

**MEDICAID WORK REQUIREMENTS: THE IMPACT ON PAYER
MIX, OPERATING MARGINS, AND UNCOMPENSATED CARE
COSTS AT DISPROPORTIONATE-SHARE HOSPITALS IN
NORTH CAROLINA**

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ABSTRACT

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Medicaid Work Requirements: The Impact on Payer Mix, Operating Margins, and Uncompensated Care Costs of Disproportionate-Share Hospitals in North Carolina
(Under the direction of Dr. Saravanan Kesavan)

Medicaid work requirements are a relatively new policy, coming into effect January 2018. While the current literature focuses on coverage loss for Medicaid recipients, this honor thesis examines the impacts of implementing Medicaid work requirements in North Carolina. I examine the effects of Medicaid work requirements on payer mix, operating margins, and uncompensated care costs of Disproportionate-Share Hospitals in North Carolina. Using a quantitative approach with hospital data from the Centers for Medicare and Medicaid Services, this study concludes that work requirements significantly impacts payer mix, operating margins, and uncompensated care costs. The results indicate that work requirements could decrease the Medicaid payer mix by 2% at hospitals. Additionally, my research suggests that operating margins improve between 1.8% and 2.0% while uncompensated care costs increase between 3.3% and 3.4%. The results indicate that while hospital margins could improve with work requirements, the increases would be outweighed by the increases in uncompensated care costs.

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LIST OF ABBREVIATIONS

CMS	The Centers for Medicare and Medicaid Services
DSH	Disproportionate Share Hospitals
ACA	The Affordable Care Act
SNAP	Supplemental Nutrition Assistance Program

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INTRODUCTION

A significant change in Medicaid policy occurred in January 2018 when the federal government began allowing states to impose work requirements on Medicaid recipients. North Carolina was one of several more states that has considered filing an application with the Centers for Medicare & Medicaid Services (CMS) for the approval of Medicaid work requirements. On March 27, 2019, the North Carolina Senate filed a bill titled “Medicaid Work and Community Engagement Opp.” (NC Senate Bill 387). If passed, Senate Bill 387 would implement work reporting requirements for ‘able-bodied’ adults who receive Medicaid health benefits (North Carolina General Assembly, Senate Bill 387, 2019). Senate Bill 387 would require current North Carolina Medicaid recipients to work or perform community service for a certain number of hours per week in order to retain their Medicaid benefits (Boughton, 2019). If the North Carolina legislature sends a waiver request to CMS, the impacts of these changes would expand beyond just Medicaid coverage and have downstream consequences on hospitals. This thesis aims to understand how a change in Medicaid work requirements would affect the payer mix, operating margins, and uncompensated care costs of Disproportionate-Share Hospitals (DSH) in North Carolina.

LITERATURE REVIEW

In this literature review, I first provide a background of the Medicaid program that is important for contextualizing my research. Then, I outline current research which studies the effects Medicaid expansion has on state economies, coverage rates, labor participation, and hospital finances. Next, I discuss the body of research that examines the effects of work requirements on means-tested programs¹, such as the Supplemental Nutrition Assistance Program and Medicaid. Finally, I conclude this literature review by considering the gaps in the current literature and describing how this research contributes to the conversation about Medicaid work requirements.

Background of the Medicaid Program

In this section, I will discuss the history of Medicaid, the structure of the program, and critical recent changes to the program. Together, these sections provide a foundational knowledge of Medicaid, which is necessary for understanding my research.

The Medicaid program: from origins to present day

From its humble beginnings a little over fifty years ago, Medicaid has evolved from a footnote in healthcare to the nation's most extensive healthcare program. President Lyndon B. Johnson signed Medicaid and Medicare into law as a part of the Social Security Amendments of 1965. A child of President Johnson's "Great Society Programs," Medicaid sought to provide medical care to low-income individuals and families. Since its implementation in 1965, Medicaid has become the largest means-

¹ A means-tested program, such as Medicaid, is a program that uses individual income or poverty guidelines as criteria for eligibility. Government agencies set different thresholds on individual income or poverty guidelines for program eligibility.

tested transfer program in the United States, in both the number of participants and total costs (Buchmueller, Ham, & Shore-Sheppard, 2015; Centers for Medicare & Medicaid Services, 2019b). According to CMS, around one in five Americans, or 66 million people, were enrolled in Medicaid in 2019. Federal spending for Medicaid reached \$593 billion in fiscal year 2018, and it accounted for two percent of Gross Domestic Product (Congressional Budget Office, 2019). Medicaid has grown from a small program at its inception to a fundamental part of the healthcare system.

Federal-State structure of the Medicaid Program

Medicaid is a joint federal-state program responsible for providing medical coverage to low-income individuals and families. State participation in Medicaid is voluntary for all states, the District of Columbia (DC), and American territories (Medicaid and CHIP Payment and Access Commission, 2019a). The federal government provides a large majority of the funding for Medicaid and sets requirements for eligibility, services that states must cover, and reimbursement rates (Buchmueller, Ham, & Shore-Sheppard, 2015). State Medicaid receives payments from the federal government at half or more of their costs for providing services to recipients (Centers for Medicare & Medicaid Services, 2019d). At the same time, states provide additional funding for Medicaid, and they maintain some flexibility with the program. Though states are subject to federal standards, they have considerable flexibility in terms of eligibility rules, the method and level of provider payments, and program benefits (Buchmueller, Ham, & Shore-Sheppard, 2015). More plainly, the Medicaid program combines federal mandates but allows states to select options about who is eligible for benefits and what they are entitled to receive. Because states have the flexibility to administer portions of

Medicaid, significant variations exist between state Medicaid programs (Bitler & Zavodny, 2014). Thus, scholars often argue that Medicaid is not a single program, but 51 separate programs.

While states have some control over determining eligibility, they are required to provide Medicaid and services to four federally recognized groups. The current Medicaid law covers the following groups of people: low-income families, pregnant women, people of all ages with disabilities, and individuals that need long-term care (Centers for Medicare & Medicaid Services, 2019c). To be eligible for Medicaid, an individual must meet the criteria set by the federal and state government. Tables 1-4 in the Appendix show the income and resource requirements set by the state of North Carolina to be eligible for Medicaid for different beneficiary groups (North Carolina Department of Health and Human Services, 2019). All states determine the final income thresholds for Medicaid, but they are still subject to minimum and maximum thresholds set by the federal government (Bitler & Zavodny, 2014).

Medicaid is seen as an exemplary model of federalism and shared power between the federal and state governments. Broad federal mandates and state flexibility with the Medicaid program have created a patchwork of Medicaid programs in which no state's program is structured exactly alike.

The ACA and Section 1115: two critical changes to the Medicaid program

The Patient Affordable Care Act (ACA) and Section 1115 waivers of the Social Security Act are two major critical changes that significantly modified the Medicaid program. These two policies made considerable alterations to eligibility requirements, benefits, payment structures, and other administrative aspects.

Signed into law in 2010, the ACA aimed to increase insurance coverage and reduce the rate of uninsured individuals. A key component of the ACA allowed states to voluntarily expand Medicaid to cover more low-income Americans (Camilleri, 2017). Under the ACA, Medicaid eligibility could be extended to adults with incomes up to 138 percent of the federal poverty level, with the promise of increased federal funding for expanded coverage (Camilleri, 2017). North Carolina is one of 14 states that opted out of Medicaid expansion under the ACA, and Table 5 in the Appendix shows state decisions to participate in expansions (The Kaiser Family Foundation, 2019). Although lawmakers designed the ACA to expand access to healthcare for as many individuals as possible, states still had the discretion of who to cover and what benefits individuals were entitled to receive.

Another significant change to Medicaid came in 2018 when CMS revised the criteria for Section 1115 waivers. Under Section 1115 of the Social Security Act, the Secretary of Health and Human Services (HHS) can waive certain requirements of Medicaid. The waivers permit states to use federal Medicaid funds in alternative ways if HHS determines that the state will use the funds to promote the objectives of the Medicaid program (Centers for Medicare & Medicaid Services, 2019a). In January 2018, CMS issued new guidelines for Section 1115 waivers, which gave states the discretion to impose work requirements in Medicaid as a condition of eligibility (Centers for Medicare & Medicaid Services, 2018). CMS granted ten states waivers—Arizona, Arkansas, Indiana, Kentucky, Maine, Michigan, New Hampshire, Ohio, Utah, and Wisconsin—to adopt work and community engagement requirements (Medicaid and CHIP Payment and Access Commission, 2019b). Approved states can require certain non-disabled, non-

elderly, and non-pregnant individuals to meet work and community engagement requirements for Medicaid eligibility. State Section 1115 waivers have some common features, but they vary with regards to:

- which populations are required to participate in work or community engagement as a condition of eligibility, and within those populations, which individuals qualify for an exception to the requirement;
- activities that qualify as work or community engagement, and the number of hours beneficiaries are required to complete; and
- the penalties for non-compliance (pg. 2)

Most states with approved waivers opted to expand Medicaid under the ACA, and the work requirements they adopted applies to their expansion population. CMS approved work and community engagement requirements for two non-expansion states, South Carolina and Wisconsin (Medicaid and CHIP Payment and Access Commission, 2019a).

The ACA and Section 1115 waivers dramatically changed the Medicaid program. The ACA offered states the opportunity to expand their contributions to the Medicaid program and provide more coverage to individuals. Alternatively, Section 1115 waivers approved by the Secretary of HHS allow states to enact requirements as a condition of eligibility. These two changes have given states more autonomy, discretion, and power over their Medicaid programs and whom they decide to cover.

Effects of Medicaid Expansion

In this section of my literature review, I review the bodies of research that examine the effects of Medicaid expansion. Since Medicaid work requirements are such a recent development, there is not a large body of research examining the implications.

However, I believe that understanding the impacts of Medicaid expansion will illuminate my topic and research about work requirements. I will examine the effects Medicaid has on state economies, coverage, labor, and hospitals.

Effects of Medicaid Expansion on State Economies

A substantial body of research found two main economic benefits to states through Medicaid expansion, including state budget savings and tax revenue gains. First, multiple studies suggest that expansion can result in state budget savings through offsetting state costs in other areas. Research by Ayanian, Ehrlich, Grimes, and Levy (2017) linked Medicaid expansion to positive economic impacts in Michigan. Ayanian et al. (2017) found that Michigan experienced reduced state spending on services covered by Medicaid expansion, such as state mental health and correctional health programs, for adults who were previously ineligible for Medicaid. The authors calculated that due to Medicaid expansion, Michigan saved around \$235 million annually (pg. 409). Additional studies conducted in Colorado, Montana, and Louisiana showed state budgetary savings due to Medicaid expansion offsetting the costs of various state health programs (Brown, Fisher, & Resnick, 2016; Richardson, Llorens, & Heidelberg, 2018; Ward & Bridge, 2019). Research across several different Medicaid expansion states concluded that Medicaid expansion has net positive impacts on states' budgets.

In addition to state budget savings, research suggests that states also see revenue gains from Medicaid expansion. Studies conducted in several states, including Colorado, Michigan, Montana, Louisiana, and Pennsylvania, show that Medicaid expansion positively benefits the state economy (Richardson, Llorens, & Heidelberg, 2018). A study by the Pennsylvania Department of Human Services (2017) found that the expansion of

Medicaid led to an increase in state tax revenues of \$53.4 million per year. Similarly, Ayanian et al. (2017) found that Medicaid expansion in Michigan will add approximately \$145 million to \$153 million annually in new state tax revenue. Three main factors that contributed to increased state tax revenues were: the higher federal pay rates for Medicaid populations after expansion, additional revenue from taxes on managed care organizations, and a decrease in state disproportionate share payments to hospitals as the number of uninsured individuals decreased (Ayanian, Ehrlich, Grimes, & Levy, 2017; Richardson, Llorens, & Heidelberg, 2018). The current research converges on the same idea: Medicaid expansion bolsters state economies through budget savings and new tax revenues.

Effects of Medicaid Expansion on Coverage

Substantial research conducted on health insurance coverage after expansion showed two main things – sizable coverage gains after implementation expansion and a compromise in coverage gains due to state waivers. Most all research surrounding Medicaid expansion reports that states experience coverage gains, reductions in uninsured rates, and positive externalities, such as spillover effects, after implementation (Courtemanche, et al., 2018; Kaestner, Garrett, Chen, Gangopadhyaya, & Fleming, 2017; Soni, Hendryx, & Simon, 2017; Sommers, Blendon, Orav, & Epstein, 2016; Callison & Sicilian, 2016). Additionally, several studies found that after states fully implemented Medicaid expansions, the coverage gap across income groups, racial groups, marital status, and age-groups, decreased significantly (Courtemanche, et al., 2018; Wehby & Lyu, 2017). Wehby and Lyu (2017) observed that newly eligible adults under Medicaid expansion drove the increases in enrollment. Furthermore, Hudson and Moriya (2017)

claim that legislation had an important spillover effect, also known as the “welcome mat effect,” which in turn increased enrollment. The welcome mat effect occurs when an expansion of a public program encourages individuals who were previously eligible for the program, but yet not enrolled, to now sign-up for the program. Hudson and Moriya (2017) find that Medicaid expansions increased coverage for children whose parents gained eligibility under the expansions by 5.7 percent.

However, a growing body of research suggests that Section 1115 waivers that target the expansion population cause coverage losses and may impact healthcare access. Several researchers studied Indiana’s waiver, the Healthy Indiana Plan 2.0, to determine its impacts on coverage gains. One study conducted by Freedman, Richardson, and Simon (2018), found that Indiana’s coverage gains were smaller than the gains in expansion states. Coverage in Indiana grew by about 3 percent with Medicaid expansion and the waiver in place, compared to about 4 percent for expansion states. Another study by Sommers, Fry, Blendon, and Epstein (2018) similarly concluded that coverage rates were significantly higher in expansion states than in Indiana. Sommers et al. (2018) also assert the waiver program led to less affordable healthcare in Indiana than in expansion states. The findings from these two studies suggest that Medicaid expansion interventions may lead to unintended consequences for coverage and access.

Effects of Medicaid Expansion on Labor

Another body of research examines how Medicaid expansion affects the labor participation and employment, with the evidence being somewhat mixed. Some studies find that increased expansion correlates to increased employment, but other studies determine that expansion has no statistically significant effects on employment.

One body of research observed increased employment as a result of expansion. Economic theory predicts that social programs with income-based eligibility will create positive behavioral responses to work effort (Dasgupta & Debraj, 1986; Banerjee, Hanna, Kreindler, & Olken, 2016). In other words, economic theory suggests that social programs like Medicaid can provide workers with a basic enough living standard to be productive workers. Ward and Bridge (2019) corroborate this economic theory in their study regarding the impacts of Medicaid expansion in Montana. The authors observed a 1.3% increase in employment in Montana after Medicaid expansion (Ward & Bridge, 2019). Furthermore, a multi-state study found that after the ACA, individuals living in expansion states were significantly more likely to be employed than those in non-expansion states (Hall, Shartzter, Kurth, & Thomas, 2017). The study also observed that individuals in expansion states are 6% less likely to be unemployed due to a disability compared to those in non-expansion states (pg. 263).

Another stream of research found that Medicaid expansions do not significantly affect employment or labor participation. Callison and Sicilian (2016) examined Medicaid expansions and how they affect individual labor market participation by race and ethnicity. The authors found that Medicaid expansions do not lead to increased labor force participation or employment for African American or Hispanic men or women after Medicaid expansions (pg. 318). However, the same study observed that labor market participation improved for white men and women after Medicaid expansions (pg. 318). Work by Kaestner, Garrett, Chen, Gangopadhyaya, and Fleming (2017) similarly concluded that expanded Medicaid does not lead to increased labor force participation or employment. Employing an economic-lens, Kaestner et al. (2017) assessed the impacts of

Medicaid expansion on the insurance coverage and labor supply of low-income and low-educated adults. While the authors found that the number of uninsured adults decreased with Medicaid expansion, the effects on labor supply are statistically insignificant (pg. 631).

One reason the research on labor participation and employment diverged is because studies measured different Medicaid populations. Ward & Bridge (2019), who observed positive effects in employment, controlled their regression analysis for the state, year, total population, population over age 65, population with a disability, population over age 25 with at least a bachelor's degree, and total employment in the traded sector. Additionally, Hall et al. (2017) used difference-in-difference testing to assess employment for adults with disabilities. On the other hand, Callison & Sicilian (2016), who found no statistical difference in employment, used race and ethnicity as a measure while Kaestner et al. (2017) observed the effects for low-income and low-educated adults.

Effects of Medicaid Expansion on Hospitals

Another stream of work in the Medicaid literature indicates that expansions improve hospital operating margins and overall financial performance for a variety of hospitals, including DSHs. Current research links improved financial performance and reductions in hospital closures to Medicaid expansions. Most recently, Rhodes, Buchmueller, Levy, and Nikpay (2019) report that Medicaid expansion leads to a decrease in uncompensated care costs and an increase in average operating margins. Specifically, the authors observed a 1.5 percent decrease in uncompensated care costs and a 1.2 percent increase in operating margins for hospitals after Medicaid expansion (pg.

89). Additionally, operating margins improved significantly for public hospitals and rural hospitals after expansion (pg. 89). Although a few years older than the work by Rhodes et al., Balvin (2016) and Dranove, Garthwaite, and Ody (2016) find comparable decreases in uncompensated care costs and increases in operating margins. Lindrooth, Perraiillon, Hardy, and Tung (2018) showed that hospitals in states with Medicaid expansion experienced lower rates of closure than in non-expansion states. Further, the authors showed that hospitals have stronger financial performance, with improved hospital margins of about 33 percent in expansion states (Lindrooth, Perraiillon, Hardy, & Tung, 2018). From a different perspective, Bai and Anderson (2016) provide additional evidence supporting the finding that Medicaid expansions improve hospitals' financial standings. Bai and Anderson (2016) observed that expansions reduced bad-debt expenses and enhanced hospitals' financial strength.

A subset of the hospital financial literature focuses specifically on DSHs. To investigate how hospitals would react to Medicaid expansions and cuts, Cole, Walker, Mora, and Diana (2014) evaluated hospitals' financial strength in expansion and non-expansion states. The authors found that hospitals in non-expansion states face greater financial stress than hospitals in expansion states (Cole, Walker, Mora, & Diana, 2014). Of the hospitals in non-expansion states examined by Cole et al. (2014), 42.5% of them were in a weakened financial position due to Medicaid funding cuts. In a study to assess the impact of Medicaid expansion on DSH providers, Camilleri (2017) finds that Medicaid expansion reduced uncompensated care costs by 35% for DSHs. The findings by Cole et al. (2014) and Camilleri (2017) on DSHs are consistent with the larger body of research that investigates how hospital financials respond positively to expansions.

Work Requirements in Means-Tested Programs

This section of the literature review discusses the research about work requirements in two means-tested programs, the Supplemental Nutrition Assistance Program (SNAP)² and Medicaid.

Effects of SNAP Work Requirements

One branch of research attempts to understand the connection between SNAP work requirements and program participation. Ku, Brantley, and Pillai (2019) investigated data from over 2,000 United States counties from 2013 to 2017 and assessed the impact work requirements had on SNAP beneficiaries. Results from this study indicated that work requirements reduced total SNAP participation and caused more than one-third of SNAP participants without dependents to lose benefits (pg. 1449). Additionally, the authors reported that states which implemented work requirements saw a reduction of about \$2.5 billion in federal SNAP benefits (pg. 1449). Other research by Stacy, Scherpf, and Jo (2018) suggests a decline in program participation with work requirements in place, and the authors observed a reduction of 3.1% in SNAP participation for adults with no dependents. The study also noted stronger impacts for participants in high unemployment areas and those with a high school education or less (Stacy, Scherpf, & Jo, 2018).

² The Supplemental Nutrition Assistance Program (SNAP) is a means-tested program run by the U.S. Department of Agriculture (USDA). As defined by the USDA, “SNAP provides nutrition benefits to supplement the food budget of needy families so they can purchase healthy food and move towards self-sufficiency.” To be eligible for SNAP, individuals must apply to the program in the state in which they live and meet the state’s income and resource eligibility requirements.

Effects of Medicaid Work Requirements

Another branch of research explored Medicaid work requirements and their impact on coverage and hospitals' finances. Arkansas was the first state to receive a Section 1115 waiver to implement Medicaid work requirements as a condition of eligibility, so current research assesses the impact of Medicaid work requirements in Arkansas. Sommers, Goldman, Blendon, Orav, and Epstein (2019), studied the changes in insurance coverage and employment within the first year of work requirement implementation in Arkansas. Through surveys, the authors found that work requirements in Arkansas decreased Medicaid coverage by 13.2% and increased the uninsured rate by 4% (pg.1075). Although work requirements were associated with significant losses in health insurance coverage, Sommers et al. (2019) didn't observe any significant change in employment or labor participation. This study was limited by its lower response rate than that of government surveys. Additionally, the Arkansas Department of Human services calculated that in the first 6 months of implementation, 25% of beneficiaries lost coverage (Arkansas Department of Human Services, 2018). Kentucky, a state currently in the process of petitioning for a Section 1115 waiver, forecasted that around 15% of the state's Medicaid population would lose coverage under the proposed work requirements law (Office of the Governor of Kentucky, 2017).

From a different perspective, Haught, Dobson, and Luu (2019) researched the effects that implementing work requirements has on hospital finances in Arkansas. Findings from the study suggest that Medicaid work requirements could harm hospitals' financial positions, with hospitals seeing a 10 to 11% reduction in revenues as a result of Medicaid work requirements (Haught, Dobson, & Luu, 2019). Although the research on

work requirements in means-tested programs is limited, it suggests work requirements have negative impacts on program participation and downstream effects on providers.

Goals for this Research

My question is important because I address the downstream effects of Medicaid work requirements – an area that researchers have not fully explored. While there is significant research regarding Medicaid expansion and its financial impacts on hospitals, current research is only beginning to explore the effects of Medicaid restrictions. My research addresses a gap in the current literature by reframing the debate to examine the implications of Medicaid restrictions. Overall, this research seeks to contribute new insights to the Medicaid work requirements debate by exploring the business implications of the proposed policy changes.

METHODOLOGY

In this section of the thesis, I explain my question and hypotheses and the methods I used to analyze my research question. In particular, I outline my research question and hypotheses, define DSH providers and payments, explain uncompensated care costs, describe the baseline data used to assess hospitals' financials, explain how I forecasted Medicaid enrollment in North Carolina with work requirements, and measured the impact on operating margins and uncompensated care costs. To conclude the methodology section, I identify the limitations of my research design.

Question & Hypotheses

My research question attempts to answer how Medicaid work requirements will impact the payer mix, operating margins, and uncompensated care costs of Disproportionate Share Hospitals in North Carolina. My research question is needed because it reframes the debate, and it flips what researchers have been asking. Instead of looking at the effects of Medicaid expansion, I ask what the implications of Medicaid restriction are. Overall, this research seeks to contribute new insights to the Medicaid work requirements debate by exploring the business implications of the proposed policy changes. I have five hypotheses for my research, which are described below.

First Hypothesis

I first hypothesize that Medicaid work requirements will shift the payer mix by decreasing the percentage of Medicaid patients at hospitals and increasing the percentage of non-Medicaid patients. Scholars have extensively examined the shifts in payer mix after Medicaid expansion. Several studies find that Medicaid expansion decreased the

number of uninsured discharges and increased the number of Medicaid discharges, with no significant changes in total discharges (Admon, et al., 2019; Martin, Hartman, Washington, & Catlin, 2017; Freedman, Nikpay, Carroll, & Simon, 2017; Sommers, Blendon, Orav, & Epstein, 2016). This research also suggests that Medicaid expansion increased the proportion of patients with Medicaid coverage and decreased the proportion of patients with private insurance (Admon, et al., 2019; Wu, et al., 2018; Nikpay, Buchmueller, & Levy, 2016). Much of the current research indicates that Medicaid beneficiaries experience ‘churning,’ or in other words, those who lose Medicaid coverage experience permanent coverage loss or significant gaps in their coverage (Haught, Dobson, & Luu, 2019; Garfield, Rudowitz, Orgera, & Damico, 2019).

Considering these findings, I assume that Medicaid patients who lost coverage simply end up as uninsured patients. The number of discharges remains the same after work requirements, but the numerators of the Medicaid and uninsured change with work requirements. The number of Medicaid patients will decrease with discharges constant, and the number of uninsured patients will increase with discharges constant. Because of this, I hypothesize that Medicaid work requirements will decrease the proportion of Medicaid patients and increase the proportion of uninsured patients.

