

Optimized patient pathway for Aortic Stenosis patients: the economic and clinical implications

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INTRODUCTION

Valvular heart diseases pose a significant public health challenge, with its incidence increasing with age. As the population ages, valvulopathies are becoming more prevalent, leading to a **rise in interventional and surgical treatments like TAVI for Severe Aortic Stenosis**. Therefore, reorganizing hospital resources to meet the growing demand for AS treatments is essential, especially with expanding treatment indications from ESC/EACTS guidelines¹ that recommend TAVI in patients ≥75 years or unsuitable for surgery.

OBJECTIVE

This study evaluates the **resource consumption of an optimized patient pathway for aortic stenosis**, known as day service, carried out at Ospedale del Cuore in Massa, Italy and recognized for its efficient multidisciplinary management system.

METHOD

The **Activity-Based Costing** is a cost estimation method that enables an accurate evaluation of the economic expenses associated with health interventions. It allowed to **analyze patient pathway costs and staff time**. Interviews with clinical and administrative staff have been conducted to collect information and data of the entire pathway; then a valorization of each item enabled the identification of the final costs associated to the entire pathway. Hospital provided unit costs for drugs, consumables, procedures, visits, while imaging, blood tests, and specific test costs were identified through published Toscana regional tariffs.

RESULTS

The site implemented an **innovative lean approach** and a precise and effective **day service patient pathway**. It foresees aortic stenosis patient evaluation through a **multidisciplinary approach**, with physically, geriatric and intervention risk assessments. This approach **combined with frailty-based management** let to identify the **best suitable intervention** since the **early phase** of the pathway. Following the frailty assessment, patients are assigned to a specific treatment option—TAVI, SAVR, medical therapy, or valvuloplasty—and are then placed on the appropriate waiting list. The analysis revealed the total time spent by each staff member on TAVI patient management and the cumulative cost for each pathway. Figure 1 shows the distribution of costs for the two pathways.

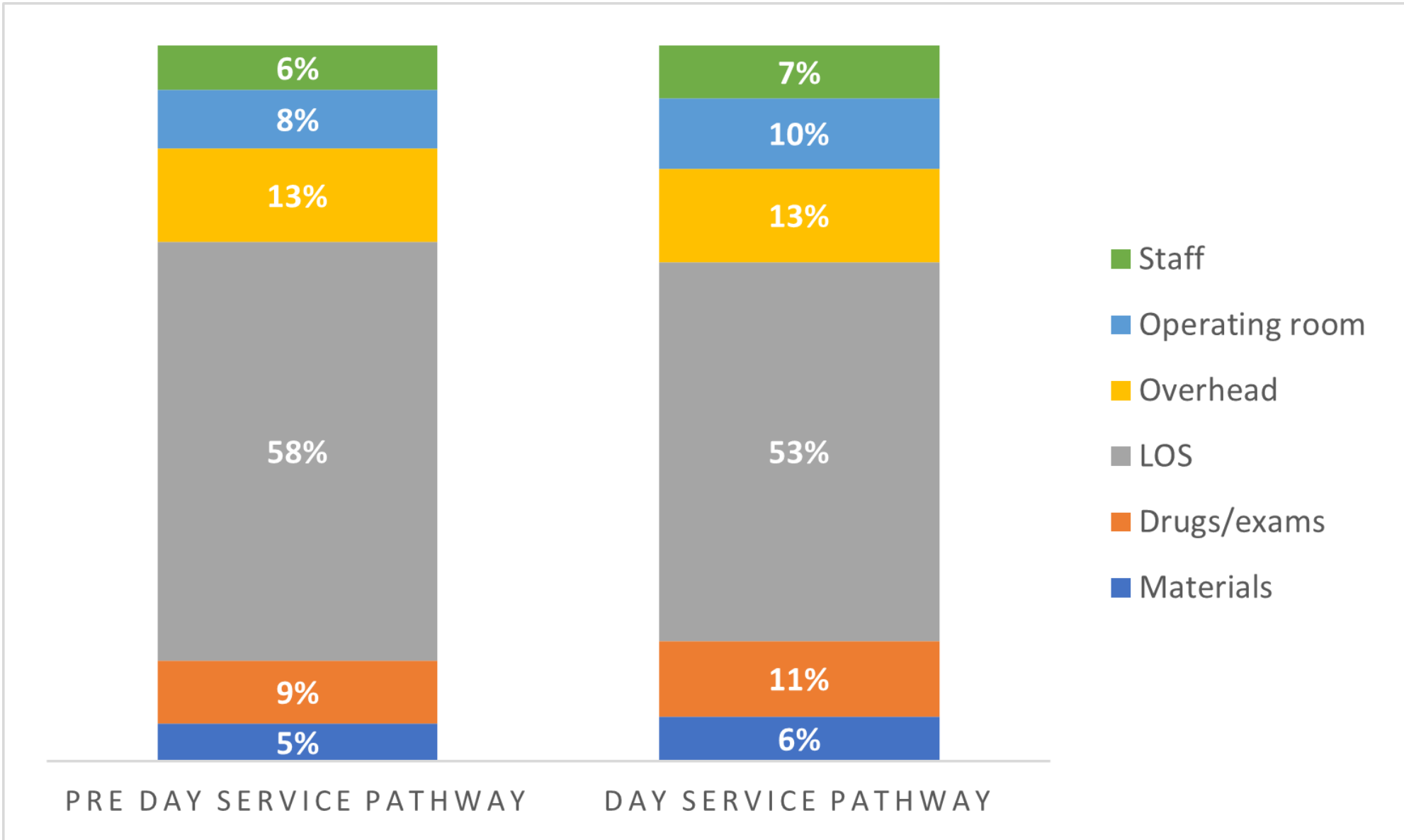


Figure 1. Cost Distribution Comparison: Pre-Day Service vs. Day Service Pathway

The main cost driver is the hospital stay, which showed to be 58% and 53% of the total for pre day service and day service pathways, respectively.

