

# National Blood Supply: Role of National Blood Centre, Thai Red Cross Society

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**B**ackground The National Blood Program in Thailand has been designated by the government to the Thai Red Cross Society since 1966 to be the National Blood Centre (NBC) of the country. It has the mission to supply adequate and safe blood to all hospitals. It performs all activities of a blood program including donor recruitment, blood collection, blood screening, blood component processing, blood storage and distribution. Apart from these activities, NBC also produces blood grouping reagents, blood bags and fractionated plasma for specific Immunoglobulin, in order to serve the whole line of the National Blood Program.

In Bangkok, we have endorsed another 6 branches in hospital-based blood banks to be our NBC's branches to perform blood collection, blood screening and preparation of blood components for their own supply.

For the provincial activities on blood services, there are another 12 Regional Blood Centers (RBC), under NBC, which act as centers for blood donation, laboratory and supply of blood, its components and other plasma products to the provincial hospitals in the different regions across the country and some of them also do the blood collection and blood component separation as the second phase of the development of RBC and plan to do full function as the NBC in the future.

Another 152 branches in the provinces are hospital-based provincial blood banks where they perform all activities as the branches in Bangkok. Only the donor recruitment is done by staff of the Red Cross Chapter.

Being in charge of the National Blood Program, National Blood Centre, the Thai Red Cross Society has close collaboration with the World Health Organization (WHO)<sup>1</sup> and the

International Federation of the Red Cross and Red Crescent Societies (IFRC/RC)<sup>2</sup>, and also follows the Blood Transfusion Service standards of the concerned 5 international organizations working in the area of blood transfusion service as follows:

1. International Society of Blood Transfusion (ISBT)<sup>3</sup>

2. International Federation of Blood Donor Organization (IFBDO/FIODS)<sup>4</sup>

3. American Association of Blood Banks (AABB)<sup>5</sup>  
4. Council of Europe (COE)<sup>6</sup>  
5. International Plasma Fractionation Association (IPFA)<sup>7</sup>

## Blood collection in Thailand

Thailand has a population of approximately 65 millions, and during the last 5 years, many blood donor recruitment programs have been carried out to increase blood donations throughout the country. As a result, the numbers of donated blood were reaching 3% of the Thai population successfully year by year as shown in Table 1. In 2009, blood collection for the whole country was 1,650,130 units (2.6% of the population). Of these 10.8% of the Bangkok population was collected in Bangkok whereas only 1.8% of the provincial population was collected from the provinces.

The blood collection at NBC as well as mobile teams in Bangkok were operated everyday except the 1<sup>st</sup> of January. The blood collection was increased yearly from 2005-2009. The number of blood collections from mobiles was rather equal to in-house collection at NBC at about 1500 donations per day. NBC supplied blood and components to hospitals both in Bangkok and in the provinces, but according to the modern advances in medical care in Thailand, the request of whole blood has been decreasing until no more while the demand for leukocyte-poor blood,

**TABLE 1.** Blood Collection in Thailand 2005-2009 (Oct-Sept).

Fiscal Year	04/05	05/06	06/07	07/08	08/09
Whole country	1,518,991	1,670,597	1,801,368	1,689,622	1,650,130
(%)	2.4	2.7	2.9	2.7	2.6
Collection in BKK	561,138	578,910	619,203	561,892	614,081
(%)	9.9	10.2	10.8	9.8	10.8
6 Branches At NBC	113,715	113,462	128,350	64,482	74,988
Collection in provinces	447,423	465,448	490,853	497,410	539,093
(%)	957,853	1,091,687	1,182,165	1,127,730	1,051,049
(%)	1.5	1.8	1.9	1.8	1.8

**TABLE 2.** Blood preparation of NBC; TRC in 2005-2009 (Oct-Sept).

Fiscal Year	04/05	05/06	06/07	07/08	08/09
Whole blood (%)	9.6	6.9	4.2	2.9	2.5
Blood components (%)	87.8	90.3	93.0	94.2	94.9
Apheresis (%)	2.6	2.8	2.8	2.9	2.6

leukocyte-depleted blood and single donor components were increased yearly. Table 2 shows that the production of blood components in the NBC has also increased from 87.8% in 2005, to 94.9% in 2009. The apheresis donations accounted about 2.6-3% each year, the majority of them were plateletpheresis. Blood components supplied to hospitals in Bangkok and in provinces in 2009 were shown in Table 3, which shows that approximately 55% of the blood products were supplied for Bangkok and 45% for the provinces.

### Blood donor testing at NBC

Every unit of donated blood is tested for blood group serology (ABO, Rh (D) typing and antibody

provinces were from replacement or from the patients' relatives and friends with less strict selection that caused a higher rate of TTI.

### Activities at the Regional Blood Centers (RBC) in the provinces

The RBCs mainly perform screening of blood donations that are collected by branches in the provinces using the same standard as NBC as shown in Table 6. In the year 2009, about 66% of blood donations in the provinces were sent for TTI screening test at 12 RBCs as shown in Table 7.

### Quality management system

In 2005, the NBC got ISO 9001 version 2000 through the whole system and we developed and distributed the Standard for Blood Bank and Transfusion manual to all hospital-based blood banks aimed to the PIC/S GMP for Blood Establishment Standards of WHO and in 2009 we got the ISO 9001 version 2008.