Second Hypothesis

Second, I hypothesize that Medicaid work requirements will reduce the Medicaid patient revenues and total net patient revenues as a result of the decrease in Medicaid patients. Haught, Dobson, and Luu (2019) researched the effects that implementing work requirements have on hospital finances in Arkansas. Findings from the study suggest that Medicaid work requirements reduce hospital revenues by 10 to 11% as a result of a

decrease in Medicaid patients and an increase in uninsured patients. Another body of research shows that hospitals saw revenues rise significantly due to fewer uninsured patients after Medicaid expansion (Rhodes, Buchmueller, Levy, & Nikpay, 2019; Camilleri, 2017). I hypothesize that due to payer shifts (explained in Hypothesis 1), revenues will decrease as work requirements move Medicaid patients from reimbursed patients to uninsured ones.

Third Hypothesis

Third, I hypothesize that hospitals' costs will decrease. Hospital operating expenses (e.g., costs) are the total expenses incurred by a hospital for providing patient services to all patients. The cost to provide service to a Medicaid patient is the same as providing care for non-Medicaid patients (American Hospital Association, 2017). However, Medicaid only pays part of a Medicaid patient's costs, 87 cents per dollar spent, and the hospital must absorb the costs that are not covered by Medicaid (American Hospital Association, 2017). I predict that a hospital's operating costs will decrease because hospitals will have to treat fewer Medicaid patients after work requirements. Medicaid beneficiaries will be moved to uninsured patient status and their care will be acknowledged as uncompensated care costs, which is separate from a hospital's operating margins.

Fourth Hypothesis

Fourth, I hypothesize the operating margins for hospitals will increase as a result of decreased revenues and decreased costs. I predict that the decrease in costs will be greater than the reduction in revenues, so operating margins for hospitals will improve. A hospital's operating costs will decrease more significantly than revenues because

hospitals lose money by providing services to Medicaid patients. Hospitals receive 87 cents for every dollar spent providing services to Medicaid patients, with more than two-thirds of hospitals receiving Medicaid payments less than the cost of delivering care (American Hospital Association, 2019). However, a Medicaid patient costs the same to treat as a non-Medicaid patient (American Hospital Association, 2017). In other words, it is more expensive for hospitals to provide services to Medicaid patients than the revenues they receive from them. While work requirements would cause hospitals to lose revenue from the displaced Medicaid patients, I predict hospitals' costs would be reduced at a greater rate since hospitals would no longer have to cover the difference between Medicaid reimbursements and patient costs. As mentioned in the hypothesis below and the DSH uncompensated care costs section, I separate operating margins from uncompensated care costs. I assume that patients still seek medical care from hospitals but as uninsured patients, and therefore I do not factor those costs into operating margins.

Fifth Hypothesis

Lastly, I hypothesize that uncompensated care costs will increase due to Medicaid work requirements. Uncompensated care costs, which are a part of a hospital's operating costs, are the health care or services hospitals provide that do not get reimbursed. Often, uncompensated care costs arise when people do not have insurance and cannot afford to pay the cost of care. Medicaid beneficiaries who lose coverage because of work requirements may be barred from reenrolling in the program for a certain period (Haught, Dobson, & Luu, 2019). Under the Arkansas law, if beneficiaries did not meet the work requirements, they would lose coverage for the remaining calendar year and have to prove they are working a certain number of hours before being allowed to reapply

(Haught, Dobson, & Luu, 2019). As a result of this lockout, large portions of recipients will be uninsured or have extended gaps in their coverage, which increases uncompensated care costs.

Other research shows that Medicaid expansions reduces the uninsured rates at hospitals and uncompensated care costs, with larger decreases in uncompensated care costs at disproportionate-share hospitals (Rhodes, Buchmueller, Levy, & Nikpay, 2019; Admon, et al., 2019; Camilleri, 2017). On the other side, studies find that for states that did not expand Medicaid, uncompensated costs increased (Price & Eibner, 2013). Considering the research, I hypothesize that Medicaid work requirements will increase uncompensated care costs since individuals are moved from Medicaid to uninsured status.

Disproportionate Share Hospitals & DSH Payments

As defined by The Health Resources & Services Administration (2019), Disproportionate Share Hospitals (DSH) “...serve a significantly disproportionate number of low-income patients and receive payments from the Centers for Medicaid and Medicare Services to cover the costs of providing care to uninsured patients.” The goal of the DSH payments is to improve access for Medicaid and uninsured patients (Medicaid and CHIP Payment and Access Commission, 2019). First, states receive DSH payments from the federal government to offset DSH hospitals’ cost of providing care to Medicaid patients. Federal law then requires each state’s Medicaid program to make DSH payments to qualifying hospitals that serve a large number of Medicaid and uninsured patients to offset those costs (Medicaid and CHIP Payment and Access Commission,

2019). The Social Security Act sets two methods for a hospital to qualify as a DSH hospital. A hospital is designated as a DSH hospital in one of two ways:

- 1) If a large urban hospital demonstrates more than 30% of their total net inpatient care revenues go towards providing indigent care³.
- 2) If a hospital's DSH Patient Percentage Equation exceeds 15% (Centers for Medicare & Medicaid Services, 2020). See Appendix B for a full explanation of the DSH Patient Percent Equation.

I chose to examine DSH hospitals because a majority of hospitals in North Carolina are classified as DSH providers. Around 70% of all hospitals in North Carolina are classified as DSH providers (Centers for Medicare & Medicaid Services, 2020)⁴.

Baseline Data and Identifying DSH Hospitals in North Carolina

My research methodology employs a quantitative approach by using Medicaid data. The quantitative approach I used relied on available data from Medicare Hospital Cost Reports (MHCRs) from the fiscal years 2014 – 2015 and 2015 – 2016 (Centers for Medicare & Medicaid Services, 2020). Any provider that receives Medicaid payments is required by law to submit an annual cost report to the Centers for Medicare & Medicaid Services (Centers for Medicaid and CHIP Services, 2020). MHCRs contain valuable data about all hospitals in North Carolina, such as facility characteristics, total costs, total revenues, uncompensated care costs, Medicaid charges, and other financial statement data (Centers for Medicare & Medicaid Services, 2015). Next, I cross-referenced the MHCR data with a list of DSH locations released by the NC Department of Health and

³ Indigent care is used to define care towards individuals who are uninsured and/or are not eligible for government health care coverage such as Medicaid or Medicare.

⁴ I calculated the percentage of DSH hospitals in North Carolina from the Hospital Public Use File data.

Human Services (NC Medicaid Division of Health Benefits, 2019). Cross-referencing the data allowed me to identify and pull out information for only DSH providers.

Forecasting Medicaid Enrollment in North Carolina after Work Requirements

After considering the hospital financial data, I used four case studies to evaluate the impact of work requirements. The first case study examines how work requirements reduce program participation and benefits in the Supplemental Nutrition Assistance Program (SNAP). The study is relevant to my Medicaid research since both SNAP and Medicaid are means-tested programs. The results are helpful to estimate how Medicaid enrollment in North Carolina is impacted by work requirements (Ku, Brantley, & Pillai, 2019). The second case study is from Kentucky, which forecasted how the state's Medicaid population would lose coverage under the proposed work requirements law. Kentucky's work requirement law has similar language as the proposed North Carolina law, and it projects the Medicaid population which will lose coverage under the law (Office of the Governor of Kentucky, 2017). These forecasts are helpful to estimate how Medicaid enrollment in North Carolina is impacted by work requirements. Both the third and fourth case studies contain results from Arkansas' implementation of work requirements. The third case from the Arkansas Department of Human services calculated that 23% of beneficiaries lost coverage. For the fourth case, Sommers, Goldman, Blendon, Orav, and Epstein (2019), used surveys to estimate the impact of work requirements on Medicaid coverage and they found that around 13% of recipients lost coverage. Arkansas implemented Medicaid work requirements in 2015, and the results from this case study predict how North Carolina would react to work

requirements. Arkansas can be used as a case study due to the similar language and benefit structure of the work requirement laws as the proposed North Carolina law. Although the two laws are similar, the financial effects on hospitals in Arkansas can't be directly imposed on hospitals in North Carolina because of differences in the number of DSH hospitals per state. In Arkansas, 5% of the hospitals in the state are classified as DSH as compared to 70% of hospitals in North Carolina (Medicaid and CHIP Payment and Access Commission, 2019). Since DSH providers serve a large number of Medicaid recipients and low-income individuals, it's important to research the difference North Carolina hospitals could see as result of Medicaid work requirements.

I believe examining these four case studies is important because it gives a more holistic view of how North Carolina Medicaid beneficiaries would be impacted by work requirements. I averaged the coverage losses from each study and found that implementation of work requirements, on average, leads to a 14% decrease in coverage. I use the 14 % average in my primary analysis and then run situational analyses to show how Medicaid in North Carolina would react under each scenario. For this thesis, I assume that all individuals who lose coverage move to uninsured status. The four case studies, one from another means-tested program, one forecast, and two implementation studies from Arkansas, help me forecast different scenarios for North Carolina.

The Medicare Hospital Cost Reports contains Medicaid patient data for each DSH provider in North Carolina, including discharges, revenues, and expenses. With these data sets and the results from the case studies, I forecasted the reduction in Medicaid enrollment in North Carolina. I then apply these projections to DSH providers financials

to determine the effects on operating margins. Equation 1 shows the steps of how coverage loss is calculated.

Equation 1: Calculating potential coverage loss

- 1) Use the Medicare Hospital Cost Reports to determine the number of Medicaid discharges per hospital.
- 2) Evaluate the number of Medicaid recipients subject to work requirements that would lose Medicaid coverage in N.C. based on the average coverage loss of the four case studies

Since Medicaid work requirements are relatively new and data is still being collected on their effects, I decided to run a situational analysis to show how DSH providers reacted under different forecasts. I used the two Arkansas case studies to demonstrate how DSH providers would be affected, as well as the projections from Kentucky's work requirements proposal. Examining different projections of the financial effects gives a more holistic view of how hospitals will react under different circumstances. The language laws from Arkansas and Kentucky are nearly identical to the language of the North Carolina law, making it easier to compare the states.

Examining payer mix of DSH hospitals

The steps outlined above are essential for me to understand the Medicaid coverage landscape in North Carolina if Medicaid work requirements were to take effect. I first calculated the change in payer mix by dividing Medicaid discharges by the total discharges after work requirements. I calculated payer mix to show how the proportion of patients changed with the policy implemented.

Examining operating margins of DSH hospitals

After I determined the impact to payer at DSH providers, I examined how the coverage loss affects hospital performance in North Carolina. I hoped to determine DSH hospitals' financial well-being by observing each hospitals' operating margin before and after Medicaid work requirements are enacted. Operating margins is a measure routinely used by researchers and policymakers to measure hospital performance (Rhodes, Buchmueller, Levy, & Nikpay, 2019; Bai & Anderson, 2016). The following section outlines how I determined the operating margins for DSH providers.

Operating Margin

I focused on operating margin in this thesis because the operating margin is generated from hospitals' core business and it is more comparable across hospitals than total profit. For my study, Hospital Operating Margin is defined as net income from patient care (i.e. patient services) divided by net patient revenue. Patient care includes revenues from hospitals' inpatient, outpatient, and Medicaid-related services. Equation 1 illustrates how operating margin will be calculated both before and after Medicaid work requirements:

Equation 2: Operating Margin

$$\frac{\text{Net Patient Revenue} - \text{Total Patient Operating Expenses}}{\text{Net Patient Revenue}}$$

Total income from patient care was reduced by the total operating expenses for all patients, and then divided by net patient revenue to determine operating margin. An advantage of calculating the operating margin for hospitals rather than using just net revenue, is that operating margin implicitly adjusts for hospital size.

Revenues and Costs

To calculate the operating margin for a hospital, I first calculated the changes in revenues and costs. Accounting for differences in coverage with work requirements in place, I determined hospitals' costs and revenues from the hospital data obtained earlier. The data from CMS contains total revenues, net Medicaid revenues, operating costs, net Medicaid charges, and hospital discharges for Medicaid recipients. Total patient revenue is defined as the total amount of income generated from providing services to patients. Net Medicaid patient revenue is the total amount of income a hospital receives from the federal government from providing services to Medicaid patients, less the costs of providing service to those patients. Hospital operating expenses are the total expenses incurred by a hospital for providing services to patients, both Medicaid and non-Medicaid. I used the following equation to calculate changes to revenues and costs:

Revenues

Equation 3: Revenue per Medicaid discharge

$$\frac{\text{Net Medicaid Revenues}}{\text{Medicaid Discharges}} = \text{Average Medicaid Revenue per patient}$$

I calculate the Revenue per Medicaid discharge by dividing the net Medicaid revenues by the number of Medicaid discharges. I do this to determine the average revenue a hospital brings in per Medicaid discharge.

Equation 4: Revenue per non-Medicaid discharge

$$\frac{\text{Net Patient Revenues} - \text{Medicaid Revenues}}{\text{Total Discharges} - \text{Medicaid Discharges}} = \text{Average non-Medicaid revenue per discharge}$$

To find the average revenue per non-Medicaid patient discharge, I deducted Medicaid revenues from total revenues and Medicaid discharges from the total number of

discharges. I do this to determine the average revenue a hospital brings in per non-Medicaid discharge.

Equation 5: Hospital Revenues after Medicaid work requirements

$$\begin{aligned} & (\text{Medicaid Discharges (WR)} \times \text{Revenue per Medicaid patient}) + \\ & ((\text{Total Discharges (WR)} - \text{Medicaid Discharges (WR)}) \times \text{Revenue per discharge}) = \\ & \text{Total Hospital Revenue} \end{aligned}$$

Costs

Equation 6: Operating Expense per discharge

$$\frac{\text{Operating Expenses}}{\text{Total Discharges}} = \text{Average Operating Expense per discharge}$$

I calculate the Operating Expense per discharge by dividing the total Operating Expenses by the total number of discharges. By doing this, I am able to see the average operating expense it costs to treat each patient.

Equation 7: Operating Expenses after Medicaid work requirements

$$\text{Total Operating Expenses} - (\text{Operating Expenses per discharge} \times (\text{Total discharges} - \text{Total discharges after Medicaid work requirements}))$$

Examining uncompensated care costs of DSH hospitals

Uncompensated Care Costs

Uncompensated care costs are services provided by hospitals that do not get reimbursed (Centers for Medicare & Medicaid Services, 2020). Uncompensated care costs arise when patients do not have insurance or cannot afford the cost of medical care.

There are two types of uncompensated care:

- Charity care: the hospital does not charge the patient at all, or charges the patient at a discounted rate below the hospital's cost of delivering care
- Bad Debt: the hospital charges the patient but is not able to collect payment

Uncompensated care is the sum of charity care and bad debt. Since hospitals vary in their policies regarding charity care, there is no clear distinction between charity care and bad debt (Rhodes, Buchmueller, Levy, & Nikpay, 2019). Therefore, in this thesis, I analyze uncompensated care as a combined measure rather than each component. I also measure uncompensated care costs as a percent of operating expenses since uncompensated care is a measure of forgone revenue. Measuring uncompensated care as a percent of a hospital's operating expenses is common in this area of research (Rhodes, Buchmueller, Levy, & Nikpay, 2019; Garcia, Thompson, Howard, & Pink, 2018).

For my honors thesis, unlike other research, I kept uncompensated costs separate from operating margins in my analysis. Scholars commonly factor in uncompensated care costs to total operating expenses although hospitals categorize these two costs separately (Haught, Dobson, & Luu, 2019; Rhodes, Buchmueller, Levy, & Nikpay, 2019; Lindrooth, Perraiillon, Hardy, & Tung, 2018). I do not factor uncompensated care costs into total operating costs nor operating margins because uncompensated costs are not final values. Uncompensated care costs are subject to intergovernmental transfers from

programs, such as DSH payments or CHIP, to offset these costs. Factoring uncompensated care costs into the operating expenses and operating margins, overstates the cost of providing care, and thereby overstates both measures. I decided to measure operating margins and uncompensated care costs separately because it gives a more holistic view of how work requirements would affect different parts of hospitals' financials.

Equation 8: Uncompensated Care Costs

(Operating Expense per patient discharge x (Total discharges – Total discharges after Medicaid work requirements)) + Uncompensated Care Costs

A full list of equations and assumptions can be found in Appendix D.

Limitations

My study is not without its limitations, and I anticipate a few of them with my proposed methodology. One limitation of this study is that this is a projection. Since North Carolina has not yet implemented Medicaid work requirements, there is no definitive number of how Medicaid enrollment will change. The actual enrollment change could be higher or lower than the average I use in my methodology. Since I am forecasting how North Carolina hospitals would react, I cannot assert causality. I plan to incorporate a situational analysis of high and low estimates based on the case studies to get a better view of how work requirements impact hospitals (Appendix D).

The second limitation is the data from the Medicare Hospital Cost Reports. Although this public data is commonly used by scholars, researchers, and government agencies, the data is known to have some quality problems. Several hospitals in the cost report that the state identified as DSH providers have items in the report with no

response. I had to remove 10% of all DSH providers from the pool due to nonresponse, which reduced the sample size and limited the generalizability to North Carolina hospitals. The third limitation, also stemming from data, is that my analyses were cross-sectional, limited to a window of 2 years. I only analyzed two years of data because that was easily available to me, but that might not capture the whole picture of a hospital's financial standings. A hard or successful financial year for a hospital may have been an anomaly in one of the two fiscal years, which could have led me to drop hospitals from the data set. Furthermore, a hospital could have been categorized as being a DSH provider in the window I was examining due to high Medicaid volume, but the years prior or after it might not have been classified as such.

RESULTS

In this section, I hope to provide a high-level analysis of how work requirements impact hospitals' payer mix, operating margins, and uncompensated care costs. The analysis explores fiscal years 2014 – 2015 and 2015 – 2016, to understand how financials change as work requirements are imposed.

Prior to my analysis, I omitted all hospitals in North Carolina that the state did not identify as DSH providers. From the 2014 – 2015 DSH list, I dropped 10 DSH designated hospitals because they had missing values that were critical for the analysis (e.g. Net Revenue from Medicaid). Additionally, I removed 2 observations in which operating margins had absolute values of 100% or greater. I removed the same number of observations for the same reasons from the 2015 – 2016 DSH list. After removing these observations, I was left with 88 DSH providers in North Carolina.

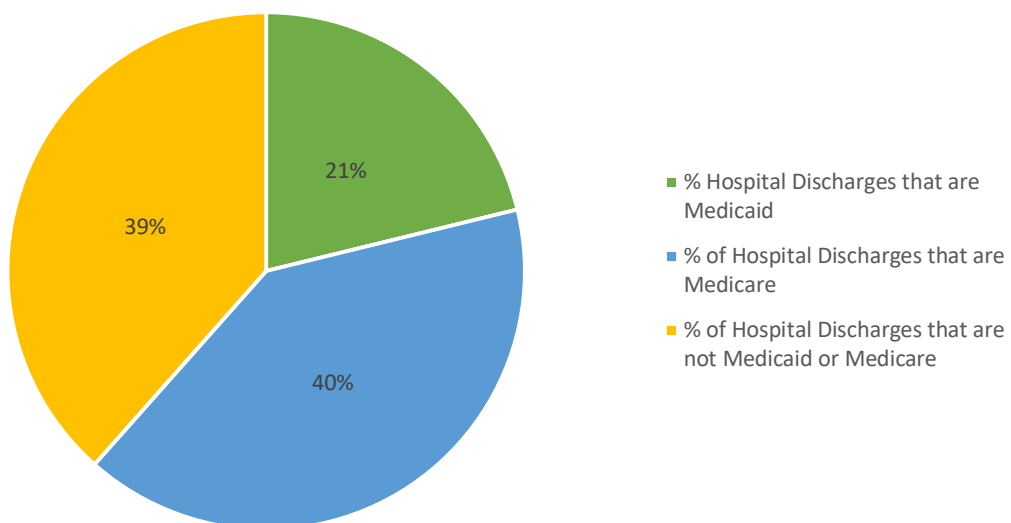
Fiscal Year 2014-2015

The first year of data I examined was from 2014 – 2015. This results subsection shows the overall payer mix, operating margins, and uncompensated care costs before and after Medicaid work requirements.

Payer mix before Medicaid work requirements

I calculated the payer mix for hospitals from this financial year by dividing the total number of Medicaid discharges by the total number of hospital discharges. I then averaged the 88 hospitals' payer mixes to find the average payer mix at hospitals before work requirements. As shown in the Figure 1 below, on average, 21 % of hospital discharges are Medicaid patients, 40% are Medicare patients, and 39% are neither. For the purposes of this study, 21% of hospital discharges are Medicaid patients and 79% are non-Medicaid patients.

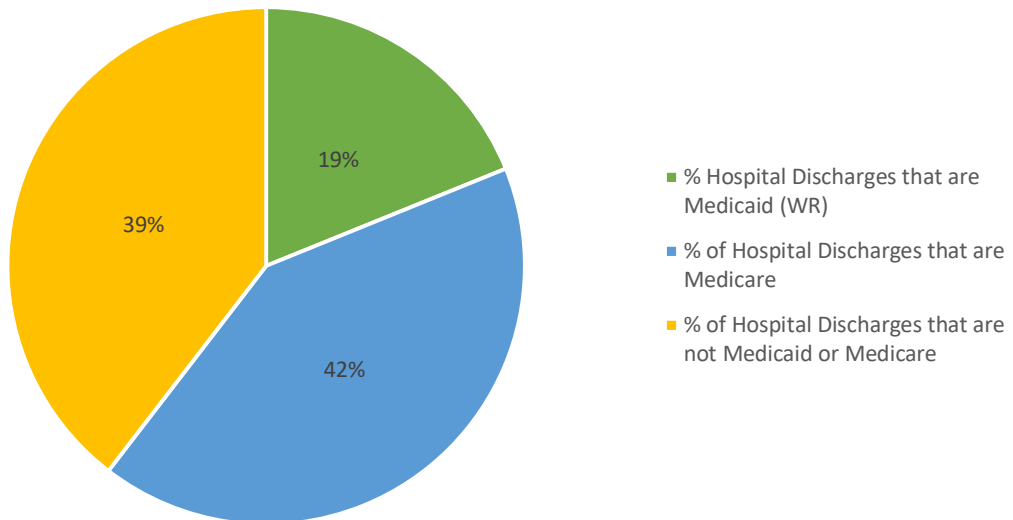
Figure 1: Payer mix before Medicaid work requirements



Payer mix after Medicaid work requirements

I then calculated the impact work requirements would have on the number of Medicaid discharges at hospitals. I repeated the steps above and divided the number of Medicaid discharges with Medicaid work requirements by the total number of hospital discharges after work requirements. Figure 2 below shows the average payer mix at hospitals after Medicaid work requirements are implemented. After work requirements, 19 % of hospital discharges are Medicaid patients, 39% are Medicare patients, and 40% are neither. Medicaid patient discharges are 19% of the payer mix and non-Medicaid patient discharges are 81%. After Medicaid work requirements, Medicaid discharges decreased by 2% and discharges of non-Medicaid patients increased by 2%.

Figure 2: Payer Mix after Medicaid work requirements

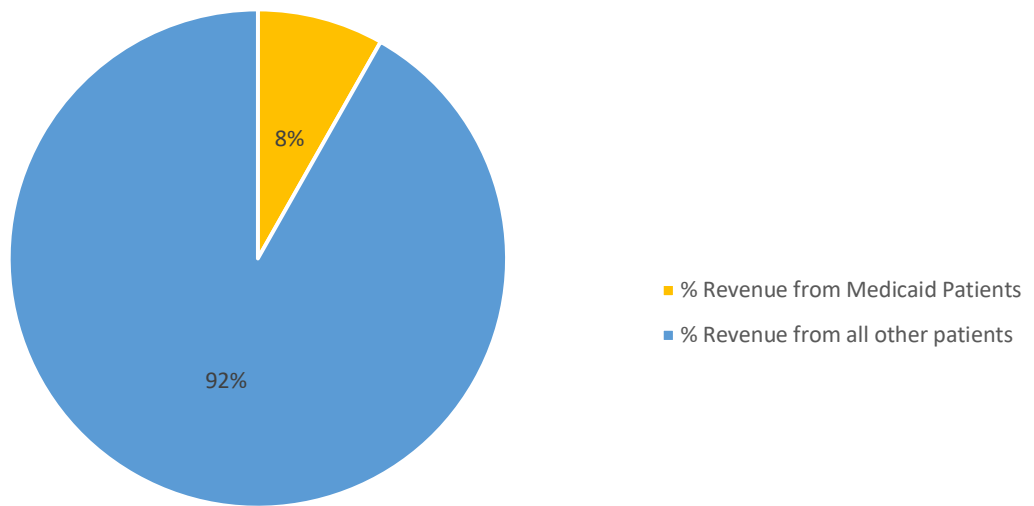


Operating Margins

Revenues before Medicaid work requirements

I calculated the percent of hospital revenue per patient type by dividing Net Medicaid Revenue by the Net Patient Revenue. I then averaged the 88 hospitals' payer mixes to find the average percent of hospitals revenues by patient type before work requirements. Figure 3 below shows that 8% of a hospital's revenues comes from Medicaid patients and 92% of revenues come from all other patients.

