

THE IMPACT OF HEALTH CARE MARKET CONCENTRATION ON  
CONSUMERS' EXPERIENCES

by  
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## **Abstract**

Competition and choice in health care are viewed as solutions to some of the most pressing issues in health care in United States. In this set of thesis papers, we use several approaches to defining health insurance market structure to examine whether consumers in more competitive markets report having better experiences with their health plan than consumers in less competitive markets.

The first paper describes methods for developing measures of competition in the hospital and health insurance industries, presenting an empirical analysis of several approaches. The paper also describes trends in hospital and health insurance concentration and the relative concentration of insurance to hospital markets from 2003-2009. The paper concludes that both hospital and health insurance markets on average have remained highly concentrated from 2003-2009. On average, there was no significant change in the average HHI though some markets experienced greater change. The paper also finds that in the average metropolitan statistical area (MSA), the health insurance market is more concentrated than the hospital market.

The second paper examines the relationship between market competition and consumers' experiences with their plans, access to care, and the percentage of spending for selected medical services paid out-of-pocket. The paper explores this relationship in two different settings, private group insurance and Medicaid managed care. This paper finds that in general, there is little to no significant association between the level of insurance concentration and consumers' access to care or experience with their health plan.

The third paper builds upon the second paper by focusing on whether a consumer directly has a choice of health plans. The paper concludes that individuals who have a choice in health plans at their current main job do report slightly better access to care on most measures and higher satisfaction and fewer administrative problems with their health plan than those without a choice in plans.

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# Preface

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# Introduction

Competition and choice in health care are often touted as solutions to some of the most pressing issues in health care in United States, including rising costs, inefficient delivery systems, and suboptimal quality. While these policy solutions follow from conventional economic theory, there is little published research that examines whether consumers in more competitive markets actually report having better experiences with their health plan than consumers in less competitive markets. In this set of thesis papers, we use several approaches to defining health insurance market structure including the level of health insurance competition, the relative balance of insurance concentration to hospital market concentration, and whether an individual consumer has a choice in health plans. While macro-level considerations such as the impact of market structure on prices and volume of services are important, these papers focus on the consumer's perspective. Findings from these papers are relevant for understanding dynamics of the current health insurance systems and will help policy makers anticipate some of the issues involved with the implementation of new health insurance marketplaces as part of the Affordable Care Act (ACA).

According to economic theory, price competition in health care is desirable because it can lead to lower costs for consumers, creating broader access to services and products. Non-price competition can lead to improved quality and enhanced innovation (U.S. Department of Justice and Federal Trade Commission 2004). As markets become more monopolistic, consumer welfare is compromised because the monopolist can charge

higher prices and reap more profit than under competitive market dynamics. Health insurers are both sellers of insurance as well as purchasers of medical services from hospitals, doctors, and other health providers, and so concentrated insurance markets can raise both monopolistic and monopsonistic concerns.

In recent years, the level of merger activity in the hospital sector has increased and the industry has grown more concentrated over time (Kirchoff 2013). Concentration in hospital markets raises concerns about the impact on costs and quality (Vogt, Town and Williams 2006). Hospital costs represent about a third of every private premium dollar, making the negotiation between insurers and hospitals an important determinant of the overall premium cost.

There are several possible scenarios that could occur when assessing the balance of power between insurers and hospitals in this negotiation. Premiums are expected to be lowest (and quality highest) in markets that are competitive in both the hospital and insurance industries, given similar population demographics and utilization patterns. Hospitals must deliver high quality at competitive prices in order to be included in networks, and insurers must pass these lower costs onto consumers in order to compete for market share. At extreme levels of either hospital or insurer concentration, premiums are expected to rise (and quality decrease). In a concentrated hospital market, hospitals can demand high reimbursement rates without fear of being excluded from a network, and insurers have greater leeway to demand high premiums from consumers without losing market share. However, greater concentration in the health insurance market could have the “monopoly busting” effect of eliciting lower prices or higher quality from

hospitals relative to markets with the same level of hospital concentration and lower insurance market concentration. When both markets are concentrated (bilateral monopolies or oligopolies), evidence points to a reduction in hospital prices and increased access, though the bargaining game between insurers and hospitals makes the outcome less predictable (Bates and Santerre 2008, Moriya, Vogt and Gaynor 2010).

## **Background**

This thesis examines the level of market structure in health care and its associated impacts from the consumer perspective, including both those with private insurance and those enrolled in Medicaid managed care. In the background section of this introduction, we provide additional information about these two markets to support methodological approaches and interpretation of findings.

## **Private Insurance Background**

The majority of Americans receive their health coverage from their employer. In 2008, 63% of adults age 19-64 (117 million) and 59% of children (46 million) reported having employer sponsored coverage (Holahan and Cook 2009). Most private firms (58%) offer only one plan option to employees, but this varies by firm size (Agency for Healthcare Research and Quality 2013) with larger firms offering more options. In 2012, 65% of private sector employees work in firms that offer two or more health plans, a percentage that has not changed statistically since 2008, but is significantly higher than the percentage (43.5%) in 1996 (Agency for Healthcare Research and Quality 2013).



Some employees may not be offered coverage at these firms based on part-time status or other eligibility restrictions.

