HealthCORR

Paul Rosenfeld, Ginnah Lee, Awalin Sopan, Angela Noh, Sohit Karol

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Acknowledgements

- Todd Park, our sponsor who is willing to clear time in his busy schedule for some grad students
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- Karen Milgate, for compiling the comprehensive Medicare data set
- Ben Shneiderman, for his continued guidance and support
- Reviewers who gave us smart feedback

And also a lot of anonymous open source-loving nerds who have contributed their time and energy into building tools so we don't have to!
Motivation

- Health care is among the **most important** issues facing the United States in the near future
  - It is not always clear to those in charge what the problem is or even that a problem exists
  - Example: McAllen, TX has the worst health care record in the country (highest costs, lowest quality) and the mayor of McAllen did not know until he read about it in *The New Yorker*

"Knowledge will forever govern ignorance, and a people who mean to be their own Governors must arm themselves with the power knowledge gives." -- James Madison, 1822
Data

**Community Health Status Indicators**
Various indicators about risk factors and general health quality

**Center for Medicare & Medicaid Services**
Detailed Medicare spending/quality data

- County level data
- HRR level data
- Quality
- Access
- Public Health
- Cost
Goals

- **Target audience**: "people in charge" -- hospital administrators, mayors, local government representatives, etc.
- People with some knowledge, but not "experts"

"Someone without a PhD in health economics should be able to use this tool" - Todd Park
Goals

- Those using the tool should be able to consider how an area of interest is doing **along the four main axes**

**Comparison**

Easy to compare a region (county or HRR) to state average, national average

**Filtering**

Filter out "excuse factors" (such as average age, median income, poverty levels, etc.) that aren't necessarily health indicators.
## Why a Web App?

<table>
<thead>
<tr>
<th>Ease of access</th>
<th>Ease of updates</th>
<th>Ease of Open Source tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interoperable with any operating system, processor, network you are on. Nothing to download, nothing to configure, no compile errors.</td>
<td>Tool (and data) can evolve over time without having to push new versions.</td>
<td>We are leveraging some industrial grade open source technologies (more on this in a second).</td>
</tr>
</tbody>
</table>
System Architecture

Client

- Browser
  - Google Closure (UI widgets)
  - Javascript (glue code)
  - Open Layers (map/interactions)

Server

- Apache http server
  - php
  - pChart (graphs)
  - PostGIS (spatial database)
  - Apache Tomcat
    - GeoServer (map rendering)

Connections:
- AJAX
- HTTP
- WMS
Main Features

- Initially start searching an area of interest by zip code

<table>
<thead>
<tr>
<th>Map view</th>
<th>For both map and table</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ Draw the map</td>
<td>✓ Can apply dynamic filter with defining the ranges by double sided sliders</td>
</tr>
<tr>
<td>✓ Zoom in &amp; out to see the overview and detail</td>
<td></td>
</tr>
<tr>
<td>✓ Allow to choose health indicators to want to see</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Table view</th>
<th>Graph view</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓ See different types of data by tabs</td>
<td>✓ Compare all selected variables with national averages of each</td>
</tr>
<tr>
<td>✓ Sort by columns to find correlated variables and areas</td>
<td></td>
</tr>
</tbody>
</table>
Feedback and conclusion

- Todd Park commented as
  - “This is incredibly cool, I think it’s spare, elegant, and Intuitive”
  - “The White House and HHS see this as a powerful seed for changing health care in the United States.”

- We think that this tool has great potential to help people understand patterns that result in low cost, high quality healthcare
Future works

- To support better map/table interactions
  - Hovering over a county will light it up in the table
  - Using the map to add counties to the table
- For better understanding in graphs
  - Add more types of graphs
  - Discover similar areas as benchmark
- For better filtering
  - Add more excuse factors for filter
  - Spatial filtering: show area within same state or within specified radius.