

ORIGINAL ARTICLE

The Workload of the Interventional Cardiology Centers from Romania: a 2020 Overview and 2014-2020 Trends

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ABSTRACT

This article provides data of the workload of the interventional cardiology centers from Romania during 2020. Members from all interventional cardiology centers from Romania were requested to fill a standard form about the total number of various procedures performed during 2020. The report highlights the total number of coronary interventions, peripheral interventions, and interventions for structural heart diseases, that were performed in 2020 in Romania. A comparison of the workload of the interventional cardiology centers from Romania between 2014 to 2020 was done.

Keywords: interventional cardiology, percutaneous coronary interventions, stents.

REZUMAT

Acest articol oferă date despre volumul de lucru al centrelor de cardiologie intervențională din România în cursul anului 2020. Membrii din toate centrele de cardiologie intervențională din România au fost rugați să completeze un formular standard despre numărul total de proceduri intervenționale efectuate în cursul anului 2020. Raportul evidențiază numărul total de intervenții coronariene, intervenții periferice și intervenții pentru boli structurale cardiace, care au fost efectuate în 2020 în România. S-a făcut o comparație între volumul de lucru al centrelor de cardiologie intervențională din România între anii 2014 și 2020.

Cuvinte cheie: cardiologie intervențională, intervenții coronariene percutane, stenturi.

There is a continuous need to be UpToDate with the annuary trend of the number of different percutaneous procedures in the interventional cardiology field in our country. Based on this number we can assess the needs for development in specific domain of interventional cardiology. The statistics of 2020 is of utmost importance being a pandemic year that has impacted a lot the activity in this field.

This article provides data of the workload of the interventional cardiology centers from Romania during 2020 and it highlights the trends in coronary or peripheral interventions between 2014 and 2020-6. Members from all interventional cardiology centers from Romania were requested to fill a standardized form about the total number of various procedures performed during 2020. Data was collected from 36

of 38 interventional cardiology centers from Romania at the initiative of the Interventional Cardiology Working Group of Romanian Society of Cardiology.

Table I summarizes the data from 2020 provided by 36 public and private interventional cardiology centers from Romania. Currently, there are 38 interventional cardiology centers in Romania, of which 13 are private centers and 25 public centers. In 2019, in Romania were 51 interventional cardiologists in training. The exact number of full interventional cardiologist is difficult to know because of some interventional cardiologists are working in public and private hospitals, also.

The annual number of PCIs in every interventional cardiology center from Romania is represented in Figure 1. A direct comparison of data from 2014 to 2020 was done, that highlights the continuous increase

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of workload of the interventional cardiology centers from Romania until 2020 when we have a clear decrease (Figure 2). In 2020, in Romania, 15879 PCIs were performed compared to 21783 in 2019, that represent a 27.1%. The total number of primary PCIs decreased in 2020 with 20.5% compared to 2019 (from 8281 in 2019 to 6587 in 2020) (Figure 3).

Although, from 2014 to 2018 the total number of peripheral angioplasties doubled, in 2019 there was a decrease in this regard by 13%, further decreasing in 2020 by 38% compared to 2019 (Figure 4).

The number of TAVI procedures doubled every year between 2015-2019 and the trend maintained in 2020 with an increased by 13.3% compared to 2019 (Figure 5). The number of procedures performed in structural heart diseases increased from 2019 to 2020 by 18.1% (Figure 5).

There is a continuous need of implementing a Mandatory Interventional Cardiology National Registry, capable of monitoring objectively these key health care services in a standard manner. This national registry can guide further development of the interventional cardiology in Romania¹⁻⁶.

