Enhancing the Value and Usefulness of Data Extracted From an Economic Systematic Literature Review

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BACKGROUND

- Economic systematic literature reviews help identify and collate information using explicit steps that are transparent, reproducible, and aimed at minimizing bias.
- However, the data identified are often extracted inconsistently by multiple researchers and presented in a way that may not allow others to readily access and summarize the information of greatest interest to them.

OBJECTIVE

- The objective of this study is to demonstrate a method for organizing the extracted data in an Excel-based tool that can make the information easily accessible for review, comparison, and quality assessment and facilitate its use in future economic analyses for a specific intervention or healthcare condition.

METHODS

- A multistep process is required, including the following:

1) Consultation with the project sponsor to understand key information needs

2) Development of an Excel-based template for extraction, including format and terms to be used

Figure 2. Extraction Template

Study overview

Study Type	Disease	Intervention Type	Target Population	Study Sponsor Type
RTI-HS: Enter the study type (e.g., budget-impact, cost-effectiveness, burden-of-illness)		RTI-HS: Specify the specific type of intervention analyzed in the study (e.g., vaccine, other prophylaxis, screening)	RTI-HS: Describe the target population (e.g., children < 5 years old, adults 18 years old and above)	

Model design

Study Type	Disease	Analysis Perspective	Willingness-to-Pay Threshold	Time Horizon
	RTI-HS: Select from dropdown	RTI-HS: "Not included" if not included in study "Not stated" if relevant to the study but not reported "Not applicable" if not applicable to study	RTI-HS: If using bullets, use "•" to start each bullet, and begin each bullet on a new line within the cell (press alt + enter to go to the next line while typing in a cell)	

3) Extraction of example studies identified during the literature search

Figure 3. Example Extraction

Study overview

First Author (Year)	Country	Study Type	Disease	Intervention Type	Target Population	Study Sponsor Type
Mauskopf (2013)	United States	Cost-effectiveness analysis	Invasive fungal disease	Prophylaxis or empiric treatment	Patients receiving allogenic hematopoietic cell transplants	Nonindustry (government, academia, etc.)

Results

Total Life Years	Annual Costs Due to Disease Without Intervention	Total Costs
Total study population life years • Voriconazole: 8.219 • Fluconazole: 8.269 AML population life years • Voriconazole: 7.911 • Fluconazole: 6.891	Not applicable	Total study population costs (2011 USD) • Voriconazole: $21,549 • Fluconazole: $12,831 AML population • Voriconazole: $22,919 • Fluconazole: $17,358

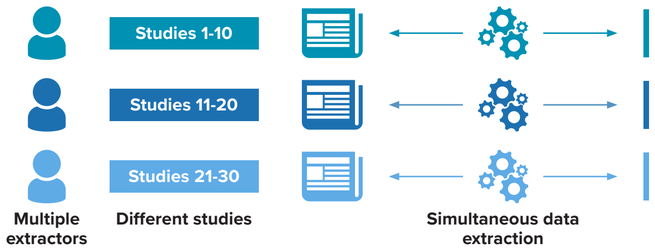
AML = acute myeloid leukemia.

METHODS *(continued)*

4) Meeting with extractors to review examples and train on format and terms to be used

5) Extraction of data using consistent format and terms

Figure 5. Data Extraction Process



6) Programming search functionality

Figure 6. Search Functionality Code

```
'Perform Data Search
Sub Do_Search()
    Dim TotalEntries As Integer, Included As Integer

    'Turn off screen updating and calculations
    Application.ScreenUpdating = False
    Application.Calculation = xlManual

    'Get total number of entries
    TotalEntries = Sheet1.Range("Total").Value

    'Loop through entries to determine what is shown in results
    For i = 1 To TotalEntries
        'Note: Tool selections/options chosen by user determine what is
        included in the search results
```

7) Adding user guidance to access information of interest or to create summary tables or slides

Figure 7. User Guidance

Guide

The **Previous** and **Next** buttons allow users to move between worksheets in the tool. The **Previous** and **Next** buttons are at the top of each worksheet beside the worksheet name.	Previous Next
The **Results** buttons allow users to view data for all extracted studies by classification.	Results ▼
The **Home** buttons at the top-left of each worksheet can be used to return to this page.	← Home

RESULTS

- Results from this process should allow the user to readily access all published information available for a specific condition or intervention on the model structure (e.g., decision tree, Markov), inputs (e.g., population characteristics, intervention efficacy/safety, intervention costs), data sources (e.g., clinical trials, observational studies, expert opinion, assumption), uncertainty analyses (e.g., one-way sensitivity analyses, scenario analyses, probabilistic sensitivity analysis), and key findings (e.g., resource use, costs, health benefits, quality-adjusted life-years, incremental cost-effectiveness ratios, threshold pricing, and policy implications).

Figure 8. Tool Use

Study characteristics

Use the filter setting selections below to choose the characteristics of interest and click the 'View Results' button to see data for the studies that meet the selected criteria.

Setting	Selection
Study type	Cost-effectiveness
Perspective	Payer
Therapeutic area	Oncology

Reset

View Results

Note

Cost-effectiveness studies will be shown.

Studies from the payer perspective will be shown.

Studies focused on oncology will be shown.

Results

Study Type	Perspective	Therapeutic Area	Model Structure	Target Population	Intervention	Key Findings
Cost-effectiveness	Payer	Breast cancer	Decision tree	Women aged 30+ years	Screening	Cost/QALY varies by age at screening
Cost-effectiveness	Payer	Prostate cancer	Markov	Men aged 50+ years	Chemotherapy	Cost/QALY > $100,000
Cost-effectiveness	Payer	Melanoma	Markov	Adults aged 18+ years	Immunotherapy	Cost/QALY > $150,000
Cost-effectiveness	Payer	Bladder cancer	Decision tree	Adults aged 18+ years	Surgery	Cost/QALY > $100,000

QALY = quality-adjusted life-year.

Note: Results are hypothetical.

CONCLUSIONS

- Using this multistep process will result in a searchable Excel-based tool that can be used to answer key queries about the model structure, inputs, data sources, and outcomes for use in further economic analyses of interventions or health conditions of interest as well as to create a summary presentation of the published literature.

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