On average, in 2009 employees paid 17% of the premium for single coverage and 27% for family coverage (Kaiser Family Foundation/Health Research and Education Trust 2010). Employers offer coverage to their employees through commercial insurance plans, employer's self-insured plans, and combinations of the two (such as third-party administrators), and the insurance regulatory framework depends on the type of coverage offered. For example, self-insured plans are largely exempt from state insurance mandates because of legislation (ERISA) (U.S. Department of Justice and Federal Trade Commission 2004), and so there is some question as to whether these plans should be considered in the same market as fully insured plans subject to state regulations. Research suggests that employers are responsive to quality information about health plans and select offerings that have high quality scores for their employees (Chernew, et al. 2004). Another 5% or 14 million nonelderly people have individual coverage. These individuals must pay the full insurance premium and can select from any non-group plan available in the local market. These often have significant restrictions.

Beginning in October 2013, consumers will be able to enroll in health insurance plans offered through new health care marketplaces established as part of the Affordable Care Act (ACA). The Congressional Budget Office estimates that about 7 million people will enroll in coverage through the marketplace in 2014, increasing to 24 million by 2023 (Congressional Budget Office 2013). Most individuals purchasing coverage through the marketplace will receive a financial subsidy, which are offered at a sliding scale from

100-400% of the federal poverty guidelines. The regulation and structure of the marketplaces can be state-based, federally facilitated, or partnership models. In the marketplace, consumers can choose among Qualified Health Plans (QHPs) at four levels that differ in terms of cost-sharing and premiums. All plans will cover the Essential Health Benefits in that state, and some plans may cover additional benefits (see “Standards Related to Essential Health Benefits, Actuarial Value, and Accreditation Final Rule”, FR 78(34) 12834-72). The marketplace will provide information on plan benefits, prices, quality, and other factors in standard plain language to facilitate consumers’ decision making process. The health care marketplaces will bring new avenues for health insurance competition and choice in health plans to consumers in the individual and small group markets. The findings from this research can inform policymakers regulating the marketplace, while it will also be important to assess the effect of competition and choice on consumers in this new setting.

## **Background on Medicaid Managed Care**

The second paper in this thesis research includes an analysis of health insurance competition in Medicaid Managed Care. Medicaid is a program that provides health insurance coverage to certain qualified low-income individuals including children, pregnant women, parents, adults with disabilities, and certain Medicare beneficiaries. In 2007, Medicaid covered 58 million people or about one in five in the total US population. Medicaid is administered by the states within broad federal guidelines, and the financing of the program is shared between states and the federal government. In fiscal year 2008, Medicaid spending totaled \$338 billion (State Health Facts 2010).

By June 2008, about 71% of Medicaid beneficiaries or 33.4 million individuals received some or all of their health care services through managed care plans. In 2007-08, there were major expansions of Medicaid managed care in several states (Kaiser Family Foundation 2010). Managed care is the dominant delivery system for Medicaid beneficiaries in most states, with nearly all states (46) having more than half their Medicaid population enrolled in managed care. Medicaid managed care plans primarily cover families and children; more costly Medicaid beneficiaries such as the aged and people with disabilities tend to remain in fee-for-service Medicaid. Nearly all states operate their SCHIP program under a managed care arrangement.

The Balanced Budget Act of 1997 (BBA) gave states the authority to mandate enrollment in managed care without a waiver; states have had the ability to allow beneficiaries to enroll on a voluntary basis for longer and could mandate enrollment through a federal 1915b or 1115 waiver prior to the BBA. There are two primary forms of Medicaid managed care: risk-based, where an MCO is paid a monthly fee per enrollee for fixed set of services, and primary care case management (PCCM), wherein the beneficiary's primary care provider is paid a small case management fee to help coordinate care. A smaller share of Medicaid beneficiaries are in PCCM relative to risk-based plans, though it is more common in rural areas. In 2009, 36 states used HEDIS or similar measures and 34 states used CAHPS to monitor quality in MCOs, and 29 states reported they published data on plan performance to help Medicaid enrollees choose a health plan (Smith, et al. 2009). A 2007 study of publicly reported performance on 8 HEDIS measures suggests Medicaid managed care plan characteristics are associated

with improved quality; better performers were non-profit managed care plans, provider-owned, and larger plans relative to for profit plans, other Medicaid dominated plans, and smaller plans respectively. No difference was found between commercial plans and Medicaid –dominated plans (Felt-Lisk, Barrett and Nyman 2007). The evidence is mixed as to whether Medicaid beneficiaries actually use publicly reported CAHPS scores to choose health plans. Farley and colleagues found no difference in plan choices among Medicaid beneficiaries who did and did not receive CAHPS information, whereas more recent research by Liu and others (2009) found a positive relationship between plan choice and CAHPS scores among Medicaid beneficiaries in New York State (Farley, et al. 1999, Liu, et al. 2009).

The state has an important role in establishing the market for MMC products by determining relevant geographic areas and covered populations in addition to granting contracts to plans. Research suggests that states have been able to attract plans that are committed to serving the Medicaid population, though a few states have had difficulty finding an adequate number of plans to serve beneficiaries (Gold, et al. 2003, Holahan and Suzuki 2003, Howell, Palmer and Adams 2012). The capitation rate is an important determinant of plan participation; about half of states use administrative pricing based on risk-adjusted FFS spending to set rates, and only 9 states in 2001 used competitive bidding (Holahan and Suzuki 2003). A more recent review of Medicaid and SCHIP programs in 20 states from 2001-2010 by Howell, Palmer, and Adams found greater use of competitive contracting in either their Medicaid or SCHIP programs among the states,

with 17 using competitive bidding in all or part of the state and 7 using an any-willing-provider contracting methodology (Howell, Palmer and Adams 2012).