Figure 3: % Revenue per type of patient before Medicaid Work Requirements



Revenues after Medicaid work requirements

I then calculated the impact work requirements would have on the percent of hospital revenue per patient. In Figure 4 below, the percent of hospital revenues generated per patient type are shown. After work requirements, 7% of a hospital's revenues comes from Medicaid patients and 93% of revenues come from all other patients. With work requirements in place, the percent of hospital revenue that comes from Medicaid patients decreases by 1%. Figures 5 and 6 show hospitals' average net Medicaid revenue and average total revenue before and after Medicaid work requirements. Net Medicaid Revenue decreases by 14% after work requirements, as shown in Figure 5 below. Average total revenues for hospitals decreased by 1.17% with work requirements in place, as displayed in Figure 6.

Figure 4: % Revenue per type of patient before Medicaid Work Requirements

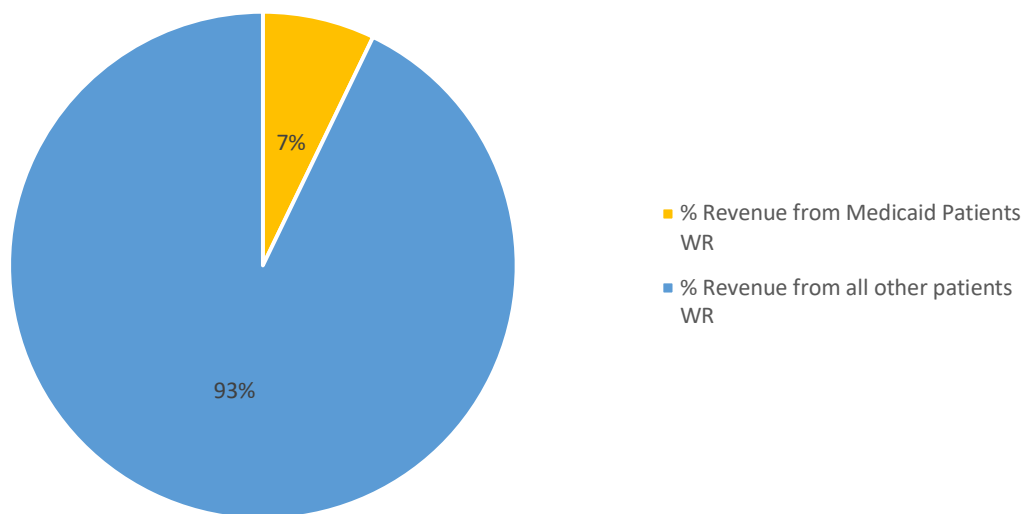


Figure 5: Net Medicaid Revenue before and after Medicaid work requirements

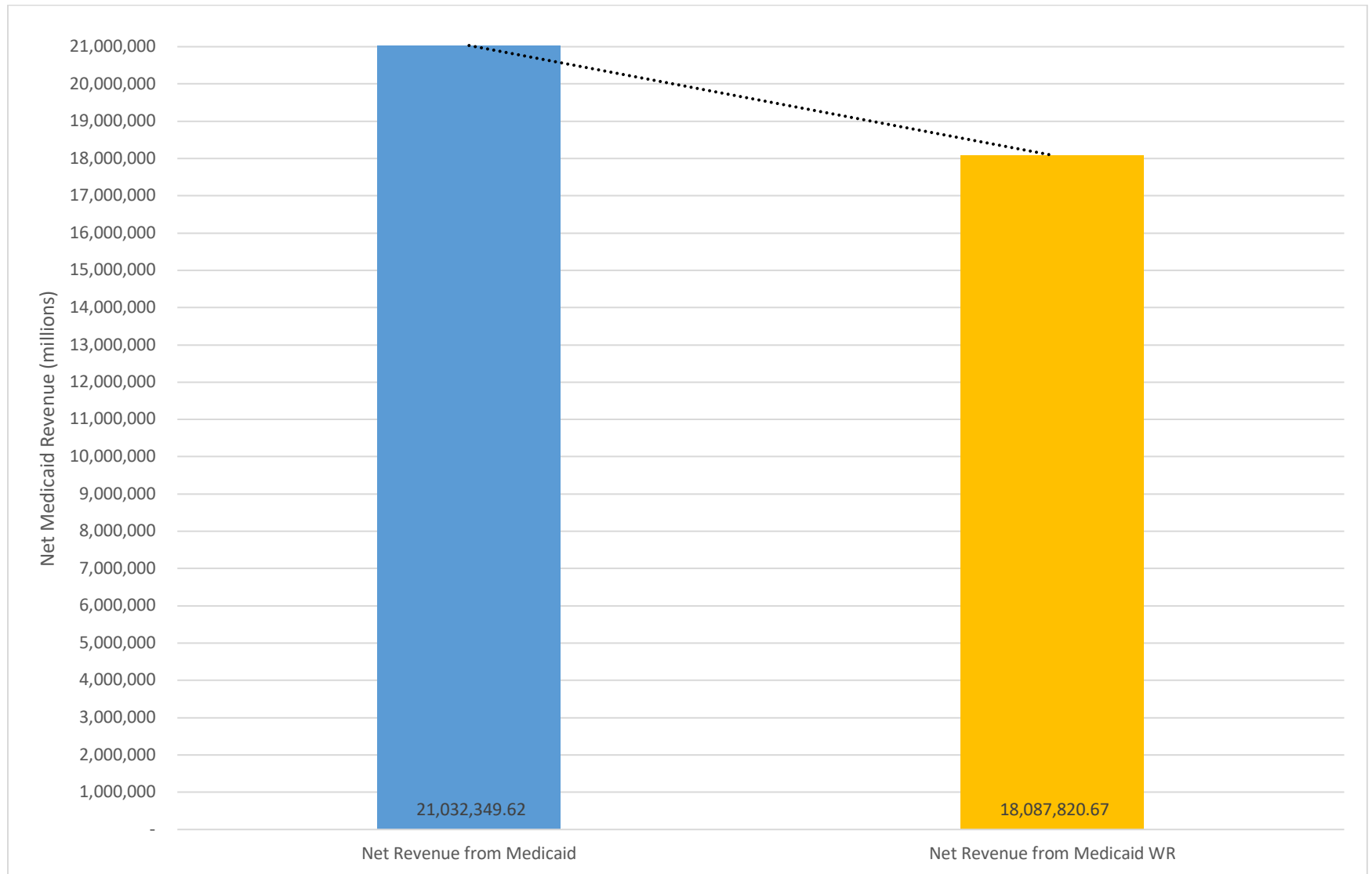
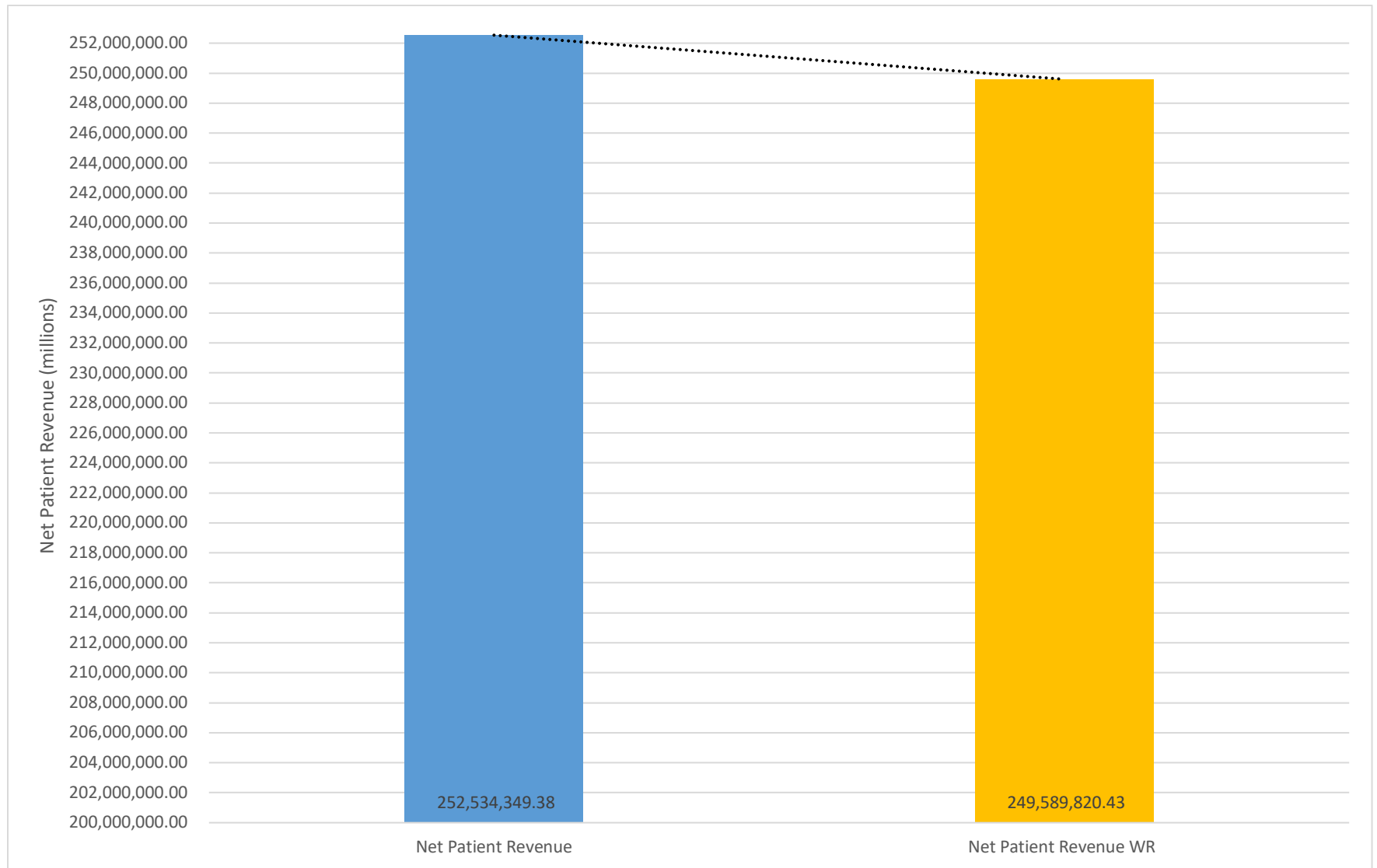


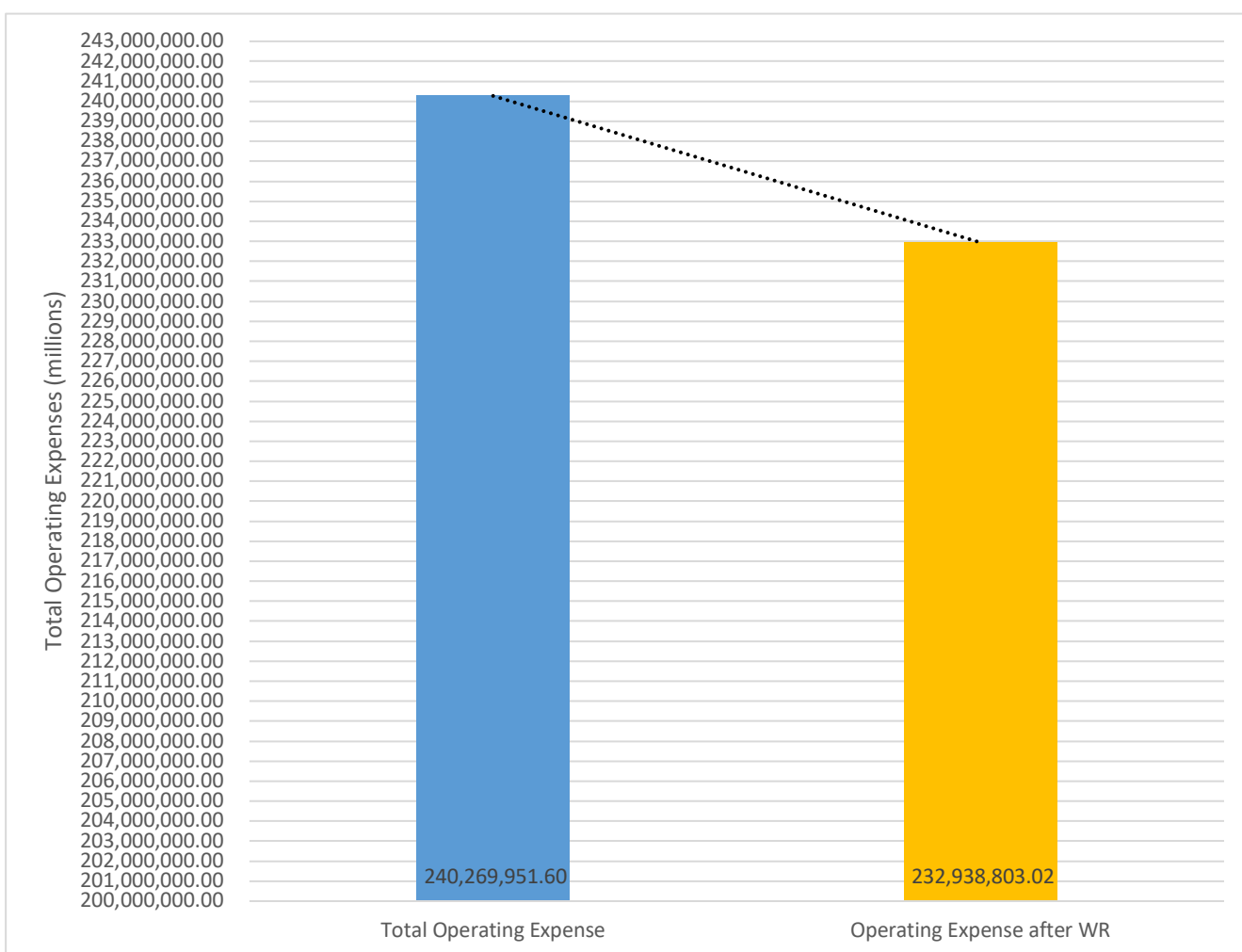
Figure 6: Average Total Net Revenue before and after Medicaid work requirements



Costs before and after Medicaid work requirements

After I calculated the revenues for hospitals, I analyzed the operating expenses. In Figure 7 below, I show the change in operating expenses before and after Medicaid work requirements. Operating expenses decreased from around \$240 million to \$232 million, or a 3.05% decrease in expenses.

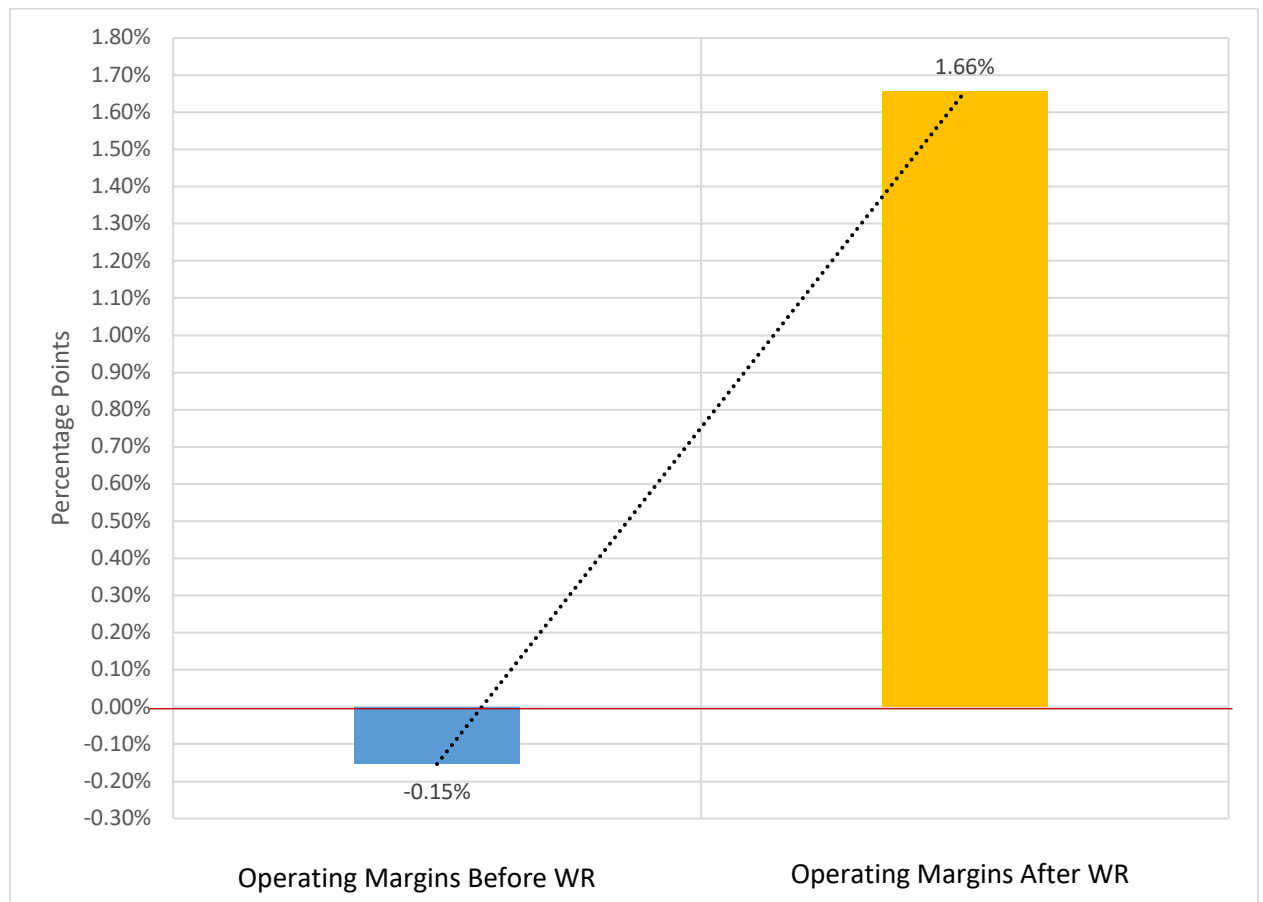
Figure 7: Operating Expenses before and after Medicaid work requirements



Overall Effects on Operating Margins

I show revenues and costs above to show how each component factors into hospital operating margins. Before work requirements the average operating margins for hospitals in North Carolina was -0.15%. After work requirements, operating margins increase to 1.66%, an average increase of 1.81 percentage points. Figure 8 displays the changes in operating margins with Medicaid work requirements in place.

Figure 8: Operating Margins before and after Work Requirements



Uncompensated Care Costs before and after Medicaid work requirements

First, I calculated the raw uncompensated care costs for hospitals. Figure 9 below shows uncompensated care costs before and after Medicaid work requirements.

Uncompensated care increased 40.26% from around \$18 million per hospital to over \$25 million after work requirements. Additionally, I calculated uncompensated care costs for hospitals as a percent of total operating expenses. As mentioned in the methodology section, measuring uncompensated care costs against total operating costs is a common measure in this area of research. I show the change in the percentage of uncompensated care costs as a percent of total operating expenses in Figure 11 below. Figure 11 shows uncompensated care costs as percent of total operating expenses increases by 3.38 percentage points from 9.45% to 12.83%.

Figure 9: Total Uncompensated Care Costs before and after Medicaid work requirements

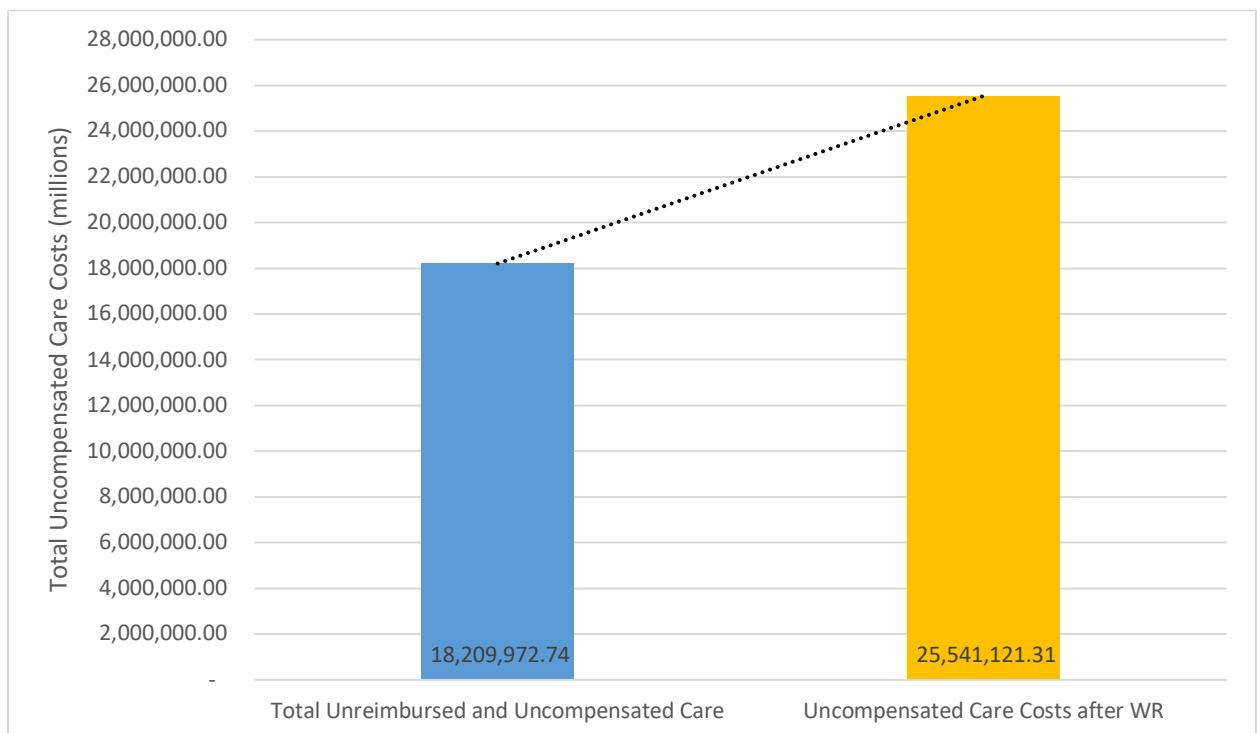
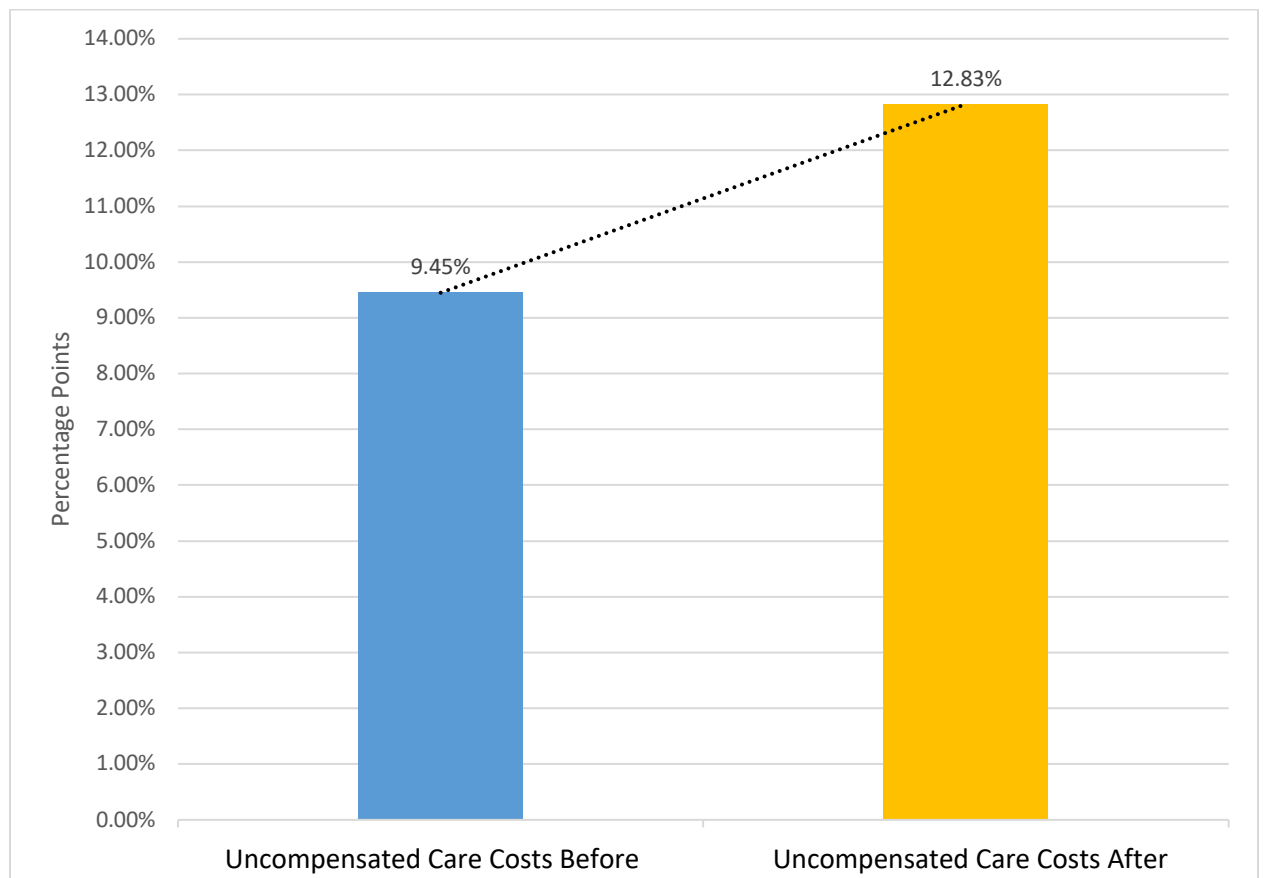


