

THE PROCEDURE OF FINANCING THE NATIONAL BLOOD SERVICE OF LATVIA

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Abstract

The National Blood Service of Latvia is a set of regional medical institutions and their structural units in Latvia that produce blood components and supply them to medical institutions. The paper characterises the procedures and ways of financing the institutions preparing blood and blood components – the State Blood Donors Centre and the Blood Establishments – that are included in the National Blood Service of Latvia and analyses their cash flow and changes in it during the period 2005-2010. Hierarchically, the State Blood Donor Centre and the Blood Establishments, in which the holder of share of capital stock is the Latvian Ministry of Health, are at the same level of subordination to the Ministry. Yet the procedures of financing the institutions included in the Service are different and the State Blood Donor Centre Statute stipulates that the State Blood Donor Centre methodically manages, organises, and coordinates the production of blood components and supplies them to medical institutions on request, except the medical institutions having their own blood establishment.

The monographic and descriptive methods are used to study elements of problems and to synthesize interrelationships or formulate correlations. The inductive method was applied to make general conclusions from several facts or to determine correlations. The deductive method, in its turn, was used to logically systematise and theoretically explain empirical research results. The methods of analysis of balance sheet and financial indicators were applied to assess funding allocated to the organisations that are studied and its use efficiency. It was examined by a disperse analysis whether the funding allocated to preparing blood and blood components differs in various regions of Latvia.

In the final part of the research, the authors draw several conclusions on the procedures of financing the regional system of the National Blood Service of Latvia which was affected by both the overall economic situation in Latvia and the structural optimisation of the Service in 2006. The optimisation was based on the „Conception for Optimising the Structure and Operational Principles of the National Blood Service of Latvia in 2006-2010” developed for the State Blood Donor Centre. The change in the system of financing has especially affected the cost of producing blood and its components, as since 2010 the State Blood Donors Centre differentiates funding for the Blood Establishments according to the quantity of blood produced. At the same time, the agreements made between the State Blood Donors Centre and the BEs stipulate particular quantities of blood to be produced. It means that the output of blood at the Blood Establishments is limited; otherwise the medical institution, to which a particular Blood Establishment is subordinated, has to pay for the excess quantity of blood. Given the fact that a single system of distributing blood and its components exists in Latvia, such a model of financing is inefficient, as it does not allow production of blood in towns where more blood donors are available.

Key words: National Blood Service of Latvia, financing.

Introduction

The National Blood Service of Latvia (hereinafter – the NBSL) is a set of regional medical institutions and their structural units in Latvia that produce blood components and supply them to medical institutions. The regional system of the NBSL includes the State Blood Donor Centre (hereinafter – the SBDC) with its affiliate in Rēzekne, the Blood Establishments of 9 hospitals (hereinafter – the BEs), the performance of which is stipulated by their agreements with the SBDC, and the Blood Offices of 32 hospitals (hereinafter – the BOs) in all the regions of Latvia that function as suppliers of blood and its components (*SBDC, 2007*).

The basic function of the SBDC is to organise and coordinate the supply of blood components, which meet the quality standards, to medical institutions, therefore, government budget funds are allocated to the following activities:

- preparation of blood and its components;
- laboratory tests for blood of donors;
- quality control of blood components;

- immunity and haematological compatibility tests;
- administration of expenditure on the BEs of medical institutions;
- purchase, storage, and dissemination of blood plasma;
- maintenance of the single information system of the NBSL;
- blood gravity surgical services.

Hierarchically, both the SBDC and companies (medical institutions which include the BEs and the BOs), in which the holder of share of capital stock is the Latvian Ministry of Health, are at the same level of subordination to the Ministry. Yet the SBDC Statute stipulates that the SBDC methodically manages, organises, and coordinates the production of blood components and supplies them to medical institutions on request, except the medical institutions having their own blood establishment (*SBDC Statute, 2005*). Besides, the SBDC finances several costs related to blood preparation at the BEs. The **research aim** is to investigate and analyse the procedure of financing the institutions producing blood and its components that are included in the NBSL. The following **research tasks** are set forth to achieve the aim:

1. To investigate and analyse the procedure of financing the SBDC and the BEs;
2. To investigate and analyse the cash flow of the SBDC.

