# New Treatments

## Cost and Effectiveness

# Cost and effectiveness

- Background information: methodology and origin of the information
- Data with new agents for the treatment of metastatic breast cancer
- Data with reastuzumab in the adjuvant setting

Health Technology Assessment: a bridge between medical evaluation, integration in health system and impact on Care management

- **A multidisciplinary approach to assess**
  - Efficacy and security in day to day practice
  - Cost, cost/effectiveness
  - Organizational impact
- Of a new validated agent (in this case)
- Link between EBM and Health Policy

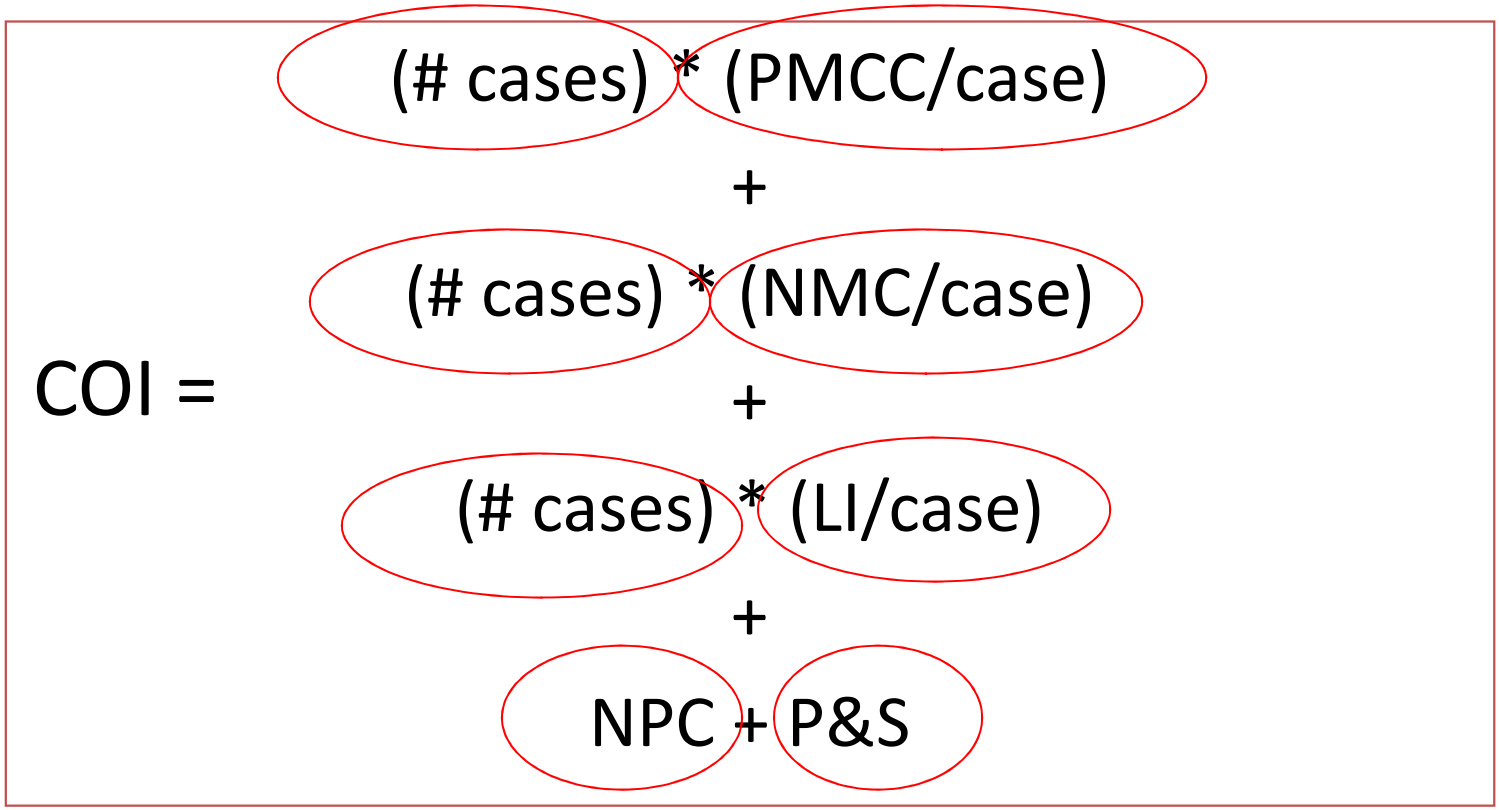
# Levels of Evidence (clinical trials)

