after the transfusion has been completed;
- The procurement, supply, central storage and distribution of reagents and materials to ensure continuity in testing at all sites;
- The maintenance of an effective blood cold chain for the storage and transportation of blood and blood products.

5.Production of blood components

Safe blood is a precious gift from blood donors. To ensure that the use of donated blood is maximized, blood is processed into blood components so that a number of patients can benefit from a single donation. Blood is a complex fluid consisting of different blood cells suspended in yellowish liquid called plasma.

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The blood cells comprise a mixture of red cells (erythrocytes), white cells (leukocytes) and platelets (thrombocytes). The plasma contains water, chemical substances (electrolytes), many different proteins such as clotting (coagulation) factors and immunoglobulins and numerous metabolic substances. Blood serves as a transport medium for carrying all its different components to and from the different organs of the body.

Blood collected in an anticoagulant can be stored and transfused to a patient in an unmodified state. This is known as 'whole blood' transfusion. Blood may be used more effectively if component therapy is practised. One unit of donated blood may be divided into components, including red cells concentrates, fresh frozen plasma, cryoprecipitates and platelet concentrates, to meet the needs of more than one patient.

Advantages of component therapy are:

- the recipient can be treated with only those blood components that are lacking, reducing the occurrence of adverse transfusion reactions;
- more than one patient can be treated with blood components derived from one donation;
- therapeutic support for patients with special transfusion requirements can be provided, for example, plasma that often is not directly needed for transfusion can be used for manufacturing of Factor VIII concentrate for Haemophilia A patients;

improved quality and functional capacity of each component when varied storage conditions and shelf lives were applied

For a safe and effective blood component processing, the following elements are required:

- Commitment and support by national health authorities for a sustainable, well-organized, nationally co-ordinated blood transfusion service, with adequate resources and quality system for all areas;
- Centralization of blood processing and testing within major centers to permit economies of scale by maximizing utilization of personnel and equipment and uniform standards;
- Reliable supply of materials and consumables;
- Well-maintained equipment and spares available to keep down-time to a minimum;
- Effective and timely testing of all donated blood to ensure maximum safety and availability of blood components;
- A system for appropriate storage and transportation to ensure quality and efficacy of blood and blood components;
- Optimization of the use of plasma for fractionation where facilities are available;
- Promotion of appropriate blood component therapy.

Types of blood donation

Sufficient supplies of safe blood can only be assured by regular donations from voluntary unpaid donors. The 2006 data reveal some improvements in such donations worldwide, but many developing and transitional countries still rely heavily on relatively unsafe family/replacement donors and paid donors.

- Fifty-one countries reported an increase in blood donation by voluntary unpaid donors. In 27 countries the level remained the same.
- In 2004, 51 countries had reached the WHO-recommended goal of collecting 100% of their blood supplies from voluntary unpaid donors. Thailand, Turkey and Uganda achieved this in 2006.
- Particularly striking is the increase from 25% in 2002 to 40% in 2006 in the proportion of donations collected from voluntary non-remunerated blood donors in developing and transitional countries.
- 92% of donations in developed countries are from voluntary unpaid donors as compared to 77% in developing and transitional countries.
- More countries are moving towards voluntary blood donation and showing a decrease in dependence on relatively unsafe family and paid blood donors. In 2002, 63 countries were collecting more than 75% of their blood supplies from family and paid blood donors. This number had fallen to 46 countries by 2004 and again to 38 countries in 2006.
- More than 1 million whole blood units were still collected from paid blood donors in 2006.

Data from 97 countries shows that 6.93 million prospective donors are deferred prior to blood collection. The causes for these deferrals include anaemia, existing medical conditions and risk behaviours for transmissible infections. This indicates the need for collecting information about blood donors, and for educating and counselling prospective donors. These measures will ensure safety and availability of blood, reduce unnecessary deferrals, and also ensure health and safety of donors.

