Distribution of Charity Care, Commercial, & Medicaid Payer Mix Following Hospital Mergers

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Abstract

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Hospital mergers are becoming increasingly common across the current U.S healthcare market. Advocates in support of hospital mergers argue that they promote continuity of care and help to contain healthcare costs. In contrast, a heavily concentrated market may increase hospital prices and lead to a reduction in the number of services provided. This analysis examines the change of hospital payer mix following hospital mergers that occurred from 2016-2021. Utilizing a generalized linear model, it was observed that for-profit hospitals that merged had a significant increase in care provided to uninsured and charity care patients ($p < .005$). Nonprofit hospitals had a significant increase in the provision of care to Medicaid payer mix patients following a merger ($p < .024$) and a decrease in the provision of care to commercial payer mix patients ($p < .005$). The changes captured across payer mix by hospital ownership may signal a response by health

insurance providers or regulatory entities to the changing landscape brought on by a hospital merger.

Introduction:

Hospital consolidations through mergers and acquisitions continue to increase with advocates arguing that these actions will improve continuity of care, contain healthcare costs, and support failing independent hospitals and physician practices (Karyn et al, 2020). A counter argument is that consolidation leads to reduced competitive pressure within a market, leading to higher prices and a reduction in the number and type of services that were previously available at the acquired hospital (Tsai & Jha 2014). Patient access to health care within a market following consolidation must be assessed to ensure that healthcare equity is not compromised in the interest of business transactions.

This analysis examines whether and to what degree hospital consolidation, change of ownership, or merger impacts hospital payer mix (i.e., Medicaid, commercial, uninsured/charity care, Medicare), which may indicate a change in the composition of individuals served and the distribution of healthcare services provided. Significant changes in the distribution of healthcare across payer groups will provide insight into whether healthcare access is impacted by a hospital merger.

Literature Review:

Concern over consolidation in the healthcare industry has grown, particularly following the implementation of the Patient Protection and Affordable Care Act (ACA), which encouraged the use of payment models that prioritize increased quality and patient outcomes at a reduced cost (Lineen, 2014). Payment models outside of the traditional fee-for-service model, such as accountable care contracts and value-based payment, benefit from the use of integrated care, rather than provision of fragmented services that are often difficult for patients to navigate and can result in delayed care or poorer health outcomes (Lineen, 2014). Improved population healthcare may be facilitated through larger hospital systems that are assumed to be more efficient and have the financial stability to implement and maintain quality improvement efforts While the ability of large hospital systems to efficiently manage the care of patients may be a reasonable assumption, hospital consolidation may decrease competition and thus offset any efficiency-driven advantages to achieving improved access and quality of care (Jakubiec, 2021).

Competition among hospitals incents these facilities to respond to patient demand on margins that may include price, access, quality, and the distribution of provided services. In a systematic review of 8 studies comparing outcomes in competitive (multiple health systems or hospitals) and noncompetitive (few hospitals present, which may directly or indirectly influence price and supply) marketplaces, increased hospital marketplace competition was associated with improved quality, particularly lower patient mortality, so consolidation may not improve healthcare quality and patient outcomes (Xu et al, 2015). There are also concerns that hospital consolidation can lead to greater avoidable or unnecessary utilization as “hospitals that own expensive equipment, are more likely to refer patients for in-system treatment over other treatment options…this practice in larger systems may lead to more suboptimal care and overtreatment” (Xu er al, 2015).

Without competitive pressure, some hospitals may shift their focus towards providing their most profitable services rather than the full range of lower-cost services, with particular concern when multiple treatment options that range in invasiveness and cost are available for the same condition. An additional threat to patient outcomes under consolidation is that "if a large hospital system with regional monopoly power fails, the population's health would likely worsen, and the people in the region may even have to pay for a bailout of the hospital system. The threat is even greater in rural areas where one hospital system is the only source of medical care" (Xu et al, 2015).

How Are Hospitals Approaching Consolidation: Recent Trends

While health plans are incented to reduce their payments to providers, their ability to achieve this goal is limited in many parts of the country due to their reduced relative market power to hospitals and provider groups. One example of this shift in market power dynamic toward providers is the increasing trend in horizontal consolidation, which happens when two or more medical practices join to form larger group practices. These horizontal consolidations reduce the number of provider groups with which insurance companies can negotiate, thus shifting market power to these providers (Karyn et al, 2020). One example of this is in a recent court case where the consolidated health system, Sutter Health, was accused of violating antitrust laws by using its market power to drive-up hospital service prices. Sutter Health settled and agreed to stop requiring that all of its hospitals be included in an insurer's network and paid compensation for damages (Karyn et al, 2020). The second way that hospitals are consolidating is through vertical integration, the most common example being instances where hospitals acquire physician practices. The trend in vertical integration has become more prevalent following the

implementation of the ACA. From 2010 to 2016, the share of primary care physicians working in organizations owned by a hospital or health care system increased from 28 percent to 44 percent—while the shares in independent solo practice or organizations owned by a medical group decreased (Fulton 2017). A much larger study using national data found that the share of primary care physicians affiliated with vertically integrated health systems increased from 38 percent to 49 percent, from 2016 to 2018. In 2018, more than half of all physicians and 72 percent of hospitals were affiliated with one of the 637 health systems identified in the Compendium of US Health Systems from the Agency for Healthcare Research and Quality (AHRQ) (Furukawa et al 2020). Church-affiliated hospitals and for-profit hospitals grew the most due to their participation in system mergers.

A standard instrument that economists use to measure market concentration is the Herfindahl-Hirschman Index (HHI), which measures the degree to which a small number of firms control a large share of a specific geographic market. An HHI greater or equal to 2,500 reflects a highly concentrated market controlled by a small number of firms. From 2010 to 2016, the mean HHI for metropolitan statistical areas in the United States for hospitals and specialist physician organizations each increased by about 5% on average (Karyn et al, 2020). Using this index, 90% of metropolitan statistical areas were highly concentrated for hospitals, 65% were highly concentrated for specialists and 39% were highly concentrated for primary care physicians by 2016 (Karyn et al, 2020). Rural hospitals are a particular target for acquisition as they already have a difficult time meeting the requirements of newer payment models that often require greater care management resources than are available to the hospital (Noles, 2015). Williams & Spaulding (2018) examined the characteristics related to the two parties involved with hospital

mergers and acquisitions and how these affect the location of the merger or acquisition. Their findings suggest that for profit organizations are less likely to engage in consolidation activities with rural hospitals than are nonprofit organizations (Williams & Spaulding 2018).

Why Consolidate?

