The Role of Antitrust in U.S. Healthcare: Market Power, Access, and Inequality

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Abstract

Health care within the United States functions as a market system. This system has resulted in higher US health care spending compared to nations of similar incomes while showing evidence of worse health outcomes. Despite antitrust laws being in place to safeguard against monopolization and highly concentrated markets, the McCarran-Ferguson Act of 1945 opened the door for states to determine their own levels of market concentration for health insurance providers. As of 2023, over half of all states' largest insurers held greater than 50% of the market share for individual, small group, and large group insurance types. I examine the distribution of market concentration across states and health insurance group types to assess the relationships with health insurance status, health care costs, and health care outcomes. Relationships were tested using multiple linear regression and correlation. The correlation results suggest a relationship between all group type concentration and health care expenditures. However, the multiple linear regression results cast doubt on the strength of this relationship. My findings highlight the complexities of the US health care system and suggest a need for additional research on the relationship between market forces, state-level policies, and health care costs as well as health care outcomes.

Introduction

In the United States (US), health care operates as a market system. Market forces such as competition typically influence how efficiently markets function. In theory, higher levels of market concentration, which means less competition within markets, should result in higher associated costs. Federal antitrust law has long been central to ensuring market competition across a wide variety of US markets. However, the McCarran-Ferguson Act of 1945 allowed states to determine their own levels of allowable market concentration for health insurance providers. This paper examines whether health insurance market concentration is associated with an increase in health care spending and an increase in poor health outcomes across US states. Contrary to expectations derived from economic theory, my results provide limited evidence that health insurance market concentration measured by the Herfindahl-Hirschman Index is strongly associated with increased health care spending or poor health outcomes. My findings suggest that health care expenditures and outcomes are more strongly associated with state-level structural factors and demographics. It is also plausible that the Herfindahl-Hirschman Index fails to capture key factors contributing to health insurance market power. Understanding the inner workings of health care markets is essential to ensuring access and equity in US health care.

Literature Review

A Brief History of Antitrust Law

The concept of competitive markets as we think of them today can be traced back to economist and philosopher Adam Smith's *The Wealth of Nations* (1776). Smith laid out the groundwork for a political economic system by describing free market capitalism where supply and demand were combined with self-interest to regulate markets efficiently. Despite Smith being a proponent of a free market system, he acknowledged the importance of preventing

monopolies from forming. Smith's opposition to monopolies had more to do with governmental monopolies rather than the contemporary concerns for private monopolies, but the basic concept is the same: excessive market power harms markets and consumers.

Around 100 years after the publication of Smith's most influential work, the United States government implemented the first antitrust laws. Antitrust seeks a balance between preventing excessively high market concentration and allowing competition enhancing mergers. The first piece of antitrust legislation was the Sherman Antitrust Act (1890) which prohibited unreasonable restraint of trade and monopolization. This act was followed by the Federal Trade Commission (FTC) Act (1914) and the Clayton Act (1914). The FTC act prohibits unfair methods of competition and unfair or deceptive acts and practices. The Clayton Act prohibits mergers or acquisitions that may significantly decrease competition along with other practices not addressed by the Sherman Act (Federal Trade Commission, 2022). These acts established the foundation for the US government's role in ensuring competitive markets.

Prior to 1979, the US Supreme Court handled antitrust issues on a case-by-case basis without much underlying guidance. This decision-making method changed following the publication of Robert Bork's *The Antitrust Paradox: A Policy at War with Itself* (Hovenkamp, 2019). Robert Bork was a conservative legal scholar who held positions such as solicitor general of the United States, acting United States Attorney General, and judge on the United States Court of Appeals for the D.C Circuit. He was later nominated to the Supreme Court by Reagan but rejected by the Senate (Heyer & Federal Trade Commission, 2014). Bork introduced the idea of "consumer welfare" in his work *The Antitrust Paradox.* Bork argued that antitrust law should concentrate on consumer welfare in the form of corporate economic efficiency rather than market competition. He believed that allowing activities like mergers, acquisitions, and

integrations provided opportunities for firms to benefit from economies of scale. These benefits could then be passed on to consumers as lower prices. Bork believed prohibiting or breaking up monopolies would result in a loss of consumer surplus as well as producer surplus, resulting in a loss of total surplus making everyone worse off economically. In the context of antitrust law, Bork's beliefs amounted to a focus on general welfare, or net gains, instead of consumer welfare specifically (Crane, 2014). The year following publication of *The Antitrust Paradox* marked the beginning of the Supreme Court frequently citing Bork in antitrust decisions. These decisions have largely focused on maintaining market efficiencies and have resulted in outcomes where a decrease in consumer surplus was acceptable so long as producer surplus increased beyond what consumers lost to protect a net positive total surplus. Critics theorize that the concept of general welfare, disguised as consumer welfare, may have played a part in the rise of market power and wages remaining stagnant relative to the increases in firm profits from the 1980s onward (Hovenkamp, 2019).

Over the years, antitrust law and the US Supreme Court have shaped the US market system. Court decisions have determined what constitutes a market, how much market concentration is permissible, and what types of market consolidation are permitted. In his research, Carlton (2007) found that horizontal mergers have remained primary targets of antitrust enforcement while vertical mergers have largely escaped antitrust scrutiny. While narrow definitions of markets have allowed some consolidation to appear less concentrated, expansion of market definitions to include innovation and inputs has prevented some potentially harmful mergers. Use of economic concepts led to an overhaul of antitrust guidance in the 1980s, but research in antitrust law and market competition is increasingly showing a need for reevaluation

in the continuously evolving modern technological and global markets (Carlton, 2007). One such market raising concern for reevaluation is healthcare.

