

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

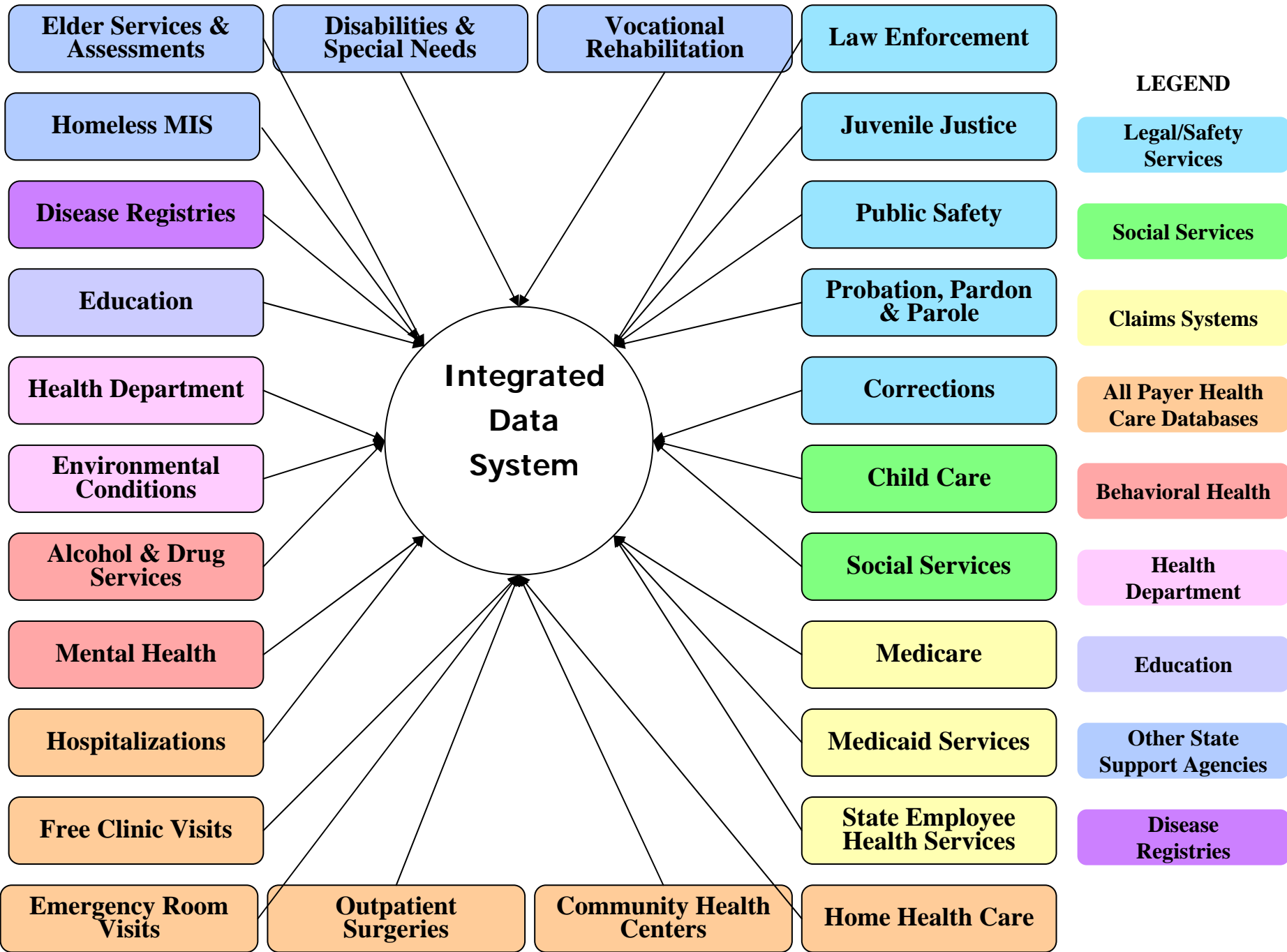
- Design a Web-Based Child Care Data System
- Utilize Current Technology
- Use Licensing System as the Base
- Improve Efficiency
- Pre-screen for Vouchers, USDA

