

SURGICAL TREATMENT OF BREAST CANCER – A STUDY ON THE MARKET SEGMENT OF THE PRIVATE SECTOR IN BULGARIA

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Abstract: This article **aims** to explore the market segment of private hospitals in Bulgaria, providing operational activities to health insured persons on the occasion of breast cancer. **Methodology:** the Pareto principle. **Results:** Thirty-nine private hospitals were studied in the following aspects: concluded contracts with the health insurance fund for treatment of breast cancer and volume of operative activity. **Discussion:** Contracts between private hospitals and the health fund for breast cancer surgery account for thirty-three percent and their activity for sixteen percent of other hospitals. Applying the Pareto principle, it was found that twelve hospitals, from university cities, make up twenty percent of the vital few where the activity is concentrated. Twenty-seven hospitals make up eighty percent with an operating volume between one and ninety operations. The most important "twenty percent of twenty percent" for breast surgery are formed by private hospitals in university cities. Eighty percent are hospitals that have performed about one hundred or one hundred and twenty surgical interventions in the four-year period, which corresponds to thirty operations per year or two and a half operations per month. **Conclusion:** The market segment of the private sector for providing surgical treatment of breast cancer is characterized by inefficient contractual process, distorted form of territorial organization, uneven distribution of financial resources (small private structures) and unreliable guarantees for the quality of surgical activity in the latter. The managerial connection between the two main elements of the health system is broken: "doctor (hospital) - patient".

Keywords: health system, private hospital, breast cancer, contractual process, market segment, Pareto principle

1. INTRODUCTION

A study of the distribution of the resources of the surgical activity for breast cancer in Bulgaria, according to the type of ownership of the medical establishments, established that one third of the activity is contracted by hospitals with private capital.

The **AIM** of this article is to present a study and analysis of the market niche of privately owned hospitals, representing the operational activities of health insured persons in connection with breast cancer.

2. METHODOLOGY

Based on the statistical data of surgical activity in breast cancer, in Bulgaria, for a period of four years, the Pareto principle has been applied to identify the leading surgical units in the country.

3. RESULTS

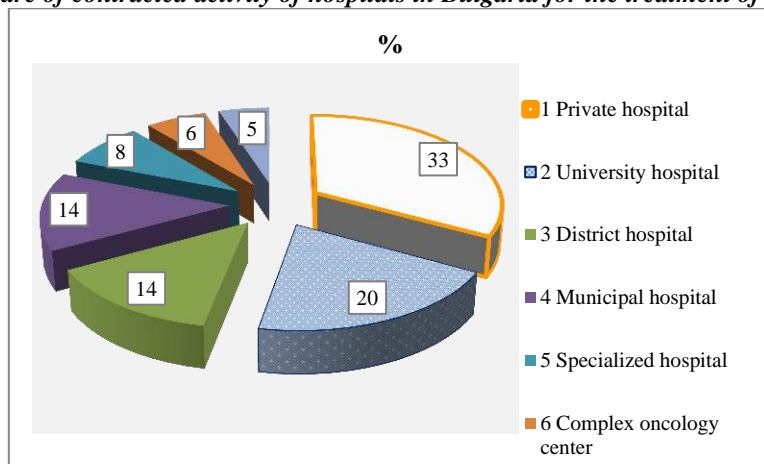
Statistics for the operative activity on the occasion of breast cancer in stage Tis 1-4, N0-2 M0-1 are presented. A total of one hundred and nineteen hospitals with different forms of ownership were studied. Of these, thirty-nine are private hospitals, twenty-four - university, ten - specialized oncology hospitals, seventeen - district, sixteen - municipal, six - departmental and seven - complex oncology centers. The statistics cover a four-year period, in two directions: (A) concluded contracts between the hospitals and the health insurance fund in Bulgaria for the treatment of breast cancer and (B) the volume of operational activity of the hospitals for the treatment of breast cancer (Table 1, figure 1 and figure 2).