Sources

1.Testing of all donated blood - WHO Fact sheet [http:// www.Blood\WHO Testing of donated blood.htm]

2,Processing of donated blood - WHO Fact sheet [http:// www. Blood\WHO Processing of donated blood.htm]

3.Blood safety and donation - WHO Fact sheet [http:// www. Blood\WHO Blood safety and donation.htm]

Table 1: Vaccine-preventable Diseases & AFP

7th - 13th June 2008 (24thWeek)

Disease	No. of Cases by Province									Number of cases during current week in 2008	Number of cases during same week in 2007	Total number of cases to date in 2008	Total number of cases to date in 2007	Difference between the number of cases to date between 2008 & 2007
	W	C	S	N	E	NW	NC	U	Sab					
Acute Flaccid Paralysis	01 CO=1	00	00	00	00	01 KR=1	00	00	00	02	02	45	42	+7.1%
Diphtheria	00	00	00	00	00	00	00	00	00	00	00	00	00	00.0%
Measles	00	01 NE=1	00	00	00	00	00	00	00	01	01	59	36	+63.9%
Tetanus	00	01 ML=1	00	00	00	00	00	00	00	01	02	18	17	+5.9%
Whooping Cough	00	00	00	00	00	00	01 PO=1	00	00	01	01	19	19	00.0%
Tuberculosis	46	21	02	12	24	33	02	17	15	172	163	3849	4707	-18.2`%

Table 2: Newly Introduced Notifiable Diseases

7th - 13th June 2008 (24thWeek)

Disease	No. of Cases by Province									Number of cases during current week in 2008	Number of cases during same week in 2007	Total number of cases to date in 2008	Total number of cases to date in 2007	Difference between the number of cases to date between 2008 & 2007
	W	C	S	N	E	NW	NC	U	Sab					
Chicken-pox	11	20	10	03	10	04	06	09	12	86	59	2769	1739	+59.2%
Meningitis	01 KL=1	02 NE=1 KD=1	07 HB=2 GL=3 MT=2	01 MU=1	01 BT=1	01 KR=1	00	03 BD=3	05 RP=1 KG=4	21	18	735	81	+807.4%
Mumps	09	09	07	00	11	10	06	03	20	75	46	1223	689	+77.5%

Key to Table 1 & 2

Provinces: W=Western, C=Central, S=Southern, N=North, E= East, NC=North Central, NW=North Western, U=Uva, Sab=Sabaragamuwa.
DPDHS Divisions: CB=Colombo, GM=Gampaha, KL=Kalutara, KD=Kandy, ML=Matale, NE=Nuwara Eliya, GL=Galle, HB=Hambantota, MT=Matara, JF=Jaffna, KN=Killinochchi, MN=Mannar, VA=Vavuniya, MU=Mullaitivu, BT=Batticaloa, AM=Ampara, TR=Trincomalee, KM=Kalmunai, KR=Kurunegala, PU=Puttalam, AP=Anuradhapura, PO=Polonnaruwa, BD=Badulla, MO=Moneragala, RP=Ratnapura, KG=Kegalle.

Table 3: Laboratory Surveillance of Dengue Fever 7th - 13th June 2008 (24thWeek)

Samples	Number tested		Number positive *		Serotypes									
					D_1		D_2		D_3		D_4		Negative	
	GT	AH	GT	AH	GT	AH	GT	AH	GT	AH	GT	AH	GT	AH
Number for current week	02	06	00	01	00	00	00	01	00	00	00	00	00	00
Total number to date in 2008	93	82	07	15	00	00	04	06	01	05	00	00	02	00

Sources: Genetech Molecular Diagnostics & School of Gene Technology, Colombo [GT] and Genetic Laboratory Asiri Surgical Hospital [AH]
* Not all positives are subjected to serotyping.
NA= Not Available.

Data Sources:
Weekly Return of Communicable Diseases: Diphtheria, Measles, Tetanus, Whooping Cough, Human Rabies, Dengue Haemorrhagic Fever, Japanese Encephalitis, Chickenpox, Meningitis, Mumps.
Special Surveillance: Acute Flaccid Paralysis.
National Control Program for Tuberculosis and Chest Diseases: Tuberculosis.