Figure 10: Percentage Point change in Uncompensated Care Costs



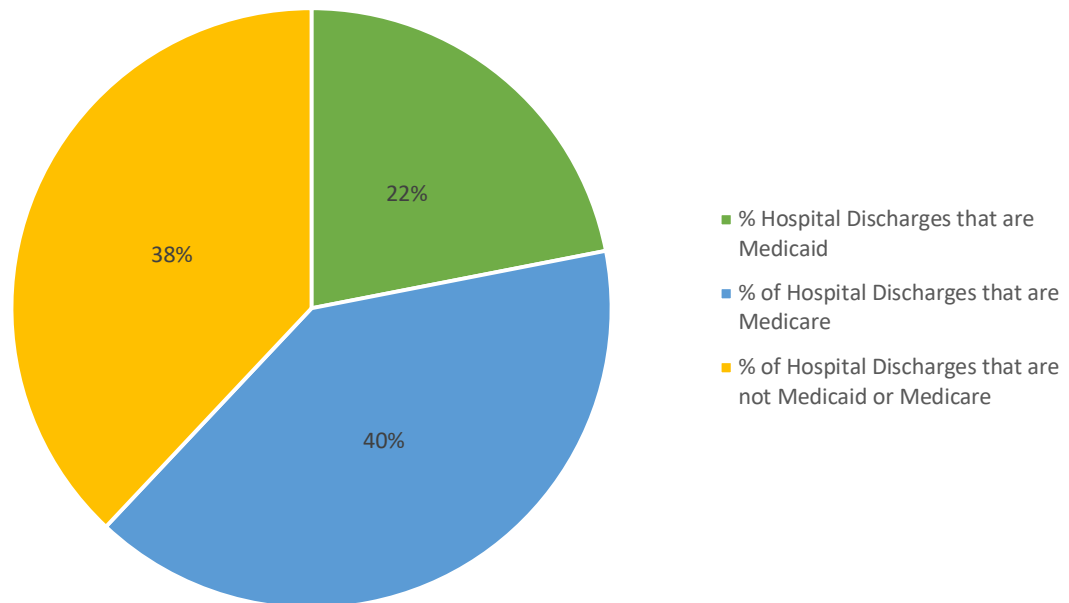
Fiscal Year 2015-2016

The second year of data I examined was from 2015 – 2016. This results subsection shows the overall payer mix, operating margins, and uncompensated care costs before and after Medicaid work requirements.

Payer mix before Medicaid work requirements

I calculated the payer mix for hospitals in fiscal year 2015 – 2016 using the same steps as from fiscal year 2014 – 2015. Figure 12 shows that across hospitals, an average of 22% of hospital discharges are Medicaid patients, 40% are Medicare patients, and 38% are neither. Conclusively, 22% of hospital discharges are Medicaid patients and 78% are non-Medicaid patients.

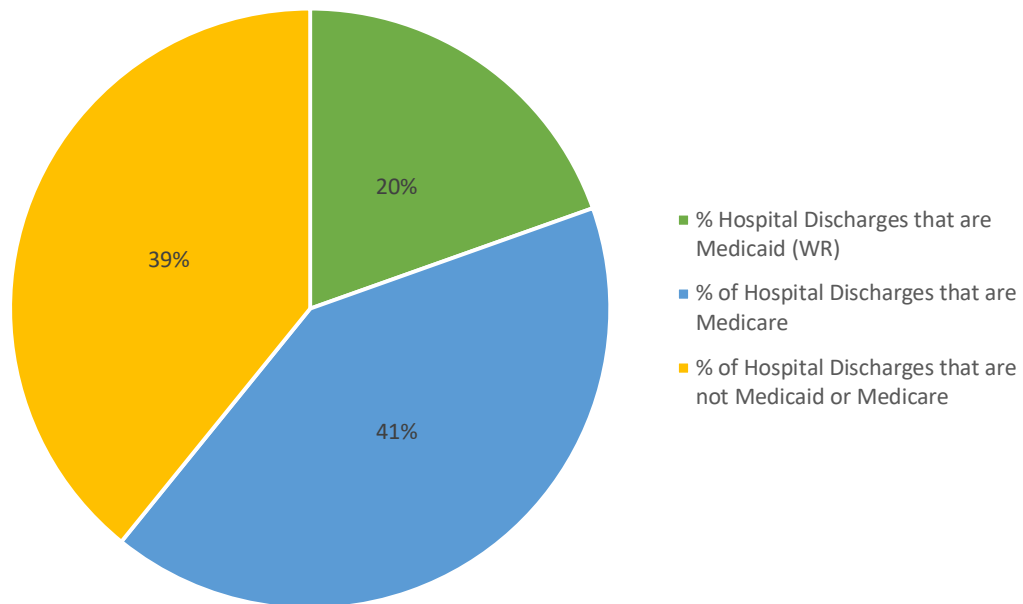
Figure 11: i



Payer mix after Medicaid work requirements

I then calculated the impact work requirements would have on the number of Medicaid discharges at hospitals. Figure 13 below shows the average payer mix at hospitals after Medicaid work requirements are implemented. After work requirements, 20 % of hospital discharges are Medicaid patients, 41% are Medicare patients, and 39% are neither. Medicaid patient discharges are 20% of the payer mix and non-Medicaid patient discharges are 80%. In fiscal year 2015 – 2016, the same as in 2014 – 2015, Medicaid discharges decreased by 2% and discharges of non-Medicaid patients increased by 2%.

Figure 12: Payer Mix after Medicaid work requirements

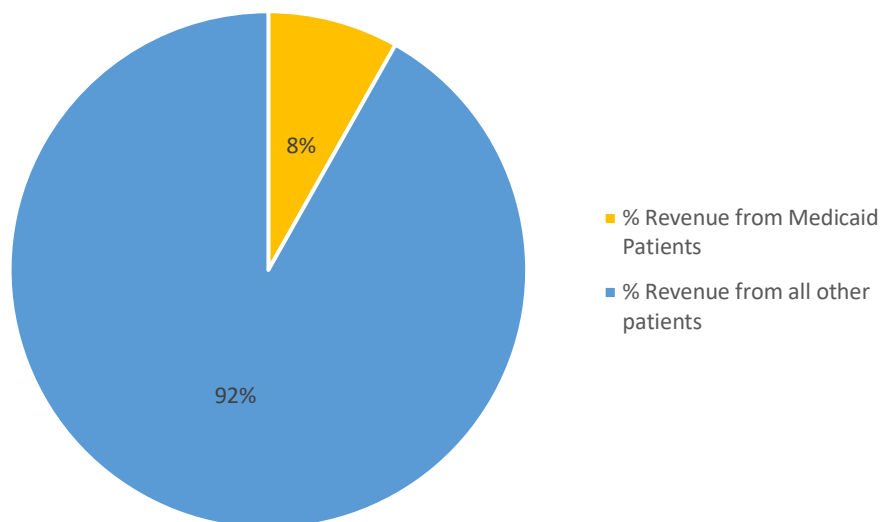


Operating Margins

Revenues before Medicaid work requirements

I calculated the percent of hospital revenue per patient type by dividing Net Medicaid Revenue by the Net Patient Revenue. I then averaged the 88 hospitals' payer mixes to find the average percent of hospitals revenues by patient type before work requirements. Figure 14 below shows that 8% of a hospital's revenues comes from Medicaid patients and 92% of revenues come from all other patients, similar to the previous fiscal year.

Figure 13: % Revenue per type of patient before Medicaid Work Requirements



Revenues after Medicaid work requirements

I then calculated the impact work requirements would have on the percent of hospital revenue per patient. In Figure 15 below, the percent of hospital revenues generated per patient type are shown. After work requirements, 7% of a hospital's revenues comes from Medicaid patients and 93% of revenues come from all other patients. With work requirements in place, the percent of hospital revenue that comes from Medicaid patients decreases by 1%. Figures 16 and Figure 17 show hospitals' average net Medicaid revenue and average total revenue before and after Medicaid work requirements. Net Medicaid Revenue decreases by 14% after work requirements, as shown in Figure 16 below. Average total revenues for hospitals decreased by 1.15% with work requirements in place, as displayed in Figure 17.

Figure 14: Revenue per type of patient before Medicaid Work Requirements

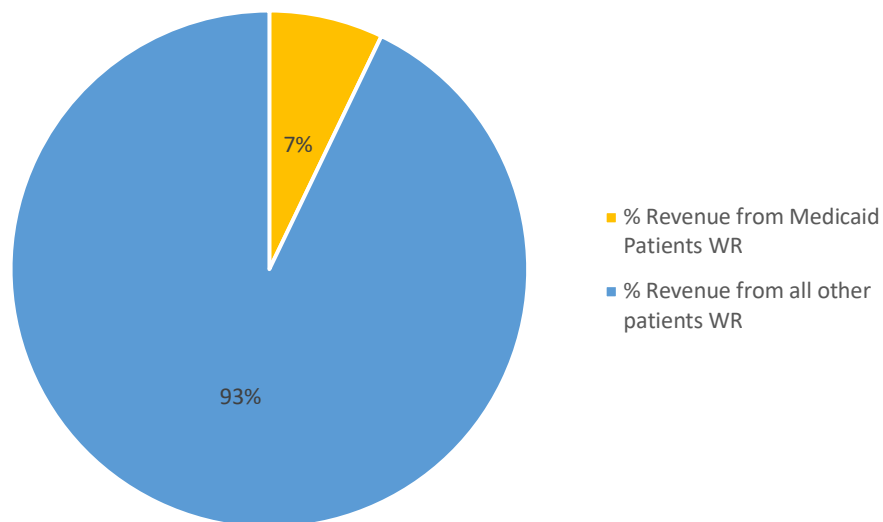


Figure 15: Net Medicaid Revenue before and after Medicaid work requirements

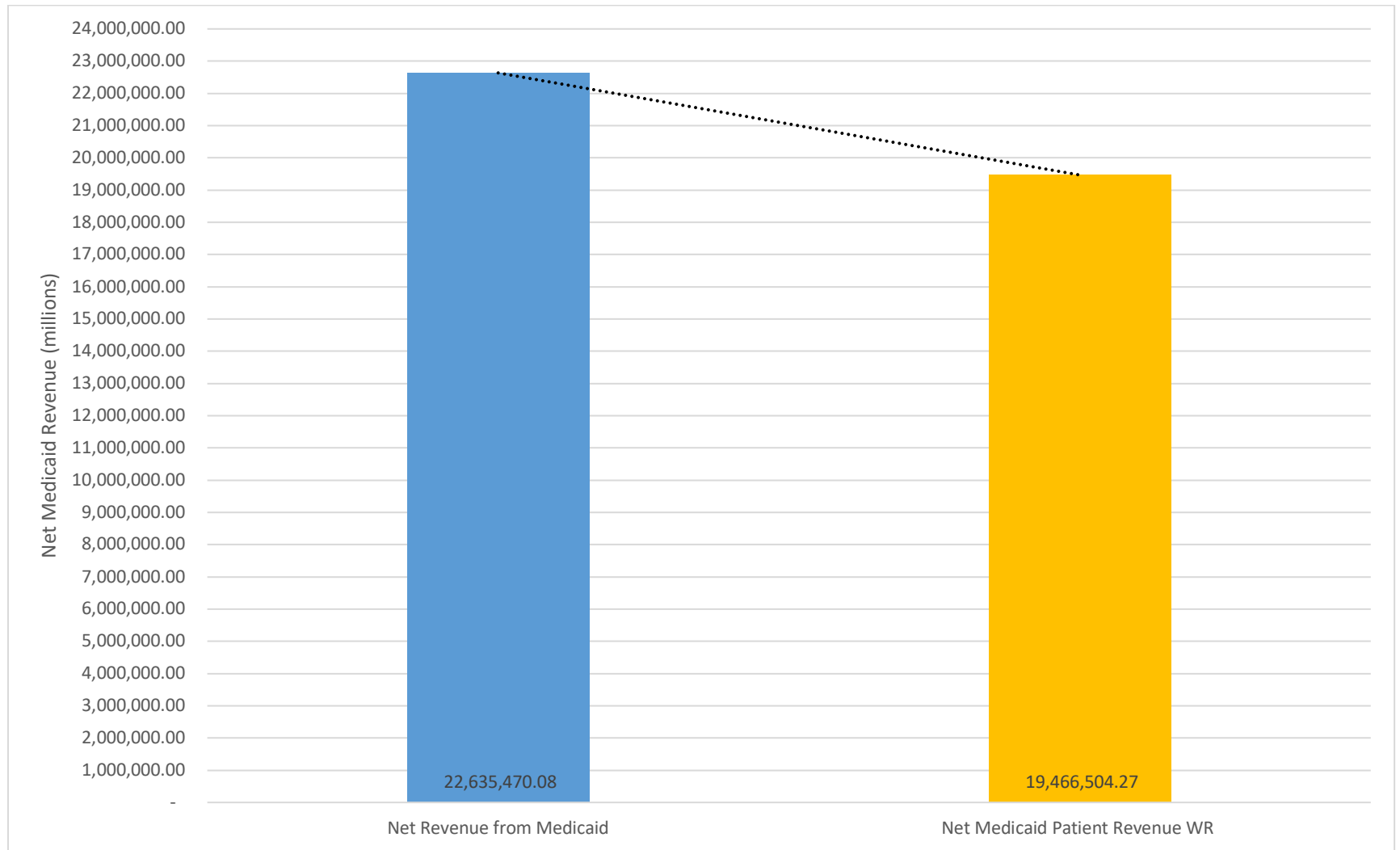
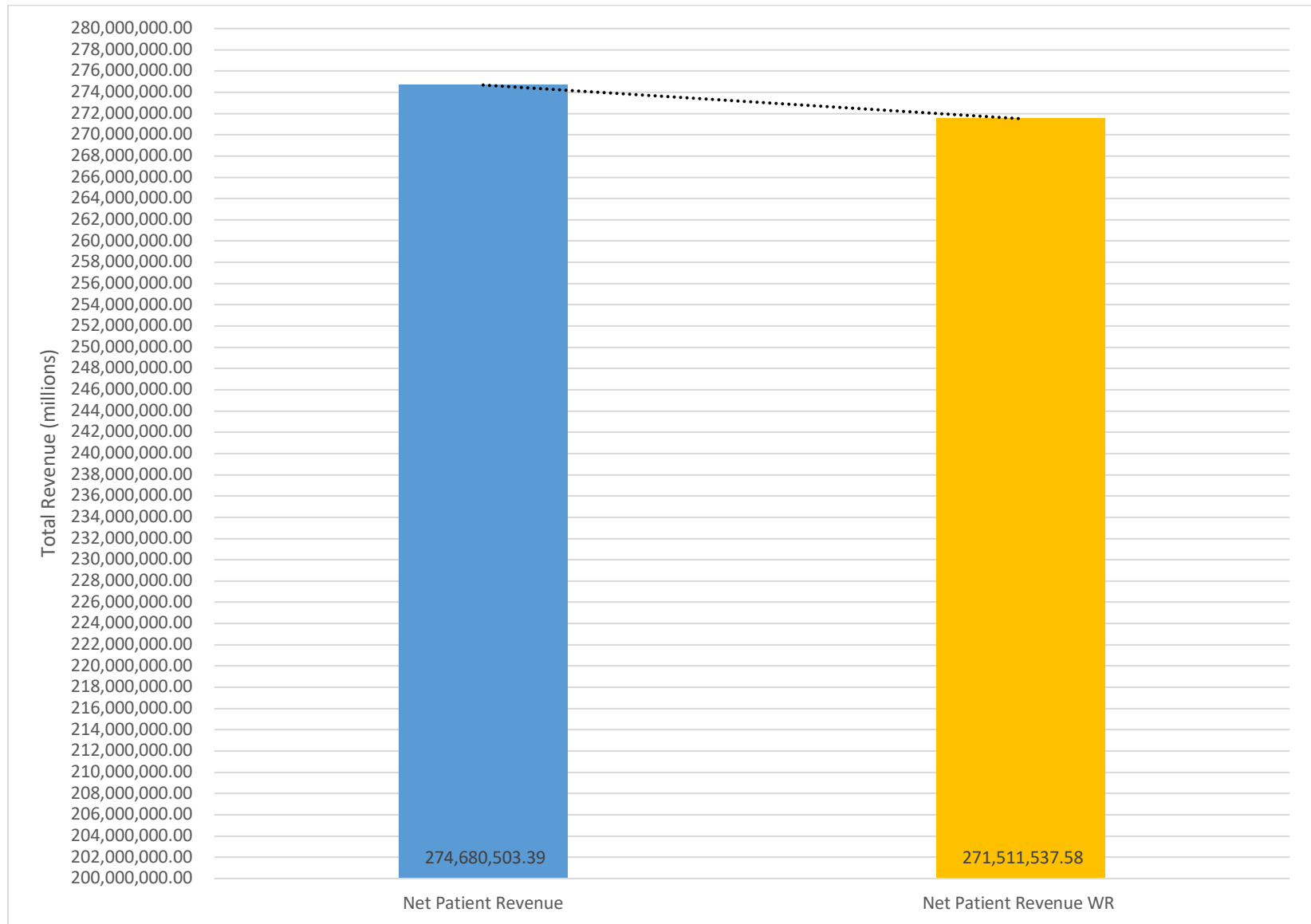


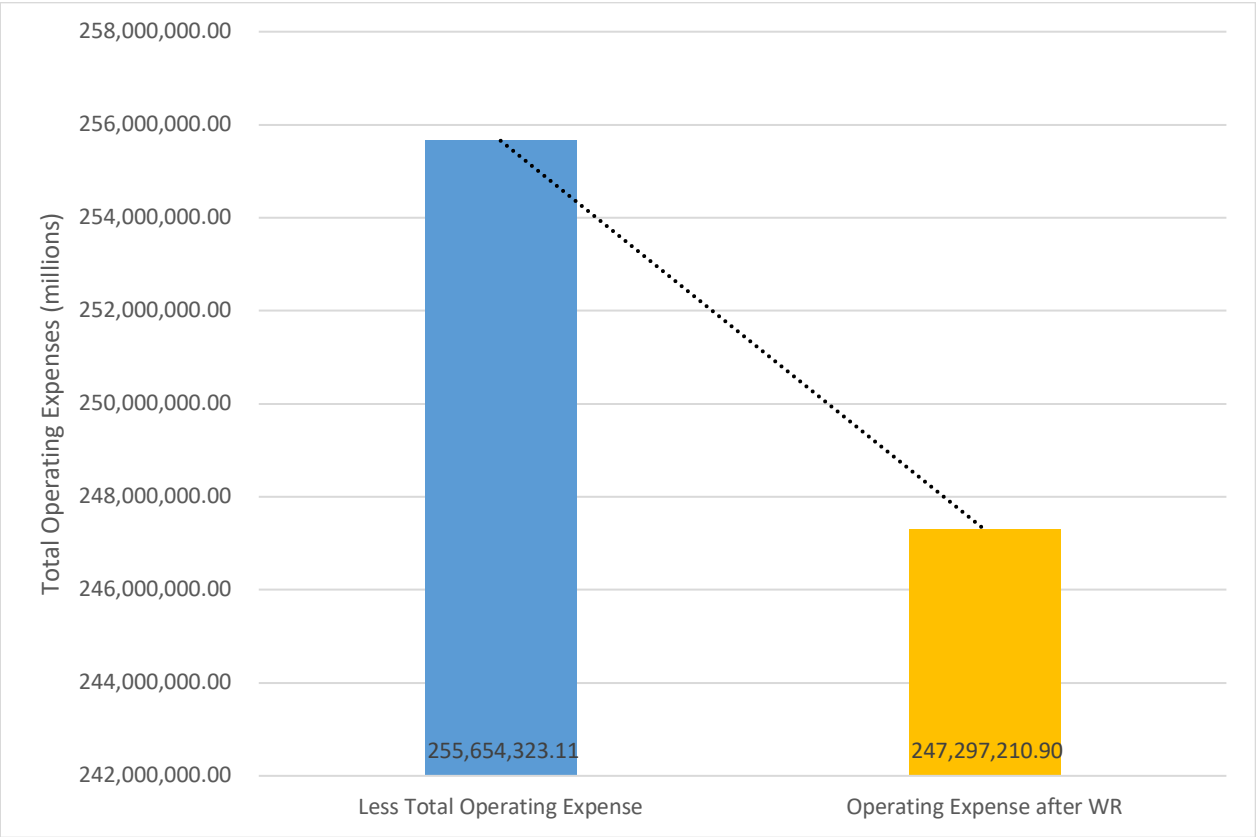
Figure 16: Average Total Net Revenue before and after Medicaid work requirements



Costs before and after Medicaid work requirements

After I calculated the revenues for hospitals, I analyzed the operating expenses. In Figure 18 below, I show the change in operating expenses before and after Medicaid work requirements. Operating expenses decreased from around \$255 million to \$247 million, or a 3.27% decrease in expenses.