Compelling evidence about the consolidation imperative may come from California, where more than 40 percent of physicians worked for practices owned by hospitals (Scheffler et al, 2018). Possible motives to consolidate have been to increase referrals and additionally, for physicians working in a hospital-owned practice, to add a facility fee to their charges for the same services provided in the same settings prior to being acquired by a hospital (Scheffler et al, 2018). Consolidation can also aid in achieving more integrated care (useful for managing chronically ill patients) or allow hospitals to be better financially equipped to make the investments needed to improve quality of care (Tsai & Jha, 2014).

To better adapt to the marketplace that has emerged following the ACA, hospitals are mostly choosing to integrate vertically, under the assumption that this will support better care coordination. As a result, they are rapidly acquiring physician practices and other small healthcare facilities where consolidation can now provide access to more comprehensive resources (Jakubiec, 2021). An initial response to ACA reforms were mergers among for-profit hospitals that were transitioning to value-based reimbursement and potential hospital partners were evaluated on their ability to "safely navigate the transition from Fee-for-Service (FSS) to value-risk-based reimbursement models and the combined ability to coordinate care for a critical mass of a defined population" (Lineen 2014).

McCue and colleagues (2015) assessed factors associated with acquisitions and provided some insight as to why hospitals chose to consolidate and found that facilities with a higher patient case mix, lower cash flow margin, and fewer occupied hospital beds are more often targets for acquisition, providing the resources to address changing market forces and the acquiring hospital able to provide corporate expertise on how to promote services and expand market share. McCue also found that location matters for acquisition in the market-driven since acquisitions tend to take place in an area where hospitals can gain leverage in negotiating higher rates. Hospitals were also interested in acquiring facilities with new equipment to avoid making those investments directly and allocate those funds towards purchasing physician practices (McCue et al, 2015). Alternative research suggests consolidation and system membership may reduce duplication of services, improve recruitment of highly skilled employees, offer more favorable opportunities to raise capital, and enhance marketing efforts, all of which may be instrumental in transitioning from volume to value reimbursement (Walker et al, 2018). Additionally, regional consolidation and the subsequent experience of collaborating with other providers in a local market may support better population health to maintain and improve retention across the care continuum (Walker et al, 2018).

One incentive for horizontal consolidation is that "practice-practice consolidation appears to increase stability of physician networks. This may be indicative of the motivation for consolidation: acquired physicians take up excess capacity that other physicians in that practice were unable to accommodate without increasing their practice size" (O'Hanlon, 2019). Proximity within a practice enables physicians to get to know each other better and reduce transaction costs incurred by creating new referral relationships, which include the time and

effort it takes to interact with other care providers effectively and efficiently, and this may be a way that consolidation can result in lower costs and higher quality care for patients.

Hospital bed size and population density may influence the likelihood that a small to medium hospital is acquired by a hospital system. Smaller rural hospitals are more likely to be targets of acquisitions and consolidation. Williams & Spaulding (2018) estimate that the percent of merger and acquisition activity related to targeting rural hospitals is increasing over time, where smaller hospitals are targets for acquisition and larger hospitals can assert their dominance over wider geographic regions. Further evidence suggests that as hospitals are deciding to consolidate, rural hospitals continue to be a common target for acquisition because they do not generate the capital necessary to invest in infrastructure improvements needed for value-based purchasing payment models. Consolidating with small rural hospitals and local physician practices is also an ideal way for larger systems to gain market share. The ACA promotes collaboration through the development of accountable care organizations (ACO's), which is when doctors, hospitals, and providers come together to provide coordinated care, to avoid duplication of services and medical errors (Centers for Medicare and Medicaid Services, 2023). Small rural hospitals have a hard time thriving in ACO's due to their small patient volume and geographic isolation, and with consolidation gain access to electronic health records, expanded services, expensive medical technology, and increased access to specialists to accomplish the goal of providing coordinated healthcare (Noles et al, 2015).

Merger Costs to hospital systems:

Few studies have reported a direct increase in hospital system prices related to hospital consolidation. Lin and colleagues (2021) performed a longitudinal analysis vertically integrated hospital. Hospital prices increased on average by 3–5% following integration. The hospital systems in their analysis did not experience any notable improvements in quality of care across patient case mixes. Price increases across the general hospital system were attributed to stronger bargaining leverage and foreclosure of rival hospitals as potential mechanisms for the estimated price effects (Lin et al., 2021).

Koch et al. examined spending for hospital cardiology services between consolidated and non-consolidated health systems and found that an increase in market concentration was associated with 7 to 11 percent increase in cardiology healthcare spending (Koch et al., 2018). The study also captured the effects on health outcomes and utilization and found that increases in cardiology market concentration are associated with worse health outcomes and overall higher health care expenditures.

Changes in Medicare Reimbursement:

Changes in Medicare reimbursement have been noted in 2 studies looking at physicians working in vertically integrated hospitals and vertically integrated skilled nursing facilities. Post et al. compared different types of physician reimbursement under the Medicare outpatient price update. The study compared physicians practicing in integrated settings to independent practice physicians and found that payments were $114,000 higher per physician per year if a physician practiced in an integrated setting. Integrated primary care physicians experience a 78% increase, medical specialists 74%, and surgeons 224% in comparison to providers at physician practices

that remained independent (Post et al., 2021). Additionally, Konetzka et al. found that vertical integration between hospitals and skilled nursing facilities increases Medicare payments and reduces rehospitalization rates, but vertical integration between hospitals and home health agencies has little to no effect on payments. Integrated hospital-skilled nursing facilities receive higher total Medicare payments for the first 60 days of care than hospital-skilled nursing facility pairs that are not vertically integrated by $2424 per beneficiary. From the Medicare perspective, costs increase under vertical integration and produce longer stays, but there is some value from this in the form of reduced readmission rates (Konetzka et al., 2018).

Physician Prices:

Four studies have examined the impact of vertical integration on prices charged by physicians. Carlin et al. examined the impact of integration of three multispecialty clinic systems by two hospital-owned procedure-specific physician prices and found evidence of an increase in physician prices at both the acquired clinic system and the acquiring legacy clinics 4 years after the acquisitions. Average physician prices in the acquired clinic systems were "32–47% higher than the expected in absence of the acquisitions and average physician prices in the legacy clinics were 14–20% higher than the expected" (Carlin et al., 2017).

Godwin et al included the billing of hospital facility fees in their analysis and did not find that hospital-physician vertical integration was associated with the billing of facility fees for office visits. However, vertical integration did affect office visit physician prices for some specialties in vertically integrated hospital systems where "a 10-percentage-point increase in vertical integration was associated with a 1.0% price increase for primary care, a 0.6% increase for

orthopedics, and a 0.5% increase for cardiology but no such association was found for obstetrics/gynecology or oncology" (Godwin et al., 2021). The authors conclude that the price increase associated with physicians practicing in integrated settings may have anticompetitive implications if no significant quality improvements are also associated with this increase in prices.