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

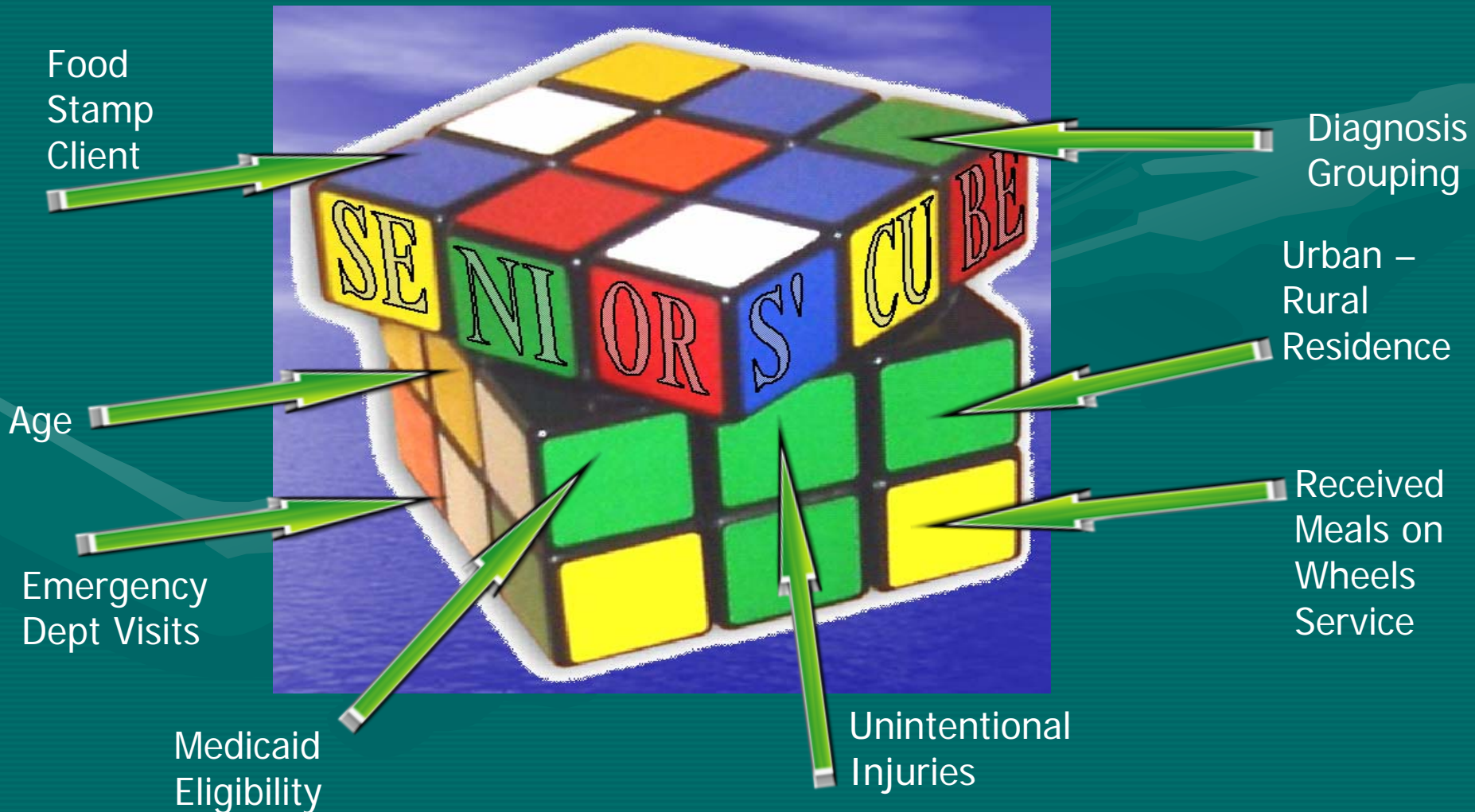
Analytic Data Cubes

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



You can create a subgroup for your research focus

Slicers [X]

- ## _Patients per 10K Pop_
 - 2003
 - Charges
 - Count Visits ER Year
 - Count Visits IP Year
 - Count Visits OP Year
 - Count Visits IPER Year
 - County Name Residence
 - Day of Week
 - Diag Proc Grouping
 - Disposition
 - Gender
 - Procedure Groupings
 - Length of Stay
 - MDC DRG
 - VR Deceased
 - NCHS Groupings
 - Payor Primary Expected
 - All Race
 - Region Residence
 - Treatment Setting
 - Urban Rural Residence

Navigation icons: Home, Back, Forward, Refresh, Print, Save, etc.

	65-69 ⁺	70-74 ⁺	75-79 ⁺	80-84 ⁺	85 + ⁺
<input type="checkbox"/> All Diagnosis Grouping	4,188	4,530	5,051	5,269	5,326
<input type="checkbox"/> I.INFECTIVE & PARASITIC DIS	11	12	14	15	16
<input type="checkbox"/> II.NEOPLASMS	617	625	621	530	364
<input type="checkbox"/> III.ENDOCRINE,NUTRIT.& META.	188	226	292	343	426
<input type="checkbox"/> IV.BLOOD & BL-FORMING ORGANS	48	64	74	87	97
<input type="checkbox"/> V.MENTAL DISORDERS	69	78	92	119	136
<input type="checkbox"/> VI.NERVOUS SYS.& SENSE ORGANS	478	678	857	844	593
<input type="checkbox"/> VII.DIS OF CIRCULATORY SYS	781	932	1,135	1,292	1,417
<input type="checkbox"/> VIII.DIS OF THE RESP.SYS.	429	492	577	666	838
<input type="checkbox"/> IX.DIS OF THE DIGESTIVE SYS	835	898	972	954	856
<input type="checkbox"/> X.DIS OF GENITOURINARY SYS	326	360	421	478	587
<input type="checkbox"/> XII.DIS OF SKIN/SUBCUT.TISSUE	142	146	166	183	214
<input type="checkbox"/> XIII.MUSCULOSKELETAL/CONN.TI.	597	623	653	605	503
<input type="checkbox"/> XIV.CONGENITAL ANOMALIES	13	14	15	15	10
<input type="checkbox"/> XV.CAUSES,PERINATAL MORB/MORT					
<input type="checkbox"/> XVI.SYMPTOMS/ILL-DEFINED COND.	831	908	1,016	1,109	1,161
<input type="checkbox"/> XVII.ACCIDENTS/POISON/VIOLENCE	684	734	891	1,050	1,301
<input type="checkbox"/> XVIII.SUPPLEMENTARY CLASS.	304	320	357	347	308
<input type="checkbox"/> XX.ACC,POIS & VIOL(EXT.CAUSE)					
<input type="checkbox"/> NO CODE FOUND	1	1	1	1	1
<input type="checkbox"/> CODE OUT OF RANGE	73	83	117	149	194

