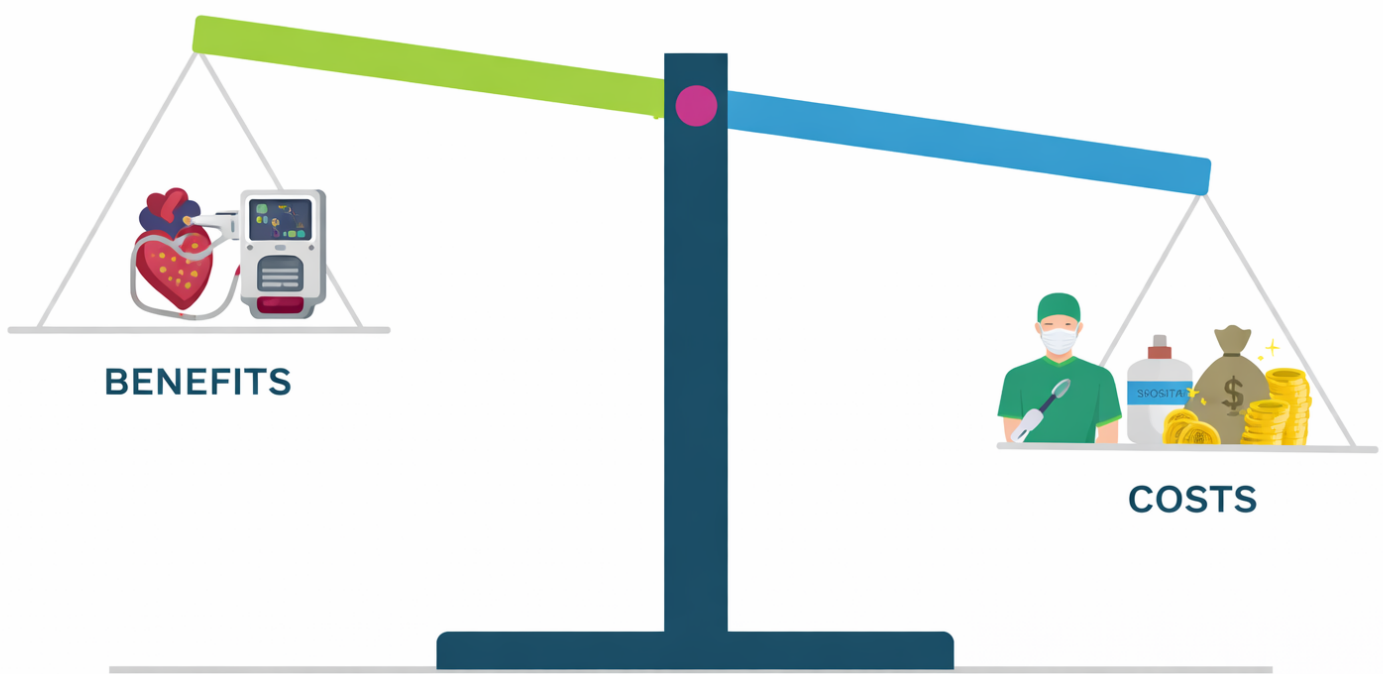
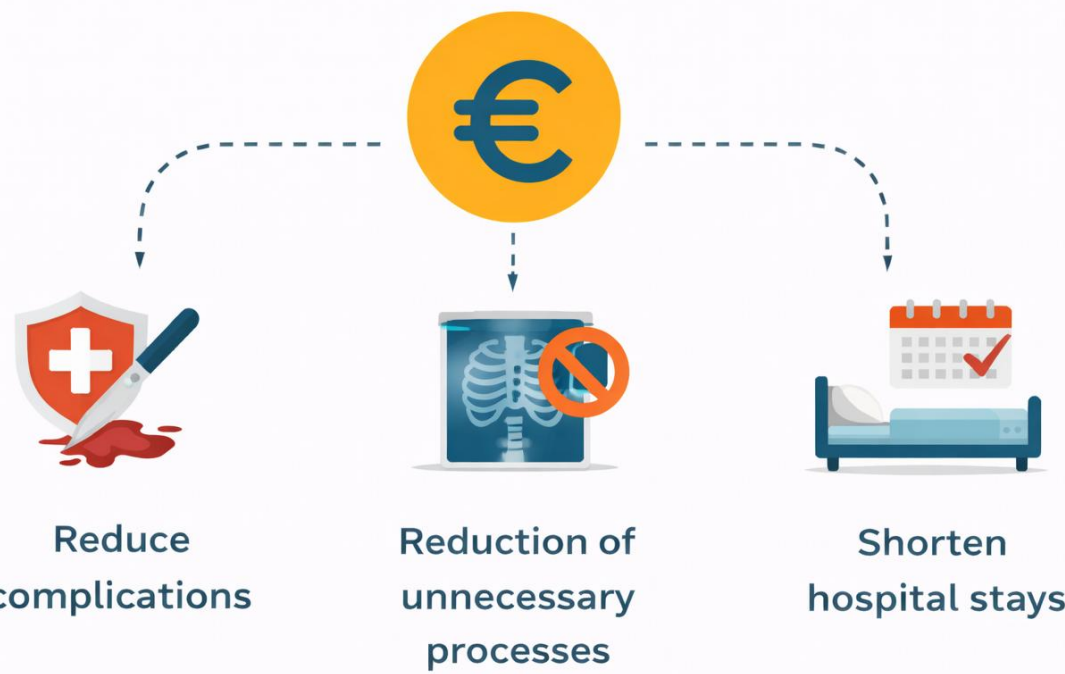