Research methods used:

The monographic and descriptive methods as well as analysis and synthesis are used to study elements of problems and to synthesize interrelationships or formulate correlations. The inductive method was applied to make general conclusions from several facts or to determine correlations. The deductive method, in its turn, was used to logically systematise and theoretically explain empirical research results. The methods of analysis of balance sheet and financial indicators were used to assess funding allocated to the organisations that are studied and its use efficiency. It was examined by a disperse analysis whether the funding allocated to preparing blood and blood components differs in various regions of Latvia.

Financing of the SBDC and its procedure

The SBDC is an institution directly subordinated to the Latvian Ministry of Health, the performance of which is financed from the government budget.

Any annual budget of the SBDC is set by a respective calendar year's Latvian law "On the Government Budget for the Year XX".

Table 1. SBDC funding for 2005–2010

| Year | | Budget subsidy LVL | Own income LVL | Total LVL | Change in budget against previous year, % |
|-------|---------|--------------------|----------------|-----------|---|
| 2005* | Planned | 4555461 | 105878 | 4661339 | - |
| | Real | 4233323 | 106460 | 4556043 | - |
| 2006* | Planned | 4368815 | 77000 | 4565339 | -2.06 |
| | Real | 4446277 | 121135 | 4598672 | +0.93 |
| 2007* | Planned | 7506656 | 144000 | 7650656 | +67.58 |
| | Real | 7506656 | 141323 | 7735508 | +68.21 |
| 2008 | Planned | 8314563 | 141000 | 8455563 | +10.52 |
| | Real | 8314563 | 141000 | 8455563 | +9.3 |
| 2009 | Planned | 6643913 | 141000 | 6784913 | -19.76 |
| | Real | 6703913 | 120395 | 6824308 | -19.3 |
| 2010 | Planned | 6019106 | 141000 | 6160106 | -9.21 |
| | Real | 6219106 | 177299 | 6396405 | -6.27 |

*in addition to the government budget funding, funds from the ERDF were obtained.

Source: developed by the authors according to the SBDC's balance sheets from 2005 to 2010

For instance, in accordance with the law "On the Government Budget for the Year 2010", the SBDC budget for 2010 was made of the subprogram "Provision of Blood and Blood Components" under the government budget program "Provision of Specialised Health Care" (Republic of Latvia

Saeima, On the Government Budget for the Year 2010). The amount of funding allocated from the government budget as well as its percentage change, compared to a previous year, for the period 2005-2010 are presented in Table 1.

According to Table 1, the amount of funding allocated to the SBDC from the government budget was volatile during the recent five years – from a 71.82% increase in 2007 compared to 2006 to a gradual reduction in the funding in 2009 and 2010. These sharp changes in budget funds do not allow rational and prudent investments in developing the infrastructure for testing, preparing, and storing blood and its components, as it is not possible to plan the amount of funds for a next year.

The indicators of asset turnover of the SBDC – asset turnover ratio (hereinafter – ATR), fixed asset turnover ratio (hereinafter – FATR), as well as current asset turnover ratio (hereinafter – CATR) in the period from 2005 to 2010 (see Table 2) show whether the funding allocated to the SBDC is efficiently used.

Table 2. Indicators of SBDC performance efficiency in the period 2005-2010

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|------|------|------|------|------|------|------|
| ATR | 1.8 | 1.5 | 1.8 | 2.16 | 2.11 | 1.8 |
| FATR | 4.1 | 3.9 | 4.25 | 4.31 | 3.74 | 3.8 |
| CATR | 2.1 | 1.17 | 3.02 | 4.33 | 4.92 | 3.5 |

Source: developed by the authors according to the SBDC's financial management reports on performance results

The ATR shows how efficiently assets are used regarding net turnover, i.e. how many times a full cycle of production and turnover is done. Given the specifics of SBDC performance, one can consider that the SBDC performance is efficient, as its assets make a full cycle more than once a year. The performance efficiency is also determined by the amount of funding available to the SBDC. Since the SBDC produces blood and its components that are supplied to Latvia's medical institutions free of charge, the performance of the SBDC fully depends on the amount of funding allocated from the government budget. Its own revenues, which are laboratory tests for compensation, are relatively small.

