



Health and Demographics

The SC Integrated Data System: Overview and Health Care Examples

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Who are we?

- **Agency Mission:** To provide independent research, analysis, and resources to facilitate informed policy decisions and administration of services
- **Division Vision:** “It is the entire human experience that influences health and social well-being and should therefore be captured and analyzed through an integrated data system.”
- **Staff:** 34 employees, 2/3 statisticians trained in either theoretical statistics or their substantive disciplines. The remaining staff are focused on supporting information/knowledge deployment skills such as software development and data base administration, project management, and compliance.



Evolution of the Integrated Data System

- Philosophy developed over time and experience eventually becoming a recognized example nationally.
- Characteristics of a successful data warehouse:
 - Data must be housed in a neutral setting
 - Data holder can not be a regulator, payer, or provider of services
 - Provides equal access for all users
 - Promotes research and use
 - Data release must be approved by data owner or by multi-stakeholder councils and committees
 - Data security and privacy must be an overarching and compelling concern



Authorization by Proviso

- **102.4.** (RFAO: SC Health & Human Services Data Warehouse) "There is hereby established within the Revenue and Fiscal Affairs Office, the South Carolina Health and Human Services Data Warehouse. The purpose of the Warehouse is to ensure that the operation of health and human services agencies may be enhanced by coordination and integration of client information. Client data is defined as person-level data that is created, received, and/or maintained by state agencies and other entities required to report client information to the Revenue and Fiscal Affairs Office under this provision. To integrate client information, client data from health and human services state agencies will be linked to improve client outcome measures, enabling state agencies to analyze coordination and continuity of care issues. The addition of these data will enhance existing agency systems by providing client data from other state agency programs to assist in the provision of client services. Certain client information shall be delivered to the Revenue and Fiscal Affairs Office in order to assist in the development and maintenance of this Warehouse..."

