



# ANALYSIS OF EQUALITY OF THE HEALTH SERVICES DELIVERED IN THE VARIOUS COVID-19 CENTERS

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## SUMMARY

- The research of the equality of health services delivered in various COVID centers in the country was conducted by the Center for Civil Communications within the project for “Monitoring in corruption-risk areas: health and environment”, supported by the Foundation Open Society - Macedonia.
- There are large differences between the 28 COVID centers that were subject of the analysis in the period from 1 October 2020 to 31 March 2021, in terms of the number of medical staff engaged, the drugs used to treat hospitalized patients, the oxygen support provided, the masks consumed both in terms of number of average days of hospitalization and the mortality rate of patients.
- Only five COVID centers provided a high level of health services according to the research indicators in the analyzed period. Twenty one of these centers provided an average level of health services and two centers provided a low level of health services. The indicators on the basis of which the COVID centers were evaluated in terms of provision of health services to hospitalized patients are the following:
  - hospitalization days
  - deceased patients
  - patients who received oxygen support
  - quantity of oxygen per patient
  - patients who received ventilatory support
  - total number of medical staff
  - total number of doctors
  - total number of nurses
  - quantity of drugs used per patient
  - total number of oxygen support masks used
- The COVID Center in the PHI General City Hospital “8 September” Skopje is the best ranked COVID center that provided the highest level of medical services to hospitalized patients, while the PHI University Clinic for Ear, Nose and Throat Skopje is at the bottom of the list.
- The total number of patients who were hospitalized in the 28 COVID centers in the country during the six-month period covered with the analysis is 20,005 patients or an average of 714.5 per COVID center.
- Most of the patients in the analyzed period were hospitalized in PHI University Clinic for Infectious Diseases and Febrile Conditions in Skopje (3,821) and least in the PHI University Clinic for Plastic and Reconstructive Surgery Skopje (58).
- The patients in the COVID centers across the country were hospitalized for an average of ten days. They were retained for the longest time in the PHI General Hospital with extended activity Debar (an average of 77 days) while this period was the shortest in the PHI University Clinic for Children Diseases (5 days).
- A total of 3,139 patients died in COVID centers across the country during the analyzed period, which is an average of 17.4 patients per day.
- On average, one out of six hospitalized patients died in the COVID centers. The death rate was the highest in the PHI University Clinic for Nephrology and the PHI General City Hospital “8 September” Skopje, where every third patient that was hospitalized died. The lowest death rate was recorded at the PHI Institute for Lung Diseases in Kozle where there was one death for every 31 patients.

- Seventy four point five percent of the hospitalized patients received oxygen support. All patients hospitalized in PHI University Clinic of Dermatology Skopje, PHI General Hospital Struga and PHI Clinical Hospital Tetovo received oxygen support while percentage of patients who received oxygen support was the lowest in PHI General Hospital with extended activity Debar (20.8%).
- Ten of the 28 COVID centers provided respiratory support to patients. The PHI University Clinic for Eye Diseases had the most respirators.
- Most of the 42.2% of the patients hospitalized in the PHI Clinical Hospital Tetovo received respiratory support, while in the PHI Clinical Hospital Shtip this support was provided to only one patient.
- On average, there were one medical staff member for every 6 patients, one doctor for every 22 patients, and one nurse for every 10 patients.
- In the PHI University Clinic for Children's Diseases there was one member of the medical staff per each patient, while in the PHI Clinic for Infectious Diseases and Febrile Conditions Skopje there was one in every 38 patients.
- In the 26 COVID centers that submitted data on the number of doctors engaged, a total of 822 or an average of 32 doctors per COVID center were engaged during the analyzed period.
- Most doctors (211) were engaged in PHI General City Hospital "8 September" while this number was the lowest in the PHI General Hospital Kichevo (6).
- At the University Clinic for Pediatrics there was one doctor for every three patients, while at the PHI Clinic for Infectious Diseases and Febrile Conditions Skopje there was one doctor for every 103 patients.
- In the 26 COVID centers that submitted data on the number of nurses engaged, a total of 1,698 or an average of 65 nurses per COVID center were engaged in the analyzed period.
- Most nurses were engaged in PHI General City Hospital "8 September" Skopje (380) while at the PHI General Hospital with extended activity Debar and PHI Clinical Hospital Tetovo this number was the lowest (11).
- At the University Clinic for Child Diseases there were two nurses for every three patients, while at the PHI Clinical Hospital Tetovo there was one nurse for every 64 patients.
- In terms of analysis of the drugs used to treat the patients, Enoxaparin (Clexane) and Nadroparin (Fraxiparine) were taken into consideration. On the basis of expert consultations, these were indicated as the most used drugs in treatment of Covid-19 and as most appropriate for comparison.
- On average, one patient received 17 ampoules and 174 kilograms of oxygen during the treatment process.
- Most drugs per patient were used in PHI General City Hospital "8 September" Skopje (56 ampoules) while this number was smallest in PHI General Hospital with extended activity in Prilep (1 ampoule).
- The highest quantity of oxygen for treatment purposes per patient was observed in PHI University Clinic for Traumatology, Orthopedic Diseases, Anesthesia, Resuscitation, Intensive Care and Emergency Center Skopje (1,428 kg), while the quantity was lowest in PHI General Hospital Strumica (5).
- The COVID centers spent 135,846,597 denars (inclusive of VAT) or 2,208,888 euros in total for procurement of the Enoxaparin (Clexane) and Nadroparin (Fraxiparine) drugs.
- Ninety four point eight percent of the procurement of drugs was conducted using open procedures, while the remaining 5.2% was carried out through negotiated procedure without prior announcement of competition. However, transparency was not adequately reflected in both the competition and prices.
- PHI University Clinic for Infectious Diseases and Febrile Conditions Skopje spent most of the funds for procurement of the Enoxaparin (Clexane) drug. This institution purchased 20,000 packages of 0.2 ml and 63,800 packages of 0.4 ml for a total sum of 15,447,138 denars. The PHI University Clinic for Ear, Nose and Throat Skopje spent the least (15,853 denars, inclusive of VAT) by purchasing 50 packages of 0.2 and 0.4 ml.

- Most funds for procurement of the Nadroparin (Fraxiparine) drug were spent by PHI Clinical Hospital Shtip - 9,309,530 denars inclusive of VAT for which it procured 20,500 packages of 0.3 ml, 36,000 of 0.4 ml and 5,500 packages of 0.6 ml. The PHI University Clinic for Nephrology spent least funds - 96,030 denars inclusive of VAT for the purchase of Nadroparin (Fraxiparine) - 200 packages of 0.3 ml and 800 of 0.4 ml.
- The drug Enoxaparin (Clexane) was procured by all COVID centers for the same price per unit - 109.2 denars inclusive of VAT for packages of 0.2 ml and 207.9 denars inclusive of VAT for packages of 0.4 ml.
- All COVID centers procured the Enoxaparin (Clexane) drug from the Company for Internal and External Trade, Representation and Services MEDEX PHARM DOOEL Skopje in a total value of 67,509,795 denars inclusive of VAT or 1,097,720 euros.
- Significant differences of up to 84% were observed in the unit price for Nadroparin (Fraxiparine). Prices range from 74.2 to 137.1 denars inclusive of VAT for packages of 0.3 ml, from 101.5 to 175.6 denars inclusive of VAT for packages of 0.4 ml and from 150.9 to 222.9 denars inclusive of VAT for packages of 0.6 ml. The differences in prices cannot be justified either by the time period of the procurement or by the quantity that was procured.
- Ninety eight percent of the procurement of the Nadroparin (Fraxiparin) drug is from the Company for Trade, Production and Services FENIKS PHARMA DOOEL Skopje in the total amount of 66,959,111 denars inclusive of VAT or 1,088,766 euros, while the remaining 2% of the value goes to the Company MAKEDONIJA LEK DOO Skopje in the amount of MKD 1,377,691 inclusive of VAT or EUR 22,401.
- The COVID centers in the Clinical Center in Skopje were procuring oxygen, both liquid and compressed, through the public institution (PI) in the field of health for the needs of the public health institutions, university clinics, Institute and Emergency Center Skopje while the others were procuring independently.
- The COVID centers spent 136,290,500 denars inclusive of VAT or 2,216,105 euros in total for procurement of medical oxygen during the analyzed period (1 March 2020 to 31 March 2021),
- The Public Institution in the field of health has spent the most for procurement of medical oxygen for the needs of the public health institutions, university clinics, Institute and Emergency Center Skopje - 38,525,430 denars inclusive of VAT or 626,430 euros.
- There are significant differences in the unit prices at which the COVID centers procured the medical oxygen for treatment of the patients. The differences reach up to 700% in unit prices of liquid oxygen and almost 250% in prices for compressed oxygen.
- The entire quantity of medical oxygen was procured by the COVID centers from a total of four companies. Most of the contracts (59%) were signed with the Company for production of industrial gases TGS TECHNICAL GAS DOO Skopje in the amount of 79,700,054 denars inclusive of VAT or 1,295,935 euros.



## OBJECTIVES AND METHODOLOGY

The research on the equality of health services delivered in various COVID centers in the country was conducted by the Center for Civil Communications within the project for “Monitoring in corruption-risk areas: health and environment”, supported by the Foundation Open Society - Macedonia.

Since the World Health Organization announced the global coronavirus pandemic in March 2020, a state of emergency was declared in the Republic of North Macedonia .

With the progression and spread of the virus, and in order to hospitalize the infected patients and provide appropriate medical treatment, COVID centers were established all over the country. The number of these centers and the number of cities in which they were established grew with the number of patients in need of hospitalization.

The need for urgent procurement of goods, services and health care occurred simultaneously with the spread of the virus and the growing number of people who were infected. Given the urgency for provision of the necessary drugs and means of protection, the public procurement in a pandemic situation was conducted by shortened and accelerated procedures, with direct negotiations with companies and without prior publication of a public notice. The public procurement during pandemic has reduced transparency and is increased the risks of corruption.

The purpose of the study was to investigate whether a patient hospitalized in various COVID centers in the country was provided with equal medical treatment, in terms of key drugs and medical equipment.

Furthermore, the aim of the research is to use the findings as a starting point for providing recommendations for changing practices and creating policies and strategic documents in case of future similar crises.

The subject of the research were 28 COVID centers established in university clinics, general hospitals, institutes and clinical hospitals across the country. The data requested from them refer to a six-month period, starting from 1 October 2020 until 31 March 2021, because most of the patients were recorded in this period, which also meant largest burden and engagement of the available capacities.

In terms of the analyzed public procurement procedures implemented by the COVID centers, the procurement procedures for the Enoxaparin (Clexane) and Nadroparin (Fraxiparine) drugs, including oxygen, were taken into account. According to the information these were consumed in each COVID center and were most suitable for

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<sup>1</sup> [Official Gazette of the Republic of North Macedonia No. 68 from 18.03.2020](#)

comparison. For the purpose of this research, these were implemented in the period from the beginning of the pandemic in March 2020 until 31 March 2021. The type of public procurement procedures, the competition and prices were also taken into account.

The data required for conducting the research were provided through requests for access to public character information that were sent to the COVID centers and by collecting data from the Electronic Public Procurement System.