Financing of the BEs and its procedure

Until 2006, the BEs of medical institutions were financed only from the funding allocated to these medical institutions. Such a system of financing was recognised as inefficient, as it could not provide adequate technological and medical conditions for producing blood in the entire NBSL. Based on the „Conception for Optimising the Structure and Operational Principles of the National Blood Service of Latvia in 2006-2010”, the procedure of financing was also changed (*SBDC, Conception for Optimising the Structure and Operational Principles of the National Blood Service in 2006 - 2010*).

Based on European Parliament and Council Directive 2002/98/EK (27 January 2003) that stipulates the quality and safety standards concerning preparing, testing, processing, storing, and distributing human blood and its components, the SBDC elaborated the „Conception for Optimising the Structure and Operational Principles of the National Blood Service of Latvia in 2006-2010” which included a new

procedure of financing the BEs, and their number was reduced from 18 to 8.

When making a decision on optimising the NBSL's structure and elaborating a conception for optimising the performance and structure of the National Blood Service of Latvia, the following factors as the main prerequisites for planning optimal locations of the NBSL in the country were examined: population density, locations of medical institutions in the country, availability of information technologies in accordance with the possibilities provided by the National Program's project "Establishment of a Single Information System for the National Blood Service of Latvia", and establishment of BEs in geographically advantageous locations in Latvian regions. As a result, by approving the optimisation of the NBSL's structure, a decision was made to retain 10 BEs instead of 8 with the same funding approved, which reduces the available funds of any BE to cover its maintenance costs by 20%.

The Conception envisaged allocating LVL 347840 to 8 BEs of the SBDC (BEs at Vidzeme Hospital, hospitals in the towns of Daugavpils, Jelgava, and Kuldīga, Liepāja Regional Hospital, Hospital No.1 in Rīga, Clinical University Hospital Gaīļezers, P.Stradiņš Clinical University Hospital) from the government budget to cover their maintenance costs. Yet by starting implementing an EU SF project "Establishment of a Single Information System for the National Blood Service of Latvia", it was decided to retain 10 BEs with the same funding (BE of Northern Kurzeme Regional Hospital located in Ventspils and the BE of Jēkabpils Regional Hospital).

Based on the amount of funding allocated to the SBDC, any BE spent LVL 3623.30 a month in 2006, including:

1. personnel cost – LVL 3350.43;
2. cost of premises, including electricity, heating, water/sewage, waste removal, security, deratization, goods for cleaning – LVL 160.67;
3. transportation cost – LVL 112,20.

Table 3. Funding allocated for maintaining one BE in 2006-2009, LVL

| Funding allocated | 2006 | 2007 | 2008 | 2009 |
|------------------------------|----------|----------|----------|----------|
| Salaries | 32163.6 | 50046.6 | 50046.6 | 45041.76 |
| Maintenance cost of premises | 1542.00 | 2399.16 | 2399.16 | 2159.28 |
| Transport cost | 1078.44 | 1678.08 | 1678.08 | 1510.32 |
| Total | 34784.04 | 54123.84 | 54123.84 | 48711.36 |

Source: developed by the authors according to the SBDC's financial reports for 2006-2009

With the economic situation improving in the country, and due to the fact that two additional BEs were included in the NBSL, the Latvian Ministry of Health made a decision to allocate additional LVL 193398 in 2007 to cover the costs of the BEs, thus raising the available funding to LVL 541238. The BEs funding remained unchanged in 2008 and in the three first months of 2009, but with the economic situation worsening, the BEs funding was reduced by 10% in April of 2009. The BEs funding in the period 2006-2009 is presented in Table 3.

