

# The Impact of COVID-19 Pandemic on the Interventional Cardiology Workload in Private Versus Public Hospitals of Romania in 2020

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## ABSTRACT

The Covid-19 pandemic has severely affected and changed medical activity worldwide. Public hospitals have been suffocated by the large number of Covid-19 patients, sometimes making it difficult for patients with other conditions to be admitted to hospital. This was also true for patients with cardiovascular disease. In the present article we describe the main variations in the activity of interventional cardiology laboratories in Romania between the pre-pandemic year 2019 and the pandemic year 2020 in private and public hospitals.

**Keywords:** interventional cardiology, percutaneous coronary interventions, covid-19, public hospital, private hospital.

## INTRODUCTION

The Covid-19 pandemic has severely affected and changed medical activity worldwide. Public hospitals have been suffocated by the large number of Covid patients, sometimes making it difficult for patients with other conditions to be admitted to hospital. This was also true for those with cardiovascular disease. Because public hospitals were faced to many patients infected with Covid-19, especially complex ones with multiple complications, those with cardiovascular disease

found that healthcare in private hospitals was more easily accessible. However, at least during the first part of 2020, many patients were afraid to seek medical help in a hospital, even a private one, due to the potential risk of infection, although all public and private hospitals had adopted effective strategies to prevent contamination. Thus, it is intuitive to say that the activity in both public and private hospitals has been affected, including invasive treatment of cardiovascular diseases. In this article we present the main variations in the activity of interventional cardiology laboratories in Romania between the pre-

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pandemic year 2019 and the pandemic year 2020 in private and public hospitals. □

**MATERIALS AND METHODS**

Data was collected from all interventional cardiology centers in Romania using a standardized form at the initiative of the Interventional Cardiology Working Group of Romanian Society of Cardiology. Statistics from 2020 were

compared to already published data from 2019 (1-6). Table 1 summarizes data from 2020 and 2019 provided by all public and private interventional cardiology centers in Romania. □

**RESULTS**

Both coronary diagnostic and treatment interventions witnessed an important decrease in 2020 compared to 2019 in public and private

**TABLE 1.** Reported data from all public and private interventional cardiology centers of Romania in 2019 and 2020

Year	2020		2019		↓/↑	2020 vs 2019 percentage variation (%)	
	Public	Private	Public	Private		Public	Private
<b>Hospital</b>							
No. of Cath labs	35	17	36	17			
No. of independent operators	95	37	88	44			
No. of in training operators	51	0	56	2			
<b>Coronary interventions</b>							
Coronarography	22118	7706	33223	9941	↓	50.21	↓ 29
Total no. of PCI <sup>1</sup>	13269	2610	18820	2963	↓	41.83	↓ 13.52
PCI without stents	1020	96	1176	130	↓	15.29	↓ 35.42
PCI with stents	12164	2444	17182	2833	↓	41.25	↓ 15.92
STEMI with primary PCI	6323	264	7878	403	↓	24.59	↓ 52.65
PCI left main	511	42	857	104	↓	67.71	↓ 147.62
CTO	306	44					
Stents per patient <sup>2</sup>	1.47	1.4	1.44	1.52	↑	2.42	↓ 9.22
Total no. of stents	18122	3853	27599	4456	↓	52.3	↓ 15.65
No. of DES	17698	3852	25762	4445	↓	45.56	↓ 15.39
DES/stents ratio (%)	98	100	89.91	99.64	↑	8.25	↑ 0.36
Cutting, scoring	123	59	140	56	↓	13.82	↑ 5.08
Rotablation	46	33	36	22	↑	21.74	↑ 33.33
Shockwave	3	12	0	0			
FFR/IFR	217	21	309	51	↓	42.4	↓ 142.86
IVUS	55	20	107	38	↓	94.55	↓ 90
OCT	67	5	111	37	↓	65.67	↓ 640
<b>Peripheral interventions</b>							
Peripheral PTA <sup>3</sup>	769	345	1419	377	↓	84.53	↓ 9.28
Renal PTA	47	12	86	7	↓	82.98	↑ 41.67
Carotid PTA	173	40	312	70	↓	80.35	↓ 75
Total no. of stents in peripheral PTA	602	239	1153	251	↓	91.53	↓ 5.02
Peripheral angiography	4118	1066	5270	1245	↓	27.97	↓ 16.79
<b>Other interventions</b>							
TAVI	365	129	344	84	↑	5.75	↑ 34.88
MitraClip	1	2	0	3			
Aortic endoprosthesis	72	19	76	37	↓	5.56	↓ 94.74
Interventions in structural heart disease <sup>4</sup>	131	40	87	53	↑	33.59	↓ 32.5