Subject of this research were the following COVID centers:

	COVID CENTER	CITY
1	PHI University Clinic for Ear, Nose and Throat	Skopje
2	PHI University Clinic for Gastroenterohepatology	Skopje
3	PHI University Clinic of Dermatology	Skopje
4	PHI University Clinic for Infectious Diseases and Febrile Conditions	Skopje
5	PHI University Clinic of Neurology	Skopje
6	PHI University Clinic of Nephrology	Skopje
7	PHI University Clinic for Eye Diseases	Skopje
8	PHI University Clinic for Children's Diseases	Skopje
9	PHI University Clinic for Traumatology, Orthopedic Diseases, Anesthesia, Resuscitation, Intensive Care and Emergency Center	Skopje
10	PHI Clinic for Plastic and Reconstructive Surgery Skopje	Skopje
11	PHI Institute for Lung Diseases and Tuberculosis	Skopje
12	PHI Institute for Lung Diseases in Children Kozle	Skopje
13	PHI General City Hospital "8 September" Skopje	Skopje
14	PHI General Hospital Veles	Veles
15	PHI General Hospital with expanded activity Gevgelija	Gevgelija
16	PHI General Hospital with expanded activity Debar	Debar
17	PHI General Hospital with expanded activity Kavadarci	Kavadarci
18	PHI General Hospital Kichevo	Kichevo
19	PHI General Hospital with expanded activity Kochani	Kochani
20	PHI General Hospital Kumanovo	Kumanovo
21	PHI General Hospital Prilep	Prilep
22	PHI General Hospital Strumica	Strumica
23	PHI General Hospital Ohrid	Ohrid
24	PHI General Hospital "Dr. Ferid Murad" Gostivar	Gostivar
25	PHI General Hospital Struga	Struga
26	PHI Clinical Hospital Tetovo	Tetovo
27	PHI Clinical Hospital Shtip	Shtip
28	PHI Clinical Hospital Bitola	Bitola

- ▶ All of the above institutions (except the COVID centers in the PHI University Clinic for Dermatology and PHI Clinic for Plastic and Reconstructive Surgery Skopje) were active during the six-month period which is subject to analysis. The Covid Center in the PHI University Clinic of Dermatology started with operation on 08.11.2020, while the one in the PHI Clinic for Plastic and Reconstructive Surgery Skopje started on 19.03.2021. Accordingly, the data received from these two COVID centers refer to their work from the day they commenced their operations and until 31.03.2021.

Requests for access to public character information were sent to the 28 COVID centers across the country on 19.07.2021, requesting the following data:

- Total number of hospitalized patients with Covid 19;
- Total number of hospital days for patients with Covid 19;
- Total number of patients who died from Covid 19;
- Total number of patients at oxygen support;
- Total number of patients on ventilatory (respiratory) support;
- Total number of medical staff engaged (individually: doctors, with data on their specialty, nurses and paramedics) for patients with Covid 19;
- Consumed quantity of Enoxaparin (Clexane) for patients with Covid 19;
- Consumed quantity of oxygen for patients with Covid 19
- Total number of oxygen support masks used for patients with Covid 19;
- Total number of ventilatory support devices used (respirators)

In the process of collecting data from the COVID centers, 15 complaints were submitted to the Agency for Protection of the Right to Free Access to Public Character Information because some of the information holders did not submit a response within the legally prescribed deadline or their answers did not contain all the required data.

The ranking of the COVID centers is made on the basis of ten indicators for measuring the quality of the medical treatment provided which were selected based on the example of similar research activities globally and the availability of data in the country.

The methodological approach of calculation effectively eliminated the impact of the unequal data availability on the overall ranking. The COVID centers are first ranked according to each indicator individually and then, based on the ranking, they are scored, which results in the final ranking.

## TOTAL NUMBER OF PATIENTS HOSPITALIZED IN THE COVID CENTERS

The total number of patients who were hospitalized in the 28 COVID centers in the country in the period from 01.10.2020 to 31.03.2021 is 20,005 or an average of 714.5 patients per COVID center.

The largest number of hospitalized patients in the analyzed period was in the PHI University Clinic for Infectious Diseases and Febrile Conditions in Skopje (3,821). Second place goes to PHI General Hospital with expanded activity Prilep with 2,110 patients and the third place goes to PHI General Hospital Ohrid with 1,448 patients.

The lowest number of patients in the analyzed period were hospitalized in PHI University Clinic for Plastic and Reconstructive Surgery Skopje (58) and in the PHI University Clinic for Children's Diseases Skopje (60). In terms of average number of days, patients in the COVID centers across the country spent an average of 10 days. The patients received the longest treatment in PHI General Hospital with extended activity (77.6 days), followed by PHI General Hospital Kumanovo where they stayed for 15.6 days and PHI General Hospital Kichevo with 14 days on average.

In short, the patients were receiving treatment that lasted between 5 and 6 days at the PHI University Clinic for Children's Diseases Skopje, PHI University Clinic for Infectious Diseases and Febrile Conditions Skopje, PHI General Hospital Struga and PHI University Clinic for Ear, Nose and Throat.

### TOTAL NUMBER OF HOSPITALIZED PATIENTS, TOTAL NUMBER OF HOSPITAL DAYS AND AVERAGE NUMBER OF HOSPITAL DAYS PER PATIENT IN THE PERIOD 01.10.2020 - 31.03.2021

COVID CENTER	TOTAL NUMBER OF HOSPITALIZED PATIENTS	TOTAL NUMBER OF HOSPITAL DAYS FOR THE PATIENTS	AVERAGE NUMBER OF HOSPITALIZATION DAYS PER PATIENT
PHI General Hospital with expanded activity Debar	260	20 181	77,6
PHI General Hospital Kumanovo	1 001	15 593	15,6
PHI General Hospital Kichevo	289	4 046	14,0
PHI Institute for Lung Diseases and Tuberculosis Skopje	432	5 365	12,4

COVID CENTER	TOTAL NUMBER OF HOSPITALIZED PATIENTS	TOTAL NUMBER OF HOSPITAL DAYS FOR THE PATIENTS	AVERAGE NUMBER OF HOSPITALIZATION DAYS PER PATIENT
PHI General Hospital Ohrid	1 448	17 436	12,0
PHI General Hospital with expanded activity Kochani	209	2 508	12,0
PHI General City Hospital "8 September" Skopje	1 338	14 817	11,1
PHI Institute for Lung Diseases in Children Kozle Skopje	337	3 725	11,1
PHI General Hospital Veles	663	7 315	11,0
PHI General Hospital "Dr. Ferid Murad" Gostivar	540	5 527	10,2
Average			10,1
PHI University Clinic of Neurology	384	3 683	9,6
PHI University Clinic of Dermatology Skopje	405	3 757	9,3
PHI Clinical Hospital Shtip	1 056	9 696	9,2
PHI General Hospital with expanded activity Kavadarci	654	5 977	9,1
PHI General Hospital Strumica	1 061	9 664	9,1
PHI University Clinic of Nephrology	304	2 736	9,0
PHI Clinical Hospital Bitola	988	8 533	8,6
PHI Clinical Hospital Tetovo	702	5 748	8,2
PHI University Clinic for Gastroenterohepatology Skopje	182	1 438	7,9
PHI General Hospital with expanded activity Gevgelija	474	3 450	7,3
PHI University Clinic for Plastic and Reconstructive Surgery Skopje	58	378	6,5
PHI University Clinic for Ear, Nose and Throat Skopje	330	1 927	5,8
PHI General Hospital Struga	613	3 406	5,6
PHI Clinic for Infectious Diseases and Febrile Conditions Skopje	3 821	20 493	5,4
PHI University Clinic for Children's Diseases Skopje	60	320	5,3
PHI University Clinic for Eye Diseases Skopje	126	No data	/
PHI General Hospital with expanded activity Prilep	2 110	No data	/
PHI University Clinic for Traumatology, Orthopedic Facilities, Anesthesia, Resuscitation, Intensive Care and Emergency Center Skopje	160	No data	/

## TOTAL NUMBER OF PATIENTS WHO DIED IN THE COVID CENTERS

During the analyzed period, a total of 3,139 patients, or an average of 17.4 patients per day, died in the COVID centers across the country.

Most patients died in PHI University Clinic for Infectious Diseases and Febrile Conditions Skopje (473), in PHI General City Hospital "8 September" Skopje there were 457 deaths, and 199 deaths in PHI General Hospital with extended activity Prilep.

None of the patients in the analyzed period died in the PHI University Clinic for Children's Diseases Skopje, while three patients died in the PHI Clinic for Plastic and Reconstructive Surgery Skopje, noting that this center operated for only 13 days in the analyzed period. PHI University Clinic for Eye Diseases Skopje has a total of 5 deaths.

In terms of ratio between hospitalized and deceased patients, one patient in every six who are hospitalized in the COVID centers has died.

The highest death rate was recorded at the PHI University Clinic for Nephrology and at the PHI General City Hospital "8 September" Skopje, where every third patient who was hospitalized has died.

The least number of hospitalized patients who died is in PHI Institute for Lung Diseases in Children Kozle Skopje - one in 31; and in PHI University Clinic for Eye Diseases Skopje where one patient died on every 25 who were hospitalized.

### TOTAL NUMBER OF DECEASED PATIENTS AND RATIO BETWEEN HOSPITALIZED AND DECEASED PATIENTS IN THE PERIOD 01.10.2020 - 31.03.2021

COVID CENTER	TOTAL NUMBER OF HOSPITALIZED PATIENTS	TOTAL NUMBER OF PATIENTS WHO DIED	RATIO BETWEEN HOSPITALIZED AND DECEASED PATIENTS
PHI University Clinic of Nephrology	304	104	2,9
PHI General City Hospital "8 September" Skopje	1 338	457	2,9
PHI University Clinic of Neurology	384	110	3,5
PHI University Clinic for Ear, Nose and Throat Skopje	330	90	3,7

COVID CENTER	TOTAL NUMBER OF HOSPITALIZED PATIENTS	TOTAL NUMBER OF PATIENTS WHO DIED	RATIO BETWEEN HOSPITALIZED AND DECEASED PATIENTS
PHI University Clinic for Traumatology, Orthopedic Diseases, Anesthesia, Resuscitation, Intensive Care and Emergency Center Skopje	160	42	3,8
PHI Clinical Hospital Tetovo	702	164	4,3
PHI General Hospital Kichevo	289	64	4,5
PHI General Hospital "Dr. Ferid Murad" Gostivar	540	108	5
PHI University Clinic of Dermatology Skopje	405	78	5,2
PHI General Hospital Kumanovo	1 001	184	5,4
PHI Institute for Lung Diseases and Tuberculosis Skopje	432	76	5,7
PHI Clinical Hospital Bitola	988	169	5,9
PHI Clinical Hospital Shtip	1 056	173	6,1
Average			6,4
PHI General Hospital Veles	663	104	6,4
PHI General Hospital with expanded activity Kavadarci	654	97	6,7
PHI General Hospital Struga	613	80	7,7
PHI University Clinic for Gastroenterohepatology Skopje	182	23	7,9
PHI Clinic for Infectious Diseases and Febrile Conditions Skopje	3.821	473	8,1
PHI General Hospital with expanded activity Kochani	209	23	9,1
PHI General Hospital Strumica	1 061	103	10,3
PHI General Hospital Ohrid	1 448	140	10,3
PHI General Hospital with expanded activity Prilep	2 110	199	10,6
PHI General Hospital with expanded activity Gevgelija	474	40	11,9
PHI General Hospital with expanded activity Debar	260	19	13,7
PHI University Clinic for Plastic and Reconstructive Surgery Skopje	58	3	19,3
PHI University Clinic for Eye Diseases Skopje	126	5	25,2
PHI Institute for Lung Diseases in Children Kozle Skopje	337	11	30,6
PHI University Clinic for Children's Diseases Skopje	60	0	0

## TOTAL NUMBER OF PATIENTS WHO RECEIVED OXYGEN SUPPORT IN THE COVID CENTERS

Out of 20,005 patients who were hospitalized in the COVID centers across the country, 14,894 or 74.5% of them received oxygen support in the analyzed period.

According to the data received from the COVID centers of the PHI University Clinic of Dermatology Skopje, all patients hospitalized in the PHI General Hospital Struga and PHI Clinical Hospital Tetovo received oxygen support.

The lowest percentage of hospitalized patients who received oxygen support was in PHI University Clinic for Children's Diseases Skopje - 15% and in PHI General Hospital with extended activity Debar - 20.8%.