Table 1. Reported data from all Interventional Cardiology Centers from Romania in 2020

City	Bucharest							
Hospital	CC Iliescu	SUUB	Floreasca	Agrippa Ionescu	Militar	Bagdasar-Arseni	Elias	Sf. Ioan
No. of cathlabs	1	2	1	1	3	1	2	1
No. of independent operators	7	6	5	2	5	2	5	2
Nr. of in training operators	12	5	4	0	1	2	3	0
Coronary interventions								
Coronarography	2057	1193	1185	525	1938	434	1282	252
Total nr. of PCI ¹	1025	770	809	110	881	129	593	72
PCI without stents	88	46	25	3	54	4	17	0
PCI with stents	937	724	784	107	733	125	576	72
STEMI with primary PCI	506	516	777	3	271	12	307	11
PCI left main	156	30	64	9	14	7	UR	0
CTO	72	25	UR	5	68	11	UR	0
Stents per patient ²	1.5	1.63	1.36	1.46	1.27	1.56	1.28	1.26
Total nr. of stents	1407	1257	1008	161	929	195	743	91
Nr. of DES	1407	1257	1008	161	918	195	735	91
DES/stents ratio (%)	100%	100%	100.00%	100%	99%	100	99%	100%
Cutting, scoring	65	5	5	6	3	0	0	0
Rotablation	16	0	8	2	2	0	0	0
Shockwave	3	0	0	0	0	0	0	0
FFR/IFR	5	10	7	7	0	0	0	0
IVUS	7	0	12	2	0	0	0	0
OCT	3	10	5	5	0	0	0	0
Peripheral interventions								
Peripheral PTA ³	106	0	0	8	154	0	15	11
Renal PTA	4	1	0	1	7	0	0	3
Carotid PTA	3	0	0	16	37	0	5	0
Total nr. of stents in peripheral PTA	60	0	0	7	157	0	5	17
Peripheral angiography	301	50	15	75	595	22	87	54

Other interventions								
TAVI	146	24	0	8	12	0	0	0
MitraClip	0	0	0	0	0	0	0	0
Aortic endoprosthesis	11	0	0	3	11	0	0	0
Interventions in structural heart disease ⁴	23	44	0	0	1	0	0	0

Hospital	Bucharest				
	Sanador	Ares - Monza	Colentina	Medlife	CDT Victor Babes
Nr. of cathlabs	2	3	1	1	1
Nr. of independent operators	2	7	1	5	1
Nr. of in training operators	0	0	1	0	0
Coronary interventions					
Coronarography	858	1038	56	438	46
Total nr. of PCI ¹	142	510	25	112	28
PCI without stents	0	15	0	9	2
PCI with stents	142	495	25	103	26
STEMI with primary PCI	11	5	2	2	0
PCI left main	3	UR	0	3	UR
CTO	UR	UR	0	10	UR
Stents per patient ²	1.42	1.65	1.36	1.5	1.7
Total nr. of stents	202	834	34	169	44
Nr. of DES	202	834	34	169	44
DES/stents ratio (%)	100%	100%	100%	100%	100%
Cutting, Scoring	52	0	0	4	0
Rotablation	2	15	0	0	0
Shockwave	0	UR	0	1	0
FFR/IFR	0	0	0	0	0
IVUS	0	1	0	0	0
OCT	0	0	0	0	0
Peripheral interventions					
Peripheral PTA ³	56	75	3	28	4
Renal PTA	2	1	0	2	0
Carotid PTA	0	3	0	6	0
Total nr. of stents in peripheral PTA	15	31	3	51	7
Peripheral angiography	451	13	12	197	12
Other interventions					
TAVI	18	57	0	0	0
MitraClip	0	1	0	0	0
Aortic endoprosthesis	8	3	0	0	0
Interventions in structural heart disease ⁴	0	31	0	1	0