Table 4: Selected notifiable diseases reported by Medical Officers of Health

7th - 13th June 2008 (24thWeek)

DPDHS Division	Dengue Fever / DHF*		Dysentery		Encephal-itis		Enteric Fever		Food Poisoning		Leptos-pirosis		Typhus Fever		Viral Hepatitis		Human-Rabies		Re-turns Re-ceive
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	%
Colombo	38	866	02	81	00	06	00	54	01	61	04	201	00	02	00	62	00	00	**85**
Gampaha	05	546	01	86	03	11	00	30	00	66	02	210	00	04	01	74	00	03	**86**
Kalutara	11	288	09	178	00	08	01	42	00	16	18	240	00	02	01	25	00	00	**75**
Kandy	08	125	09	131	00	05	03	32	04	34	17	234	05	55	01	83	00	01	**72**
Matale	01	62	02	125	00	02	04	30	01	03	33	517	00	01	00	19	00	00	**75**
Nuwara Eliya	01	15	08	126	00	01	17	170	00	107	01	30	01	34	01	77	00	01	**92**
Galle	02	62	04	97	01	11	00	10	00	42	05	192	01	10	02	06	00	03	**71**
Hambantota	00	52	03	47	00	03	00	06	00	06	02	63	00	52	00	04	00	00	**82**
Matara	06	129	05	100	00	04	01	22	00	02	06	193	03	108	01	07	00	01	**82**
Jaffna	00	52	00	78	00	01	00	199	00	08	00	00	00	139	00	23	00	00	**63**
Kilinochchi	00	00	00	12	00	00	00	00	00	00	00	02	00	00	00	01	00	00	**25**
Mannar	00	24	00	10	00	06	02	108	00	00	00	00	01	01	00	11	00	00	**50**
Vavuniya	00	10	01	31	00	02	00	02	00	11	00	04	01	01	00	04	00	00	**50**
Mullaitivu	00	00	00	02	00	00	00	08	00	12	00	00	00	01	00	06	00	00	**40**
Batticaloa	01	83	06	52	00	03	01	17	00	19	00	02	00	01	04	76	00	05	**45**
Ampara	00	19	04	116	00	00	00	04	00	00	00	16	00	00	00	05	00	00	**43**
Trincomalee	02	171	05	55	00	00	00	09	00	12	04	24	02	15	00	12	00	00	**70**
Kurunegala	03	220	00	139	01	11	01	30	00	11	08	143	01	16	03	29	00	04	**94**
Puttalam	07	253	01	45	01	06	10	112	02	21	04	14	01	32	01	22	00	03	**78**
Anuradhapur	00	107	01	45	00	06	00	08	00	05	15	208	00	10	00	10	00	02	**79**
Polonnaruwa	00	50	04	71	00	01	00	21	00	06	04	48	00	00	00	16	00	00	**86**
Badulla	01	47	12	240	00	05	02	67	00	13	00	27	01	69	01	62	00	01	**60**
Monaragala	02	41	12	152	00	02	01	27	61	100	05	80	00	64	03	18	00	00	**100**
Ratnapura	01	135	06	142	00	21	00	41	00	42	01	109	00	69	01	39	00	00	**81**
Kegalle	12	230	01	199	00	21	02	37	00	01	06	165	02	43	13	369	00	00	**100**
Kalmunai	03	24	11	147	00	03	00	09	00	10	00	00	00	02	02	19	00	00	**46**
SRI LANKA	**104**	**3611**	**107**	**2507**	**06**	**139**	**45**	**1095**	**69**	**608**	**135**	**2722**	**19**	**731**	**35**	**1079**	**00**	**24**	**75**

Source: Weekly Returns of Communicable Diseases (WRCD).

***Dengue Fever / DHF** refers to Dengue Fever / Dengue Haemorrhagic Fever.

****Timely** refers to returns received on or before 21 June, 2008 Total number of reporting units =238. Number of reporting units data provided for the current week: 262

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