Table 1: Number of contracts and volume of operative activity (number of cases) in physical values and in % of hospitals, for treatment of breast cancer, for a period of four years.

№	A) Type of hospital	Number of contracts	%	№	B) Type of hospital	Number of cases	%
1	Private Hospital	39	33	1	University Hospital	5 699	33
2	University Hospital	24	20	2	Complex oncology center	4 052	23
3	District Hospital	17	14	3	Private Hospital	2 860	16
4	Municipal Hospital	16	14	4	Specialized Hospital	2 203	13
5	Specialized Hospital	10	8	5	District Hospital	1 186	7

6	Complex oncology center	7	6	6	Departmental hospital	1 032	6
7	Departmental hospital	6	5	7	Municipal Hospital	396	2
Total		119	100	Total		17 428	100

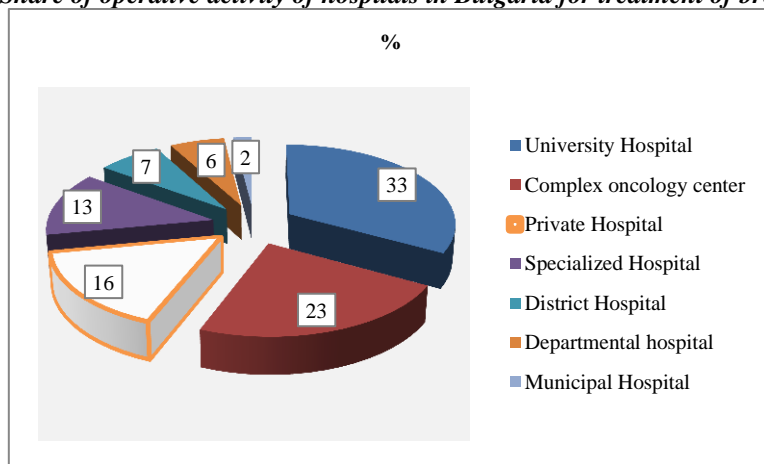
Figure 1 Share of contracted activity of hospitals in Bulgaria for the treatment of breast cancer



Contractual relationships between private hospitals and the National Health Fund for breast cancer surgery account for 33% of or 39 contracts (Figure 1).

The activity of private hospitals for breast surgery accounted for 183 or 16% of the same type of activity compared to other hospitals (Figure 2).

Figure 2 Share of operative activity of hospitals in Bulgaria for treatment of breast cancer



The statistics show that during the four-year period under review, the share of private hospitals in the contractual process is one third of all contracts in the country, against provided surgical activity to health insured persons - twice less or one sixth of all operational activity of all contractual partners of the national health fund.

4. DISCUSSION

The market niche of private hospitals in the surgical treatment of breast cancer gland in Bulgaria occupies a large part of the health service market, but twice - a small product. The application of the Pareto principle as a tool for analysis provides information about its structure and effectiveness.