Healthcare as a Market System

Healthcare in the US did not begin as a market system. Smith (2023) addressed the groundwork for the contemporary healthcare market system. The earliest proposed healthcare bill resembling aspects of our system today was drafted in 1915. This bill failed to be enacted mainly due to World War I. The precursor to Blue Cross, the health insurance provider, was introduced in 1929 by Baylor Hospital. Not long after, the Great Depression sparked interest in social policies including healthcare. This interest stalled until the 1940s when legislators proposed the idea of incorporating health insurance into social security, but the bill did not pass. During and after World War II, employer-sponsored health insurance grew substantially due to frozen wages and tax cuts for employers offering employees health insurance. The relationship between employment and health insurance reinforced the status of health insurance as a private good. By 1965, Medicaid and Medicare became part of the Social Security Act. A major step in private health insurance coverage equality did not occur until 1996 when health insurers became restricted from using pre-existing conditions to determine coverage for individuals when the Health Insurance Portability and Accountability Act (HIPAA) was passed. The Affordable Care Act (ACA), passed in 2010, expanded Medicaid and improved insurance access to those unable to qualify for Medicaid by partially subsidizing health insurance plans through insurance market exchanges (Smith, 2023). The failure of several bills aimed at socializing healthcare, along with a growing demand, eventually resulted in our current market system.

The healthcare market experiences multiple incongruent theories behind what can improve or stifle competition within it. Day's 2024 article addressed a concern raised in the mid-

2010s focusing on whether price transparency would help or harm competition between healthcare systems. The traditional economic rationale for price transparency is that it gives consumers information to make better choices. It also allows consumers to make choices based on their specific financial positions. Economic theory would suggest that if enough consumers chose the lower cost option, other healthcare systems would have to adjust their prices to remain competitive. Day's article later contrasts this traditional economic theory by using the FTC's own price opacity rationale. The FTC claimed that price opacity is not misaligned with antitrust law and that price transparency would be more likely to enable anticompetitive acts such as collusion. This theory focuses on the idea that if hospitals knew what other hospitals were charging, they could increase their prices because consumers are not able to price shop with few service providers to choose from. The other side of the coin is that hospitals can make their own prices since consumers lack awareness of rates. This structure also allows for providers and insurers to practice price discrimination (Day, 2024). The No Surprises Act became effective in 2022 to help curb surprise medical bills, but it did not address price opacity, which remains an ongoing problem for consumers. A key component to competitive markets is consumers having access to information about market goods. When prices lack transparency, consumers lack decision-making information which leads to market inefficiencies.

Horizontal integration, such as mergers between two hospitals or two insurers, has long been the focus of antitrust action in healthcare. Despite concern for market concentration, Brot-Goldberg (2024) found only 13 out of 1,000 horizontal mergers spanning 2002 to 2020 were acted upon by the FTC. Between 2010 and 2015, horizontal hospital mergers were estimated to have increased hospital prices by 1.6% and hospital spending by $204 million in the first year post-merger. Of mergers that were not acted upon by the FTC, it is estimated that 97 of them

could have triggered a review for their likelihood of decreasing competition. These mergers on average led to price increases of at least 5%. The researchers concluded that there is likely inadequate US hospital antitrust enforcement (Brot-Goldberg et al., 2024). This research raises an important question regarding distribution of mergers: is inadequate antitrust enforcement evenly distributed spatially across the US? While horizontal integration still poses active threats to market concentration, it is not the only form of integration threatening markets.

A growing area of concern for healthcare market concentration is the more recent increase in occurrences of vertical integration in healthcare systems. Vertical integration, once touted as the path toward healthcare efficiency via coordinated care, involves mergers of separate entities providing different services along the same supply chain (King, 2017). An example of this would be an insurance provider acquiring a physician practice. Vertical integration may result in better coordinated care for improved patient outcomes, but it also may result in increased prices for patients. Ekaireb et al. (2024) investigated the relationship between vertical integration and both health outcomes and their associated costs. Their research found modest to significant improvements in some specific markers of healthcare outcomes including improved mortality for colon cancer, improved diabetes care, increased smoking cessation, and improved rates of immunization. They noted that overall mortality outcomes, along with other significant health outcome markers, have not been shown to have a significant relationship to vertical integration (Ekaireb et al., 2024). Godwin et al. (2021) found a positive association between higher physician prices for primary care and select specialties and vertical integration. The researchers found that the highest quartile of vertical integration in their study experienced an increase of $45.8 million for primary care alone (Godwin et al., 2021). These findings are problematic in that no significant relationship has conclusively been proven to exist between

vertical integration and a broad range of healthcare outcomes despite that relationship being cited as a reason for allowing vertical integration. Further, increased healthcare costs for patients and insurers are arguably not an improvement in healthcare.

Ekaireb et al. (2024) referenced a study by Sinaiko et al. (2023) addressing the relationship between vertical integration and utilization of healthcare and its subsequent costs. Their study examined utilization and costs of patients whose primary care provider (PCP) entered a vertical relationship compared to those whose PCP did not from 2013 to 2017. They found a 22.64% increase in occurrences of specialist visits and a 29.38% increase of in-system specific specialist visits. This points toward an increased utilization of healthcare services. After a PCP entered a vertical relationship, total patient expenditures rose by 6.26%. The study also failed to find conclusive evidence that vertical integration was related to a decrease in readmission rates. This is not to say that vertical integration is related to lower quality care (Sinaiko et al., 2023). Vertical integration does not appear to necessarily aid in reducing patients' costs on the healthcare service side despite alleged efficiency benefits. An increase in the utilization of healthcare can also be problematic for health insurance premium prices. Further research on the impacts of vertical integration and health insurance premium prices is needed to assess its potential impacts.