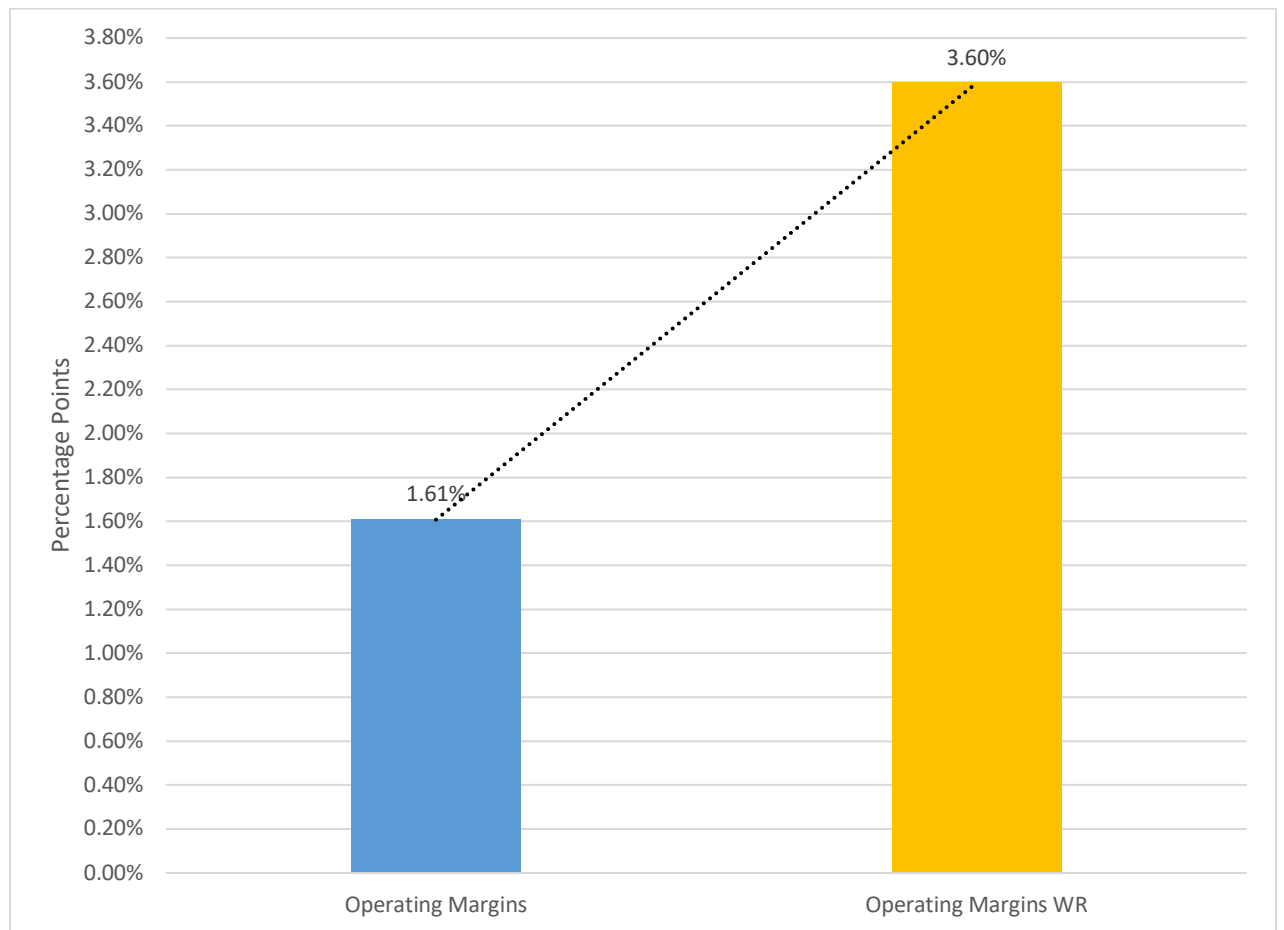
Figure 17: Operating Expenses before and after Medicaid work requirements



Overall Effects on Operating Margins

I show revenues and costs above to show how each component factors into hospital operating margins. Before work requirements the average operating margins for hospitals in North Carolina was -1.61%. After work requirements, operating margins increase to 3.60%, an average increase of 1.99 percentage points. Figure 19 displays the changes in operating margins with Medicaid work requirements in place.

Figure 18: Operating Margins before and after Work Requirements



Uncompensated Care Costs before and after Medicaid work requirements

First, I calculated the raw uncompensated care costs for hospitals. Figure 9 below shows uncompensated care costs before and after Medicaid work requirements.

Uncompensated care increased 50.43% from around \$16 million per hospital to over \$24 million after work requirements. Additionally, I calculated uncompensated care costs for hospitals as a percent of total operating expenses. As mentioned in the methodology section, measuring uncompensated care costs against total operating costs is a common measure in this area of research. I show the change in the percentage of uncompensated care costs as a percent of total operating expenses in Figure 20 below. Figure 20 shows uncompensated care costs as percent of total operating expenses increases by 3.27 percentage points from 8.71% to 11.98%.

Figure 19: Total Uncompensated Care Costs before and after Medicaid work requirements

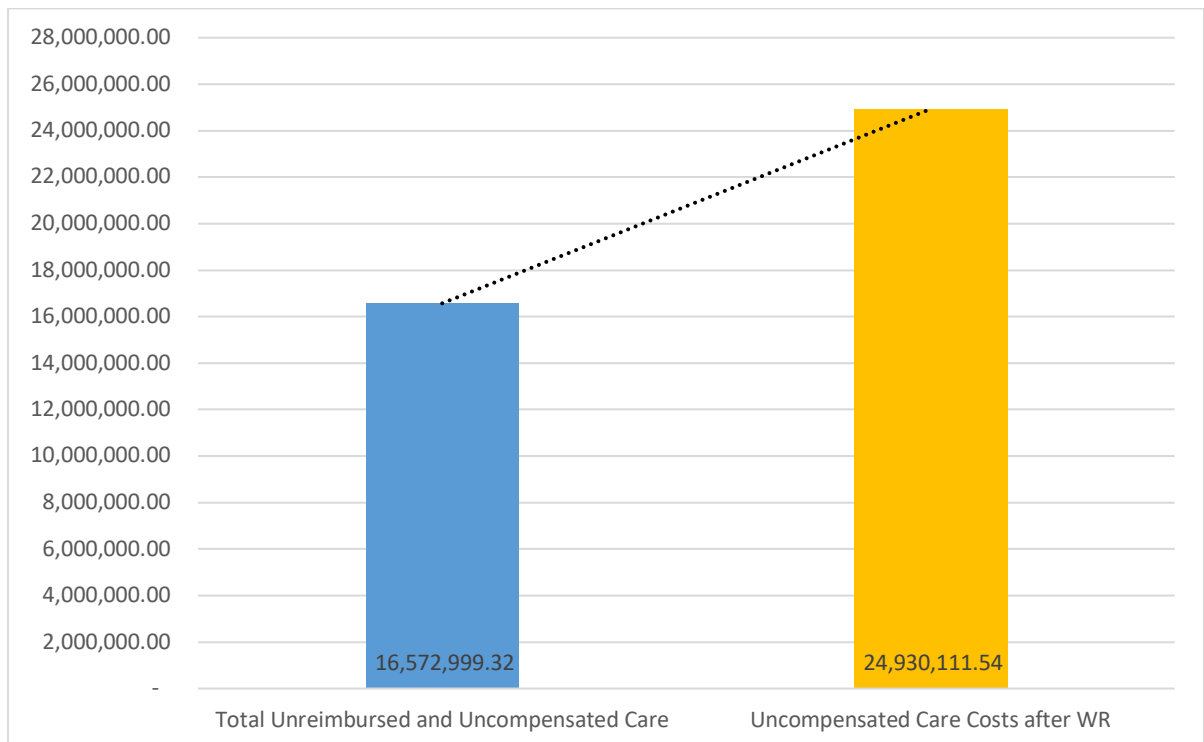
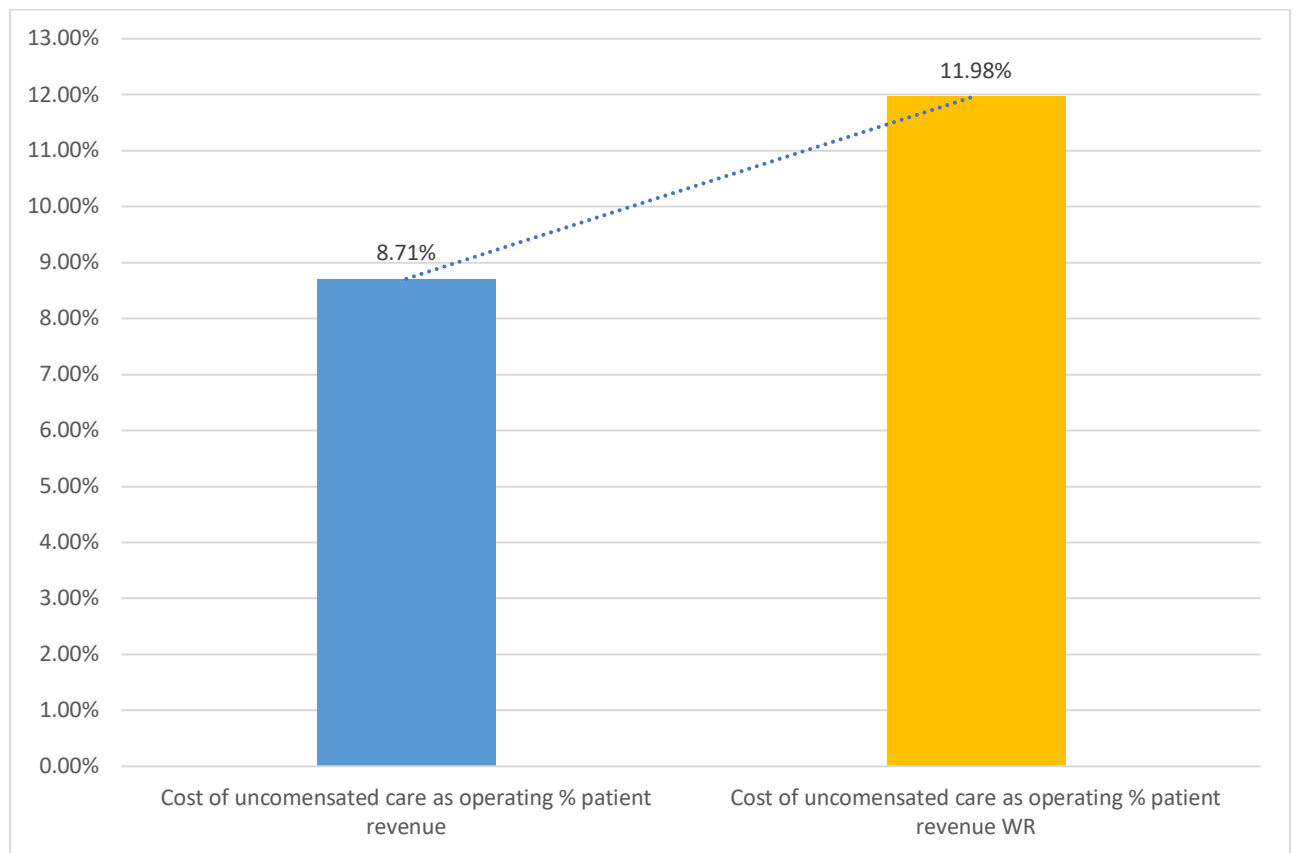


Figure 20: Percentage Point change in Uncompensated Care Costs



DISCUSSION

In this section, I discuss the key implications of the results from my study. I divide up the discussion section by the three main areas of analysis: payer mix, operating margins, and uncompensated care costs. I also explore some of the limitations of my research in the following section. The situational analysis in Appendix C shows how DSH providers could react under different circumstances.

Effects on Payer Mix at Hospitals

Based on the results from the 2014 – 2015 and 2015 – 2016 fiscal years, the payer mix shifted with the introduction of work requirements. In both years, the percentage of Medicaid discharges per hospital decreased by 2%, and the percentage of non-Medicaid discharges increased by 2%. Research from Medicaid expansion suggested that expansion increased the proportion of patients with Medicaid coverage and decreased the proportion of patients with private insurance (Admon, et al., 2019; Wu, et al., 2018; Nikpay, Buchmueller, & Levy, 2016). My findings suggest that Medicaid work requirements would result in changes in payer mix for DSH hospitals, with reductions in payers covered by Medicaid and increases in patients with no expected source of payment. The total volume of hospitals appears to decrease as patients are ‘crowded-out’ from Medicaid to uninsured.

Effects on Hospital Operating Margins

Effects on Revenues

The findings from this study suggest that for DSH providers, Medicaid work requirements reduce revenue because patients who lost their Medicaid coverage will no longer have their services reimbursed by Medicaid. Medicaid revenues appear to be hit the hardest by the implementation of work requirements, with hospitals seeing an average of a 14% decrease in Medicaid revenues. The data implies that total net patient revenues decrease between 1.15 and 1.17 percentage points as a result of the reduction in Medicaid revenues. Findings from current work requirements research suggest that Medicaid revenues at hospitals fall by 10 to 11% (Haught, Dobson, & Luu, 2019). My research agrees with previous studies, and it suggests that hospitals' Medicaid and total revenues decrease as a result of the decrease in Medicaid patients and an increase in uninsured patients.

Effects on Expenses

Similar to revenues, the study indicates that costs for DSH are reduced after Medicaid work requirements by between 3.05% and 3.27%. Costs for providing service to Medicaid patients and non-Medicaid patients remained the same with work requirements in place. This study suggests that the payer shift moving away from Medicaid patients decreases a hospital's operating expenses because there are fewer patients whose healthcare costs have to be absorbed by the hospital.

Overall Effects on Operating Margins

Overall, operating margins appear to increase as a result of Medicaid work requirements because the decrease in operating expenses is greater than the decrease in revenues. The data in my study shows that Medicaid patients bring in less revenue per discharge than non-Medicaid patients, and it appears that Medicaid patients' costs exceed the reimbursement rates. Therefore, a reduction in the number of these patients will increase the overall margins. The results suggest that hospital operating margins improve because the costs of treating Medicaid patients are greater than the revenues they generate.

Hospital Uncompensated Care Costs

My analysis suggests that uncompensated costs will increase if Medicaid work requirements are implemented. The total uncompensated care costs increased by 40.26% and 50.43% in fiscal years 2014 – 2015 and 2015 – 2016, respectively. These increases translate to a 3.38 and a 3.27 percentage point increase in uncompensated care costs as a percent of total operating expenses. Not only do uncompensated care costs increase after work requirements, but they also become a more significant part of total operating expenses for hospitals. Increases in uncompensated care appear to be affected by shifts in payer mix. Individuals that are moved from Medicaid to uninsured status, so those patients are no longer able to cover their hospital care expenses. Hospitals are required by law to provide care to patients, regardless of insurance status, and those care expenses are categorized as uncompensated care costs. With the decrease in Medicaid patients and the

increase in uninsured patients, hospitals' uncompensated care costs increase since Medicaid no longer reimburses patients costs.

Discussion Conclusion

The results of my research suggest that work requirements could decrease the Medicaid payer mix by 2% at hospitals, increase operating margins between 1.8% and 2.0%, and increase uncompensated care costs between 3.3% and 3.4%. The results indicate that while hospital margins could improve with work requirements, the increases would be outweighed by the increases in uncompensated care costs.

CONCLUSION

In the introduction of this thesis, I wrote about North Carolina's proposed Medicaid work requirements law and its approval by CMS. I also introduced my goals for this thesis, which were to show that Medicaid work requirements have impacts just beyond Medicaid coverage. Then, in the literature review, I discussed the background of the Medicaid program and research on the effects of Medicaid expansion on state economies, coverage rates, labor participation, and hospital finances. I also walked through the current, but limited, research on the effects of work requirements on means-tested programs and how my research could contribute to the conversation about Medicaid work requirements. In the methodology section, I outlined my questions, hypotheses, and the steps I used to analyze both. Finally, in the results and discussion sections, I examined fiscal years 2014 – 2015 and 2015 – 2016 and the effect work requirements could impose on hospitals' payer mixes, operating margins, and uncompensated care costs. My findings suggest the following if Medicaid work requirements are implemented in North Carolina: Hospital payer mixes shift away from Medicaid patients towards non-Medicaid payers, Operating Margins increase, and Uncompensated Care Costs increase. To conclude this paper, I identify future areas of research for this topic.

The use of this forecast can be useful, but only under certain circumstances. The goal of a forecast is to predict what might happen under a given set of conditions. It is important to understand North Carolina's uniqueness as a state, in terms of Medicaid population, DSH providers, and law language. Just because the forecast created here shows that Medicaid work requirements could weaken hospitals' financial positions, does

not mean that other states will behave in lockstep. The impact on payer mix, operating margins, and uncompensated care costs at hospitals in other states depends on the characteristics of the states, hospitals, and the design of state' Medicaid work requirement programs. All of these mentioned play a key role in how many recipients lose coverage and the resulting financial impact that would have on hospitals.

While the forecasts for North Carolina show work requirements shift the payer mix away from Medicaid patients, increase operating margins, and increase uncompensated care costs, there are still many questions we can ask on the relationship between work requirements and hospital finances. I would expand on this research asking how Medicaid work requirements impact Critical Access Hospitals. Critical Access Hospitals designation helps rural hospitals reduce their financial vulnerability and improve access to healthcare in rural communities. It would be interesting to examine this subset of hospitals in North Carolina and how Medicaid work requirements could impact them. Another question to ask would be how all North Carolina hospitals would respond to the implementation of requirements. The adoption of North Carolina's Medicaid work requirements appears to be in the near future, possibly within a year. If these work requirements were to pass, it would be worthwhile to turn these forecasts into a case study. I think it would be interesting to explore the actual results from Medicaid work requirements, if implemented, to see their impact on hospitals. The implementation in North Carolina and the design of the program could end up being different from Arkansas, so I would be curious to investigate how the implementation would affect the state. Diverging from North Carolina, additional research could be conducted to examine

the relationship between work requirements and hospital closures in Arkansas, the first state that implemented these requirements.

I hope this thesis contributes to additional lines of questioning in the Medicaid work requirements area and inspires future research questions that expand on this research and the current literature. Lawmakers in states considering Medicaid work requirements should consider these findings and the downstream effects work requirements can have on hospitals.

APPENDICES

Appendix A

Table 1: Medicaid for Aged, Blind, and Disabled

Family Size	1	2
Monthly Income Limit	\$1041	\$1,410

Table 2: Medicaid for Infants and Children

Family Size	Age 0-5	Age 6-18
1	\$2125	\$1346
2	\$2881	\$1825
3	\$3637	\$2304
4	\$4393	\$2782
5	\$5149	\$3261

Table 3: Medicaid for Families with Dependent Children

Family Size	Caretakers and Children age 19-20
1	\$434
2	\$569
3	\$667
4	\$744

Table 4: Medicaid for Pregnant Women

Family Size	Monthly Income Limit
1	\$1983
2	\$2689
3	\$3395
4	\$4100

Table 5: States Decisions on ACA Expansion

Location	Status of Medicaid Expansion Decision
United States	37 expansion states including Washington D.C 14 Non-adoption states
Alabama	Not Adopted
Arizona	Adopted
Arkansas	Adopted
Colorado	Adopted
Connecticut	Adopted
Delaware	Adopted
District of Columbia	Adopted
Florida	Not Adopted
Georgia	Not Adopted
Hawaii	Adopted
Idaho	Adopted

Illinois	Adopted
Indiana	Adopted
Iowa	Adopted
Kansas	Not Adopted
Kentucky	Adopted
Louisiana	Adopted
Maine	Adopted
Maryland	Adopted
Massachusetts	Adopted
Michigan	Adopted
Minnesota	Adopted
Mississippi	Not Adopted
Missouri	Not Adopted
Montana	Adopted
Nebraska	Adopted
Nevada	Adopted
New Hampshire	Adopted
New Jersey	Adopted
New Mexico	Adopted
New York	Adopted
North Carolina	Not Adopted
North Dakota	Adopted
Ohio	Adopted

Oklahoma	Not Adopted
Oregon	Adopted
Pennsylvania	Adopted
Rhode Island	Adopted
South Carolina	Not Adopted
South Dakota	Not Adopted
Tennessee	Not Adopted
Texas	Not Adopted
Utah	Adopted
Vermont	Adopted
Virginia	Adopted
Washington	Adopted
West Virginia	Adopted
Wisconsin	Not Adopted
Wyoming	Not Adopted

Table 5: States not adopting Medicaid expansion under the ACA are highlighted.

Appendix B

1. First Method

Qualifying for the alternate special exception Medicare DSH adjustment applies to hospitals meeting all the following:

- Located in an urban area
- Have 100 or more beds
- Can demonstrate more than 30 percent of their total net inpatient care revenues come from state and local government sources for indigent care (other than Medicare or Medicaid)

These hospitals are known as “Pickle” hospitals. If a hospital qualifies under this method, it is eligible for a specific Medicare DSH adjustment.

2. Alternate Special Exception Method

The primary method applies to hospitals serving a significantly disproportionate number of low-income patients, based on the hospital’s disproportionate patient percentage (DPP).

The DPP equals the sum of the percentage of Medicare inpatient days (including Medicare Advantage inpatient days) attributable to patients entitled to both Medicare Part A and Supplemental Security Income (SSI) (including patient days not covered under Part A and patient days when patients exhaust their Part A benefits), and the percentage of total inpatient days attributable to patients eligible for Medicaid but not entitled to Medicare Part A.

If a hospital’s DPP equals or exceeds a specified threshold amount, the hospital qualifies for the Medicare DSH adjustment. The Medicare DSH adjustment is determined by using a complex formula (the applicable formula is based on a hospital’s DPP).

Medicare DPP Formula

Medicare DPP =	Medicare/Supplemental Security Income Days	+	Medicaid, Non-Medicare Days
	_____		_____
	Total Medicare Days		Total Patient Days

