

## CONDITION OF DONATION IN BLOOD SERVICE

*Kamal Tashtemirov*

*Sagit Imangazinov*

*Olga Tashtemirova*

Semey State Medical University, Semey, Kazakhstan

---

### Abstract

There has been a monitoring of donation in Pavlodar region. It has been established that over the years of observation there was a significant change both in the number and structure of the donors in Pavlodar region: number of donors seems to increase, similar to the growth of the total number of donors, the number of donors per thousand people has increased. The number of primary donors has decreased and there are unsteady requests for blood donation. Growth of free donations is conditioned upon donating relatives of recipients. There is a tendency to a decrease in the share of male donors and increase in the share of female donors. There is a steady increase in the share of donors from 30 to 39 years old, workers and employees with a predominance of urban residents.

---

**Keywords:** Donor, blood service, blood donation

### Relevance

Issues of blood and its components donation are one of the most important for the state and key ones for public health. That is why this issue can be rated as an issue of national security<sup>1</sup>.

According to WHO estimates, share of blood donors is less than 1 % of total population in Central Asian countries, and in the last 3 - 5 years this figure sharply decreased while, according to international standards, to satisfy potential needs, share of blood donors shall include 2.5 % of the population. As a result, blood services in Central Asian countries have no necessary and safe blood resources that poses risks to health and life of patients who need blood transfusion<sup>2</sup>.

Despite a certain progress, too many Central Asian countries depend on paid or substituting donation. By estimate, in Central Asia, share of paid donors accounts for 80 % of all blood donors used by blood services for their needs. Pool of voluntary donors from lower risk group constantly decreases while prevalence of infectious diseases increases in those places where resources are limited<sup>3</sup>.

In the Republic of Kazakhstan, from 1990s, donation has reduced more than twice. In 2009, 271,000 donations of blood and its components were recorded which is 18 donations per thousand people a year and only by 45 % corresponds to minimal level recommended by WHO. Average republican rate per thousand people according to the results of 2009 is 18 donors<sup>4</sup>. Taking into account the above stated we have conducted research to find out how donation is developing in blood service in one of the regions of Kazakhstan.

### Research material and methods

The object of the research is donors who applied to Pavlodar Region Blood Center (PRBC) from 2008 to 2012. Epidemiologic information about donors was collected with the help of a standard questionnaire approved by the order of the Ministry of Public Health of the Republic of Kazakhstan No. 332 of 08/07/2009. Material for study also was annual reports

on PRBC operation. Sociological, analytical and statistical research methods were used in the work.

**Results of the research**

There are 168,339 people (according to RK census of 2009) from 18 to 50 years old in Pavlodar region who could become potential donors, but in average only 6% apply to blood centers (BC) of Pavlodar region. See the illustration of change in the total number of donors in Pavlodar region over the period of five years in Figure 1.

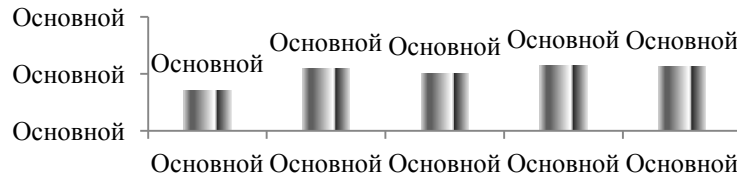


Figure 1- Number of PRBC donors over 2008-2012

As it can be seen from the chart in Figure 1, number of donors in Pavlodar region over the period under review seems to increase. Decline in donation is observed in 2008 (7148 donors). Stabilization in the number of donors is observed from 2011.

It is known that the number of donors per thousand people is considered to be a rate which precisely enough shows both attitude to donation and its condition in the country. Change in the number of donors per thousand people in Pavlodar region is shown in Figure 2.