There remains the argument that consolidation can have positive effects on prices consumers pay for health insurance premiums. Ho and Lee (2017) analyzed the relationship between healthcare costs, in the forms of health insurance premium prices with negotiated hospital prices, and changes in health insurance market competition. Their research utilized 1.2 million individuals enrolled during 2004 in employer-sponsored health insurance at the large-group scale in California. Ho and Lee employed a Nash equilibrium model to predict the

potential impacts of one out of three major insurers leaving the market. Their model predicted greater premium increases when an insurer with a larger market share exited the market. This effect is decreased if benefits managers, such as public pension fund managers, intervene and negotiate prices for their members. In a scenario where negotiation takes place, there is a chance for premiums to slightly decrease upon exit of a smaller insurer. Their study concluded that prices do not need to necessarily increase if a market loses an insurer. However, absent negotiation abilities or other constraints on determining premiums, higher premiums are more likely if insurer concentration is increased. The study also noted that even if premium prices decrease, consumers may still experience negative externalities from choice restriction in less competitive markets (Ho and Lee, 2017). An important follow up to this study would be analyzing the effects of increased insurer concentration with a wider variety of consumers including those without employer sponsored health insurance.

Another ongoing debate in healthcare markets is whether competition within markets helps to create innovation. Those in opposition of antitrust law assert that innovation is enhanced by market concentration due to factors such as pooling capital. This occurs when capital, in the forms of financial investments for research and development and exchanges of information, is shared between cooperating parties. However, research conducted by Sidak and Teece (2009) noted that a statistically significant relationship between market concentration and innovation has not been conclusively found in fifty years of economic research. This potentially helps to rule out, or at least raise questions to, innovation as a legitimate contributing factor against enforcement of antitrust law. Further, Sidak and Teece cite a study by Almarin Phillips (1971) suggesting the possibility that innovation impacts the structure of markets rather than market structure impacting innovation. This hypothesis highlights that innovation is not conclusively

shown to be a result of market concentration. The argument that concentrated markets lead to innovation may be invalid, and further research is needed to assess the mechanisms at play between innovation and market concentration.

Traditional economic theory states that market concentration leads to market inefficiencies, outputs below what is considered socially optimal, and consumer price increases. The impact of price increases is particularly troubling when the effect distributes wealth from consumers to producers. Consumers typically possess less wealth than producers making price increases regressive. The regressive nature of the price increases contributes to widening wealth inequalities. In 2017, Khan and Vaheesan found a growing association over the past fifteen years between a rise in corporate profits and a rise in wealth inequality within the US. They estimated that hospitals in triopoly markets are 4.8% more expensive than competitive markets, and hospitals in duopoly markets are 6.4% more expensive than competitive markets. This effect is seen in for-profit and nonprofit hospitals with nonprofits seeing additional benefits as high as $30 billion dollars from tax exemptions on top of increased consumer revenue (Khan and Vaheesan, 2017). If antitrust enforcement is conducted to ensure markets remain competitive, why are hospitals operating in duopoly and triopoly markets where they can function as price makers? The results of this study may point to a need for a reevaluation of current antitrust enforcement.

Inequality and Access to Healthcare

A point of concern for healthcare access is barriers to entry in healthcare markets. For market competition to exist, markets need to have relatively free entry and exit for agents and firms. Many government regulations are in place to protect consumers, but they are not without market level consequences. Each state has their own licensing laws and laws addressing scope of

practice for providers. Cannon's 2022 study found that these laws tend to hinder entry of midlevel providers, such as nurse practitioners and physician assistants, more than physicians. This is troubling for insurance providers who utilize midlevel providers as a cost-reducing measure (Cannon, 2022). Midlevel providers are increasingly being used in underserved communities to bridge healthcare access gaps. While the number of physician graduates and licensees has been unable to keep up with the growing healthcare demand, the number of midlevel graduates and licensees has been increasing (Chauhan et al., 2023). Cost-saving measures for insurance providers are not likely at the forefront of consumers' minds, but access to healthcare is. A legislative option worth considering is reevaluating laws creating barriers to entry for midlevel providers to help boost healthcare market competition and ensure equitable healthcare accessibility.

Health insurance providers remain an issue in healthcare access and equality. High market concentration of insurers can not only make healthcare inaccessible due to cost, but also by narrowing the network of providers that consumers may utilize. This can be particularly troubling for those with chronic conditions and established ongoing care. Ho and Lee (2019) found that historically, insurers have practiced varying degrees of exclusionary practices to negotiate lower reimbursement rates with health systems and to ensure patients are more likely to choose cost-effective providers and hospitals. Their research determined that insurers attempting to maximize profits by narrowing networks are more likely to cut costs by negotiating lower rates with health systems than by guiding patients toward more cost-efficient providers and hospitals. This can work to the benefit of the consumer if insurers have adequate bargaining power and choose to pass the savings on to consumers through reduced insurance premiums (Ho and Lee, 2019). Research has not established that insurers have in the past, or will in the future,

pass these potential savings on to consumers. If patients cannot see their established primary care providers because of narrowing networks, will they continue to purchase health insurance? Further research is needed to examine the accessibility effects of network narrowing, particularly in areas with less accessible care.

How did health insurance markets become highly concentrated when antitrust law exists explicitly to prevent monopolization? Another federal law passed in 1945, the McCarran-Ferguson Act, is at least partially to blame. Calabresi (2013) explains that McCarran-Ferguson gave states the sole authority to license their own health insurers within their borders. Citizens of one state cannot purchase from out of state insurers without prior state approval. The result of this act is self-contained markets lacking external, and often internal, competition. The McCarran-Ferguson act further protects states from action under the Dormant Commerce Clause (Calabresi, 2013). Without federal oversight from antitrust law, states are free to regulate health insurance market competition as they see fit. In many cases, this regulation could arguably be deemed inadequate by economic standards.

Economic theory explains that market shares over 50% are cause for concern of monopolization, and market shares of 70% are typically considered to be monopolistic (King, 2017). As of 2023, the largest insurers in 28 states held 50% or more of the individual market share within their states, and the largest insurers in 8 states held 70% or more of the market share. The largest insurers in 36 states held 50% or more of the large group market share with the largest insurers in 22 of these states holding 70% or more. Small group markets are worse off yet. The largest insurers in 37 states held 50% or more of the small group market share with the largest insurers in 25 states holding 70% or more (KFF, 2025). These figures beg the question: is

there unequal protection from monopolization among the states? Further, what implications does this enforcement, or lack thereof, have on states' citizens?

