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## APPLICATION OF THE PARETO PRINCIPLE IN THE CONTRACTUAL PROCESS FOR ONCOLOGICAL DISEASE

**Darina Mineva**

Headquarters of the National Health Insurance Fund Sofia, Bulgaria, [dariamineva@abv.bg](mailto:dariamineva@abv.bg)

**Abstract:** In the last four years, the National Health Insurance Fund in Bulgaria has found an increase in the cases in which surgery was performed for breast cancer in stage Tis 1-4 N 0-2 M0-1 for which activity was paid.

**Aim:** To analyze the allocation of resources for surgery in breast cancer in Bulgaria, according to the type of ownership of the medical establishments. Define the factors that influence the contracted operative activity in breast cancer. **Methodology:** An analysis of Pareto is applied in the aspect of - concluded contracts of the National Health Insurance Fund with hospitals performing surgery for breast cancer in Bulgaria. Results: Statistics on breast cancer incidence in Bulgaria for the four-year period 2016-2019 are presented (data from the National Health Insurance Fund in Bulgaria). The study covers hospitals in Bulgaria, which in the period 2016 - 2019 were contracted with the National Health Insurance Fund to perform diagnostic and surgical activities for breast cancer (as a diagnostic and therapeutic algorithm, in the form of a clinical pathway "Operationally treatment of stage 2 breast cancer Tis 1-4, N0-2 M0-1 "). One hundred and nineteen contracts were registered for the study period. **Discussion:** According to the Pareto principle, 80% of effects occur due to 20% of actions. It is based on the fact that only a small number of the many possible factors have a major share in the observed impact. 80% of the contractual relations (effect of the contractual process) of the National Health Fund in Bulgaria for breast cancer surgery are with private and university hospitals, district and municipal. A small percentage of contracts have been concluded with specialist hospitals that carry out the entire process of cancer treatment due to the policy of building a health network over the last fifty years of the twentieth century. These include specialist hospitals, comprehensive cancer centers and departmental hospitals. 20% of the hospitals - private and university, district and municipal - form 80% of the contractual relations with the NHIF. These 20% are the most important partners for the fund. They are the reason for the largest volume of contracted activities, respectively the highest costs. **Conclusions:** The factors influencing the quality of the contracting process are the demographic status of the regions and the social status of patients, medical standards, the market for healthcare services with deformed market forces, the ownership of hospitals and the imperfect state regulation. The Pareto analysis identified an ineffective contractual process for breast cancer surgery in Bulgaria, with the market niche of the contracting process being occupied by the private sector and an uneven distribution of resources, leaving regions of the country without access or poor quality care provided by small municipal hospitals. .

**Keywords:** breast cancer, contract, contract process, hospital, form of ownership, breast cancer

### 1. INTRODUCTION

In the last four years the National Health Insurance Fund in Bulgaria finds an increase in the cases in which surgical intervention was performed for breast cancer in stage Tis 1-4 N 0-2 M0-1, by 8% a year and for which the activity was paid .

One of the most important issues for the Health Fund and the healthcare system in Bulgaria is to gain clarity on the organization (allocation) of resources for surgery for breast cancer. The Pareto Chart method is applied as a universal tool for setting priorities, key reasons for the quality of a product / service and its applicability in all spheres of human activity, including healthcare.

### 2. AIM

To analyze the allocation of resources of surgery for breast cancer in Bulgaria, according to the type of ownership of the medical establishments. Define the factors that influence the contracted operative activity in breast cancer.

### 3. METHODS

Attached is an analysis of Pareto in the aspect - concluded contracts of the National Health Insurance Fund with hospitals performing surgery for breast cancer in Bulgaria. Statistical data on breast cancer incidence in Bulgaria for the four-year period 2016-2019 were used (cases reported and paid by the National Health Insurance Fund in Bulgaria).

**4. RESULTS**

The study covers hospitals in Bulgaria, which in the period 2016 - 2019 were contracted with the National Health Insurance Fund to perform diagnostic and surgical activities for breast cancer (as a diagnostic and therapeutic algorithm, in the form of a clinical pathway "Operationally treatment of breast cancer stage Tis 1-4, N0-2 M0-1 "). 119 contracts were registered for the study period (Table 1).