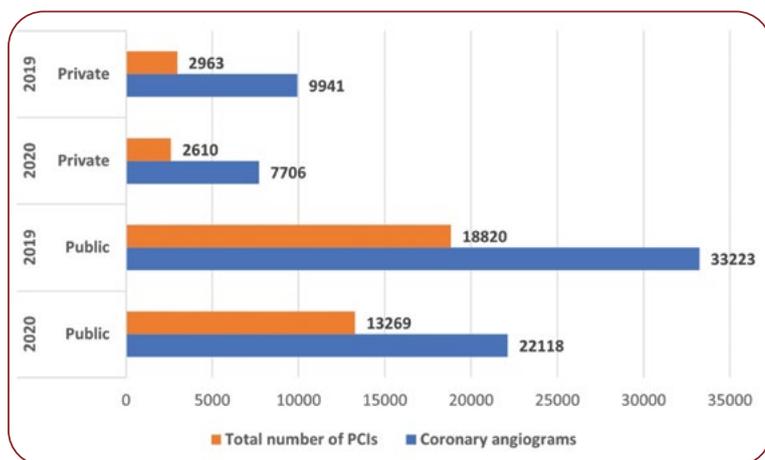
<sup>1</sup>Total number (no.) of elective and urgent PCIs

<sup>2</sup>It will represent the ratio between the total number of implanted stents and the total number of patients undergoing PCI

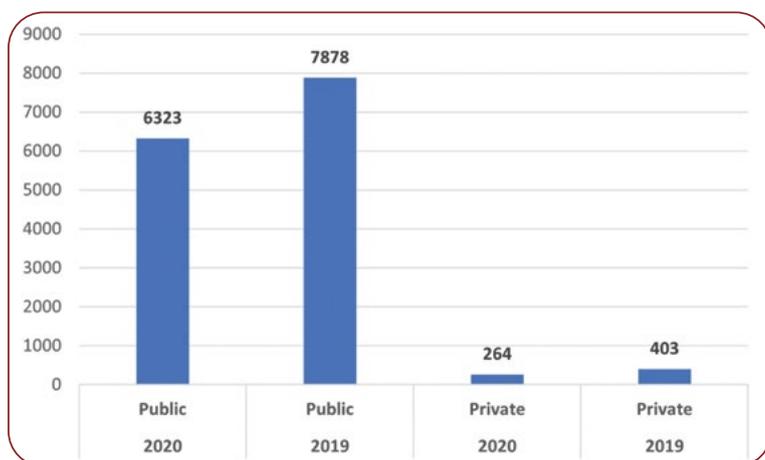
<sup>3</sup>Number of peripheral angioplasty (lower and upper limbs artery, not including carotid arteries)

<sup>4</sup>Interventions in cardiac structural diseases: percutaneous closures of DSA, DSV, PFO, arterial duct, balloon valvulotomies, left atrial appendage closure

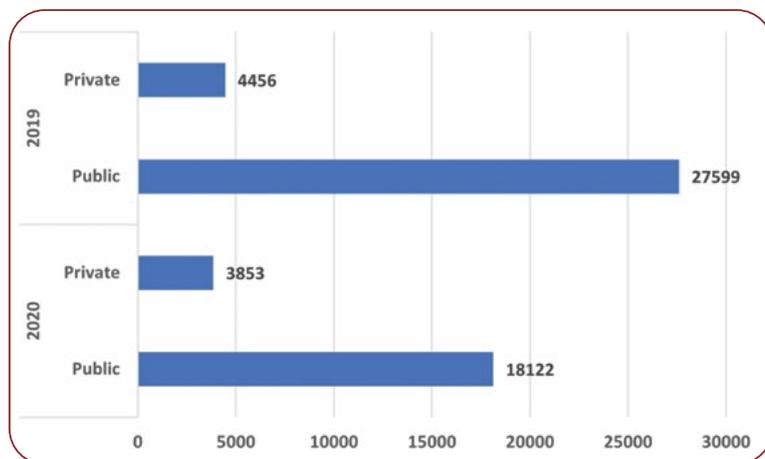
(↑: increase; ↓: decrease; PCI: percutaneous coronary intervention; STEMI: ST segment elevation myocardial infarction; DES: drug eluting stent; BVS: bioresorbable vascular scaffold; FFR: fractional flow reserve; IFR: instantaneous wave-free ratio; IVUS: intravascular ultrasound; OCT: optical coherence tomography; PTA: percutaneous transluminal angioplasty; TAVI: transcatheter aortic valve implantation; CTO: chronic total occlusion)



**FIGURE 1.** Total number of coronary angiograms and percutaneous coronary interventions (PCIs) performed in public and private hospitals of Romania in 2019 and 2020



**FIGURE 2.** The total number of primary percutaneous coronary interventions performed in public and private hospitals of Romania in 2019 and 2020



**FIGURE 3.** The total number of implanted stents in public and private hospitals of Romania in 2020 and 2019

hospitals alike. From 2019 to 2020, the number of coronary angiograms decreased by 50% in

public hospitals compared to 29% in private ones (Figure 1). There is a more striking difference in the total number of percutaneous coronary interventions (PCIs) that decreased from 2019 to 2020 by 41.8% in public hospitals compared to only 13.5% in private ones (Figure 1). These numbers included the elective and urgent procedures.