Whaley et al. also found that vertical integration of physician practices with hospitals or health systems was associated with lower income for nonsurgical specialists, no difference in income for primary care physicians, and slightly higher income for surgical specialists (Whaley et al., 2021a). Finally, Scheffler et al. looked at physician prices by market concentration across California and found that higher primary care physician concentration of physicians practicing in integrated settings was positively associated with prices. They similarly found a positive and highly significant ($p < 0.01$) relationship between the level of vertical integration and specialist prices. (Scheffler et al., 2018)

Changes in other health services:

Whaley et al, examined changes in lab imaging and testing in a primary care physician group after vertical integration. Their analysis found that there was an increase of $6.38 in cost per procedure for imaging tests and $0.57 for laboratory tests—relative increases of 2.0 percent and 3.8 percent, respectively. Across "all services performed during the period examined and among the sample, these increases translated to increases of $40.2 million and $32.9 million in Medicare spending, respectively" (Whaley et al., 2021b).

Drug Costs:

Jung et al. assessed drug related costs in their analysis of outpatient chemotherapy use and spending in Medicare. Their findings concluded that vertical integration decreased the frequency of chemotherapy service use, increased spending on chemotherapy drugs through changes in treatment mix, while spending on chemotherapy administration increased after integration due to different Medicare payments by site. They note that integrated oncologists use fewer services but more expensive treatments, however, the impact on chemotherapy-administration spending is modest because the difference in administration payments by site was relatively small (Jung et al., 2019).

Costs to the Patients:

Baker et al., examined the effects of vertical integration on patient hospital choice and found that a hospital's ownership of a physician practice increases the probability that the physician's patients will receive care at the hospital that acquired the practice By contrast, patients are more likely to choose a high-cost hospital when their physician is owned by that hospital, and more likely to choose a hospital that is low quality and farther from the patient's residence, although the latter result is sensitive to the method by which patients are assigned to physicians (Baker et al., 2016).

Scheffler et al also viewed how increased concentration of vertically integrated hospitals in California effected insurance premium prices for those participating in the state's health insurance market exchange. For a hospital in a moderately concentrated area (HHI between 1,500 and 2,500), the predicted average monthly marketplace premium for a forty-year-old person was about $375 in 2017. When hospital concentration increased, the "predicted premium

rose to about $400 (a 7 percent increase) if the percentage of physicians in practices owned by hospitals was 35 percent or more (the sample mean). If this percentage was 55 percent (the sample maximum), the predicted average monthly premium increased by even more-to about $419 (a 12 percent increase)" (Scheffler et al., 2018). They suggest that the association between hospital market concentration and insurance premiums varies with the percentage of physicians in practices owned by hospitals (an interaction effect) and that the impact of hospital concentration on premiums becomes larger as vertical integration increases (Scheffler et al., 2018).

Consolidation and the distribution of healthcare services following a merger

Although merging with a large hospital system may improve any specific facilities financial sustainability, this may require that some service lines seen as crucial to the community are maintained following a merger. Examples of this reduced service availability is seen with fewer maternal/neonatal, surgical, and mental/substance use disorder services among hospitals acquired in mergers, while these services increased within hospitals that remained independent, suggesting a potential unmet need in the communities of rural hospitals post-merger (Fingar et al, 2021).

Following health system affiliation, rural hospitals experienced a significant reduction in on-site diagnostic imaging technologies, the availability of obstetric and primary care services, and outpatient nonemergency visits, as well as a significant increase in operating margin. However, this observed increase was not accompanied by increased utilization or a reduction in uncompensated or unreimbursed care, which suggests that the increased operating margins may

be due to a combination of reduced provision of unprofitable services, increased prices, and improved efficiency (O' Hanlon et al, 2019). In a study that interviewed community stakeholders in Pittsburgh, Pennsylvania about their perceptions and experience of health care consolidation, community members largely expressed that specialty services and non-emergency care like screening colonoscopies and orthopedic surgeries had become more difficult to obtain for discounted rates due to consolidation. Participants stated that more charity care was available prior to mergers (O'Hanlon, 2020). There is some evidence that suggests that hospital mergers improve access to surgical care for Medicaid recipients. Surgical practices that had merged into a larger hospital system were more likely to accept Medicaid in the future. With vertical integration, however, this increased access to surgical specialists for Medicaid populations is accompanied by higher costs. Vertical integration has consistently been associated with higher prices of care delivery due to large, integrated health care systems exploiting their greater market power. These increased prices after vertical integration are not associated with significant improvement in quality metrics, such as hospital length of stay or patient satisfaction, leading some to argue that vertical integration threatens the affordability of health services. The high prices set by integrated health systems will prevent sustainable access to surgical specialists for low-income populations. Medicaid systems will likely not be able to compete with the prices set by a powerful hospital market in the long term (Haddad & Resnick, 2020).

Antitrust Laws and State Oversight Limitations and Lack of Equity Consideration

Three key federal antitrust laws govern competition: the Sherman Antitrust Act, the Clayton Antitrust Act, and the Federal Trade Commission Act (FTCA). Section 1 of the Sherman Antitrust Act prohibits contracts, combinations, and conspiracies "in restraint of trade," which in

health care often occur in contracts between providers and insurers. The Clayton Act prohibits mergers and acquisitions that may lessen competition or tend to create a monopoly. The FTCA prohibits "unfair methods of competition," which include all violations of the Sherman and Clayton acts, and "unfair or deceptive acts and practices (Berenson, et al. 2020). State attorney generals can examine the impact of health care entities' behavior on more than just competition, including considerations of charitable trust doctrine, consumer protection, and the public interest. Instead of negotiating a consent decree, states, wishing to approve a merger with conditions, can also issue a certificate of public advantage (COPA), a legal mechanism by which the state approves a health care merger and shields it from federal antitrust enforcement by committing to state oversight and supervision of the merged entity's prices and conduct. States do this to grant immunity to the merging entities and avoid scrutiny from federal regulators. However, the FTC reports that COPA's are not sustainable, and often are overturned, leaving communities with a monopolized hospital market, and continuously driving up prices with no evidence of improved quality of care (FTC, 2022). State government oversight of hospital transactions has diminished in recent years. This formally existed in the form of "certificate of need" (CON) programs, designed during the 1960s and 1970s, states were federally mandated to implement them when concerns arose about hospital expansion and the potential duplication of services that could lead to increases in health care costs. CON programs were implemented to ensure that health care business decisions aligned with need assessments and regional health planning. After the repeal of the Health Planning Resources and Development Act in 1987, many states terminated their CON laws or greatly diminished their scope, since there was no longer a federal mandate. Currently, 36 states still have CON programs, but they have not adapted them to assess

community health needs along with the changing landscape of the largescale mergers and consolidations of today (Khaikin & Uttley, 2016).