Methods and Analysis

Data

Data for this study was obtained through KFF who offers an interactive state health fact tool to explore several state health indicators. KFF acquired health insurance market concentration data from Mark Farrah Associates Health Coverage Portal database, health insurance coverage data from the American Community Survey (ACS) conducted by the US Census Bureau, health care expenditure data from the National Health Statistics Group, Office of the Actuary, and Centers for Medicare and Medicaid, median income data from the ACS, and access to care data from the Centers for Disease Control and Prevention. All data is described as representative of each state's population in the US (KFF, 2026). This data was merged with the Datasets for: An IBM SPSS Companion to Political Analysis, 5th Edition, compiled by Barry Edwards for CQ/Sage Publishing updated in 2024. This dataset includes state level data representative of each state's population and includes variables such as political ideology, health insurance status, health status, educational attainment, and more. The data spans 2008 through 2016 (Edwards, 2024).

Market concentration is broken down into individual group (nongroup), large group (50 or more individuals), and small group (up to 50 individuals). The Herfindahl-Hirschman Index (HHI) was used to measure market concentration. HHI scores are calculated by first squaring then summing the market shares of individual firms in a given market. The index ranges from 0 to 10,000. Lower market concentration, meaning a more competitive market, is associated with a score closer to 0. Higher market concentration, meaning a less competitive market, is associated

with a score closer to 10,000. As of 2023, the DOJ and FTC determined that an HHI score greater than 1,800 is considered highly concentrated therefore less competitive (KFF, 2026).

Total annual health care expenditures by state of residence are measured in millions of US dollars and includes all privately and publicly funded hospital care, prescription drugs, physician services, care in nursing homes, and other personal health care services. This total does not include health insurance programs costs. Largest insurer enrollment share is measured as the number of people enrolled in comprehensive major medical insurance and mini-med plans through each state's largest insurer. Heart disease deaths by 100,000 measures each state's number of heart disease deaths per 100,000 residents each year. Infant mortality is measured as children under one year of age dying per 1,000 births in each state (KFF, 2026).

Distribution of Health Insurance Market Concentration

Despite antitrust law being federal in nature, the McCarran-Ferguson Act has allowed states to individually determine their own degrees of antitrust enforcement for health insurance providers. Previous research has shown that it is likely for market concentration to vary depending on health insurance group size. I used the Microsoft Excel data mapping tool to visualize and compare HHI score distribution across the nation for large, small, and individual group health insurance types. I used a box-and-whisker plot to compare HHI score medians and ranges between individual, small, and large group health insurance markets.

(Figure 1)

(Figure 2)

(Figure 3)

(Figure 4)

Figures 1 through 3 show the state level distribution of market concentration for large, small, and individual group health insurance types. There is significant variation in market between states. This variation is consistent with the McCarran-Ferguson act bypassing federal antitrust law allowing states to determine their own acceptable levels of health insurance market concentration. These figures also highlight the higher overall market concentration for large and small group insurers compared to individual group. Figure 4 shows the distribution of market concentration for large, small, and individual group health insurance types including the median and range for each group type. While small group has the highest median market concentration, large group has the largest range of market concentration. This result could be due to varying degrees of acceptable market concentration levels for each health insurance group type in each state.

Market Concentration and Health Care Costs

Hypothesis one is in a comparison of states, those having higher market concentration will be more likely to have higher health care expenditures. I first used bivariate Pearson Correlation to determine whether an association between health insurance market concentration and health care costs was plausible. Economic theory would suggest that higher market concentration should result in higher related costs.

(Table 1)

Table 1 depicts the correlation matrix of market concentration and health care costs. There is a negative and statistically significant correlation between market concentration for all health insurance group types and total annual health care expenditures for each state. There is a positive and not statistically significant correlation between market concentration for all health insurance group types and health care spending per capita. There is a negative and not

statistically significant correlation between market concentration for all health insurance group types and per enrollee private health insurance spending. To further assess the potential relationships between market concentration and health care costs, I utilized multiple linear regression analyses. Large, small, and individual group health insurance types are the independent variables. The dependent variables are total annual health care expenditures, health care spending per capita, and private health insurance spending per enrollee. The percent of each state's population with a bachelor's degree or more, the percent of each state's population over the age of 64, per capita income, percent of each state's population identifying as Black, Hispanic, or white are included as control variables.

(Table 2)

Table 2 depicts the multiple regression analysis of market concentration and health care expenditures. Individual and large group are both negatively associated with total annual health care expenditures, but the association is not statistically significant. The negative effect of large groups on expenditures could be due in part to the bargaining power of larger insurers on health care systems resulting from monopsony power. Small group has a weaker positive association with total expenditures, but it is not statistically significant. Among control variables, the percent of each state identifying as Hispanic is positively associated with total annual health care expenditures at a significant level of less than 0.01. Other control variables do not show statistical significance. The adjusted R-squared shows relatively weak explanatory power for the model. This suggests other variables contribute more meaningfully to total annual health care expenditures.

All group sizes have weak positive associations with health care spending per capita, but the associations are not statistically significant. Per capita income has a strong positive

association with health care spending per capita at a significance level of less than 0.001. This could be due to the effect of individuals having a greater portion of income to spend on health care services along with an increased willingness to pay. The percent of each state's population identifying as Hispanic has a strong negative association with per capita health care spending. Other control variables do not show statistical significance. The adjusted R-squared shows moderate explanatory power for the model.

Individual group and small group have weak negative associations with per enrollee private health insurance spending, but they are not statistically significant. Large group is positively associated with per enrollee private health insurance spending, but it is not statistically significant. Among control variables, per capita income has a strong positive association with per enrollee private health insurance spending at a significance level of less than 0.001. This could be due in part to an increased willingness to pay for more comprehensive health insurance benefits as an individual's income increases. Other variables do not show statistical significance. The F value and adjusted R-squared show weak explanatory power and statistical significance for the model. The bivariate analysis suggests a relationship between market concentration and health care expenditures. However, the regression analyses cast doubt on the strength of these relationships. Therefore, I fail to reject the null hypothesis.

