Grid-Enabled Measures (GEM): Using Web 2.0 Capabilities to Share Measures and Harmonize Data
Towards Standardization and Reuse in Behavioral Informatics

Richard P. Moser, Ph.D.
Research Psychologist
Behavioral Research Program

April 27, 2011

GEM Team
• NCI
  • Rick Moser
  • Brad Hesse
  • Abdul Shaikh
  • Paul Courtney
  • Erik Augustson
  • Gordon Willis
  • Glen Morgan
  • Sarah Kobrin

• Westat
  • Cindy Helba
  • Kerry Levin
  • Marsha Dunn
  • David Garner
  • Katy Caperna

• SAIC
  • Mary Cooper

• University of Pittsburgh
  • Ellen Beckjord
Science in a New Collaborative Environment

Amazon.com Customer Review Average:

Customer Reviews

Monster Hunter Tri

49 Reviews

Average Customer Review

1 star: (32)
2 star: (12)
3 star: (4)
4 star: (18)
5 star: (0)

Share your thoughts with other customers
Create your own review

Federal Data Dissemination: Open and Transparent
Recommendation 2

The committee recommends that the Department of Health and Human Services support and implement the following to integrate, align, and standardize health data and health-outcome measurement at all geographic levels:

1. A core, standardized set of indicators that can be used to assess the health of communities.
2. A core, standardized set of health-outcome indicators for national, state, and local use.

(IOM, December, 2010)

http://www.nap.edu/catalog/13005.html

Grid Enabled Measures (GEM): Science 2.0

Overall Goals:

To facilitate a virtual community of scientists using collaborative web technology to:

- vet and promote the use of shared measures—based on theoretically-meaningful constructs;
- share the resulting harmonized data.

https://www.gem-beta.org/
### Comparison to Other Measurement Systems

**NIH Toolbox**

*Assessment of Neurological and Behavioral Function*

**PhenX**

*Patient-Reported Outcomes Measurement Information System*

*Dynamic Tools to Measure Health Outcomes From the Patient Perspective*

### Data Sharing: Use Case Scenario

<table>
<thead>
<tr>
<th>ID</th>
<th>VarX</th>
<th>VarY</th>
</tr>
</thead>
<tbody>
<tr>
<td>101</td>
<td>2.3</td>
<td>1</td>
</tr>
<tr>
<td>102</td>
<td>1.2</td>
<td>1</td>
</tr>
<tr>
<td>103</td>
<td>4.9</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ID</th>
<th>VarX</th>
<th>VarY</th>
</tr>
</thead>
<tbody>
<tr>
<td>201</td>
<td>3.5</td>
<td>0</td>
</tr>
<tr>
<td>202</td>
<td>2.7</td>
<td>0</td>
</tr>
<tr>
<td>203</td>
<td>1.8</td>
<td>0</td>
</tr>
</tbody>
</table>

---

*Note: The table on the right is a visual representation of the data shared in the use case scenario.*

---

*Image: A person sitting at a desk with a computer and papers, possibly illustrating a data-sharing scenario.*
GEM: Measure Detail

Meta-Data
- Description
- Target population
- Author
- Number of items
- Reliability
- Validity

GEM: Datasets Tab

Other Attributes:
- Collection mode
- Population
- Data dictionary
- Associated measures
How Can You Be Involved?

- Identify, provide meta-data for constructs and measures
  - Templates available
- Comment on, rate existing measures
- Got data?
- I want your input!
  - Email me: moserr@mail.nih.gov

https://www.gem-beta.org/
GEM in Action

Working with Professional Organizations:
- Propose and vet measures for curation
- Consensus on recommended measures for use in electronic health records (EHRs)
  - Consensus meeting May 2-3, 2011 in Bethesda

American Journal of Preventive Medicine (AJPM) Special Issue
- Special supplement on cyberinfrastructure
- Now published

SBM Campaign: New Constructs or Measures

- **New constructs = 30**
  - Decisional balance
  - Religious coping

- **New measures = 48**
  - Patient Health Questionnaire
  - Multidimensional Health Locus of Control

- **Measures ‘Ready for Rating’ = 51**
  - CES-D
  - Binge Eating Scale
Informatics for Consumer Health

Funding Opportunities

- **SBIR Topic 278: Data harmonization and advanced computation of population health data**
- **Grant: Using Systems Science Methodologies to Protect and Improve Population Health (PAR-08-224; R21)**
- **Grant: Methodology and Measurement in the Behavioral and Social Sciences (R01)**

Thanks to Abdul Shaikh, Ph.D.
For More Information.....


http://www.gem-beta.org/