The SBDC changed the procedure of financing the BEs in 2010, differentiating the funding according to the quantity of blood produced. Besides, the BEs maintenance costs were differentiated after the State Audit Office of Latvia pointed to it for the second time.

As stipulated in the agreements between the SBDC and the BEs, medical institutions are covered the cost incurred due to preparing blood for the country's needs from the government budget every month, but not more than it is stipulated in the agreement's paragraph concerning maintenance cost that is computed individually for each BE since 2010. Based on an analysis of the SBDC, the maintenance cost that consists of salaries and state compulsory social insurance contributions, maintenance cost for premises, and transport cost is differentiated for each BE.

Given the blood production plan for a calendar year, the BEs are classified into 3 groups (see table 4):

- Large BEs – their blood production plan is from 1400 to 2000 litres a year (BE of P.Stradiņš Clinical University Hospital, Gaīļezers BE of Rīga Eastern Clinical University Hospital, and the BE of Daugavpils Regional Hospital).
- Medium BEs - their blood production plan is from 900 to 1000 litres a year (BEs of Vidzeme Hospital, Liepāja Regional Hospital, and Jelgava Hospital).
- Small BEs - their blood production plan is from 650 to 700 litres a year (BEs of Kuldīga Hospital, Northern Kurzeme Regional Hospital, and Jēkabpils Central Hospital)

Table 4. Grouping of the BEs in Latvia since 2010

| Criterion | Large BEs | Medium BEs | Small BEs |
|--|-------------|------------|-----------|
| Blood production plan (litres) for a calendar year | 1400 - 2000 | 900 - 1000 | 650 - 700 |
| Average number of employees | 12 | 7 | 6 |

Source: developed by the authors according to information of the SBDC's Department of Planning and Economy

Any group of personnel (doctors, junior personnel, paraprofessionals, and others) in each group of BEs has a certain number of employees:

- Large BEs – 12 employees (2 doctors, 7 medical paraprofessionals, 2 junior medical employees, and 1 – others).
- Medium BEs – 7 employees (1 doctor, 4 medical paraprofessionals, 1 junior medical employee 1 – others).
- Small BEs – 6 employees (1 doctor, 3 medical paraprofessionals, 1 junior medical employee 1 – others).

The SBDC computes the amount of salaries for any group of medical personnel in each group of BEs (it is not lower as stipulated by Paragraph 180 of the Cabinet's of Ministers 19 December 2006 Regulation No.1046 "Procedures of Organising and Financing Health Care") by multiplying an average monthly wage by an average number of employees in a personnel group (doctors, junior personnel, paraprofessionals, and others). The state compulsory social

insurance contributions of personnel are also computed by this institution.

An average monthly expenditure on transport for a BE is obtained by summing up the respective expenditure of all the nine BEs for the previous calendar year and dividing by the number of BEs and the number of months a year.

An average monthly expenditure on maintenance of premises per BE is obtained as follows:

- average expenditure on maintenance of premises of a BE per square meter is computed, and the available monthly funding for covering maintenance cost is divided by the floor area of premises of all the nine BEs;
- average expenditure on maintenance of premises per square meter is multiplied by the floor area of premises of each BE.

Thus, the BEs are financed from two sources – the SBDC's budget and the medical institution's budget. The medical institution covers the cost of its BE that is related to infrastructure (premises, equipment etc.), human resources, and other costs (administration of its BE etc.).

Since the funding of all the BEs was equal until 2010, a significant difference is observed in the part of funding that is spent on preparing blood and its components.

