Congratulations to IDIES - Welcome to Health Arena
from the
Johns Hopkins *individualized* Health Initiative

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October, 2013

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Population Patterns $\leftrightarrow$ Individual States

- 40 year old man with no family history of cancer tests “positive” in a screening test
- What is his cancer state?

Data from population of “similar” people

<table>
<thead>
<tr>
<th>Actual cancer status</th>
<th>Test result</th>
<th>Yes</th>
<th>No</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>Yes</td>
<td>15</td>
<td>985</td>
<td>1,000</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Negative</td>
<td>Yes</td>
<td>5</td>
<td>8,995</td>
<td>9000</td>
</tr>
<tr>
<td></td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>20</td>
<td>9,980</td>
<td>10,000</td>
</tr>
</tbody>
</table>
Extending the Population – Individual Connection to Emerging Health Data Types (Boole-a-Bayes)
Virtuous Learning Cycle
“Learning Health System (IOM)”

Updated knowledge

Discovery

Population

Professional Practice

Evidence relevant to existing hypotheses; Novel questions
JOHNS HOPKINS INDIVIDUALIZED HEALTH INITIATIVE – HOPKINS inHEALTH

Cores

Data Science

Learning Cycles Methodology

Basic Science Discovery

Organizational Models for Affordable Health

Technology Development and Dissemination

Pilot Projects

- cancer screening
- management of autoimmune diseases
- cardiology interventions
- cystic fibrosis
- telomere biology
- myostatin and age-related sarcopenia

JH Learning Health Community

Scale and replicate

Improve Health at More Affordable Costs

Scale and replicate

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1. What is the person’s health state given health measurements to date?

2. What is the person’s health “trajectory”?

3. Does a particular intervention improve health – on average; for a person with specific set of characteristics?

4. Is the intervention being used optimally? How much difference does it make to the population’s health?
Health State Trajectory – Affected by Exogenous (X) and Endogenous (Rx) Covariates Person-specific Regression Coefficients ($\beta_i$) and Expressed in Partially Observed Outcomes ($Y_t$) with Parameters $\varphi_i$.

Causal factors: e.g. environment, patient characteristics, treatments

Measurements of Health Status

Dynamic Health Status

April, 2013

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Health State Trajectory – Affected by Exogenous (X) and Endogenous (Rx) Covariates Person-specific Regression Coefficients ($\beta_i$) and Expressed in Partially Observed Outcomes ($Y_t$) with Parameters $\varphi_i$
Johns Hopkins – University of Maryland, College Park
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Full Block Layout

• Each Full Block has 1.5MW IT Capacity
• Ultimate Site Build Out has 5 Full Blocks

Legend:
DS1200G: Data Modules
P2400G: Power Module
A060: Air Handlers
C0500A: Chiller
Data Module Layout

Each DS1200G Module Fits 48 24” Wide Cabinets
Day 1 Deployment Includes 2 DS1200 G Modules

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Rendering: Ultimate Build Out