You can expand a row to see subcategories

Patients per 10K Pop by Age over Diagnosis Grouping for 2003

Slicers: **## _Patients per 10K Pop_**

2003

Charges

	65-69 <input type="checkbox"/>	70-74 <input type="checkbox"/>	75-79 <input type="checkbox"/>	80-84 <input type="checkbox"/>	85 + <input type="checkbox"/>
<input type="checkbox"/> III.ENDOCRINE,NUTRIT.& META.	188	226	292	343	426
<input type="checkbox"/> DIS OF THYROID GLAND	9	9	10	10	7
<input type="checkbox"/> DIABETES MELLITUS W/O COMP.	26	28	33	31	31
<input type="checkbox"/> DIABETES MELLITUS W/COMP.	71	78	92	91	81
<input type="checkbox"/> OTHER ENDOCRINE DIS	10	14	16	16	18
<input type="checkbox"/> OBESITY	1				
<input type="checkbox"/> NUTRIT.DEFIC.& META. DIS	84	110	159	211	307
<input type="checkbox"/> XVIII.SUPPLEMENTARY CLASS.	304	320	357	347	308
<input type="checkbox"/> XX.ACC,POIS & VIOL(EXT.CAUSE)					
<input type="checkbox"/> NO CODE FOUND	1	1	1	1	1
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Procedure Groupings