Table 5. Percentage distribution of the funding for the BEs in 2006-2010

| Region | Costs | 2006 | 2007 | 2008 | 2009 | 2010 |
|---------|------------------------|---------|---------|---------|---------|---------|
| Rīga | maintenance | 57,35% | 66,50% | 67,57% | 72,65% | 76,73% |
| | compensation for blood | 42,65% | 33,50% | 32,43% | 27,35% | 23,27% |
| | Total | 100,00% | 100,00% | 100,00% | 100,00% | 100,00% |
| Vidzeme | maintenance | 76,94% | 80,11% | 78,43% | 79,47% | 79,50% |
| | compensation for blood | 23,06% | 19,89% | 21,57% | 20,53% | 20,50% |
| | Total | 100,00% | 100,00% | 100,00% | 100,00% | 100,00% |
| Kurzeme | maintenance | 81,13% | 84,84% | 82,18% | 82,74% | 84,62% |
| | compensation for blood | 18,87% | 15,16% | 17,82% | 17,26% | 15,38% |
| | Total | 100,00% | 100,00% | 100,00% | 100,00% | 100,00% |
| Zemgale | maintenance | 81,50% | 84,67% | 81,98% | 83,27% | 84,41% |
| | compensation for blood | 18,50% | 15,33% | 18,02% | 16,73% | 15,59% |
| | Total | 100,00% | 100,00% | 100,00% | 100,00% | 100,00% |
| Latgale | maintenance | 70,03% | 74,95% | 83,92% | 74,96% | 79,91% |
| | compensation for blood | 29,97% | 25,05% | 16,08% | 25,04% | 20,09% |
| | Total | 100,00% | 100,00% | 100,00% | 100,00% | 100,00% |

Source: developed by the authors according to information of the SBDC's Department of Planning and Economy

After analysing the percentage distribution of the BE funding during the period from 2006 to 2010 (see Table 5), the authors concluded that in general, the cost of preparing blood and its components accounts for only 20% of total cost, the other costs (approximately 80%) consist of expenditures on maintenance of a BE, which includes salaries, maintenance of premises, and transport. Respectively, the SBDC started a more rational use of the budget when made a decision on differentiating the funding for each BE; as a result, the total

funding intended for the BEs was reduced by 10% or LVL 48711 since 2008.

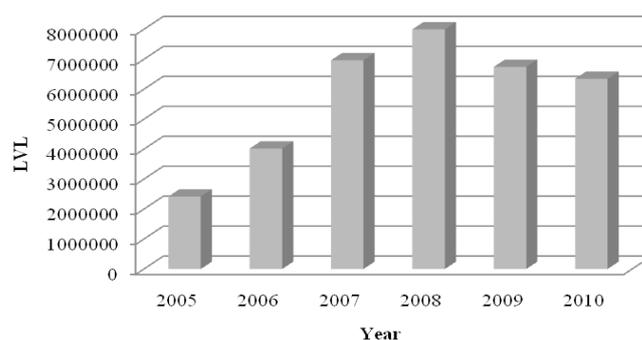
The authors did a dispersion analysis to ascertain whether the funding allocated to producing blood and its components significantly differ among the regions of Latvia. To assess the result gained, the significance level was assumed $\alpha = 0.05$.

When computing, it was found that the funding allocated to producing blood and its components do significantly differ among the regions of Latvia ($p = 0.0000086 < \alpha = 0.05$).

As of 1 March 2011, the funding is not individually allocated to the BEs and the BOs; they are financed from each medical institution's budget that is also financed from the national government budget. Besides, the BEs are also additionally financed from the SBDC, the cooperation with which is stipulated in agreements. The agreements stipulate the amounts of blood to be produced and the coverage of costs incurred to produce donor blood in accordance with the Latvian law "On the Government Budget for the Year 2010", government procurement orders under the national program "Provision of Specialised Health Care", the Latvian Cabinet's of Ministers Regulation No.1037 "Regulations regarding the Quality and Safety Standards of Collecting, Testing, Processing, Storing, and Disseminating Blood and its Components and the Compensation for Costs Incurred to Restore the Amount of Blood Lost", the Latvian Cabinet's of Ministers Regulation No.138 "Statute of the SBDC", and the technologies approved.