Market Concentration and Health Outcomes

Hypothesis two is in a comparison of states, those with higher market concentration will be more likely to have poorer health outcomes. I first used bivariate Pearson Correlation to determine whether an association between health insurance market concentration and health care outcomes was plausible. Previous research has argued that market concentration enhances care through coordination, while other research argues higher concentration leads to a decrease in

accessibility of health care. A decrease in accessibility of health care has been associated with worse health outcomes. I expect some level of variation in health care outcomes if my results align with the literature.

(Table 3)

Table 3 depicts the correlation matrix of market concentration and health care outcomes. Market concentration for all group sizes has a positive correlation with heart disease death rates and infant mortality rates. The results are only statistically significant for the small group size. Individual group has a negative correlation with the percent of each state's population reporting fair to poor health, but it is not statistically significant. Small and large group have a positive but not statistically significant correlation with the percent of each state reporting fair to poor health. To further assess the potential relationships between market concentration and health outcomes, I conducted multiple linear regression analyses. The independent variables are large, small, and individual group health insurance types. The dependent variables are infant mortality rates per 1,000 births, heart disease death rates per 100,000, percent of population reporting fair to poor health, and percent of population uninsured. The percent of each state's population with a bachelor's degree or more, the percent of each state's population over the age of 64, per capita income, percent of each state's population identifying as Black, Hispanic, or white are included as control variables.

(Table 4)

Table 2 depicts the multiple regression analysis of market concentration and health outcomes. Individual group has no effect on infant mortality and is not statistically significant. Small group has a weak positive association with infant mortality, but it is not statistically significant. Large group has a weak negative association with infant mortality but shows no

statistical significance. Among control variables, the percent of each state's population with a bachelor's degree or more has a negative association with infant mortality at a significance level of less than 0.01. The percent of each state's population identifying as Black has a positive association with infant mortality at a significance level of less than 0.001. This finding aligns with the research of Loggins and Andrade (2013) who found that racial disparities in infant mortality rates between Black and white mothers have remained consistent through the 1990s and 2000s with estimates showing that the disparities are likely to persist through the 2020s. The percent of each state's population identifying as Hispanic has a negative association with infant mortality at a significance level of less than 0.01. Other variables do not show significance. The adjusted R-squared shows the model has strong explanatory power. This result suggests that the significant control variables explain a substantial amount of variation in infant mortality rates.

Health insurance market concentrations have similar relationships with heart disease death rates per 100,000 with weak and not statistically significant associations. Among control variables, the percent of each state's population with a bachelor's degree or more has a strong negative association with heart disease death rates at a significance level of less than 0.001. The percent of each state's population identifying as Black has a moderately strong positive association with heart disease death rates at a significance level of less than 0.01. Other variables do not show statistical significance. The adjusted R-squared shows the model has moderate explanatory power. This result suggests that the significant control variables explain a fair amount of variation in heart disease death rates.

Individual and large group market concentration have a weak negative association with the percent of each state's population reporting fair to poor health, but the results are not statistically significant. Small group has a positive association with the percent reporting fair to

poor health, but it is not statistically significant. Among control variables, the percent of each state's population with a bachelor's degree or more has a strong negative association with the percent reporting fair to poor health at a significance level of less than 0.001. The association between educational attainment and health outcomes could be partially due to the positive relationship between educational attainment and income or the positive relationship between education and employer sponsored health insurance. Other variables do not show significance. The adjusted R-squared shows the model has strong explanatory power. This result suggests that the significant control variables explain a substantial amount of variation in percent reporting fair to poor health.

Small and large group market concentration have a weak positive association that is not statistically significant with the percent of each state's population that is uninsured. Individual group has a small negative association with uninsured rates that is not statistically significant. Among control variables, the percent of each state's population over age 64 has a negative association with uninsured rates at a significance level of less than 0.05. This is likely partially due to Medicare coverage. The percent of each state's population identifying as Black or Hispanic have positive associations with uninsured rates at significance levels of less than 0.05 and 0.01 respectively. Other variables do not show significance. The adjusted R-squared shows the model has moderate explanatory power. This result suggests that the significant control variables explain a modest amount of variation in uninsured rates. Therefore, I fail to reject the null hypothesis.

Conclusion

My research examined whether health insurance market concentration was associated with increased health care spending and poor health outcomes. The results of my analyses are

indicative of complex and interrelated dynamics within health insurance and health care markets that are not easily predicted by standard economic models. Market concentration along with state demographics and institutional factors appear to work together to explain health care spending and outcomes. On an antitrust level, my findings raise questions as to whether market concentration measured by the HHI is an adequate metric for evaluating competitiveness of health care markets. My results suggest that HHI scores may not fully represent the inner workings of market structures as they are based solely off market shares. The inability of the HHI to capture health insurance market concentration factors such as vertical integration, provider network control, and contracting practices neglects factors that contribute to market power. It is also plausible that the mechanisms of health insurance market structures are less impactful on health care spending and outcomes than other factors such as hospital consolidation, Medicaid expansion status, and other state-level health care regulatory frameworks. Additional research in these specific areas is needed to address their potential impacts.

Due to the nature of the Census and KFF data at the state level, my analyses were conducted on the population rather than a sample. Additionally, having only 50 states for my N makes achieving statistical significance difficult. This data also does not account for differences between urban and rural health care. It is possible that health insurance market concentration has a stronger association with health care expenditures and outcomes on a smaller scale as health insurance providers are often regionalized within states. Future research using county-level data with market concentration factors beyond HHI scores may be useful for determining the effects of market concentration on health care systems. Differences between state-level policies and institutions may impact health care spending and outcomes in aspects my models did not account

for. Additional research is needed to assess health insurance market efficiency, outcomes, and equality to determine whether a more uniform federal antitrust policy could be beneficial for US health care.

