Using Big Data and Technology to Inform Practice

University of Maryland Institute Presentation July, 2018
PREDICTIVE ANALYTICS
To support practice & policy in NJ
A Longitudinal View

5 Years of data

Over 22,000 youth included initially

4 groups populations randomly split into four groups
## Development of the Predictive Equations

### Sample Randomly Divided

<table>
<thead>
<tr>
<th></th>
<th>2011 - 2014</th>
<th>2015-2016</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>80% Development Sample</strong></td>
<td>Predictive Variables Clinical Characteristics</td>
<td>Outcome Variables</td>
</tr>
<tr>
<td></td>
<td>• Socio-demographics</td>
<td>• BH-Out of Home Admission</td>
</tr>
<tr>
<td></td>
<td>• Service Utilization</td>
<td>• Readmission</td>
</tr>
<tr>
<td><strong>Predictive Variables</strong></td>
<td></td>
<td>• Length of Stay</td>
</tr>
<tr>
<td><strong>Outcome Variables</strong></td>
<td></td>
<td><strong>Predict</strong></td>
</tr>
<tr>
<td><strong>20% Validation Sample</strong></td>
<td>Apply Algorithm from 80% Predictive Model</td>
<td></td>
</tr>
<tr>
<td><strong>Predict</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>80% Development Sample</strong></td>
<td>N = 12,265</td>
<td>N = 3,067</td>
</tr>
<tr>
<td><strong>20% Validation Sample</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Proprietary algorithm used to maximize generalizability of the resulting model*
Results

Predicting BH OOH Placement
- Incorrectly classified: 22%
- Accuracy: 78%

Predicting Re-admissions
- Incorrectly classified: 13%
- Accuracy: 87%

Predicting BH OOH Length of Stay
- 12% reduction in error compared to median

Model Performance:
1. F-test: p < .001
2. 34% reduction over NULL deviance (an intercept only model)
3. Hosmer-Lemeshow Goodness of Fit: p > .05
Most Powerful Predictors of BH-OOH Placement in the **Multivariate** Model

These characteristics increased the odds of OOH placement

- Having an ADHD diagnosis
- Victim of child abuse
- Legal problems
- Having a diagnosis of oppositional defiant disorder
- High score on youth risk behaviors
Some of the Strongest **Bivariate** Predictors of BH OOH Placement

![Bar Chart]

- **Bipolar**
- **PTSD**
- **ODD**
- **Conduct Disorder**
- **Depakote 250/500**
- **Abilify**

- **BH OOH**
- **Not BH OOH**

#LEADINGCHANGE
TECHNOLOGY TO SUPPORT THE EVOLUTION OF PRACTICE IN NJ CSOC
Population Health Risk Stratification

- High Complexity
- Rising Risk
- At-Risk
- Healthy

PHYSICAL  BEHAVIORAL  SOCIAL
Programmatic Uses of the Predictive Model

• Identify youth at highest risk of BH OOH placement
  – Provide greater clinical attention
  – Marshall additional resources to support the family/support system

• At the time of BH OOH placement
  – Identify youth at higher risk of an extended placement
  – Identify youth at higher risk of re-placement

• Use in a learning community to better design system and clinical response

• Enhance understanding with outcome analyses

• More accurately identify preventable BH OOH placements
Insight to action using BH OOH Risk Score and client threshold
Insight to action using BH OOH Risk Score and client threshold
ABOUT ODH INC.

ODH, Inc. is a health technology company providing data aggregation and analytics solutions that enables data integration and the delivery of coordinated care.

Our technology advances interoperability among legacy systems.

Our Mentrics® technology platform helps identify and manage members with complex illnesses, particularly those with co-morbid behavioral and physical health conditions, enabling improved outcomes and reduced costs.
Candace Saldarini, MD
Candace Saldarini, M.D.
Director of Medical Affairs, ODH, Inc.

www.odhsolutions.com
Thank you!

The Evolution of New Jersey Children’s System Of Care