### PERCENTAGE OF HOSPITALIZED PATIENTS WHO RECEIVED OXYGEN SUPPORT IN THE PERIOD 01.10.2020 - 31.03.2021

COVID CENTER	TOTAL NUMBER OF HOSPITALIZED PATIENTS	TOTAL NUMBER OF PATIENTS WHO RECEIVED OXYGEN SUPPORT	PERCENTAGE OF HOSPITALIZED PATIENTS WHO RECEIVED OXYGEN SUPPORT
PHI University Clinic of Dermatology Skopje	405	405	100
PHI General Hospital Struga	613	613	100
PHI Clinical Hospital Tetovo	702	702	100
PHI General Hospital with expanded activity Kavadarci	654	637	97,4
PHI General Hospital Kumanovo	1 001	959	95,8
PHI University Clinic for Eye Diseases Skopje	126	120	95,2
PHI University Clinic of Neurology	384	362	94,3
PHI University Clinic for Gastroenterohepatology Skopje	182	170	93,4
PHI General Hospital with expanded activity Kochani	209	190	90,9
PHI General Hospital Veles	663	597	90,0
PHI General Hospital with expanded activity Gevgelija	474	426	89,9



COVID CENTER	TOTAL NUMBER OF HOSPITALIZED PATIENTS	TOTAL NUMBER OF PATIENTS WHO RECEIVED OXYGEN SUPPORT	PERCENTAGE OF HOSPITALIZED PATIENTS WHO RECEIVED OXYGEN SUPPORT
PHI University Clinic for Plastic and Reconstructive Surgery Skopje	58	52	89,7
PHI General City Hospital "8 September" Skopje	1 338	1 190	88,9
PHI General Hospital with expanded activity Prilep	2 110	1 867	88,5
PHI Clinical Hospital Bitola	988	871	88,2
PHI University Clinic for Ear, Nose and Throat Skopje	330	290	87,9
PHI Clinical Hospital Shtip	1 056	926	87,7
PHI General Hospital Ohrid	1 448	1 200	82,9
PHI University Clinic of Nephrology	304	250	82,2
PHI Institute for Lung Diseases in Children Kozle Skopje	337	270	80,1
PHI Institute for Lung Diseases and Tuberculosis Skopje	432	346	80,1
Average			74,5
PHI General Hospital Kichevo	289	200	69,2
PHI University Clinic for Traumatology, Orthopedic Diseases, Anesthesia, Resuscitation, Intensive Care and Emergency Center Skopje	160	109	68,1
PHI General Hospital Strumica	1 061	482	45,4
PHI Clinic for Infectious Diseases and Febrile Conditions Skopje	3 821	1 412	37,0
PHI General Hospital "Dr. Ferid Murad" Gostivar	540	185	34,3
PHI General Hospital with expanded activity Debar	260	54	20,8
PHI University Clinic for Children's Diseases Skopje	60	9	15

## TOTAL NUMBER OF RESPIRATORY SUPPORT PATIENTS IN THE COVID CENTERS

In cases when the health condition of patients is deteriorated with reduced saturation i.e. the level of oxygenation in the blood reduced, they require respiratory support. These patients are unable to breathe on their own and therefore need respiratory support.

Respiratory support was provided to patients in ten of the COVID centers.

Most respirators (50) were in the COVID center of the PHI University Clinic for Eye Diseases Skopje, but no data on the number of patients who received respiratory support was obtained from this institution.

The PHI General Hospital Ohrid notified that this center had four respiratory machines that were not used, and the patients who needed respiratory support were sent to the PHI University Clinic for Infectious Diseases and Febrile Conditions in Skopje.

### TOTAL NUMBER OF RESPIRATORY SUPPORT DEVICES (RESPIRATORS) ACTUALLY USED IN THE PERIOD 01.10.2020 - 31.03.2021

COVID CENTER	NUMBER OF RESPIRATORY SUPPORT DEVICES USED (RESPIRATORS)
PHI University Clinic for Eye Diseases Skopje	50
PHI University Clinic for Infectious Diseases and Febrile Conditions Skopje	42
PHI University Clinic for Traumatology, Orthopedic Diseases, Anesthesia, Resuscitation, Intensive Care and Emergency Center Skopje	16
PHI General City Hospital "8 September" Skopje	15
PHI General Hospital with expanded activity Prilep	13
PHI Clinic for Plastic and Reconstructive Surgery Skopje	10
PHI General Hospital Ohrid	4
PHI General Hospital Strumica	3
PHI Clinical Hospital Tetovo	3
PHI General Hospital with expanded activity Kavadarci	1
PHI Clinical Hospital Shtip	1

The total number of patients who received respiratory support in the analyzed period is 935 or 4.7%, with a note that no data was provided by the PHI University Clinic for Eye Diseases Skopje. The total number of respiratory machines used was 158.

The highest percentage of hospitalized patients who received respiratory support was in PHI Clinical Hospital Tetovo (42.2%) while the lowest in PHI Clinical Hospital Shtip where only one out of 1,056 hospitalized patients received respiratory support (0.1%).

**PERCENTAGE OF HOSPITALIZED PATIENTS WHO RECEIVED RESPIRATORY SUPPORT IN THE PERIOD 01.10.2020 - 31.03.2021**

COVID CENTER	TOTAL NUMBER OF HOSPITALIZED PATIENTS	TOTAL NUMBER OF PATIENTS ON RESPIRATORY SUPPORT	PERCENTAGE OF PATIENTS WHO RECEIVED RESPIRATORY SUPPORT
PHI Clinical Hospital Tetovo	702	296	42,2
PHI University Clinic for Traumatology, Orthopedic Diseases, Anesthesia, Resuscitation, Intensive Care and Emergency Center Skopje	160	58	36,5
PHI General City Hospital "8 September" Skopje	1 338	260	19,4
Average			12,1
PHI University Clinic for Plastic and Reconstructive Surgery Skopje	58	6	10,3
PHI Clinic for Infectious Diseases and Febrile Conditions Skopje	3 821	259	6,8
PHI General Hospital Strumica	1 061	30	2,8
PHI University Clinic of Neurology	384	8	2,1
PHI General Hospital with expanded activity Prilep	2 110	13	0,6
PHI General Hospital with expanded activity Kavadarci	654	4	0,6
PHI Clinical Hospital Shtip	1 056	1	0,1

## TOTAL NUMBER OF MEDICAL STAFF ENGAGED IN THE COVID CENTERS

The COVID centers were asked for data on the total number of medical staff who were engaged to provide health care to hospitalized patients, with specific data on the individual number of doctors, nurses and paramedics engaged.

A total of 3,269 doctors, nurses and paramedics were engaged in the 28 COVID centers within the analyzed period, or an average of 117 per COVID center.

According to the data, there was one medical staff member for every 6 patients across the COVID centers in the country.

Most of the medical staff was engaged in the PHI General City Hospital "8 September" Skopje - a total of 672 people, while the least in the PHI General Hospital Kichevo (19).

Regarding patients, the PHI University Clinic for Children's Diseases Skopje engaged 62 people on a total of 60 hospitalized patients or there was one member of the medical staff for each patient. On average, less than two patients had one member of the medical staff available at the PHI Clinic for Plastic and Reconstructive Surgery Skopje and in PHI General City Hospital "8 September" Skopje.

The largest number of patients per member of the medical staff was in the PHI University Clinic for Infectious Diseases and Febrile Conditions - 38.

### TOTAL NUMBER OF ENGAGED MEDICAL STAFF (DOCTORS, NURSES AND PARAMEDICS) AND RATIO BETWEEN HOSPITALIZED PATIENTS AND ENGAGED MEDICAL STAFF IN THE PERIOD 01.10.2020 - 31.03.2021

COVID CENTER	TOTAL NUMBER OF HOSPITALIZED PATIENTS	TOTAL NUMBER OF ENGAGED MEDICAL STAFF	TOTAL NUMBER OF PATIENTS PER MEDICAL STAFF MEMBER
PHI University Clinic for Children's Diseases Skopje	60	62	1
PHI University Clinic for Plastic and Reconstructive Surgery Skopje	58	50	1,2
PHI General City Hospital "8 September" Skopje	1 338	672	2
PHI University Clinic for Eye Diseases Skopje	126	55	2,3

COVID CENTER	TOTAL NUMBER OF HOSPITALIZED PATIENTS	TOTAL NUMBER OF ENGAGED MEDICAL STAFF	TOTAL NUMBER OF PATIENTS PER MEDICAL STAFF MEMBER
PHI University Clinic for Traumatology, Orthopedic Diseases, Anesthesia, Resuscitation, Intensive Care and Emergency Center Skopje	160	67	2,4
PHI Institute for Lung Diseases in Children Kozle Skopje	337	108	3,1
PHI Clinical Hospital Shtip	1 056	301	3,5
PHI Institute for Lung Diseases and Tuberculosis Skopje	432	97	4,5
PHI General Hospital Kumanovo	1 001	218	4,6
PHI University Clinic for Gastroenterohepatology Skopje	182	37	4,9
PHI University Clinic of Nephrology	304	57	5,3
PHI General Hospital Veles	663	117	5,7
PHI General Hospital Ohrid	1 448	246	5,9
PHI University Clinic of Neurology	384	64	6
Average			6,1
PHI General Hospital with expanded activity Prilep	2 110	340	6,2
PHI General Hospital Struga	613	95	6,5
PHI General Hospital with expanded activity Kavadarci	654	96	6,8
PHI Clinical Hospital Bitola	988	136	7,3
PHI University Clinic for Ear, Nose and Throat Skopje	330	42	7,9
PHI General Hospital with expanded activity-Gevgelija	474	55	8,6
PHI General Hospital with expanded activity Kochani	209	23	9,1
PHI General Hospital "Dr. Ferid Murad" Gostivar	540	59	9,2
PHI University Clinic of Dermatology Skopje	405	39	10,4
PHI General Hospital with expanded activity Debar	260	21	12,4
PHI General Hospital Kichevo	289	19	15,2
PHI General Hospital Strumica	1 061	68	15,6
PHI Clinical Hospital Tetovo	702	24	29,3
PHI Clinic for Infectious Diseases and Febrile Conditions Skopje	3 821	101	37,8

## TOTAL NUMBER OF DOCTORS ENGAGED IN THE COVID CENTERS

In the 26 COVID centers that provided data on the total number of doctors engaged in the analyzed period, 822 doctors were engaged or an average of 32 in each COVID center.

On average, there was one doctor for every 22 patients in the COVID centers.

Most of the doctors were engaged in the PHI General City Hospital "8 September" Skopje (211) while the least in the PHI General Hospital Kichevo (6).

PHI University Clinic for Eye Diseases and PHI General Hospital with extended activity Prilep did not provide data on the number of doctors engaged.

In terms of the number of patients, in PHI University Clinic for Children's Diseases Skopje there was one doctor on three patients, followed by PHI Clinic for Plastic and Reconstructive Surgery Skopje where one doctor served four patients.

The largest number of patients per one doctor was registered in the PHI University Clinic for Infectious Diseases and Febrile Conditions (103).

### TOTAL NUMBER OF DOCTORS AND THE RATIO BETWEEN THE NUMBER OF HOSPITALIZED PATIENTS AND THE NUMBER OF DOCTORS ENGAGED IN THE PERIOD 01.10.2020 - 31.03.2021

COVID CENTER	TOTAL NUMBER OF HOSPITALIZED PATIENTS	TOTAL NUMBER OF DOCTORS	NUMBER OF PATIENTS PER DOCTOR
PHI University Clinic for Children's Diseases Skopje	60	19	3,2
PHI University Clinic for Plastic and Reconstructive Surgery Skopje	58	16	3,6
PHI General City Hospital "8 September" Skopje	1 338	211	6,3
PHI Institute for Lung Diseases in Children Kozle Skopje	337	39	8,6
PHI University Clinic for Gastroenterohepatology Skopje	182	20	9,1

COVID CENTER	TOTAL NUMBER OF HOSPITALIZED PATIENTS	TOTAL NUMBER OF DOCTORS	NUMBER OF PATIENTS PER DOCTOR
PHI University Clinic for Traumatology, Orthopedic Diseases, Anesthesia, Resuscitation, Intensive Care and Emergency Center Skopje	160	16	10
PHI Institute for Lung Diseases and Tuberculosis Skopje	432	42	10,3
PHI General Hospital Kumanovo	1 001	61	16,4
PHI University Clinic of Neurology	384	23	16,7
PHI University Clinic for Ear, Nose and Throat - Skopje	330	16	20,6
PHI General Hospital Ohrid	1 448	70	20,7
PHI General Hospital Struga	613	29	21,1
Average			22,1
PHI University Clinic of Dermatology Skopje	405	18	22,5
PHI General Hospital with expanded activity Kochani	209	9	23,2
PHI University Clinic of Nephrology	304	13	23,4
PHI General Hospital Veles	663	26	25,5
PHI General Hospital with expanded activity-Gevgelija	474	18	26,3
PHI Clinical Hospital Shtip	1 056	37	28,5
PHI General Hospital with expanded activity Debar	260	8	32,5
PHI General Hospital with expanded activity Kavadarci	654	20	32,7
PHI General Hospital Strumica	1 061	28	37,9
PHI General Hospital "Dr. Ferid Murad" Gostivar	540	12	45
PHI General Hospital Kichevo	289	6	48,2
PHI Clinical Hospital Tetovo	702	12	58,5
PHI Clinical Hospital Bitola	988	16	61,8
PHI Clinic for Infectious Diseases and Febrile Conditions Skopje	3 821	37	103,3
PHI University Clinic for Eye Diseases Skopje	126	no data	
PHI General Hospital with expanded activity Prilep	2 110	no data	

## TOTAL NUMBER OF NURSES ENGAGED IN THE COVID CENTERS

A total of 1,698 nurses were engaged in the 26 COVID centers that provided data on this issue, or an average of 65 per COVID center. On average, one nurse was available to every ten patients.