VR Deceased

NCHS Groupings

Payor Primary Expected

All Race

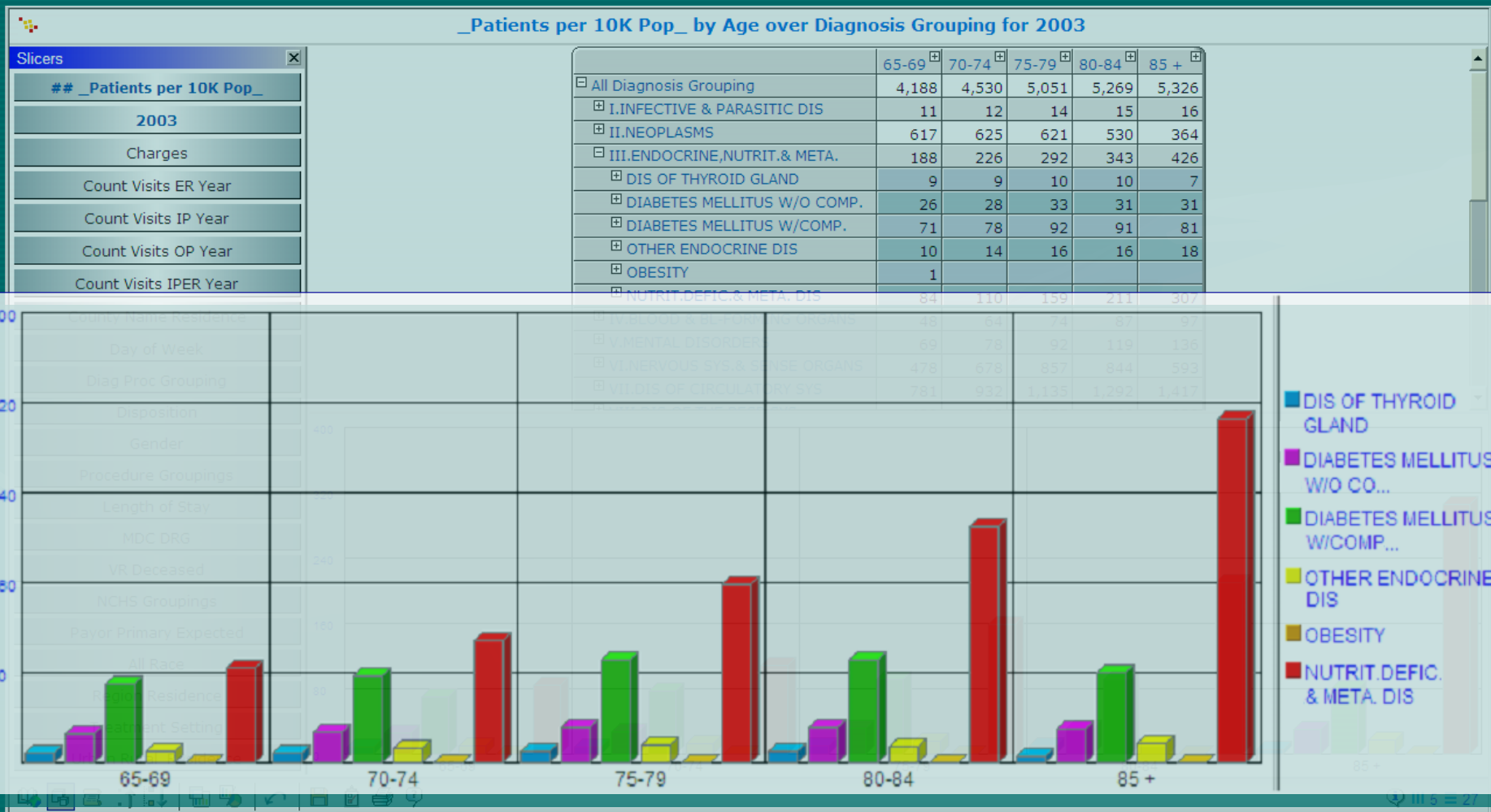
Region Residence

Treatment Setting

Urban Rural Residence

11 5 21

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

Patients per 10K Pop_ by Age over Diagnosis Grouping for 2003

Slicers Patients per 10K Pop_ by Age over Diagnosis Grouping for 2003, Emergency Room

	All Age	45-49 ⁺	50-54 ⁺	55-59 ⁺	60-64 ⁺	65-69 ⁺	70-74 ⁺	75-79 ⁺	80-84 ⁺	85 + ⁺
All Diagnosis Grouping	1,624	1,057	1,674	1,582	1,562	1,684	1,783	2,051	2,324	2,638
I.INFECTIVE & PARASITIC DIS	6	6	8	7	5	4	4	5	5	3
II.NEOPLASMS	6	3	4	6	7	7	8	8	8	8
III.ENDOCRINE,NUTRIT.& META.	68	31	56	62	68	77	92	116	123	136
IV.BLOOD & BL-FORMING ORGANS	6	3	5	4	6	6	9	11	13	20
V.MENTAL DISORDERS	58	54	80	58	47	44	44	52	59	72
VI.NERVOUS SYS.& SENSE ORGANS	62	55	81	66	61	58	51	54	56	49
VII.DIS OF CIRCULATORY SYS	131	50	97	107	126	153	175	232	280	315
VIII.DIS OF THE RESP.SYS.	193	139	212	197	196	209	205	211	219	234
IX.DIS OF THE DIGESTIVE SYS	121	84	126	114	114	119	137	149	175	192
X.DIS OF GENITOURINARY SYS	105	68	103	98	97	106	114	135	167	225
XII.DIS OF SKIN/SUBCUT.TISSUE	57	47	67	61	56	57	53	52	52	64
XIII.MUSCULOSKELETAL/CONN.TI.	210	156	245	212	199	202	211	233	258	275
XIV.CONGENITAL ANOMALIES					1	1	1	1	1	1
XVI.SYMPTOMS/ILL-DEFINED COND.	504	312	501	473	483	532	586	672	770	845
XVII.ACCIDENTS/POISON/VIOLENCE	523	373	570	520	477	500	520	621	722	915
XVIII.SUPPLEMENTARY CLASS.	49	32	47	45	45	46	56	68	84	98
XX.ACC,POIS & VIOL(EXT.CAUSE)										
CODE OUT OF RANGE	28	24	34	29	26	26	24	29	28	30

