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The effect of the COVID-19 pandemic on the patient flow of the Nuclear Medicine Department of a COVID-19 Reference Hospital

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- **The COVID-19 pandemic** has influenced medical practices globally, **including nuclear medicine.**
- This study assesses the impact of the pandemic on the patient flow of the **Nuclear Medicine Dept of AHEPA University Hospital** (COVID-19 reference hospital), by comparing:
 - **The yearly number of examinations** and
 - **Collective Doses (CDs) from 2019 to 2023.**

2. Materials & Methods

➤ Our Dept keeps detailed records of all activities administered for diagnostic examinations.

➤ We use:

- the EANM pediatric dosage card for pediatric patients
- the IAEA recommendations for activity escalation in overweight patients, **a practice that results in similar effective doses for all patients.**

ΦΥΛΛΟ ΠΑΡΑΚΟΛΟΥΘΗΣΗΣ ΗΜΕΡΗΣΙΑΣ ΕΚΔΟΣΗΣ ΓΕΝΝΗΤΡΙΑΣ 99m-Tc											
	A/A Γεννήτριας:	19		Ημερομηνία:	Τετάρτη	22/5/2019		Ωρα :	7:58	T1/2:	6:00
	Ενεργότητα (mCi):	260		Όγκος (ml):	5			Ραδιενεργός συγκέντρωση (mCi/ml):	52		
A/A	Ωρα	Σήμανση	Όγκος (ml)	Ενεργότητα (mCi)	Αραίωση (ml)	Ραδιενεργός Συγκέντρωση (mCi/ml)	Χορηγούμενη Ενεργότητα (mCi)	Χορηγούμενος Όγκος (ml)	Υπολ. Όγκος (ml)	Παρατηρήσεις	
1	8:04	MDP	3,31	170,00	5,00	34,00			5,00		
	8:56	MDP				30,76	19,50	0,63	4,37	Οστό 1	
	8:56	MDP				30,75	21,00	0,68	3,68	Οστό 2	
	9:31	MDP				28,74	20,00	0,70	2,99	Οστό 3	
	9:48	MDP				27,84	21,00	0,75	2,23	Οστό 4	
2	8:07	DTPA	0,98	50,00	5,00	10,00			5,00		
	9:22	DTPA				8,65	9,30	1,08	3,92	Νεφρόγραμμα 1	
	9:48	DTPA				8,23	8,00	0,97	2,95	Νεφρόγραμμα 2	
4	13:11	TcO4-				28,52	4,30	0,15		Θυρεοειδής 1	
	A/A Γεννήτριας:	20		Ημερομηνία:	Τετάρτη	22/5/2019		Ωρα :	13:00	T1/2:	6:00
	Ενεργότητα (mCi):	1500		Όγκος (ml):	11			Ραδιενεργός συγκέντρωση (mCi/ml):	136,36		
A/A	Ωρα	Σήμανση	Όγκος (ml)	Ενεργότητα (mCi)	Αραίωση (ml)	Ραδιενεργός Συγκέντρωση (mCi/ml)	Χορηγούμενη Ενεργότητα (mCi)	Χορηγούμενος Όγκος (ml)	Υπολ. Όγκος (ml)	Παρατηρήσεις	
3	13:10	MIBI	3,29	440,00	8,00	55,00			8,00		
	13:39	MIBI				52,01	7,00	0,13	7,87	Καρδιά stress 1	
	13:39	MIBI				52,00	7,90	0,15	7,71	Καρδιά stress 2	
	13:39	MIBI				51,99	8,80	0,17	7,54	Καρδιά stress 3	
	13:39	MIBI				51,99	8,80	0,17	7,37	Καρδιά stress 4	
	13:45	MIBI				51,42	7,80	0,15	7,22	Καρδιά stress 5	
	15:32	MIBI				41,87	19,60	0,47	6,76	Καρδιά rest 1	
	15:32	MIBI				41,86	20,80	0,50	6,26	Καρδιά rest 2	