Background

➤ Controlling healthcare costs is the goal of individual hospitals and national healthcare systems with increasing importance of the last decades.



HOW TO REDUCE COSTS?



Previous study

➤ The randomized controlled trial by Van Linden et al. (DOI: 10.21037/jtd.2019.12.20) highlighted the clinical advantages of digital chest drainage systems (Thopaz+) over analog systems (Ocean) for cardiac surgery patients.

Reduction of drainage-associated complications in cardiac surgery with a digital drainage system: a randomized controlled trial

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J Thorac Dis. 2019 Dec;11(12):5177-5186.



Figure 1 The analog drainage system Ocean Atrium (Maquet, Germany): a classical wet-seal drainage system with an analog scale to measure the total amount of fluid, a surge chamber and external vacuum suction.



Figure 2 The digital drainage system Thopaz+ (Medela, Switzerland): a digital drainage and monitoring system with onboard motor as vacuum source along with a suction control canister and water seal.

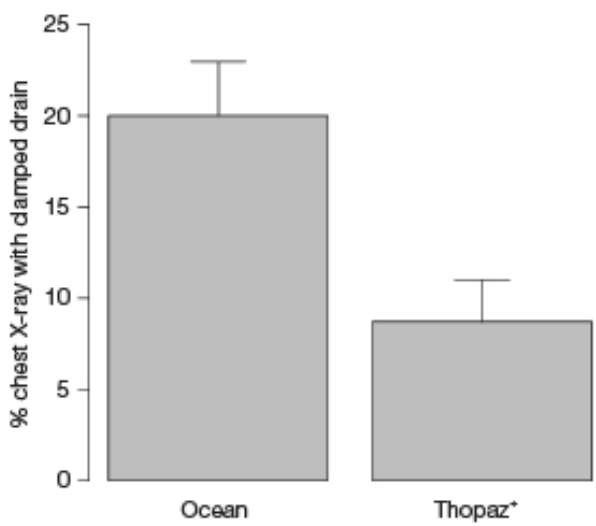


Figure 4 Significant reduction of chest X-rays with clamped drains to detect air leaks in the digital Thopaz+ drainage group (20.2% vs. 8.6%, P<0.01).

Scientific Gap

- While the study from van Linden et. al presented evidence in favour of digital systems, it remains to be determined whether these clinical advantages translate into economic benefits.
- The aim of this proposed study is to evaluate the cost-effectiveness of digital versus analogue drainage systems in the postoperative care of cardiac surgery patients.