Most of the engaged nurses were in PHI General City Hospital "8 September" Skopje (380), while the least in PHI General Hospital with extended activity Debar and in PHI Clinical Hospital Tetovo - 11 in each.

In the PHI University Clinic for Children's Diseases Skopje, two nurses were available for every three patients, while in the PHI Clinical Hospital Tetovo there was one nurse for 64 patients. There were more than 60 patients per one nurse in the PHI University Clinic for Infectious Diseases and Febrile Conditions (63).

### TOTAL NUMBER OF NURSES AND RATIO BETWEEN THE NUMBER OF HOSPITALIZED PATIENTS AND THE NUMBER OF ENGAGED NURSES IN THE PERIOD 01.10.2020 - 31.03.2021

COVID CENTER	TOTAL NUMBER OF HOSPITALIZED PATIENTS	TOTAL NUMBER OF NURSES	NUMBER OF PATIENTS PER NURSE
PHI University Clinic for Children's Diseases Skopje	60	43	1,4
PHI University Clinic for Plastic and Reconstructive Surgery Skopje	58	20	2,9
PHI General City Hospital "8 September" Skopje	1 338	380	3,5
PHI Clinical Hospital Shtip	1 056	256	4,1
PHI University Clinic for Traumatology, Orthopedic Diseases, Anesthesia, Resuscitation, Intensive Care and Emergency Center Skopje	160	35	4,6
PHI Institute for Lung Diseases in Children Kozle Skopje	337	50	6,7
PHI General Hospital Veles	663	91	7,3



COVID CENTER	TOTAL NUMBER OF HOSPITALIZED PATIENTS	TOTAL NUMBER OF NURSES	NUMBER OF PATIENTS PER NURSE
PHI General Hospital Kumanovo	1 001	129	7,8
PHI General Hospital with expanded activity Kavadarci	654	68	9,6
PHI University Clinic of Nephrology	304	31	9,8
Average			10,5
PHI General Hospital Ohrid	1 448	130	11,1
PHI General Hospital Struga	613	53	11,6
PHI Institute for Lung Diseases and Tuberculosis Skopje	432	35	12,3
PHI Clinical Hospital Bitola	988	80	12,4
PHI General Hospital "Dr. Ferid Murad" Gostivar	540	43	12,6
PHI University Clinic of Neurology	384	27	14,2
PHI General Hospital with expanded activity-Gevgelija	474	32	14,8
PHI General Hospital with expanded activity Kochani	209	14	14,9
PHI University Clinic for Gastroenterohepatology Skopje	182	12	15,1
PHI University Clinic for Ear, Nose and Throat - Skopje	330	18	18,3
PHI General Hospital with expanded activity Debar	260	11	23,6
PHI General Hospital Kichevo	289	12	24,1
PHI University Clinic of Dermatology Skopje	405	16	25,3
PHI General Hospital Strumica	1 061	40	26,5
PHI Clinic for Infectious Diseases and Febrile Conditions Skopje	3 821	61	62,6
PHI Clinical Hospital Tetovo	702	11	63,8
PHI University Clinic for Eye Diseases Skopje	126	No data	
PHI General Hospital with expanded activity Prilep	2 110	No data	

## DRUGS USED FOR TREATMENT OF THE PATIENTS HOSPITALIZED IN THE COVID CENTERS

Enoxaparin (Clexane) and Nadroparin (Fraxiparine) were used in the COVID centers across the country to treat hospitalized patients. Most of the COVID centers used the drug Enoxaparin (Clexane), some used both drugs, and only one center used only the Nadroparin (Fraxiparine) drug.

According to data, most ampoules of the drugs were used in the PHI General City Hospital "8 September" Skopje (74,899), while least ampoules were used in the PHI General Hospital with extended activity Kochani (250).

On average, one patient received 17 ampoules of drugs during the treatment process.

According to the data, most ampoules per patient were used in the PHI General City Hospital "8 September" Skopje (56).

One ampoule per patient was used in PHI General Hospital with extended activity Kochani, PHI University Clinic for Ear and Nose and PHI General Hospital with extended activity Prilep.

### TOTAL NUMBER OF ENOXAPARIN (CLEXANE) AND NADROPARIN (FRAXIPARINE) AMPOULES USED FOR TREATMENT OF PATIENTS AND TOTAL NUMBER OF AMPOULES USED PER PATIENT IN THE PERIOD 01.10.2020 - 31.03.2021

COVID CENTER	TOTAL NUMBER OF HOSPITALIZED PATIENTS	TOTAL NUMBER OF AMPOULES	TOTAL NUMBER OF AMPOULES USED PER PATIENT
PHI General City Hospital "8 September" Skopje	1 338	74 899	56
PHI University Clinic for Gastroenterohepatology Skopje	182	6 098	33,5
PHI Institute for Lung Diseases in Children Kozle Skopje	337	11 182	33,2
PHI General Hospital with expanded activity Kavadarci	654	20 100	30,7
PHI University Clinic of Neurology	384	11 784	30,7
PHI General Hospital Kichevo	289	8 100	28

COVID CENTER	TOTAL NUMBER OF HOSPITALIZED PATIENTS	TOTAL NUMBER OF AMPOULES	TOTAL NUMBER OF AMPOULES USED PER PATIENT
PHI University Clinic for Traumatology, Orthopedic Diseases, Anesthesia, Resuscitation, Intensive Care and Emergency Center Skopje	160	4 254	26,6
PHI University Clinic for Eye Diseases Skopje	126	3 264	25,9
PHI Institute for Lung Diseases and Tuberculosis Skopje	432	11 090	25,7
PHI General Hospital Veles	663	16 140	24,3
PHI General Hospital Kumanovo	1 001	24 014	24
PHI University Clinic of Nephrology	304	6 739	22,2
PHI Clinical Hospital Tetovo	702	15 216	21,7
PHI General Hospital with expanded activity-Gevgelija	474	8 250	17,4
PHI Clinical Hospital Bitola	988	17 166	17,4
Average			16,7
PHI University Clinic for Children's Diseases Skopje	60	978	16,3
PHI General Hospital Struga	613	9 680	15,8
PHI Clinical Hospital Shtip	1 056	15 336	14,5
PHI General Hospital Ohrid	1 448	18 647	12,9
PHI University Clinic of Dermatology Skopje	405	5 200	12,9
PHI Clinic for Infectious Diseases and Febrile Conditions Skopje	3 821	43 820	11,5
PHI University Clinic for Plastic and Reconstructive Surgery Skopje	58	497	8,6
PHI General Hospital with expanded activity Debar	260	1 408	5,4
PHI General Hospital Strumica	1 061	5 280	5
PHI General Hospital "Dr. Ferid Murad" Gostivar	540	976	1,8
PHI General Hospital with expanded activity Kochani	209	250	1,2
PHI University Clinic for Ear, Nose and Throat - Skopje	330	370	1,1
PHI General Hospital with expanded activity Prilep	2 110	1 537	0,7

## OXYGEN USED TO TREAT PATIENTS IN THE COVID CENTERS

Data on the quantity of oxygen used for treatment needs of the hospitalized patients was requested from the COVID centers, as well as from the Public Institution in the field of health, concerning the needs of the public health institutions, university clinics, Institute and Emergency Center Skopje that were providing the supply with oxygen of the COVID centers within the former Clinical Center in Skopje.

According to the data obtained, an average of 174 kilograms of oxygen were used per patient.

Most oxygen is used by the PHI University Clinic for Infectious Diseases and Febrile Conditions - 581,729 kg. Least oxygen is used in PHI General Hospital Kichevo - 2,433 kilograms.

In terms of oxygen used per patient, the PHI University Clinic for Traumatology, Orthopedic Facilities, Anesthesia, Resuscitation, Intensive Care and Emergency Center Skopje used 1,428 kg per patient, while least oxygen per patient was used in PH Strumica General Hospital - 5 kg per patient.

### QUANTITY OF OXYGEN USED FOR TREATMENT OF PATIENTS IN KILOGRAMS AND QUANTITY OF OXYGEN USED PER PATIENT IN THE PERIOD 01.10.2020 - 31.03.2021

COVID CENTER	TOTAL NUMBER OF PATIENTS WHO RECEIVED OXYGEN SUPPORT	TOTAL AMOUNT OF OXYGEN USED IN KILOGRAMS	CONSUMPTION OF OXYGEN PER PATIENT
PHI University Clinic for Traumatology, Orthopedic Facilities, Anesthesia, Resuscitation, Intensive Care and Emergency Center Skopje	109	155 674	1 428
PHI University Clinic for Plastic and Reconstructive Surgery Skopje	52	22 508	433
PHI Clinic for Infectious Diseases and Febrile Conditions Skopje	1 412	581 729	412
PHI Institute for Lung Diseases and Tuberculosis Skopje	346	126 708	366
PHI General City Hospital "8 September" Skopje	1 190	350 000	294

COVID CENTER	TOTAL NUMBER OF PATIENTS WHO RECEIVED OXYGEN SUPPORT	TOTAL AMOUNT OF OXYGEN USED IN KILOGRAMS	CONSUMPTION OF OXYGEN PER PATIENT
PHI Clinical Hospital Tetovo	702	198 362	283
PHI University Clinic for Children's Diseases Skopje	9	2 200	244
PHI General Hospital with expanded activity Prilep	1 867	450 000	241
PHI General Hospital with expanded activity Debar	54	11 129	206
PHI General Hospital "Dr. Ferid Murad" Gostivar	185	34 613	187
PHI General Hospital Veles	597	85 275	143
PHI Clinical Hospital Bitola	871	124 000	142
PHI General Hospital with expanded activity Kavadarci	637	79 517	125
PHI Clinical Hospital Shtip	926	81 567	88
PHI Institute for Lung Diseases in Children Kozle Skopje	270	22 726	84
PHI General Hospital with expanded activity Kochani	190	15 360	81
PHI General Hospital Kumanovo	959	70 816	74
PHI General Hospital Ohrid	1 200	71 010	59
PHI General Hospital Struga	613	34 300	56
PHI University Clinic for Ear, Nose and Throat - Skopje	290	14 193	49
PHI University Clinic for Gastroenterohepatology Skopje	170	7 470	44
PHI General Hospital with expanded activity-Gevgelija	426	15 223	36
PHI University Clinic of Neurology	362	9 706	27
PHI University Clinic for Eye Diseases Skopje	120	2 991	25
PHI University Clinic of Dermatology Skopje	405	8 797	22
PHI University Clinic of Nephrology	250	4 571	18
PHI General Hospital Kichevo	200	2 433	12
PHI General Hospital Strumica	482	2 524	5

## TOTAL MASKS FOR OXYGEN SUPPORT USED IN THE COVID CENTERS

According to the data obtained, 45,759 oxygen support masks were used in the 28 COVID centers, or three masks for each patient who received oxygen support.

Most masks were used in PHI General Hospital with expanded activity Prilep (28,000), followed by PHI Clinic for Infectious Diseases and Febrile Conditions Skopje (4,964).