2. Materials & Methods

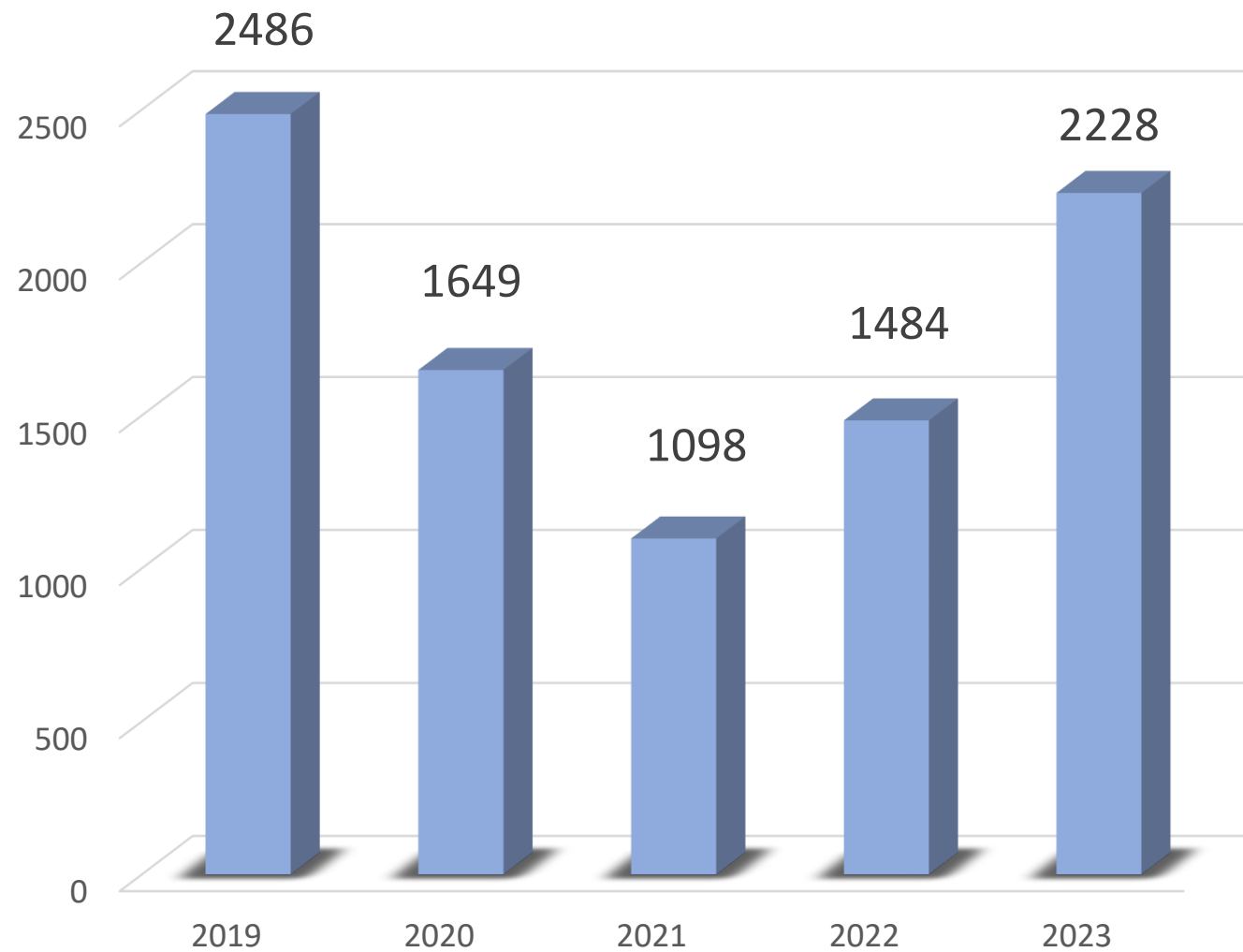
- CDs can thus be estimated by multiplying the effective dose per examination (E_i) with the corresponding number of patients (N_i).