From an antitrust law perspective, both high-risk and low-risk consumers count equally. Although the use of a consumer welfare standard treats the same people unequally in their roles as workers and producers, it treats all consumers as equally deserving with respect to consumption. If a merger between a health insurer and a drug supplier leads to an increase in the cost of treatment for high-risk consumers but to a reduced cost for lower-risk ones, the antitrust enforcers might thus accept the merger even though it could harm the most vulnerable populations. This is antitrust law's blind spot. By aggregating consumers into one group without weighing the circumstances and the interests of different consumer groups, antitrust law often fails to consider "the effects on different classes or types of consumers that are affected by the conduct or the transaction" (Stavroulaki, 2022).

Hospital consolidation is also supported by the nature of antitrust regulations, which are limited by how markets are defined. Since the 1990s, academics and regulators have defined local markets in health care using tertiary hospital catchment areas or hospital referral regions (HRRs). HRRs were constructed based on referral patterns of cardiovascular and neurosurgery hospitalizations from 1992-1993 Medicare data for research purposes. Yet these outdated HRRs meant for research are frequently used in antitrust enforcement today, despite the hospital mergers that have occurred since their development. HRRs are larger areas that do not capture where patients are realistically accessing their care and clouds antitrust regulators judgement of the localized impacts of healthcare consolidation (Kocher et al, 2021).

Consequences of Consolidation: Gaps to be Filled

While the results of post-ACA hospital consolidation continue to unveil, several concerns exist on the effects of these business-driven decisions. One is the ability of large health systems to meet community needs at the local level if hospital systems are consolidating across vast geographic areas. A reason often cited for consolidating is that integrated care can be managed under one roof, however, consolidation does not equate to integration. "Clinical integration requires meaningful data sharing, systems for effective handoffs, and streamlined care transitions. These processes can be achieved through other mechanisms, such as participating in health information exchanges" (Tsai & Jha 2014). However, larger systems may be less motivated to join health information exchanges if they already capture a large proportion of patients' clinical information internally. In such instances, hospital mergers may create new islands of data in which information is seen as a tool to retain patients within their system, not as a tool to improve care (Tsai & Jha 2014). Further implications of consolidation on patient satisfaction should be explored, a study concluded that increased vertical integration of physicians and hospitals (defined loosely as employment of physicians by hospitals), reduced patient satisfaction scores and suggests that integration leads to less incentive to keep patients' content in the face of decreased competition (Manas, 2020). This may also lead to further needed research on how consolidation impacts quality. Legal concerns surrounding anti-trust laws are legitimate, as we are seeing the effects of consolidation on prices, "the smaller number of independent hospitals represents a loss of alternatives for patients and fewer costs for health systems do not transpire into lower prices for patients (Jakubiec 2021). For example, in a Federal Trade Commission lawsuit, the FTC blocked the proposed acquisition believing the transaction

would substantially lessen competition in the Memphis area. The complaint alleged once the proposed acquisition was completed, healthcare costs will escalate, the incentive to expand offerings, invest in technology, improve access to care and the emphasis on providing quality of care will fade. Consequently, as a response the Biden Administration has urged the Federal Trade Commission to closely examine acquisitions and mergers that can lead to higher consumer prices and Biden called out mergers that have "left rural communities without good options for convenient and affordable healthcare service. Due to unchecked mergers, the ten largest systems now control a quarter of the market" (Jakubiec 2021). Williams & Spaulding (2018) found that mergers that consolidate markets lead to price increases regardless of ownership status. However, it is not known whether private or publicly traded firms lead to higher prices compared to hospital prices of nonprofit hospitals in non-consolidated markets. Finally, reasons that hospitals have separated from their mergers and consolidation agreements should be explored to identify the shortfalls of the practice, "most of the hospitals that joined a larger system accomplished greater revenue but failed to become more efficient. Often the acquired hospital of a system asserts that expectations were not met, cultures clashed, executive turnover disrupted operations, performance declined, and the hospital's autonomy is lost" (Jakubiec, 2021).

Price discrimination can also be a consequence of severely concentrated healthcare market. Generally, hospital price discrimination primarily disadvantages low-income and minority populations. Hospitals will utilize the cash flow from private health plans to gain market share (through marketing or acquisitions) or enhance quality. This enhances the hospital's pricing power, which then increases the financial incentive to tilt services even further toward the privately insured, which tend to be disproportionately white, higher income individuals. For example, in 2017, the average hospital was paid approximately $10,700 for treating a Medicare

patient with heart failure and shock. That payment would have dropped to roughly $7,500 if the patient were covered by Medicaid (base rate only) but would have averaged approximately $21,000 if the patient were privately insured (Kaplan & O'Neill, 2020). More research is needed on the long-term effects of consolidation on access and distribution of healthcare. Further insight to the consequences of consolidation can better protect patients as consumers of healthcare.

Conceptual Model:

Healthcare access exists where services are available and there is adequate supply. Reducing the supply of services to contain prices or costs decreases access. Gaining access depends on financial, organizational, and social or cultural barriers that limit utilization. Access will be assessed through spending on 4 types of healthcare consumers following a hospital merger: Medicaid recipients, commercial payers, Medicare, and charity care consumers. The main framework stems from Aday & Andersen's (1984) Framework for the Study of Access. In their framework, access to healthcare is categorized into 4 healthcare dimensions: Potential Access – Structural Indicators, Potential Access – Process Indicators, Realized Access – Objective Indicators, and Realized Access – Subjective Indicators. In this paper the analysis will focus on potential access and its structural indicators. This dimension is categorized by the characteristics of the healthcare system and is further broken down by healthcare availability: volume & distribution. In this model, access to healthcare is assessed at the individual hospital level, and the change of percentage of total hospital services provided to individual payers (Medicaid recipients, commercial payers, Medicare, and charity care/uninsured consumers) will indicate whether there has been a change in the distribution of healthcare. A change in the distribution of

healthcare following a merger will provide insight into understanding whether healthcare access has been affected by a merger.