Appendix

Figure 1: Individual Group Market Concentration (HHI Score)

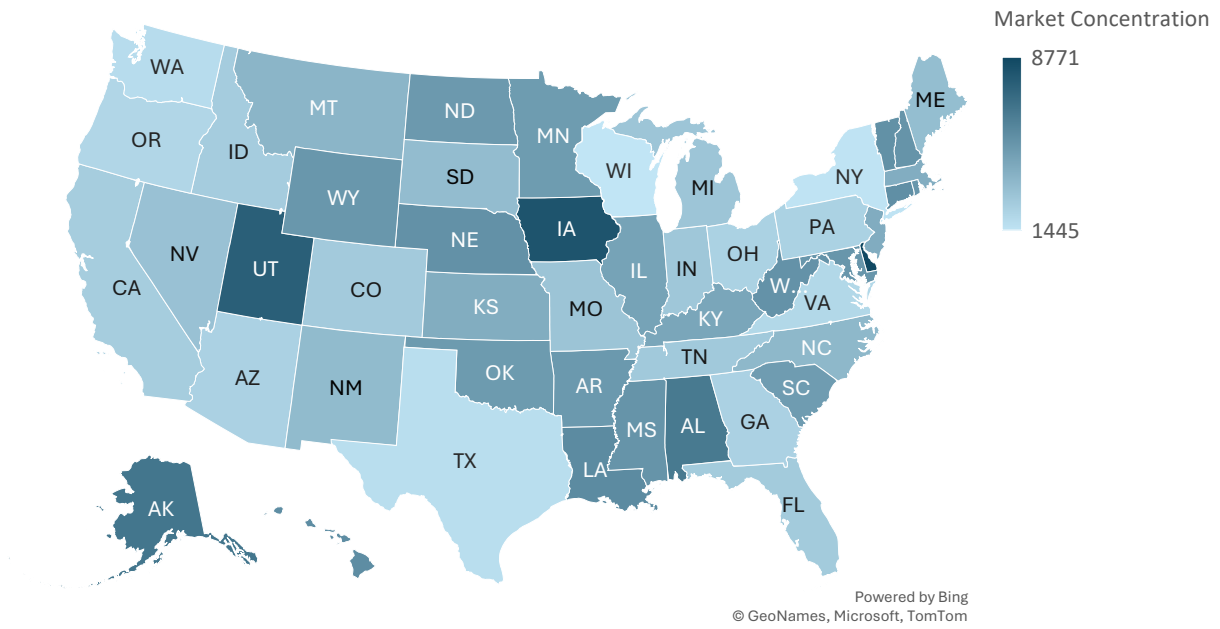

Figure 2: Small Group Health Insurance Market Concentration (HHI Score)

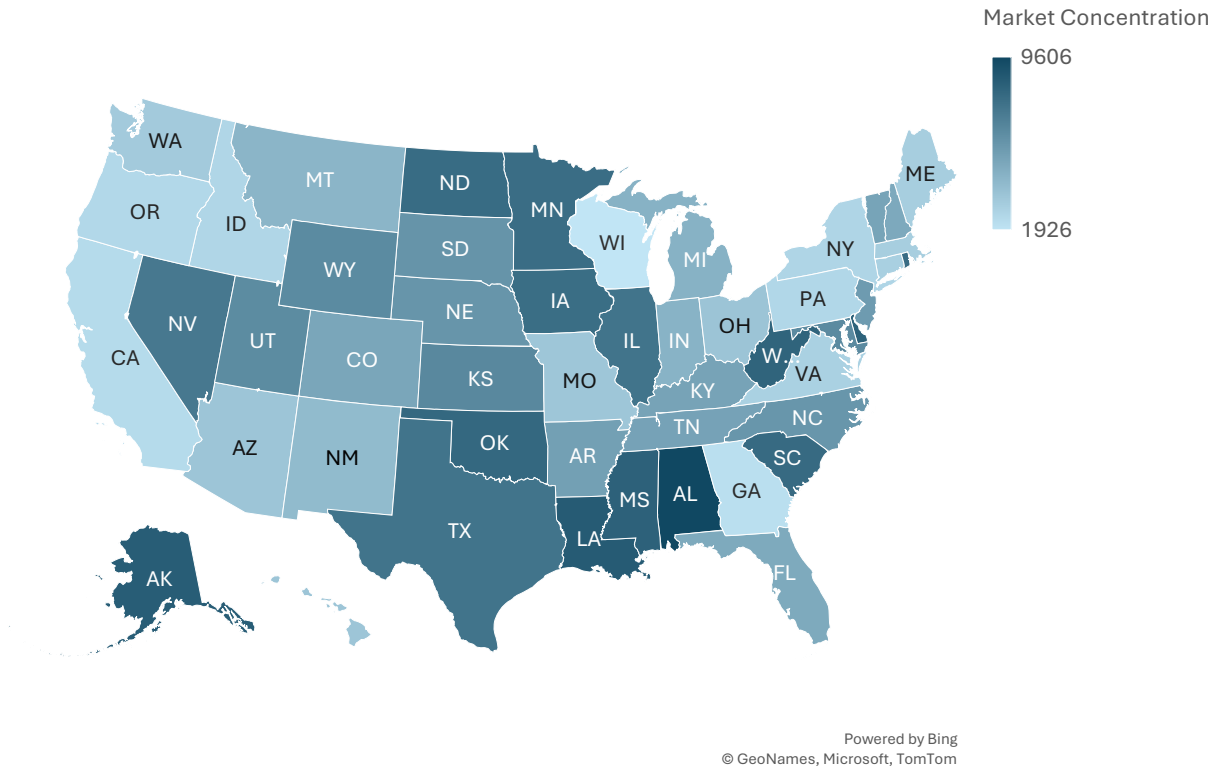

Figure 3: Large Group Health Insurance Market Concentration (HHI Score)