- **Level A/ 1** : one or several meta-analysis or several randomized trials with converging results . → recommandation
- **Level B/ 2** : Evidence of acceptable quality : randomized trials (B1) or prospective ou retrospective studies (B2), with converging results→suggestion
- **Level C/ 3** : available studies are disputable from a methodological point of view or with discordant results .→ treatment may be an option
- **Niveau D/4** : Noreal data, case reports or retrospective small series→ insufficient evidence to make a recommandation
- **Expert consensus**:-→ In the absence of reliable evidence, it is the opinion of the group that…

# Literature search

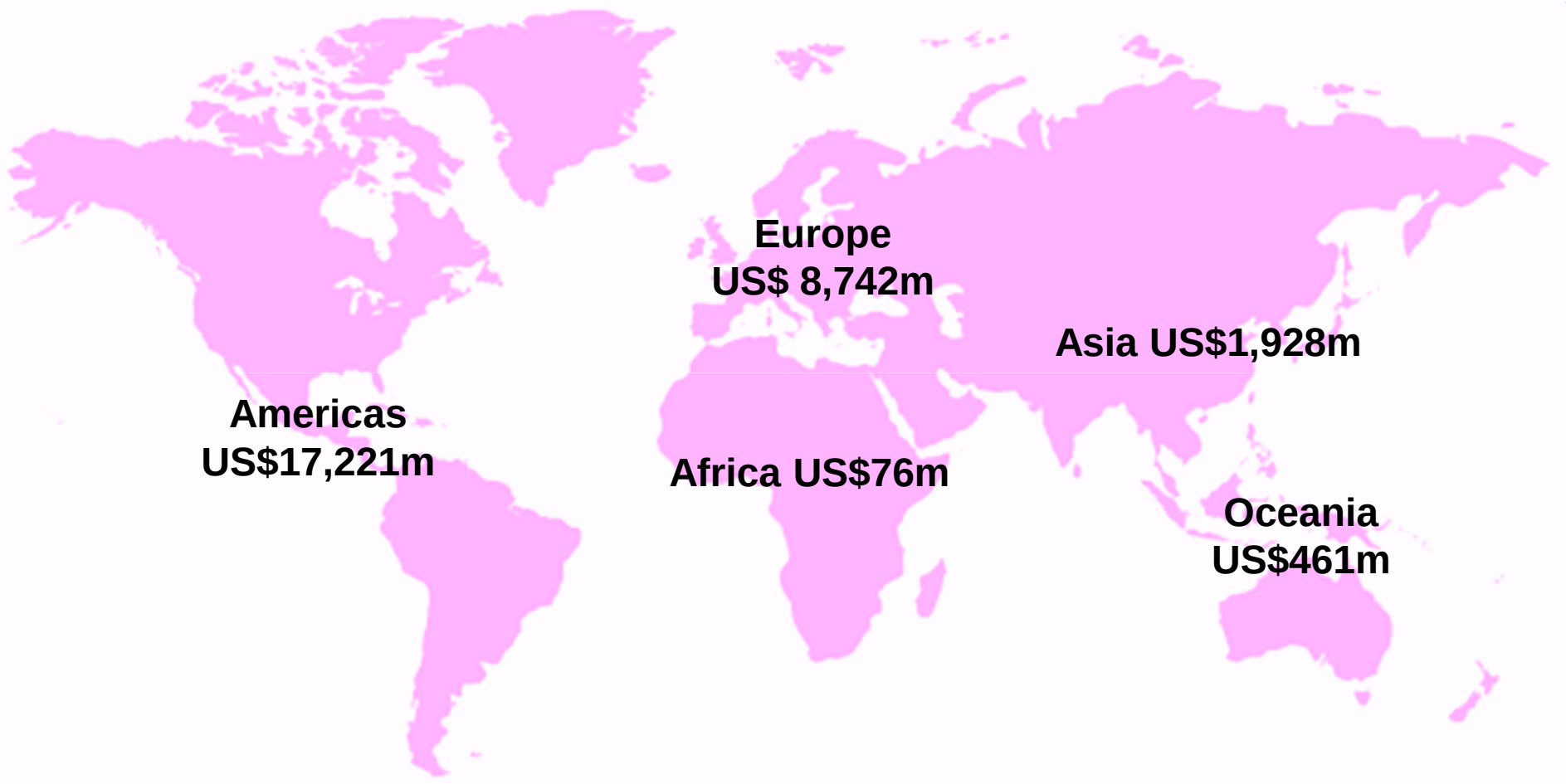
- Agents: trastuzumab, lapatinib, eribulin, bevacizumab
- Breast neoplasms
- Health Technology Assessment, cost effectiveness
- -→67 indexed publications
- +CPG from different groups and or Organizations