Results

Variable	Costs
Chest X-Ray with clamped drain	51,08 €
Chest X-Ray (1 level)	20,12 €
Chest X-Ray (2 level)	30,96 €
Re-thoracotomy	733,00 €
ICU stay (per day)	1.235,68 €
Hospital stay (per day)	182,41 €

Table 1. Hospital costs during the enrollment of the studied patients

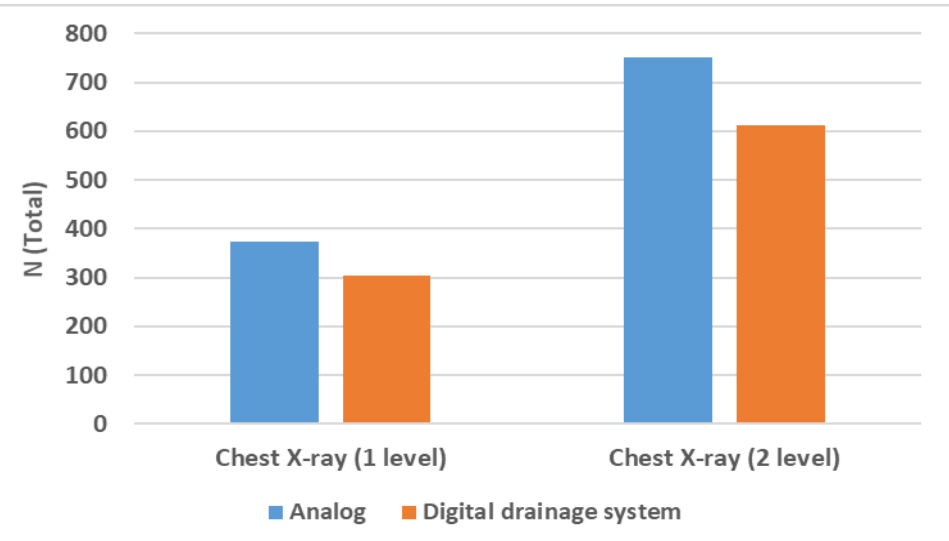


Figure: Total number of x-ray performed during study period: analog vs digital drainage system

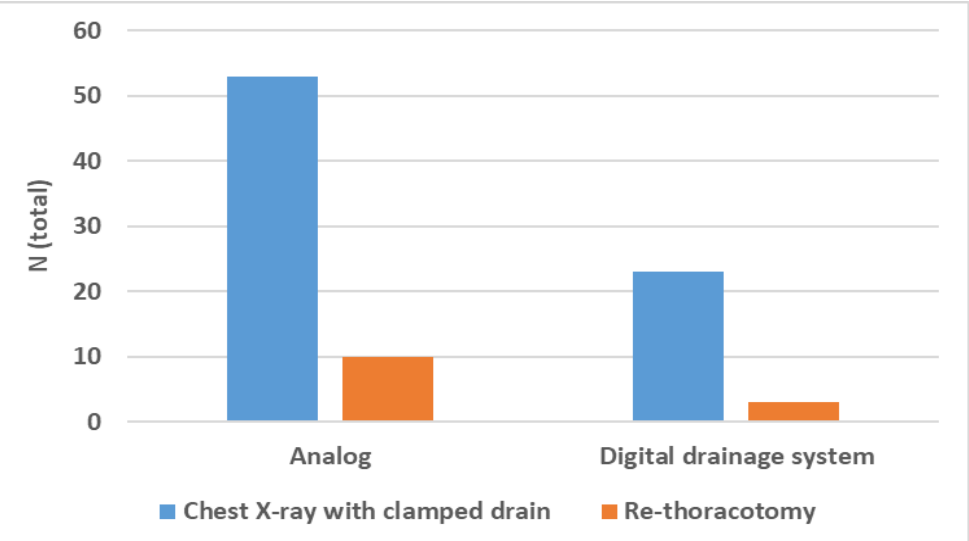


Figure: Total number of x-ray with clamped drain and Re-thoracotomy: analog vs digital drainage system

