Assessing the potential impact of recommendations made through the CADTH Common Drug Review (CDR) program

Cody Black, CADTH
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Disclosure

I have the following relevant financial relationship to disclose:

• Employed by: CADTH

CADTH:

• Funded by federal, provincial, and territorial ministries of health
• Receives application fees from manufacturers for three programs:
  • CADTH Common Drug Review (CDR)
  • CADTH pan-Canadian Oncology Drug Review (pCODR)
  • CADTH Scientific Advice
CADTH: Common Drug Review (CDR)

- Pan-Canadian process to review drugs for public reimbursement introduced in 2003
  - Goal: Provide a common process to improve efficiency and reduce duplication of effort
- Assess clinical effectiveness, cost-effectiveness and patient information for new drugs
- Canadian Drug Expert Committee (CDEC) provides formulary listing recommendations to participating Canadian public drug plans:
  - List
  - List with clinical criteria (or reduced price)
  - Do not List
- CDR has provided recommendations for ~500 drugs since May 2004
Project Objectives

• Expand upon previous pilot project:
  • Purpose: To assess health and cost implications with the uptake of CDR recommendations at a population level (between 2011-2012)
  • Estimated incremental net benefit (INB) of $460M
  • Limited by small sample size (n=55)

• Current project expands to a 5-year time-frame (2011-2015)

• Objective: Impact of CDR program beyond intended efficiencies is unknown (i.e. value of the recommendations)
# Methods

- Identified CDR reviews with recommendations containing a CUA or CMA, as well as BIA, from January 2011 to December 2015 [n=156]

<table>
<thead>
<tr>
<th>Project Number</th>
<th>Drug Name</th>
<th>Brand Name</th>
<th>Indication</th>
<th>Recommendation Date</th>
<th>Recommendation</th>
<th>Criteria</th>
<th>Analysis</th>
<th>Time Frame</th>
<th>Comparator</th>
</tr>
</thead>
<tbody>
<tr>
<td>SR0000</td>
<td>drugA</td>
<td>Drug A</td>
<td>Indicated for disease A</td>
<td>January 1, 2010</td>
<td>DNL</td>
<td>NA</td>
<td>CEA/CUA</td>
<td>1 year</td>
<td>drugB</td>
</tr>
</tbody>
</table>

**Manufacturer Info: Total cost, QALY, ICUR**

<table>
<thead>
<tr>
<th>Drug</th>
<th>Total cost</th>
<th>QALY</th>
<th>ICUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>drugA</td>
<td>$12,030.00</td>
<td>0.835</td>
<td>$62,750.00</td>
</tr>
<tr>
<td>drugB</td>
<td>$11,277.00</td>
<td>0.823</td>
<td></td>
</tr>
</tbody>
</table>

**Population Numbers**

<table>
<thead>
<tr>
<th>Province</th>
<th>Individuals eligible for drugA (Year 2)</th>
<th>Individuals prescribed drugA (Year 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Columbia</td>
<td>1,445</td>
<td>194</td>
</tr>
<tr>
<td>Alberta</td>
<td>311</td>
<td>42</td>
</tr>
<tr>
<td>Saskatchewan</td>
<td>165</td>
<td>22</td>
</tr>
<tr>
<td>Manitoba</td>
<td>87</td>
<td>11</td>
</tr>
<tr>
<td>Ontario</td>
<td>1,080</td>
<td>145</td>
</tr>
<tr>
<td>New Brunswick</td>
<td>61</td>
<td>8</td>
</tr>
<tr>
<td>Nova Scotia</td>
<td>150</td>
<td>20</td>
</tr>
<tr>
<td>Prince Edward Island</td>
<td>22</td>
<td>3</td>
</tr>
<tr>
<td>Newfoundland &amp; Labrador</td>
<td>80</td>
<td>11</td>
</tr>
<tr>
<td>NIBH</td>
<td>85</td>
<td>11</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>3,486</strong></td>
<td><strong>467</strong></td>
</tr>
</tbody>
</table>

**Manufacturer BIA**

**CDR PE Report**

**CDR Recommendation**
Two scenarios were defined:

- Uptake scenario: public drug plans implement CDR recs.
- Counterfactual scenario: public drug plans do not implement CDR recs.
- For each recommendation, calculated net-costs and net-QALYs for the entire eligible population (difference between uptake and counterfactual scenarios)

<table>
<thead>
<tr>
<th>CDR Recommendation</th>
<th>Net-costs</th>
<th>Net-QALYs (where applicable)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>List</td>
<td>Total Cost listing – Total Cost not listing</td>
<td>Total QALYs listing – Total QALYs not listing</td>
</tr>
<tr>
<td>Do not list</td>
<td>Total Cost not listing – Total Cost listing</td>
<td>Total QALYs not listing – Total QALYs listing</td>
</tr>
<tr>
<td>List with criteria</td>
<td>Total Cost listing (w/criteria) – Total Cost not listing</td>
<td>Total QALYs listing (w/criteria) – Total QALYs not listing</td>
</tr>
</tbody>
</table>

* Note: For CMAs, net-QALYs=0, and only costs are included
Methods (cont.)