# Cost of illness methodology: general framework



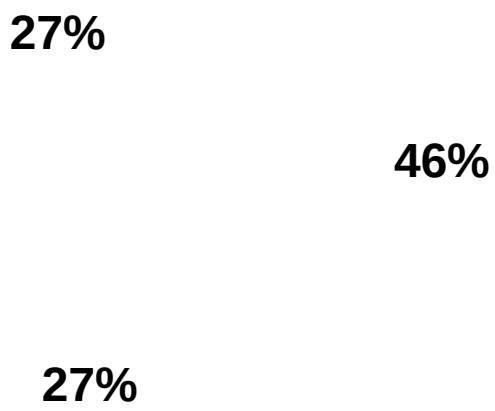

PMCC: personal medical care costs
NMC: non-medical costs
LI: lost income
NPC: non personal costs
P&S: pain and suffering

# Total costs ($m) of new breast cancer cases, by geographic region, 2009




Global economic burden of breast cancer in 2009= US$28bn

# Components of total cost of new breast cancer cases in year 1, 2009



# Burden of Breast Cancer Recurrence (From patients charges)

| Parameter | No Recurrence (6-12 months | Recurrence: 1st 6-12 months |
|---|---|---|
| Medical charges | $10,715 and $12,344 | $45,855 and $79,253 |
| Terminal care | | $63,434 |

Cancer 2006, vol. 106, nº9,

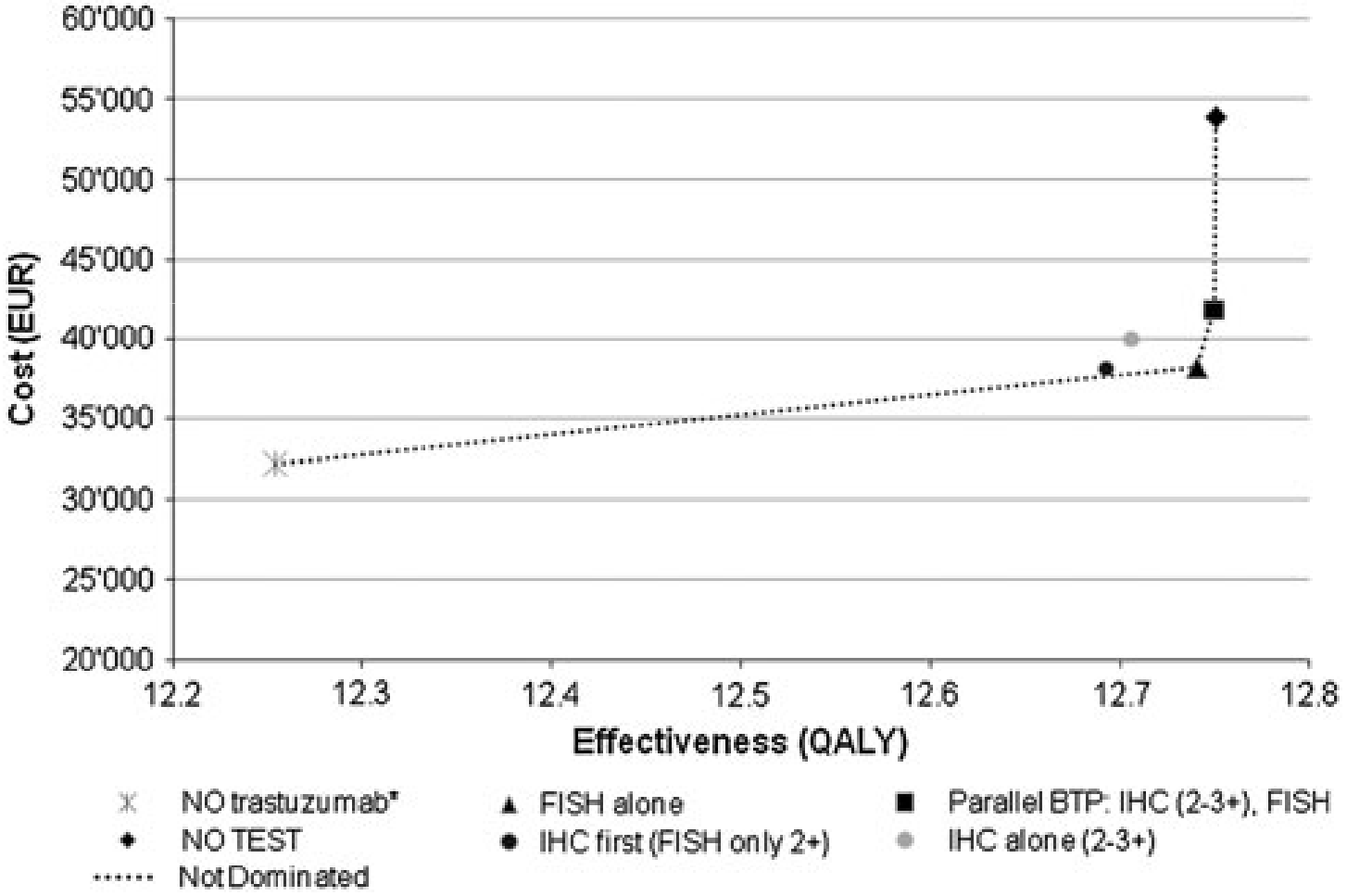
# Cost effectiveness of cytotoxic and targeted therapy for metastatic breast cancer

