South Carolina’s Integrated Database: Changing Hearts and Minds with Data:

Presentation to the State Administrators Meeting – July 2007

SC Department of Social Services
and the
SC Budget and Control Board’s Office of Research and Statistics
Child Care Services

- ABC Voucher program (CCDF)
- Child Care Licensing
- Head Start Collaboration Office
- Social Services Block Grant
Systemic Issues
In Child Care Licensing

• No Policy Manual
• 7 Approach Databases
• Manual Data Collection
Systemic Issues
In ABC Voucher Program

- Reliable But Inflexible Payment System
- Labor-Intensive Fiscal Process
- Paper Checks
- Manual Data Collection for Quality Monitoring Activities
The Vision

- Design a Web-Based Child Care Data System
- Utilize Current Technology
- Use Licensing System as the Base
- Improve Efficiency
- Pre-screen for Vouchers, USDA
The Vision (cont’d)

- Incorporate Environmental Rating Scales
- Collect Market Rate Data
- Automate Payments (EBT)
- Redesign Website
- Collect Data on Children to Measure Outcomes
Office of Research & Statistics: Who are We?

• SC Budget and Control Board is a Service Agency in South Carolina

• Neutral, no programmatic responsibilities

• Statistical and Research-focused
The Integrated System

- Built using existing systems (legacy systems from state agencies and private sector)
- Create a Unique Tracking Number (not related to any other number)
- Identifiers are separated from the statistical data. Use only the statistical data
- Data always “owned” by the originating agency. Must have permissions to use and/or link any data
- Employ HIPPA Best practices and have extensive security measures.
Linking Data Sets

- Records are linked for the same individual using a unique tracking number.
- Tracking number is random so cannot be unencrypted to identify the individual.
- An individual is assigned the same number over time.
Putting Data Into the Hands of the Users

• Evaluation of interventions and programs by:
  – Assessing outcomes
  – Understanding interaction with other programs and providers
  – Analyzing aggregate data
  – Accessing analytic data cubes
  – Managing client care
  – Creating a research capacity
Analytic Data Cubes

Asked and Answered in the Click of a Mouse
What Is an Analytic Cube?

- A way to “slice and dice” through large amounts of data
- Define “slicers,” characteristics that are important to analyzing the subject population
- Pre-aggregate the linked data by all possible combinations of “slicers”
- Web Based
What is a cube? An example with the Seniors’ Cube

- Food Stamp Client
- Age
- Emergency Dept Visits
- Medicaid Eligibility
- Diagnosis Grouping
- Urban - Rural Residence
- Received Meals on Wheels Service
- Unintentional Injuries
- Medicaid Eligibility
- Emergency Dept Visits
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- Age
You can create a subgroup for your research focus.

![Table](image-url)
You can expand a row to see subcategories

<table>
<thead>
<tr>
<th>Subcategory</th>
<th>65-69</th>
<th>70-74</th>
<th>75-79</th>
<th>80-84</th>
<th>85+</th>
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</thead>
<tbody>
<tr>
<td>III. ENDOCRINE, NUTRIT. &amp; META.</td>
<td>188</td>
<td>226</td>
<td>292</td>
<td>343</td>
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<td>DIS OF THYROID GLAND</td>
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<td>DIABETES MELLITUS W/O COMP.</td>
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<td>28</td>
<td>33</td>
<td>31</td>
<td>31</td>
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<td>78</td>
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<td>NUTRIT. DEFIC. &amp; META. DIS</td>
<td>84</td>
<td>110</td>
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<td>211</td>
<td>307</td>
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Other supplementary class data:

<table>
<thead>
<tr>
<th>Subcategory</th>
<th>65-69</th>
<th>70-74</th>
<th>75-79</th>
<th>80-84</th>
<th>85+</th>
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<tbody>
<tr>
<td>XIX. SUPPLEMENTARY CLASS</td>
<td>304</td>
<td>320</td>
<td>357</td>
<td>347</td>
<td>308</td>
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<td>XX. ACCIDENT &amp; VIOLENT (EXT. CAUSE)</td>
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<td>1</td>
<td>1</td>
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<td>1</td>
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<tr>
<td>NO CODE FOUND</td>
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<tr>
<td>CODE OUT OF RANGE</td>
<td>73</td>
<td>83</td>
<td>117</td>
<td>149</td>
<td>194</td>
</tr>
</tbody>
</table>
You can view a chart of your selection.
We can see which diagnoses are the most prevalent among a particular treatment setting, such as Emergency Room.