And then see Diagnoses for Emergency Room Charted

Patients per 10K Pop by Age over Diagnosis Grouping for 2003, Emergency Room

Slicers

Patients per 10K Pop

2003

Charges

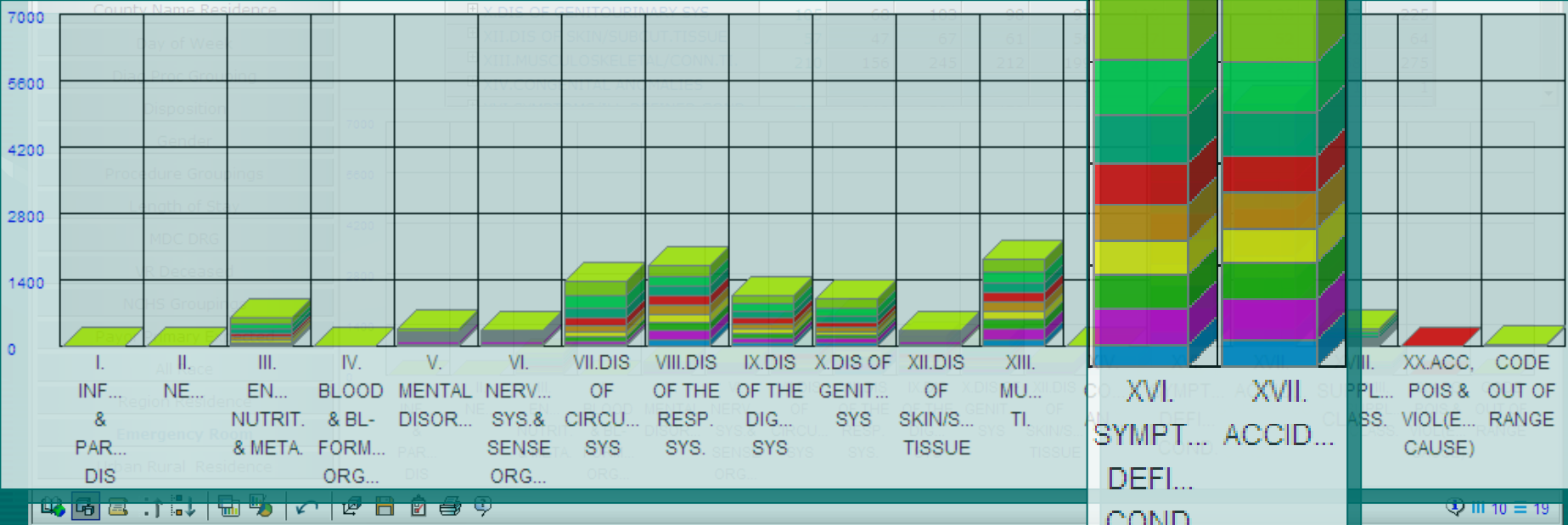
Count Visits ER Year

Count Visits IP Year

Count Visits OP Year

Count Visits IPER Year

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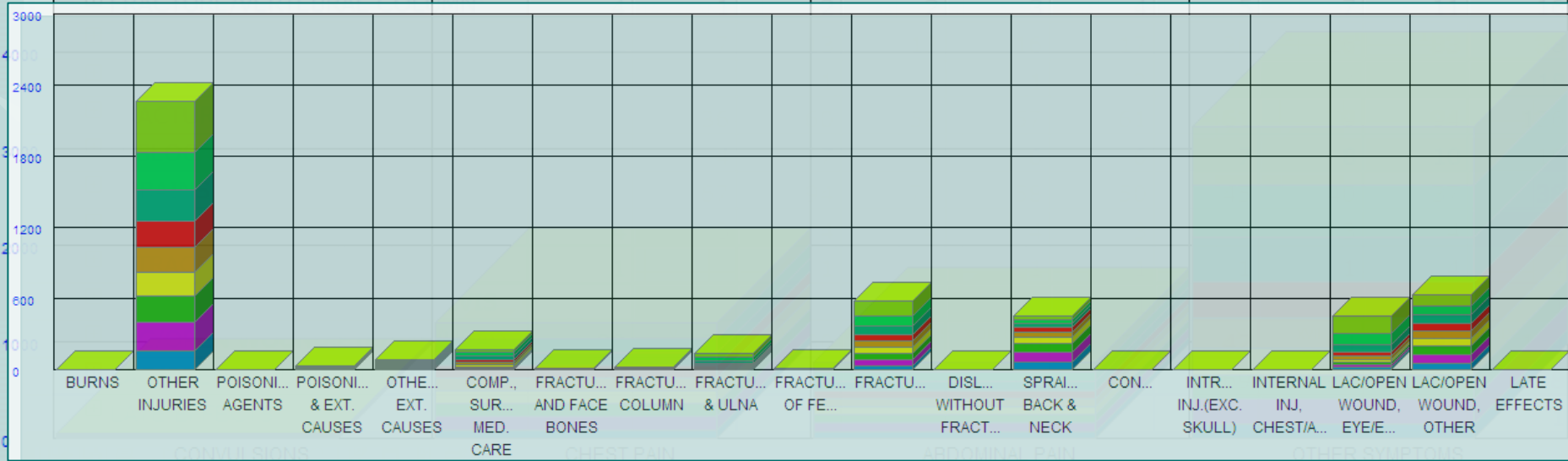


XVI. SYMPT... DEFI... COND.

XVII. ACCID... SUPPL... VIOL(E... RANGE CAUSE)

We can dig a little deeper and see what subcategories make up “symptoms/ill-defined conditions” or “accidents”

	All Age	45-49	50-54	55-59	60-64	65-69	70-74	75-79	80-84	85 +
<input type="checkbox"/> XVI.SYMPTOMS/ILL-DEFINED COND.	504	312	501	473	483	532	586	672	770	845
<input type="checkbox"/> CONVULSIONS	16	14	19	18	16	13	12	12	15	17
<input type="checkbox"/> CHEST PAIN	136	97	159	143	136	136	140	147	151	165
<input type="checkbox"/> ABDOMINAL PAIN	90	70	103	90	86	92	89	100	103	107
<input type="checkbox"/> OTHER SYMPTOMS	302	163	267	261	282	327	380	461	551	615
<input type="checkbox"/> COMP.,SURGERY/OTHER MED. CARE	20	9	15	17	22	28	30	33	33	27
<input type="checkbox"/> FRACTURE/SKULL AND FACE BONES	4	3	4	3	2	4	5	7	9	11



Instead of patient counts, we can look at the hospital ER charges for 2003

Patie Charges by Age over Diagnosis Grouping for 2003, Emergency Room Room

Slicers

- ## Charges
- 2003
- Charges
- Count Visits ER Year
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- County Name Residence
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- NCHS Groupings
- Payor Primary Expected
- All Race
- Region Residence
- Emergency Room