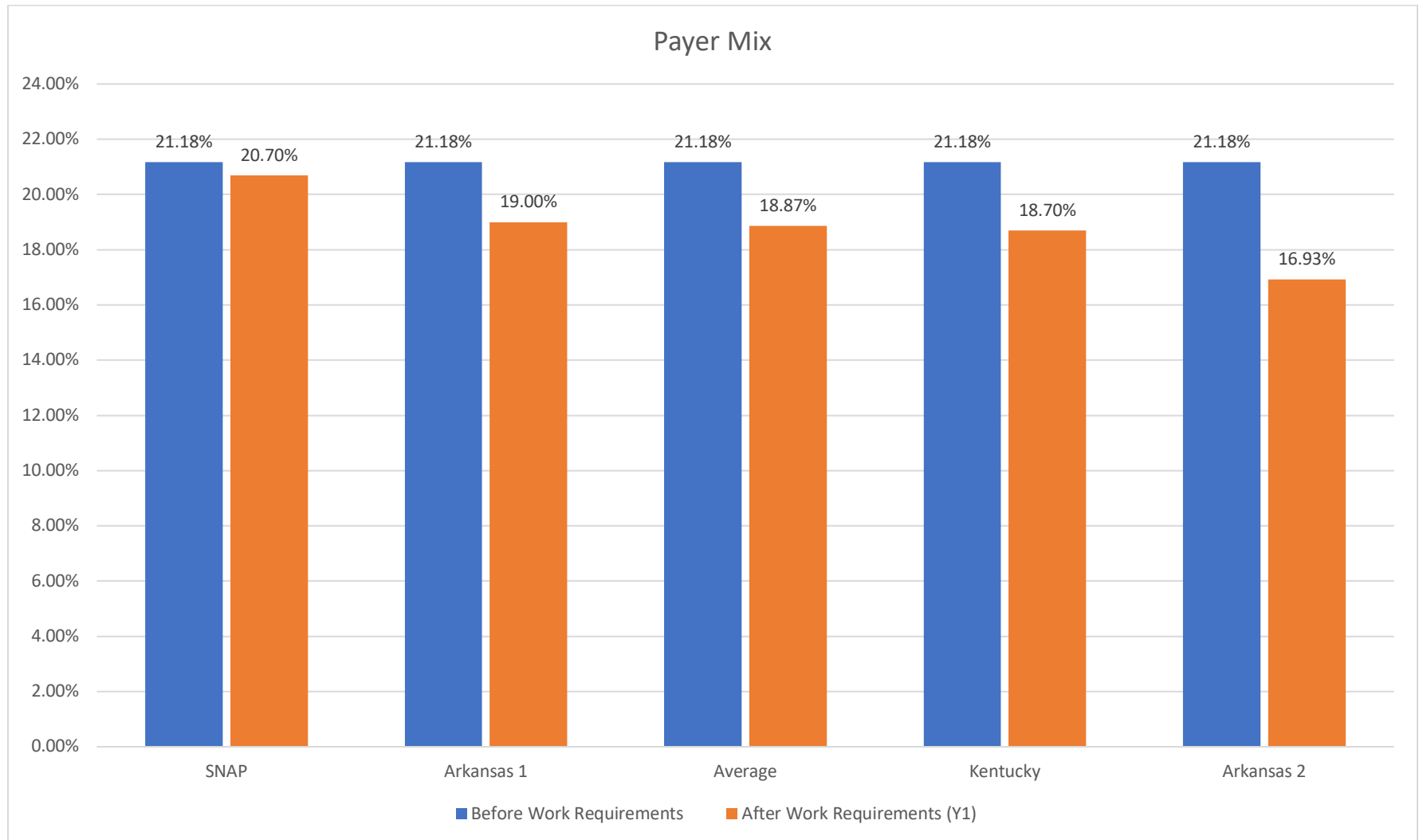
Appendix C

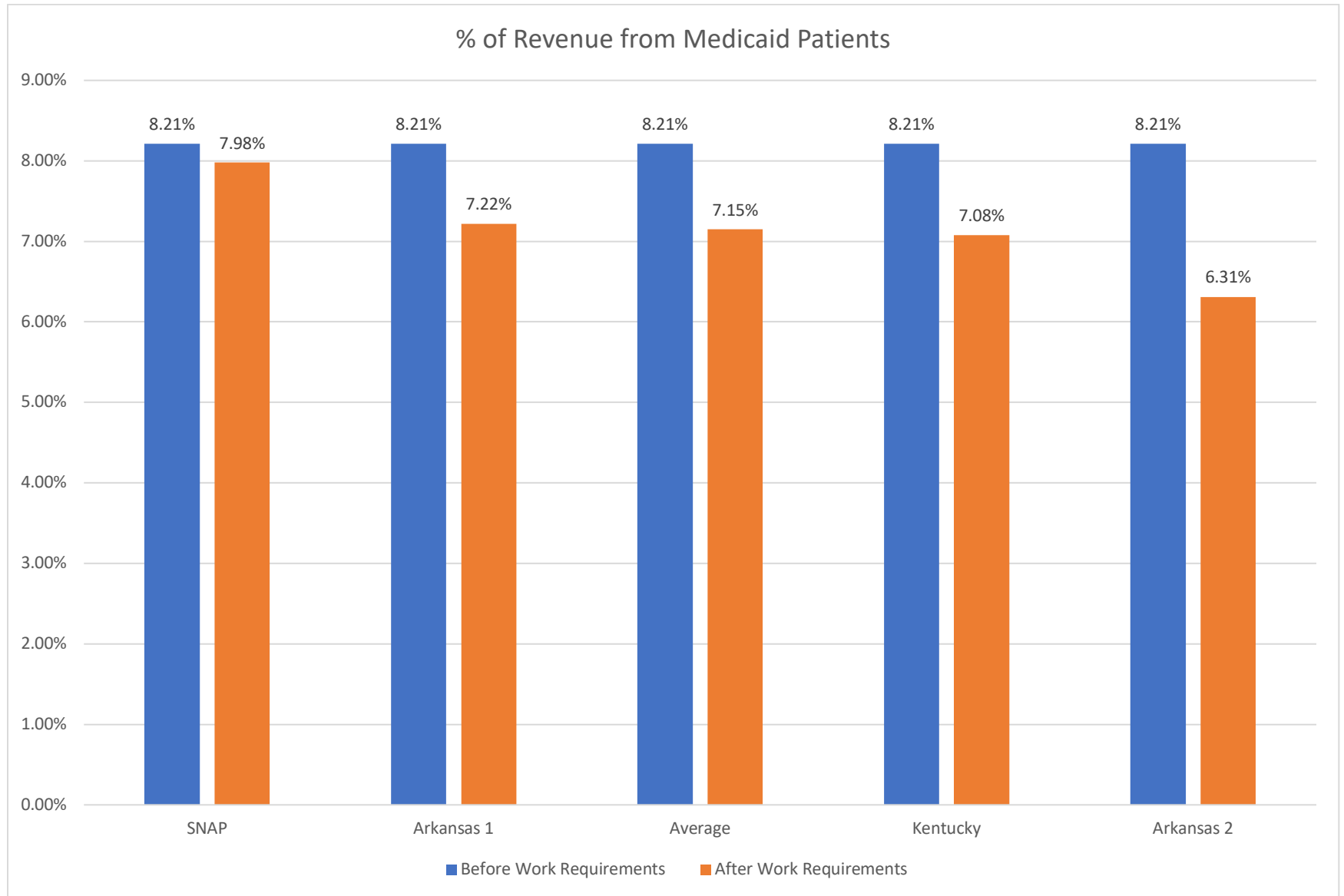
Table 6: Table of Data and Assumptions

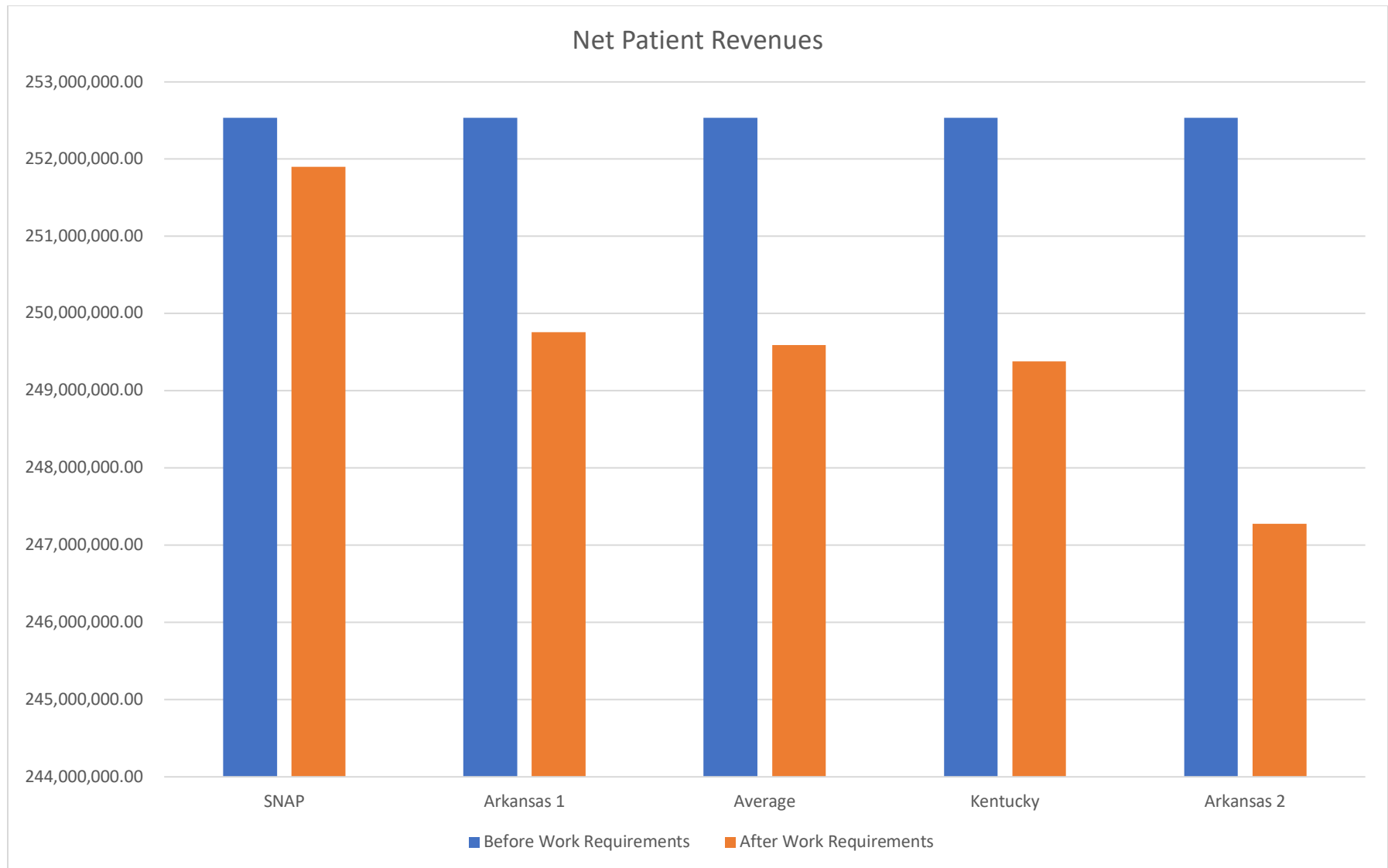
Variable	Source	Equations / Assumptions
1) Payer Mix (before work requirements)	From Cost Reports: total Medicaid discharges and total discharges	Medicaid discharges / total discharges Assumption: all Medicaid beneficiaries who lose coverage move to uninsured status
2) Medicaid discharges (after work requirements)	From Cost Reports: total Medicaid discharges	Medicaid discharges – (Medicaid Discharges * percent of beneficiaries that lose coverage) **Percent of beneficiaries that lose coverage is taken from the case studies (3%, 13%, 15%, 25%)
3) Total Discharges (after work requirements)	From Cost Reports: total Medicaid discharges and total discharges	Total discharges – (Medicaid discharges – Medicaid discharges after work requirements)
4) Payer Mix (after work requirements)	total discharges after work requirements (#3)	Medicaid discharges with work requirements / total discharges Assumption: all Medicaid beneficiaries who lose coverage move to uninsured status
5) Net Revenue	From Cost Reports: Net Revenue	
6) Medicaid Revenue	From Cost Reports: Net Revenue from Medicaid	
7) Revenue per Medicaid discharges	From Cost Reports: Medicaid revenue and Medicaid discharges	Medicaid revenue / Medicaid discharges
8) Revenue per discharge	From Cost Reports: total revenue and total discharges	Total revenue / total discharges
9) Net Revenue (after work requirements)	Medicaid discharges after work requirements (#2), total discharges after work requirements (#3), and revenues from discharges (#7&8)	(Medicaid discharges after work requirements *revenue per Medicaid discharge) + ((total discharges after Medicaid – Medicaid discharges after work requirements) * revenue from other discharges)
10) Medicaid Revenue (after work requirements)	Medicaid discharges (#2) and revenue per discharge (#8)	(Medicaid discharges after work requirements *revenue per Medicaid discharge)
11) Operating Costs	From Cost Reports: Total Operating Expenses	
12) Cost per discharge	Operating Expenses and Total Discharges	Operating Expenses / Discharges
13) Operating Margins	From Cost Reports	(Net Patient Revenue – Operating Expenses) / Net Patient Revenue
14) Operating Margins after work requirements	From calculations	(Net Patient Revenue – Operating Expenses) / Net Patient Revenue
15) Uncompensated Care Costs (after work requirements)	From Cost Reports: Uncompensated Care Costs	(Operating Expense per patient discharge *(total discharges – discharges after work requirements)) + total uncompensated costs

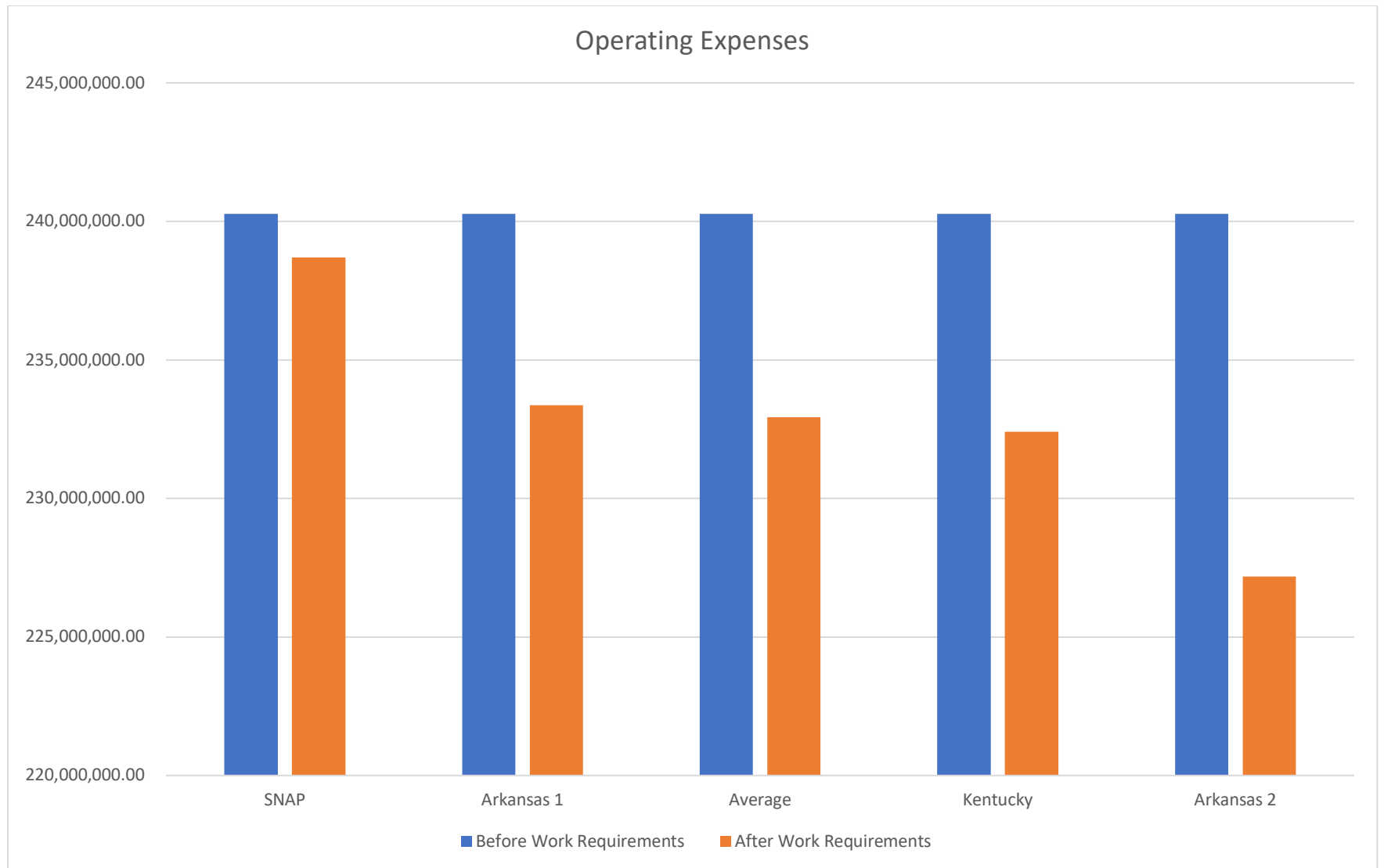
Appendix D: Situational Analyses

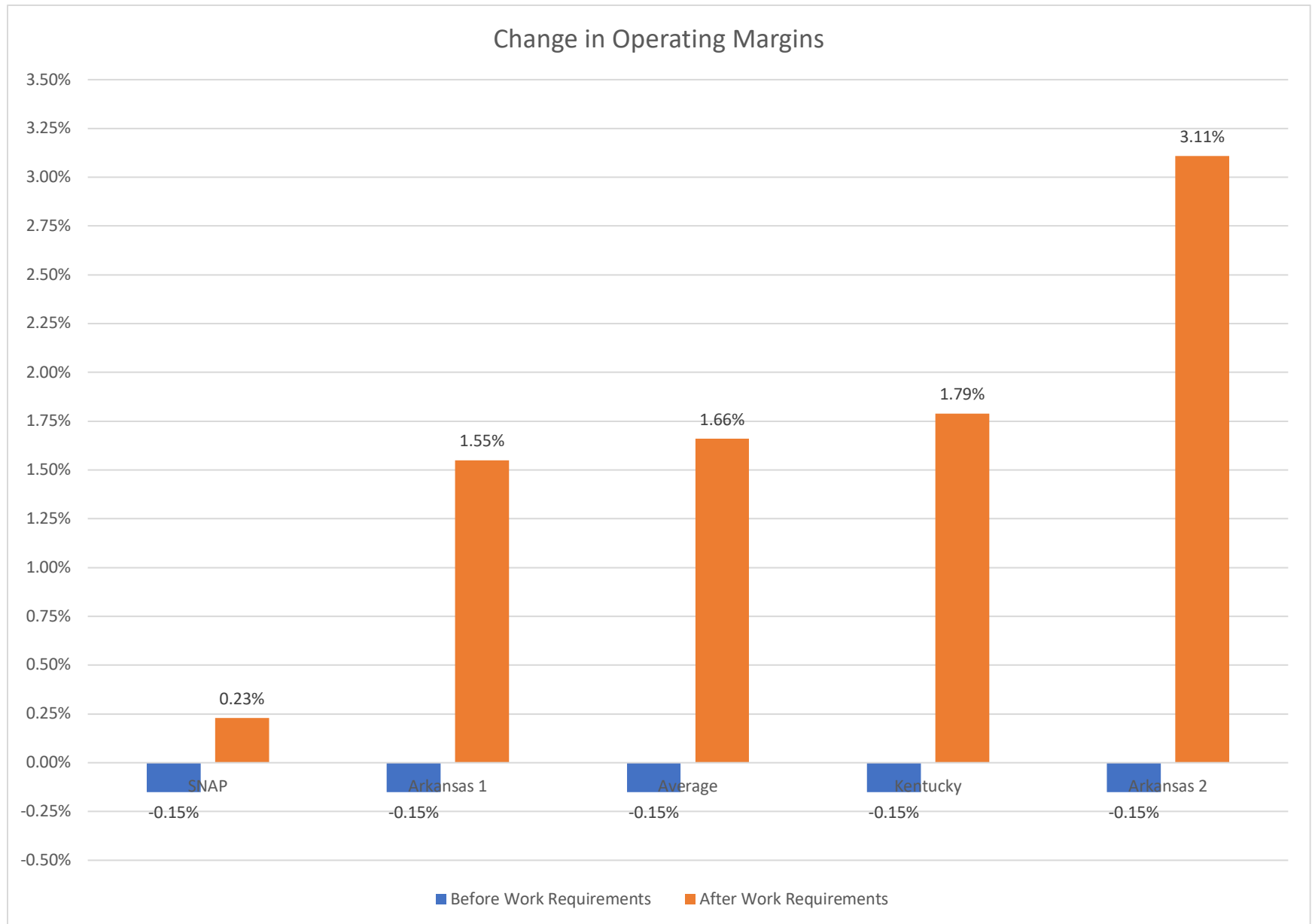
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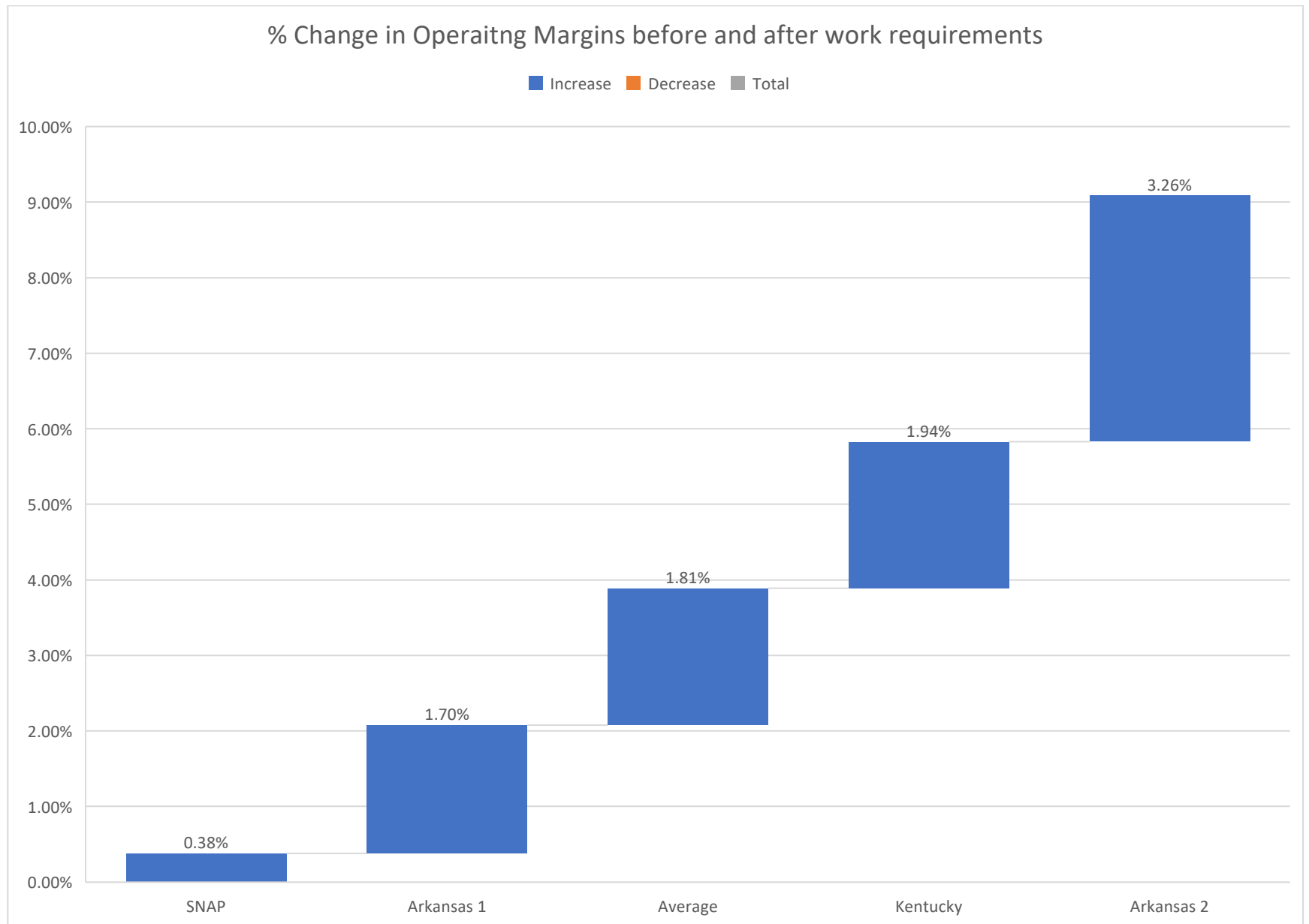