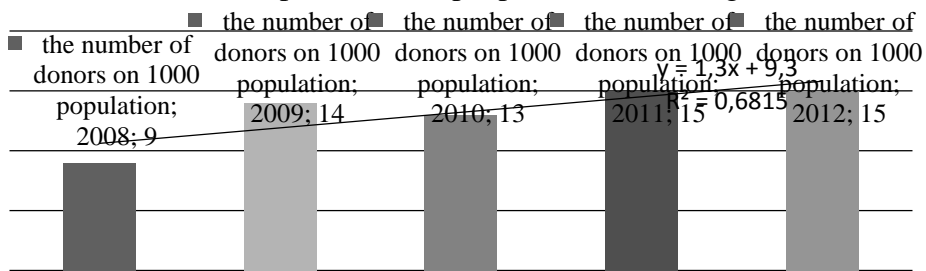


Figure 2- Number of donors per thousand people in Pavlodar region over 2008-2012

The chart in Figure 2 allows noting that similarly to the growth of total number of donors there is also an increase of number of donors per thousand people: if in 2008 it was 9, in 2009 it increased to 14 per thousand people, and in 2011 there is a stabilization and a certain increase of donors, to 15 donors per thousand people.

From 2008 to 2009 number of primary donors decreased from 44% to 41% of the total number of donors correspondingly. Then, in 2010 there is a significant growth of primary donors up to 51% of the total number of donors. In the following years a tendency towards decrease is seen in 2012 to 33% (Figure 3).

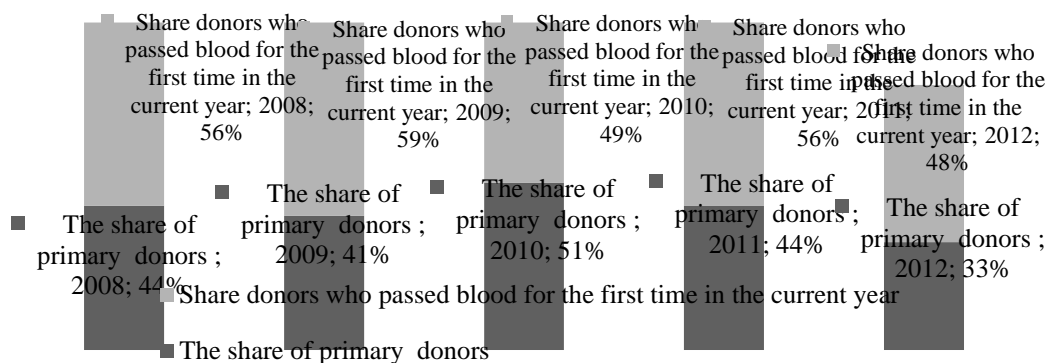


Figure 3- Composition of donors in Pavlodar region over 2008-2012

The above chart also shows that there is a decline of first applying donors from 56% of the total number of donors in 2008 to 49% in 2010, then there is a growth of donors to 56% in 2011, and in 2012 – maximal fall to 47,9%. Such unsteady requests of people for blood donation indicates inadequate agitation educative activities among population while improved facilities of PRBC allows for safe and more comfortable blood donation.

Over five years, PRBC observed 50,836 donors, where men were 68,7% (34,918 people), and women – 31,2% (15,854 people). Data according to years are illustrated in Figure 4.

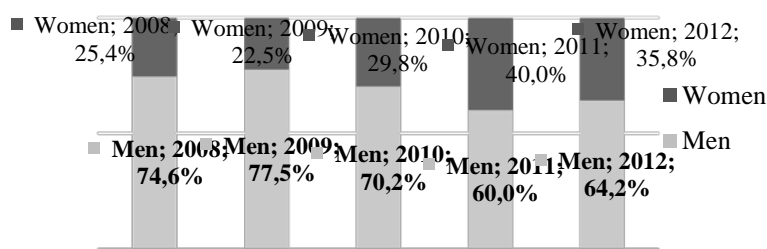


Figure 4 – Ratio of men and women over 2008-2012

Data illustrated in the chart above (Figure 4) show that there is a tendency to reduction in the share of male donors and growth of female donors, especially in 2011 (40%).

As for age of donors, maximum percent – 69, 3% - is the age between 18 and 39. Donors from 40 to 59 years old account for 30,7%. See ratio of age groups in Table 1.