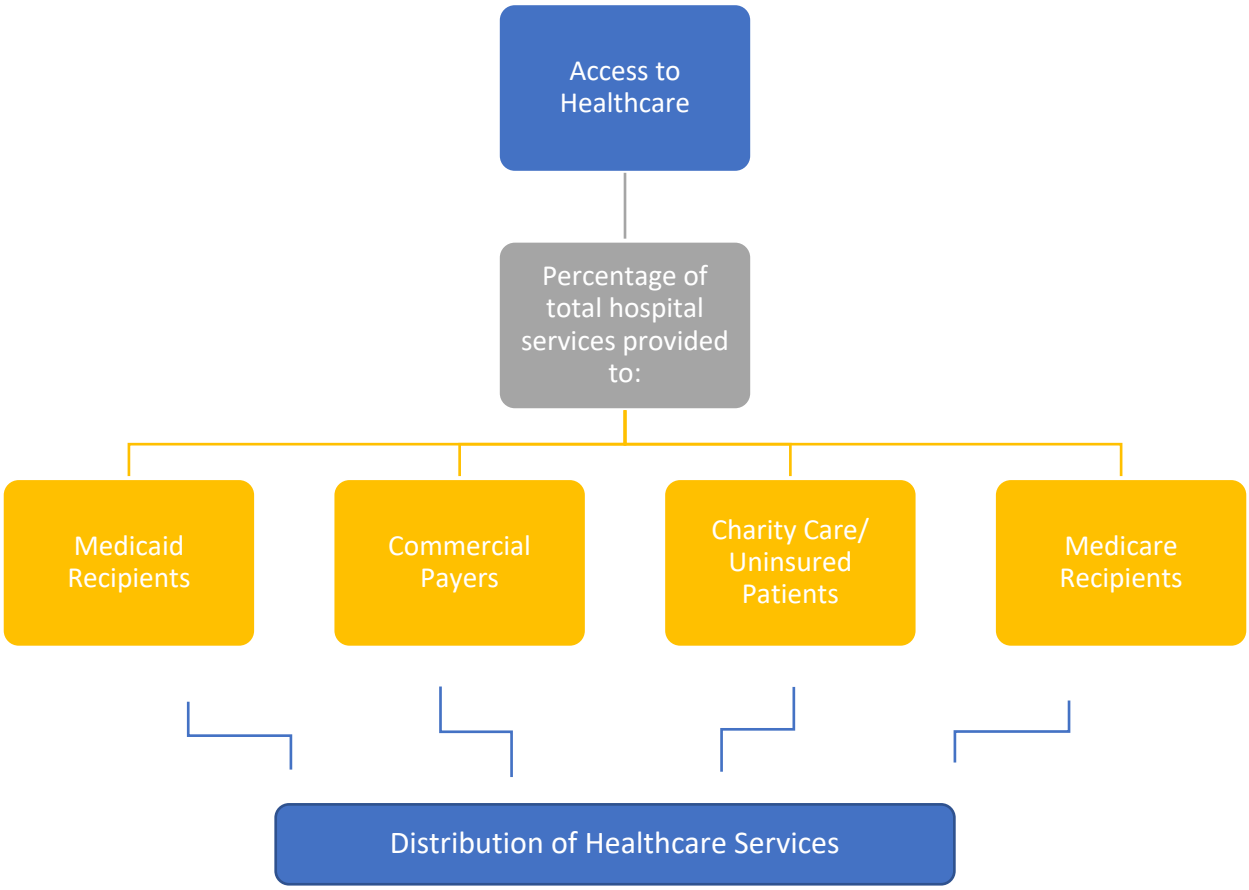

Figure 1. Conceptual Model

Data Sources:

Hospital Change of Ownership - The Hospital Change of Ownership (CHOW) dataset provides information on the hospital ownership changes that occurred on or after January 1, 2016. This data includes information on the buyer and seller organization's legal business name, provider type, change of ownership type (CHOW, Acquisition/Merger, or Consolidation) and the effective

date of the change. The Centers for Medicare & Medicaid Services (CMS) is collecting this data to ensure transparency and to promote competition in the U.S healthcare system (Centers for Medicare and Medicaid, 2022).

Hospital Cost Tool Dataset - This dataset was produced and released in November 2022 by the Coverage, Cost, and Value team at the National Academy for State Health Policy (NASHP) in collaboration with Rice University's Baker Institute for Public Policy, with funding from Arnold Ventures. Sources for this dataset include the Healthcare Cost Report Information System, 2018 Compendium of U.S. Health Systems, and RAND 3.0 and 4.0 supplemental data. The hospital cost tool includes data for hospitals up until July 2021, creating a 1-year discrepancy between the data presented in the CHOW dataset, which reports data up until 2022. The hospital cost tool did not capture data for specialty hospitals, behavioral health, or skilled nursing facilities, so they are not included in the analysis. Hospital change ownership was matched to the hospitals available in the Hospital Cost Tool.

RUCA Code - U.S. census tracts using measures of population density, urbanization, and daily commuting. 33 RUCA codes are aggregated into seven categories: urban, other urban, large rural core, other large rural, small rural core, other small rural, and isolated.

States Chosen for Analysis:

The states were chosen for having had 15 or more mergers or changes in ownership reported on the CHOW data from 2016-2022. In total, 7 states were chosen: Florida (FL), California (CA),

South Carolina (SC), Texas (TX), Louisiana (LA), Pennsylvania (PA), and Illinois (IL). The total mergers amongst them were 216. We excluded specialty hospitals, behavioral health, skilled nursing facilities, (SNFs) because the payers typically reimbursing events in these facilities are limited to Medicaid and commercial insurers and are therefore less sensitive to changes following a merger as well as that occurred after July 2021 because of the lack of post-merger experience within the data used for these analyses. States were also chosen for their diverse regulatory practices of hospital mergers (Table 1). Florida, South Carolina, and Illinois all continue to require approval of a Certificate of Need (CON) in their states. However, the CON requirements vary significantly by state. In Florida, the activities that would trigger the CON would be the addition of beds in community nursing homes or intermediate care facilities for the developmentally disabled, construction of new facilities, conversion of a facility from one type to another (including conversion of general hospital or long-term care hospital to a Class II, III or IV specialty hospital), and establishment of hospice or hospice inpatient facilities. In South Carolina, a new health care facility (acute care hospitals, psychiatric hospitals, alcohol, and substance abuse hospitals, etc.), change in bed complement, or new medical equipment exceeding $600,000 will trigger a CON (NASHP, 2020). Similar activity will trigger a CON in IL, and closing a facility, changing ownership of a facility, or discontinuing a service. Unfortunately, the CON does not apply to all hospital transactions, but mostly to specialized facilities such as long-term care facilities or dialysis centers (NASHP, 2020). PA and CA do not require a CON, but still have mechanisms for rigorously assessing mergers. In PA, the state attorney general has oversight authority, which requires notice of all nonprofit health entity transactions with review and based on consideration of public interest and antitrust implications. Additionally, the attorney general may challenge transactions in court and maintain post-merger

oversight. Texas is one of the states with the least restrictions on mergers, requiring just a non-compete agreement for physicians, but does not provide statutory authority for notice or review of mergers and acquisitions involving healthcare entities. They largely rely on COPA agreements to bypass strict FTC review of their hospital mergers. LA relies on a combination of COPA and state attorney general approval for mergers (UC Law San Francisco, 2023).

