Patient-level prediction #3: Amongst patients hospitalized with pneumonia, who are most likely to require intensive services or die?

Aniek Markus
Erasmus MC
Background

• Lack of evidence of factors associated with disease severity

• Enables close monitoring of high risk patients

• Indicator for short-term demand of intensive services
Methods

• T [IV]: Hospitalization with pneumonia
• T [EV]: Hospitalization with COVID-19

• O1: Patients requiring intensive services* or death
• O2: Death

* Includes ventilation, intubation, tracheotomy, or ECMO.
## Preliminary results

<table>
<thead>
<tr>
<th>Analysis</th>
<th>Dev</th>
<th>Val</th>
<th>T</th>
<th>O</th>
<th>Model</th>
<th>TAR start</th>
<th>TAR end</th>
<th>AUC</th>
<th>AUPRC</th>
<th>T Size</th>
<th>O Count</th>
<th>Incidence (%)</th>
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</thead>
<tbody>
<tr>
<td>Analysis_1</td>
<td>optum</td>
<td>optum</td>
<td>30</td>
<td>[COVID19 (923 VL)] Hospitalizations with pneumonia, age&gt;=18</td>
<td>[COVID19 (923 VL)] Hospitalizations with pneumonia or ARDS or sepsis or AKI requiring intensive services or resulting in death in 30d</td>
<td>Lasso Logistic Regression</td>
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<td>0.642</td>
<td>0.322</td>
<td>37459</td>
<td>8002</td>
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<td>[COVID19 (923 vl)] persons who die</td>
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Discussion and next steps

• Developing more parsimonious models
  – easier to use and understand in practice

• External validation in COVID-19 data

• In the future: also train models in COVID-19 data