*Table 1 Number of contracts concluded for the period 2016 - 2019. "*

Surgical Contracts for Breast Cancer	Type of hospital / property							Total
	Complex Oncology Center	Private	University	Specialized	Regional	Municipal	Departmental	
	7	39	24	10	17	16	6	119

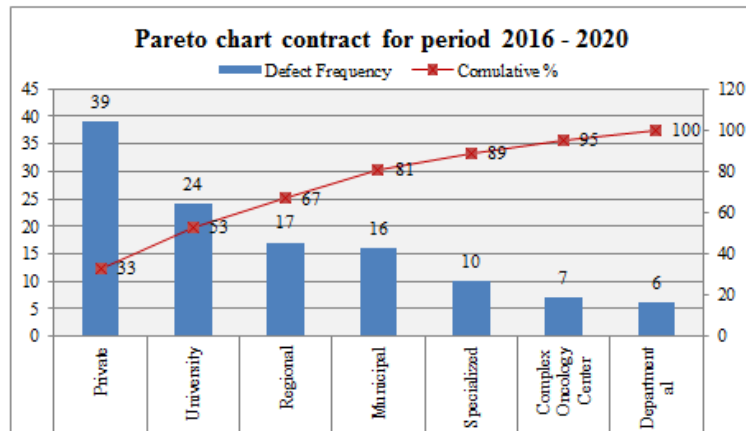
The Pareto method analysis is based on a contractual relationship based on the type of ownership of a hospital. Diagnostic activity (biopsy) and surgery for breast cancer are performed in hospitals with different ownership: private, university, regional, municipal, specialized, complex oncology center and departmental property. A table is created to build the Pareto diagram. The table contains the parameters: frequency, cumulative frequency, percentage and cumulative percentage by type of hospital ownership, for the period 2016 - 2019 (Table 2).

*Table 2 Table for constructing the Pareto diagram*

№	Part Number (Type of hospital / property)	Defect Frequency	Comulative Amount	%	Comulative %
1	Private	39	39	33	33
2	University	24	63	20	53
3	Regional	17	80	14	67
4	Municipal	16	96	14	81
5	Specialized	10	106	8	89
6	Complex Oncology Center	7	113	6	95
7	Departmental	6	119	5	100
	Total	119		100	

Part Number (ownership attribute) should be understood as the attribute of the analysis, in this case hospital ownership. In the material production, this column records the defects of production, which were determined in advance by the techniques of brainstorming and control charts. The property type parameter was chosen because of the restructuring of the healthcare market in Bulgaria. The number of contracts is represented in the Defect Frequency column and the other columns represent the cumulative frequency, percentages, and cumulative percentages required to draw up the Pareto chart. Using Defect Frequency and Cumulative% data, a histogram (Figure 1) is compiled using Microsoft Excel, which is a Pareto diagram.