City	Cluj Napoca				Iasi	
Hospital	Heart Institute, Cluj	Emergency County Clinical Hospital, Cluj	Monza-Ares Cluj	Rehabilitation Hospital, Cluj	IBCV Iasi	Arcadia Iasi
Nr. of cathlabs	2	1	1	UR	3	1
Nr. of independent operators	9	4	1	UR	6	2
Nr. of in training operators	1	9	0	UR	3	0
Coronary interventions						
Coronarography	1430	730	510	UR	2075	857
Total nr. of PCI ¹	1105	428	230	UR	1492	142
PCI without stents	93	19	8	UR	160	5
PCI with stents	1012	409	222	UR	1332	137
STEMI with primary PCI	422	152	0	UR	606	0
PCI left main	34	32	UR	UR	UR	UR
CTO	12	33	UR	UR	UR	UR
Stents per patient ²	1.03	1.96	1.5	UR	1.24	1.3
Total nr. of stents	1138	840	310	UR	1849	178
Nr. of DES	1134	840	310	UR	1811	178
DES/stents ratio (%)	99%	100.00%	100%	UR	98%	100%
Cutting, Scoring	6	0	0	UR	0	0
Rotablation	4	0	0	UR	0	0
Shockwave	0	0	UR	UR	0	0
FFR/IFR	35	0	2	UR	0	0
IVUS	18	0	0	UR	0	0
OCT	5	8	0	UR	0	0
Peripheral interventions						
Peripheral PTA ³	62	84	46	UR	18	18
Renal PTA	12	5	5	UR	2	1
Carotid PTA	17	2	17	UR	4	9
Total nr. of stents in peripheral PTA	63	62	79	UR	14	UR
Peripheral angiography	40	181	54	UR	363	121
Other interventions						
TAVI	95	0	0	UR	31	0
MitraClip	0	0	1	UR	1	0
Aortic endoprosthesis	14	0	0	UR	0	0
Interventions in structural heart disease ⁴	10	0	4	UR	15	1

City	Targu Mures				Timisoara	Brasov		
Hospital	IBCV Tg. Mures	CardioMed Tg. Mures	Emergency County Clinical Hospital, Tg. Mures	Nova Vita	IBCV Timisoara	Clinicco Brasov	County Hospital Brasov	„Sf. Constantin” Hospital
Nr. of cathlabs	2	2	2	1	2	1	1	1
Nr. of independent operators	6	5	6	6	7	2	4	3
Nr. of in training operators	0	0	2	0	2	0	0	0
Coronary interventions								
Coronarography	1106	499	157	743	2300	823	1548	655
Total nr. of PCI ¹	620	299	492	81	1490	270	982	103
PCI without stents	65	26	26	0	98	4	233	1
PCI with stents	564	203	466	81	1392	266	749	102
STEMI with primary PCI	302	0	303	0	871	9	384	2
PCI left main	30	2	24	0	UR	19	UR	3
CTO	5	UR	38	0	UR	0	UR	0
Stents per patient ²	1.4	1.1	1.31	1.18	1.94	1.6	1.2	1.3
Total nr. of stents	863	262	611	96	2710	426	878	138
Nr. of DES	862	262	385	96	2601	426	878	138
DES/stents ratio (%)	99%	100%	63%	100%	96%	100%	100%	100%
Cutting, scoring	5	0	0	0	3	1	4	2
Rotablation	5	0	2	0	0	2	0	2
Shockwave	0	0	0	0	0	11	0	0
FFR/IFR	33	19	2	0	1	0	31	0
IVUS	0	19	1	0	0	0	0	0
OCT	5	5	15	0	0	0	4	0
Peripheral interventions								
Peripheral PTA ³	47	69	9	18	44	11	0	10
Renal PTA	2	0	0	0	10	0	0	1
Carotid PTA	11	1	0	4	37	0	10	0
Total nr. of stents in peripheral PTA	24	12	3	10	84	10	0	12
Peripheral angiography	112	88	13	64	1620	17	30	23
Other interventions								
TAVI	41	0	2	0	6	3	0	14
MitraClip	0	0	0	0	0	0	0	0
Aortic endoprosthesis	17	0	0	0	6	1	0	5
Interventions in structural heart disease ⁴	38	0	0	0	0	0	0	0