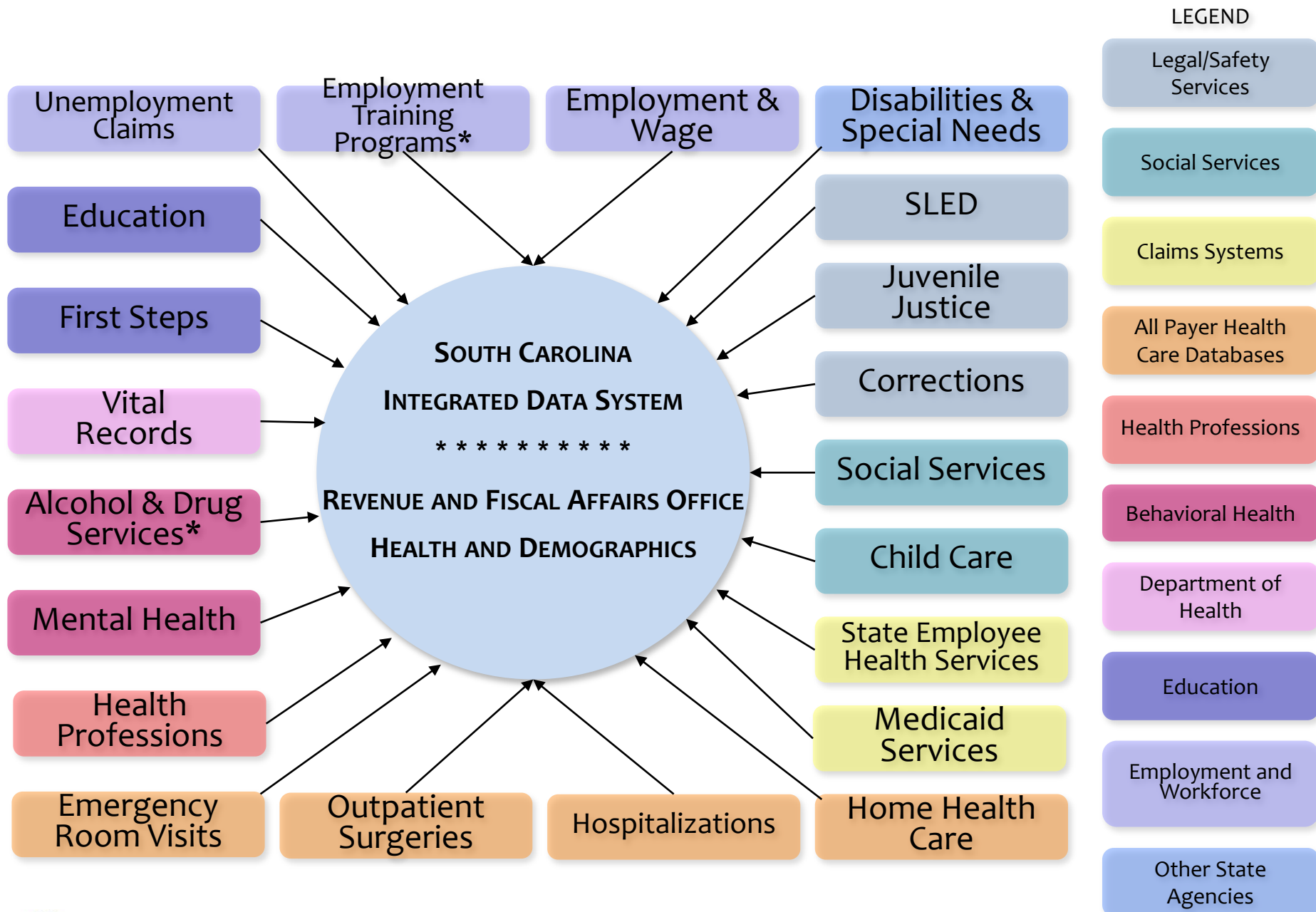


Administrative Data for Research

Made Data Experimental	Made Data Observational (e.g. Social Surveys)	Found Data Administrative Data	Found Data Other Types of Big Data
<ul style="list-style-type: none"> • Data are collected to investigate a fixed hypothesis. • Usually relatively small in size. • Usually relatively uncomplex. • Highly systematic. • Known sample / population. 	<ul style="list-style-type: none"> • Data may be used to address multiple research questions. • Data may be very large and complex (but usually smaller than big data). • Highly systematic. • Known sample / population. 	<ul style="list-style-type: none"> • Data are not collected for research purposes. • May be large and complex. • Semi-systematic. • May be messy (i.e. may involve extensive data management to clean and organise the data). • Multidimensional (i.e. may involve multiple fragments of data which have to be brought together through data linkage). • Usually a known sample / population. 	<ul style="list-style-type: none"> • Data are not collected for research purposes. • May be very large and very complex. • Some sources will be very unsystematic (e.g. data from social media posts). • Very messy / chaotic. • Multidimensional (i.e. may involve multiple fragments of data which have to be brought together through data linkage). • Sample / population usually unknown.

R. Connelly et al. *Social Science Research* 59 (2016) 1-12.





Tracking System

- Series of algorithms to create a unique random identifier for each individual
- Unique identifier stays with the individual over time
- Enables staff to “link across” multiple providers and settings
- Protects the confidentiality of the individual
- Requests to link across systems must be approved by all participating agencies and organizations

Personal identifiers are never stored with the statistical data; the unique identifier is appended to the statistical record and is not derived from identifiable information.



