Criterion-Based Benchmarking (CBB) approach of the appropriate use of radiotherapy in NSW-ACT

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Planning for radiotherapy services

Australia (CCORE) & Canada (Ontario) developed evidence-based estimation of the optimal radiotherapy utilization.

Mackillop et al in Ontario established a Criterion-Based Benchmarking (CBB)

- Assumes perfect service delivery in parts of the health service to benchmark the whole service.
AIMS

• Compare actual and CBB RTU with the estimated optimal rates in NSW

• Compare CBB with other jurisdictions
Method:

1. Patients make no direct payment for RT,
2. All RT is provided by site-specialised radiation oncologists in multi-disciplinary centres,
3. Radiation oncologist receive a salary for their service,
4. More than 75% of patients live within 30 km, and
5. Patients waiting times ≤4 weeks.
METHODS

- Collect RT data – link to CCR
- Calculate road distance
- Exclude cross borders & non-NSW/ACT residents
- Merge adjacent LGA with <500 patients in each LGA to form larger geographical areas
Figure-1  Criterion-Based Benchmarking of the appropriate use of radiotherapy
Radiotherapy centres, Local Government Areas (LGAs), NSW and ACT (2004-06) - Australia

- Private RT centres
- Public RT centres
- Benchmark LGAs
- LGAs with >500 patients
- LGAs with <500 patients 'merged'
- Cross-border LGAs
Radiotherapy utilization in NSW & ACT (2004-2006) by Local Government Areas (LGA)
Vertical bars represent 95% CI (Excluding cross border LGAs)
## RESULTS

<table>
<thead>
<tr>
<th>Population</th>
<th>Actual RTU (within 1 year of diagnosis)</th>
<th>$P$</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBB</td>
<td>25,996</td>
<td>25%</td>
</tr>
<tr>
<td>Non-CBB</td>
<td>72,004</td>
<td>21%</td>
</tr>
<tr>
<td>All</td>
<td>98,000</td>
<td>22%</td>
</tr>
</tbody>
</table>
### Comparison of actual, CBB and optimal RTU
Australia (AU), Canada (AB, ON) & USA (SEER)

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Actual RTU within 1 year of diagnosis</th>
<th>RTU - CBB within 1 year of dx</th>
<th>Evidence-based optimal RTU</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>AU 04-06</td>
<td>AB 04-08</td>
<td>ON 09-11</td>
</tr>
<tr>
<td>Breast</td>
<td>51%</td>
<td>52%</td>
<td>64%</td>
</tr>
<tr>
<td>Lung</td>
<td>36%</td>
<td>37%</td>
<td>45%</td>
</tr>
<tr>
<td>Prostate</td>
<td>19%</td>
<td>27%</td>
<td>30%</td>
</tr>
<tr>
<td>Rectum</td>
<td>24%</td>
<td>39%</td>
<td>52%</td>
</tr>
<tr>
<td>Cervix</td>
<td>49%</td>
<td>49%</td>
<td>48%</td>
</tr>
</tbody>
</table>

CBB=Criterion-based benchmarking  RTU=Radiotherapy utilization  AB=Alberta  ON=Ontario
Limitation of the CBB approach

1) Lack of generalizability to other jurisdictions:
   - RT payment models differ
   - Lack of site-specialised radiation oncologists
   - Radiation oncologists salary arrangements
   - Dispersed populations
   - Population data on RTU not available

2) CBB depends upon practice not evidence, therefore can be influenced by non-evidence-based practices (over-servicing and/or under-servicing).
CONCLUSION

• NSW RTU 7-16% higher in benchmark LGAs than average LGA

• Still 30-65% below evidence-based RTU

• Differed significantly from Ontario
CONCLUSION

- CBB is only applicable in well-resourced services like Ontario.
- Does not seem reproducible in other jurisdictions.
- May not be recommended for benchmarking radiotherapy services.
- Recommend evidence-based approach to estimate optimal RTU.
LESSON


THANK YOU