The OHDSI Patient-Level Prediction Journey

2015
- PLP identified as OHDSI priority analytic use case

2016
- PLP workgroup started
- PLPv1 released
- PLP Framework and best practices developed

2017
- PLP Tutorials offered
- PLPv2 released

2018
- PLP toolkit expanded (deep learning, ensemble methods, network external validation)
- PLPv3 released
Design and implementation of a standardized framework to generate and evaluate patient-level prediction models using observational healthcare data

Jenna M Reps, Martijn J Schuemie, Marc A Suchard, Patrick B Ryan, Peter R Rijnbeek


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Abstract

The OHDSI community have published a framework for developing large-scale patient-level prediction models and the software to apply the framework
Join the OHDSI Patient-Level Prediction Journey

Prediction Checklist

Standardized Framework - we have a framework for developing and evaluating patient-level prediction models

State-of-the-art software

We need you to help us apply the tools to important areas and solve clinically useful prediction problems...

Data - we have a community that collectively represents an international data network of more than 1 billion patient records

Questions - We need clinically useful research areas to apply our framework
## Components within the Patient-Level Prediction Framework

<table>
<thead>
<tr>
<th>Prediction Components</th>
<th>Description</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>T (Target Population)</td>
<td>Who do you want to do the prediction for?</td>
<td>Patients with atrial fibrillation</td>
</tr>
<tr>
<td>O (Outcome)</td>
<td>What do you want to predict?</td>
<td>Ischemic stroke</td>
</tr>
<tr>
<td>TAR (Time-at-risk)</td>
<td>When do you want to predict whether the outcome occurs?</td>
<td>1 day until 1 years after initial atrial fibrillation diagnosis</td>
</tr>
<tr>
<td>Clinical Application</td>
<td>Why is this clinically relevant or important to public health?</td>
<td>Can identify patients who would most benefit from anticoagulant therapy</td>
</tr>
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We need your help

Can you tell us what predictions to focus on?

https://goo.gl/WGeHeG
# Types of Patient-Level Prediction Questions to Consider

https://goo.gl/WGeHeG

<table>
<thead>
<tr>
<th>Type</th>
<th>Structure</th>
<th>Example</th>
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</thead>
<tbody>
<tr>
<td>Disease onset and progression</td>
<td>Amongst patients who are newly diagnosed with <strong>&lt;insert your favorite disease&gt;</strong>, which patients will go on to have <strong>&lt;another disease or related complication&gt;</strong> within <strong>&lt;time horizon from diagnosis&gt;</strong>?</td>
<td>Among newly diagnosed AFib patients, which will go onto to have ischemic stroke in next 3 years?</td>
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<tr>
<td>Treatment choice</td>
<td>Amongst patients with <strong>&lt;indicated disease&gt; who are treated with either &lt;treatment 1&gt; or &lt;treatment 2&gt;</strong>, which patients were treated with <strong>&lt;treatment 1&gt; (on day 0)</strong>?</td>
<td>Among AFib patients who took either warfarin or rivaroxaban, which patients got warfarin? (as defined for propensity score model)</td>
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<tr>
<td>Treatment response</td>
<td>Amongst patients who are new users of <strong>&lt;insert your favorite chronically-used drug&gt;</strong>, which patients will <strong>&lt;insert desired effect&gt;</strong> in <strong>&lt;time window&gt;</strong>?</td>
<td>Which patients with T2DM who start on metformin stay on metformin after 3 years?</td>
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<tr>
<td>Treatment safety</td>
<td>Amongst patients who are new users of <strong>&lt;insert your favorite drug&gt;</strong>, which patients will experience <strong>&lt;insert your favorite known adverse event from the drug profile&gt;</strong> within <strong>&lt;time horizon following exposure start&gt;</strong>?</td>
<td>Among new users of warfarin, which patients will have GI bleed in 1 year?</td>
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<tr>
<td>Treatment adherence</td>
<td>Amongst patients who are new users of <strong>&lt;insert your favorite chronically-used drug&gt;</strong>, which patients will achieve <strong>&lt;adherence metric threshold&gt;</strong> at <strong>&lt;time horizon&gt;</strong>?</td>
<td>Which patients with T2DM who start on metformin achieve &gt;=80% proportion of days covered at 1 year?</td>
</tr>
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</table>
Let’s see your questions

https://docs.google.com/forms/d/1l_qgBYy4PLfEpx8KcpLq4onzZhamIwM0bR98VWLRBXQ/edit