In terms of oxygen support per number of patients, most masks (25) were used in PHI University Clinic for Pediatrics Skopje and at least 0.2 in PHI University Clinic for Ear, Nose and Throat Skopje.

### QUANTITY OF MASKS USED FOR OXYGEN SUPPORT TO PATIENTS IN THE PERIOD 01.10.2020 - 31.03.2021

COVID CENTER	TOTAL NUMBER OF OXYGEN SUPPORT PATIENTS	TOTAL NUMBER OF MASKS USED FOR OXYGEN SUPPORT	TOTAL NUMBER OF MASKS USED PER PATIENT ON OXYGEN SUPPORT
PHI University Clinic for Children's Diseases Skopje	9	225	25
PHI General Hospital with expanded activity Prilep	1 867	28 000	15
PHI Clinic for Infectious Diseases and Febrile Conditions Skopje	1 412	4 964	3,5
Average			3,1
PHI General Hospital with expanded activity-Gevgelija	426	1 100	2,6
PHI University Clinic for Traumatology, Orthopedic Diseases, Anesthesia, Resuscitation, Intensive Care and Emergency Center Skopje	109	275	2,5
PHI University Clinic for Plastic and Reconstructive Surgery Skopje	52	124	2,4

COVID CENTER	TOTAL NUMBER OF OXYGEN SUPPORT PATIENTS	TOTAL NUMBER OF MASKS USED FOR OXYGEN SUPPORT	TOTAL NUMBER OF MASKS USED PER PATIENT ON OXYGEN SUPPORT
PHI Institute for Lung Diseases and Tuberculosis Skopje	346	810	2,3
PHI General City Hospital "8 September" Skopje	1 190	2 668	2,2
PHI General Hospital "Dr. Ferid Murad" Gostivar	185	400	2,2
PHI Institute for Lung Diseases in Children Kozle Skopje	270	392	1,5
PHI University Clinic for Gastroenterohepatology Skopje	170	230	1,4
PHI University Clinic for Eye Diseases Skopje	120	150	1,3
PHI Clinical Hospital Tetovo	702	831	1,2
PHI General Hospital with expanded activity Kavadarci	637	736	1,2
PHI General Hospital Kumanovo	959	1 100	1,2
PHI General Hospital Struga	613	690	1,1
PHI General Hospital with expanded activity Debar	54	56	1
PHI University Clinic of Nephrology	250	250	1
PHI University Clinic of Neurology	362	340	0,9
PHI Clinical Hospital Bitola	871	720	0,8
PHI General Hospital Kichevo	200	150	0,8
PHI General Hospital Ohrid	1 200	671	0,6
PHI University Clinic of Dermatology Skopje	405	200	0,5
PHI General Hospital Strumica	482	200	0,4
PHI Clinical Hospital Shtip	926	247	0,3
PHI General Hospital with expanded activity Kochani	190	50	0,3
PHI University Clinic for Ear, Nose and Throat - Skopje	290	60	0,2
PHI General Hospital Veles	597	120	0,2

# RANKING OF COVID CENTERS ACCORDING TO THE PROVISION OF EQUAL HEALTH SERVICES TO PATIENTS

The ranking of the COVID centers in this regard was done by indexing the indicators for assessing the equality of health services provided by the COVID centers to the hospitalized patients.

Based on the data obtained from the COVID centers and by cross-referencing them, the COVID centers are ranked according to the ten individual indicators on the basis of which final ranking of the provision of health services to hospitalized patients in the COVID centers is made.

The indicators on the basis of which the COVID centers are ranked in terms of provision of equal health services to hospitalized patients are the following:

- hospitalization days
- deceased patients
- patients who received oxygen support
- quantity of oxygen per patient
- patients who received ventilatory support
- total number of medical staff
- total number of doctors
- total number of nurses
- quantity of drugs used per patient
- oxygen support masks used

The final ranking of the COVID centers is based on the position that each COVID center occupies within each individual indicator compared to the other COVID centers. The results are shown as percentages and divided into three groups: 70-100% means high level of provided health services, 35-70% means average level of health services and 0-35% means low level of health services.

In order for a COVID center to achieve 100% it is necessary to be ranked first in relation to other COVID centers on the basis of each individual indicator.



RANKING OF COVID CENTERS ACCORDING TO HEALTH SERVICES PROVIDED

COVID CENTER	PERCENTAGE
PHI General City Hospital "8 September" Skopje	77,1
PHI Clinic for Plastic and Reconstructive Surgery Skopje	76,1
PHI Institute for Lung Diseases in Children Kozle Skopje	74,2
PHI University Clinic for Traumatology, Orthopedic Diseases, Anesthesia, Resuscitation, Intensive Care and Emergency Center	72,6
PHI University Clinic for Children's Diseases Skopje	71,4
PHI University Clinic for Eye Diseases Skopje	69,6
PHI Institute for Lung Diseases and Tuberculosis Skopje	67,5
PHI General Hospital Kumanovo	66,3
PHI General Hospital with expanded activity Prilep	62,2
PHI Clinic for Gastroenterohepatology Skopje	61,1
PHI General Hospital with expanded activity Kavadarci	60
PHI General Hospital Veles	56,8
PHI General Hospital Ohrid	54
PHI Clinical Hospital Shtip	53,2
PHI General Hospital Struga	52
PHI University Clinic of Neurology	52
PHI General Hospital with expanded activity Gevgelija	51,6
PHI Clinical Hospital Tetovo	49,3
PHI General Hospital with expanded activity Kochani	45,6
PHI General Hospital with expanded activity Debar	45,6
PHI Clinical Hospital Bitola	43,3
PHI University Clinic for Infectious Diseases and Febrile Conditions	42,5
PHI University Clinic of Nephrology	42,1
PHI General Hospital "Dr. Ferid Murad" Gostivar	40,5
PHI University Clinic of Dermatology Skopje	39,7
PHI General Hospital Kichevo	36,1
PHI General Hospital - Strumica	32,1
PHI University Clinic for Ear, Nose and Throat - Skopje	29,8

According to the results, five of the COVID centers provided a high level of health services in the analyzed period according to the research indicators, 21 of the centers provided an average level of health services and two provided a low level of health services.

The COVID center in PHI General City Hospital "8 September" Skopje is the best ranked COVID center that has provided the highest level of medical services to hospitalized patients. According to the indexing, this COVID center is in the second place according to the quantity of drugs with which the patients have been treated, and in the third place according to the number of patients who were provided with respiratory support, according to the ratio between the number of patients and the medical staff engaged as well as individually between the number of patients and the doctors and nurses engaged.

## **PUBLIC PROCUREMENT OF THE ENOXAPARIN (CLEXANE) AND NADROPARIN (FRAXIPARINE) DRUGS**

Subject of the research were the public procurements conducted by the 28 COVID centers for procurement of the Enoxaparin (Clexane) and Nadroparin (Fraxiparine) drugs in the period 01.03.2020 - 31.03.2021.

For procurement of the Enoxaparin (Clexane) and Nadroparin (Fraxiparine) drugs, the COVID centers conducted a total of 57 tenders in the analyzed period for which they spent a total of 135,846,597 denars inclusive of VAT or 2,208,888 euros.

The COVID Centers procured the Enoxaparin (Clexane) drug at the same price per unit, while for procurement of the Nadroparin (Fraxiparine) drug there is a difference in the unit prices, which in some procurements is twice as large as in others.

Forty three 43 contracts were signed in the analyzed period for the Enoxaparin (Clexane) drug by 25 COVID centers which were procuring this drug in packages of 0.2 and 0.4 ml.

The unit price in all procurements was 109.2 denars inclusive of VAT for packages of 0.2 ml and 207.9 denars inclusive of VAT for packages of 0.4 ml.

Twenty-two of the COVID centers have conducted public procurement procedures for the Enoxaparin (Clexane) drug in packages of 0.2 ml in the analyzed period.

Most funds for procurement of the Enoxaparin (Clexane) drug in packages of 0.2 ml have been spent by PHI University Clinic for Infectious Diseases and Febrile Conditions - 2,183,789 denars inclusive of VAT or 35,509 euros, while the least by PHI University Clinic for Ear, Throat and Nose - 5,459 denars inclusive of VAT or 89 euros.

**PROCURED QUANTITIES AND TOTAL VALUE OF THE TENDERS FOR PROCUREMENT OF THE ENOXAPARIN (CLEXANE) DRUG IN PACKAGES OF 0.2 ML IN THE PERIOD 01.03.2020 - 31.03.2021**

	COVID CENTER	QUANTITY	VALUE OF THE TENDERS IN DENARS (INCLUSIVE OF VAT)
1	PHI University Clinic for Infectious Diseases and Febrile Conditions	20 000	2.183.789
2	PHI Institute for Lung Diseases in Children Kozle Skopje	11 500	1.255.679
3	PHI General Hospital with expanded activity Gevgelija	7 500	818.921
4	PHI General Hospital Kumanovo	7 000	764.326
5	PHI General Hospital with expanded activity Prilep	6 000	655.137
6	PHI University Clinic for Traumatology, Orthopedic Diseases, Anesthesia, Resuscitation, Intensive Care and Emergency Center	6 000	655.137
7	PHI University Clinic of Neurology	5 000	545.947
8	PHI General Hospital with expanded activity Kavadarci	4 000	436.758
9	PHI Clinical Hospital Shtip	4 000	436.758
10	PHI General Hospital Ohrid	3 000	327.568
11	PHI General Hospital Strumica	2 400	262.054
12	PHI Clinical Hospital Bitola	2 000	218.379
13	PHI General Hospital Struga	1 800	196.540
14	PHI University Clinic of Nephrology	1 600	174.703
15	PHI Clinical Hospital Tetovo	1 600	174.703
16	PHI University Clinic for Children's Diseases Skopje	1 560	170.335
17	PHI General Hospital with expanded activity Debar	700	76.432
18	PHI Clinic for Gastroenterohepatology Skopje	500	54.594
19	PHI General Hospital Veles	400	43.667
20	PHI General Hospital Kichevo	60	6.551
21	PHI General Hospital "Dr. Ferid Murad" Gostivar	50	5.459
22	PHI University Clinic for Ear, Throat and Nose	50	5.459

Twenty-five of the COVID centers have conducted public procurement procedures for the Enoxaparin (Clexane) drug in packages of 0.4 ml in the analyzed period.

As in the case of the quantities of 0.2 ml, most funds for procurement of the Enoxaparin (Clexane) drug in packages of 0.4 ml have been spent by PHI University Clinic for Infectious Diseases and Febrile Conditions (13,263,349 denars inclusive of VAT or 215,664 euros), while least by the PHI University Clinic for Ear, Throat and Nose - 10,394 denars inclusive of VAT or 169 euros.

**PROCURED QUANTITIES AND TOTAL VALUE OF THE TENDERS FOR PROCUREMENT OF THE ENOXAPARIN (CLEXANE) DRUG IN PACKAGES OF 0.4 ML IN THE PERIOD 01.03.2020 - 31.03.2021**

	COVID CENTER	QUANTITY	VALUE OF TENDERS IN DENARS INCLUSIVE OF VAT
1	PHI University Clinic for Infectious Diseases and Febrile Conditions	63 800	13.263.349
2	PHI Clinical Hospital Tetovo	26 100	5.425.914
3	PHI University Clinic for Traumatology, Orthopedic Diseases, Anesthesia, Resuscitation, Intensive Care and Emergency Center	26 000	5.405.126
4	PHI General Hospital Ohrid	25 000	5.197.237
5	PHI Institute for Lung Diseases in Children Kozle Skopje	20 000	4.157.790
6	PHI General Hospital Kumanovo	15 400	3.201.498
7	PHI General Hospital with expanded activity Gevgelija	12 300	2.557.040
8	PHI General Hospital Struga	12 040	2.502.989
9	PHI General Hospital with expanded activity Prilep	12 000	2.494.974
10	PHI University Clinic of Neurology	10 000	2.078.895
11	PHI Clinical Hospital Bitola	10 000	2.078.895
12	PHI General Hospital with expanded activity Kavadarci	9 000	1.871.006
13	PHI Clinical Hospital Shtip	9 000	1.871.005
14	PHI Clinic for Gastroenterohepatology Skopje	5 000	1.039.447
15	PHI General Hospital Strumica	4 800	997.869
16	PHI General Hospital with expanded activity Debar	4 800	997.869
17	PHI University Clinic of Nephrology	4 000	831.558
18	PHI General Hospital "Dr. Ferid Murad" Gostivar	3 700	769.191
19	PHI Institute for Lung Diseases and Tuberculosis Skopje	2 500	519.723
20	PHI University Clinic for Children's Diseases Skopje	1 400	291.044
21	PHI General Hospital Veles	1 000	207.868
22	PHI General Hospital with expanded activity Kochani	600	124.733
23	PHI General City Hospital "8 September" Skopje	400	83.118
24	PHI General Hospital Kichevo	300	62.367
25	PHI University Clinic for Ear, Throat and Nose	50	10.394

Most funds for procurement of the Enoxaparin (Clexane) drug was spent by PHI University Clinic for Infectious Diseases and Febrile Conditions Skopje - 15,447,138 denars or 251,173 euros, while least was spent by PHI University Clinic for Ear, Nose and Throat Skopje - 15,853 denars inclusive of VAT or 258 euros.