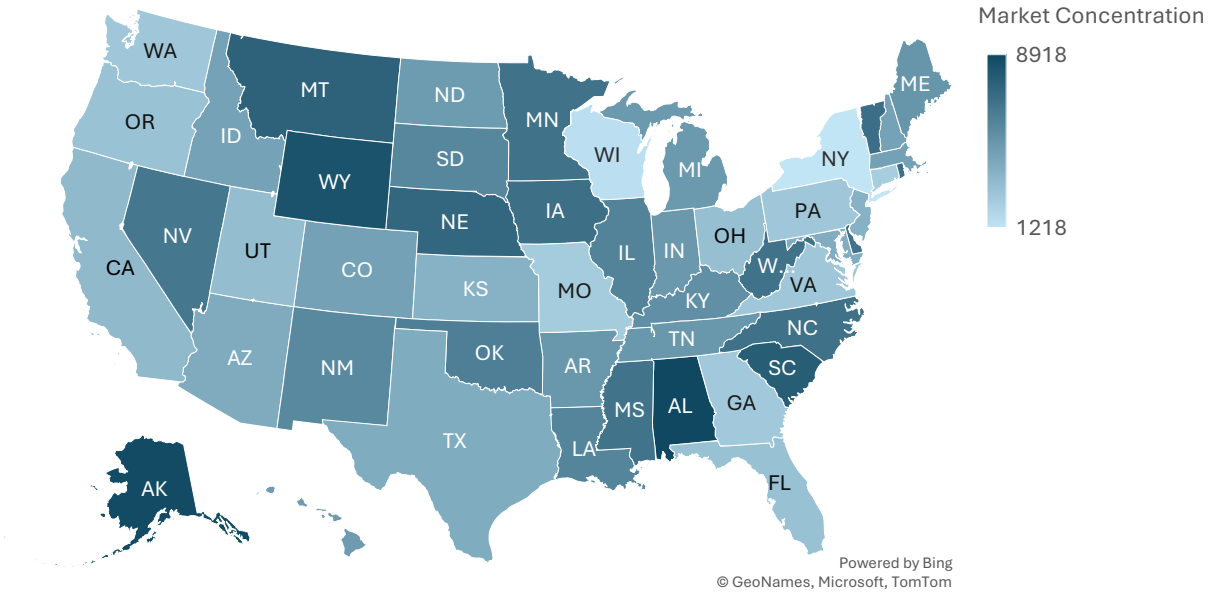

Figure 4: HHI by Health Insurance Group Type

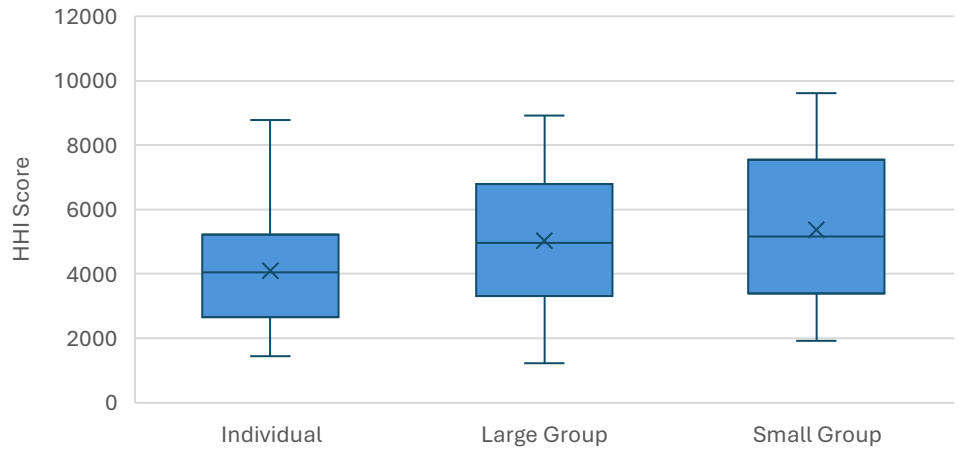

Table 1
Pearson's Correlation of Health Insurance Market Concentration and Health Care Costs at the State Level

Correlation Matrix of Health Insurance Market Concentration and Health Care Spending

		Individual Grp. HHI (Market Concentration)	Small Grp. HHI (Market Concentration)	Large Grp. HHI (Market Concentration)	Total Annual Health Care Expenditures	Health Care Spending Per Capita	Per Enrollee Private Health Insurance Spending
Individual Grp. HHI (Market Concentration)	Pearson Correlation	1	.675**	.599**	-.477**	.227	-.042
	Sig. (2-tailed)		<.001	<.001	<.001	.113	.773
	N	50	50	50	50	50	50
Small Grp. HHI (Market Concentration)	Pearson Correlation	.675**	1	.732**	-.305*	.014	-.166
	Sig. (2-tailed)	<.001		<.001	.031	.923	.250
	N	50	50	50	50	50	50
Large Grp. HHI (Market Concentration)	Pearson Correlation	.599**	.732**	1	-.465**	.080	-.087
	Sig. (2-tailed)	<.001	<.001		<.001	.582	.549
	N	50	50	50	50	50	50
Total Annual Health Care Expenditures	Pearson Correlation	-.477**	-.305*	-.465**	1	.001	.259
	Sig. (2-tailed)	<.001	.031	<.001		.996	.070
	N	50	50	50	50	50	50
Health Care Spending Per Capita	Pearson Correlation	.227	.014	.080	.001	1	.678**
	Sig. (2-tailed)	.113	.923	.582	.996		<.001
	N	50	50	50	50	50	50
Per Enrollee Private Health Insurance Spending	Pearson Correlation	-.042	-.166	-.087	.259	.678**	1
	Sig. (2-tailed)	.773	.250	.549	.070	<.001	
	N	50	50	50	50	50	50

Note: Light green denotes a positive Pearson Correlation, and light red denotes a negative Pearson Correlation.
** Correlation is significant at the .01 level (2-tailed)
* Correlation is significant at the .05 level (2-tailed)
Source: KFF State Health Facts Data Set and Barry Edwards' Datasets for: An IBM SPSS Companion to Political Analysis, 5th Edition.

