Continuous Distribution: LSAM Simulation Study

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Disclosures

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Goals

- Introduce a simple continuous distribution system.
- Use the LSAM software to illustrate differences in continuous distribution scenarios.
  - Adjust parameters
  - Assess outcomes of parameter adjustment
  - Extend to other important metrics
Goals

• Introduce a simple continuous distribution system.
• Use the LSAM software to illustrate differences in continuous distribution scenarios.
  • Adjust parameters
  • Direct results of parameters adjustment
  • Extend to other important metrics
• *Example of how a continuous system could be conceived.*
• *Any changes will be implemented through the OPTN policy-making process.*
Continuous Distribution

- The distribution score is the sum of two components¹:
  - **Medical priority score:**
    - Can be based on both candidate and donor characteristics
    - In liver distribution: MELD
  - **Geographic feasibility score:**
    - Medical and financial costs of travel
      - Ischemic time
      - Flying vs. driving
Simulation Study Scenarios

- Evaluating a simple feasibility score function.
- Priority for transplant centers within a fixed distance (proximal zone).
  - Fly vs. drive cutoff
  - Influence determined by cliff size
- Decreasing boost with increasing distance thereafter.
## Simulation Study Scenarios

<table>
<thead>
<tr>
<th>Sharing</th>
<th>PZ</th>
<th>Cliff</th>
</tr>
</thead>
<tbody>
<tr>
<td>High</td>
<td>450</td>
<td>10</td>
</tr>
<tr>
<td>Middle</td>
<td>300</td>
<td>10</td>
</tr>
<tr>
<td>Low</td>
<td>150</td>
<td>15</td>
</tr>
</tbody>
</table>

Feasibility Score Function: Basic Shape

![Graph showing feasibility score function](image_url)
Results: Travel Distance Distribution

- Comparisons must be made across scenarios.
- A baseline helps establish the range of possible outcomes.
  - Orange violin
- Sharing decreases from left to right.
Results: Travel Distance Distribution

- Uniform distance distribution with MELD only.
- The proximal zone decrease is clear with decreased sharing.
Results: MELD Distribution

- Prioritizing less travel leads to wider distribution of MELD score at transplant.
Conclusions

- The LSAM is capable of modelling a wide range of continuous distribution systems.
  - For any system, a range of parameters should be considered
  - Care must be taken to ensure that the parameters’ effects can be disentangled
- Baselines are important to establish range.
- It is possible to model and calculate many other interesting metrics with the LSAM results.
References