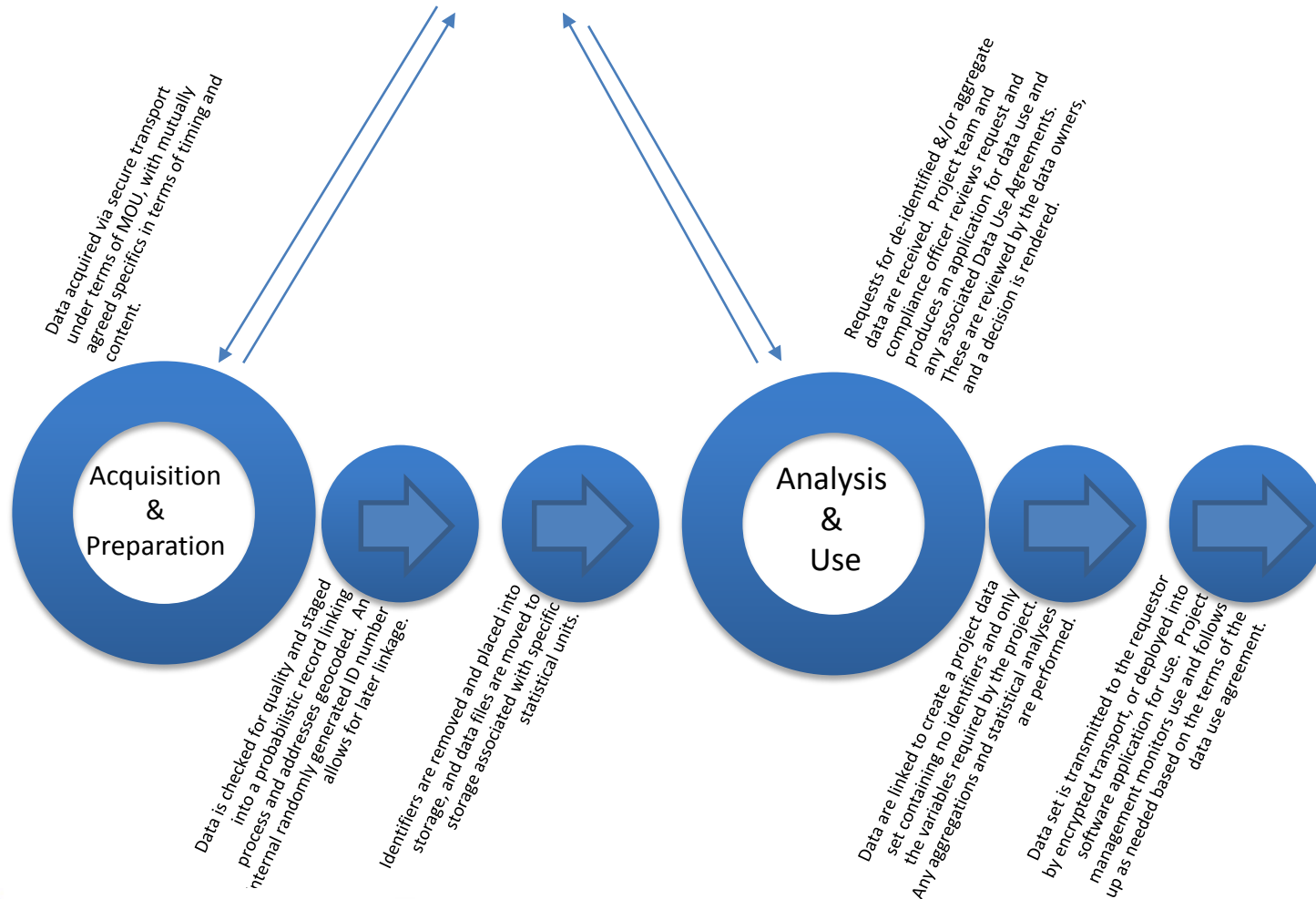
Security and Privacy: A Core Concern

- Data security: RFA follows industry standards for privacy and data protection and is compliant with SCDIS-200 information security and privacy standards set forth by the Department of Administration's Division of Information Security. The Enterprise Privacy Office of the Department of Administration has been involved with RFA to ensure proper safeguards of citizen privacy.
 - *All data are encrypted at rest.*
 - *Access to the data is restricted to personnel directly involved in the project; data access is monitored and audited.*
 - *The systems and procedures protecting the data are regularly subjected to third party review and penetration testing.*
 - *Upon hire and annually thereafter, all staff are required to receive privacy and security training and sign confidentiality agreements.*
- Data collection: Data collected by state agencies for the administration of their respective programs are included in the Integrated Data System. New data are not collected by RFA.
- Data privacy protections: The data are protected by the Family Educational Rights and Privacy Act (FERPA), a federal law that protects the privacy of student education records; the Health Insurance Portability and Accountability Act (HIPAA) as amended by the Health Information Technology for Economic and Clinical Health (HITECH); and other state and federal laws.
- Data release: Only statistical results that do not identify individuals are released; exceptions to this only exist if required by law or at the request of the data owner. Data owners approve data for release.



Process Overview

Data Owners and External Governance



Information Products

Analytic Products

- Agency Collaboration
- Researcher Collaboration
 - Data linkage
 - De-identified datasets
 - GIS support
 - Analytic support
- Public Website
 - Descriptive statistics
 - Ability to query data sources and generate ad-hoc reports

Application Partners

- ABC Tablet Application
- Community Long Term Care Application (Phoenix)
- Ages and Stages Questionnaire
- Dept. of Education Data Warehouse
- Purpose Built Screening and Referral Systems
- South Carolina Health Information Exchange (SCHIEx)



EXAMPLE 1: HEALTH CARE PRICE TRANSPARENCY



about

Much of the world of health care pricing in the U.S. remains an opaque mystery. Price often bears little relation to cost or quality. The vast majority of consumers have no idea how much health care procedures will cost them, or why. Indeed, health care is one of the last remaining sectors of the economy in which price transparency is largely non-existent.

But things are changing. A tide of pricing transparency is growing across the country, fueled by a variety of sources including news reporting and the rise of several state and private health transparency websites. In 2013, the federal Centers for Medicare and Medicaid Services (CMS) for the first time released some charge information for hospitals across the country. And non-government groups such as Catalyst for Payment Reform continue to push states to do more to shed light on health care pricing and quality for consumers and their families.

Origins

It is in this context that SCHealthData.org was conceived. The website was created and is maintained by the South Carolina Department of Health and Human Services (SCDHHS), the agency that runs the state's \$6 billion Healthy Connections Medicaid program. The site was launched in January 2014. The site is the result of collaboration with several state agencies and groups, including the South Carolina Office of Research and Statistics, the South Carolina Public Employee Benefit Authority and the South Carolina Hospital Association (SCHA).