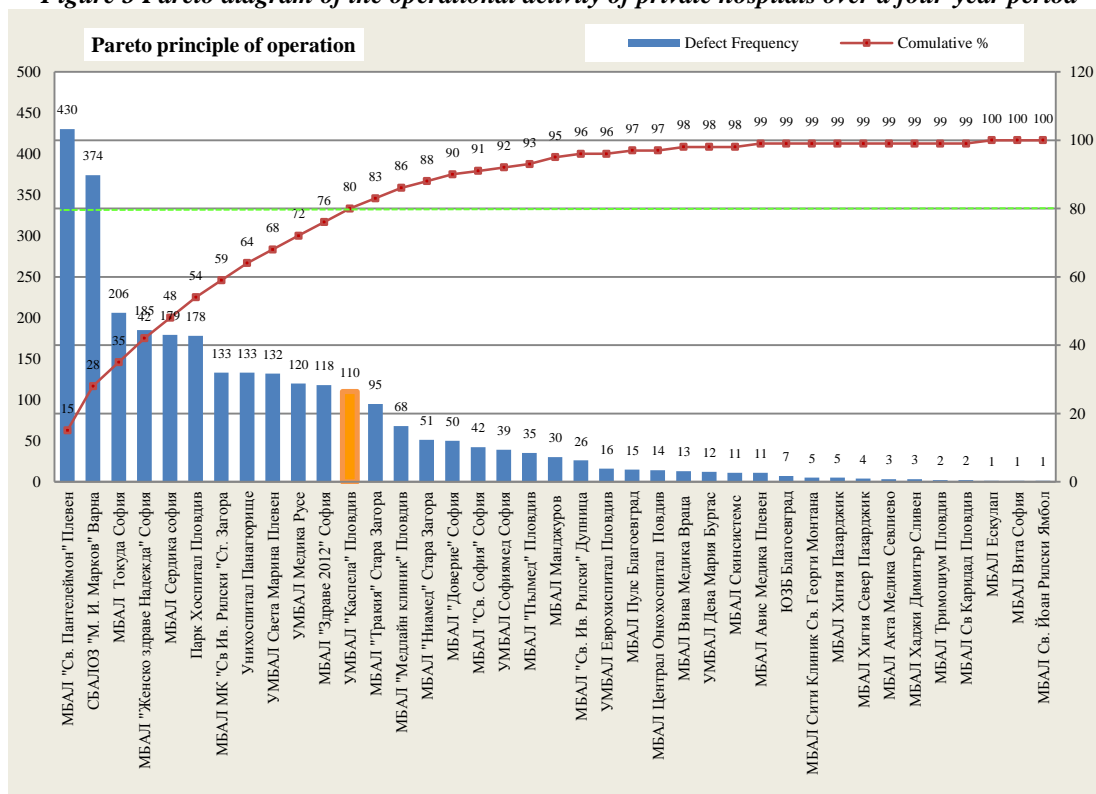
To build the Pareto diagram, a table is created. The table contains the parameters: frequency, cumulative frequency, percentage and cumulative percentage on the basis of "Type of ownership of the hospital" for the period 2016 - 2019 (Table 2).

Table 2: Table for construction of the Pareto diagram (frequency, cumulative frequency, percentage and cumulative percentage by attribute in hospitals with private capital ownership, for the period 2016 - 2019).

№	Part Number	Defect Frequency	Comulative Amount	%	Comulative %
1	МБАЛ "Св. Пантелеймон" Плевен	430	430	15	15
2	СБАЛЮЗ "М. И. Марков" Варна	374	804	13	28
3	МБАЛ Токуда София	206	1010	7	35
4	МБАЛ "Женско здраве Надежда" София	185	1195	6,5	42
5	МБАЛ Сердика софия	179	1374	6	48
6	Парк Хоспитал Пловдив	178	1552	6	54
7	МБАЛ МК "Св. Ив. Рилски" "Ст. Загора	133	1685	5	59
8	Унихоспитал Панагюрище	133	1818	5	64
9	УМБАЛ Света Марина Плевен	132	1950	5	68
10	УМБАЛ Медика Русе	120	2070	4	72
11	МБАЛ "Здраве 2012" София	118	2188	4	76
12	УМБАЛ "Каспела" Пловдив	110	2298	4	80
13	МБАЛ "Тракия" Стара Загора	95	2393	3	83
14	МБАЛ "Медлайн клиник" Пловдив	68	2461	3	86
15	МБАЛ "Ниамед" Стара Загора	51	2512	2	88
16	МБАЛ "Доверие" София	50	2562	2	90
17	МБАЛ "Св. София" София	42	2604	1	91
18	УМБАЛ Софиямед София	39	2643	1	92
19	МБАЛ "Пълмед" Пловдив	35	2678	1	93
20	МБАЛ Манджуров	30	2708	1	95
21	МБАЛ "Св. Ив. Рилски" Дупница	26	2734	1	96
22	УМБАЛ Еврехоспитал Пловдив	16	2750	1	96
23	МБАЛ Пулс Благоевград	15	2765	1	97
24	МБАЛ Централ Онкохоспитал Пловдив	14	2779	1	97
25	МБАЛ Вива Медика Враца	13	2792	1	98
26	УМБАЛ Дева Мария Бургас	12	2804	1	98
27	МБАЛ Скинсистемс	11	2815	1	98
28	МБАЛ Авис Медика Плевен	11	2826	1	99
29	ЮЗБ Благоевград	7	2833	1	99
30	МБАЛ Сити Клиник Св. Георги Монтана	5	2838	1	99
31	МБАЛ Хигия Пазарджик	5	2843	1	99
32	МБАЛ Хигия Север Пазарджик	4	2847	1	99
33	МБАЛ Акта Медика Севлиево	3	2850	1	99
34	МБАЛ Хаджи Димитър Сливен	3	2853	1	99
35	МБАЛ Тримоциум Пловдив	2	2855	1	99
36	МБАЛ Св. Каридад Пловдив	2	2857	1	99
37	МБАЛ Ескулап	1	2858	0	100
38	МБАЛ Вита София	1	2859	0	100
39	МБАЛ Св. Йоан Рилски Ямбол	1	2860	0	100
Тотал		2860			