The **length of stay (LOS)** was **reduced** from 7.9 days to 6 days **with the optimized pathway** (figure 2), resulting in a cost difference of €1,291.34 per patient.

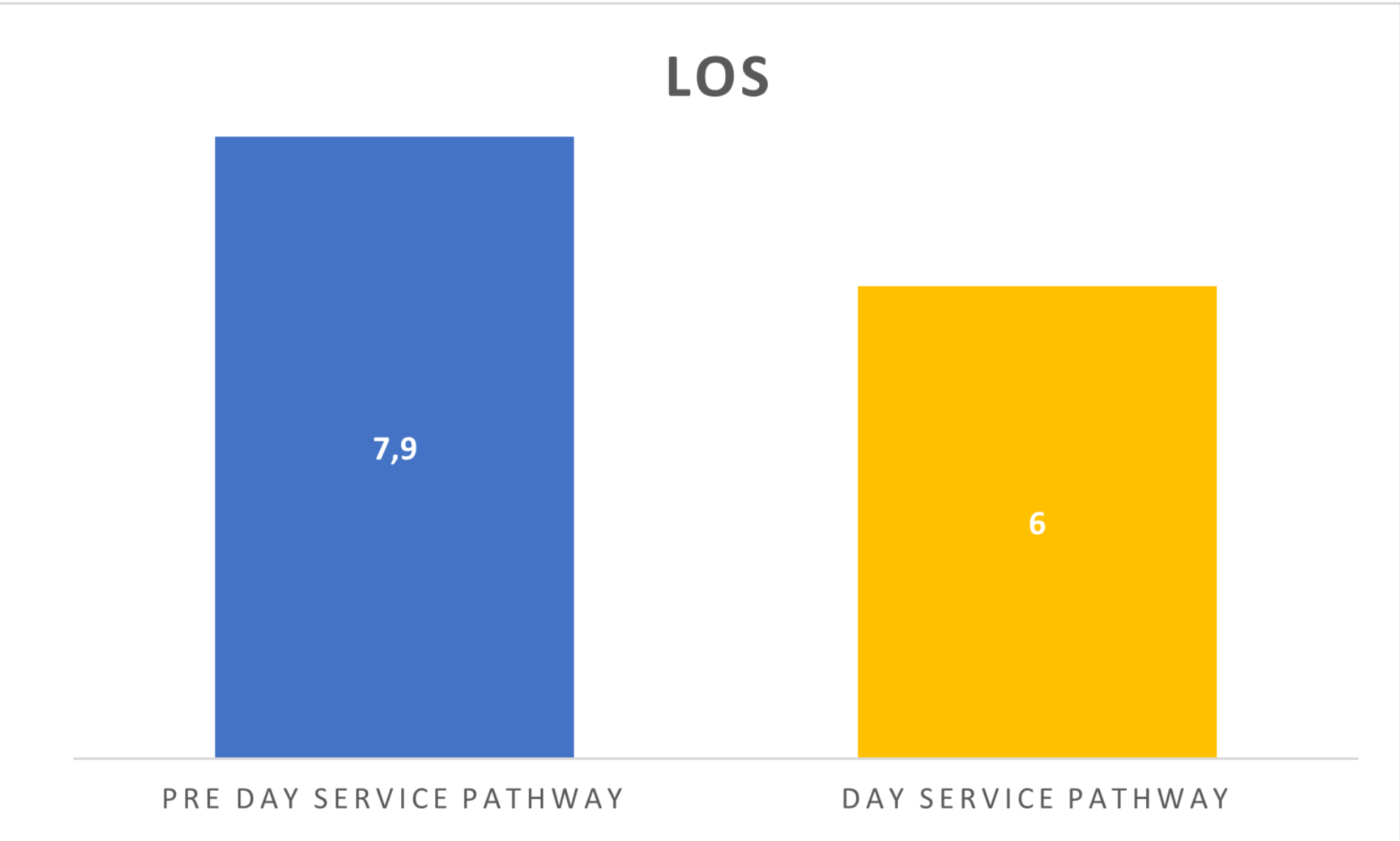


Figure 2. Length of Stay (LOS) Comparison: Pre-Day Service vs. Day Service Pathway

Additionally, the optimized patient pathway positively impacted mortality rates. The **assessment of frailty**, as reported by Mazzone et al.² for the same day service pathway, **allows the identification of the best candidates for AS treatment**: pre-frail/early frail patients appear to be ideal candidates for procedures such as TAVI, with a high survival rate in the mid-term.

CONCLUSIONS

Given the need to optimize resources and promote sustainability within the Italian healthcare system, adopting an optimized pathway for aortic stenosis could be crucial.

Careful patient selection, early diagnosis, and clinical appropriateness help identify **tailored care pathways**, which also yield significant **clinical benefits**. The adoption of an optimized TAVI pathway led to the **reduction of resource consumption** and enabled the hospital to manage more AS patients, addressing the growing demand for treatment. This approach enhanced the **sustainability** of both the hospital and the broader healthcare system. Furthermore, it should contribute to **shortening waiting lists** and enabling **faster patient access to care**.

REFERENCES

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2. Mazzone A, Del Turco S, Trianni G et al. The Positive Impact of Early Frailty Levels on Mortality in Elderly Patients with Severe Aortic Stenosis Undergoing Transcatheter/Surgical Aortic Valve Replacement. Journal of Cardiovascular Development and Disease. 2023; 10(5):212.

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