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## Introduction

- Costs for cancer treatment have increased worldwide as advanced targeted therapies replace traditional chemotherapies as standard of care in many cancer types. Targeted therapies like trastuzumab have improved the 5-year survival rate in HER2-positive breast cancer even in metastatic disease states.
- Biosimilars offer a more affordable option to expensive biological therapies in both supportive and therapeutic cancer care.
- Ogivri (Trastuzumab-dkst), a biosimilar trastuzumab, was approved by the FDA in December 2017 and by the EMA in December 2018.
- We conducted economic modeling of Ogivri vs Herceptin Hylecta (Trastuzumab SC) in metastatic breast cancer in both the United States (US) and France.

## Objectives

- To compare cost-efficiency and budget-neutral expanded access to biosimilar intravenous (IV) trastuzumab-dkst achieved through conversion from subcutaneous (SC) trastuzumab in metastatic breast cancer in US and France.

## Methods

The following cost-efficiency models were evaluated:

- Trastuzumab-SC (Q3 weeks) vs trastuzumab-dkst IV (weekly) monotherapy
- Trastuzumab-SC (Q3 weeks) vs trastuzumab-dkst IV (Q3 weeks) in combination with pertzumab (and paclitaxel in cycles 1-4)

Model inputs included:

- A panel of 1000 female patients in three weight (W) categories (US[1]: W1: 62.2kg; W2: 73.1kg; W3: 88.6kg; France[2]: W1: 49.5kg; W2: 66kg; W3: 82.5kg)
- Annual cost-savings and expanded access of 1 year treatment with trastuzumab-dkst with conversion rates from 10% to 100%
- Drug costs (US: average selling price [US$]; France: public unit price [€] converted to US purchasing power parity)
- Drug administration costs

## Results

- In a panel of 1,000 patients, cost savings of trastuzumab-dkst over trastuzumab-SC monotherapy range from $564,347 (W3 at 10% conversion) to $20,706,175 (W1 at 100%) in the US (**Table 1**) and from $1,465,126 (W3;10%) to $25,438,492 (W1;100%) in France (**Table 2**).
- In combination with pertuzumab in a 1,000 patient-panel, trastuzumab-dkst saves up to $34,234,181 (W1;100%) in the US and up to $27,601,228 (W1;100%) in France.
- In the US, reallocation of these savings can provide between 425 (W3;10%) and 19,810 (W1;100%) additional maintenance doses of trastuzumab-dkst monotherapy, sufficient to treat 8 to 376 patients, respectively, for one year (**Table 1**).
- In France, these savings can provide between 2,606 (W3;10%) and 70,932 (W1;100%) additional maintenance doses or 49 to 1,342 one-year treatment regimens, respectively (**Table 2**).
- For trastuzumab-dkst in combination with pertuzumab, savings in a 1,000 patient-panel could expand access to 202 (W3;10%) to 4,379 (W1;100%) additional maintenance doses or 11 (W3;10%) to 232 (W1;100%) one-year regimens in the US.
- In France, savings can provide between 254 (W3;10%) and 4,728 (W1;100%) additional maintenance doses or 13 (W3;10%) to 243 (W1;100%) one-year regimens.

## Results

**Table 1:** Cost-savings and budget-neutral expanded access of trastuzumab-dkst in the US

| Cost-savings | Type of therapy | Weight 1 | | Weight 2 | | Weight 3 | |
|---|---|---|---|---|---|---|---|
| Per patient | Monotherapy | $20,706.18 | | $14,647.12 | | $5,643.47 | |
| | Combination | $34,234.18 | | $27,948.62 | | $17,642.55 | |
| | *Panel conversion rate* | *10%* | *100%* | *10%* | *100%* | *10%* | *100%* |
| Per panel (1000 patients) | Monotherapy | $2,070,618 | $20,706,175 | $1,464,712 | $14,647,116 | $564,347 | $5,643,468 |
| | Combination | $3,423,418 | $34,234,181 | $2,794,862 | $27,948,616 | $1,764,255 | $17,642,553 |
| *Expanded access* | | | | | | | |
| Additional maintenance doses | Monotherapy | 1,980 | 19,801 | 1,264 | 12,638 | 425 | 4,247 |
| | Combination | 438 | 4,379 | 343 | 3,426 | 202 | 2,022 |
| Additional 1-yr regimens | Monotherapy | 38 | 376 | 24 | 239 | 8 | 80 |
| | Combination | 23 | 232 | 18 | 182 | 11 | 107 |

**Table 2:** Cost-savings and budget-neutral expanded access of trastuzumab-dkst in France

| Cost-savings | Type of therapy | Weight 1 | | Weight 2 | | Weight 3 | |
|---|---|---|---|---|---|---|---|
| Per patient | Monotherapy | $25,438.49 | | $20,044.88 | | $14,651.26 | |
| | Combination | $27,601.23 | | $22,004.08 | | $16,406.94 | |
| | *Panel conversion rate* | *10%* | *100%* | *10%* | *100%* | *10%* | *100%* |
| Per panel (1000 patients) | Monotherapy | $2,543,849 | $25,438,492 | $2,004,488 | $20,044,879 | $1,465,126 | $14,651,265 |
| | Combination | $2,760,123 | $27,601,228 | $2,200,408 | $22,004,081 | $1,640,694 | $16,406,935 |
| *Expanded access* | | | | | | | |
| Additional maintenance doses | Monotherapy | 7,093 | 70,932 | 4,354 | 43,538 | 2,606 | 26,062 |
| | Combination | 473 | 4,728 | 358 | 3,582 | 254 | 2,544 |
| Additional 1-yr regimens | Monotherapy | 134 | 1,342 | 82 | 823 | 49 | 493 |
| | Combination | 24 | 243 | 18 | 183 | 13 | 130 |

## Discussion

The magnitude of per-patient savings in monotherapy is higher in France because:

- Costs of trastuzumab-dkst and trastuzumab-SC are both higher in the US, despite purchasing power parity adjustment for France. However, the cost of trastuzumab-SC is 40.5% less in France than in the US, while trastuzumab-dkst is 45.5% lower. This gives trastuzumab-dkst additional advantage over trastuzumab-SC in France.
- Drug administration costs are significantly higher in the US than in France.
- The US cohort has higher body weight in all 3 weight categories relative to the French cohort.

The savings of trastuzumab-dkst in combination with pertuzumab is higher in the US than in France since:

- In the US, significant savings associated with drug administration costs are achieved for less frequent (Q3W) dosing.
- The cost of pertuzumab in France is higher.

## Conclusions

- Trastuzumab-dkst monotherapy and in combination with pertuzumab is cost-efficient vs Trastuzumab SC in all 3 patient weights in the US and France.
- In a panel of 1,000 patients, cost-savings can be reallocated on a budget-neutral basis to expand access to additional maintenance doses and one-year regimens of trastuzumab-dkst.

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Acknowledgement

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References

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