- 8 studies encompassing new agents (mostly trastuzumab)
- methods of reporting costs and effects varied considerably
- Studies on cytotoxic agents showed mainly favourable cost-effectiveness ratios
- Targeted therapies indicated both favourable and non-favourable ratios

# Cost per type of resource use (per first year) in € per patient following adjuvant chemotherapy: HERA model

| Type of resource | Duration/amount | Unit cost (€) |
|---|---|---|
| Hormonal therapy | 1 year | 2,233 |
| Trastuzumab price (Herceptin®, Roche, Switzerland) | 1 vial per 150 mg | 860 |
| | 1 vial per 440 mg | 2,341 |
| Trastuzumab treatment (Incl. Infusion and 4× echocardiography) | 1 year | 42,588 |
| IHC test | 1 test | 53 |
| FISH test[a] | 2 test probes | 686 |
| Gynaecological examination[b] | 1 | 142 |
| Mammography | 1 | 107 |
| Sonography | 1 year | 100 |
| Surgery | 1 year | 1,275[c] |
| | | 2,778[d] |
| Material | 1 year | 167 |
| Anaesthesia | 1 year | 540 |
| Radiotherapy | 1 year | 4,688[e] |
| | | 8,467[f] |
| Hospitalization | 7.6 days | 2,281[g] |

# A cost–effectiveness analysis of different HER2 predictive assay strategies for localized breast cancer



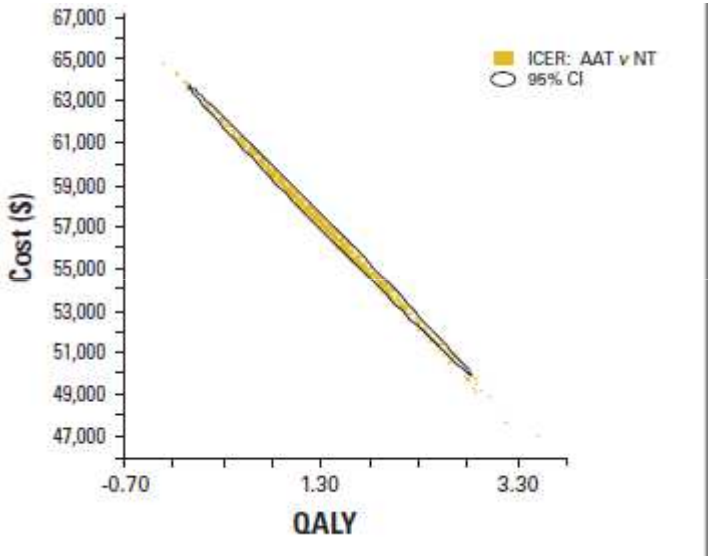
# Cost-effectiveness of adjuvant trastuzumab from HERA data

| | Total cost of T arm (€) | Total cost of CTL (€) | Incremental cost (€) | LYG | Cost/LYG (a) |
|---|---|---|---|---|---|
| At 5 years | 53403 | 27304 | 26099 | 0,12 | 212360 |
| At 10 years | 62656 | 41559 | 21097 | 0,52 | 40505 |
| At 15 years | 67682 | 47791 | 19891 | 1,01 | 19673 |

