California Healthcare Atlas –
Integrating Geography and the Data Warehouse

California Office of Statewide Health Planning & Development

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Outline Overview

- What is OSHPD?
  - Mission and Data
- Typical Data Delivery
- Atlas’ Evolution: Steps in the Right Direction
  - Yesterday’s Healthcare Atlas (v1)
  - Today’s Healthcare Atlas (v2)
  - Future Healthcare Atlas
- Lessons Learned
About OSHPD

- CA State Dept w/in Health & Human Services Agency
- Facilities Development & **Permitting**
  - Code enforcement
  - Earthquake retrofitting
- **Workforce** Planning
- Data **Collection**
  - Patient data
  - Facility
  - Financials
  - Utilization
- Mortgage **Insurance**

“Equitable Healthcare Accessibility for California”
About our Data Warehouse

- **Inpatient**
  - 12 years
  - 48M encounters
  - 400+ attributes

- **Emergency Dept.**
  - 3 years
  - 26M encounters
  - 500+ attributes

- **Ambulatory Surgery**
  - 3 years
  - 11M encounters
  - 500+ attributes

- **Facility**
  - 6400 facilities

- **Financial** *
  - 5 years in data mart (in progress),
  - 33 yrs in mainframe
    - 1741 data elements
  - 17 yrs in hospital pivot tables
    - 254 attributes

- **Utilization** *
  - 5 years in data mart (in progress),
  - 4200-4600 reports annually
  - 131 to 615 data elements each report

* Coming soon
Voice from the Past

“…wherever the people are well informed they can be trusted with their own government…”[1]

- Thomas Jefferson, 1789

Transparency → Better Health Policy

How?
Transparent, Yes – Useful?
Example, Hospital Data

- Pivot tables
- PDF
- Silos typically by year & data type.
- Jargon

Typical Data Delivery

- **Types** of Data Delivery
  - PDF
  - Website silo
  - Excel Spreadsheet/Pivot Table

- **Problems** with Traditional Methods
  - Static
  - Difficult to **use**
  - Difficult to **compare**
  - Difficult to **browse**
  - No inherent spatial **visualization** or **analysis**
Example, Excel Pivot Table

<table>
<thead>
<tr>
<th>A</th>
<th>AH</th>
<th>AI</th>
<th>AJ</th>
</tr>
</thead>
<tbody>
<tr>
<td>OSHPD_10</td>
<td>License Category</td>
<td>Clin_FQHC_or_Like</td>
<td>Clin_95210_Rural</td>
</tr>
<tr>
<td>slice010201</td>
<td>slice010301</td>
<td>slice020201</td>
<td>slice020301</td>
</tr>
<tr>
<td>FINAL 2006 Final DATA</td>
<td>FINAL DATA</td>
<td>FINAL DATA</td>
<td>FINAL DATA</td>
</tr>
</tbody>
</table>

**Profile Characteristics (Individual Hospital Information)**

- **OSHPD Facility No.**: 106010735
- **Hospital Name**: ALAMEDA HOSPITAL
- **County**: Alameda
- **Address**: 2070 CLINTON
- **City**: ALAMEDA
- **ZIP Code**: 94501
- **Type of Control**: District
- **Teaching/Rural**: N/A
- **Licensed Bed Size**: 100-149
- **Senate District**: SD 3
- **Assembly District**: AD 16

**TYPE OF CARE**

<table>
<thead>
<tr>
<th>#</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total:</td>
<td>100%</td>
</tr>
<tr>
<td>Acute</td>
<td>3,324</td>
</tr>
<tr>
<td>Skilled Nursing/Intermediate Care</td>
<td>13</td>
</tr>
<tr>
<td>Psychiatric</td>
<td>0</td>
</tr>
</tbody>
</table>

**STEPS:** 
Caution! Failure to follow these steps as outlined may cause erroneous data to display.

- Require more effort
- Limited functionality
- Opportunity for misuse/error
- Cannot reference specific data element
Example, Adobe PDF

- Static
- Difficult to compare dimensions (time, facility, geography, attributes)
- Lack of other context
Atlas: Evolving Data Delivery

Delivering healthcare data in increasingly more meaningful ways.
Atlas v1.0 – Good 1st Step

- Emphasized the map
- Initial use of ArcIMS
- Warehouse
  - E.T.L. only
  - On learning curve
  - Immature
Live Demonstration – v2.x

- Locate
  - Locate ‘things’ on the map

  Focus ➔

- Select
  - Discover info and compare hospitals

Focus ➔

- Create
  - Create specific types of thematic maps

- Other tabs
  - Results, Map, Help
Today’s Atlas v2.x – Better 2nd Step

- Tabs & Workflows
  - Increased usability
- Better performance
- More functionality
  - More maps
  - Hospital comparisons
- Integrates more data sources
  - Inpatient, emergency dept., ambulatory surgical center, financial, utilization, charity care, workforce, vital statistics
- Some stakeholder outreach pre-production
- In maintenance phase now
  - Stabilize the product
  - Room to plan next generation application

http://www.oshpd.ca.gov/atlas
System Architecture – Atlas v2.x

Source Data

Data Warehouse

ArcSDE

Layers

Locators

Atlas Web Server

ArcIMS

.NET

Web Server

Other Website

Other Website

Other Website

User

Internet

PDF

ETL

ETL

ETL
Atlas: Next Generation

- Sustainable architecture
- Data use cases
  - Refocus on the user
- More data integration
  - Warehouse growing & maturing
  - 3 data marts (now)
  - 2 more marts (coming soon)
- More effective, easier, & faster investigations
- Quick, easy answers (as appropriate)
- Web 2.0 – enabling the community
- “Story telling” – data don’t talk, people do
Lessons (being) Learned

- Data warehouse is catalyst
- Best comments come after product released
- Observe many users
- Be flexible & adaptive
  - Build it into your plan & architecture
- Grow paths are not linear (embrace that)
- “Data Use Cases”
  - Mission + User + Data = ACTION
- Web 2.0 is a giant megaphone
- Geography cuts across all boundaries
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Questions ??

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