City	Oradea	Arad	Suceava	Baia Mare	Sibiu	
Hospital	County Hospital Oradea	County Hospital Arad	County Hospital Suceava	County Hospital Baia Mare	Polisano Sibiu	County Hospital Sibiu
Nr. of cathlabs	2	1	UR	2	1	1
Nr. of independent operators	3	1	UR	3	1	2
Nr. of in training operators	1	1	UR	1	0	0
Coronary interventions						
Coronarography	880	647	UR	221	714	440
Total nr. of PCI ¹	508	276	UR	431	312	165
PCI without stents	18	8	UR	18	5	0
PCI with stents	490	268	UR	413	307	165
STEMI with primary PCI	226	25	UR	233	22	79
PCI left main	23	41	UR	22	12	UR
CTO	27	10	UR	0	34	UR
Stents per patient ²	1.9	1.59	UR	2.21	1.44	1.28
Total nr. of stents	969	439	UR	695	440	212
Nr. of DES	951	439	UR	686	439	212
DES/stents ratio (%)	98%	100%	UR	99.00%	99%	100%
Cutting, scoring	0	5	UR	7	0	0
Rotablation	3	0	UR	0	12	0
Shockwave	0	0	UR	0	0	0
FFR/IFR	16	38	UR	14	0	0
IVUS	0	0	UR	0	0	0
OCT	0	0	UR	7	0	0
Peripheral interventions						
Peripheral PTA ³	4	31	UR	20	10	42
Renal PTA	0	0	UR	0	0	0
Carotid PTA	0	23	UR	0	0	0
Total nr. of stents in peripheral PTA	3	36	UR	7	12	19
Peripheral angiography	23	109	UR	103	22	62
Other interventions						
TAVI	0	0	UR	0	37	0
MitraClip	0	0	UR	0	0	0
Aortic endoprosthesis	6	0	UR	3	2	0
Interventions in structural heart disease ⁴	0	0	UR	0	3	0

City	Constanta	Ploiesti	Pitesti		Craiova
Hospital	Monza - Ares Constanta	County Hospital Ploiesti	County Hospital Pitesti	Muntenia Hospital	County Hospital Craiova
Nr. of cathlabs	1	1	1	1	1
Nr. of independent operators	1	2	3	1	4
Nr. of in training operators	0	1	1	0	1
Coronary interventions					
Coronarography	492	411	405	33	846
Total nr. of PCI ¹	369	305	295	12	266
PCI without stents	20	9	31	1	5
PCI with stents	349	296	264	11	261
STEMI with primary PCI	213	166	31	0	118
PCI left main	UR	6	UR	0	19
CTO	UR	UR	UR	0	0
Stents per patient ²	1.32	1.2	1.3	1	1.74
Total nr. of stents	743	306	332	11	455
Nr. of DES	743	306	332	11	455
DES/stents ratio (%)	100%	100%	100.00%	100.00%	100%
Cutting, scoring	0	0	9	0	0
Rotablation	0	0	4	0	0
Shockwave	0	0	0	0	0
FFR/IFR	0	0	9	0	4
IVUS	0	0	7	0	0
OCT	0	0	0	0	0
Peripheral interventions					
Peripheral PTA ³	0	4	107	0	0
Renal PTA	0	0	0	0	0
Carotid PTA	0	0	8	0	0
Total nr. of stents in peripheral PTA	0	0	38	0	0
Peripheral angiography	2	40	163	2	48
Other interventions					
TAVI	0	0	0	0	0
MitraClip	0	0	0	0	0
Aortic endoprosthesis	0	0	0	0	0
Interventions in structural heart disease ⁴	0	0	0	0	0
¹ Total number of elective and urgent PCIs. ² It will represent the ratio between the total number of implanted stents and the total number of patients undergoing PCI. ³ Number of peripheral angioplasty (lower and upper limbs artery, not including carotid arteries) ⁴ Interventions in cardiac structural diseases: percutaneous closures of DSA, DSV, PFO, arterial duct, balloon valvulotomies, left atrial appendage closure. (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)					