**TOTAL AMOUNT OF FUNDS SPENT FOR PROCUREMENT OF THE ENOXAPARIN (CLEXANE) DRUG IN MKD, INCLUSIVE OF VAT**

	COVID CENTER	VALUE OF THE TENDERS IN DENARS, INCLUSIVE OF VAT
1	PHI University Clinic for Infectious Diseases and Febrile Conditions Skopje	15.447.138
2	PHI University Clinic for Traumatology, Orthopedic Diseases, Anesthesia, Resuscitation, Intensive Care and Emergency Center	6.060.263
3	PHI Clinical Hospital Tetovo	5.600.617
4	PHI General Hospital Ohrid	5.524.805
5	PHI Institute for Lung Diseases in Children Kozle Skopje	5.413.469
6	PHI General Hospital Kumanovo	3.965.824
7	PHI General Hospital with expanded activity Gevgelija	3.375.961
8	PHI General Hospital with expanded activity Prilep	3.150.111
9	PHI General Hospital Struga	2.699.529
10	PHI University Clinic of Neurology	2.624.842
11	PHI General Hospital with expanded activity Kavadarci	2.307.764
12	PHI Clinical Hospital Shtip	2.307.763
13	PHI Clinical Hospital Bitola	2.297.274
14	PHI General Hospital Strumica	1.259.923
15	PHI Clinic for Gastroenterohepatology Skopje	1.094.041
16	PHI General Hospital with expanded activity Debar	1.074.301
17	PHI University Clinic of Nephrology	1.006.261
18	PHI General Hospital "Dr. Ferid Murad" Gostivar	774.650
19	PHI Institute for Lung Diseases and Tuberculosis Skopje	519.723
20	PHI University Clinic for Children's Diseases Skopje	461.379
21	PHI General Hospital Veles	251.535
22	PHI General Hospital with expanded activity Kochani	124.733
23	PHI General City Hospital "8 September" Skopje	83.118
24	PHI General Hospital Kichevo	68.918
25	PHI University Clinic for Ear, Nose and Throat Skopje	15.853

All COVID centers procured the Enoxaparin (Clexane) drug from the Company for Internal and External Trade, Representation and Services MEDEX PHARM DOOEL Skopje in a total value of 67,509,795 denars inclusive of VAT or 1,097,720 euros.

Most of the funds for procurement of the Enoxaparin drug was spent by using open procedures (92%), while 8% was spent by using negotiated procedure without prior announcement.

**PERCENTAGE OF FUNDS SPENT IN RELATION TO THE TYPE OF PUBLIC PROCUREMENT PROCEDURE FOR THE ENOXAPARIN (CLEXANE) DRUG**

TYPE OF PROCEDURE	NUMBER OF TENDERS	VALUE OF TENDERS IN DENARS, INCLUSIVE OF VAT	PERCENTAGE OF THE PROCUREMENT
Open procedure	25	51.437.450	76,3 %
Simplified open procedure	10	10.014.420	14,8 %
Negotiated procedure without announcement	5	5.621.358	8,3 %
Small value purchase	2	436.567	0,6 %

Regarding the Nadroparin (Fraxiparine) drug, 19 of the COVID centers conducted a total of 35 procedures which were procuring this drug in the period from 01.03.2020 to 31.03.2021.

Unlike Enoxaparin, there are differences in the unit prices at which the COVID centers procured the Nadroparin.

The unit prices ranged from 74.2 to 137.1 denars inclusive of VAT for ampoules of 0.3 ml, from 101.5 to 175.6 denars inclusive of VAT for ampoules of 0.4 ml and from 150.9 to 222.9 denars inclusive of VAT for ampoules of 0.6 ml.

**UNIT PRICE AT WHICH THE NADROPARIN (FRAXIPARINE) DRUG WAS PROCURED, IN DENARS AND INCLUSIVE OF VAT**

COVID CENTER		TENDER REFERENCE NUMBER	UNIT PRICE FOR PURCHASE OF NADROPARIN (FRAXIPARINE) IN DENARS, INCLUSIVE OF VAT		
			0,3 ml	0,4 ml	0,6 ml
1	PHI University Clinic for Ear, Throat and Nose	09791/2020		101,5	
2	PHI University Clinic for Infectious Diseases and Febrile Conditions	15299/2020	74,2	101,5	150,9
		19287/2020	137,1		222,9
		15988/2019	74,2		150,9
		09383/2020	74,2		150,9
3	PHI University Clinic of Nephrology	07036/2020	74,2	101,5	
4	PHI Institute for Lung Diseases in Children Kozle - Skopje	No announcement	74,2	101,5	150,9
5	PHI General City Hospital "8 September" -Skopje	16387/2020	137,1	167,2	212,26
6	PHI General Hospital Veles	09316/2020	74,2	101,5	150,9
			137,1	175,6	222,9

COVID CENTER	TENDER REFERENCE NUMBER	UNIT PRICE FOR PURCHASE OF NAD-ROPARIN (FRAXIPARINE) IN DENARS, INCLUSIVE OF VAT			
		0,3 ml	0,4 ml	0,6 ml	
7	PHI General Hospital with expanded activity Gevgelija	13466/2020	74,2	101,5	150,9
8	PHI General Hospital Kichevo	00188/2021	74,2	101,5	150,9
		16613/2020	137,1	175,6	222,9
9	PHI General Hospital with expanded activity Kochani	13111/2020		101,5	150,9
10	PHI General Hospital Kumanovo	14725/2020	74,2	101,5	150,9
		00838/2021		175,6	222,9
11	PHI General Hospital with expanded activity Prilep	15224/2020	74,2	101,5	150,9
12	PHI General Hospital Strumica	03695/2020	74,2	101,5	150,9
13	PHI General Hospital Ohrid	10320/2020	74,2	101,5	150,9
		00018/2021		175,6	222,9
14	PHI General Hospital "Dr. Ferid Murad" Gostivar	05975/2020	74,2	101,5	150,9
				175,6	222,9
15	PHI General Hospital Struga	08945/2020	74,2	101,5	150,9
			137,1		222,9
16	PHI Clinical Hospital Tetovo	05301/2020		101,5	
		14835/2020	74,2	101,5	150,9
		00756/2021	137,1	175,6	222,9
17	PHI Clinical Hospital Shtip	14325/2019	74,2	101,5	150,9
		16421/2020	137,1	175,6	222,9
18	PHI Clinical Hospital Bitola	13278/2020	74,2	101,5	150,9
		16549/2020			222,9
		18599/2020			222,9
19	PHI University Clinic for Traumatology, Orthopedic Diseases, Anesthesia, Resuscitation, Intensive Care and Emergency Center	13389/2019	74,2	101,5	150,9
				101,5	

PHI Clinical Hospital Shtip spent most of the funds for procurement (and procured the largest quantity of the Nadroparin drug in packages of 0.3 ml in the period 01.03.2020 - 31.03.2021 - 2,464,008 denars inclusive of VAT or 40,065 euros, while the least money was spent by PHI General Hospital "Dr. Ferid Murad" Gostivar - 7,418 denars inclusive of VAT or 121 euros.

**PROCURED QUANTITIES AND TOTAL VALUE OF THE TENDERS FOR PROCUREMENT OF NADROPARIN (FRAXIPARINE) DRUG IN PACKAGES OF 0.3 ML IN THE PERIOD 01.03.2020 - 31.03.2021**

	COVID CENTER	QUANTITY	VALUE OF TENDERS IN DENARS INCLUSIVE OF VAT
1	PHI Clinical Hospital Shtip	20 500	2.464.008
2	PHI University Clinic for Infectious Diseases and Febrile Conditions	17 500	1.927.085
3	PHI Clinical Hospital Tetovo	6 250	715.196
4	PHI General Hospital with expanded activity Gevgelija	9 000	667.699
5	PHI General Hospital with expanded activity Prilep	5 000	370.944
6	PHI General Hospital Kichevo	3 400	308.810
7	PHI Clinical Hospital Bitola	3 600	267.079
8	PHI General Hospital Strumica	3 600	267.057
9	PHI General City Hospital "8 September" Skopje	1 850	253.575
10	PHI General Hospital Veles	1 950	248.418
11	PHI General Hospital Kumanovo	3 000	222.566
12	PHI Institute for Lung Diseases in Children Kozle Skopje	3 000	222.547
13	PHI General Hospital Struga	950	97.639
14	PHI University Clinic for Traumatology, Orthopedic Diseases, Anesthesia, Resuscitation, Intensive Care and Emergency Center	1 000	74.182
15	PHI General Hospital Ohrid	400	29.675
16	PHI University Clinic of Nephrology	200	14.836
17	PHI General Hospital "Dr. Ferid Murad" Gostivar	100	7.418

Nineteen COVID centers procured Nadroparin in 0.4 ml packs. The largest quantity and at the same time the most funds was procured/ spent by PHI Clinical Hospital Shtip - 5,727,624 denars inclusive of VAT or 93,132 euros, while the least was spent by PHI University Clinic for Nephrology - 81,194 denars inclusive of VAT or 1,320 euros.



**PROCURED QUANTITIES AND TOTAL VALUE OF THE TENDERS FOR PROCUREMENT OF THE DRUG NADROPARIN (FRAXIPARINE) IN PACKAGES OF 0.4 ML IN THE PERIOD 01.03.2020 - 31.03.2021**

	COVID CENTER	QUANTITY	VALUE OF THE TENDERS IN DENARS, INCLUSIVE OF VAT
1	PHI Clinical Hospital Shtip	36 000	5.727.624
2	PHI General Hospital Veles	27 000	4.221.757
3	PHI General Hospital Kichevo	23 500	3.051.725
4	PHI General City Hospital "8 September" Skopje	14 400	2.528.124
5	PHI General Hospital Kumanovo	17 000	2.392.046
6	PHI General Hospital with expanded activity Prilep	18 000	1.826.930
7	PHI General Hospital with expanded activity Gevgelija	12 000	1.217.953
8	PHI General Hospital Ohrid	8 700	1.179.293
9	PHI Clinical Hospital Bitola	10 000	1.014.962
10	PHI Clinical Hospital Tetovo	7 000	932.708
11	PHI General Hospital Strumica	7 200	730.749
12	PHI General Hospital "Dr. Ferid Murad" Gostivar	4 800	576.046
13	PHI University Clinic for Traumatology, Orthopedic Diseases, Anesthesia, Resuscitation, Intensive Care and Emergency Center	5 000	507.402
14	PHI General Hospital with expanded activity Kochani	3 000	304.488
15	PHI Institute for Lung Diseases in Children Kozle Skopje	3 000	304.479
16	PHI General Hospital Struga	2 900	291.376
17	PHI University Clinic for Ear, Throat and Nose	1 000	101.496
18	PHI University Clinic for Infectious Diseases and Febrile Conditions	1 000	101.496
19	PHI University Clinic of Nephrology	800	81.194

In terms of procurement of the Nadroparin drug in packages of 0.6 ml, the PHI University Clinic for Infectious Diseases and Febrile Conditions spent the most - 6,419,568 inclusive of VAT or 104,383 euros, while least was spent by PHI General Hospital with extended activity Kochani - 114,996 denars inclusive of VAT or 1,870 euros.

