

Implementing a Radiation Exposure Monitoring Programme in Cyprus

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Background

IAEA Safety Report No. 112 highlights the need for **systematic patient radiation exposure monitoring** and advocates for the use of **automatic digital systems**. This study aimed to explore the Report's goals on **patient dose monitoring** and **data quality**, using the installed **dose management system, 'DOSE' (Qaelum NV, Belgium)**, at the State Health Services Organisation's (SHSO) hospitals in **Cyprus**.

Materials & Methods

Over 70 X-ray imaging units from the 8 public hospitals were connected to DOSE, including 37 DX units. Patient and study data from examinations acquired with **11 DX units** (Mecall General Medical Merate SpA KALOS) and **7 CT units** (2 Toshiba Aquilion, 2 GE Revolution Apex Elite and 3 GE Optima CT540), **over 12 months**, were collected and refined for a **preliminary analysis**. Median **dose area product (DAP)** values of **common adult DX examinations**, performed in 5 hospitals, were estimated and compared to the European Diagnostic Reference Levels (DRLs). Additionally, **data integrity** aspects were evaluated for studies of the same period, including CT examinations' **nomenclature** and **operators' identification** in DX examinations.

Results

The **median DAP values** for all the DX examinations studied were well **below the European DRLs** (Table 1).

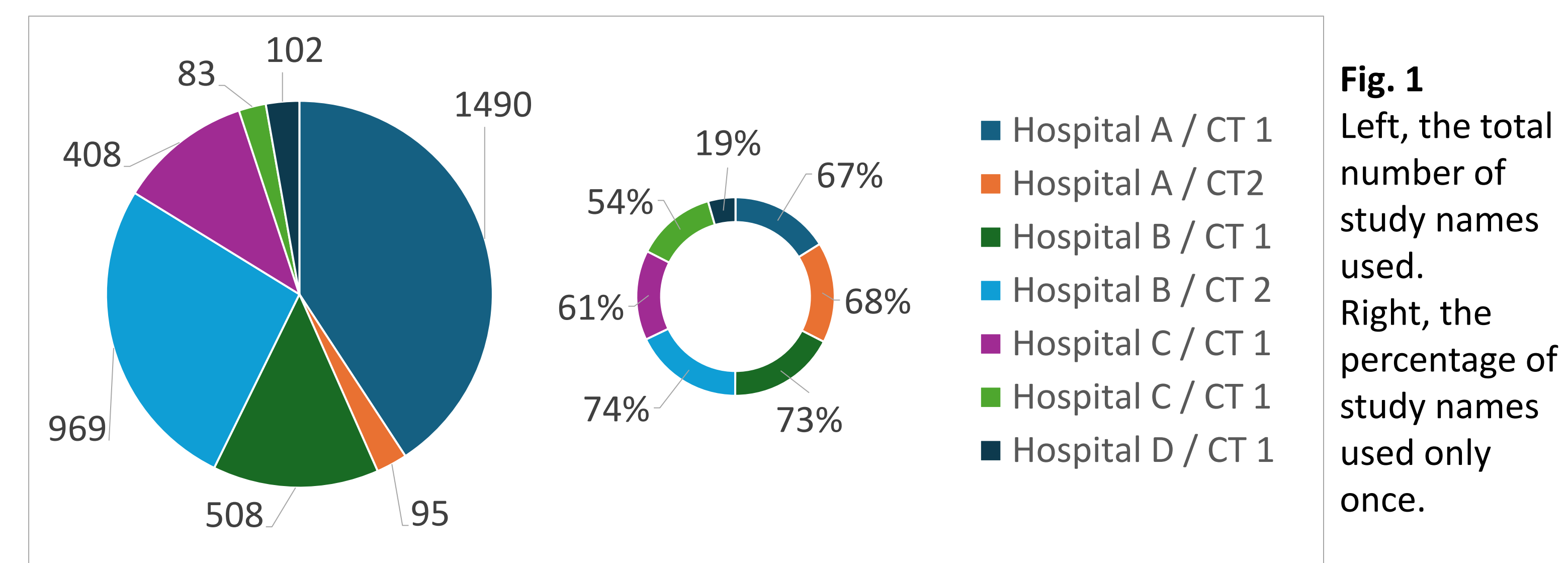
A **non-harmonized nomenclature** was observed in CT examinations, with **19%-74%** of names being **used only once** (Fig. 1). To address this,

Table 1

DAP (Gy.cm²) values obtained from DX examinations conducted between 01/01/2023-31/12/2023, across 5 SHSO hospitals.

	Chest PA	Chest LAT	Abd AP	Pelv AP	L-spine AP	L-spine LAT	C-spine AP	C-spine LAT	Hip AP	Skull AP/PA	Skull LAT
N	30592	2314	2772	3947	4746	4218	4897	3750	1559	1478	1279
25th	0.03	0.10	0.38	0.39	0.31	0.39	0.04	0.04	0.18	0.13	0.12
Mean	0.05	0.24	0.85	0.73	0.75	0.79	0.08	0.08	0.36	0.21	0.22
Median	0.05	0.18	0.62	0.59	0.53	0.63	0.06	0.06	0.30	0.18	0.19
75th	0.07	0.28	1.04	0.90	0.93	0.99	0.09	0.10	0.46	0.25	0.30

the naming of the studies will be standardised based on the **RadLex Playbook** controlled terminology. Significant **inconsistencies** in **recording the technologists' names** were also noted and will be addressed in the **image analysis rejection programme**.



Conclusion

DOSE can greatly aid a **successful patient radiation exposure monitoring programme** across SHSO's facilities. Integrating DOSE marks a significant **advancement** for **public health services** in **Cyprus**.