The impetus behind SCHealthData.org is to help spur a new era of transparency in South Carolina health care. As mentioned in



South Carolina hospital profits rose from \$636M to \$914M from 2011 to 2012

find



Facility Name

- or -

Zip Code

Go

list



Hospitals

By Name

Go

map



Show All

View All

Go



a comprehensive guide to



understanding hospital costs

HOME

INPATIENT SERVICES

OUTPATIENT SURGERY

EMERGENCY SERVICES

CONSUMER RESOURCES

South Carolina hospitals are committed to delivering the best care possible and providing consumers the information they need to make good decisions about their health care.



Find prices for different services and compare among hospitals.



INPATIENT SERVICES



OUTPATIENT SURGERY



EMERGENCY
& URGENT CARE



BUT WHAT IF I STILL HAVE
QUESTIONS ABOUT MY
HOSPITAL BILL?

That's understandable.



WHAT IF I HAVE QUESTIONS
ABOUT THE QUALITY OF MY
HEALTH CARE AS WELL?

You need information

Inpatient: Cesarean Delivery (APRDRG 540)

All South Carolina Hospitals (January 2018 - December 2018)

Services Hospitals

Select Hospitals

By City By County

Statewide Totals ▼

All South Carolina Hospitals	EXPECTED PAYER TYPE	NUMBER OF DISCHARGES	AVERAGE CHARGE	AVERAGE CHARGE PER DAY	AVERAGE STAY	MEDIAN CHARGE
Severity of Illness: <input checked="" type="checkbox"/> 1 <input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> 4	ALL	17,309	\$30,232	\$9,422	3.2 Days	\$26,702
<input type="checkbox"/> Show State Totals	COMMERCIAL	8,601	\$29,511	\$9,500	3.1 Days	\$26,023
COMPARE TO OTHER HOSPITALS	MEDICARE	638	\$31,358	\$9,745	3.2 Days	\$28,318
Print Report	MEDICAID	7,714	\$31,140	\$9,382	3.3 Days	\$27,559
Hospital Website	UNINSURED	356	\$25,949	\$7,943	3.3 Days	\$26,702

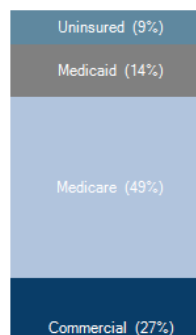
[How Much Do I Really Owe?](#)

*NR = 1-4 Discharges (Not Reported)

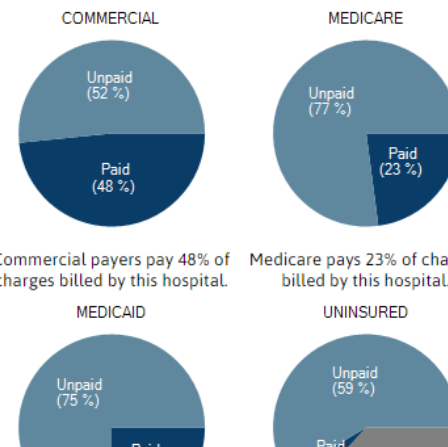
**NA = Not Appropriate to report 'Total' due to some payers having number of discharges less than 5.

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PERCENTAGE OF TOTAL CHARGES
BILLED TO EACH PAYER TYPE



CHARGE REIMBURSEMENT FOR THIS HOSPITAL
(The Fiscal data below is from 2015. For updated information, please contact the hospital.)