	Sub Total	65-69	70-74	75-79	80-84	85 +
All Diagnosis Grouping	\$193,858,302.00	\$45,904,475.00	\$43,033,135.00	\$40,691,853.00	\$33,082,947.00	\$31,145,892.00
I.INFECTIVE & PARASITIC DIS	\$110,799.00	\$37,549.00	\$24,244.00	\$25,871.00	\$15,707.00	\$7,428.00
II.NEOPLASMS	\$870,527.00	\$247,478.00	\$206,511.00	\$220,895.00	\$112,594.00	\$83,049.00
III.ENDOCRINE,NUTRIT.& META.	\$7,456,713.00	\$1,561,402.00	\$1,583,722.00	\$1,697,456.00	\$1,327,265.00	\$1,286,868.00
IV.BLOOD & BL-FORMING ORGANS	\$1,039,920.00	\$205,175.00	\$234,809.00	\$212,367.00	\$193,079.00	\$194,490.00
V.MENTAL DISORDERS	\$3,756,903.00	\$909,213.00	\$771,136.00	\$819,818.00	\$642,637.00	\$614,099.00
VI.NERVOUS SYS.& SENSE ORGANS	\$2,696,368.00	\$771,472.00	\$649,224.00	\$559,549.00	\$433,116.00	\$283,007.00
VII.DIS OF CIRCULATORY SYS	\$24,862,668.00	\$5,375,673.00	\$5,352,234.00	\$5,638,949.00	\$4,547,552.00	\$3,948,260.00
VIII.DIS OF THE RESP.SYS.	\$15,731,045.00	\$4,152,420.00	\$3,760,926.00	\$3,293,701.00	\$2,445,746.00	\$2,078,252.00
IX.DIS OF THE DIGESTIVE SYS	\$10,541,339.00	\$2,725,255.00	\$2,424,044.00	\$2,187,113.00	\$1,710,405.00	\$1,494,522.00
X.DIS OF GENITOURINARY SYS	\$10,601,590.00	\$2,513,536.00	\$2,151,740.00	\$2,068,462.00	\$1,801,567.00	\$2,066,285.00
XII.DIS OF SKIN/SUBCUT.TISSUE	\$1,783,796.00	\$518,030.00	\$428,360.00	\$347,418.00	\$237,968.00	\$252,020.00
XIII.MUSCULOSKELETAL/CONN.TI.	\$11,155,152.00	\$2,821,017.00	\$2,563,268.00	\$2,280,871.00	\$1,870,806.00	\$1,619,190.00
XIV.CONGENITAL ANOMALIES	\$44,695.00	\$5,664.00	\$13,874.00	\$6,847.00	\$7,317.00	\$10,993.00
XVI.SYMPTOMS/ILL-DEFINED COND.	\$65,778,539.00	\$15,994,794.00	\$15,236,831.00	\$13,817,622.00	\$10,992,633.00	\$9,736,659.00
XVII.ACCIDENTS/POISON/VIOLENCE	\$34,451,913.00	\$7,476,766.00	\$7,009,963.00	\$6,847,162.00	\$6,202,683.00	\$6,915,339.00
XVIII.SUPPLEMENTARY CLASS.	\$1,662,001.00	\$300,037.00	\$341,137.00	\$371,187.00	\$326,402.00	\$323,238.00
XX.ACC,POIS & VIOL(EXT.CAUSE)	\$2,748.00	\$2,602.00	\$146.00			
CODE OUT OF RANGE	\$1,310,744.00	\$286,392.00	\$280,966.00	\$296,565.00	\$215,470.00	\$231,351.00

6 19

Over \$34 million was billed for all accidents treated in the ED

Charges by Age over Diagnosis Grouping for 2003, Emergency Room

Slicers

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6 19

Replacing diagnoses with primary payor expected, we can see the distribution of charges

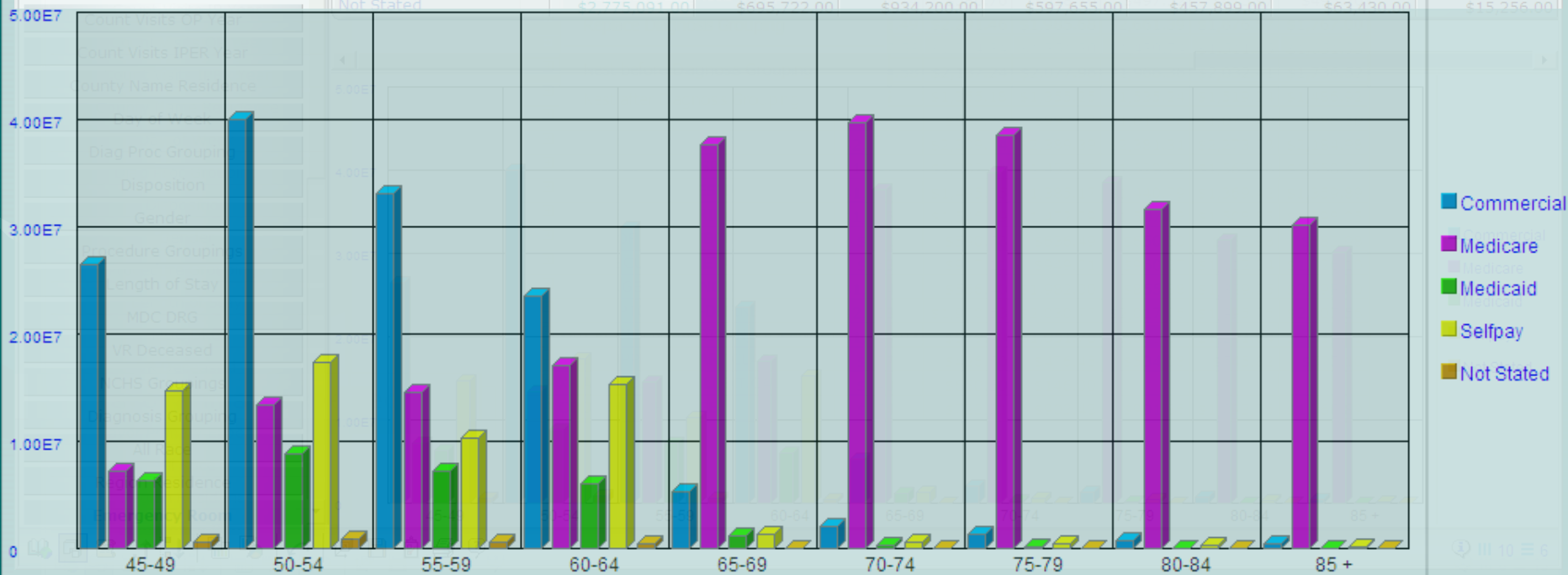
Charges by Age over Payor Primary Expected for 2003, Emergency Room

