

# ICERs are not all the same. How cost-effectiveness estimates differ between the UK and US

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## Introduction/objective

- ▶ Cost-effectiveness is widely used by Health Technology Assessment (HTA) bodies to inform decisions regarding health interventions, but controversies remain due to methodological variabilities and challenges in interpreting the outcomes.
- ▶ The cost-effectiveness analyses conducted by the Institute for Clinical and Economic Review (ICER) are becoming increasingly influential on US healthcare, exerting pressure on manufacturers when drug prices exceed ICER's affordability threshold.
- ▶ This study investigates if there is a difference between incremental cost-effectiveness ratios (ICERs) in oncology calculated by the National Institute for Health and Care Excellence (NICE) in the UK and ICER in the US, and if any differences are solely driven by drug costs.

## Methods

- ▶ ICER Final Evidence Report and Meeting Summary documents and NICE final Technology Appraisal or Appraisal Consultation documents were identified in oncology between January 2015 and December 2017.
- ▶ Where the health technology assessments were conducted with comparable indications and comparators, the ICERs and drug unit costs were identified from both the NICE and ICER reports.
- ▶ If NICE were unable to identify a most plausible ICER, the ICER that most influenced their recommendation was used.
- ▶ Data extraction was conducted in November 2017. NICE figures were converted to USD at an exchange rate of 1.34 USD per GBP, and all figures were adjusted for inflation.

## Results

- ▶ Three ICER Final Evidence Report and Meeting Summary documents were identified, covering 18 therapies in total across non-small cell lung cancer (NSCLC), multiple myeloma and ovarian cancer.
- ▶ Of these, seven NICE Final Technology Appraisal or Appraisal Consultation documents were available in NSCLC and multiple myeloma where both the indication and comparator were comparable to those of ICER (Table 1).

**Table 1:** Comparable health technology assessments conducted by NICE and ICER in oncology between January 2015 and December 2017

| Molecule     | Indication                                   | Comparator                         |
|--------------|--|------------------------------------|
| Afatinib     | 1L EGFR+ NSCLC                               | Cis+pem                            |
| Gefitinib    | 1L EGFR+ NSCLC                               | Carbo+pac (NICE)<br>Cis+pem (ICER) |
| Atezolizumab | 2L NSCLC (NICE)<br>2L TC/IC 2/3 NSCLC (ICER) | Docetaxel                          |
| Nivolumab    | 2L NSCLC                                     | Docetaxel                          |
| Carfilzomib  | 2L multiple myeloma                          | Lenalidomide+dexamethasone         |
| Carfilzomib  | 3L multiple myeloma                          | Lenalidomide+dexamethasone         |
| Ixazomib     | 3L multiple myeloma                          | Lenalidomide+dexamethasone         |
| Panobinostat | 3L multiple myeloma                          | Lenalidomide+dexamethasone         |

