

## HDX compared to HDF in Kidney failure: Cost-Minimization Study in Saudi Arabia

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### INTRODUCTION

Expanded hemodialysis (HDX therapy) enabled by the THERANOVA dialyzer is a novel dialysis therapy that achieves comparable or superior clearance of large middle molecules without the need for a double pump hemodialysis machine with online production of replacement fluids, offering a simpler and a more cost-minimizing alternative to online hemodiafiltration (HDF therapy) for patients with kidney failure (KF). (1)

### OBJECTIVE

This model aims at comparing the operational and infrastructure costs of implementing HDX therapy compared to HDF therapy within dialysis centers in the Kingdom of Saudi Arabia (KSA).

### METHODS

A 10-year cost-minimization analysis was conducted from the public perspective to compare single-pump dialysis machine using the THERANOVA 400/500 dialyzer (HDX therapy) compared to the double pump dialysis machine using the high-flux 210H dialyzer (HDF therapy).

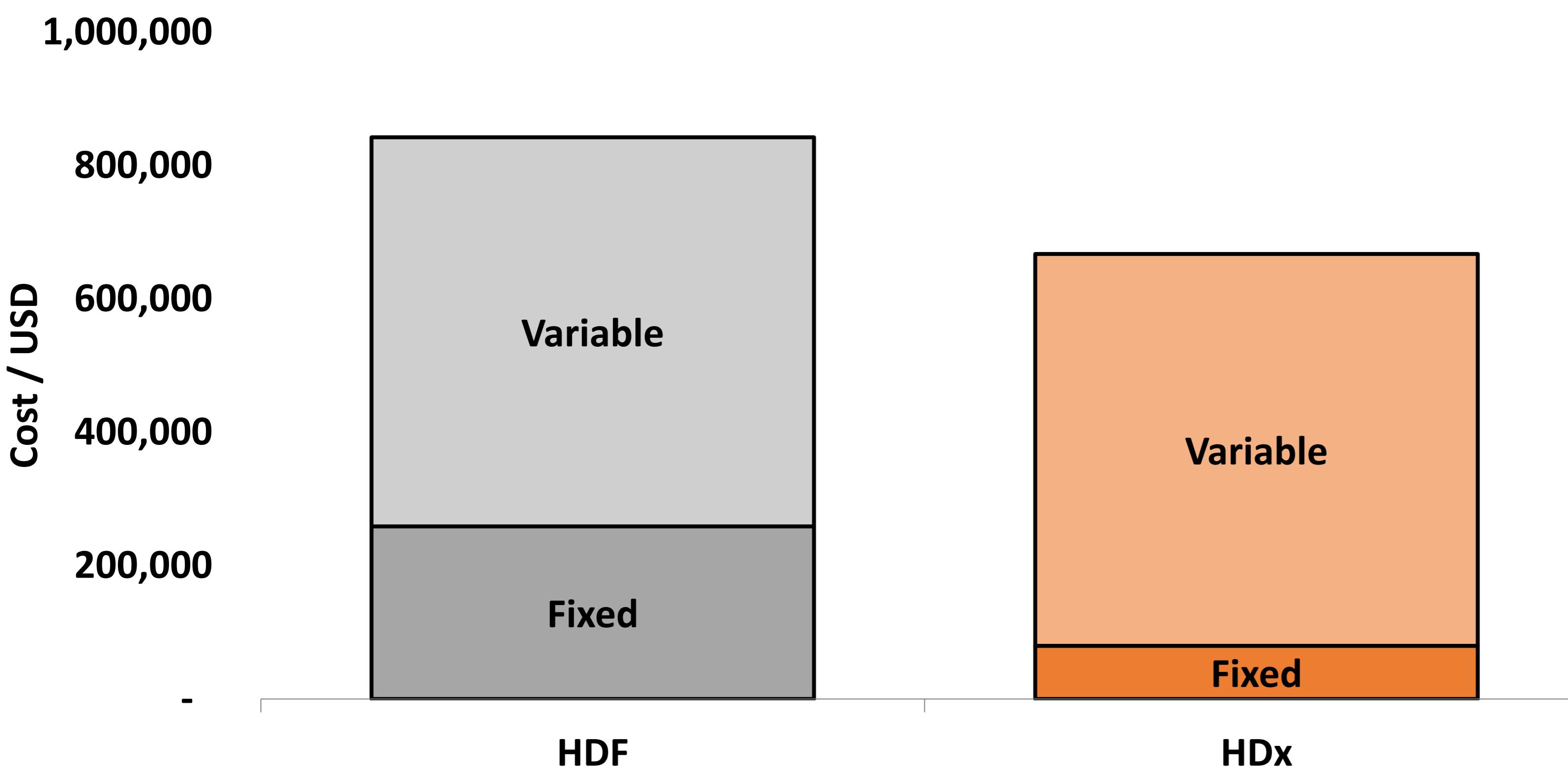
The model incorporated both fixed costs (device acquisition, maintenance, and other fixed costs) and variable costs (consumables, power and water consumption, and waste disposal). The combined fixed and variable costs were used to estimate the average cost per dialysis session.