$$CD = \sum_i E_i N_i$$

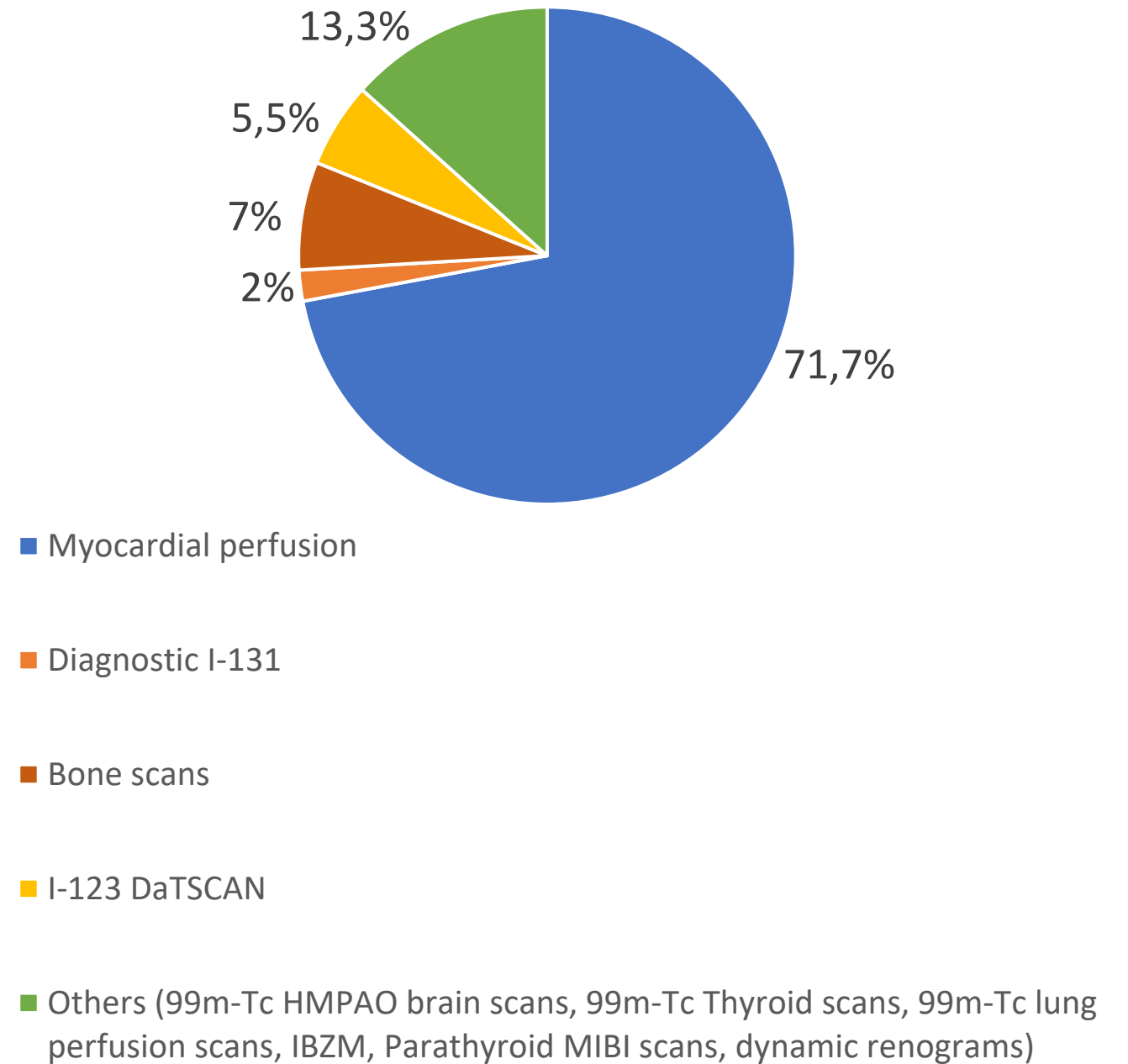
- CDs were estimated for:
 - the pre-pandemic year (2019),
 - the intra-pandemic years (2020-2021), and
 - the post-pandemic years (2022-2023)