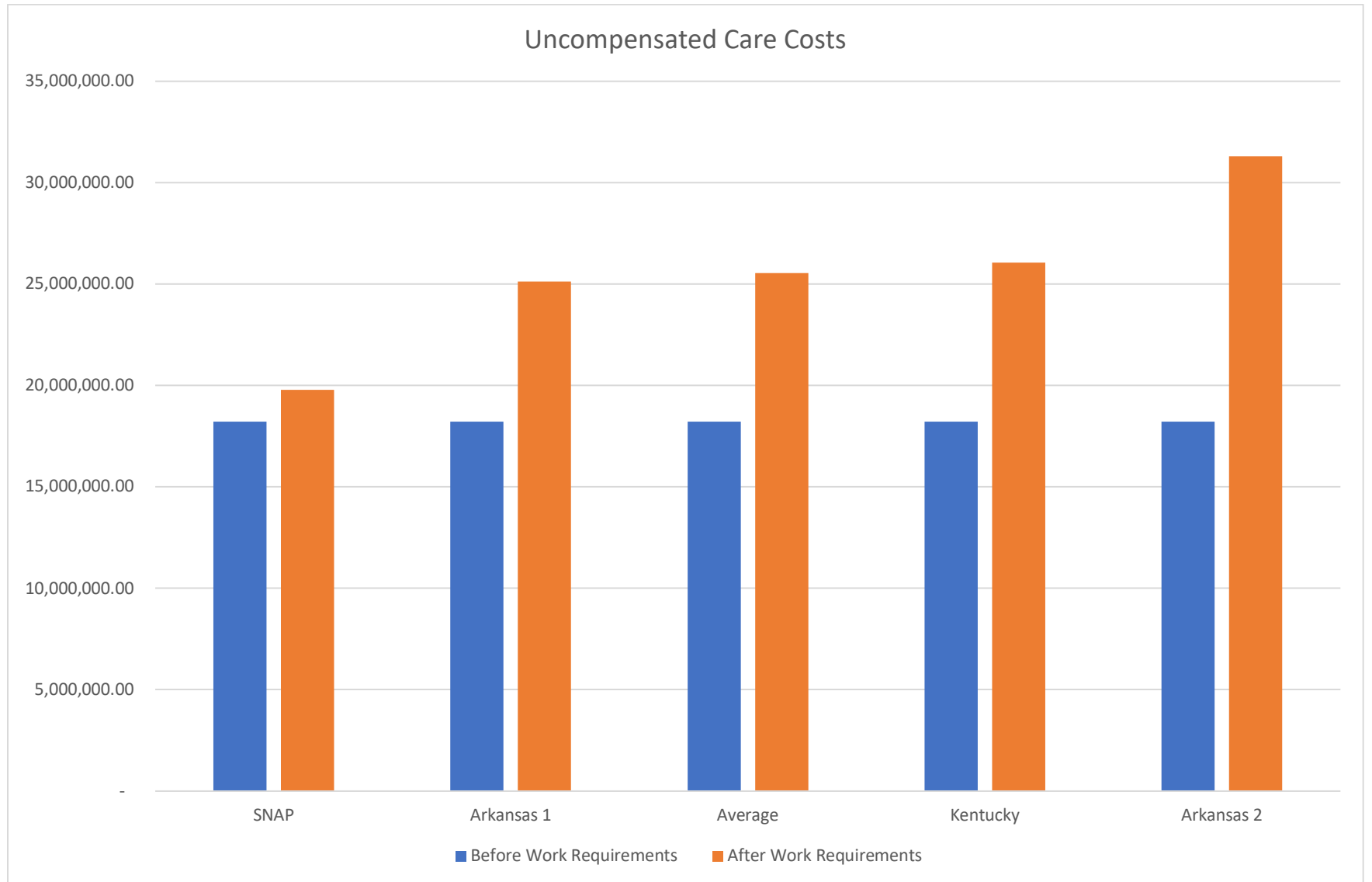


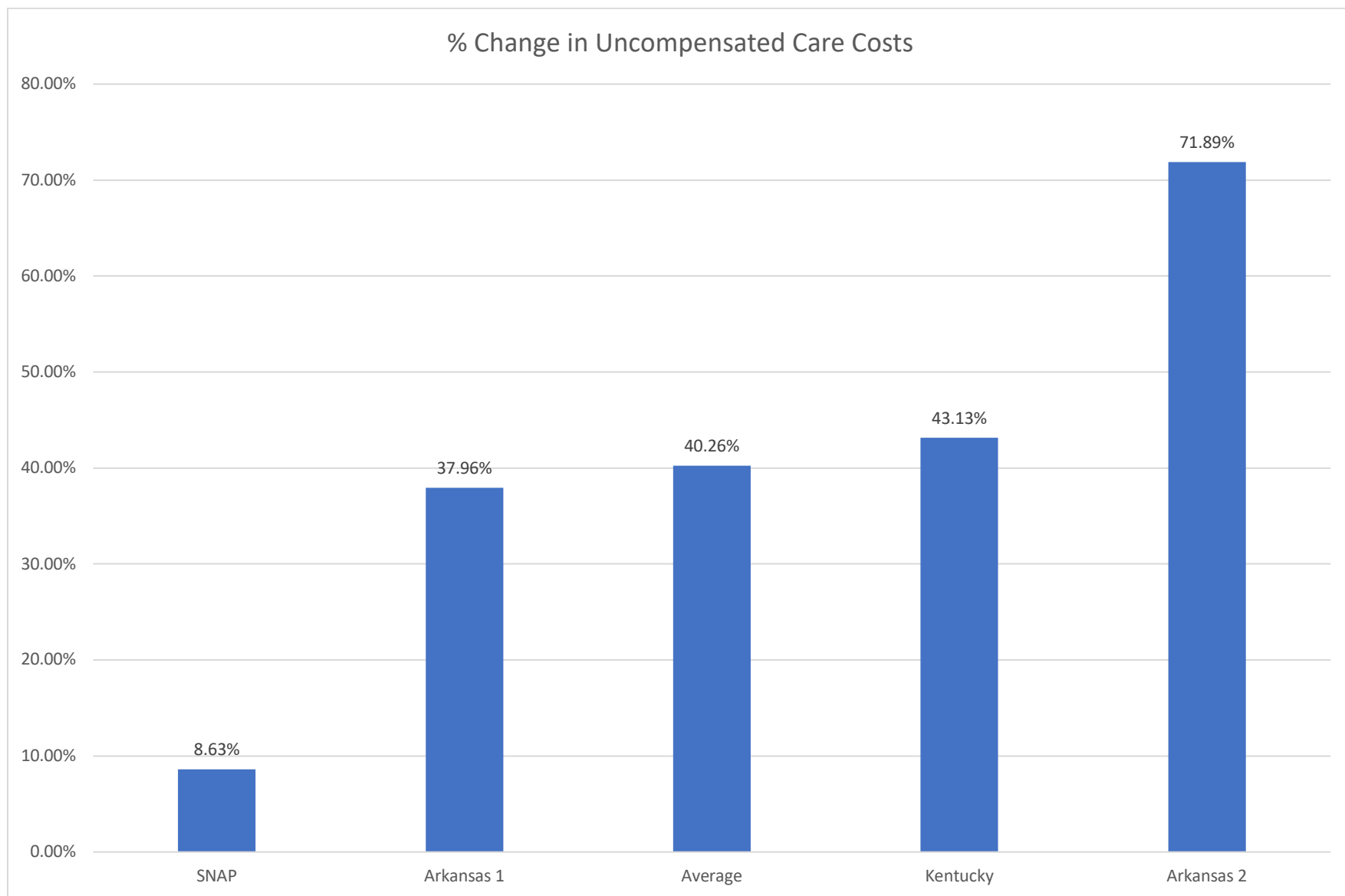


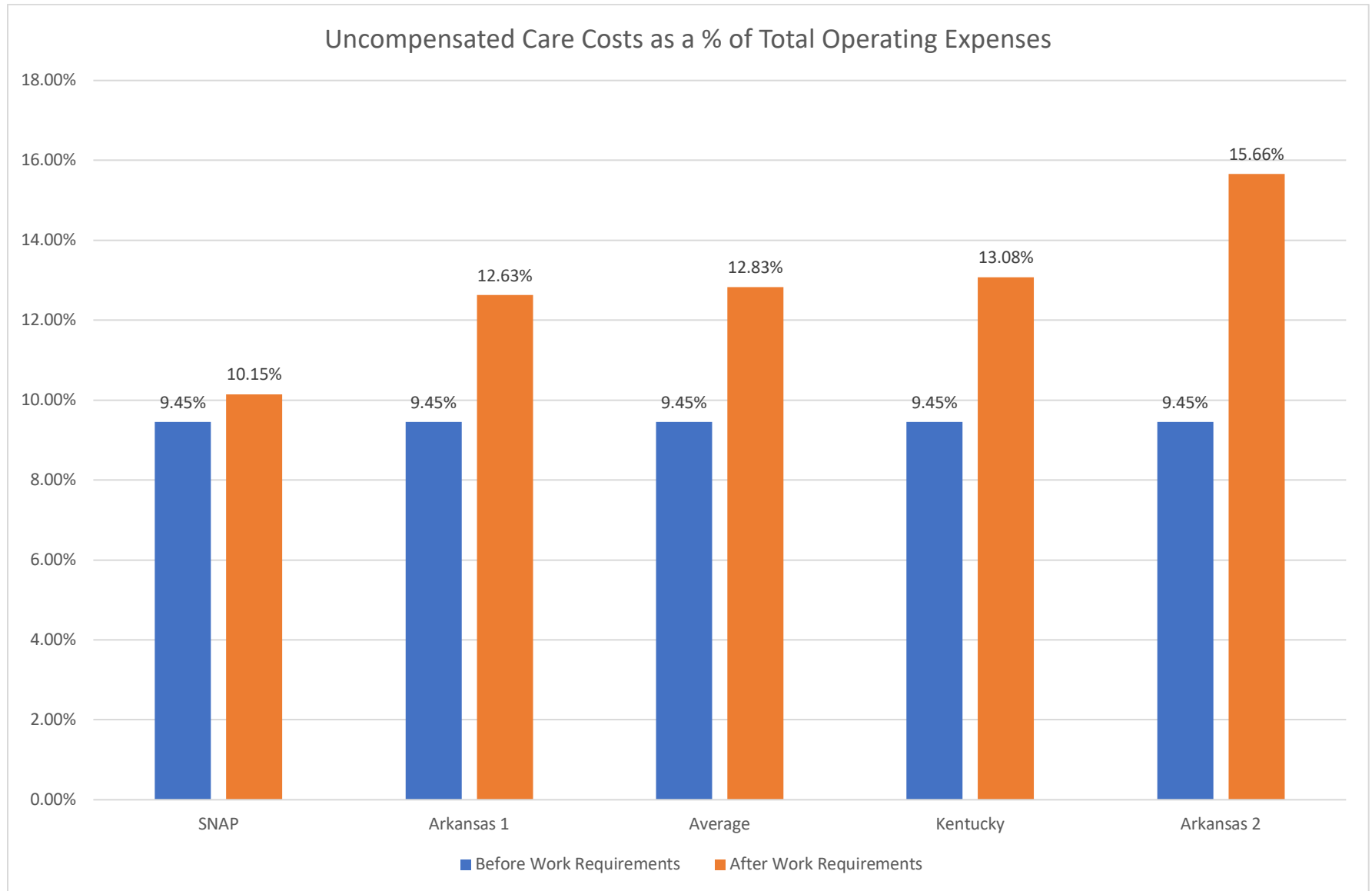


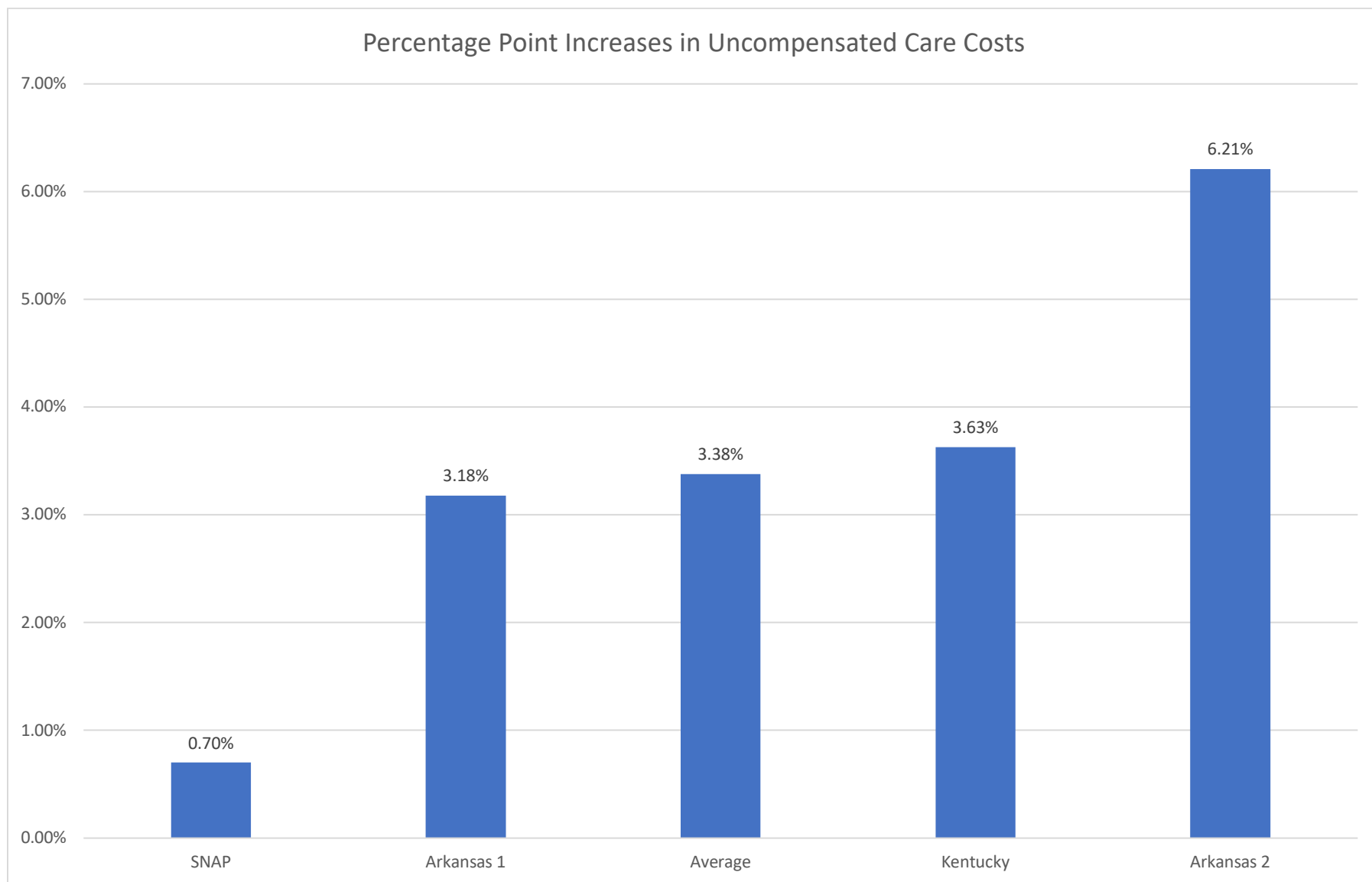




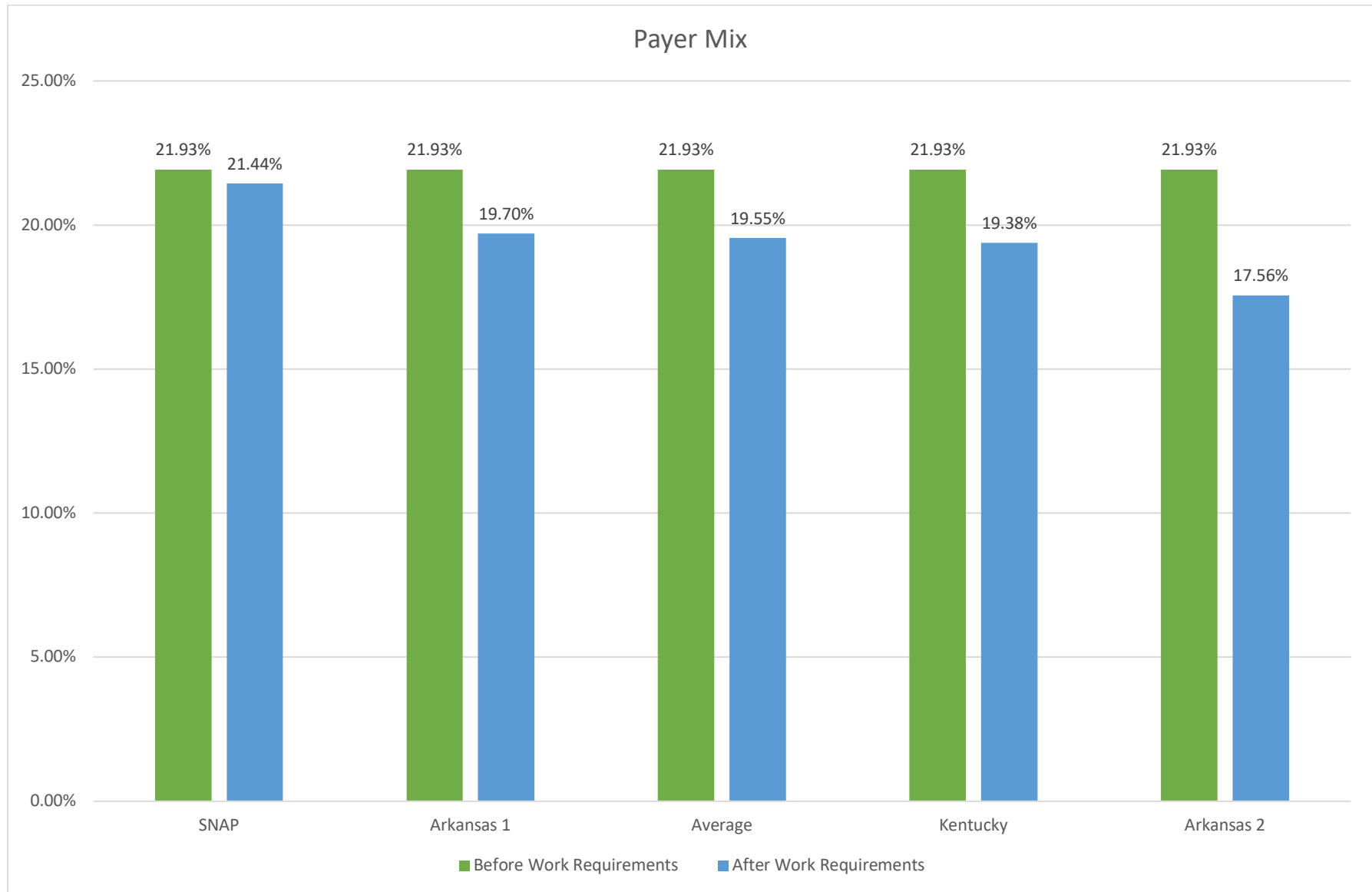


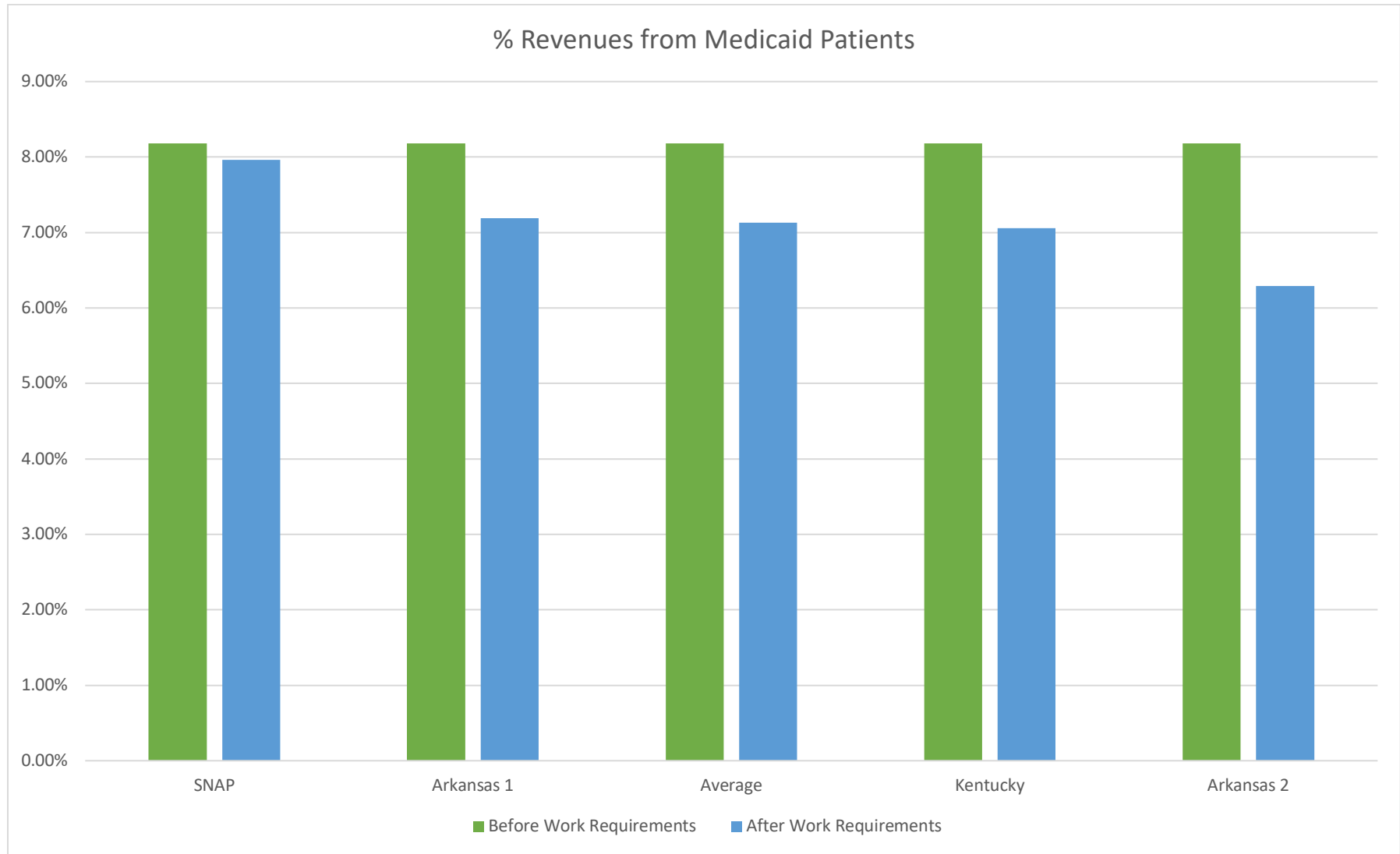


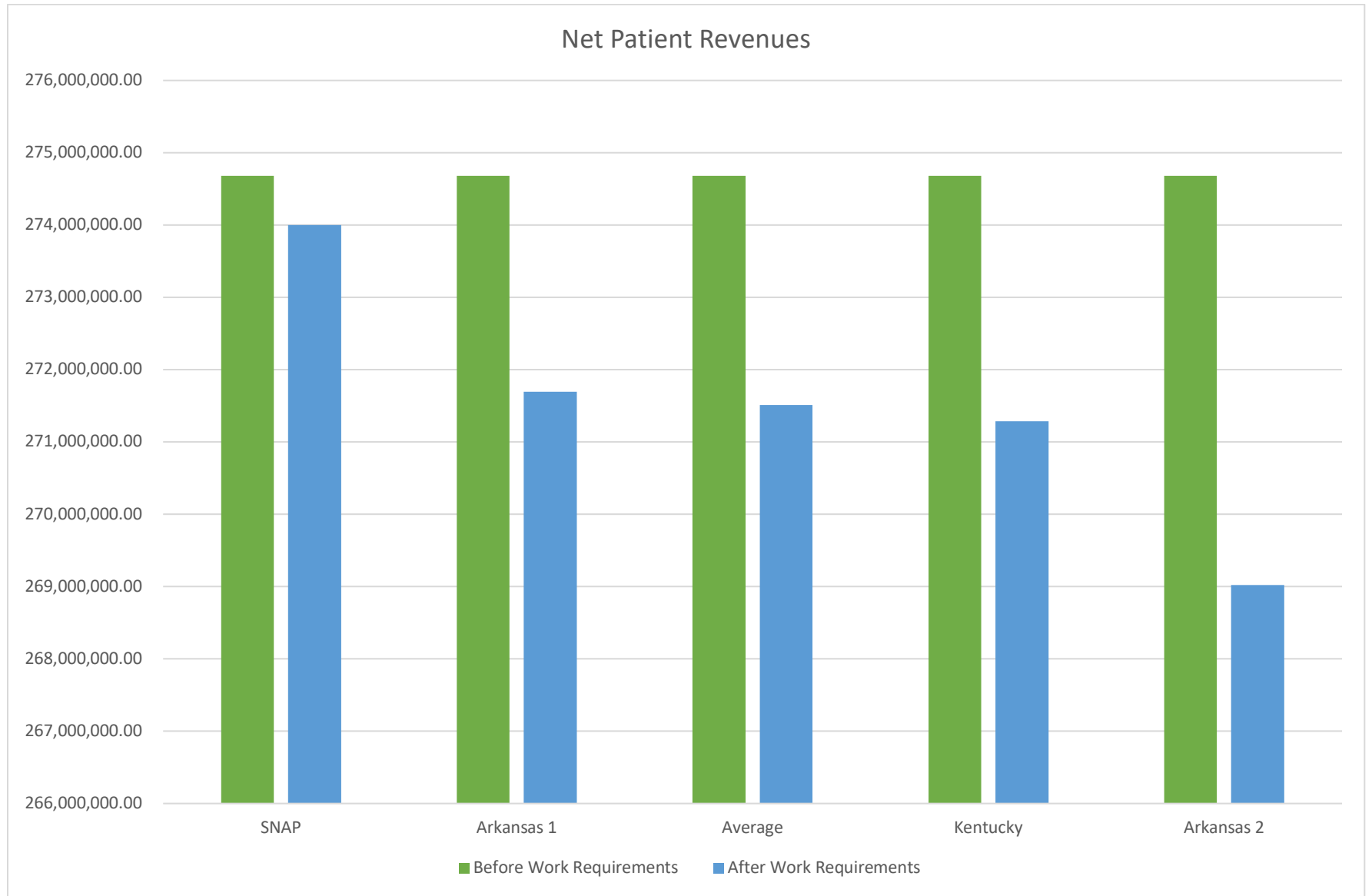


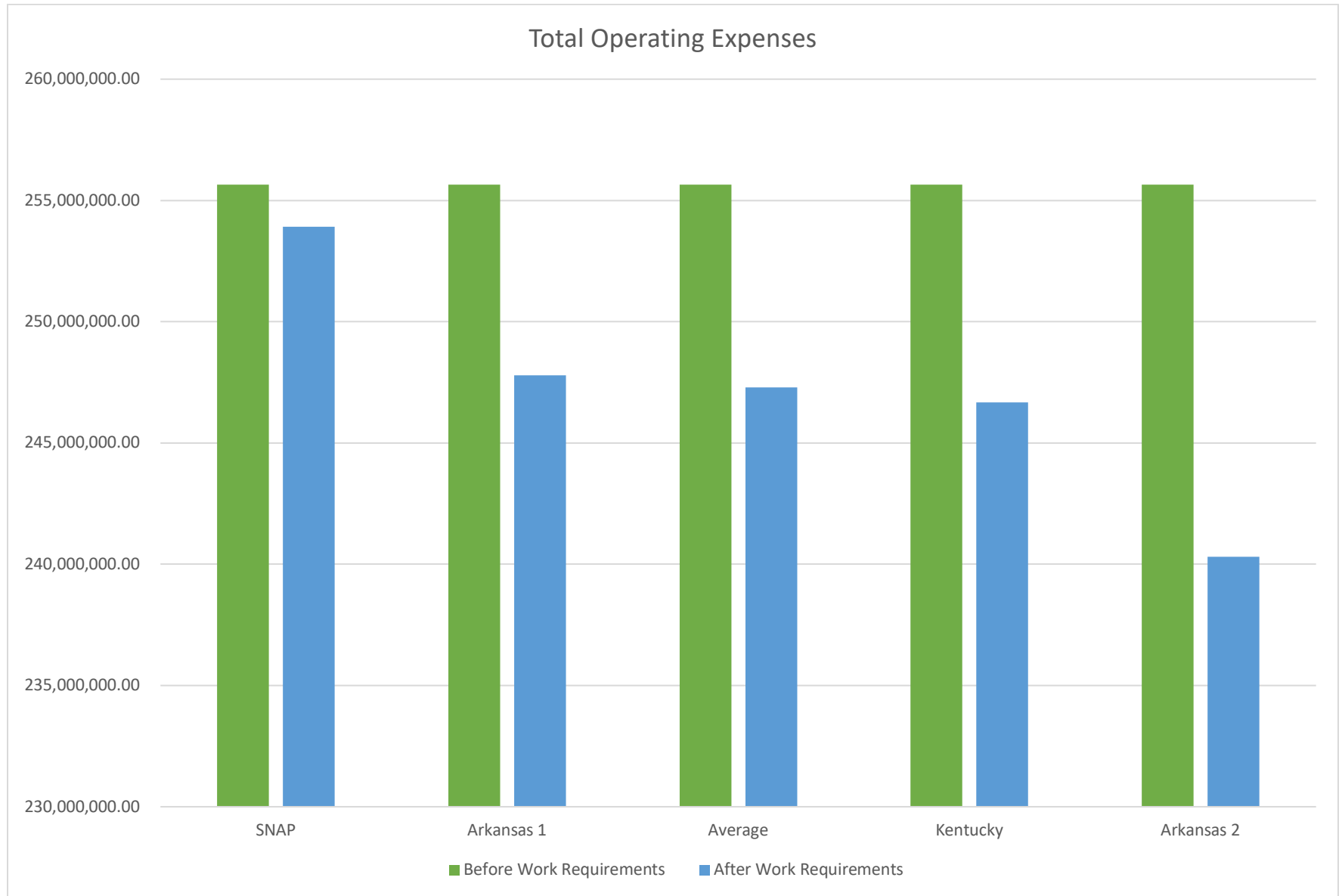