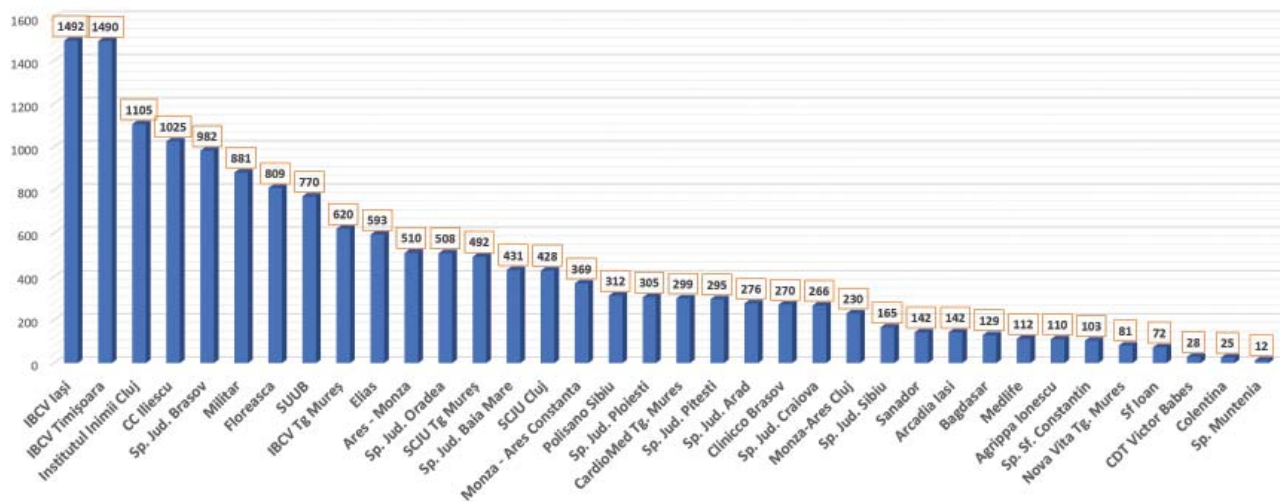


Figure 1. Total number of PCIs in 2020 in all interventional centers from Romania (PCI - percutaneous coronary intervention).

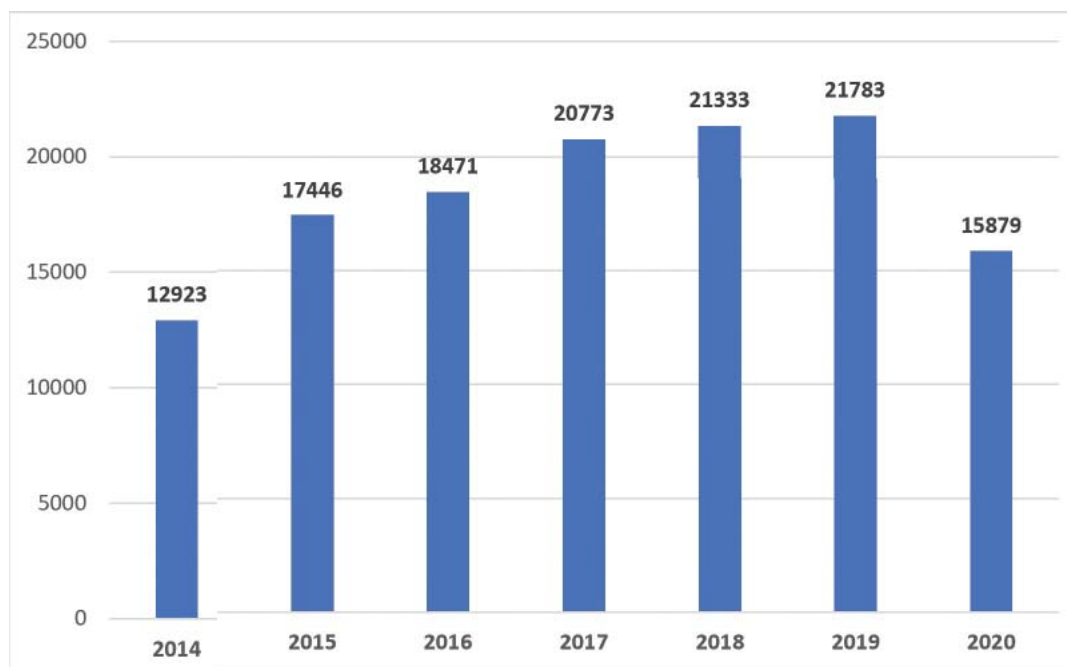


Figure 2. Total number of percutaneous coronary interventions from 2014 to 2020 in Romania.