**PROCURED QUANTITIES AND TOTAL VALUE OF THE TENDERS FOR PROCUREMENT OF THE NADROPARIN (FRAXIPARINE) DRUG IN PACKAGES OF 0.6 ML IN THE PERIOD 01.03.2020 - 31.03.2021**

	COVID CENTER	QUANTITY	VALUE OF THE TENDERS IN DENARS, INCLUSIVE OF VAT
1	PHI University Clinic for Infectious Diseases and Febrile Conditions	33 000	6.419.568
2	PHI Clinical Hospital Bitola	34000	6.419.263
3	PHI General City Hospital "8 September" Skopje	20 000	4.457.544
4	PHI Clinical Hospital Tetovo	15 600	3.433.717
5	PHI General Hospital with expanded activity Gevgelija	10 000	1.509.322
6	PHI General Hospital with expanded activity Prilep	10 000	1.509.322
7	PHI General Hospital Kumanovo	8 000	1.495.237
8	PHI General Hospital Ohrid	7 000	1.344.304
9	PHI General Hospital Veles	5 700	1.205.649
10	PHI General Hospital Struga	5 710	1.149.577
11	PHI Clinical Hospital Shtip	5 500	1.117.898
12	PHI General Hospital Kichevo	4 200	849.747
13	PHI Institute for Lung Diseases in Children Kozle Skopje	5 000	754.635
14	PHI General Hospital Strumica	3 600	543.337
15	PHI General Hospital "Dr. Ferid Murad" Gostivar	2 060	454.801
16	PHI University Clinic for Traumatology, Orthopedic Diseases, Anesthesia, Resuscitation, Intensive Care and Emergency Center	2 000	301.554
17	PHI General Hospital with expanded activity Kochani	800	120.745

Nineteen of the COVID centers procured Nadroparin (Fraxiparine) regardless of the packaging in the period from 01.03.2020 to 31.03.2021. Most funds for that purpose was spent by PHI Clinical Hospital Shtip - 9,309,530 denars inclusive of VAT or 151,374 euros, while least funds was spent by PHI University Clinic for Nephrology - 96,030 denars inclusive of VAT or 1,561 euros.

**TOTAL AMOUNT SPENT BY THE COVID CENTERS FOR PROCUREMENT OF NADROPARIN (FRAXIPARINE) DRUG IN DENARS, INCLUSIVE OF VAT IN THE PERIOD 01.03.2020 - 31.03.2021**

	<b>COVID CENTER</b>	<b>VALUE OF TENDERS IN DENARS INCLUSIVE OF VAT</b>
1	PHI Clinical Hospital Shtip	9.309.530
2	PHI University Clinic for Infectious Diseases and Febrile Conditions	8.448.149
3	PHI Clinical Hospital Bitola	7.701.304
4	PHI General City Hospital "8 September" Skopje	7.239.243
5	PHI General Hospital Veles	5.675.824
6	PHI Clinical Hospital Tetovo	5.081.621
7	PHI General Hospital Kichevo	4.210.282
8	PHI General Hospital Kumanovo	4.109.849
9	PHI General Hospital with expanded activity Prilep	3.707.196
10	PHI General Hospital with expanded activity Gevgelija	3.394.974
11	PHI General Hospital Ohrid	2.553.272
12	PHI General Hospital Strumica	1.541.143
13	PHI General Hospital Struga	1.538.592
14	PHI Institute for Lung Diseases in Children Kozle Skopje	1.281.661
15	PHI General Hospital "Dr. Ferid Murad" Gostivar	1.038.265
16	PHI University Clinic for Traumatology, Orthopedic Diseases, Anesthesia, Resuscitation, Intensive Care and Emergency Center	883.138
17	PHI General Hospital with expanded activity Kochani	425.233
18	PHI University Clinic for Ear, Nose and Throat	101.496
19	PHI University Clinic of Nephrology	96.030

As much as 98% of the procurement of the Nadroparin (Fraxiparine) drug is carried out using an open or simplified open procedure, while only 2% was procured with negotiated procedure without prior publication of a contract notice.

**PERCENTAGE OF FUNDS SPENT IN RELATION TO THE TYPE OF PUBLIC PROCUREMENT PROCEDURE FOR THE NADROPARIN (FRAXIPARINE) DRUG**

TYPE OF PROCEDURE	NUMBER OF TENDERS	VALUE OF THE TENDERS IN DENARS, INCLUSIVE OF VAT	PERCENTAGE OF PROCUREMENTS
Open procedure	26	60.323.136	88,3 %
Simplified open procedure	6	6.630.575	9,7 %
Negotiation procedure without announcement (notice)	2	1.383.091	2 %

Most of the tenders for procurement of Enoxaparin and Nadroparin drugs were conducted in open procedures by publishing an announcement (91%). At the same time, however, there is a high concentration of only two companies with which 99% of the contracts for procurement of medicines were concluded.

Covid Centers procured the Nadroparin (Fraxiparine) drug from two companies. The procurement from the Company for Trade, Production and Services FENIX FARMA DOOEL Skopje was part of 32 procurement contracts in the total amount of 66,959,111 denars inclusive of VAT or 1,088,766 euros (98% of the total procurement), while the remaining 2% of the value (two contracts) were signed with the Trade Company MAKEDONIJA LEK DOO Skopje in the amount of MKD 1,377,691 inclusive of VAT or 22,401 euros.

A total of 57 tenders were carried out for procurement of both drugs, for which a total of 135,846,597 denars inclusive of VAT or 2,208,887 euros were spent.

The largest share of funds spent for procurement of medicines was through open procedures - 128,842,148 denars inclusive of VAT or 2,094,994 euros.

**PERCENTAGE OF FUNDS SPENT IN RELATION TO THE TYPE OF PUBLIC PROCUREMENT PROCEDURE FOR THE ENOXAPARIN (CLEXANE) AND NADROPARIN (FRAXIPARINE) DRUGS**

TYPE OF PROCEDURE	TOTAL NUMBER OF TENDERS	VALUE OF THE TENDERS IN DENARS, INCLUSIVE OF VAT	PERCENTAGE OF PURCHASES
Open procedure	51	111.760.586	82,3 %
Simplified open procedure	16	16.644.995	12,2 %
Negotiation procedure without announcement (notice)	7	7.004.449	5,2 %
Small value purchase	2	436.567	0,3 %

Only three companies were involved in the procurement procedures for Enoxaparin (Clexane) and Nadroparin (Fraxiparine) drugs - Company for Trade, Production and Services FENIX FARMA DOOEL Skopje; Company for Internal and External Trade, Representation and Services MEDEKS FARM DOOEL Skopje; and MAKEDONIJA LEK DOO Skopje.

**COMPANIES AND VALUE OF THE CONTRACTS FOR PROCUREMENT OF THE ENOXAPARIN (CLEXANE) AND NADROPARIN (FRAXIPARINE) DRUGS**

ECONOMIC OPERATOR	TOTAL NUMBER OF TENDERS	VALUE OF THE CONTRACTS IN DENARS, INCLUSIVE OF VAT	VALUE OF THE CONTRACTS IN EUROS	SHARE
Company for internal and external trade, representation and services MEDEX FARM DOOEL Skopje	42	67.509.795	1.097.720	49,7 %
Company for trade, production and services FENIKS FARMA DOOEL Skopje	32	66.959.111	1.088.766	49,3 %
Company for trade MAKEDONIJA LEK DOO Skopje	2	1.377.691	22.401	1 %

## PUBLIC PROCUREMENT OF MEDICAL OXYGEN

Subject of the research were the public procurement conducted by the 28 COVID centers for procurement of medical oxygen in liquid and compressed form in the period 01.03.2020 - 31.03.2021.

For procurement of medical oxygen, the COVID centers conducted a total of 23 tenders in the analyzed period for which they spent a total of 136,290,500 denars inclusive of VAT or 2,216,105 euros.

The COVID centers within the Clinical Center in Skopje procured oxygen, both liquid and compressed, through the public institution (PI) in the field of health for the needs of public health institutions, university clinics, Institute and Emergency Center – Skopje, while the other entities were procuring independently.

The total amount spent for procurement of liquid oxygen in the period 01.03.2020 - 31.03.2021 is 67,768,156 denars inclusive of VAT or 1,101,921 euros, of which the PI in the field of health spent the most for the needs of public health institutions, university clinics, Institute and Emergency Center Skopje - 37,552,320 denars inclusive of VAT or 610,607 euros.

#### TOTAL AMOUNTS SPENT FOR LIQUID OXYGEN IN DENARS, INCLUSIVE OF VAT

	COVID CENTER	VALUE OF THE TENDERS IN DENARS, INCLUSIVE OF VAT
1	PI in the field of health for the needs of public health institutions, university clinics, Institute and Emergency Center Skopje	37.552.320
2	PHI Clinical Hospital Bitola	13.820.208
3	PHI General City Hospital "8 September" Skopje	8.389.800
4	PHI Clinical Hospital Tetovo	5.377.968
5	PHI Clinical Hospital Shtip	1.412.460
6	PHI General Hospital "Dr. Ferid Murad" Gostivar	736.320
7	PHI General Hospital with expanded activity Prilep	479.080

PI in the field of health for the needs of public health institutions, university clinics, Institute and Emergency Center Skopje procured a total of 1,250,000 kilograms of liquid oxygen with a unit price between 28.3 and 30.6 denars inclusive of VAT per kilogram, in a total value of 37,552. 320 denars or 610,606 euros.

The largest quantity per individual COVID centers was procured by the PHI University Clinic for Infectious Diseases and Febrile Conditions - 579,900 kilograms.

#### QUANTITY OF LIQUID OXYGEN PROCURED, IN KILOGRAMS

	COVID CENTER	QUANTITY IN KG
1	PHI University Clinic for Infectious Diseases	579 900
2	PHI General City Hospital "8 September" Skopje	390 000
3	PHI Clinical Hospital Bitola	200 000
4	PHI University Clinic for Traumatology, Orthopedic Diseases, Anesthesia, Resuscitation, Intensive Care and Emergency Center	155 416
5	PHI University Clinic for Children's Diseases	86 810
6	PHI Clinical Hospital Tetovo	78 000
8	PHI University Clinic for Plastic Surgery and Reconstructive Surgery	22 508
9	PHI Clinical Hospital Shtip	18 000
10	PHI University Clinic for Ear, Nose and Throat	14 167
11	PHI General Hospital "Dr. Ferid Murad" Gostivar	12 000
12	PHI University Clinic of Neurology	9 702
13	PHI University Clinic for Gastroenterohepatology	7 470

	COVID CENTER	QUANTITY IN KG
13	PHI University Clinic for Gastroenterohepatology	7 470
14	PHI General Hospital with expanded activity Prilep	7 000
15	PHI Institute for Lung Diseases and Tuberculosis	5 600
16	PHI University Clinic of Dermatology	5 208
17	PHI University Clinic of Nephrology	4 464
18	PHI University Clinic for Eye Diseases	2 976

The unit prices at which the COVID centers that procured liquid oxygen through the PI in the field of health for the needs of public health institutions, university clinics, Institute and Emergency Center Skopje ranged from 25.2 to 31.9 denars inclusive of VAT or an average of 30,3 denars per kilogram. In general, there are significant differences in the unit prices at which the COVID centers procured liquid oxygen for treatment of patients that go as high as 700% i.e. they range from 11.1 to 78.5 denars inclusive of VAT.

#### UNIT PRICES PER KILOGRAM OF LIQUID OXYGEN IN DENARS, INCLUSIVE OF VAT

	COVID CENTER	TENDER REFERENCE NUMBER	UNIT PRICES PER KILOGRAM IN DENARS, INCLUSIVE OF VAT
1	PHI General City Hospital "8 September" Skopje	00527/2021	11,1
		11206/2020	40,1
2	PI in the field of health for the needs of public health institutions, university clinics, Institute and Emergency Center Skopje	without announcement	28,3
		16271/2020	30,6
3	PHI General Hospital "Dr. Ferid Murad" Gostivar	01488/2021	61,4
4	PHI General Hospital with expanded activity Prilep	11231/2020	62,5
5	PHI Clinical Hospital Bitola	13989/2020	61,4
		without announcement	73,3
6	PHI Clinical Hospital Tetovo	15799/2020	68,7
		without announcement	69,4
7	PHI Clinical Hospital Shtip	without announcement	78,5

Only three companies were involved in the procedures for procurement of liquid oxygen, of which the Company for production of industrial gases TGS TECHNICAL GAS DOO Skopje received 70.2% of the total funds spent for these procurements.