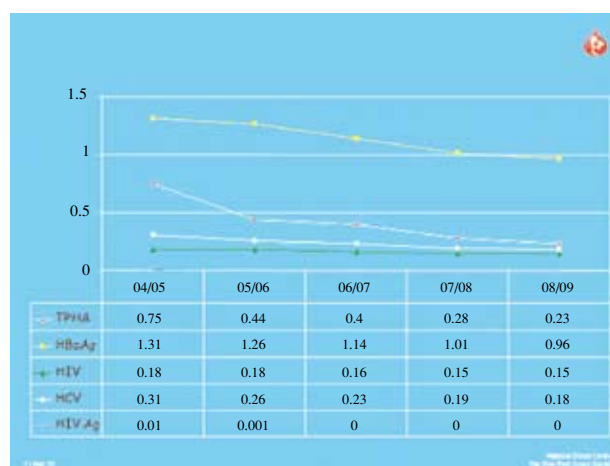
### Challenges

We are moving toward the consolidation and cen-

**TABLE 3.** Supplied of Blood & Blood Components from NBC.

Fiscal Year	04/05		05/06		06/07		07/08		08/09	
	BKK	Provinces	BKK	Provinces	BKK	Provinces	BKK	Provinces	BKK	Provinces
Whole Blood (%)	10,099	26,033	7,739	22,138	3,405	16,261	1,815	11,314	943	10,548
	2.3	6.0	1.7	4.9	0.7	3.4	0.4	2.3	0.2	2.0
Blood Components (%)	231,438	157,642	236,540	172,449	253,357	189,785	266,642	195,342	278,051	224,417
	53.2	36.2	52.5	38.3	53.5	40.1	54.9	40.2	53.0	42.7
Aphaeresis (%)	9,525	381	10,922	884	10,117	797	10,158	751	10,274	814
	2.2	0.1	2.4	0.2	2.1	0.2	2.1	0.2	2.0	0.2
Total	57.7%	42.3%	56.6%	43.4%	56.3%	43.7%	57.3%	42.7%	55.1%	44.9%

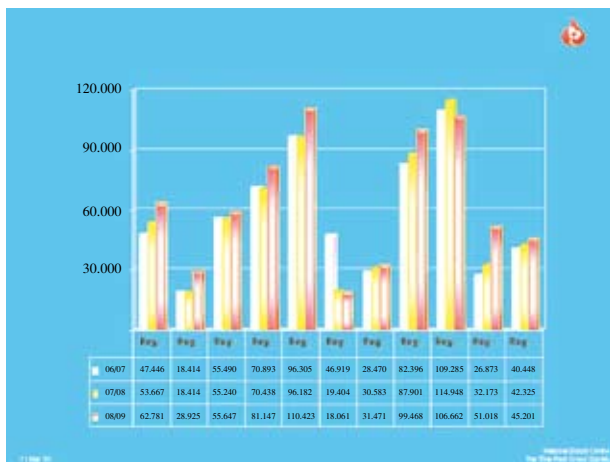
screening) and infectious marker testing (Syphilis, HBsAg, anti-HCV, HIV Ag/Ab and NAT for HBV, HCV, HIV). The percentage of syphilis positive, HBsAg, HCV and HIV reactive was declining year by year shown in Table 4. In 2009, the rate of positive donated blood in the NBC (Bangkok) for TPHA, HBsAg, HCV and HIV reactive were 0.23%, 0.96%, 0.18% and 0.15% respectively. NAT screening for detection of HIV DNA, HCV RNA and HBV DNA in the NBC was performed as requested by the hospitals, approximately 14.4% at the beginning in 2004 and reached 100% in May 2006 and from now on. Table 5 shows the percentage of TTI positive in blood donations for the whole country from 2006 to 2009. The TTI positive rate at the NBC was the lowest compared with the provinces. It is due to 100% of the blood donations of the NBC in Bangkok were strictly selected from voluntary non-remunerated blood donors, while 7-10% of the blood donations from branches in Bangkok and



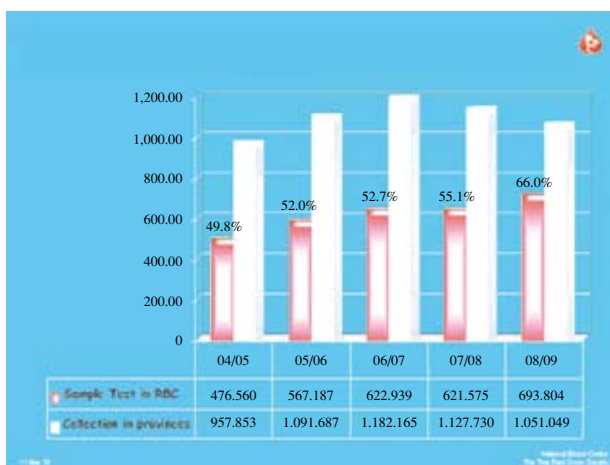
**TABLE 4.** % of positive TTI in blood donors at NBC fiscal year 2005-2009.

**TABLE 5.** % of positive TTI in blood donation of the country.

	05/06			06/07			07/08			08/09		
	Blood donation	TTI positive	%	Blood donation	TTI positive	%	Blood donation	TTI positive	%	Blood donation	TTI positive	%
Branches in provinces	1,091,687	49,606	4.5	1,182,165	51,978	4.4	1,127,730	51,978	4.6	1,051,049	36,913	3.5
Branches in BKK	113,462	3,413	3.0	128,350	3,190	2.5	64,482	1,054	1.6	74,988	1,490	2.0
National Blood Centre	465,448	6,359	1.4	490,853	6,304	1.3	497,410	5,825	1.2	539,093	4,925	0.9



**TABLE 6.** Comparison of sample test in each region blood centre fiscal year 2005-2009.



**TABLE 7.** Comparison of blood collection and sample test in region blood centre fiscal year 2005-2009.

tralization of the Blood Transfusion Service in Thailand in order to provide adequate and safe blood supply with the same standard throughout the country. We aim to increase the number of blood collections not only in BKK, but also in the provinces. We plan to have a 5-year plan for extension of the activities of the RBCs to perform full functions of blood services the same as the NBC in Bangkok.

## REFERENCES

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