Variable Classification:

Unit of Analysis – Hospital Year

Exposure Variable – The exposure variable, "Hospital Merger", was extracted from the CMS CHOW dataset, and is a categorical predictor variable.

Intermediate Variables

- Hospital Ownership Type: Hospital ownership classification (Non-Profit, For-Profit, or Governmental).
- Bed Size: Small (> 50), Medium (100>500), Large (500 >1000), and Very Large (<1000)
- RUCA codes: Categorical
    - Urban: 1.0, 1.1, 2.0, 2.1, 3.0, 4.1, 5.1, 7.1, 8.1, 10.1;
    - Non-urban:
        - large rural: 4.0, 4.2, 5.0, 5.2, 6.0, 6.1;
        - small rural: 7.0, 7.2, 7.3, 7.4, 8.0, 8.2, 8.3, 8.4, 9.0, 9.1, 9.2;
        - isolated: 10.0, 10.2, 10.3, 10.4, 10.5, 10.6.

Outcome Variable – The outcome variable is quantitative and continuous. It is divided by payer mix:

- % of total hospital services provided to Medicaid patients, as measured by Hospital Charges.
- % of total hospital services provided to all other Commercial payers (insured plans, employer self-funded plans, TriCare, VA, etc.), as measured by Hospital Charges.
- % of total hospital services provided to Medicare patients (including Medicare advantage), as measured by Hospital Charges.
- Combined % of Charity Care Payer Mix and Uninsured and Bad Debt Payer Mix as measured by Hospital Charges

Hypothesis:

- Null Hypothesis: Hospitals where consolidation, change of ownership, and mergers have taken place have no significant change in the immediate year(s) following a merger in spending of healthcare services for different types of payers (Medicaid, Medicare, Commercial, Uninsured/Charity Care)

- Hypothesis: Hospitals that engage in consolidation, change of ownership, and mergers experienced changes in the immediate year(s) following a merger in spending of healthcare services for different types of payers (Medicaid, Medicare, Commercial, Uninsured/Charity Care), which indicates a change in the distribution of healthcare services

Statistical Methods:

We used a repeated measures generalized linear model to assess the impact of hospital mergers and acquisition over time. The number of hospital years following a merger varied by hospital. The percent of patients within each market segment (Medicaid, Medicaid, commercial and charity care) was estimated as a function of: merger/acquisition status, hospital size measured as small, medium or large staffed beds, hospital ownership type (private for profit, private non-profit and public), whether the hospital operated in an urban or non-urban setting and an interaction between ownership and merger status nested within the state in which the hospital operates the state in which the hospital operates. This approach allows for a repeated measures framework that does not require the same number of observations per time period, which in this case is hospital year.

Results

The sample size included 15619 total observations, of which 369 observations had captured the presence of a hospital merger. A majority of the sample consisted of non-profit hospitals (N=7875), followed by for-profit (N=4712) and Governmental (N=3226) (Table 1). California contained the largest proportion of merged hospital observations (.69%), followed by Florida (.43%) and South Carolina (.38%) (Table 1). Many of the hospitals observed were in areas classified as urban or moderately urban according to the RURAC code classification, and were medium sized, except for Texas which had the largest proportion of hospitals with less than 50 beds (Table 2).

Inferential Statistics Results:

When stratified by hospital ownership, there were notable statistically significant results ($p \leq 0.05$) within the sample. The impact of a merger on a non-profit was an increase of 3% (Table 4) in the percent of patients insured through Medicaid ($p < .024$). Among for profit hospitals, a merger was associated with an increase of 1.3% in the percent of patients for whom charity care was provided ($p <.005$) following a merger (Table 5), whereas there was a lower proportion (3.5%) of patient for whom charity ($p<.005$) following a merger (Table 6). However, there was no association between a merger and the percent of patients insured through Medicare for any hospital ownership type. (Table 7).

Discussion:

The purpose of this analysis was to assess to what degree hospitals that engage in consolidation, change of ownership, or mergers impact the distribution of payer mix. The findings suggest that Medicaid recipients are gaining access to consolidated hospital systems. However, there is concern of how sustainable the continuity of care will be for patients receiving care in largely concentrated markets, as the Medicaid system will have to keep up with the prices set by these hospitals with substantial market power. There is still more information needed on how regulatory processes at the state and federal level will continue to affect the approval of hospital mergers. For-profit hospitals that consolidated were shown to provide more charity care following a merger. The provision of more charity care may be a condition of merger approval in certain states or at the federal level. While this analysis was limited to only seven states and there were missing observations for hospital mergers which did not take place between the years 2016-2021, it provides some insight towards the effects consolidation may have on payers and how health insurance providers may be responding to changes in the hospital market.

Sources

Aday, Lu Ann, and Ronald M. Andersen. "Equity of Access to Medical Care: A Conceptual and Empirical Overview." *Medical Care*, vol. 19, no. 12, 1981, pp. 4–27. JSTOR, http://www.jstor.org/stable/3763937.

Baker, L. C., M. K. Bundorf, and D. P. Kessler, 2016, The effect of hospital/physician integration on hospital choice: *Journal of Health Economics*, v. 50, p. 1-8.

Berenson, R. A., King, J. S., Gudiksen, K., Murray, R., & Shartzer, A. (2020). *Addressing Health Care Market Consolidation and High Prices: The Role of the States, Urban Institute.* Available at: https://www. urban. org/sites/default/files/publication/101508/addressing_

Carlin, C. S., R. Feldman, and B. Dowd, 2017, The impact of provider consolidation on physician prices: *Health Economics*, v. 26, p. 1789-1806.

Centers for Medicare and Medicaid Services. (2022, April 20). *Press release HHS Releases New Data and Report on Hospital and Nursing Home Ownership*. CMS. https://www.cms.gov/newsroom/press-releases/hhs-releases-new-data-and-report-hospital-and-nursing-home-ownership

Centers for Medicare and Medicaid Services. (2023, April 13). *Accountable Care Organizations (ACOs): General Information*. CMS Innovation Center. https://innovation.cms.gov/innovation-models/aco

Fulton, B. D. (2017). Health care market concentration trends in the United States: evidence and policy responses. *Health Affairs*, *36*(9), 1530-1538.

Furukawa, M. F., Kimmey, L., Jones, D. J., Machta, R. M., Guo, J., & Rich, E. C. (2020). Consolidation Of Providers Into Health Systems Increased Substantially, 2016–18: Study examines provider consolidation into vertically-integrated health systems. *Health Affairs*, *39*(8), 1321-1325.