<table>
<thead>
<tr>
<th>All Diagnosis Grouping</th>
<th>All Age</th>
<th>45-49</th>
<th>50-54</th>
<th>55-59</th>
<th>60-64</th>
<th>65-69</th>
<th>70-74</th>
<th>75-79</th>
<th>80-84</th>
<th>85+</th>
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<tbody>
<tr>
<td>I.INFECTIVE &amp; PARASITIC DIS</td>
<td>1,624</td>
<td>1,057</td>
<td>1,674</td>
<td>1,582</td>
<td>1,562</td>
<td>1,684</td>
<td>1,783</td>
<td>2,051</td>
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<td>2,638</td>
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<td>II.NEOPLASMS</td>
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<td>7</td>
<td>5</td>
<td>4</td>
<td>4</td>
<td>5</td>
<td>5</td>
<td>3</td>
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<td>III.ENDOCRINE,NUTRIT.&amp; META.</td>
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<td>62</td>
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<td>77</td>
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<td>116</td>
<td>123</td>
<td>136</td>
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<td>IV.BLOOD &amp; BL-FORMING ORGANS</td>
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<td>3</td>
<td>5</td>
<td>4</td>
<td>6</td>
<td>6</td>
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<td>V.MENTAL DISORDERS</td>
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<td>54</td>
<td>80</td>
<td>58</td>
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<td>44</td>
<td>44</td>
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<td>59</td>
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<td>VI.NERVOUS SYS.&amp; SENSE ORGANS</td>
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<td>55</td>
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<td>58</td>
<td>51</td>
<td>54</td>
<td>56</td>
<td>49</td>
</tr>
<tr>
<td>VII.DIS OF CIRCULATORY SYS</td>
<td>131</td>
<td>50</td>
<td>97</td>
<td>107</td>
<td>126</td>
<td>153</td>
<td>175</td>
<td>232</td>
<td>280</td>
<td>315</td>
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<tr>
<td>VIII.DIS OF THE RESPSYS.</td>
<td>193</td>
<td>139</td>
<td>212</td>
<td>197</td>
<td>196</td>
<td>209</td>
<td>205</td>
<td>211</td>
<td>219</td>
<td>234</td>
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<tr>
<td>IX.DIS OF THE DIGESTIVE SYS</td>
<td>121</td>
<td>84</td>
<td>126</td>
<td>114</td>
<td>114</td>
<td>119</td>
<td>137</td>
<td>149</td>
<td>175</td>
<td>192</td>
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<td>103</td>
<td>98</td>
<td>97</td>
<td>106</td>
<td>114</td>
<td>135</td>
<td>167</td>
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<tr>
<td>XII.DIS OF SKIN/SUBCUT.TISSUE</td>
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<td>47</td>
<td>67</td>
<td>61</td>
<td>56</td>
<td>57</td>
<td>53</td>
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<td>52</td>
<td>64</td>
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<tr>
<td>XIII.MUSCULOSKELETAL/CONN.TI.</td>
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<td>156</td>
<td>245</td>
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<tr>
<td>XVI.SYMPTOMS/ILL-DEFINED COND.</td>
<td>504</td>
<td>312</td>
<td>501</td>
<td>473</td>
<td>483</td>
<td>532</td>
<td>586</td>
<td>672</td>
<td>770</td>
<td>845</td>
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<tr>
<td>XVII.ACCIDENTS/POISON/VIOLENCE</td>
<td>523</td>
<td>373</td>
<td>570</td>
<td>520</td>
<td>477</td>
<td>500</td>
<td>520</td>
<td>621</td>
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<td>XVIII.SUPPLEMENTARY CLASS.</td>
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<tr>
<td>XX.ACC.POIS &amp; VIOL(EXT.CAUSE)</td>
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<td>24</td>
<td>34</td>
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</tbody>
</table>

 Patients per 10K Pop by Age over Diagnosis Grouping for 2003, Emergency Room.
And then see Diagnoses for Emergency Room Charted
We can dig a little deeper and see what subcategories make up “symptoms/ill-defined conditions” or “accidents”