"Part Number" should be understood as the criterion by which the analysis is made, in this case private property of the hospitals. In material production, this column records production defects that have been pre-determined by brainstorming techniques and control charts. The number of operative interventions is presented in the "Defect Frequency" column, and the other columns represent the cumulative frequency of cases, percentages and cumulative percentages required to compile the Pareto chart. Using the data from Defect Frequency and Cumulative%, a histogram (Figure 3) is compiled using Microsoft Excel, which is a Pareto Chart.

Figure 3 Pareto diagram of the operational activity of private hospitals over a four-year period



Along the axis of the abscissa are arranged the hospitals with private form of ownership, and along the axis of the ordinate are located the quantitatively expressed volumes of surgical activity - problems, both in numerical and cumulative form. The Pareto chart contains bars and lines, where the individual values are presented in descending order by bars, and the cumulative sum (cumulative percentage) of the sample is represented by a "curved" line in red. At 80% of the cumulative value, the so-called "reporting" line may be included to indicate where the 80/20 rule applies. In Figure 3 and Figure 4, the reporting line is shown in green. The few vital factors that require the most attention are below these 80% of the reporting line. This line must be considered conditional because the fold is not absolute due to the presence of a natural imbalance.

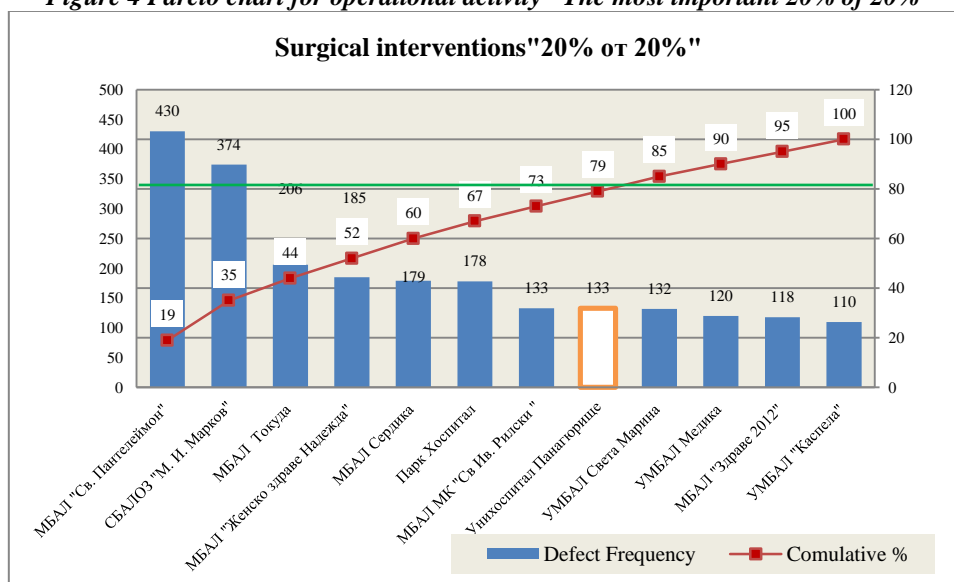
For the studied four-year period, below the reporting line are the data from the operative activity for breast cancer of twelve hospitals, which are located in Sofia, Plovdiv, Varna, Stara Zagora, Plevan and Ruse. According to the Pareto principle, they make up 20% and are the vital few private hospitals where the activity is concentrated. One third of them are university hospitals, and the rest - multidisciplinary and three university hospitals. Out of the (over) reporting line remain 27 privately owned hospitals, or 80%, which perform operative volume for breast cancer in the range of 90 to 1 operations for the four-year period.