Avg Chg Per Pat by Age over Diagnosis Grouping for 2003, Emergency Room

Slicers

- ## Charges
- 2003
- Charges
- Count Visits ER Year
- Count Visits IP Year

	All Age	45-49	50-54	55-59	60-64	65-69	70-74
All Payor Primary Expected	\$459,128,691.00	\$55,751,492.00	\$80,783,057.00	\$66,062,760.00	\$62,673,080.00	\$45,904,475.00	\$43,033,135.00
Commercial	\$133,760,012.00	\$26,576,708.00	\$40,104,203.00	\$33,089,793.00	\$23,559,734.00	\$5,412,993.00	\$2,175,093.00
Medicare	\$230,629,267.00	\$7,325,825.00	\$13,382,675.00	\$14,598,202.00	\$17,171,305.00	\$37,710,781.00	\$39,825,009.00
Medicaid	\$30,946,332.00	\$6,442,009.00	\$8,956,559.00	\$7,350,829.00	\$6,155,811.00	\$1,307,577.00	\$334,552.00
Selfpay	\$61,017,989.00	\$14,711,228.00	\$17,405,420.00	\$10,426,281.00	\$15,328,331.00	\$1,409,694.00	\$683,225.00
Not Stated	\$2,775,091.00	\$695,722.00	\$934,200.00	\$597,655.00	\$457,899.00	\$63,430.00	\$15,256.00



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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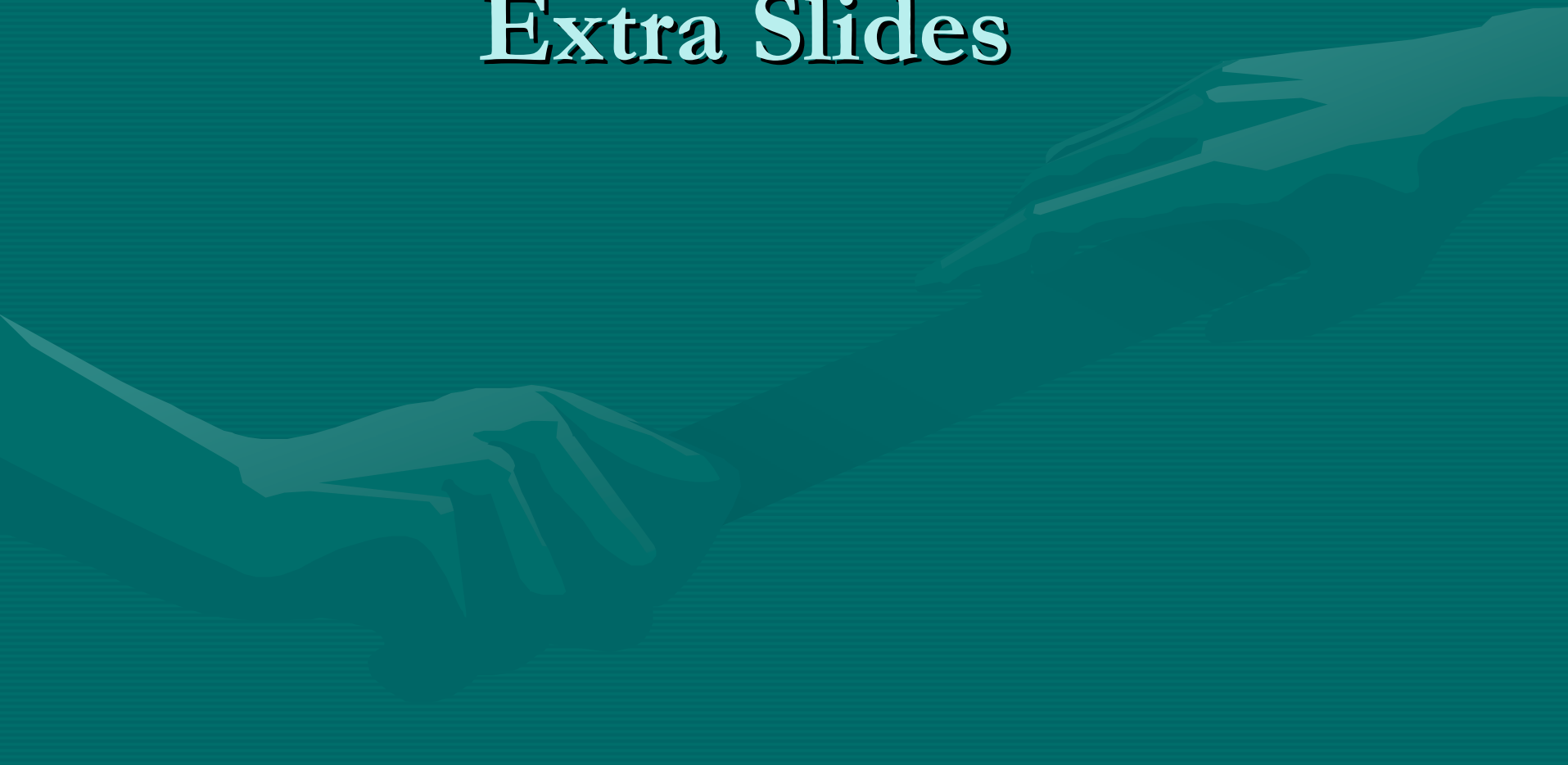
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Extra Slides