All costs were discounted at 3% in line with Saudi FDA guidance. (2) The model assumed immediate replacement of all existing dialysis machines in the facility. The robustness of results was tested through deterministic and probabilistic sensitivity analyses.

### RESULTS

The base case results show that HDX therapy is more cost-saving than HDF therapy over the 10-year model time horizon. Compared with HDF therapy, HDX therapy resulted in a 21% reduction in overall costs per dialysis session, equivalent to USD 18.39 (exchange rate 0.27)(SAR 69).

Figure 1: HDF and HDX fixed and variable costs per device over the model's time horizon



The majority of savings came from the device maintenance costs (around 80%) and a 38% lower device cost. Variable costs, by contrast, remained almost constant with only a marginal increase (<1%).

Figure 2: Fixed costs total difference over model's time horizon (presented as a reduction from HDF)

■ HDF ■ HDx

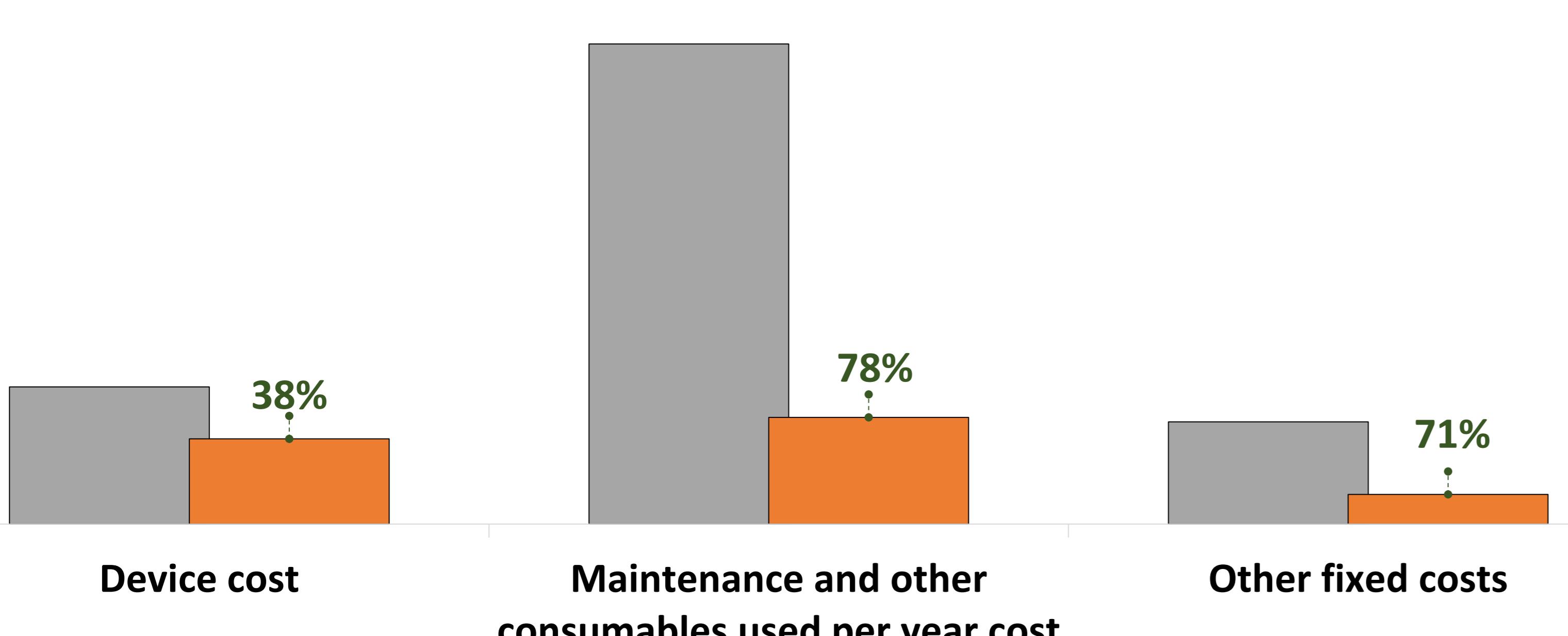
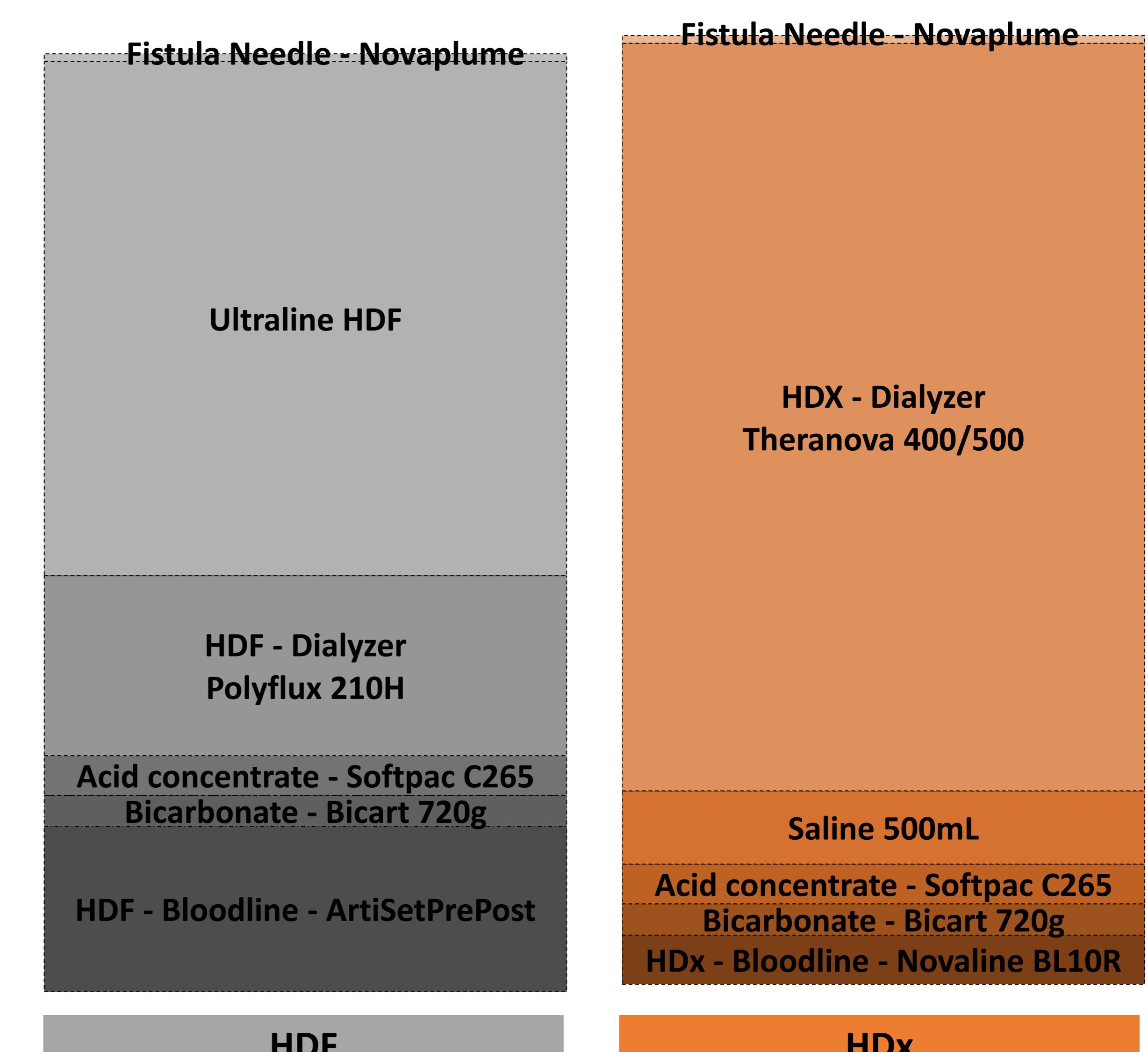