Federal Trade Commission (FTC). 2022. *Key COPA Facts.* https://www.ftc.gov/system/files/ftc_gov/pdf/Key_COPA_Facts.pdf

Godwin, J., D. R. Arnold, B. D. Fulton, and R. M. Scheffler, 2021, The Association between Hospital-Physician Vertical Integration and Outpatient Physician Prices Paid by Commercial Insurers: New Evidence: Inquiry-the Journal of Health Care Organization

Haddad DN, Resnick MJ, Nikpay SS. Does Vertical Integration Improve Access to Surgical Care for Medicaid Beneficiaries? *J Am Coll Surg*. 2020 Jan;230(1):130-135.e4. doi: 10.1016/j.jamcollsurg.2019.09.016. Epub 2019 Oct 28. PMID: 31672671; PMCID: PMC9109457.

Henke, R. M., Fingar, K. R., Jiang, H. J., Liang, L., & Gibson, T. B. (2021). Access to obstetric, behavioral health, and surgical inpatient services after hospital mergers in rural areas. Health Affairs, 40(10), 1627-8. https://doi.org/10.1377/hlthaff.2021.00160

Jakubiec, Pauline. (2021). Yea or Nay? Hospital Mergers and Acquisitions. *Journal of Health Care Finance*.

Jung, J., R. Feldman, and Y. Kalidindi, 2019, The impact of integration on outpatient chemotherapy use and spending in Medicare: *Health Economics,* v. 28, p. 517-528.

Kaplan, A., & O'Neill, D. (2020). Hospital price discrimination is deepening racial health inequity. *NEJM Catalyst Innovations in Care Delivery*, *1*(6). Retrieved from https://catalyst.nejm.org/doi/full/10.1056/CAT.20.0593

Karyn, K., Lopez, E., Rae, M., & Neuman, T. (2020, September 2). What We Know About Provider Consolidation. Kaiser Family Foundation. Retrieved from https://www.kff.org/health-costs/issue-brief/what-we-know-about-provider-consolidation/

Khaikin, C., & Uttley, L. (2016). State Oversight of Hospital Consolidation: Inadequate to Protect Patients' Rights and Community Access to Care. *AMA Journal of Ethics*, *18*(3), 272-278.
Koch, T., B. Wendling, and N. E. Wilson, 2018, Physician Market Structure, Patient Outcomes, and Spending: An Examination of Medicare Beneficiaries: Health Services Research, v. 53, p. 3549-3568.

Kocher RP, Shah S, Navathe AS. Overcoming the Market Dominance of Hospitals. JAMA. 2021;325(10):929–930. doi:10.1001/jama.2021.0079

Konetzka, R. T., E. A. Stuart, and R. M. Werner, 2018, The effect of integration of hospitals and post-acute care providers on Medicare payment and patient outcomes: Journal of Health Economics, v. 61, p. 244-258.

Lin, H., I. M. McCarthy, and M. Richards, 2021, Hospital Pricing Following Integration with Physician Practices: Journal of health economics, v. 77, p. 102444.

Lineen, J. (2014). Hospital consolidation:"safety in numbers" strategy prevails in preparation for a value-based marketplace. *Journal of Healthcare Management*, *59*(5), 315-317

Manas, J. S. (2020). PRACTITIONER APPLICATION: Better Together? An Examination of the Relationship Between Acute Care Hospital Mergers and Patient Experience. *Journal of Healthcare Management*, *65*(5), 344-345.

McCue, M. J., Thompson, J. M., & Kim, T. H. (2015). Hospital acquisitions before healthcare reform. *Journal of Healthcare Management*, *60*(3), 186-203.

National Academy for State Health Policy (NASHP). (2020, May 22). *50-State Scan of State Certificate-of-Need Programs*. NASHP. https://nashp.org/50-state-scan-of-state-certificate-of-need-programs/.
National Academy for State Health Policy (NASHP). (2022, November 21). *Hospital Cost Tool (HCT) dashboard*. https://d3g6lgu1zfs2l4.cloudfront.net

Noles, M. J., Reiter, K. L., Boortz-Marx, J., & Pink, G. (2015). Rural hospital mergers and acquisitions: which hospitals are being acquired and how are they performing afterward?. *Journal of healthcare management*, *60*(6), 395-407.

O'Hanlon, C. E., Whaley, C. M., & Freund, D. (2019). Medical practice consolidation and physician shared patient network size, strength, and stability. *Medical Care*, *57*(9), 680-687.

O'Hanlon, C. E., Kranz, A. M., DeYoreo, M., Mahmud, A., Damberg, C. L., & Timbie, J. (2019). Access, quality, and financial performance of rural hospitals following health system affiliation. *Health Affairs*, *38*(12), 2095-2104.

O'Hanlon CE. Impacts of Health Care Industry Consolidation in Pittsburgh, Pennsylvania: A Qualitative Study. *INQUIRY: The Journal of Health Care Organization, Provision, and Financing*. 2020;57. doi:10.1177/0046958020976246

Post, B., E. C. Norton, B. Hollenbeck, T. Buchmueller, and A. M. Ryan, 2021, Hospital-physician integration and Medicare's site-based outpatient payments: *Health Services Research,* v. 56, p. 7-15.

Scheffler, R. M., Arnold, D. R., & Whaley, C. M. (2018). Consolidation trends in California's health care system: impacts on ACA premiums and outpatient visit prices. *Health Affairs*, *37*(9), 1409-1416.

Stavroulaki, T. (2022). Mergers that harm our health. *Berkeley Business Law Journal*,19(1), 89-125.

Tsai, T. C., & Jha, A. K. (2014). Hospital consolidation, competition, and quality: is bigger necessarily better? *Jama*, *312*(1), 29-30.

UC Law San Francisco. (2023). *State Action*. The Source on HealthCare Price and Competition. https://sourceonhealthcare.org/state-action/

United States Department of Justice. (2018, July 31). *Herfindahl-Hirschman Index - Antitrust Division*. Antitrust Division. https://www.justice.gov/atr/herfindahl-hirschman-index

Walker, D. M., Mora, A. M., Hogan, T. H., Diana, M. L., & McAlearney, A. S. (2018). Assessing trends in hospital system structures from 2008 to 2015. *Medical Care*, *56*(10), 831-839.

Whaley, C. M., D. R. Arnold, N. Gross, and A. B. Jena, 2021a, Physician Compensation In Physician-Owned And Hospital-Owned Practices*: Health Affairs,* v. 40, p. 1865-1874.

Whaley, C. M., X. X. Zhao, M. Richards, and C. L. Damberg, 2021b, Higher Medicare Spending On Imaging And Lab Services After Primary Care Physician Group Vertical Integration: Health Affairs, v. 40, p. 702-709.

