EE460

# A health economic and environmental evaluation of subcutaneous versus intravenous pertuzumab/trastuzumab for HER2-positive breast cancer in Denmark (HEREAFTER)

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## BACKGROUND

Capacity are a growing challenge within publicly funded healthcare in Denmark, where increasing demand places pressure on limited healthcare resources.

Treatment administration modality influences healthcare resource use, patient burden, and environmental impact. Subcutaneous (SC) administration of monoclonal antibodies offers a more time-efficient alternative to intravenous (IV) infusion, but its broader system-level implications remain underexplored.

## OBJECTIVES

This study analyzed the potential cost, capacity, and environmental impact of SC pertuzumab/trastuzumab (PHESGO) versus IV pertuzumab/trastuzumab (PT) in a Danish outpatient setting.

The objective was to quantify differences in healthcare resource utilization, including healthcare professional time, non-drug costs, and material use, across neoadjuvant, adjuvant, and first-line treatment settings

## METHODS

A deterministic cost and time model was developed to compare two outpatient treatment scenarios: PHESGO SC and IV PT. The analysis was conducted from a Danish hospital perspective and included the full treatment pathway from pharmacy preparation to patient discharge.

**Population:** Patients with HER2-positive breast cancer in the neoadjuvant, adjuvant, and first-line metastatic settings.
**Data sources:** Model inputs were obtained from Summary of Product Characteristics (1), Danish HTA unit cost data (2), regional salary statistics (2024) (3), and the Danish Breast Cancer Group (DBCG) database (4).
**Key assumptions:** Resource use was driven by administration time, pharmacy preparation, and chair occupancy.
**Validation:** Model structure, inputs, and assumptions were validated with clinical experts.

## 8.8x reduction in HCP workload with SC administration

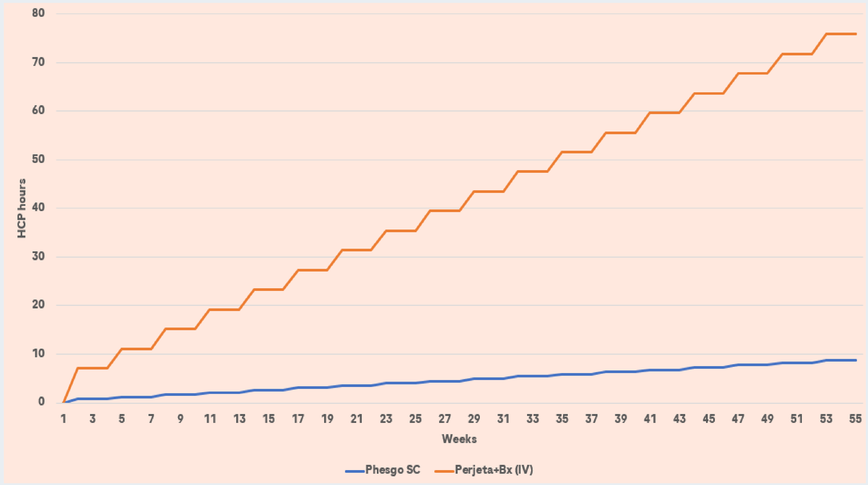


Figure 1:Total HCP hours used pr year pr patient treating with either IV (orange) or SC formulation (blue)

## KEY FINDINGS

- 8.8x reduction in HCP time (~11,360 hours; ~6 FTEs)
- Up to $5,380 USD non-drug cost savings per patient
- Up to 65% reduction in material use – reducing environmental footprint
- Highlights impact beyond drug acquisition costs

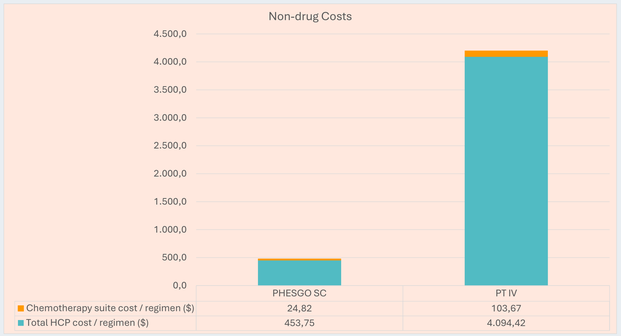


Figure 2: 1L indication non-drug costs per patient in USD. HCP cost time (turquise), chemo suite (orange)

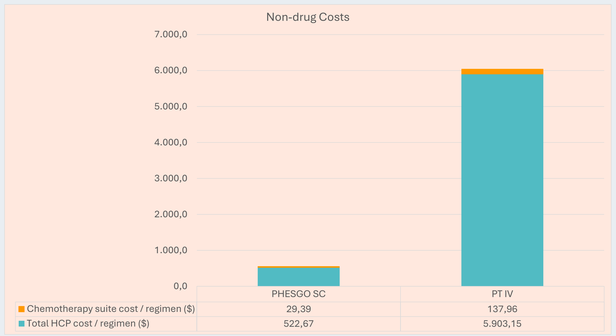


Figure 3: Adjuvant indication non-drug costs per patient in USD. HCP cost time (turquise), chemo suite (orange)