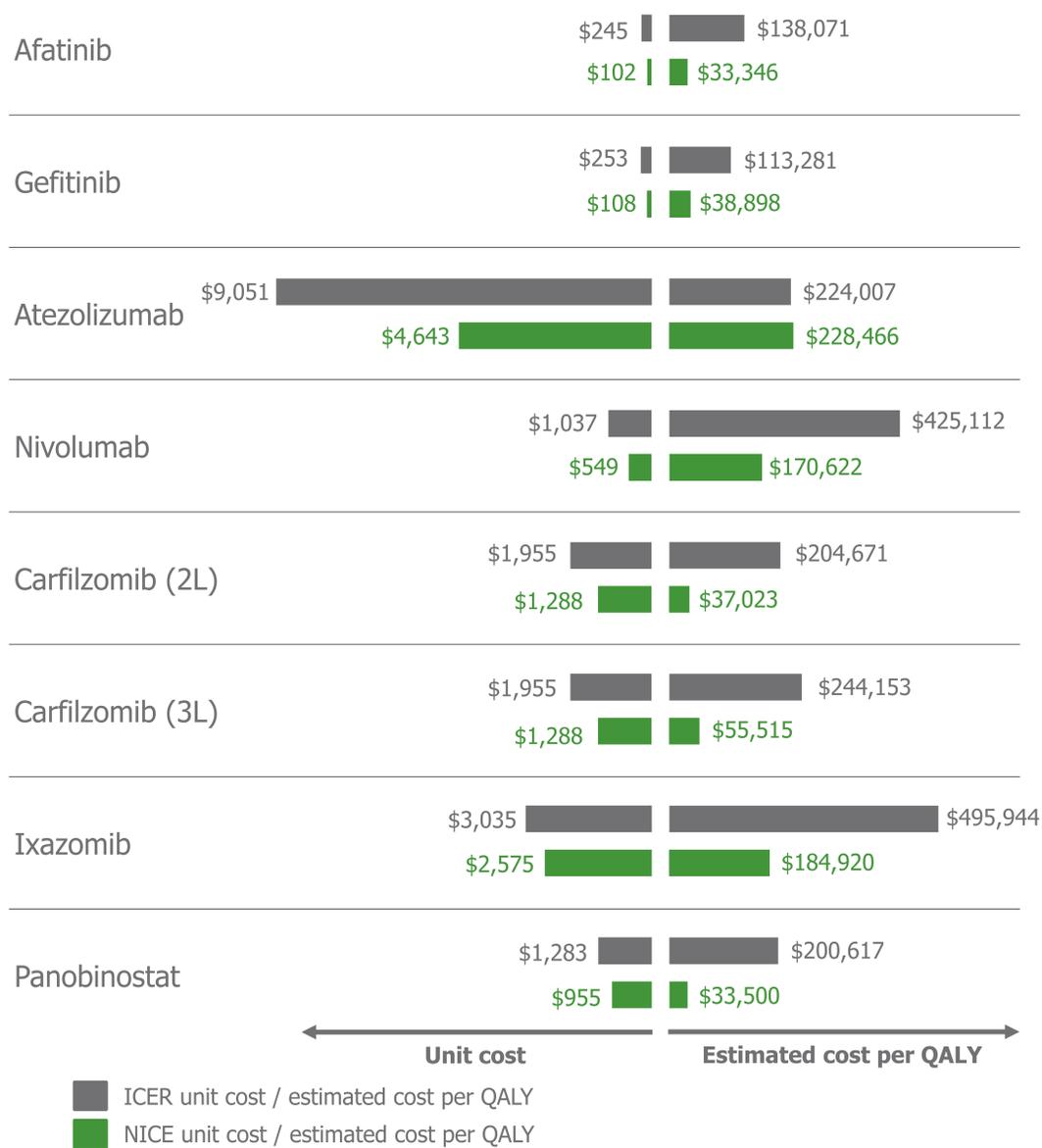
Carbo=Carboplatin; Pac=Paclitaxel; Cis=Cisplatin; Pem=Pemetrexed; TC=Tumor cell; IC=Tumor-infiltrating cell; 1L=First-line; 2L=Second-line; EGFR=Epidermal growth factor receptor

- ▶ A comparison of the costs per QALY and unit costs from the ICER and NICE assessments is shown in Figure 1. The ICER costs per QALY were higher than those of NICE in all cases other than for atezolizumab. Similarly, the unit costs used by ICER were higher than those of NICE in all cases.
- ▶ ICER cost per QALYs were 3.64 times higher than those of NICE, with an average difference of \$157,946. ICER unit costs were 1.77 times higher than those of NICE, with an average difference of \$913 (Table 2). The differences in cost per QALY were primarily driven by the multiple myeloma indication.

**Table 2:** Relative magnitude of ICER drug unit costs and costs per QALY compared to NICE

| Molecule         | Unit cost | Cost per QALY |
|------------------|-----------|---------------|
| Afatinib         | 242%      | 414%          |
| Gefitinib        | 233%      | 291%          |
| Atezolizumab     | 195%      | 98%           |
| Nivolumab        | 189%      | 249%          |
| Carfilzomib (2L) | 152%      | 553%          |
| Carfilzomib (3L) | 152%      | 440%          |
| Ixazomib         | 118%      | 268%          |
| Panobinostat     | 134%      | 599%          |

**Figure 1:** Drug unit cost and cost per QALY comparison between ICER and NICE



## Discussion and conclusions

- ▶ The methodologies applied by ICER and NICE to assess cost-effectiveness do not differ substantially, although ICER conducts independent reviews while NICE requires manufacturer submissions. Furthermore, higher willingness-to-pay thresholds are applied by ICER (\$100k-\$150k per QALY) compared to NICE (£20k / \$27k – £50k / \$67k per QALY, higher for cancer or rare disease).
- ▶ Here, we show that the costs per QALY and drug unit costs from ICER HTAs in oncology are substantially higher than those of NICE. There is a greater relative difference in cost per QALY than drug unit cost, indicating that higher drug unit costs in the United States are not the sole driver of these differences in costs per QALY.
- ▶ Given that health outcomes based on clinical trial data incorporated into the cost per QALY calculations are likely to be comparable, we hypothesize that the differences in ICERs are primarily driven by increased costs across the whole US healthcare system.