How to read an economic study 2018-2019

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Learning outcomes

By the end of this lecture, you will be able to

* Learn how to assess pharmacoeconomics research articles
* Identify weakness or strength in the methods, findings and conclusions within pharmacoeconomics research articles
* To identify the article that would be of most use to your purpose or aid in your/ company decision

Referemce

* Rascati K. *Essentials of pharmacoeconomics*: Lippincott Williams & Wilkins, 2013.
* Husereau. Consolidated Health Economic Evaluation Reporting Standards (CHEERS),2013.

* An economic analysis should be based on a primary study or meta-analysis that is scientifically valid, reliable, and relevant

When ever you come to read or use PE paper:

* Is the title appropriate ?
  * What is compared?
  * What type of PE evaluation?

* Clear objectives?
  * At the end of introduction usually
  * E.g. " this study was to assess benefit to cost ration of employing a full time pharmacist in paediatric unit"
  * Not clear to use: better, worse,…

When ever you come to read or use PE paper:

* Target population
  * Characteristics of the base group, in term of age, disease, and sex
* Clear justification for the alternative being used (comparator)?
  * New products with the standard current therapy
  * "With or without"
* Comprehensive description of the alternatives, including dosage, frequency, method of administration?
  * Comparing two drugs; dosages, length of therapy
  * High dose vs. low dose!!!
  * Three times pracetamol vs. 4 times dose.

When ever you come to read or use PE paper:

* Is the perspective **explicitly stated**?
  * Is the perspective matching the costs included
* Time horizon
  * State the time horizon(s) over which costs and consequences are being evaluated and why appropriate.
* Estimating resources and costs
  * Approaches and data sources used to estimate resource use and unit costs
* Appropriate health outcomes
  * Describe what outcomes were used as the measure(s) of benefit in the evaluation and their relevance for the type of analysis performed

When ever you come to read or use PE paper:

* Discounting done, appropriate?
  * Discounting for outcome and costs, justification for the rate being chosen
* Currency, price date, and conversion
  * Report the dates of the estimated resource quantities and unit costs.
  * Was inflation used ?
  * Describe methods for adjusting estimated unit costs to the year of reported costs if necessary
* Measurement and valuation of preference-based outcomes
  * The population and methods used to elicit preferences for outcomes

* Choice of model
  * Describe and give reasons for the specific type of decision-analytic model used.
  * Providing a figure to show model structure is strongly recommended.

* Sensitivity analysis ?
  * Type of sensitivity analysis
  * If PSA was used, CEAC was presented

* Result
  * Report incremental cost and outcome
  * ICER

* Discussion
  * Key findings
  * Limitation and strengths
  * Generalizability

Class exercise (CMA)

* What do you think of this title ?

TITLE: ECONOMIC ANALYSIS OF ONCOPLATIN ALONE (A CHEMOTHERAPY AGENT) COMPARED WITH ONCOPLATIN COMBINED WITH NONAUSEA (AN ANTINAUSEA AGENT)

The title identify the two therapeutic options that were being compared? ☑

The title indicate that the type of study was a CMA? ☒

Look to background and objectives

BACKGROUND: A relatively new chemotherapy agent, Oncoplatin, is administered intravenously in physician offices and clinics. Originally, because of problems with chemotherapy-induced nausea, the recommended administration directions were to split the monthly dose needed for each cycle in half and administer each half 5 days apart. Follow-up studies found that if patients were given NoNausea, an antinausea medication, at the same visit, the full monthly dose of Oncoplatin could be given at one visit. Clinical effectiveness measures of the chemotherapy treatment were shown to be the same for the two methods of administration (previous clinical literature should be cited in a real article).

OBJECTIVE: The objective of the study was to perform a cost-minimization analysis (CMA) comparing the cost of Oncoplatin given in two doses with Oncoplatin combined with NoNausea administered in one dose. The perspective of the study is the third-party payer.

* Clear objectives? ☒
* Appropriate alternatives? ☑
* Detailed description of the alternatives? ☑
* Perspective stated: ☑
* Target population ☒

Look to methods

METHODS: Over a 6-month period (February 2007 to July 2007), patients from two oncology clinics were enrolled in this study and randomized to receive either the split dose of Oncoplatin (25 mg/m^2 on days 1 and 5) or the single dose of Oncoplatin (50 mg/m^2) plus the oral antinausea medication (35 mg of NoNausea). Adverse drug events (ADEs) of the treatment were recorded. The average wholesale prices (AWP) of Oncoplatin and NoNausea from the 2007 Redbook were used to estimate prescription costs. Costs for intravenous infusions and physician or clinic visits were estimated using the 2007 *Physician Fee Reference*. Other costs were assumed to be equivalent between the two groups. It was assumed that the physician or clinic visits to receive chemotherapy were in addition to regular visits. Only the first cycle of chemotherapy for each patient was included in the analysis because it was thought that follow-up cycles would produce similar results.

* **Relevant costs?**
* Based on the perspective, only direct medical costs to a third party provider were assessed. Other costs, such as patient or family costs, direct nonmedical costs (e.g., other sector costs), and productivity (indirect) costs, were not measured.