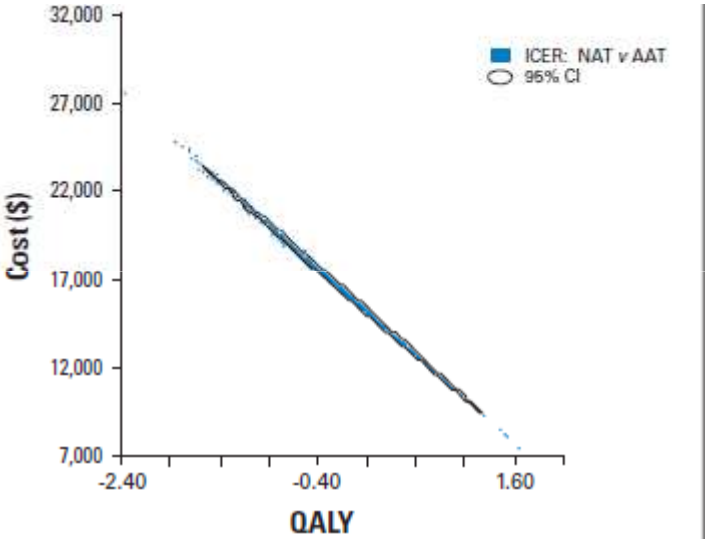
a) Assuming a constant effect over years

Annals of Oncology 18: 1493–1499, 2007

# Cost-effectiveness of adjuvant trastuzumab from NSABP B31, NCCTG N9831 and BCIRG 06 (Incremental cost effectiveness ratio- ICER)




Anthra-pacli+ T vs no trastu




Anthra-pacli+ T vs no anthracyclins

Annals of Oncology 18: 1493–1499, 2007

# Cost-effectiveness of trastuzumab as adjuvant therapy for early breast cancer: a systematic review

- 23 cost-effectiveness ratios pertaining to treatment of early breast cancer. These ratios ranged from $5020/QALY to $134,610/QALY.
- Most studies reported favorable cost-effectiveness values (ie, below $50,000/QALY).
- 84.6% were conducted using a Markov model based on data from clinical trials and 15.3% were analyzed by other economic or cost models;
- 84.6% reported sensitivity analysis, 11 studies (84.6%) clearly described a justification of selecting study design, and only 15.3% noted study limitations.
- All studies mentioned their perspective
- Methods of reporting costs, effectiveness, and time-horizons for disease states varied significantly.
- Nine (69.2%) studies used a discount rate of 3%, 3 studies used a discount rate of 5%, and 1 study used 3.5%.
- CONCLUSIONS: Most studies presenting the frequently proposed threshold of QALY suggest that trastuzumab may be cost-effective for treatment of early breast cancer in a 1-year treatment regimen

# Bevacizumab for Advanced Breast Cancer

- « Bevacizumab plus paclitaxel improved progression-free survival relative to weekly paclitaxel, but that there was no robust evidence that bevacizumab plus paclitaxel improved overall survival" (NICE)
- cost estimate of bevacizumab plus paclitaxel versus paclitaxel
  - Incremental cost: 40369 €
  - Gain: 0,22 QALY
  - Cost effectiveness : 189,427€/QALY

# Lapatinib + Capecitabine for relapsing cERB2 positive BC: cost effectiveness

| Parameters | Lapatinib+Capecitabine | Capecitabine Alone |
|---|---|---|
| Mean time to progression, mo | 6.21 | 4.24 |
| Mean overall response rate, % | 24.1 | 13.6 |
| Mean overall survival, mo | 17.41 | 15.45 |
| Mean duration after disease progression, mo | 11.20 | 11.22 |
| Average total cost per patient | $66,499 | $46,869 |
| Cost per life-year gained | $120,184 | |
| Cost per quality-adjusted life-year gained | $166,113 | |
| Cost per progression-free life-year gained | $133,167 | |

Cancer 2009;115:489–98.

# Conclusions

- No new targeted agent shows an ICER compatible with « willingness to pay » in developed countries
- So far only adjuvant trastuzumab appears to be cost-effective
- Thus, emergency with new targeted agents is
  - Either to show a largely improved OS in the metastatic setting
  - Or to improve DFS in the adjuvant setting
  - In population identified by predictive biomarkers