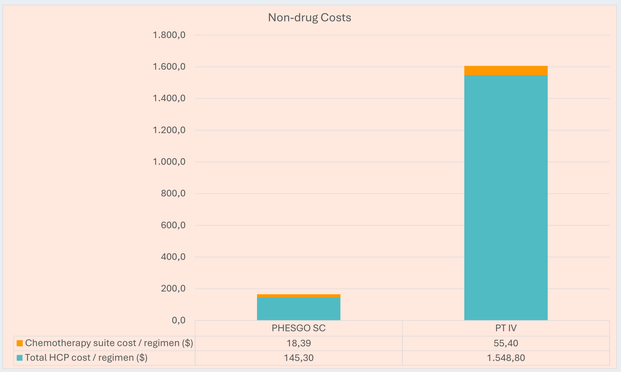


Figure 4: Neoadjuvant indication non-drug costs per patient . HCP cost time (turquise), chemo suite (orange)

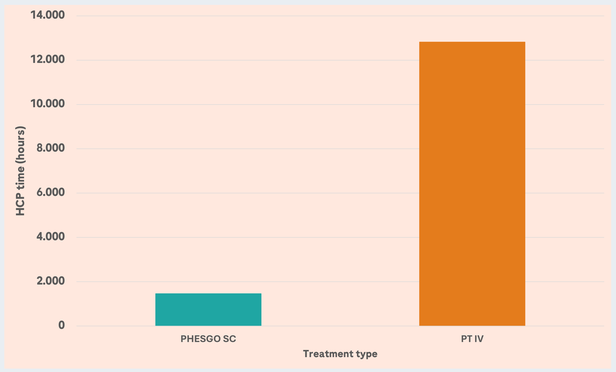


Figure 5: Total HCP time across neoadjuvant, 1L and adjuvant in Denmark treating with PHESGO SC or the IV formulations.

## RESULTS

- The analysis demonstrated substantial non-drug cost and capacity savings with administration of PHESGO.
- The economic and resource impacts are summarized in table 1 and table 2.
- Up to a 65% reduction in vials and clinical utensils with PHESGO compared to PT IV, resulting in reduced environmental footprint.

Table 1: Additional Non-Drug Costs of IV vs PHESGO (Per Patient Course)

| Treatment Setting | Annual Patient Volume (n) | Additional Cost pr patient for PT IV vs. PHESGO |
|---|---|---|
| Neoadjuvant (4 cycles) | 215 | $1,403.50 USD |
| 1st Line (11.6 cycles) (5) | 92 | $3,640.67 USD |
| Adjuvant (17 cycles) | 52 | $5,380.48 USD |

Table 2: National Annual HCP Resource Utilization (100% PHESGO vs. 100% IV)

| Capacity Metric | 100% PHESGO | 100% PT IV | Impact of PHESGO usage |
|---|---|---|---|
| Total HCP Time | 1,461 hours | 12,822 hours | Saves 11,360 HCP hours |
| Workload Factor | 1.0x | 8.8x | Avoids an 8.8-fold workload increase |
| FTE Equivalent | Base | +6 FTEs | Frees up ~6 FTEs annually |

## DISCUSSION

This analysis demonstrates that treatment administration modality has implications beyond drug acquisition costs. Non-drug savings (up to $5,380 USD/patient) reveal the resource intensity and economic burden of complex IV workflows.

- **Workforce & Sustainability Impact:** The reduction in healthcare professional time, corresponding to approximately 6 full-time equivalents per year, suggests that subcutaneous administration may help address capacity constraints and improve efficiency in Danish oncology care. Additionally, a 65% reduction in material use supports sustainability efforts.

- **Limitations:** Simulated 100% SC vs. IV model, only assessing monotherapy. Real-world time savings may vary by local hospital logistics, and environmental metrics rely on material volume rather than a full life-cycle assessment (LCA).

## CONCLUSION

PHESGO is associated with substantial reductions in healthcare resource use in Denmark. It reduces healthcare professional workload by a factor of 8.8, while also lowering costs and environmental impact.
These findings highlight the importance of considering capacity constraints, patient burden, and overall system efficiency alongside drug acquisition costs when evaluating oncology treatment strategies

## REFERENCES

1. Summary of Product Characteristics Perjeta®, Herceptin® and PHESGO®.
2. Valuation of unit costs, Danish Health and Techology assessment organ, Medicinrådet, https://medicinraadet.dk/media/gpjgcotu/v%C3%A6rdis%C3%A6tning-af-enhedsomkostninger-vers-1-7.pdf
3. Regional statistics of personnel and salary in Denmark, www.RKL.dk
4. The database of Danish Breast Cancer Group DBCG. Dataset

## CONTACT AND CONFLICT OF INTEREST

**Contact:** Anders Davidsen, anders.davidsen@roche.com
**Conflict of interest:** M Botoft, A Fanoe and A Davidsen are employees of Roche. Tange U and Knoop A has previously participated in an advisory board for Roche.

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