Numerous studies have examined the impact of Medicaid managed care on access to care for beneficiaries relative to fee for service. In general, the studies have found that managed care increases the likelihood of having a usual source of care (USC), reduces reliance on the ER, and reduces rates of referrals to specialists for adults (Coughlin and Long 2000, Garrett, Davidoff and Yemane 2003, Garrett and Zuckerman 2005), although this relationship varies depending on the length of Medicaid enrollment (Lo Sasso and Freund 2000). The findings for physician visits, inpatient visits, access problems, and preventive care are less consistent in the literature (Garrett, Davidoff and Yemane 2003). Additionally, MMC enrollees report shorter travel times to the USC and shorter wait times once there to see their provider (Sisk 1998, Coughlin and Long 2000). Adults with disabilities enrolled in MMC reported higher rates of inpatient admissions for ambulatory-care sensitive conditions and higher ER visits (Lo Sasso and Freund 2000), while other research found that disabled beneficiaries living in counties with MMC reported improved access (Coughlin, Long and Graves 2009).

## **Conceptual Framework**

The conceptual framework for this study is guided by the Andersen-Aday model for access to care (Aday and Andersen 1974, Andersen and Aday 1978, Andersen, McCutcheon, et al. 1983) and economic theory of competition (Appendix A). The Andersen-Aday framework integrates important, broad factors that relate to the outcomes of interest—access and consumer satisfaction—while the economic theory guides study of

the key issue, namely how the market power of insurance companies' and its balance with hospital market power may impact access and satisfaction.

The access framework has several major components: health policy, delivery system and population characteristics, health care utilization, and consumer satisfaction. For the study of Medicaid managed care, the access and quality dimensions included follow from requirements for Medicaid MCOs set forth in the Balanced Budget Act of 1997. Through the CMS regulations released in accordance with this act, Medicaid MCOs are required to provide an ongoing source of care for enrollees, to consider the expected utilization of services, to provide timely access to services, and to consider the geographic location and accessibility of providers when developing networks (U.S. Government Accountability Office 2004).

Health policy includes issues such as financing and regulations and is the most distal factor, influencing delivery system characteristics and population characteristics. In the case of health insurance competition, antitrust regulatory policy, insurance regulatory policy, and state Medicaid policy are relevant distal policy factors. States determine Medicaid managed care offerings on a county level, deciding which population groups (children, people with disabilities, etc.) are to be included, whether enrollment is voluntary or mandatory, the delivery mechanism (fully capitated managed care versus PCCM), and the specific health plans that will be available to beneficiaries.

Delivery system characteristics can also influence access to care because these factors represent the availability of care in an area, or potential access in Andersen's

framework. The number of doctors, specialists, health clinics, and hospital beds per capita are linked to utilization and access.

Characteristics of the population also influence access to care and consumer satisfaction with health care. For example, the need for health services—often described by measures of health status—is clearly related to the amount of healthcare a consumer uses. Other individual-level factors predispose individuals to have greater need for health care or access challenges: age, sex, race/ethnicity, socioeconomic status, and residence.

Recent research using the Andersen-Aday framework to examine access for adults with disabilities in MMC controlled for the following individual-level factors available in MEPS: age, sex, race/ethnicity, highest degree earned, residence in a metropolitan statistical area, annual income, marital status, family size, employment in the past 12 months, and self-reported physical and mental health and activity limitations (Burns 2009). This research also took into account local-level factors known to influence access to care: poverty rate, average per capita income, median household income, population density, HMO penetration rate, physicians per 10,000 residents, and the percent of households with an SSI beneficiary. In her analysis, Burns included an indicator for the presence of Medicaid prepaid health plan in the county, which can provide “carved out” services, and dummy variables to account for residual state-level factors that might influence MCO enrollment or health care access such as Medicaid program characteristics or socioeconomic status.

In the Andersen-Aday framework, one important enabling factor that affects access to care is health insurance coverage. Building upon previous reports, the IOM in 2009 summarized research published in 2002-2008 and found there to be strong evidence that health insurance coverage impacts access to care (Institute of Medicine 2009). The IOM report states, *“If health insurance affects individuals’ health, functioning, and quality of life, it is by enabling access to effective health care services, including preventive services, early detection of disease, diagnostic services, treatment, rehabilitation, and palliative care.”* It is plausible that insurance coverage in different contexts may differentially enable access to beneficial services.

Turning to the crux of the framework and the economic theory behind it, the context of insurance coverage (i.e. market competition and bargaining power) can shape the enabling benefits of insurance coverage and therefore alter health access and consumer satisfaction. Notably, models of competition in health care may produce results that deviate from those predicted by standard theory since “competition in health markets is complex because of asymmetric information, the interrelationship between insurance and physician and hospital markets, and the role of employers and government in financing health care.” (Scanlon, Chernew, et al. 2006). Thus, analysis of health insurance competition and its impact on consumers can yield important information about how this market differs from expected theory.

Health insurers in a concentrated market can exhibit behavior tending toward both monopoly and monopsony. As firms selling a product to employers and individuals, there is evidence that insurers in concentrated markets can demand higher premiums for



their products in order to maximize profit. Research findings have generally found that increased competition results in lower health insurance premiums (Wholey, Feldman and Christianson 1995, Pizer and Frakt 2002).