Williams, D. R., & Spaulding, T. J. (2018). An empirical study of the determinants of location of hospital mergers and acquisitions: 1997-2016. *Journal of health care finance*.

Xu, T., Wu, A. W., & Makary, M. A. (2015). The potential hazards of hospital consolidation: implications for quality, access, and price. *Jama*, *314*(13), 1337-1338.

Table 1
Payer Mix by Hospital Ownership Type

	No Merger				Merger			
	Charity Care Payer Mix	Commercial Payer Mix	Medicare Payer Mix	Medicaid Payer Mix	Charity Care Payer Mix	Commercial Payer Mix	Medicare Payer Mix	Medicaid Payer Mix
For-Profit (N=4712)	26.84%	29.31%	29.15%	28.55%	0.59%	0.62%	0.61%	0.62%
Governmental (N=3226)	19.83%	19.82%	20.20%	19.93%	0.23%	0.22%	0.22%	0.23%
Non-Profit (N=7875)	50.92%	48.52%	48.32%	49.13%	1.58%	1.51%	1.50%	1.54%
Grand Total (N=15619)	**97.60%**	**97.64%**	**97.66%**	**97.61%**	**2.40%**	**2.36%**	**2.34%**	**2.39%**

Table 2

Observations by State and Bed size

	NO MERGER	MERGER	GRAND TOTAL (N=15619)
CA	**22.89%**	**0.69%**	**23.58%**
LARGE	0.95%	0.00%	0.95%
MEDIUM	15.11%	0.51%	15.61%
SMALL	6.84%	0.18%	7.02%
VERY LARGE	0.00%	0.00%	0.00%
FL	**12.36%**	**0.43%**	**12.79%**
LARGE	1.29%	0.06%	1.35%
MEDIUM	7.96%	0.27%	8.23%
SMALL	2.84%	0.10%	2.94%
VERY LARGE	0.27%	0.00%	0.27%
IL	**12.24%**	**0.20%**	**12.44%**
LARGE	0.52%	0.01%	0.53%
MEDIUM	6.00%	0.19%	6.18%
SMALL	5.72%	0.00%	5.72%
VERY LARGE	0.00%	0.00%	0.00%
LA	**8.18%**	**0.21%**	**8.39%**
LARGE	0.18%	0.04%	0.23%
MEDIUM	2.61%	0.14%	2.75%
SMALL	5.38%	0.03%	5.40%
VERY LARGE	0.01%	0.00%	0.01%
PA	**11.57%**	**0.09%**	**11.65%**
LARGE	0.78%	0.00%	0.78%
MEDIUM	6.03%	0.03%	6.06%
SMALL	4.67%	0.06%	4.72%
VERY LARGE	0.09%	0.00%	0.09%
SC	**3.86%**	**0.38%**	**4.24%**
LARGE	0.22%	0.06%	0.27%
MEDIUM	1.91%	0.10%	2.01%
SMALL	1.73%	0.22%	1.95%
VERY LARGE	0.00%	0.00%	0.00%
TX	**26.57%**	**0.34%**	**26.91%**
LARGE	1.15%	0.00%	1.15%
MEDIUM	8.79%	0.15%	8.94%
SMALL	16.39%	0.18%	16.57%
VERY LARGE	0.24%	0.00%	0.24%
MISSING	0.00%	0.01%	0.01%
TOTAL	**97.67%**	**2.33%**	**100.00%**

Table 3

Observations by State and Urban/Non-Urban Classification

	No Merger	Merger	Grand Total (N=15619)
CA	**22.89%**	**0.69%**	**23.58%**
URBAN	21.12%	0.69%	21.81%
NON-URBAN	1.77%	0.00%	1.77%
FL	**12.36%**	**0.43%**	**12.79%**
URBAN	12.36%	0.43%	12.79%
NON-URBAN	0.00%	0.00%	0.00%
IL	**12.24%**	**0.20%**	**12.44%**
URBAN	8.82%	0.20%	9.02%
NON-URBAN	3.42%	0.00%	3.42%
LA	**8.18%**	**0.21%**	**8.39%**
URBAN	5.89%	0.18%	6.08%
NON-URBAN	2.29%	0.03%	2.31%
PA	**11.57%**	**0.09%**	**11.65%**
URBAN	10.15%	0.09%	10.24%
NON-URBAN	1.42%	0.00%	1.42%
SC	**3.86%**	**0.38%**	**4.24%**
URBAN	3.06%	0.35%	3.41%
NON-URBAN	0.80%	0.03%	0.83%
TX	**26.57%**	**0.34%**	**26.91%**
URBAN	26.57%	0.34%	26.90%
NON-URBAN	0.00%	0.00%	0.00%
MISSING	0.00%	0.01%	0.01%
TOTAL	**97.67%**	**2.33%**	**100.00%**

Table 4

Mean Differences in Percent of Patients Insured through Medicaid by Hospital Ownership Type

Hospital Ownership (N=14955)	Merger Status	Mean Medicaid Payer Mix	Standard Error	P Value
For Profit	0	0.192	0.005	
For Profit	1	0.193	0.010	0.879
Non-Profit	0	0.161	0.004	
Non-Profit	1	0.190	0.013	**0.024**
Governmental	0	0.201	0.005	
Governmental	1	0.257	0.054	0.298

Table 5

Mean Differences in Percent of Patients Receiving Charity Care by Hospital Ownership Type

Hospital Ownership (N=14359)	Merger Status	Mean Charity Care Payer Mix	Standard Error	P Value
For Profit	0	0.028	0.003	
For Profit	1	0.041	0.005	**0.005**
Non-Profit	0	0.036	0.002	
Non-Profit	1	0.035	0.003	0.651
Governmental	0	0.049	0.005	
Governmental	1	0.042	0.007	0.407

Table 6

Mean Differences in Percent of Patients with Commercial Insurance by Hospital Ownership Type

Hospital Ownership (N=15619)	Merger Status	Mean Commercial Payer Mix	Standard Error	P Value
For Profit	0	0.377	0.007	
For Profit	1	0.352	0.201	0.201
Non-Profit	0	0.373	0.005	
Non-Profit	1	0.337	0.013	**0.005**
Governmental	0	0.350	0.008	
Governmental	1	0.349	0.035	0.990

Table 7

Mean Differences in Percent of Patients Insured Through Medicare by Hospital Ownership Type

Hospital Ownership (N=13579)	Merger Status	Mean Medicare Payer Mix	Standard Error	P Value
For Profit	0	.401	0.005	
For Profit	1	.420	0.013	0.134
Non-Profit	0	.407	0.004	
Non-Profit	1	.417	0.010	0.314
Governmental	0	.347	0.007	
Governmental	1	.322	0.039	0.518