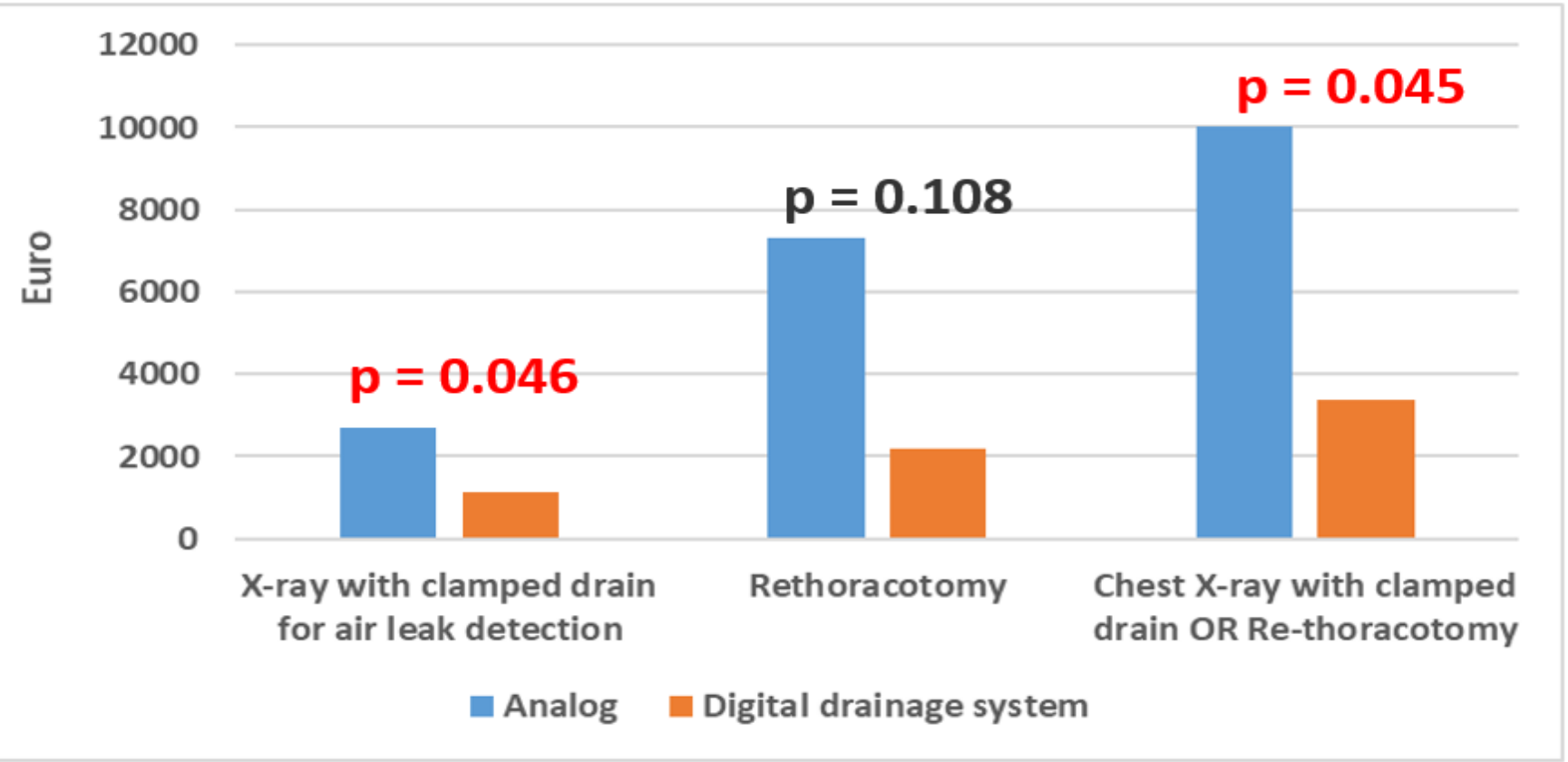


Figure: Cost differences (in Euro) in regards of x-ray with clamped drain and rethoracotomy: analog vs digital drainage system