3. Results

Total number of exams 2019 - 2023



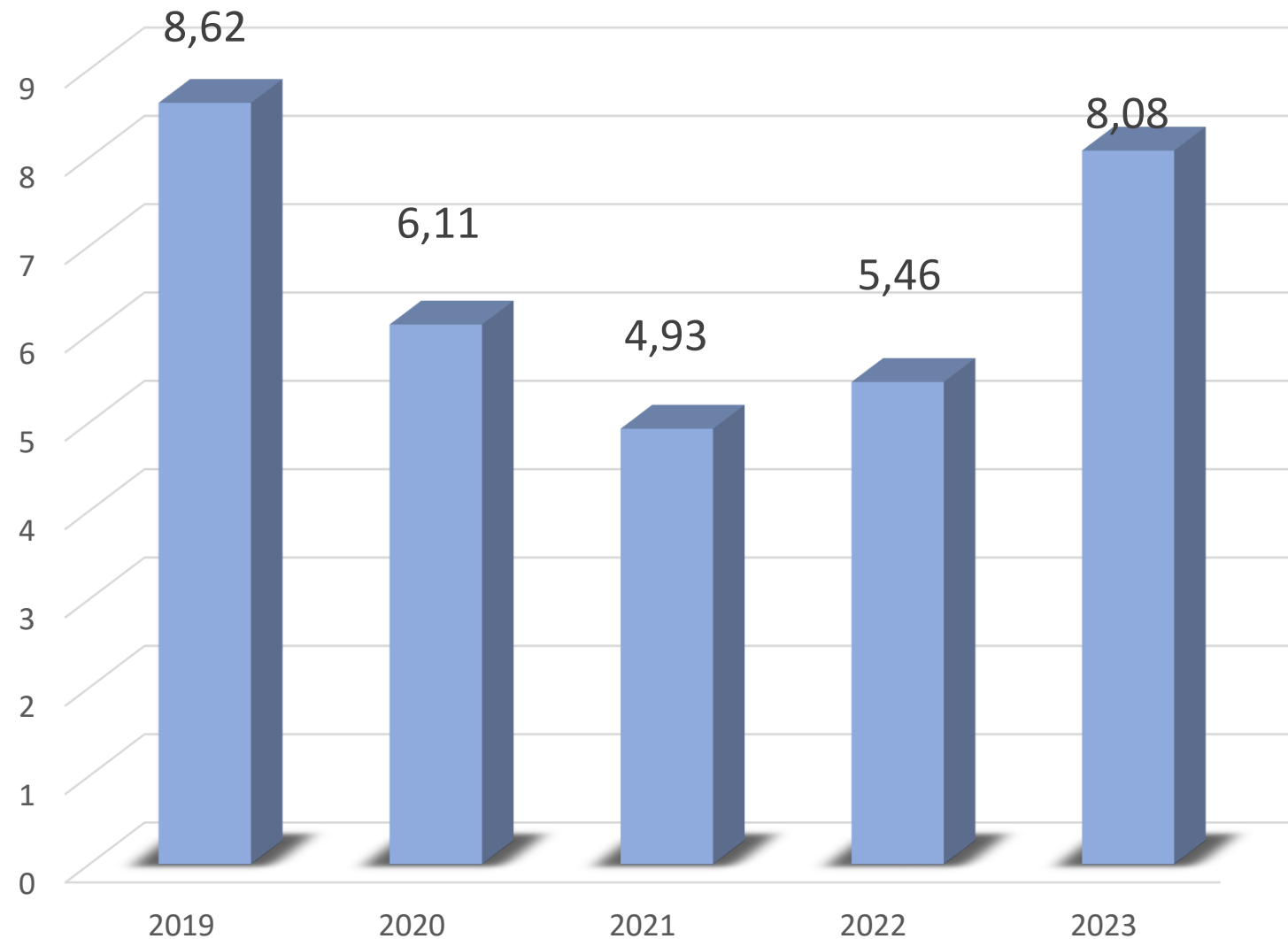
Examination types 2019 - 2023