## COMPANIES AND THE VALUE OF THE CONTRACTS FOR SUPPLY OF LIQUID MEDICAL OXYGEN

ECONOMIC OPERATOR	NUMBER OF CONTRACTS	VALUE OF THE CONTRACTS IN DENARS, INCLUSIVE OF VAT	VALUE OF THE CONTRACTS IN EUROS	SHARE
Company for production of industrial gases TGS TECHNICAL GAS DOO Skopje	7	47.594.828	773.900	70,2 %
Company for production, trade and services LG WEST BALKAN INDUSTRIAL AND MEDICAL GAS DOOEL Skopje	3	14.556.528	236.691	21,5 %
Company for trade, production and services MESER VARDAR TECHNOGAS Meser Group Gmbh DOOEL import-export Skopje	1	5.616.800	91.330	8,3 %

Two-thirds of the total funds spent on the supply of liquid oxygen were through procurements using open procedure, while one third were spent using negotiated procedure without prior publication of a contract notice.

TYPE OF PROCEDURE	NUMBER OF TENDERS	VALUE OF THE PURCHASES IN DENARS, INCLUSIVE OF VAT	PERCENTAGE OF PURCHASES
Open procedure	3	37.446.120	55,3 %
Negotiated procedure without announcement	3	22.316.208	32,9 %
Simplified open procedure	5	8.005.828	11,8 %

A total of 68,522,344 denars were spent with VAT or 1,114,184 euros for purchase of compressed oxygen in the analyzed period, of which the PHI General Hospital Ohrid spent the most - 31,374,708 denars inclusive of VAT or 510,158 euros.



**TOTAL AMOUNTS SPENT FOR COMPRESSED OXYGEN PURCHASE IN DENARS, INCLUSIVE OF VAT**

	COVID CENTER	VALUE OF THE TENDERS IN DENARS, INCLUSIVE OF VAT
1	PHI General Hospital Ohrid	31.374.708
2	PHI General Hospital Kumanovo	9.852.480
3	PHI General Hospital Kichevo	8.425.200
4	PHI Clinical Hospital Shtip	7.010.320
5	PHI General Hospital Struga	3.580.710
6	PHI General Hospital with expanded activity Kavadarci	2.206.600
7	PHI General Hospital with expanded activity Prilep	2.206.600
8	PHI General Hospital "Dr. Ferid Murad" Gostivar	991.200
9	Public institution in the field of health for the needs of public health institutions University clinics, Institute and Emergency Center Skopje	973.110
10	PHI Clinical Hospital Tetovo	856.397
11	PHI Clinical Hospital Bitola	521.099
12	PHI General City Hospital "8 September" Skopje	323.320
13	PHI General Hospital with expanded activity Kochani	200.600

## QUANTITY OF COMPRESSED OXYGEN PROCURED

Same like the liquid oxygen, the COVID centers from the Clinical Center were also procuring the the compressed oxygen through the PI in the field of health for the needs of the public health institutions, university clinics, Institute and Emergency Center - Skopje while the remaining institutions were procuring independently.

The largest quantity of compressed oxygen was procured by PHI General Hospital Ohrid - 169,600 kilograms.

## QUANTITY OF COMPRESSED OXYGEN PROCURED, IN KILOGRAMS

	COVID CENTER	QUANTITIES IN KILOGRAMS
1	PHI General Hospital Ohrid	169 600
2	PHI General Hospital Kumanovo	59 000
3	PHI Clinical Hospital Shtip	50 880
4	PHI General Hospital Kichevo	42 000
5	PHI General Hospital Struga	40 250
6	PHI General Hospital "Dr. Ferid Murad" Gostivar	12 000
7	PHI General Hospital with expanded activity Prilep	11 000
8	Public institution in the field of health for the needs of public health institutions University clinics, Institute and Emergency Center - Skopje	5 500
9	PHI Clinical Hospital Tetovo	4 400
10	PHI Clinical Hospital Bitola	2 600
11	PHI General City Hospital "8 September" Skopje	2 000
12	PHI University Clinic for Traumatology	1 008
13	PHI General Hospital with expanded activity Kavadarci	1 000
14	PHI General Hospital with expanded activity Kochani	1 000
15	PHI University Clinic for Infectious Diseases	508
16	PHI University Clinic for Traumatology	258
17	PHI University Clinic of Nephrology	107
18	PHI University Clinic for Children's Diseases	32
19	PHI University Clinic for Ear, Nose and Throat	26
20	PHI University Clinic for Eye Diseases	15
21	PHI University Clinic of Dermatology	12
22	PHI University Clinic of Neurology	4

The price at which the COVID centers procured the compressed oxygen ranged from 82.6 to 200.6 denars inclusive of VAT per kilogram i.e. it reached a difference of up to 250%.

**UNIT PRICES PER KILOGRAM OF COMPRESSED OXYGEN IN DENARS, INCLUSIVE OF VAT**

	COVID CENTER	TENDER REFERENCE NUMBER	UNIT PRICES IN DENARS, INCLUSIVE OF VAT
1	PHI General Hospital "Dr. Ferid Murad" Gostivar	01488/2021	82,6
2	PHI General Hospital Struga	19147/2020	89
3	PHI General Hospital Kumanovo	20051/2020	92,3
		No announcement	182,2
4	PHI General Hospital with expanded activity Kavadarci	17267/2020	110,3
5	PHI Clinical Hospital Shtip	No announcement	123,9
		07283/2020	200,4
		13748/2020	112,1
6	PHI General City Hospital "8 September" Skopje	11206/2020	161,7
7	Public institution in the field of health for the needs of public health institutions University clinics, Institute and Emergency Center Skopje	16271/2020	176,9
8	PHI General Hospital Ohrid	17628/2020	184,1
		09260/2020	200,2
9	PHI Clinical Hospital Tetovo	15799/2020	194,7
		No announcement	194,7
10	PHI Clinical Hospital Bitola	13989/2020	200,6
		No announcement	198,3
11	PHI General Hospital Kichevo	10847/2020	200,6
		01153/2021	200,6
12	PHI General Hospital with expanded activity Prilep	11231/2020	200,6
13	PHI General Hospital with expanded activity Kochani	00016/2021	200,6

The compressed oxygen was procured by the COVID centers from four companies in the total amount of 68,522,344 denars. 94.5% of the tenders were won by two companies: Company for Trade, Production and Services Meser Vardar Tehnogas Meser Group GmbH DOOEL import-export Skopje and Company for Production of Industrial Gases TGS Technical gases DOO Skopje.

ECONOMIC OPERATOR	NUMBER OF TENDERS	VALUE OF THE CONTRACTS IN DENARS, INCLUSIVE OF VAT	VALUE OF THE CONTRACTS IN EUROS	SHARE
Company for trade, production and services MESER VARDAR TECHNOGAS Meser Group Gmbh DOOEL import-export Skopje	4	32,689,228	531,532	47.7%
Company for production of industrial gases TGS TECHNICAL GAS DOO Skopje	12	32,105,226	522,036	46.8%
Company for production of industrial gases TGS TECHNICAL GAS AD Skopje	2	3,206,791	52,143	4.7%
Company for production, trade and services LG VEST BALKAN INDUSTRIAL AND MEDICAL GAS DOOEL Skopje	2	521,099	8,473	0.8%

Most of the funds spent for procurement of compressed oxygen were with the use of open procedures (85.3%) while the remaining 14.7% were with the negotiated procedure without publishing of announcement.

TYPE OF PROCEDURE	NUMBER OF TENDERS	VALUE OF THE PURCHASES IN DENARS, INCLUSIVE OF VAT	PERCENTAGE OF THE PROCUREMENTS
Open procedure	6	45,830,137	66,9 %
Simplified open procedure	8	12.003.096	17,5 %
Negotiated procedure without announcement	4	10,087,311	14,7 %
Small value purchases	2	601,800	0,9 %

In total, the Public Institution in the field of health for the needs of the public health institutions, university clinics, Institute and Emergency Center Skopje has spent the most of the money for oxygen - 38,525,430 denars inclusive of VAT or 626,430 euros.

**TOTAL AMOUNTS SPENT FOR OXYGEN IN DENARS, INCLUSIVE OF VAT**

	COVID CENTER	VALUE OF THE TENDERS IN DENARS, INCLUSIVE OF VAT
1	Public institution in the field of health for the needs of public health institutions University clinics, Institute and Emergency Center Skopje	38.525.430
2	PHI General Hospital Ohrid	31.374.708
3	PHI Clinical Hospital Bitola	14.341.307
4	PHI General Hospital Kumanovo	9.852.480
5	PHI General City Hospital "8 September" Skopje	8.713.120
6	PHI General Hospital Kichevo	8.425.200
7	PHI Clinical Hospital Shtip	8.422.780
8	PHI Clinical Hospital Tetovo	6.234.365
9	PHI General Hospital Struga	3.580.710
10	PHI General Hospital with expanded activity Prilep	2.685.680
11	PHI General Hospital with expanded activity Kavadarci	2.206.600
12	PHI General Hospital "Dr. Ferid Murad" Gostivar	1.727.520
13	PHI General Hospital with expanded activity Kochani	200.600

The total quantity of oxygen used by the COVID centers across the country to treat the patients in these centers was procured from a total of four companies.

Most of the contracts (5)9% were signed with the Company for production of industrial gases TGS TECHNICAL GAS DOO Skopje in the amount of 79,700,054 denars inclusive of VAT or 1,295,935 euros.

ECONOMIC OPERATOR	NUMBER OF TENDERS	VALUE OF THE CONTRACTS IN DENARS, INCLUSIVE OF VAT	VALUE OF THE CONTRACTS IN EUROS	SHARE
Company for production of industrial gases TGS TECHNICAL GAS DOO Skopje	19	79.700.054	1.295.935	58,5 %
Company for trade, production and services MESER VARDAR TECHNOGAS Meser Group Gmbh DOOEL import-export Skopje	5	38.306.028	622.862	28,1 %
Company for production, trade and services LG WEST BALKAN INDUSTRIAL AND MEDICAL GAS DOOEL Skopje	5	15.077.627	245.165	11 %
Company for production of industrial gases TGS TECHNICAL GAS AD Skopje	2	3.206.791	52.143	2,4 %

Three-quarters of medical oxygen procurement were implemented using open procedures and one quarter was implemented using negotiated procedure without prior announcement.

TYPE OF PROCEDURE	NUMBER OF TENDERS	VALUE OF THE PURCHASES IN DENARS, INCLUSIVE OF VAT	PERCENTAGE OF THE PROCUREMENTS
Open procedure	9	83.276.257	61,1 %
Negotiated procedure without announcement			23,8 %
Simplified open procedure	13	20.008.924	14,7 %
Small value purchases	2	601.800	0,4 %



## CONCLUSIONS AND RECOMMENDATIONS

- There are large differences between the 28 COVID centers that were covered by the analysis, both in terms of the number of medical staff engaged, the drugs used to treat the hospitalized patients, the oxygen support provided, the masks used and the number of average days of hospitalization and patient mortality rate;
- Only five COVID centers provided a high level of health services in the analyzed period according to the research indicators, 21 of the centers provided an average level of health services and two provided a low level of health services;
- When conducting public procurement procedures by applying negotiation procedure without prior publication of a contract notice, more companies should be included in the negotiation because the reason for negotiation is the urgency of the procurement and not protection of the exclusive right of certain companies;
- Respect the deadlines for delivery of the procured products, having in mind that the urgency of the procurement justifies the implementation of this negotiation procedure without prior publication of a contract notice;
- Elaborate in detail the reasons for each procurement in the procurement decision in order to justify that the contracting authority could not have foreseen or plan the procurement, did not have time to apply other procedures and that the circumstances of extreme urgency can in no case be attributed to the institution which does the procurement.