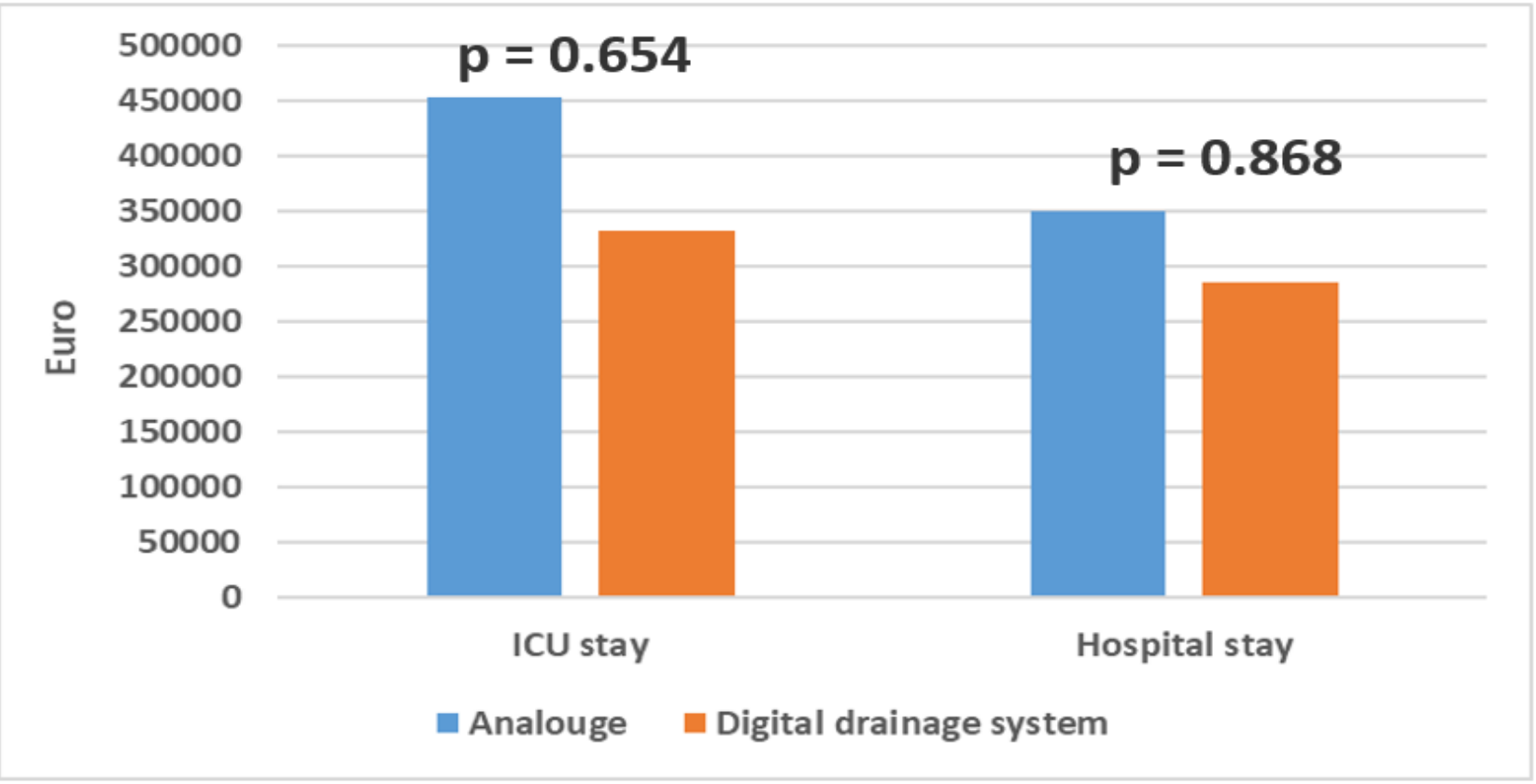


Figure: Cost differences (in Euro) in regards of ICU and hospital stay: analog vs digital drainage system

Conclusion

- When combined with economic data, the reduction in X-ray use suggests that digital drainage systems are a cost-effective alternative to conventional analogue systems.
- However, cost and outcome data may vary depending on the geographical and institutional context, particularly since the data collection was performed in a different hospital to that used for the cost-effectiveness analysis.