Table 1. Ratio of different age groups among donors over 2008-2012

Age	Year									
	2008		2009		2010		2011		2012	
	n	%	N	%	n	%	n	%	n	%
18-29	3324	46,5	4781	44	4214	41,6	4352	38,2	3311	29,3
30-39	1794	25,1	2934	27	2735	27	3737	32,8	3955	35
40-49	1380	19,3	2162	19,9	2056	20,3	2518	22,1	2938	26
50-59	650	9,1	989	9,1	1124	11,1	786	6,9	1096	9,7
<b>Total:</b>	<b>7148</b>		<b>10866</b>		<b>10129</b>		<b>11392</b>		<b>11301</b>	

Data in Table 1 show that if in initial for our research 2008 young donors from 18 to 39 accounted for 71,6%, donors of senior age group – from 40 to 60 years – 28,6%, and the biggest part – 46,5% - accounted for people between 18 and 29, then by 2012 share of donors from 18 to 29 years decreased to 29.3%, senior age group increased to 35,7% of the total number of donors. There is no doubt that positive factor is steady growth of donors' share from 30 to 39 years old, which in recent years reached 35%.

It is interesting to note change in characteristics of social structure of donors. Distribution of donors by social sign is represented in Table 2.

Table 2. Distribution of donors in Pavlodar region by social sign over 2008-2012

Social group	Year									
	2008		2009		2010		2011		2012	
	n	%	N	%	n	%	n	%	n	%
Worker	4003	56	5498	51	5510	54,4	5252	46,1	5707	50,5
Employee	1272	18	1282	12	1935	19,1	2028	17,8	2712	24
Student	829	12	2195	20	1165	11,5	1857	16,3	1367	12,1
Retiree	43	0,6	33	0,3	20	0,2	11	0,1	45	0,4
Unemployed	643	8,7	1021	9,4	891	8,8	2119	18,6	870	7,7
Serviceman	172	2,4	348	3,2	324	3,2	57	0,5	203	1,8
Other	186	2,6	489	4,5	284	2,8	68	0,4	396	3,5
<b>Total:</b>	<b>7148</b>		<b>10866</b>		<b>10129</b>		<b>11392</b>		<b>11301</b>	

As it is seen from Table 2, the biggest percent of donors are workers (51,6%) and employees (18,18%), the smallest percent falls to the retired (0,32%). Socially disadvantaged group of donors – the unemployed – were observed in 10,6% of cases. Number of rural dwellers among donors in average over five years is 18,7%, and urban dwellers – 81,30% (Figure 5).

Increase in the number of donors certainly increases the total number of blood donations in Pavlodar region. Thus, from 2008 to 2012, number of donations increased from 9,790 to 12,053, that is, by 1,2 times. See the monitoring of donations over five years in Figure 5.

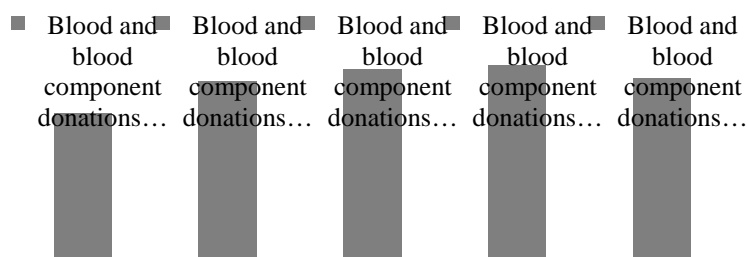


Figure 5 – Monitoring of donations in PRBC over five years

The number of donations per thousand people increased from 13, 2 per thousand people to 16 per thousand people and in average accounted for 15, 9 per thousand people (Figure 6).

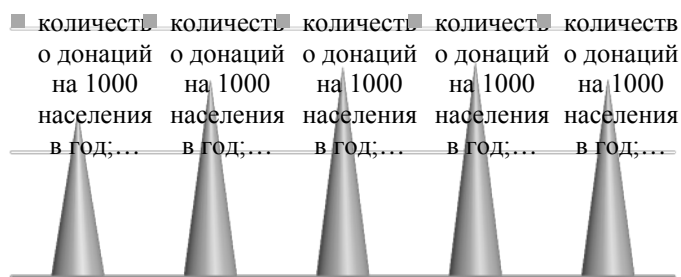


Figure 6- Number of donations per thousand people a year

The number of free donations increases annually while percentage of paid donations by 2012 decreased from 28,6% in 2008 to 17,3% (Figure 7).