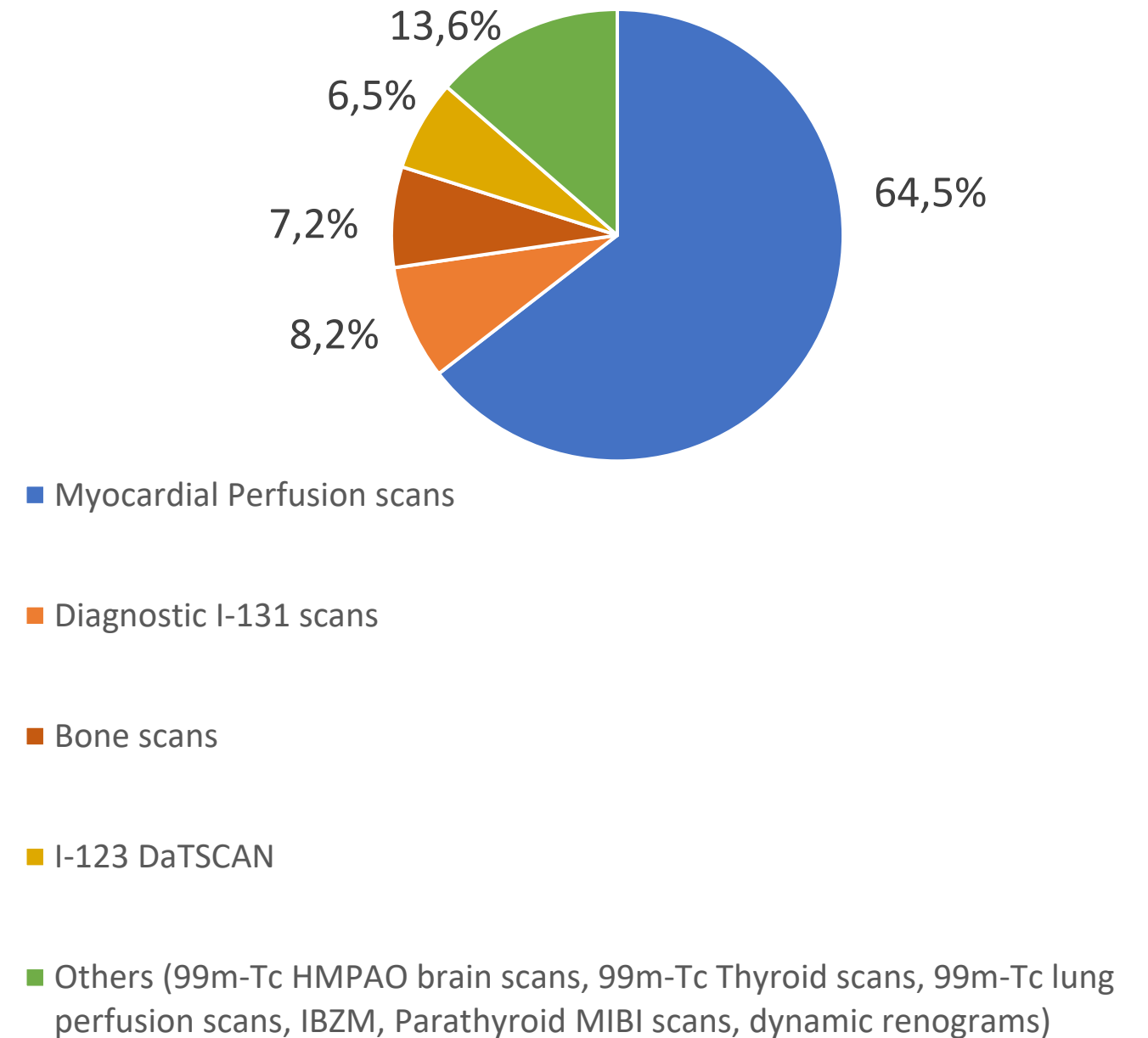
A total of 8945 examinations were performed during this period.