Profit is total revenue minus total costs, and the benefits that a plan provides to consumers represent costs in the form of spending on medical claims and administrative costs like marketing and customer service. The following equation demonstrates this concept:

**Equation 1:** 
$$\sum_t Profit_{imt} = \sum_t Premiums_{imt} - Claims_{imt} - Administration_{imt}$$

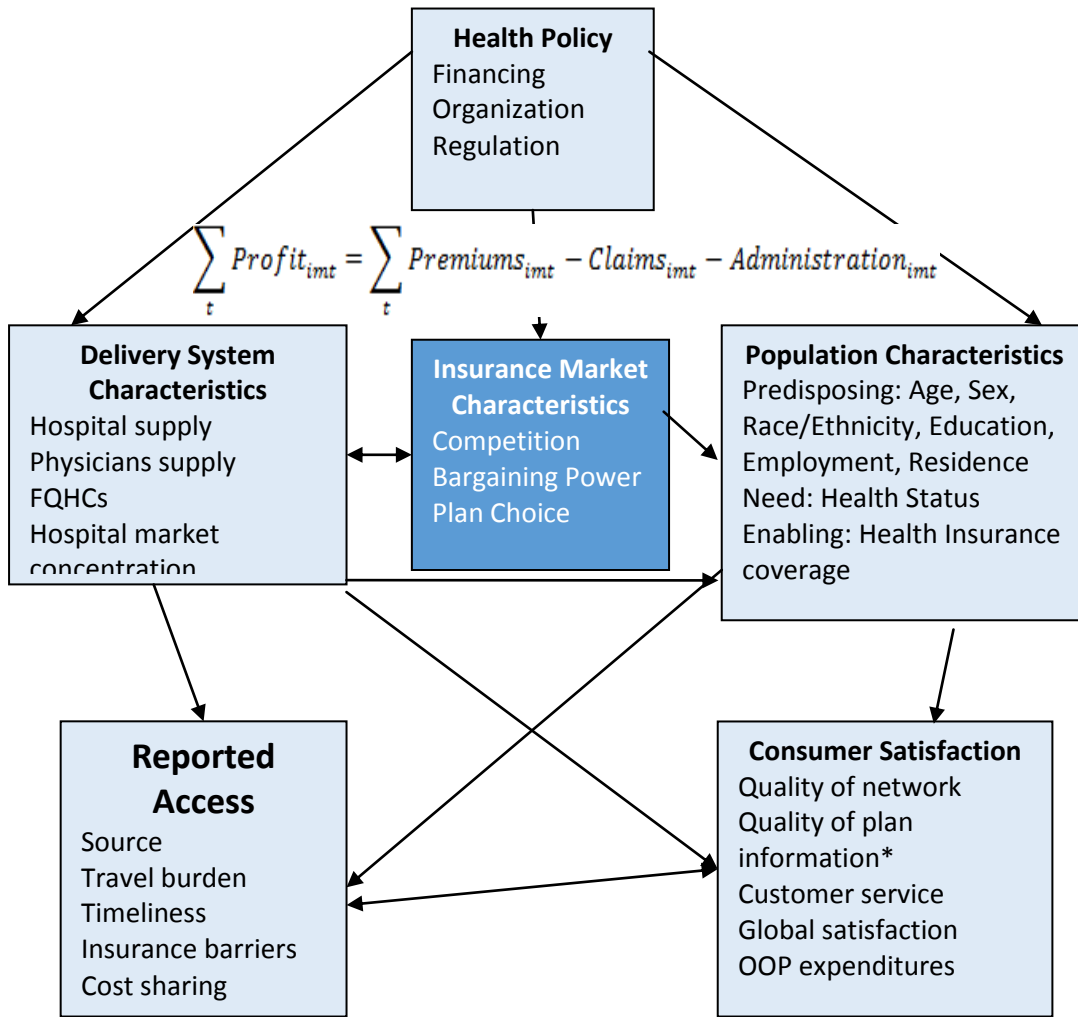
Here, the term “premiums” is the total revenue collected from individuals and employers who purchase coverage from the insurer  $i$  in market  $m$  in year  $t$ . The term *Claims* is the total money paid to providers for the insurer’s enrollees in that market; it is the number of claims multiplied by the price of each claim. The term “administration” represents the total amount spent on administrative costs in the market. This includes both annual administrative costs such as claims processing, customer service, and marketing. Thus, insurers may also seek to maximize profit by providing fewer services to consumers. Quality, like price, could also be influenced by market characteristics because quality is also “an endogenous outcome of the competitive process” (Scanlon 2008). In markets where prices are regulated (such as in Medicaid), insurers may compete primarily on quality in order to gain or maintain market share whereas when prices are not determined, insurers could compete both on price and quality (Gaynor 2006).

Consumers experience the “benefits” of a health plan in several ways—the medical benefits of covered services, cost sharing requirements, the extent and quality of provider networks for covered services, as well as the quality of the health plan’s customer service. Research suggests that an individual’s enrollment choice among available health plans is shaped by both insurance characteristics (premiums, out-of-pocket costs, and extent of covered benefits) and delivery system characteristics (Berki and Ashcraft 1980). Available plans are generally determined by employers or state Medicaid offices, but some with non-group coverage purchase plans directly in the marketplace. Consumers use multidimensional evaluative criteria of cost, freedom, access, and quality to choose plans (Thomas 2004). Thus, insurers can modify internal characteristics like premiums, cost-sharing, and customer service (reflecting cost and quality), as well as the restrictiveness, quality, and accessibility of their contracted network. The level of competition in the insurance market determines the ability of insurers to alter the benefits of plans; in concentrated markets, insurers could offer higher cost plans with more restrictive networks, lower quality, and reduced access while maintaining market share.