Table 2
Regression Analysis: Market Concentration and Health Care Costs at the State Level

Independent Variables	*Total Annual Health Care Expenditures*	*Health Care Spending Per Capita*	*Per Enrollee Private Health Insurance Spending*
Indiv. Grp. HHI (Market Concentration)	-12.873 (7.685)	.074 (.149)	-.006 (.064)
Sm. Grp. HHI (Market Concentration)	2.819 (7.811)	.029 (.151)	-.093 (.065)
Lg. Grp. HHI (Market Concentration)	-8.918 (7.282)	.074 (.141)	.090 (.061)
Percent of Population with Bachelor's Degree or More	-1,655.708 (3,066.444)	-74.617 (59.262)	-43.933 (25.654)
Percent of Population Over Age 64	-606.283 (5,243.626)	201.228 (101.338)	-6.721 (43.868)
Per Capita Income	4.016 (3.329)	.278*** (.064)	.115*** (.028)
Percent of Population Black	1,727.400 (1,270.942)	-34.706 (24.562)	7.100 (10.633)
Percent of Population Hispanic	2,808.525** (1,004.854)	-44.690* (19.420)	-3.056 (8.406)
Percent of Population White	-164.604 (922.036)	-7.554 (17.819)	-.796 (7.714)
Constant	41,773.035	1,300.812	2,693.953
F	4.402***	5.357***	2.971**
Adjusted R Sq.	.385	.445	.266

Note: Entries are multiple linear regression coefficients with standard errors in parenthesis
* $p < .05$, ** $p < .01$, *** $p < .001$.
Source: KFF State Health Facts Data Set and Barry Edwards' Datasets for: An IBM SPSS Companion to Political Analysis, 5th Edition.

Table 3
Pearson's Correlation of Health Insurance Market Concentration and Health Outcomes at the State Level

Correlation Matrix of Health Insurance Market Concentration and Health Outcomes

		Individual Grp. HHI (Market Concentration)	Small Grp. HHI (Market Concentration)	Large Grp. HHI (Market Concentration)	Heart Disease Death Rate per 100,000	Percent of Population Reporting Fair to Poor Health	Infant Mortality Rates per 1,000 Births
Individual Grp. HHI (Market Concentration)	Pearson Correlation	1	.675**	.599**	.135	-.109	.078
	Sig. (2-tailed)		<.001	<.001	.351	.457	.589
	N	50	50	50	50	49	50
Small Grp. HHI (Market Concentration)	Pearson Correlation	.675**	1	.732**	.373**	.188	.364**
	Sig. (2-tailed)	<.001		<.001	.008	.196	.009
	N	50	50	50	50	49	50
Large Grp. HHI (Market Concentration)	Pearson Correlation	.599**	.732**	1	.246	.114	.256
	Sig. (2-tailed)	<.001	<.001		.085	.437	.072
	N	50	50	50	50	49	50
Heart Disease Death Rate per 100,000	Pearson Correlation	.135	.373**	.246	1	.688**	.776**
	Sig. (2-tailed)	.351	.008	.085		<.001	<.001
	N	50	50	50	50	49	50
Percent of Population Reporting Fair to Poor Health	Pearson Correlation	-.109	.188	.114	.688**	1	.661**
	Sig. (2-tailed)	.457	.196	.437	<.001		<.001
	N	49	49	49	49	49	49
Infant Mortality Rates per 1,000 Births	Pearson Correlation	.078	.364**	.256	.776**	.661**	1
	Sig. (2-tailed)	.589	.009	.072	<.001	<.001	
	N	50	50	50	50	49	50

Note: Light green denotes a positive Pearson Correlation, and light red denotes a negative Pearson Correlation.
** Correlation is significant at the .01 level (2-tailed)
* Correlation is significant at the .05 level (2-tailed)
Source: KFF State Health Facts Data Set and Barry Edwards' Datasets for: An IBM SPSS Companion to Political Analysis, 5th Edition.

Table 4
Regression Analysis: Market Concentration and Health Outcomes at the State Level

Independent Variables	*Infant Mortality Rates per 1,000 births*	*Heart Disease Death Rate per 100,000*	*Percent of Population Reporting Fair to Poor Health*	*Percent of Population Uninsured*
Indiv. Grp. HHI (Market Concentration)	.000 (.000)	.000 (.002)	-1.336E-6 (.000)	-3.781E-6 (.000)
Sm. Grp. HHI (Market Concentration)	7.258E-5 (.000)	.002 (.002)	5.460E-7 (.000)	1.260E-6 (.000)
Lg. Grp. HHI (Market Concentration)	-4.885E-6 (.000)	-.003 (.002)	-1.336E-6 (.000)	2.418E-6 (.000)
Percent of Population with Bachelor's Degree or More	-.086** (.027)	-3.475*** (.953)	-.005*** (.001)	-.002 (.001)
Percent of Population Over Age 64	.014 (.046)	.371 (1.629)	.002 (.001)	-.004* (.002)
Per Capita Income	-4.343E-5 (.000)	-.001 (.001)	7.873E-7 (.000)	-7.112E-7 (.000)
Percent of Population Black	.053*** (.011)	1.081** (.395)	.001 (.000)	.001* (.000)
Percent of Population Hispanic	-.031** (.009)	-.528 (.312)	.000 (.000)	.001** (.000)
Percent of Population White	-.006 (.008)	.224 (.287)	.000 (.000)	.000 (.000)
Constant	10.13	267.380	.289	.156
F	20.11***	11.261***	13.165***	6.292***
Adjusted R Sq.	.778	.653	.695	.493

Note: Entries are multiple linear regression coefficients with standard errors in parenthesis
* $p < .05$, ** $p < .01$, *** $p < .001$.
Source: KFF State Health Facts Data Set and Barry Edwards' Datasets for: An IBM SPSS Companion to Political Analysis, 5th Edition.

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