<table>
<thead>
<tr>
<th>Category</th>
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<th>50-54</th>
<th>55-59</th>
<th>60-64</th>
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<td>13</td>
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<td>15</td>
<td>17</td>
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<tr>
<td>CHEST PAIN</td>
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<td>97</td>
<td>159</td>
<td>143</td>
<td>136</td>
<td>136</td>
<td>140</td>
<td>147</td>
<td>151</td>
<td>165</td>
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<tr>
<td>ABDOMINAL PAIN</td>
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<td>86</td>
<td>92</td>
<td>89</td>
<td>100</td>
<td>103</td>
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<td>380</td>
<td>461</td>
<td>551</td>
<td>615</td>
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<td>30</td>
<td>33</td>
<td>33</td>
<td>27</td>
</tr>
</tbody>
</table>
Instead of patient counts, we can look at the hospital ER charges for 2003.
Over $34 million was billed for all accidents treated in the ED.
Replacing diagnoses with primary payor expected, we can see the distribution of charges.
Analytic Cubes have been created for:

- Injuries
- Behavioral Health
- Medicaid
- Seniors – awarded recognition from the national Administration on Aging
- Dental Services
- Mother - Baby
For More Information

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Software

- Fact tables created in SAS
- Loaded into Microsoft SQL Server
- Cube Created Using “Analysis Services” (a tool in SQL Server)
- Retrieval from Cube and Web Interface Using “Panorama” (Nova View)
- Secure Web Access Using User and Work Station Certificates
Example of Existing Cube: Linked Mother/Baby

- Linked data sets for
  - Hospital delivery record of mother
  - Hospital birth record of infant
  - All pre-natal hospitalizations and ED visits of the mother
Example of Existing Cube
(continued)

– All Medicaid claims for the mother during the pre-natal period
– Vital Record birth/infant death certificate
– Sub-population indicators for Food Stamp and TANF participants
### Percentage of Births by Race over Birth Outcome

<table>
<thead>
<tr>
<th></th>
<th>All Race</th>
<th>White</th>
<th>African American</th>
<th>Hispanic</th>
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<td>[8,310]</td>
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<td>[65,873]</td>
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<td>[35,491]</td>
<td>[6,106]</td>
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<td></td>
<td>[7,145]</td>
<td>[1,117]</td>
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<tr>
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<td>[23,159]</td>
<td>[10,190]</td>
<td></td>
<td>[10,152]</td>
<td>[847]</td>
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<td>[1,290]</td>
<td>[479]</td>
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<td>[756]</td>
<td>[39]</td>
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<tr>
<td><strong>Full Term with Chronic Problems</strong></td>
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<td>[7,458]</td>
<td>[4,152]</td>
<td></td>
<td>[2,307]</td>
<td>[315]</td>
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<tr>
<td><strong>Low Birth Weight</strong></td>
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<td>[12,192]</td>
<td>[4,819]</td>
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<td>[5,493]</td>
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<td>[1,171]</td>
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<td>Category</td>
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<td>African American</td>
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<tr>
<td>All Birth Outcome</td>
<td>[109,929] 100.%</td>
<td>[69,739] 100.%</td>
<td>[32,169] 100.%</td>
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<tr>
<td>Healthy</td>
<td>[78,107] 71.05%</td>
<td>[51,485] 73.83%</td>
<td>[21,618] 67.2%</td>
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<tr>
<td>Other Problem</td>
<td>[14,089] 12.82%</td>
<td>[8,884] 12.74%</td>
<td>[4,198] 13.05%</td>
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<tr>
<td>Unknown</td>
<td>[3,119] 2.84%</td>
<td>[2,177] 3.12%</td>
<td>[704] 2.19%</td>
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### Percentage of Births by Race over Birth Outcome for Adequate, No Risks Identified

<table>
<thead>
<tr>
<th>Birth Outcome</th>
<th>All Race</th>
<th>White</th>
<th>African American</th>
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<td>[39,616]</td>
<td>[29,223]</td>
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<td>[22,948]</td>
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<td>[805]</td>
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<td>[724]</td>
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<td>[1,606]</td>
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**Percentage of Births by Race over Birth Outcome for College, Adequate, No Risks Identified**

<table>
<thead>
<tr>
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<th>All Race</th>
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<th>African American</th>
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<td>All Birth Outcome</td>
<td>[14,234]</td>
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<td>[1,508]</td>
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<td>[617]</td>
<td>[134]</td>
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<tr>
<td>Unknown</td>
<td>[597]</td>
<td>[506]</td>
<td>[66]</td>
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