The ability of health insurers in concentrated markets to maximize profits is tempered by concentration among providers, particularly hospitals. As hospital markets become more concentrated, insurers have less ability to exert low prices or demand high quality services. Recent research has suggested that there is an important bargaining dynamic between providers (hospitals) and insurers. For example, the concentration of hospitals in a market may impact the concentration of health insurers; in markets

dominated by one large hospital, an insurance market with many firms of relatively equal size would have limited negotiating power while a dominant insurer would hold more sway in negotiating with the hospital. Feldman and Wholey (2001) found that increased HMO market power resulted in lower hospital prices, and Ho found that hospitals with greater market share could demand higher prices (Ho 2009). Thus, the bargaining power of insurance companies (defined as the ratio of insurer concentration to hospital concentration) is an important element of the market structure. To the extent that provider networks, premiums, and covered benefits are a function of the joint market structure of hospitals and insurers, this factor may have an appreciable impact on the consumer. Smith (2007) suggests that financial incentives in managed care increase the potential for reduced access and quality. Increased financial pressure on hospitals—purportedly due to increased consolidation in commercial and Medicaid health insurance markets—is associated with an increased likelihood of preventable medical errors. Overall, the framework serves as a guideline for considering the various factors that are associated with access to care and consumer satisfaction with their health plan. Competition and bargaining power may have an impact on the consumer through the benefits that a health plan provides.

**Figure 1: Conceptual Framework**



## Organization

Following this introduction, this thesis includes three papers and a conclusion.

The first paper describes alternative methods for developing measures of competition in the hospital and health insurance industries. As decision points in the methodology arise, the paper presents an empirical analysis of several approaches. The paper presents trends

in hospital and health insurance concentration from 2003-2009 as well as trends in the relative concentration of insurance to hospital markets. It then summarizes existing literature on the impact of hospital and health insurance concentration on prices and quality. The paper concludes that, across a variety of approaches to measuring concentration, both hospital and health insurance markets on average have remained highly concentrated from 2003-2009. On average, there was no significant change in the average HHI over the study period though some markets experienced greater change. The paper also finds that in the average metropolitan statistical area (MSA), the health insurance market is more concentrated than the hospital market. The review of literature assessing the impact of concentration in hospital and insurance markets finds that greater hospital concentration is associated with higher prices, greater insurance concentration is associated with higher premiums, and that increased insurance concentration in the context of concentrated hospital markets can have a “monopoly busing” effect. There is more mixed evidence on the impact of hospital concentration on quality, and generally studies have found no statistically significant association between health insurance concentration and quality.

Using measures of competition developed in the first paper, the second paper examines the relationship between market competition and consumers’ reported experience with their plans, access to care, and the percentage of spending for selected medical services paid out-of-pocket. The paper explores this relationship in two different settings, private group insurance and Medicaid managed care. This paper finds that in general, there is little to no significant association between the level of private or MMC

insurance concentration and consumer-reported access to care or experience with their health plan.

The third paper builds upon the second paper by focusing on the health insurance market experienced more directly by the consumer, namely whether a consumer has a choice of health plans. The paper concludes that individuals who have a choice in health plans at their current main job do report slightly better access to care on most measures and higher satisfaction and fewer administrative problems with their health plan than those without a choice in plans.

The conclusion summarizes key findings across the studies and discusses policy implications. The main contribution of the conclusion is a discussion of the three papers. While many studies on the impact of competition in health insurance and hospital markets have been published, this thesis contributes to the body of research in several ways. As a whole, the thesis focuses on consumer-reported assessments of their experience with their health plan and access to care. Much of the literature has focused on the impact on prices or premiums, and the literature on quality has tended to focus on process measures of health plan or hospital performance. In the area of health insurance markets, papers historically used measures of HMO concentration. Enrollment in other types of managed care products has grown in recent years, and within the past few years data sources like HealthLeaders-Interstudy have started to provide data that includes PPOs and other types of plans so that the competition measures better reflect enrollment trends in the marketplace. This thesis includes these newer types of plans in market competition measures.

Specifically, the first paper summarizes this research and adds an empirical demonstration of different approaches to measuring insurance and hospital competition. The paper also newly presents trends in the relative concentration of health insurance and hospital markets. The second paper assesses whether insurance and hospital market concentration and the relative concentration of the two are associated with consumer-reported experiences with their health plan, access to care, and out-of-pocket expenditures in two distinct markets, private insurance and Medicaid managed care. The two studies in this area have used plan-level summary outcome measures; this paper uses individually-reported outcomes as well as individual demographic and health status measures to better control for individual variation in reporting access to care and experience with a health plan. The third paper uses recent survey data to assess whether those with a choice report better access and satisfaction than those without a choice. Much of the research on consumer health plan choice has focused on the factors that influence plan selection or on employer-level effects such as premiums and adverse selection.

# **Paper 1: Implications of Market Concentration**

## **Measures**

### **Summary**

The hospital and health insurance industries have experienced dynamic changes in recent decades, with increased consolidation in both markets and the introduction of new players such as preferred provider organizations (PPOs), consumer-directed health plans (CDHPs), and physician-owned specialty hospitals. An important question is whether the relative concentration of insurance and hospital markets has changed over time. Policy concern has been raised about growing concentration in the hospital and insurance industries; research has demonstrated that increased concentration in the insurance industry can have a “monopoly busting” effect on hospital markets, meaning that prices are lower and output is higher relative to similarly concentrated hospital markets. Increased concentration in both markets may be of less concern so long as the two balance each other, but excessive growth in one relative to the other may encourage regulators to alter their enforcement activities.