Figure 3: HDF and HDX consumables costs per device over the model's time horizon

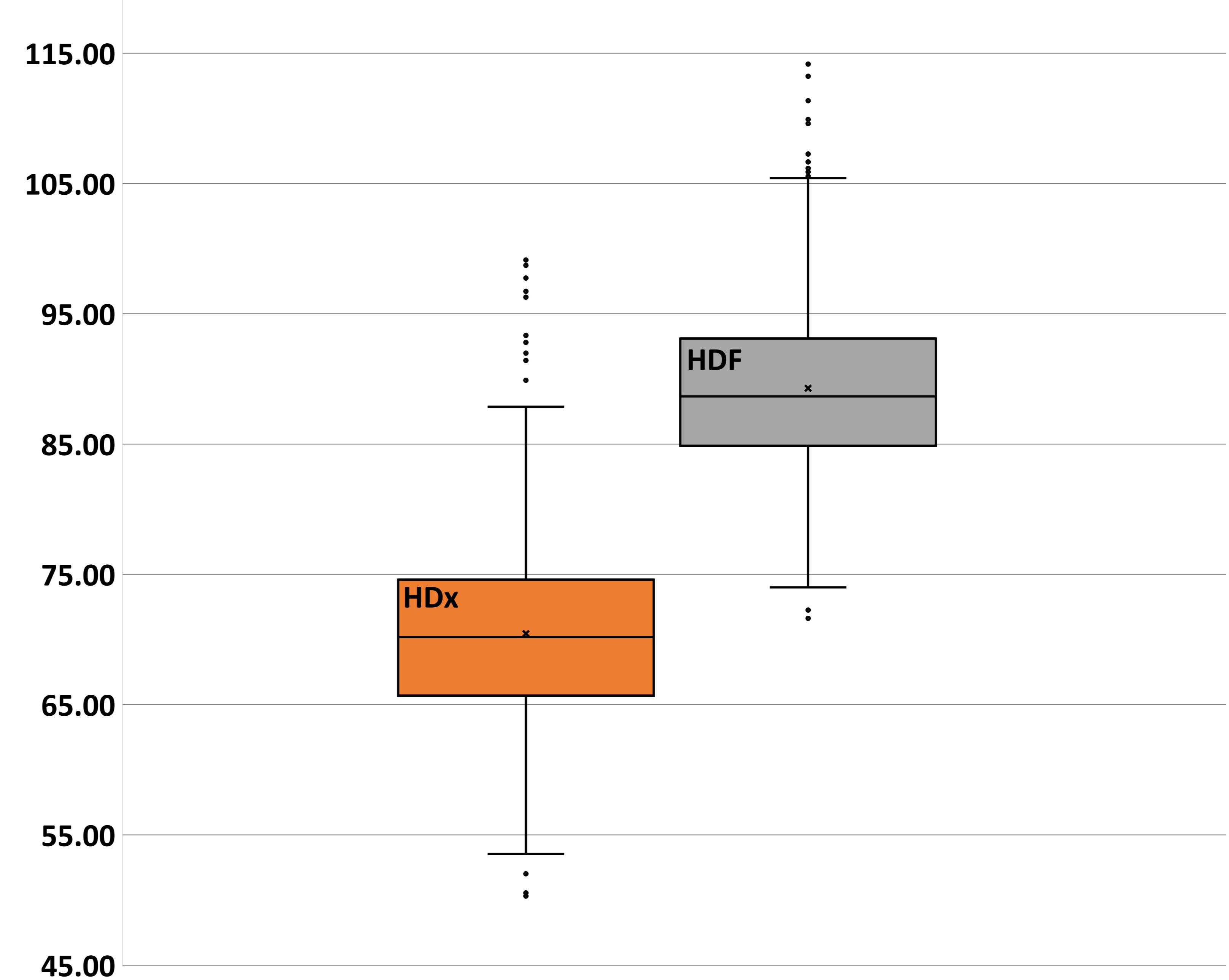


### SENSITIVITY ANALYSES

The reliability of the results was confirmed through sensitivity analyses. In the deterministic sensitivity analysis, all input parameters were varied by  $\pm 10\%$  to assess the difference in average cost per session between HDX therapy and HDF therapy.

The results showed HDX therapy to be consistently more economically favorable than HDF therapy, with consumable costs and their usage frequency being the main factors influencing results.

Figure 4: Probabilistic Sensitivity Analysis for HDX and HDF Average Cost Per Session



### CONCLUSION

From a public perspective, HDX therapy represents a more cost-saving dialysis modality compared to HDF therapy for KF patients. These results assist decision-makers and payers in evidence-based planning and resource allocation.

### REFERENCES

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