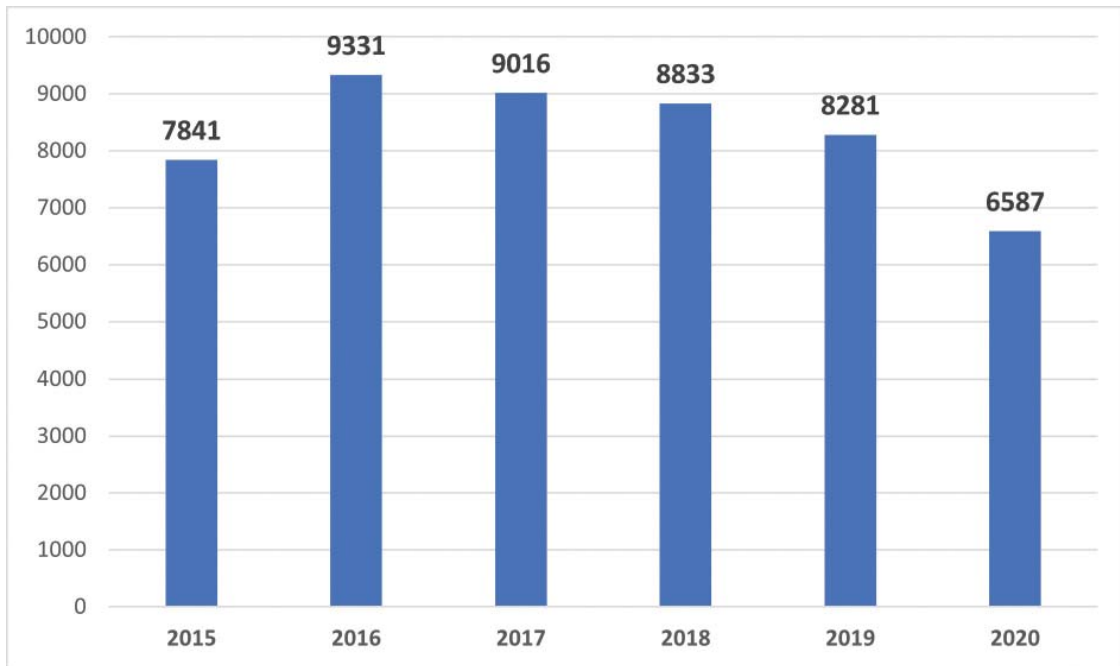


Figure 3. Total number of primary PCIs in STEMI patients from 2015 to 2020 in interventional centers from Romania (PCI - percutaneous coronary intervention, STEMI - ST segment elevation myocardial infarction).