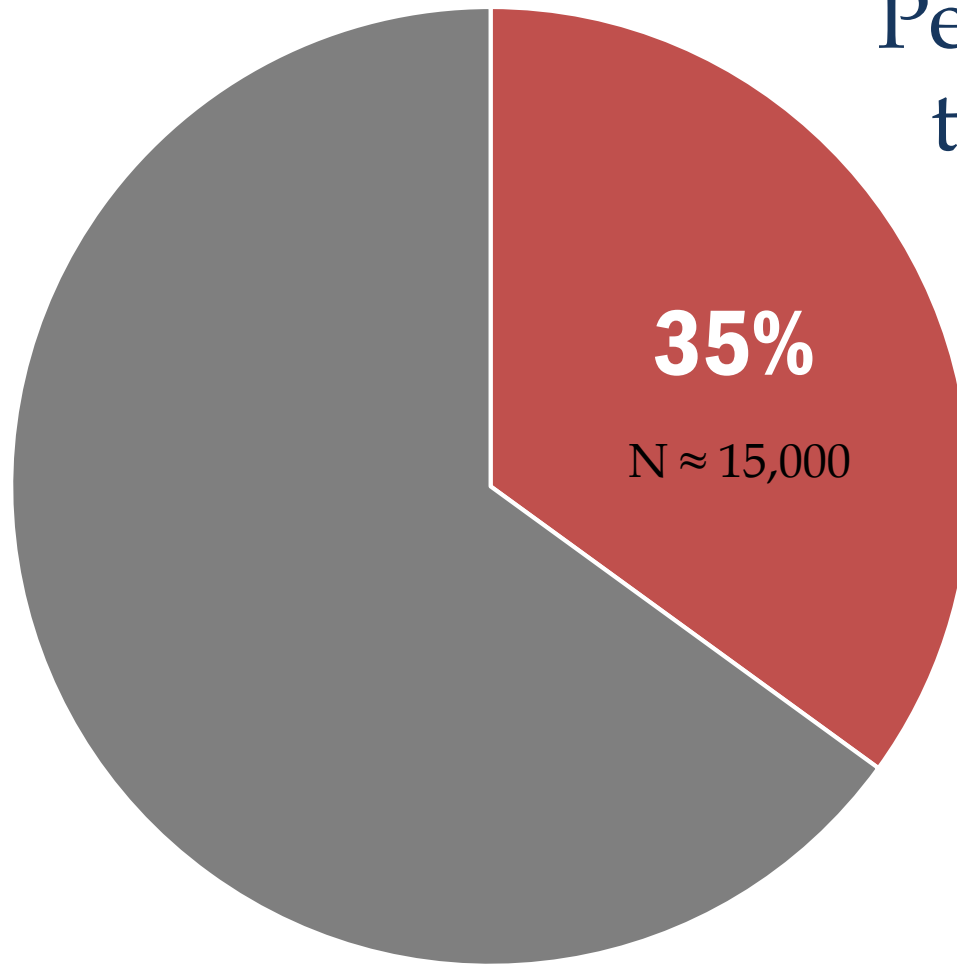
Commercial payers pay 48% of charges billed by this hospital.

Medicare pays 23% of charges billed by this hospital.