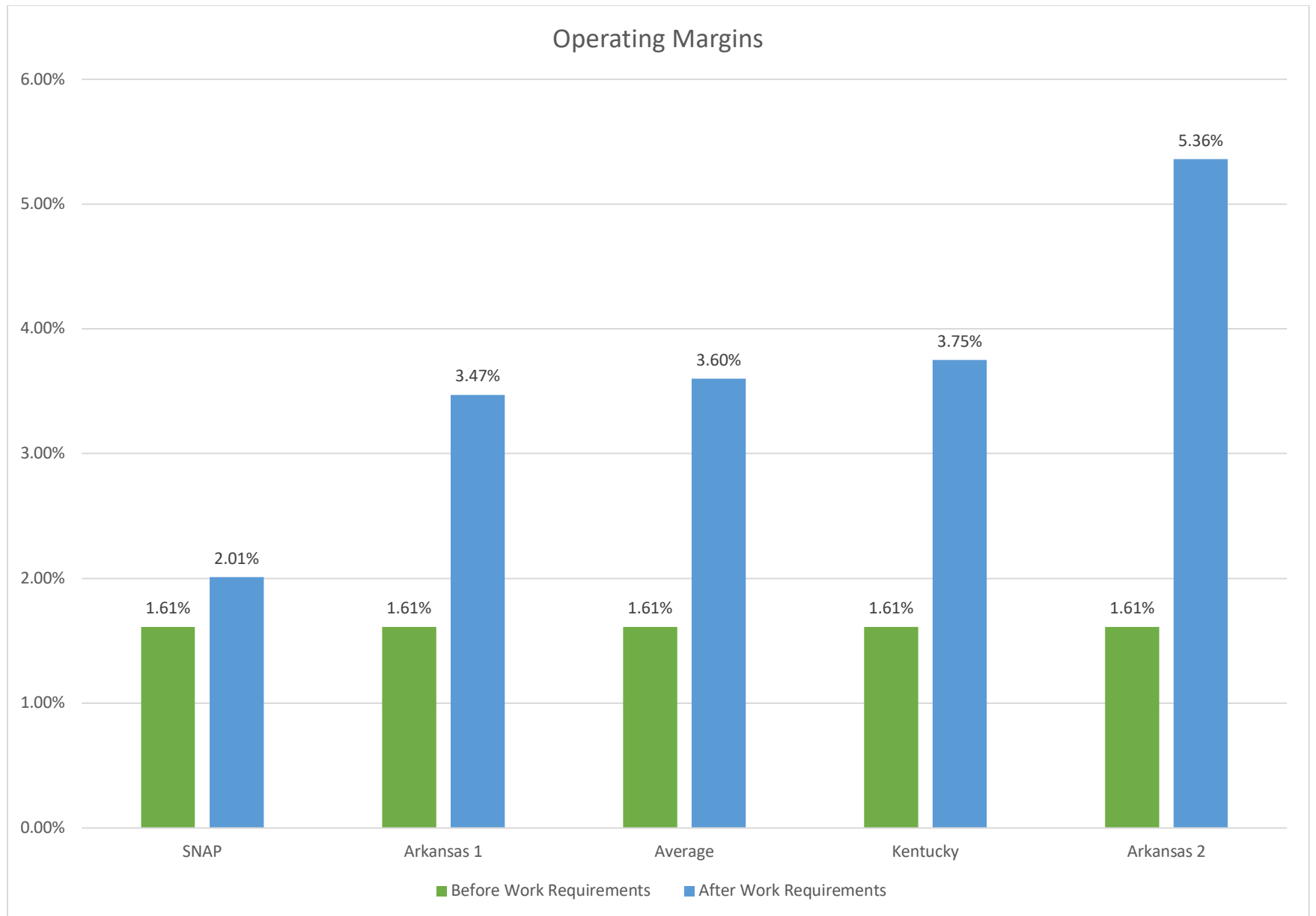
Fiscal Year 2015 – 2016

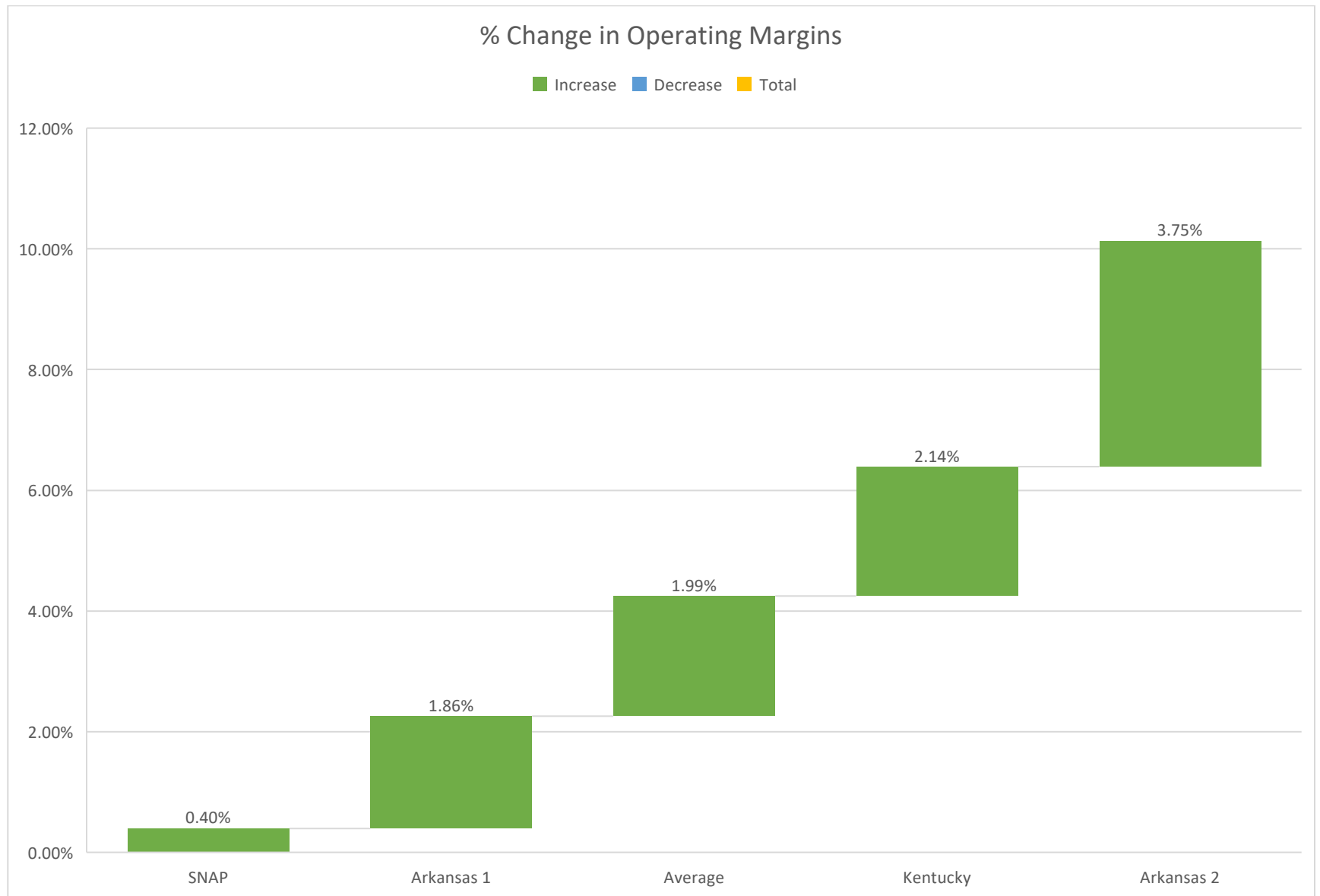


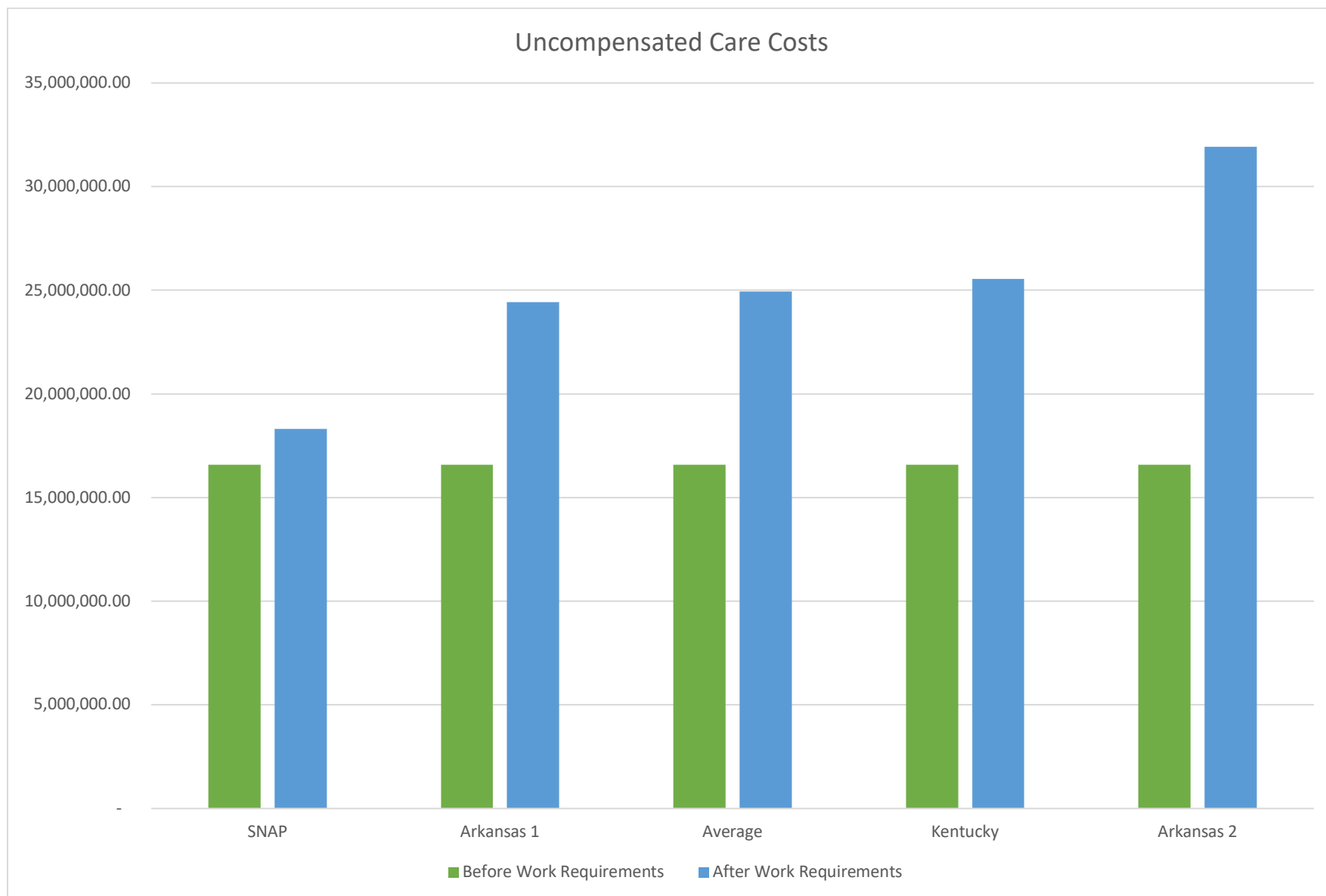


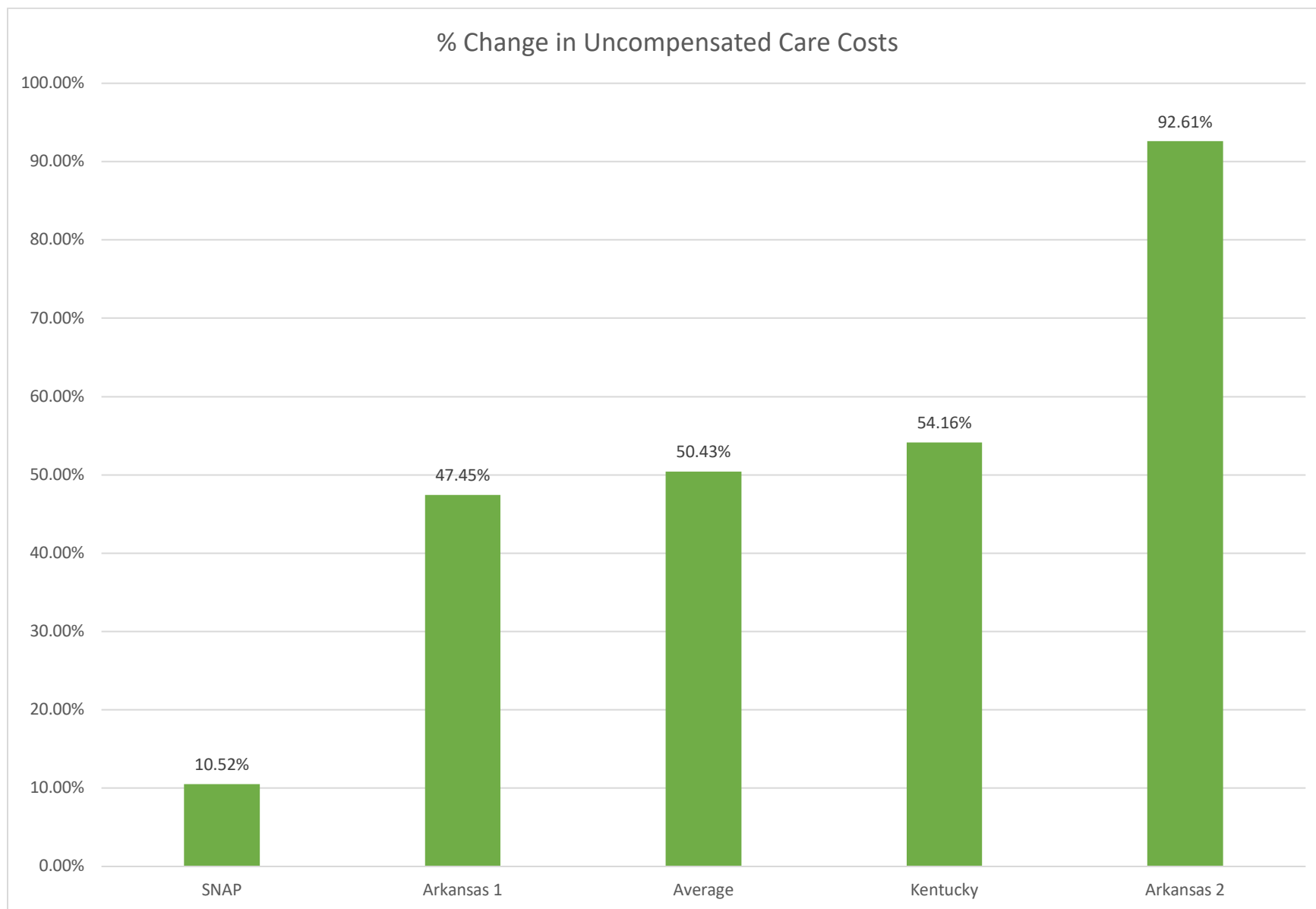


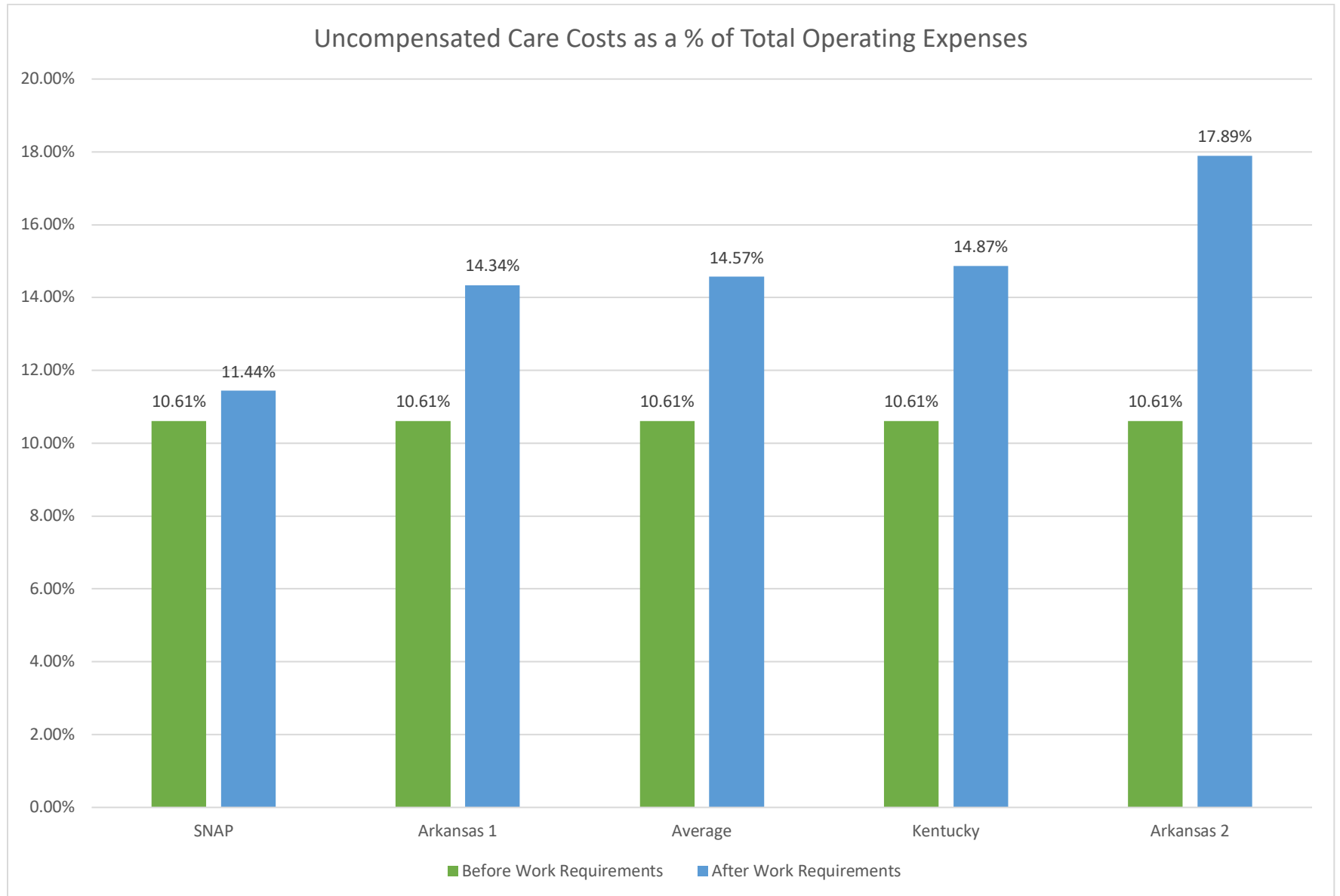


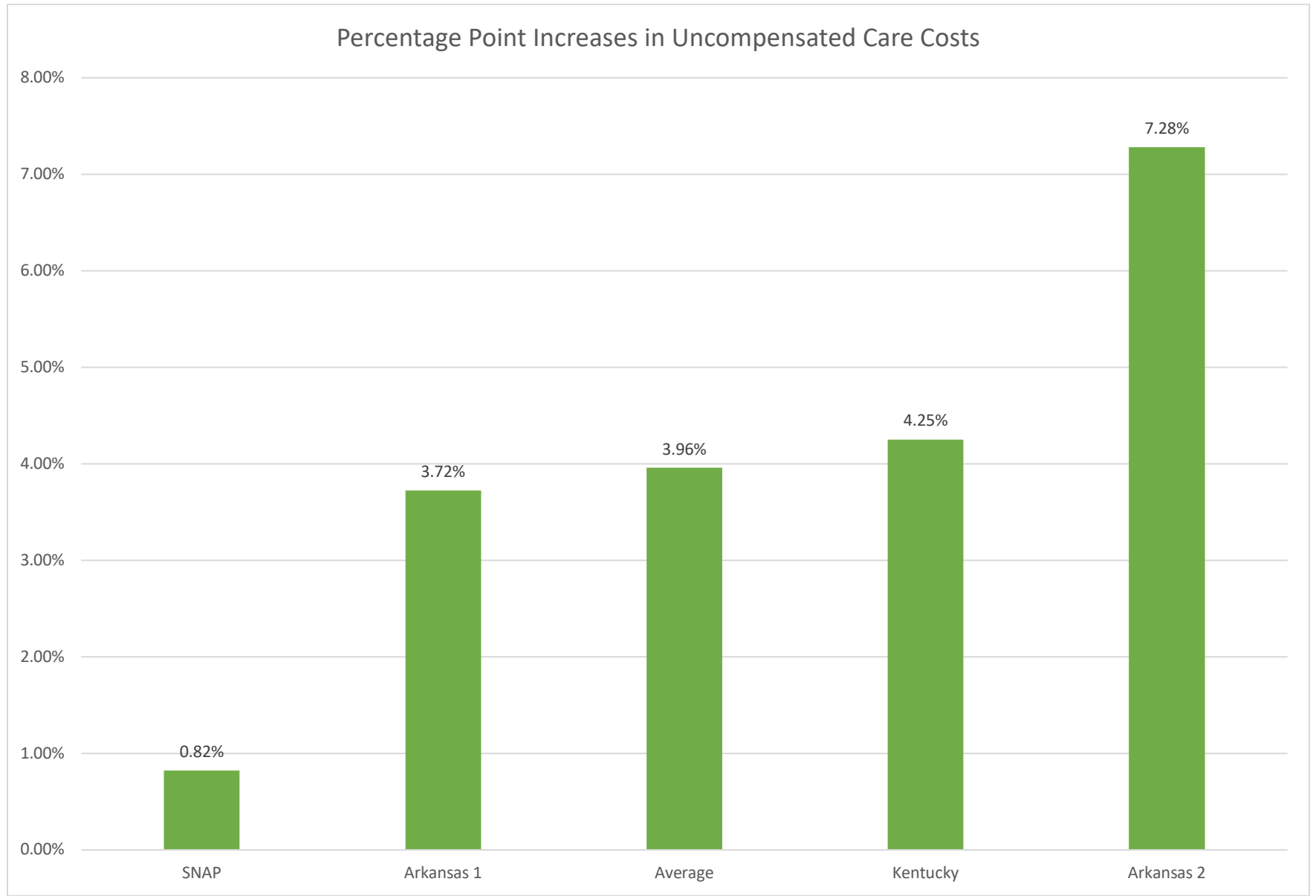












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