This paper reviews the literature on methods for developing hospital and insurance market concentration measures to understand the implications of various approaches to measurement of market concentration and incorporates an empirical analysis of insurance and hospital concentration measures and the relative balance of the two using recent (2003-2009) data that is likely to be available to policymakers and regulators. The paper describes trends in insurance and hospital market concentration as



well as insurer's market power relative to hospitals. The paper then examines published findings on the impact of hospital and insurance concentration, followed by a consideration of other provider concentration measures and findings in light of the expansion of Accountable Care Organizations (ACOs).

This paper finds generally high correlation among measures using different methodologies, though we caution that analyst should carefully tailor the measure to the research question. We also find that the national mean concentration in hospital and health insurance markets did not change significantly over 2003-2009, though there was variation across markets in market consolidation over the period. The body of research indicates that increased hospital consolidation is associated with higher hospital prices (generally defined as net revenue per discharge), while the effects on quality are mixed. Increased insurance concentration is associated with higher premiums and has little to no significant effect on quality. Several research studies support the theory that increased insurance consolidation counteracts hospital market power, and regulators and policymakers at the state and federal level should be aware that policy efforts to increase competition in the health insurance market without addressing hospital market concentration could have unanticipated negative effects.

## **Context**

The level of competition in health insurance and hospital markets receives considerable attention, with policymakers and thought leaders often citing increased competition as a way to reform the U.S. health care system. The health insurance industry has experienced consolidation among insurers—large firms have acquired

smaller plans and merged with other large firms (Robinson 2004). The American Medical Association (AMA) publishes an annual report on concentration in the health insurance industry and concluded the majority of metropolitan markets like Atlanta or Denver are highly concentrated and dominated by one or two insurers. In two thirds (67%) of metropolitan areas, one insurer had a market share of 50% or more (American Medical Association, 2012). The hospital industry has also experienced consolidation in recent years, resulting in increased costs and potential reductions in quality (Vogt, Town, & Williams, 2006). A recent *New York Times* article highlighted the uptick in hospital merger activity in recent years, with 105 mergers in 2012 compared to 50 in 2005 (Creswell & Abelson, 2013). The Federal Trade Commission (FTC) and Department of Justice (DOJ) are the two federal agencies that have the primary responsibility for regulating the level of competition in hospital and health insurance markets, evaluating and challenging mergers that could have anti-competitive effect within a local market.

The Patient Protection and Affordable Care Act of 2010 (ACA) impacts the structure of both hospital and provider markets. Through the establishment of new insurance exchanges, plans will compete for additional market share in an environment where consumers select plans directly on the basis of price and quality information. Anticipated increases in Medicaid managed care enrollment may also shift the dynamics of health insurance markets (Holahan 2012). At the same time, the emphasis on hospital-provider integration through Accountable Care Organizations and bundled payments to improve care coordination affects market structure on the provider side. As these changes unfold, improved understanding about baseline market concentration and the

relationship between health insurance and hospital markets will provide a richer, more nuanced knowledge base to aid in effective evaluation and regulatory efforts.

## **Concentration from the Perspective of Insurers and Hospitals**

Previous literature has examined methods for developing hospital and insurance market concentration measures in isolation (Gaynor & Town, 2012) (Scanlon, Chernew, Swaminathan, & Lee, 2006) (Wong, Zahn, & Mutter, 2005) (Zwanziger, Melnick, & Eyre, 1994). This paper adds to the literature by addressing measures of the relative concentration of the two markets, highlighting particular challenges and presenting trends in the relative concentration of insurance to hospital markets from 2003 to 2009. The organization of the paper proceeds as follows: we first review recent literature on measures of hospital and insurance market concentration, highlighting analytic decisions in the development of these measures. As these issues are discussed, the paper compares market concentration measures that analysts may encounter.

In the discussion of approaches to developing concentration measures, we focus on data sources that produce national estimates of market concentration likely available to policymakers and regulators, including: the American Hospital Association, HealthLeaders-Interstudy (HLI), and the Centers for Medicare and Medicaid Services (CMS). We analyze trends in health insurance and hospital market concentration independently to provide a systematic description of changes in market structure across the US and then focus on the joint concentration of these two markets to assess whether one market is growing more concentrated relative to the other over time.

A review of the literature assessing the impact of market concentration in hospitals, insurance, and the combination of the two on prices and quality follows the discussion of market concentration measures. With an eye to the growing emphasis on integrated care through organizations such as Accountable Care Organizations, we address literature on market concentration for providers beyond hospitals and raise considerations for measures of market concentration that incorporate a more integrated delivery system. While growing concentration in one market alone may be cause for policy attention, changes in the relative concentration of the health insurance and hospital markets may point to different policy approaches given current knowledge about the impact of concentration and market leverage on prices and quality. For example, a merger of two health plans in a local market may raise independent competitive concerns to initiate a regulatory challenge; if the hospital market is monopolistic, however, it may be in the consumers' best interest to allow the health plan merger to proceed.

## **Hospital Markets**

An effort to assess trends in market concentration requires the analyst to address two fundamental questions: how the markets are defined and what measures are used to describe the level of competition. While there is considerable literature assessing approaches to defining hospital market competition, describing the level of hospital competition, and analyzing the effect of hospital market concentration, the body of literature regarding insurance markets is smaller in comparison.