EXAMPLE 2: EMPLOYMENT CHANGES AMONG RN/APN'S



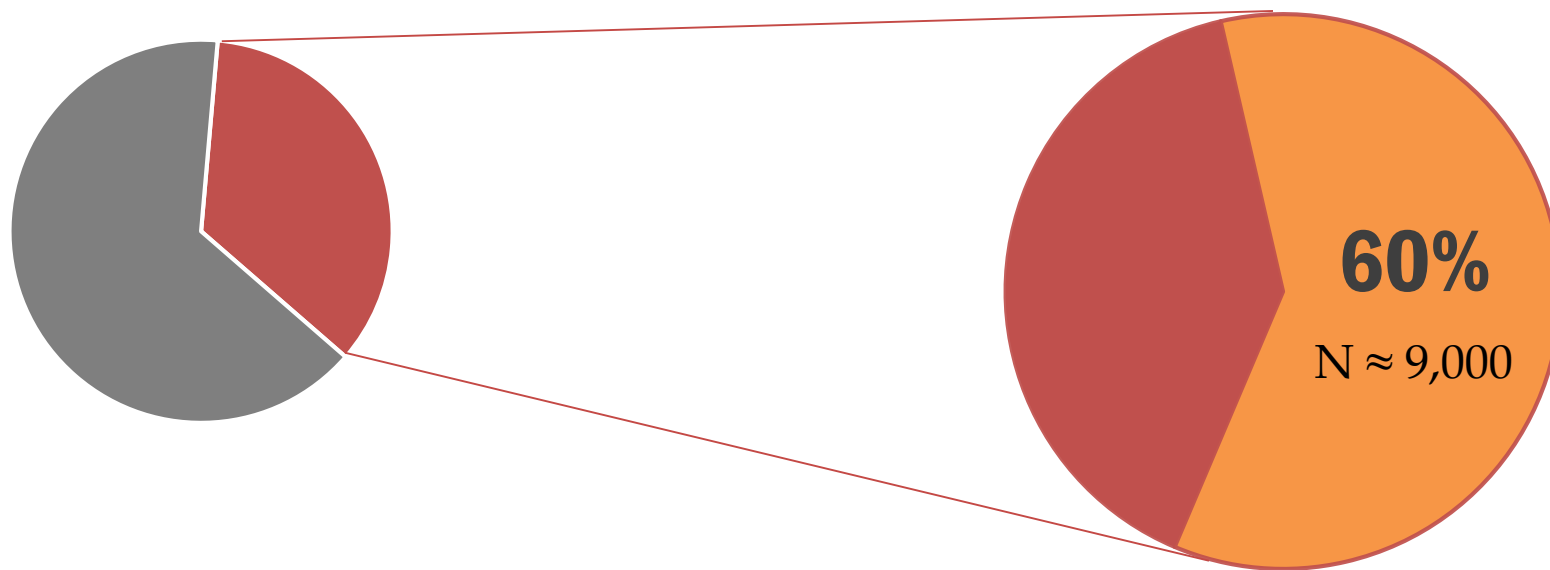
RN/APNs Working in SC, 2016 Renewal



Percent of the workforce
that no longer has the
same employer* in
2018 renewal**



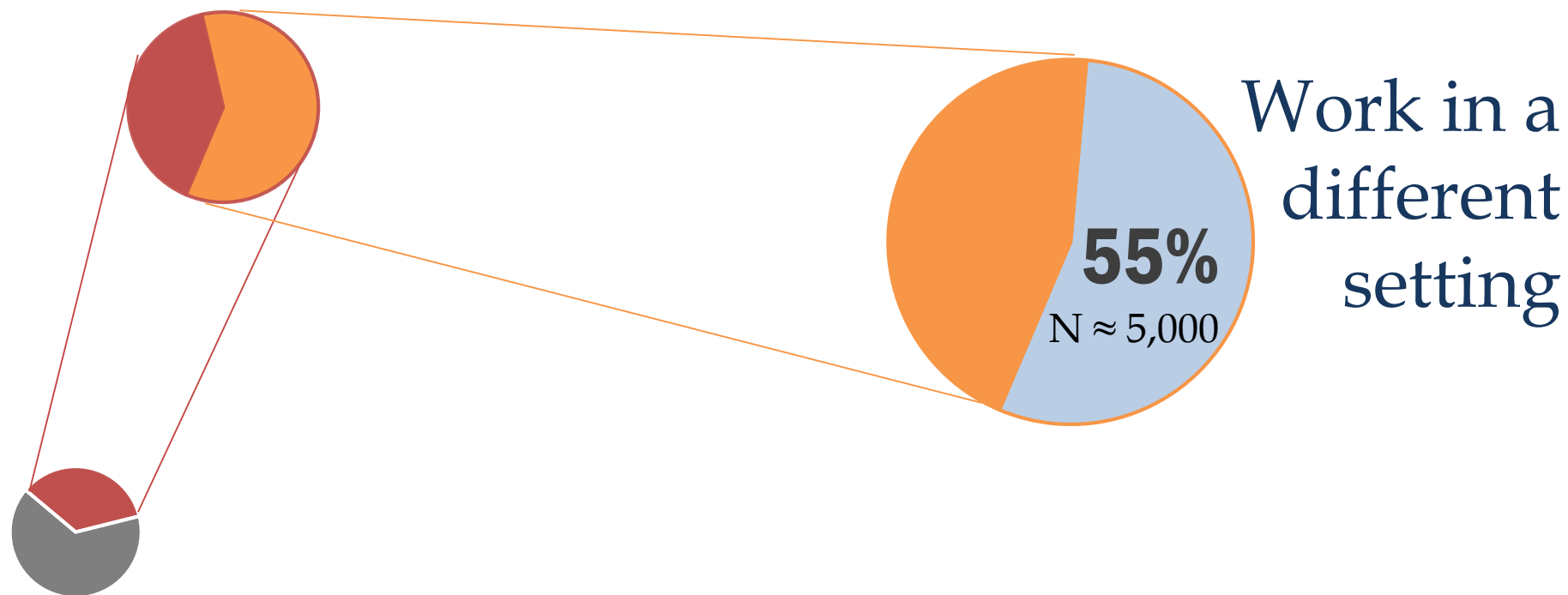
RN/APNs Working in SC, 2016, that no longer have the same employer* in 2018 renewal**