It follows from the diagram in Figure 3 that these twelve hospitals are "those most important" 20% of hospitals, as partners of the national fund. Based on these 20%, a Pareto chart is compiled again to find out which of these 20% are the most important. A table is drawn up to construct the Pareto diagram for the most important 20% (Table 3).

Table 3: Table for constructing the Pareto chart for operational activity "The most important 20% of 20%"

№	Part Number	Defect Frequency	Comulative Amount	%	Comulative %
1	МБАЛ "Св. Пантелеймон" Плевен	430	430	19	19
2	СБАЛОЗ "М. И. Марков" Варна	374	804	16	35
3	МБАЛ Токуда София	206	1010	9	44
4	МБАЛ "Женско здраве Надежда" София	185	1195	8	52
5	МБАЛ Сердика София	179	1374	8	60
6	Парк Хоспитал Пловдив	178	1552	7	67
7	МБАЛ МК "Св. Ив. Рилски" Ст. Загора	133	1685	6	73
8	Унихоспитал Панагюрище	133	1818	6	79
9	УМБАЛ Света Марина Плевен	132	1950	6	85
10	УМБАЛ Медика Русе	120	2070	5	90
11	МБАЛ "Здраве 2012" София	118	2188	5	95
12	УМБАЛ "Каспела" Пловдив	110	2298	5	100
Total		2298		100	

Figure 4 Pareto chart for operational activity "The most important 20% of 20%"



The most important 20% of 20% "for operative activity of the mammary gland are formed by private hospitals located in Sofia, Plevna, Varna, Stara Zagora and border - Panagyurishte. In 80% there are hospitals that for the four-year period have performed about 100 - 120 surgical interventions, which corresponds to 30 operations per year or 2.5 operations per month.

The quality standards for negotiating the clinical path activity set requirements for 30 surgical interventions per year. Therefore, the hospitals shown in Figure 4 could maintain a good surgical qualification. The first three hospitals are at significantly higher levels, with 107.5, 93.5 and 51.5 surgical interventions per year, respectively.

5. CONSEQUENT

The structure of the market segment in the private sector of the healthcare system in Bulgaria for providing surgical treatment of breast cancer by private hospitals is characterized by:

1. Ineffective contractual process contracts (which are not serviced) between the national health fund and a large number of private hospitals, probably in connection with low criteria set in the diagnostic and treatment algorithms and standards for quality assurance of breast cancer surgery and unfair administrative negotiation process.
2. Deformed form of territorial organization with uneven distribution of financial resources (as to small private structures);
3. Unreliable guarantees for the quality of the surgical activity in the structures with small volume of activity.

6. CONCLUSION

Structure of the market segment in the private sector of the health system in Bulgaria for the provision of surgical treatment of breast cancer by private hospitals, and disrupted the management relationship between the two main elements of the health system - doctor (hospital) - patient, by seeking and offering health service, expressed through unclear criteria for methodology of the contractual process, rules for connection between the two elements: rules for management of the profession - experience and territorial organization of resources in order to ensure the quality of surgical activity in breast cancer by the health system .

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