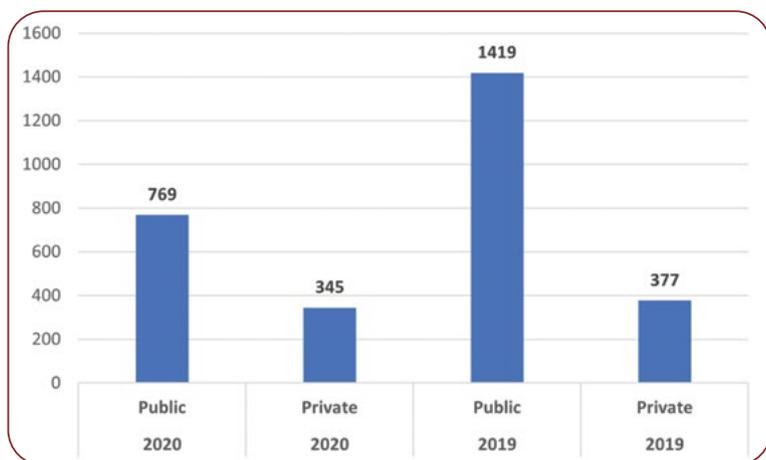
Although there is a big difference in the decrease in the number of PCIs from 2019 to 2020 in public hospitals compared to private ones, it is not entirely due to the decrease in the number of elective procedures in public hospitals. In Figure 2 we can see that the number of primary PCIs in ST segment elevation myocardial infarction (STEMI) patients registered a higher decrease in private hospitals (52.6%) compared with public ones (24.5%) in 2020 than in 2019. Although the percentage decrease in the number of emergency procedures in private hospitals was higher than in public ones, if we take the absolute numbers, we see that the number of STEMI patients has significantly decreased in public hospitals. This raises many questions about whether there was a real decrease in the incidence of heart attacks in Romania in 2020 or patients with heart attacks did not go to hospital due to fear generated by the Covid-19 pandemic.

The reduction in the total number of PCIs is reflected by the significant decrease in the number of implanted stents in 2020 compared with 2019 by 52.2% in public hospitals and 15.6% in private ones (Figure 3).

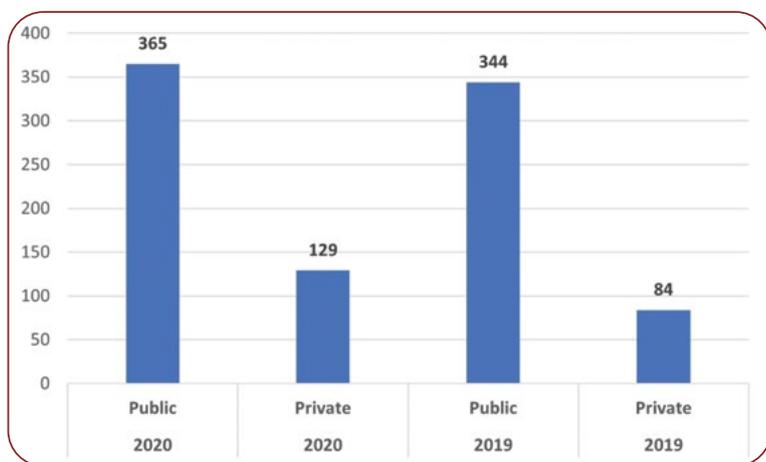
Interestingly, although the total number of PCIs decreased in 2020 compared to 2019, the number of interventions that used more complex techniques such as rotational atherectomy increased in both public hospitals (by 21.3%) and private ones (by 33.3%). Regarding coronary interventions, the use of intracoronary physiology and imaging techniques, especially in private hospitals, witnessed the most marked decline.

The largest difference between public and private hospitals was recorded in the number of peripheral angioplasties, which decreased by 84.5% in public hospitals and only 9.2% in private ones in 2020 compared to 2019 (Figure 4).

Although most areas of interventional cardiology have decreased in 2020 compared to 2019, some types of procedures were performed to a greater extent in 2020 than in 2019. Although not very large, there was still an increase in 2020 versus



**FIGURE 4.** The total number of peripheral angioplasties in public and private hospitals of Romania in 2020 and 2019



**FIGURE 5.** The total number of transcatheter aortic valve implantation procedures performed in public and private hospitals of Romania in 2019 and 2020

2019 in the number of transcatheter aortic valve implantation (TAVI) procedures (Figure 5). Prob-

bly this can be due to the impact of Covid-19 pandemic on the activity of cardiovascular surgery centers. The same thing can be seen in public hospitals about the number of interventions for patients with structural heard diseases (SHD). □

### CONCLUSIONS

There is a continuous need for implementing a Mandatory Interventional Cardiology National Registry capable of objectively monitoring these key health care services in a standardized manner. This national registry can further guide the development of interventional cardiology in Romania (1-6).

Covid-19 pandemic made 2020 a difficult year for medical activity in general. The activity of interventional cardiology labs in Romania was vastly impacted. Public hospitals were affected to a greater extent than private ones for all procedures (globally, interventional activity decreased by 33% and 22% in public and private hospitals, respectively).

Although the number of most types of interventional cardiology procedures – mostly coronary and peripheral interventions – was significantly reduced in 2020 versus 2019, there was also progress in terms of TAVI and SHD interventions.

### Study limitation

Data used in the present analysis are provided by each center, without any independent control, which should be seen as a limitation to this study. □

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