3. Results

Yearly Collective Doses (manSv) 2019 - 2023

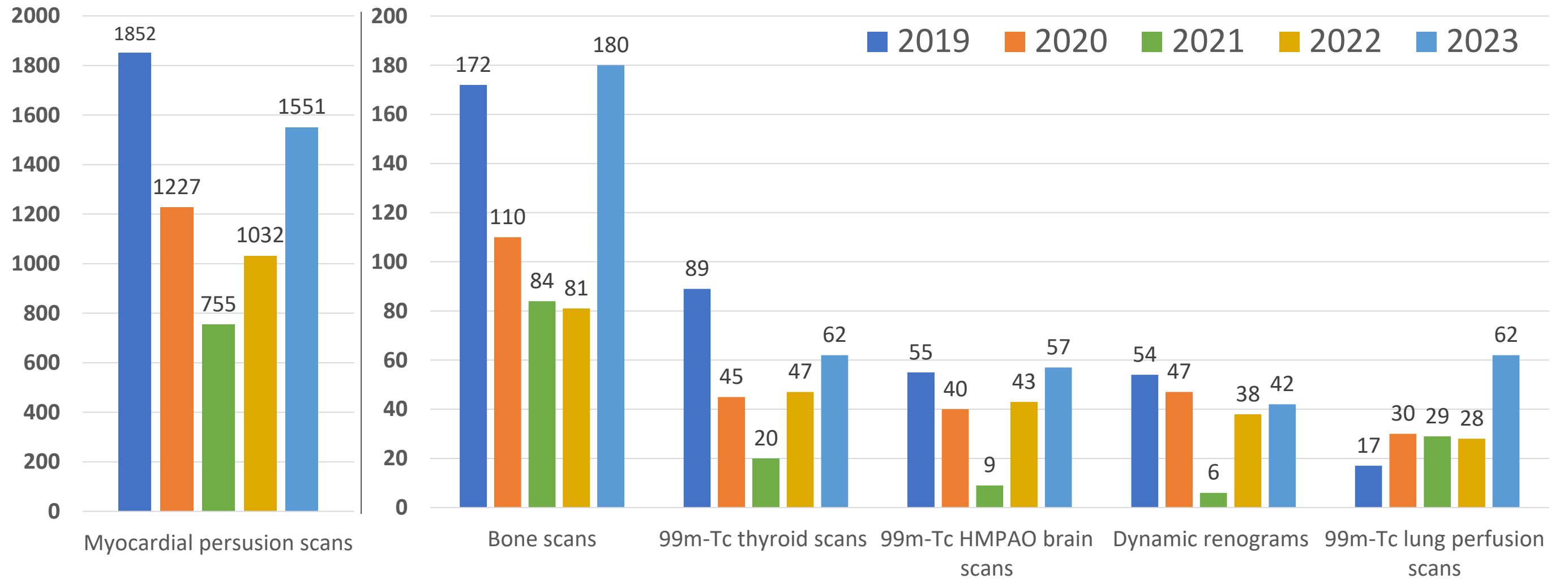


Percentage of collective dose attributed to different scan types 2019 - 2023



3. Results

Number of examinations 2019 - 2023



Some exams have only partially recovered in the last post-pandemic year.

3. Results

Table 1: Impact of COVID-19: comparisons between 2021 and 2019

	Variation in the number of exams (2021 vs 2019)	Variation in Collective Dose (2021 vs 2019)
Myocardial Perfusion scans	-59.2%	-52.1%
Diagnostic I-131 scans	26.8%	32.2%
Bone scans	-51.2%	-51.2%
I-123 DaTSCAN	-27.2%	-27.2%

4. Conclusions

- The COVID-19 had a significant impact on the diagnostic exams in our Dept.
- 2021 was the mostly affected year, showing an overall 55.8% reduction in the number of exams and a 42.9% reduction in CD.
- 3 years later, the patient flow has not yet fully recovered to the pre-COVID-19 levels.

5. References

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