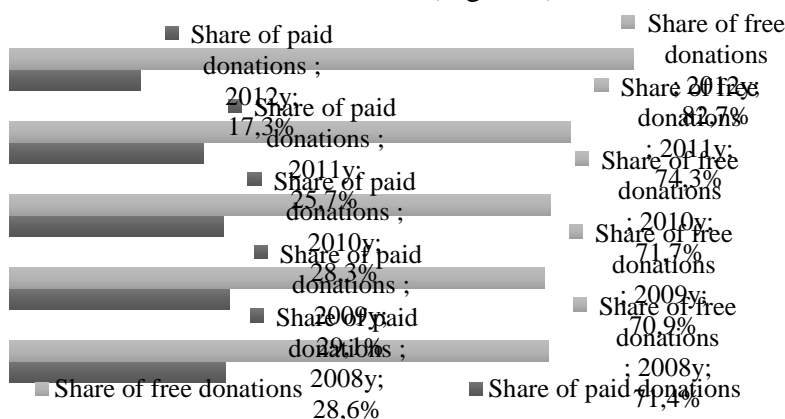


Figure 7- Ratio of paid and voluntary donors

The growth of free donations is conditioned upon donating relatives. In average, share of free donations accounts for 74,3% of all blood donations, where share of free donations from relatives of recipients is 55,9% and voluntary free donations only accounts for 18,4%, which is by 7,3% less than paid donations.

### Discussion of results

Over the years of observation there was a significant change both in the number and structure of donors in Pavlodar region: number of donors seems to increase, similar to the growth of the total number of donors, the number of donors per thousand people has increased. In spite of the fact that the number of donors increases and, correspondingly, the number of blood donations per thousand people increases, in average accounts for 15,9 per thousand people, which is a low indicator in comparison to WHO data. The level of donation recommended by World Health Organization for self-sufficiency of a country requires for 40-60 donations per thousand people<sup>5</sup>. In Kazakhstan, this rate is 18 per thousand people. For comparison: in the USA, this rate is 109 per thousand people, Denmark – 67 per thousand people, Germany – 52 per thousand people, Russia – 25 per thousand people<sup>1</sup>.

The positive fact shall be a steady growth of share of donors from 30 to 39 years old, reaching 35% in the recent years. This increase directly correlates to similar steady growth of donors from among workers (51, 6%) and employees (18, 18%) with predominance of urban dwellers (81,30%). Socially disadvantaged group of donors – the unemployed - were observed in average in 10, 6% of cases without upward trend.

According to WHO recommendations, voluntary free donor is “the gold standard”, and donors having financial or other interest are in theory potentially dangerous category<sup>6</sup>. According to results of the research, the number of free donations annually increases and

accounts for 74,3% of all blood donations while percentage of paid donations by 2012 decreased from 28,6% in 2008 to 17,3%. The growth of free donations is provided due to donating relatives of recipients and equals 55, 9%. Free voluntary donations account for 18, 4%, which is by 7, 3% less than paid donations. According to global WHO data base, 94% of blood collected in countries with high level of income is donated on free basis, and 43% of blood in countries with low and medium level of income is paid or donated from relatives<sup>7</sup>.

### **Conclusion**

Thus, despite the increasing number of donors and, correspondingly, increasing number of blood donations per thousand people, in average, the number of donations equals 15,9 per thousand people which is a low rate compared to WHO data. The growth of free donations is provided by donating relatives of recipients and equals 55, 9%.

### **References:**

- Concept for blood service development in the Republic of Kazakhstan for 2011-2015. Reference No.: 11-3/827-БҮ of: 21/07/2011
- R. Baggaley, et al. “Risk of HIV-1 Transmission for Parenteral Exposure and Blood Transfusion: A Systematic Review and Meta-analysis,” editorial review, AIDS. 20(6) 2006: 805–812.
- The Lancet, “Improving Blood Safety Worldwide,” editorial 370(4) (2007): 361.
- Program on measures for perfection and development of voluntary free donation in the Republic of Kazakhstan for 2011- 2015
- WHO global indicators of blood safety, 2007, Geneva, World Health Organization, 2009
- Developing a legislative framework for the national blood programme. Geneva, World Health Organization, 2010
- P. Carolan, M. Garcia, Gift Blood Is the Safest Blood, Perspectives in Health 10(2) (2005)