*Figure 1 Pareto contract diagram*



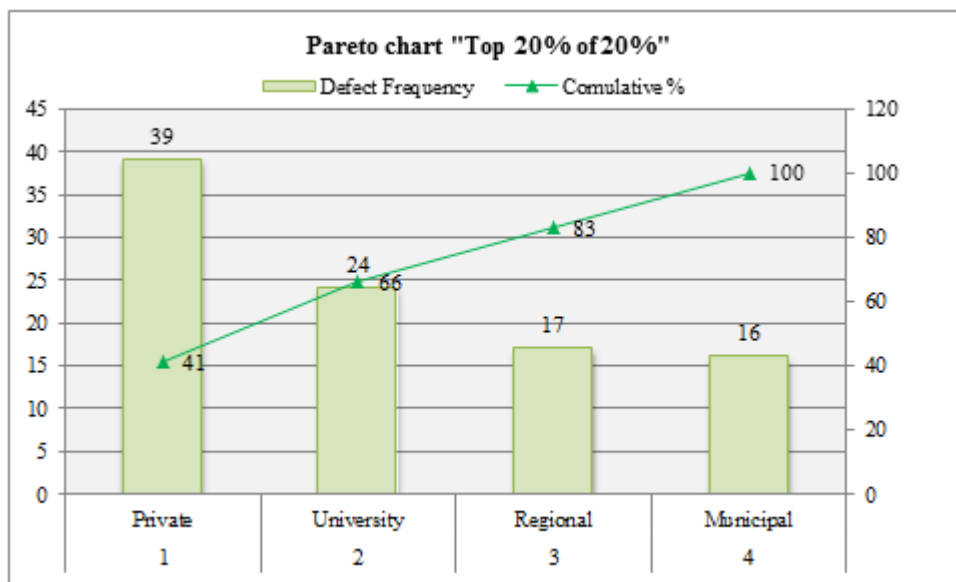
80% of breast cancer surgery contracts are formed by private, university, district and municipal hospitals. It is clear from the chart that they are "these most important" 20% of hospitals' contracts as partners of the national fund. They have different forms of ownership: private ownership, university hospitals (multi-profile state), district hospitals (multi-profile state-owned hospitals) and municipal hospitals (municipal ownership). These types of hospitals are not narrowly profiled for the treatment of cancer. Based on these 20%, a Pareto chart is drawn up again to find which of these 20% are most important. A Pareto chart for the top 20% is compiled (table 3).

**Table 3 Pareto chart to creation chart for top 20%**

№	Part Number	Defect Frequency	Comulative Amount	%	Comulative %
1	Private	39	39	41	41
2	University	24	63	25	66
3	Regional	17	80	17	83
4	Municipal	16	96	16	100
	Total	96			

Using the data in Table 3, a Pareto chart is again drawn up to find the most important 20%.

**Figure 2 Pareto diagram for the contracts "Most important 20% of 20%"**



In the most important 20% of the 20% of breast cancer operating contracts are formed by private and university hospitals. Municipal hospitals have a small percentage of contracts. District hospitals are on the verge of being 83% of the communal percentage.

## 5. DISCUSSION

According to the Pareto principle, 80% of effect / result occurs due to 20% of actions. Few of the many possible factors have a major share in the impact observed. For example: in the production of tangible goods, 20% of all types of defects lead to 80% of costs.

In the study, 80% of the contractual relations (the result of the contractual process) of the National Health Fund in Bulgaria for breast cancer surgery are with private and university hospitals, district and municipal. A small percentage of contracts have been concluded with specialist hospitals that have been set up to carry out the entire process of cancer treatment and which is due to the policy of building a health network over the last fifty years of the twentieth century. These include specialist hospitals, comprehensive cancer centers and departmental hospitals.

**20% of the hospitals - private and university, district and municipal - form 80% of the contractual relations with the NHIF. These 20% are the most important partners for the fund. They are the reason for the largest volume of contracted activities, respectively the highest costs.**

This fact implies the concentration of material, human and financial resources (equipment, equipment) in these hospitals, which make up 20% of the contractual relationship. As the most important contracting partners of the national health fund, they should provide the highest volume of health services in the country, of the highest quality and, accordingly, receive the highest revenue from the financial resources of the national fund. Specialized oncology hospitals remain beyond these 20%. Therefore, there is an imbalance in the allocation of resources in the hospital sector and an imbalance in the contracting process (the health activities that the national fund buys). The reason is the cardinal reform that took place in the health sector in 1999-2000.

With the change of the Semashko health model to the Bismarck type and the introduction of the contractual beginning, a market for health services has emerged. The idea was to compete between healthcare institutions in the healthcare market, with which to achieve better quality of health services. Structures of treatment establishments with different forms of ownership, including private ones, were formed.

Although the health market is shaped by functioning as markets in other economic sectors, its appearance has changed to resemble the contractual relationships represented in Figures 1 and 2 - an increasing share of private and university structures at the expense of district and municipal hospitals. The reasons are due to several characteristics of the health service - *indirect demand, degree of state intervention, threshold of entry into the system.*

Patients seek health but receive it indirectly by purchasing medical care, which is the real object of demand. Due to asymmetries in information, medical care does not always meet the patient's real needs.

