Economic Evaluation of Adjuvant Chemotherapy for Soft Tissue Sarcoma Using Linked NETSARC+ (French Registry) and SNDS (French National Health Data System) Real-World Data: The DeepSarc Study

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Objectives

The efficacy of adjuvant chemotherapy (CT) in reducing the risk of relapse and improving survival for patients with high-grade localized resected soft-tissue sarcoma (STS) is still the subject of debate in clinical practice guidelines. We conducted an economic evaluation based on real-world data, i.e. **a cost description** of STS and **a cost-effectiveness analysis (CEA)** comparing adjuvant CT vs. no adjuvant CT.

Methods

- **Costs** were assessed from the perspective of the French healthcare system with a 1-, 3-, and 5-year horizon using data from the French database NETSARC+ linked to the SNDS [1;2]. Costs were discounted by 2.5%.

- **Incremental Cost-Effectiveness Ratios (ICERs)** were expressed in cost per life-year gained (LYG).

- **Propensity score analysis matching (1:1)** was undertaken in an effort to minimize potential bias due to the absence of randomization, while **uncertainty** around ICERs was captured by bootstrap.

Results

- **Cost description of STS:** Of the 33,548 patients from NETSARC+, 24,539 were linked to the SNDS, achieving a correspondence of 73.1 %. Overall, 8,331 adult patients diagnosed with STS between 2012 and 2017 were included. Mean total costs (SD) per patient were €21,643 (21,063), €31,847 (29,954), and €35,763 (33,687) at 1, 3, and 5 years respectively (cf. Table 1).

Cost (€2021)	1 year Mean (SD)	3 years Mean (SD)	5 years Mean (SD)
Hospitalization	16,381 (19332)	22,819 (25,690)	25,091 (28,220)
Outpatient treatment	5,240 (4,682)	8,982 (9,066)	10,606 (10,945)
Outpatient and visits (private institutions)	21 (362)	46 (1,098)	66 (1,955)
Total	**21,643 (21,063)**	**31,847 (29,954)**	**35,763 (33,687)**

Table 1: Mean cost (SD) per patient of the total population (n = 8,331).

- **Cost-effectiveness analysis:** After propensity score matching (N=778 patients), mean total costs (SD) differences per patient between adjuvant CT and no adjuvant CT groups were €12,907 (26,946), €13,149 (47,694), and €13,946 (53,602) at 1, 3, and 5 years respectively. Mean overall survival differences (SD) per patient (in years) between CT and no CT were -0.0122 (0.1744), -0.2154 (1.0791), and -0.3238 (1.5466) at 1, 3, and 5 years respectively (cf. Table 2).

	With adjuvant chemotherapy (n = 389)	Without adjuvant chemotherapy (n = 389)	Mean cost (€, 2021) difference and mean effectiveness difference	Incremental Cost-Effectiveness Ratios (ICERs)
Time horizon 1 year				
Mean costs (€,₂₀₂₁)	33,497 (20,389)	20,590 (19,685)	12,907 (26,946)	Adjuvant chemotherapy dominated by no adjuvant chemotherapy
Life-year	0.9599 (0.13019)	0.9721 (0.1249)	-0.0122 (0.1744)	
Time horizon 3 years				
Mean costs (€,₂₀₂₁)	47,163 (33,742)	34,014 (33,903)	13,149 (47,694)	Adjuvant chemotherapy dominated by no adjuvant chemotherapy
Life-year	2.4090 (0.8348)	2.6246 (0.6897)	-0.2154 (1.0791)	
Time horizon 5 years				
Mean costs (€,₂₀₂₁)	51,808 (38,457)	37,862 (37,546)	13,946 (53,602)	Adjuvant chemotherapy dominated by no adjuvant chemotherapy
Life-year	2.9208 (1.1767)	3.2444 (0.9876)	-0.3238 (1.5466)	

Table 2: ICERs with vs. without adjuvant chemotherapy three months post-surgery after propensity score matching (n = 778).
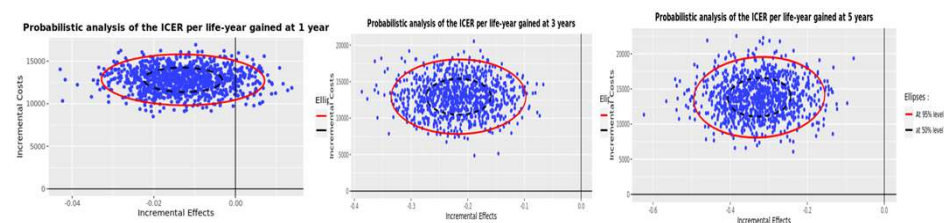

Figure 1: Scatter plot of the joint density of incremental costs and incremental effects of adjuvant chemotherapy vs. no adjuvant chemotherapy by bootstrap re-sampling at 1, 3, and 5 years after propensity score matching.

- **Limitations:** Unmeasured confounders may still introduce bias; the CEA only considered survival outcomes and did not account for the impact of CT on quality of life.

Conclusion

As few studies have addressed the costs of care for patients with STS, this economic evaluation contributes new information to existing research. Adjuvant CT was deemed to be not cost-effective compared with no adjuvant CT for patients with unselected STS. This study provides useful and practical information about the cost effectiveness of AST three months post-surgery in sarcoma patients for decision makers. Nevertheless, This analysis is based on real-world data and not a randomized controlled trial, so inherent reporting biases must be taken into account.

References: [1] Thevenet et al. J Epidemiol Popul Health 2024. https://doi.org/10.1016/j.jeph.2024.202450. [2] DREZEN et al. Linking the NETSARC+ national sarcoma database with the SNDS to evaluate adjuvant and/or neoadjuvant therapy: report on the linkage process and result (Health Data Hub's DEEPSARC pilot project). https://www.medrxiv.org/content/10.1101/2025.05.02.25326859v1 (cf. QR Code)