Cash flow of the SBDC

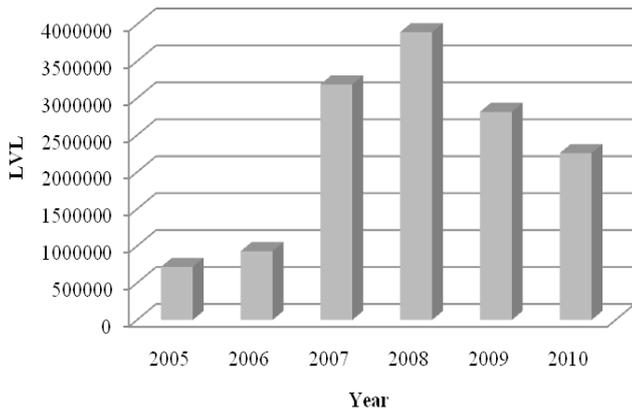
The NBSL's efficiency is also characterised by a rational use of funds. Given the changes in the SBDC budget in the period 2005-2010 (see Table 1), the SBDC has to pay special attention to organising a rational and balanced flow of expenditure. Fig.1 presents the changes in the expenditure on maintenance of the SBDC during 2005-2010, which explicitly shows an increase and a decrease in the cash flow in the respective period.



Source: developed by the authors according to balance sheets of the SBDC for 2005-2010

Fig. 1. Changes in the expenditure on maintenance of the SBDC during 2005-2010, LVL

Fig.1 shows that the overall economic situation affects the changes in the expenditure on maintenance of the SBDC during 2005-2010. During the economic boom, the funding for health care in Latvia sharply increased as well, including that for the SBDC. After a recession started, the funding was reduced for the SBDC, and it did not reach the amount of 2005 in 2010.



Source: developed by the authors according to balance sheets of the SBDC for 2005-2010

Fig. 2. Changes in salaries at the SBDC during 2005-2010, LVL

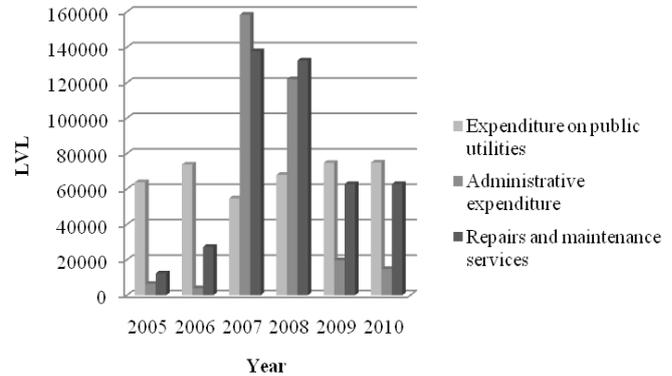
After analysing the SBDC balance sheets for the period 2005-2010, the authors concluded that the largest increase in the SBDC expenditure in 2007 and 2008, when the total funding for the SBDC significantly increased, was on salaries (see Fig.2).

Salaries include also such items of expenditure as premium pay and bonuses (premium pay for night shifts, work under special conditions, etc.) as well as state social insurance contributions paid by employers, social benefits, and compensations. An increase in the expenditure on salaries can be explained by the overall economic situation in Latvia in 2007 and 2008 when wages sharply increased in the private sector, which promoted an increase in salaries in the public sector as well. After the crisis began, salaries and the funding allocated for pay decreased, which is explicitly presented by the data for 2009 and 2010 in Fig.5. It is forecasted that salaries will keep decreasing in 2011 as well, as the total SBDC budget for 2011 was reduced by additional LVL 3.5 million.

The increase in the expenditure on salaries was also determined by the extension of SBDC functions when the institution's structure was reformed and a gradual extension of its administrative and medical functions was started after implementing the conception for optimising this institution. As a result, the NBSL's staff (as well as amount of work) increased in both Rīga and Rēzekne. Such departments as the Department of Public Relations, the Department of Quality Management, and the Department of Labour Safety started operating, while the Departments of Accounting and Information Technology were extended.

The increase in expenditure took place not only due to an increase in salaries. As we can see in Fig.3, prices rose for such items of expenditure as public utilities, administration of the SBDC, repairs, and the institution's maintenance.

The increase in the institution's expenditure on repairs and maintenance services can be explained by the depreciation of buildings and equipment.