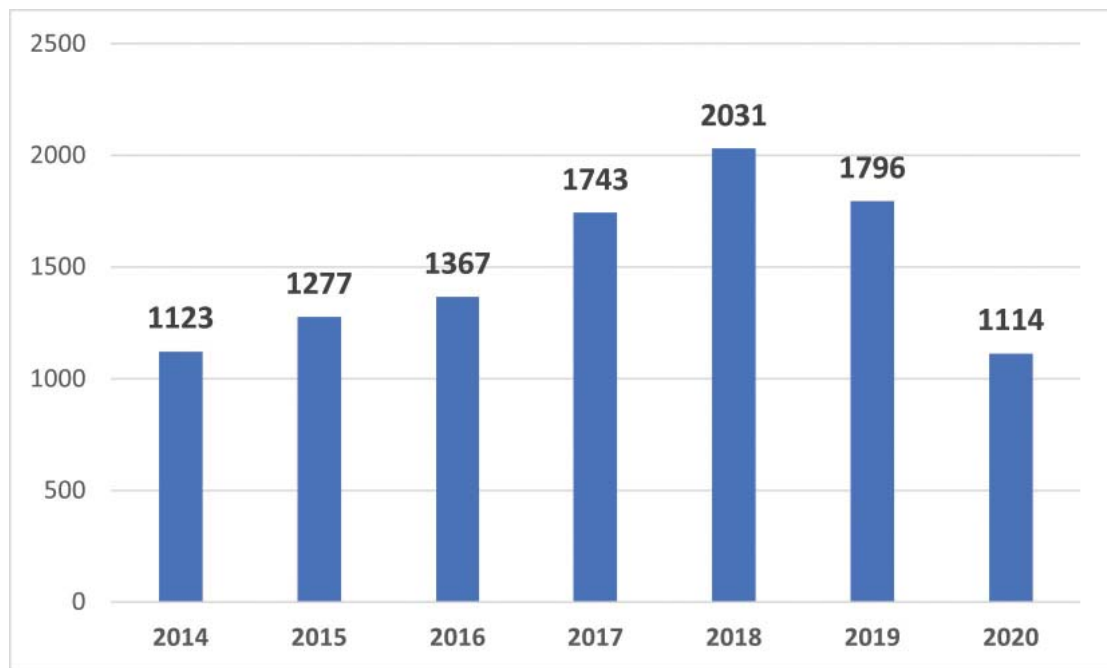


Figure 4. Total number of peripheral angioplasties from 2014 to 2020 in Romania (only in interventional cardiology centers).

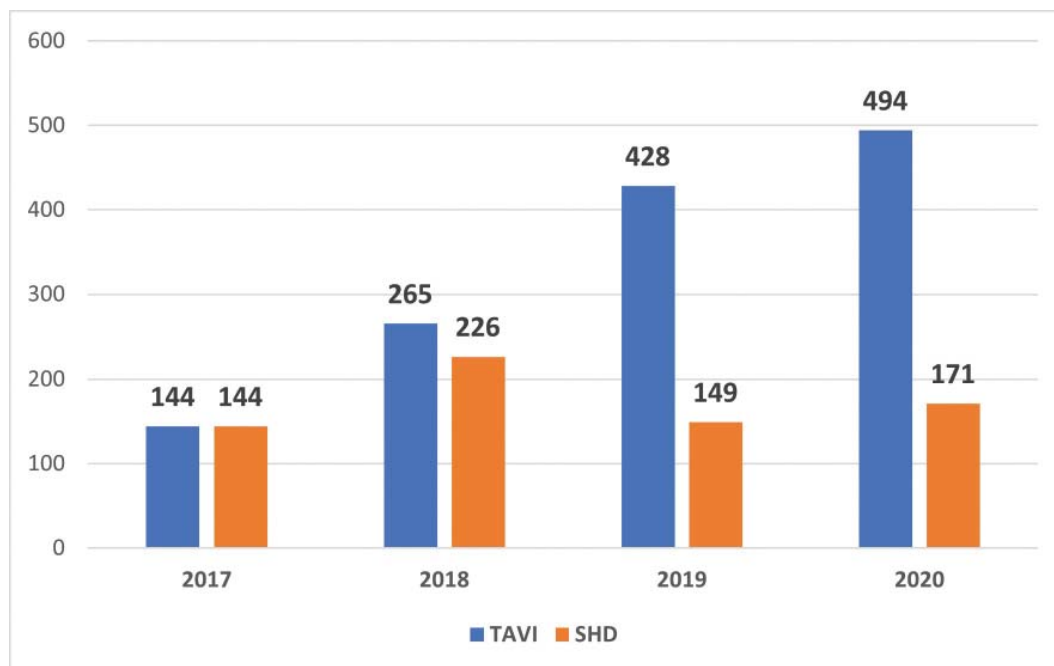


Figure 5. Total number of TAVI and interventions in SHDs performed from 2017 to 2020 in Romania (TAVI - transcatheter aortic valve implantation, SHDs – structural heart diseases).

Compliance with ethics requirements:

The authors declare no conflict of interest regarding this article. The authors declare that all the procedures and experiments of this study respect the ethical standards in the Helsinki Declaration of 1975, as revised in 2008(5), as well as the national law. Informed consent was obtained from all the patients included in the study.

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