• For each recommendation, we calculated the incremental net benefit (INB) based on a willingness to pay (WTP) threshold of $50,000 per QALY

\[
INB = (Net\_QALYs \times $50,000 \text{ per QALY}) - Net\_costs
\]

• INB aggregated for all recommendations to derive the INB of implementing all CDR recommendations reviewed in the 5 year study period

Note: We do not have an empirical estimate of the WTP threshold in Canada. 50k has been convention considered and used in Canada. Sensitivity analyses on this measure are being completed.
Results – Included Studies + INB

CDR recs. from 2013-2015 (n=116)

CDR recs. from 2013-2015 eligible (n=101)

CDR recs. from pilot project (2011-2012) (n=55)

CDR recs. included (n=156)

CDR recs. excluded for at least one of the following reasons:
• Not a CUA or CMA
• No accompanying BIA
• Resubmission (n=15)

Estimated total INB over 5-year analysis period >$1 billion
Results - CMAs

- 74 recommendations with CMAs identified over 5 year analysis period

- Over $200M in estimated INB over 1 year
  - No health gains
  - Cost savings

- Recommendations:
  - List: 6
  - List with criteria: 45
  - Do not list: 23
Results – INB by recommendation type (CMAs)

Note:
• Price reductions not included in analysis, INB likely higher (towards 0 or positive) for List with price reduction

<table>
<thead>
<tr>
<th>Incremental Net Benefit ($)</th>
<th>List</th>
<th>List with substantial price reduction</th>
<th>List with costs should not exceed comparator price</th>
<th>List with clinical criteria only</th>
<th>Do Not List</th>
</tr>
</thead>
<tbody>
<tr>
<td>$180,000,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>N=18</td>
</tr>
<tr>
<td>$160,000,000</td>
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<td></td>
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<tr>
<td>$140,000,000</td>
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<td>$120,000,000</td>
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<td>$100,000,000</td>
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<tr>
<td>$40,000,000</td>
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<tr>
<td>$20,000,000</td>
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<tr>
<td>$0</td>
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<tr>
<td>-$20,000,000</td>
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<tr>
<td>-$40,000,000</td>
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</tr>
</tbody>
</table>

N=6  N=16  N=19  N=15
Results – Distribution of INBs (CMAs)
Results - CUAs

- 82 recommendations with CUAs over 5 year analysis period
- Over $775 million in estimated INB over analysis time frame
  - 37,636 QALYs in health gains
  - Cost of $1.1 billion
- Recommendations:
  - List: 1
  - List with criteria: 50
  - Do not list: 31
Results - INB by recommendation type (CUAs)

- **List**
- **List with substantial price reduction**
- **List with costs should not exceed comparator price**
- **List with clinical criteria only**
- **Do Not List**

**Note:**
- Price reductions not included in analysis, INB likely higher (towards 0 or positive) for List with price reduction
- Analyses based on manufacturer’s base case – typically more favourable cost effectiveness for submitted drug vs CDR reanalyses

<table>
<thead>
<tr>
<th>List</th>
<th>List with substantial price reduction</th>
<th>List with costs should not exceed comparator price</th>
<th>List with clinical criteria only</th>
<th>Do Not List</th>
</tr>
</thead>
<tbody>
<tr>
<td>N=1</td>
<td>N=18</td>
<td>N=8</td>
<td>N=24</td>
<td>N=31</td>
</tr>
</tbody>
</table>

$\text{Incremental Net Benefit (\$)}$
Results - Distribution of INBs (CUAs)
Results – Additional Analyses

- Subgroup analyses by submission characteristics
  - Rarity of condition
  - ATC classification
  - Market listing position

- Sensitivity analyses
  - Population size estimate
  - QALY gain for manufacturer drug
  - WTP threshold
Limitations

• Use of manufacturer submitted costs, benefits, population size estimates

• List with criteria at reduced price – price reductions not considered

• Selection of $50,000 per QALY as willingness to pay threshold in INB calculations

• Exclusion of select federal drug plans
Conclusion

• Operating budget for CDR over the 5 year study period ~$36.5M

• Total INB from 156 recommendations: $1.002 Billion

• Jurisdictions participating in the CDR program are receiving significant benefit through potential cost savings and improved health outcomes when implementing CDR recommendations
Authorship

Presentation authors:
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• Rami El-Sayegh
• William Amegatse
Questions? - A Decision Analysis

Outcome

Easy Question
Success

Difficult Question
Failure

BRACE YOURSELF
QUESTIONS ARE COMING

You know nothing, Jon Snow.