* **Time horizon/ justification?**
* follow-up cycles produces similar results

* **Estimating resources and costs**
* Approaches used to estimate resource uses were not recorded
* Approach used to estimate cost is available
* AWP for prescription costs
* 2007 physician fee reference for clinical visits

* **Currency and price date?**
* 2007

Look to results and conclusion

RESULTS: Demographic and clinical characteristics in Exhibit 4.1 indicate that patients in each group were similar and that there were no statistical differences in adverse effects reported. A summary of costs for the first cycle of chemotherapy is listed in Exhibit 4.2. Although the medication costs are higher in the group with NoNausea, this increase is offset by a decrease in administration and office visit costs. The savings for the once-per-cycle dose was approximately $88. Sensitivity analyses (Exhibit 4.3) were conducted by varying the medication costs (both chemotherapy and NoNausea costs), office visit costs, and administration costs by 25% above and below baseline estimates. Results were similar to the base analysis, and savings for the once-per-cycle option ranged from $68 to $108.

CONCLUSIONS: Direct medical costs associated with the once-per-cycle dose of Oncoplatin plus NoNausea were lower than when the monthly dose was split. Although only direct medical costs to the third-party payer were assessed, if cost savings to the patient (decreased travel costs) and to society (increased patient productivity is possible if less time is spent at the physician's office or clinic) were included, this would further increase the economic advantage of the once-per-cycle option.

EXHIBIT 4.2

Costs for First Cycle of Treatment

	Split Dosing of Oncoplatin (n = 293)	Full Dose of Oncoplatin Plus NoNausea (n = 295)
Average cost of Oncoplatin[a]	$2964	$2980
Average cost of NoNausea (35 mg)[a]	N/A	$40
Cost of IV administration[b]	$160	$80
Cost of physician or clinic visit[b]	$128	$64
Total cost per patient	$3252	$3164

[a]2007 AWP costs were 25 mg/m^2 for two doses versus 50 mg/m^2 in one dose.

[b]2007 *Physician Fee Reference*, 50th percentile.

* **Adjustment or discounting?**
* All costs were valued in 2007 US dollars, therefore, no need for inflation. Costs and outcomes were assessed for less than 1 year, so discounting was not needed.

* **Appropriate health outcome?**
* Type of clinical effectiveness was not reported

Sensitivity analysis

EXHIBIT 4.3

Sensitivity Analyses

	Split Dosing of Oncoplatin: Total Cost	Full Dose of Oncoplatin Plus NoNausea: Total Cost
Baseline costs	$3252	$3164
Cost of medications increased by 25%	$3993	$3919
Cost of medications decreased by 25%	$2511	$2409
Cost of IV administration increased by 25%	$3292	$3184
Cost of IV administration decreased by 25%	$3212	$3144
Cost of physician or clinic visit increased by 25%	$3284	$3180
Cost of physician or clinic visit decreased by 25%	$3220	$3148

* **Sensitivity analyses?**
* Sensitivity analyses were based on all third-party direct medical costs (medicine, administration, and visits), and the results were found to be robust.
* Practically, as long as the cost of the antinausea drug was less than a visit that included administration of chemotherapy, the once-per-cycle dosing would be cost saving.
* Two way sensitivity analysis

Look to conclusion

* **Unbiased conclusions?**
* As with most CMAs, believability of the findings hinge on one important question: **Does the reader accept that the clinical outcomes of the options are the same?** If so, as long as the cost of the extra antinausea medication is lower than the cost of the extra administration or visit, the choice of once-a-cycle dosing is cost saving.

Which method of analysis was used, and was this appropriate?

* Cost minimisation analysis would be most appropriate if the interventions **produced identical outcomes**
* Cost effectiveness analysis would be most appropriate if **the important outcome is unidimensional**
* **C**ost utility analysis would be most appropriate if the important outcome is **multidimensional**
* Cost benefit analysis would be most appropriate if outcome measured in monetary values

How to search literature for PE evidence

* **Your search terms should include:**
* Alternative compared
* Methods or type of economic evaluation you are looking for
* Perspective (if you need to be specific on this)
* Use all related terms: cost*, econom*
* Settings (to limits hits)
* Country (to limit hits)

ISSG Search Filter Resource

Filters to find Economic Evaluations

Evaluations of the performance of filters can be found below the table.

Database	Filter
CINAHL	NHS CRD NHS EED filter SIGN strategy [undated] [Ovid] NOTE: Pragmatic and untested
EMBASE	NHS CRD NHS EED filter McKinlay RJ, Wilczynski NL, Haynes RB, Hedges Team. Optimal search strategies for detecting cost and economic studies in EMBASE. *BMC Health Services Research* 2006;6:67. Also at http://hiru.mcmaster.ca/hiru/HIRU_Hedges_EMBASE_Strategies.aspx Royle P, Waugh N. Literature searching for clinical and cost-effectiveness studies used in health technology assessment reports carried out for the National Institute for Clinical Excellence appraisal system. *Health Technology Assessment* 2003;7(34). [page 32] [Ovid] SIGN strategy [undated] [Ovid] NOTE: Pragmatic and untested
MEDLINE table for layout	NHS CRD NHS EED filter. A translation of this filter for PubMed is offered in Neyt M & Chalon P X. Search MEDLINE for economic evaluations: tips to translate an OVID strategy into a PubMed one. PharmacoEconomics 2013;31:1087-1090. Wilczynski NL, Haynes RB, Lavis JN, Ramkissoonsingh R, Arnold-Oatley AE, HSR Hedges team. Optimal search strategies for detecting health services research studies in MEDLINE. *Canadian Medical Association Journal* 2004;171(10):1179-85. [Ovid]. Also at