Turning first to hospital markets, the literature has utilized four primary approaches to defining hospital market boundaries: geopolitical, fixed radius, variable radius, and patient flow. In a 2005 review, Wong and colleagues discussed various methods for defining competition in hospital markets (Wong, Zahn, & Mutter, 2005). As they discuss, classical theory-based approaches to defining hospital markets—such as assessing cross-price elasticity of demand to determine whether products are substitutes or an Elzinga-Hogarty approach of inside-out and outside-in flow of goods—have largely remained unused by researchers based on practical challenges of widespread hospital price data availability and the effective size of created markets. For example, Elzinga-Hogarty hospital markets are based on patient flows between hospital areas such that no more than a certain percentage of the hospital services used by people residing in an area come from outside and no more than that percentage of hospital services are used by people residing outside the area. Ten percent is the traditional level used in the Elzinga-Hogarty assessment, though others have proposed alternative thresholds. When the number of people in an area is large, as is the case in urban markets, the Elzinga-Hogarty markets tend to be very large as the number of total people treated in the boundaries increases. Hospital markets may also appear larger if there is considerable flow between two hospitals providing heterogeneous services like trauma and cancer treatments, grouping the hospitals in the same market even though they are not truly competitors (Zwanziger, Melnick, & Eyre, 1994).

### **Hospital Market Boundaries**

Geopolitical boundaries such as states or Metropolitan Statistical Areas (MSAs) are commonly used in studies and appealing for their ease of use, compatibility with other datasets, and relevance to diverse audiences (Gaynor & Vogt, *Antitrust and Competition in Health Care Markets*, 2000). Geopolitical boundary-based approaches result in a common level of competition assigned to all the hospitals within a market; other approaches can yield a more fine-grained, hospital-specific measure of competition that assesses the level of competition a given hospital experiences (Sohn M. , 2002) and create as many markets as there are hospitals.

Geopolitical boundaries originated for reasons other than defining hospital markets. MSAs are aggregates of counties constructed by the Office of Management to represent highly populated areas with “a high degree of social and economic integration with the core as measured by commuting ties” (OMB Bulletin No. 10-02). Thus, while MSAs are based on a political boundary (counties), they also include an economic component as well. Geopolitical boundaries can include potential competitors as well as actual competitors, though the boundary can serve as a false demarcation. For example, hospitals located across state lines may in fact compete with one another but would not appear to do so in a state-based measure of competition. In this case, each state’s hospital market would appear more concentrated; however, conclusions about market structure may be biased in the other direction if hospitals in remote areas of a geopolitical region are grouped in the same market as hospitals in an urbanized core on the other side of the state, with whom they are unlikely to compete. Geopolitical boundaries create one

measure of competition for all hospitals within the area, though local hospitals can encounter different levels of competitive intensity (Zwanziger, Melnick, & Eyre, 1994).

An alternative approach to defining hospital markets was proposed by Luft and Maerki that addresses the cross-boundary issue by using a fixed radius approach (Luft & Maerki, *Competitive Potential of Hospitals and Their Neighbors*, 1984-1985). Each hospital is assigned a fixed radius that defines a circle around the hospital, and all other hospitals within that circle (including those in other states, counties, etc.) are included in its market. Luft and Maerki based their suggested radius of 15 miles on the premise that physicians have considerable influence on hospital admissions and would be unwilling to travel more than 15 miles between hospitals. Further empirical work in California suggested that this distance reasonably accounts for 90% of a hospital's admissions in urban areas (Luft, Phibbs, Garnick, & Robinson, 1989). This approach creates unique hospital-level measure of competition, but the fixed radius may not be appropriate across all hospitals. For example, hospitals in rural areas and those offering highly specialized services may draw patients from a much larger area than that proscribed by the radius distance. A similar approach allows the radius describing the hospital's market area to vary such that each hospital is assigned a distance that captures a certain percentage (usually 75% or 90%) of its discharges (Phibbs & Robinson, 1993), (Gresenz, 2004). This approach requires hospital-specific data on the geographic distribution of its discharges, and it also does not clearly account for the market area of different hospitals within a system.

A fourth approach to defining hospital markets is the patient flow approach. While both the variable radius and patient flow methods use patient origin data, the patient flow method does not require the hospital market area to be circular. Instead, the hospital's market area is an aggregation of zip codes or some other geographic unit that contributes a significant portion of the hospital's patient population, with allowances for the researcher to determine which areas should be excluded.

Using data from the American Hospital Association (AHA) Annual Survey data for 2003-2009, we create hospital market concentration measures at the Hospital Referral Region (HRR) and Core-Based Statistical Area (CBSA) levels, two variants of the geopolitical boundary approach to market definition described above. Variable radius and patient flow methods both require hospital-level patient origin data that was not available on a large scale for this analysis. The AHA's Health Forum administers the annual survey for the purpose of "collecting utilization, financial, and personnel information from each of the nation's hospitals."<sup>1</sup> The AHA sends the survey to registered hospitals, which comprise 98% of the 6,500 hospitals in the survey universe; non-registered hospitals are identified through state and local hospital associations, the Centers for Medicare and Medicaid Services, and other national organizations and governmental bodies. The overall response rate for the Annual Survey is approximately 85% of the 6,500 hospitals in the survey universe each year. Hospitals report data for their fiscal year, generally a 365-day period, primarily through an online portal. In keeping with methods used by the Medicare Payment Advisory Commission and other