Source: developed by the authors according to balance sheets of the SBDC for 2005-2010

Fig. 3. Increase in the expenditure of the SBDC in 2005-2010, LVL

A new item of expenditure emerged since 2006, which required investments in the entire NBSL – information technology services. This item of expenditure was financed, to a great extent, by the European Union Social Fund that invested LVL 220037 (investments and their distribution is shown in Table 6) in the NBSL in 2005 and 2006 under the program for establishing a single information system at the National Blood Service of Latvia.

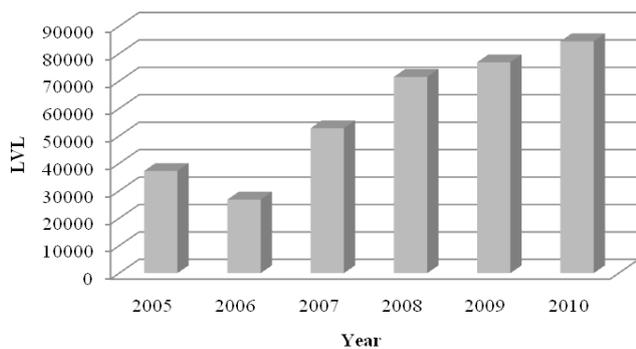
Table 6. Costs of the project of establishing a single information system at the National Blood Service of Latvia

| Indicator | 2005 | 2006 | Total |
|--|--------|--------|--------|
| Total project cost (LVL), of which: | 216260 | 83740 | 300000 |
| Total eligible cost (LVL) | 211500 | 81883 | 293383 |
| EU SF funding requested (LVL) | 158625 | 61412 | 220037 |
| EU SF funding requested as % of total SF funding | 72.09% | 27.91% | 100% |

Source: Public Information Bureau of the State Chancellery, ERDF, 2004

Since 2006 the SBDC invested LVL 166756 in the system's establishment from its own budget.

The increase in costs is determined also by an increase in tax payments paid by the SBDC as a government institution in the period 2005-2010 (see Fig.4). Other items of expenditure can be managed and impacted, whereas this item of expenditure can be hardly impacted, as the national tax system determines it. As we can see in Fig.4, the largest increase in tax payments was observed during the recent years, besides, the annual tax payments continue increasing.



Source: developed by the authors according to balance sheets of the SBDC for 2005-2010

Fig.4. Changes in the tax payments paid by the SBDC as a government institution in 2005-2010, LVL

Changes in the budget of the SBDC as the only medical institution in Latvia that performs various specific operations (for instance, preparation of cryoprecipitate, processing of blood components, apheresis operations for patients etc.) affect the quality and production of blood and its components. These changes affect the entire NBSL, as it not only partially finances the BEs, but also performs various tests on blood and its components that are not performed by the BEs.

To be stable and oriented towards long term development, it is important to the NBSL to plan and take into account its disposable funds, therefore, the health care policy of Latvia has to be based on stability.

Conclusions

1. The amount of funding allocated to the SBDC from the government budget was very volatile in the period 2005-2010. Such changes impact both the planning and production of blood and its components and the overall development of the NBSL.
2. Until 2006 when the „Conception for Optimising the Structure and Operational Principles of the National Blood Service of Latvia in 2006-2010” was implemented, the BEs were financed from the government budget without the SBDC as a mediator. Such a model of financing was regarded as inefficient, as it did not ensure equal – single safety, quality, technological and essential other – standards in blood production at all medical institutions in Latvia.
3. The amount of funding allocated to producing blood components significantly differ among the regions of Latvia.
4. In financing the BEs since 2010, the SBDC differentiates their funding according to the quantity of blood produced. At the same time, the agreements made between the SBDC and the BEs stipulate particular quantities of blood to be produced. It means that the output of blood at the BEs is limited, otherwise the medical institution to which a particular BE is subordinated has to pay for the excess quantity of blood. Taking into account the fact that a single system of distributing blood and its components exists in Latvia, such a model of financing is inefficient, as it does not allow production of blood in towns where more blood donors are available.

5. After the NBSL optimisation conception was implemented, the extension of its functions affects expenditures of the SBDC.

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