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

Slicers

- ## Births
- Age of Mother
- Baby Birth Outcome
- Baby Date of Birth
- Baby Health Condit...
- Birth Weight Group
- Body Mass Index
- Counties Individually
- DHEC Districts
- Education of Mother
- Expected Pay Source
- Food Stamp Particip...
- All Interpregnancy ...
- Kessner Adequacy ...
- Method of Delivery
- Mother Risks Found
- Multiple Birth
- Physician Specialty

	All Race	White	African American	Hispanic
All Birth Outcome	[158,105] 100.0%	[90,415] 100.0%	[53,959] 100.0%	[8,310] 100.0%
Healthy	[110,157] 69.67%	[65,873] 72.86%	[35,491] 65.77%	[6,106] 73.48%
Other Problem	[20,448] 12.93%	[11,590] 12.82%	[7,145] 13.24%	[1,117] 13.44%
Significant Problem	[23,169] 14.65%	[10,190] 11.27%	[10,152] 18.81%	[847] 10.19%
Died	[1,290] 5.57%	[479] 4.7%	[756] 7.45%	[39] 4.6%
Full Term with Chronic Problems	[7,458] 32.19%	[4,162] 40.84%	[2,807] 27.65%	[315] 37.19%
Low Birth Weight	[12,192] 52.62%	[4,819] 47.29%	[5,493] 54.11%	[438] 51.71%
Very Low Birth Weight	[2,229] 9.62%	[730] 7.16%	[1,096] 10.8%	[55] 6.49%
Unknown	[4,331] 2.74%	[2,762] 3.05%	[1,171] 2.17%	[240] 2.89%

Percentage of Births by Race over Birth Outcome for Adequate

	All Race	White	African American
All Birth Outcome	[109,929] 100.0%	[69,739] 100.0%	[32,169] 100.0%
Healthy [⊕]	[78,107] 71.05%	[51,485] 73.83%	[21,618] 67.2%
Other Problem [⊕]	[14,089] 12.82%	[8,884] 12.74%	[4,198] 13.05%
Significant Problem [⊕]	[14,614] 13.29%	[7,193] 10.31%	[5,649] 17.56%
Unknown [⊕]	[3,119] 2.84%	[2,177] 3.12%	[704] 2.19%

Percentage of Births by Race over Birth Outcome for Adequate, No Risks Identified

	All Race	White	African American
All Birth Outcome	[39,616] 100.0%	[29,223] 100.0%	[7,485] 100.0%
Healthy [⊕]	[30,822] 77.8%	[22,948] 78.53%	[5,594] 74.74%
Other Problem [⊕]	[4,159] 10.5%	[3,049] 10.43%	[805] 10.75%
Significant Problem [⊕]	[2,504] 6.32%	[1,620] 5.54%	[724] 9.67%
Unknown [⊕]	[2,131] 5.38%	[1,606] 5.5%	[362] 4.84%

Percentage of Births by Race over Birth Outcome for College, Adequate, No Risks Identified

	All Race	White	African American
All Birth Outcome	[14,234] 100.0%	[12,115] 100.0%	[1,508] 100.0%
Healthy [⊕]	[11,287] 79.3%	[9,671] 79.83%	[1,141] 75.66%
Other Problem [⊕]	[1,558] 10.95%	[1,321] 10.9%	[167] 11.07%
Significant Problem [⊕]	[792] 5.56%	[617] 5.09%	[134] 8.89%
Unknown [⊕]	[597] 4.19%	[506] 4.18%	[66] 4.38%