For business, the entry threshold is low, requiring a mandatory minimum. In healthcare, the requirements are higher because of the subject of activity. *Ownership of the means of production implies an endeavor to generate profit.* State regulation is necessary to guarantee health as a public good. It is implemented through the requirements of the National Health Fund for contracting with medical practices, based on standards that are unreliable and formally adhered to.

The demographic situation, which is characterized by low birth rates, high mortality and depopulation of the regions, due to the economic reasons that have occurred in the last thirty years in Bulgaria, has an indirect influence on the uneven "dissipation" of contractual relations. There is a tendency to concentrate health system resources in major cities at university and private hospitals. District and municipal hospitals are contracting more activities exceptionally due to lack of doctors, nurses and equipment. More difficult implementation of new technologies, which requires capital investment and which is related to the type of ownership: mixed - state and municipal or municipal. There is a tendency for hospitalization of patients with chronic nonspecific diseases, which are a major feather in the revenues of these hospitals. For oncological diseases, where complex (comprehensive) treatment is required, the availability of contracts with the national health fund implies the provision of a small volume of lower quality medical services than hospitals.

## 6. CONSEQUENT

Analysis of the contractual process for the diagnostic and surgical treatment of breast cancer shows that it is scattered, ineffective, could not guarantee the quality of medical activities, and overall the contractual process itself is of poor quality.

The factors that affect the quality of the contracting process, not only as medical matter but also as a management tool, are:

- Demographic factors of the regions and the social status of the patients .;
- Стандарти Medical standards;
- Health services market with deformed market forces;
- Form of ownership;
- State regulation.

## 7. CONCLUSION

By Pareto analysis, an ineffective contractual process for the operation of breast cancer surgery in Bulgaria was identified, with the market niche of the contracting process being occupied by the private sector and uneven distribution of resources, leaving regions of the country without access to or poor quality care provided by small municipal hospitals.

**REFERENCES**

- Жеков, А., (2016), „Фундаментални разлики между здравния и класическия мениджмънт“, Социална медицина, 1 стр. 39-41
- Муромцев, Д.Ю., Тюрин, И.В. (2015), „Управление качеством электронных средств“ Часть 1: Учебное пособие, Изд. ТГТУ
- Пономарев С.В., (2012) Управление качеством процессов и продукции книга 2, ISBN 978-5-8265-1133-6 Изд-во, ФГБОУ ВПО «ТГТУ», 2012. – 212 с.
- Пономарев С.В., Мищенко С.В., Герасимов Б. И., Трофимов А. В. (2005), „Квалиметрия и управление качеством. Инструменты управления качеством“ ISBN 5-8265-0436-6, Учебное пособие, Тамбов: Изд-во Тамб. гос. техн. ун-та, 80 с.
- Ричард, К., (n.d.) Принципът 80/20, CIIS е запазена търговска марка на Локус Пъблишинг ЕООД. [www.locus-publishing.com](http://www.locus-publishing.com)
- Чапелу, Д., (2019) , Принцип на Парето, <https://www.investopedia.com/terms/p/paretoprinciple.asp>  
<https://magnifisonz.com/2018/07/14/>
- Штефан, Ю.В. & Зорин, В. А., (2017), „Методи выявяления и оценки рисков в дорожном строительстве и машиностроении“, ISBN978-5-7962-0229-6МАДИстр- 108 - 113  
<https://mybloomingbiz.com/how-to-harness-and-effectively-use-the-pareto-principle-to-improve-your-life/>, 2018  
<https://in-business.org.uk/pareto-principles-and-the-pareto-principles-in-business>, 2017  
[http://diliev.com/Home/materiali/KNEA/Conspect\\_KNEA.pdf](http://diliev.com/Home/materiali/KNEA/Conspect_KNEA.pdf)  
<http://tuj.asenevtsi.com/TQM2009/TQM030.htm>  
<https://static1.squarespace.com/static/55dbfccee4b08731143170b6/t/599c86fe15d5dbfca07ccb97/1503430398731/The+80-20+Manager+-+Richard+Koch.pdf> 2014