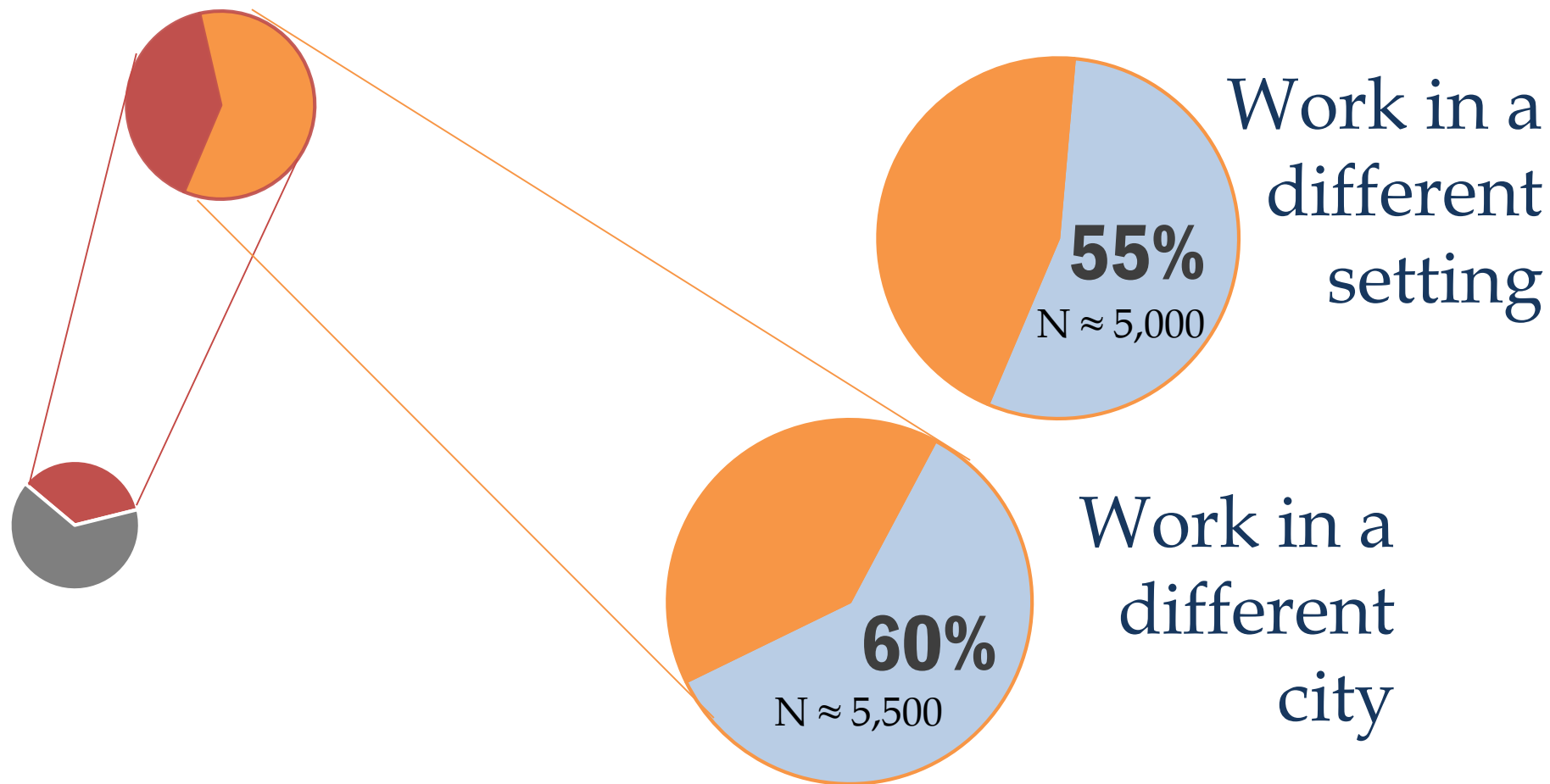
Percent
still working in SC in 2018



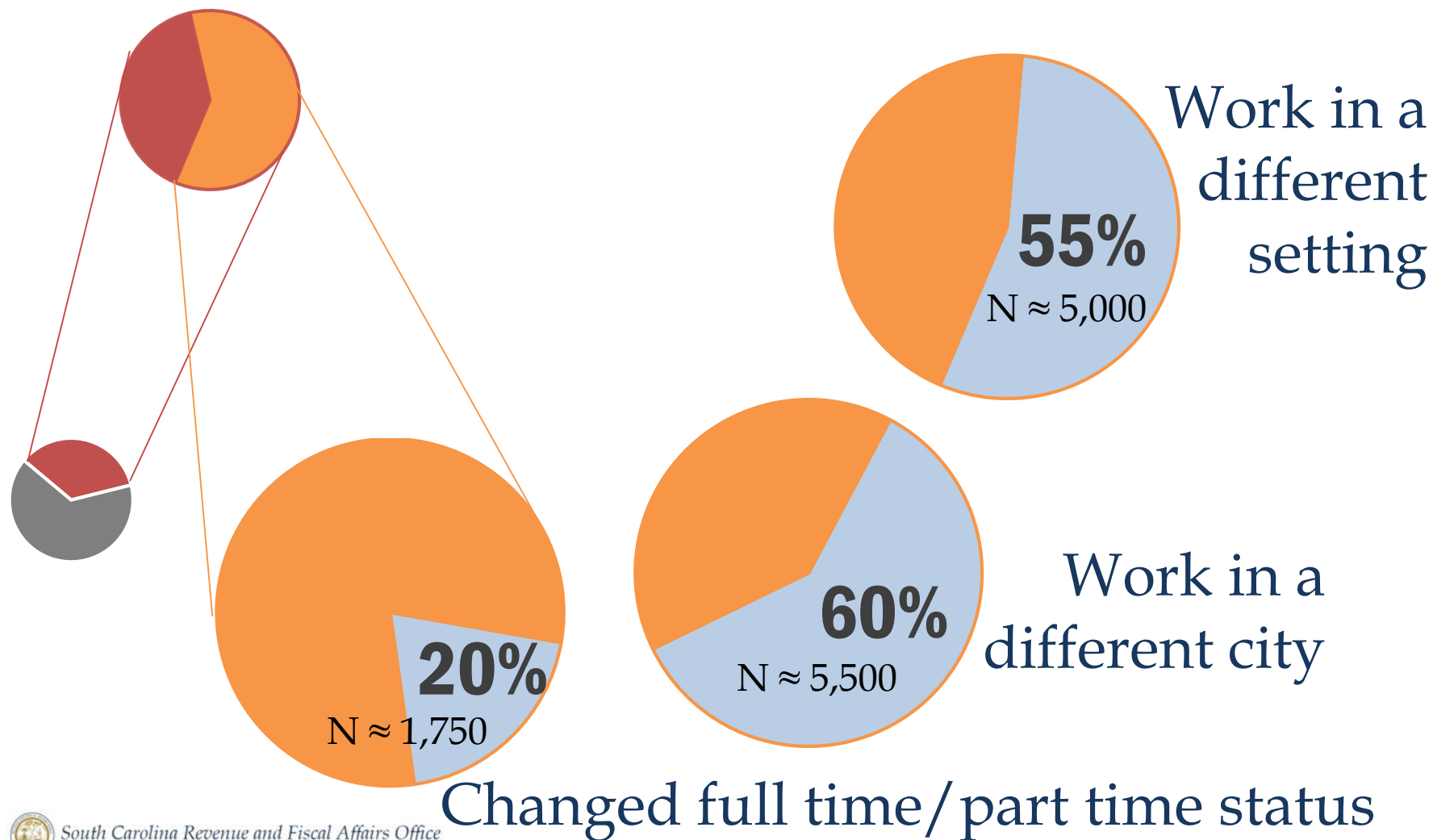
RN/APNs Working in SC, 2016, that changed employers* and are still working in SC, 2018**



RN/APNs Working in SC, 2016, that changed employers* and are still working in SC, 2018**



RN/APNs Working in SC, 2016, that changed employers* and are still working in SC, 2018**



EXAMPLE 3: TELEPSYCHIATRY PROGRAM SUPPORT AND EVALUATION



Roles of the Data Warehouse in the SC Telepsychiatry Initiative

Program Operation

- Provision of Medicaid Data
- Provision of DMH data into SC Health Information Exchange (SCHIEx)
- Integration of DMH Electronic Medical Record system with SCHIEx

Program Evaluation

- Linkage of program specific data into Integrated System
- Provision of additional linked elements from the data warehouse, most notably UB 92/04
- Statistical and analytic support



Evaluation Strategy

- Propensity scoring with optimal matching used to match patients treated at intervention EDs to those treated at non-intervention EDs in South Carolina
- Compared two groups on utilization and cost outcomes using standard econometric techniques



Baseline Characteristics

	Telepsychiatry	Control
	N=7,261	N=7,261
Age	35.7	35.7
Female	49.8%	49.8%
White	73.1 %	73.1 %
Black	23.8%	23.8%
Weekend Admission	38.6%	38.6%



Service Use

	Telepsychiatry	Control	P
	N=7,261	N=7,261	
Admission	22%	11%	<0.001
LOS at index visit (in days)	0.43	1.35	<0.001
30 day OP f/u	46%	16%	<0.001
90 day OP f/u	54%	20%	<0.001
Index 30 day IP cost	\$8,290	\$11,224	<0.001
Index 30 day hospital cost (IP+ED)*	\$12,634	\$14,052	0.002

What can we learn from these efforts?

Integrated administrative data systems can form the core of an evidence-based service delivery ecosystem

- Integrated data systems can “close the loop” between practitioners, applied analysts, and basic researchers
- Integrated data systems can help create and sustain public, private, and not for profit partnerships around issues
- Integrated data systems reduce costs by repurposing existing data, producing “economies of scale”
- Integrated data systems can fulfill these missions while simultaneously respecting the missions of individual agencies and preserving the privacy of individual citizens



For further information...

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