# COST-EFFECTIVENESS OF FIXED-DOSE COMBINATION OF PERTUZUMAB AND TRASTUZUMAB FOR SUBCUTANEOUS INJECTION IN HER2-POSITIVE EARLY BREAST CANCER IN CHINA: A POST-HOC ANALYSIS OF THE FEDERICA TRIAL

## **INTRODUCTION & OBJECTIVES**

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• In China, pertuzumab combined with trastuzumab and chemotherapy constitutes the standard treatment for HER2positive early breast cancer.

- However, intravenous (IV) administration can present multiple challenges for patients, including long infusion and observation times, the need for repeated, invasive IV access, and the potential risks associated with indwelling venous access [1].
- A fixed-dose combination of pertuzumab and trastuzumab for subcutaneous injection (PH FDC SC) offer patients less invasive and faster pertuzumab and trastuzumab administration than with individual IV [2,3].
- This study aims to evaluate the cost-effectiveness of PH FDC SC compared with IV for patients with HER2-positive early breast cancer in China.

## METHODS

#### Model structure

✓ A partitioned survival model (PSM) with three health states (including invasive disease-free survival (iDFS), disease (PD), and death) was constructed, progression incorporating a decision tree process, to simulate clinical and cost outcomes over patient's lifetimes from the Chinese societal perspective.

✓ The model presented a cycle length of 3 weeks to align with the dosage regimen for a decision.



[1] Tan AR, Im SA, Mattar A, er al. Fixed-dose combination of pertuzumab for subcutaneous injection plus chemotherapy in HER2-positive early breast cancer (FeDeriCa): a randomised, open-label, multicentre, non-inferiority, phase 3 study. Lancet Oncol. 2021 Jan; 22(1):85-97. doi: 10.1016/S1470-2045(20)30536-2. Epub 2020 Dec 21. Erratum in: Lancet Oncol. 2021 Feb; 22(2):e42. doi: 10.1016/S1470-2045(21)00010-3. [2] McCloskey C, Ortega MT, Nair S, et al. A Systematic Review of Time and Resource Use Costs of Subcutaneous Versus Intravenous Administration of Oncology Biologics in a Hospital Setting. Pharmacoecon Open. 2023 Jan;7(1):3-36. doi: 10.1007/s41669-022-00361-3. [3] Jackisch C, Manevy F, Frank S, Roberts N, Shafrin J. White Paper on the Value of Time Savings for Patients and Healthcare Providers of Breast Cancer Therapy: The Fixed-Dose Combination of Pertuzumab for Subcutaneous Injection as an Example. Adv Ther. 2022 Feb;39(2):833-844. doi: 10.1007/s12325-021-01996-0.

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#### Target population and treatment regimen

- The patient cohort in the model had a mean age of 53.9 years, mean body weight of 60 kg, and mean body surface area of  $1.60 \text{ m}^2$ .
- Patients would receive eight neoadjuvant chemotherapy cycles, comprising four chemotherapy cycle and four IV or SC cycles of HER2-targeted therapy. Then they underwent surgery, followed by a further 14 IV or SC cycles (maximum total of 18) of HER2-targeted therapy.

#### Model parameters

- Individual patient data were captured from Asian patient subgroups of a randomised, open-label, international, multicentre, non-inferiority, phase 3 trial (FeDeriCa [1]), and high-risk and clinically severe adverse events were specifically added to the states.
- Stata 15.1 was used to reconstruct and fit the iDFS and OS curves. For the survival function S(t) beyond the trial follow-up period, a best-fit model was identified by comparing against the Kaplan–Meier (KM) curves, followed by parametric extrapolation using classic survival functions (exponential, Weibull, log-normal, log-logistic, Generalized Gamma, and Gompertz).
- Treatment related costs, health productivity losses, and utilities for health states were derived from real-world data and supplemented by expert opinion and literature review.
- Key assumptions: patients were assumed to require neoadjuvant indwelling during access venous chemotherapy; however, the PH FDC SC arm involved only subcutaneous injections, with no catheter-associated or hospitalization costs.
- incremental cost-effectiveness ratio (ICER) was The calculated as the cost per quality-adjusted life year (QALY) gained. All costs were expressed in 2023 US dollars (US\$1 = 7.27 CNY), and costs and QALYs were discounted at an annual rate of 5%.

#### Sensitivity analyses

One-way sensitivity analyses (OWSA) were conducted to assess the impact of individual parameters on the base-case ICER. Probability sensitivity analyses (PSA) were performed using 5,000 Monte Carlo simulations to evaluate the effect of parameter uncertainty on model outcomes.

 Table 1 Cost-effectiveness of base-case analysis results

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#### • Base-case results

- ✓ Patients treated with PH FDC SC incurred an average cost of \$48,642 and gained 11.313 QALYs over a lifetime.
- ✓ PH FDC SC demonstrated dominance over PH IV, providing 0.065 additional QALYs while reducing predicted lifetime costs by \$11,003, resulting in an ICER of -\$170,360 per QALY.

	Patients with HER2-positive early breast cancer	
	PH IV	PH FDC SC
fe years (years)	13.138	13.135
ALY (years)	11.248	11.313
otal costs (USD)	\$59,645	\$48,642
ost-effectiveness results		
ncremental life years	-0.003	
ncremental QALY	0.065	
ncremental cost (USD)	-11,003	
CER (USD/QALY)	Dominant	

- $\checkmark$  The cost difference between the two arms was primarily attributable to variations in pre-progression treatment costs (incremental cost \$7,499), with drug acquisition being the main driver, followed by costs related to productivity loss (incremental cost \$1,389) and hospitalization (incremental cost \$1,300).
- ✓ For PH FDC SC, the potential cost savings attributable to differences in the injection modalities were estimated at approximately \$3,281.

**Figure 2 Cost comparison of treatment regimens** 



✓ The results of the OWSA showed that the one-time AE disutility and Cost of PH FDC SC maintenance doses were the main factors affecting the cost-effectiveness.

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### CONCLUSIONS

PH FDC SC simplifies the administration process and represents a promising alternative to conventional intravenous infusion for patients with HER2-positive early breast cancer, offering the dual benefits of reduced costs and improved health benefits.

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