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<sup>1</sup> American Hospital Association Annual Survey Database 2010 Estimation Document, <http://www.ahadata.com/ahadata/html/AHASurvey.html>



research organizations, we analyze the AHA database as reported.<sup>2</sup> We imputed Hospital Referral Regions (HRR) for hospitals missing this data in the AHA Database using a zip code-HRR crosswalk from the Dartmouth Atlas.<sup>3</sup>

We use a “chain-adjusted HHI as a measure of market concentration (Robinson J. , 2011). We take into account hospitals that are members of the same health care system within the same geographic area that are likely to negotiate jointly with insurers over contracts and reimbursement rates (Berenson R. , Ginsburg, Christianson, & Yee, 2012). Hospitals that are members of multi-hospital systems are able to charge higher prices than non-system members, exerting greater bargaining power with insurers (Melnick & Keeler, 2007). Roughly 55% of hospitals are members of a multi-hospital health care system each year, though these systems may be spread out over multiple geographic markets.

Table 1 shows mean HHIs for two example geographies, HRRs and CBSAs, for 2003-2009. In this analysis, rural non-CBSA areas within in a state were combined. For HRRs, the HHI decreases slightly in the first period and then increases through 2009, for a net mean increase from 2004-2009 of 131.3, though this increase is not statistically significant. This is roughly the difference in a market moving from nine firms with equal market share to eight firms. The unweighted mean HHIs for CBSAs are much higher, reflecting the higher number of CBSAs than HRRs (929 CBSAs vs. 306 HRRs), smaller geographic delineation of markets, and influence of less competitive rural areas in the unweighted estimate. Weighting the CBSA values by the CBSA population lowers the

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<sup>2</sup> Personal communication with Nguyen Nguyen, Senior Research Scientist at HHS/OS/ASPE.

<sup>3</sup> Dartmouth Atlas zip code crosswalks, 2002-2010, <http://www.dartmouthatlas.org/tools/downloads.aspx>

mean HHIs significantly, such that the CBSA values are similar to the HRR values in magnitude and trend. Consistent with the HRR measure, the CBSA HHI is not statistically significantly different in 2009 compared to 2004.

**Table 1: HRR and CBSA HHIs, 2004-2009**

	Mean HRR HHI (SD)	Mean CBSA HHI (SD)	Mean CBSAHHI, weighted by CBSA Pop
2004	2898.7 (1806.3)	7027.3 (3146.4)	2881.2 (2801.8)
2005	2878.9 (1788.1)	7000.3 (3134.0)	2871.8 (2786.8)
2006	2929.0 (1784.0)	7036.4 (3127.0)	2904.4 (2803.0)
2007	2955.4 (1800.8)	7010.3 (3121.5)	2911.9 (2894.0)
2008	2999.8 (1802.6)	7009.4 (3110.0)	2933.0 (2783.4)
2009	3030.0 (1848.1)	7015.7 (3114.2)	2928.3 (2772.4)
Notes: CBSAs were not included in the AHA file in 2003. HHI is unweighted except where noted and based on Medicare inpatient days, chain-adjusted to combine market shares of hospitals in the same system and HRR or CBSA, and includes short-term general acute, surgical, cancer, heart, obstetrics and gynecology, eye, ear, nose and throat, rehabilitation, orthopedic, chronic disease, other specialty, and children’s general hospitals.			

### Hospitals in Scope for Market

An additional element to defining the hospital market includes assessing which types of hospitals will be included as competitors. In addition to general acute-care hospitals, hospitals can focus on particular patient populations such as children or women or on a subset of services like cardiac or orthopedic services. Acute care hospitals may also offer long-term care services such as rehabilitation, substance abuse, or psychiatric care (Organisation for Economic Cooperation and Development, 2012). For example, an analyst could focus only on competition between short-term, general acute care hospitals or include other types such as surgical, children’s, orthopedic, or cardiac hospitals. In a 2003 report on specialty hospitals, the GAO found “...although general hospitals

typically have more beds than specialty hospitals, the focused mission of specialty hospitals often resulted in their treating more patients in their given fields of specialization.” (Government Accountability Office, 2003a)

In this step, the purpose of the competition measure will shape the kinds of hospitals that are appropriate to include. As a practical application of the kinds of hospitals to include, the FTC looks to the services offered by the subject hospitals in their analyses of potential hospital mergers or acquisitions to assess competitive effects of the merger. For example, a recent FTC opinion on the acquisition of St. Luke’s Hospital by Promedica Health Systems in Toledo, OH in 2011 looked at the pre- and post-merger general acute care services and obstetrical (OB) services in the area (In the Matter of Promedica Health System, Inc., 2011). Thus, in this case it would be appropriate to include the subset of specialty hospitals in the area that offer inpatient OB care such as a women’s hospital but not other types of specialty hospitals. Another analysis looking at competition for cardiology services should include different types of specialty hospitals such as cardiac hospitals.

When the purpose of the market concentration measure is to describe trends in market concentration more generally across time or geography, the choice regarding which types of hospitals to include is more open because is not defined by the types of services present in a local market nor by a targeted empirical investigation of the effects of competition within a particular service area or on a particular outcome. The GAO report found that in 2003, the 92 cardiac, orthopedic, surgical, and women’s hospitals accounted for less than 2% of all short-term acute care hospitals in the country. These

specialty hospitals were also concentrated in certain states (Government Accountability Office, 2003b). Thus, the inclusion of these types of specialty hospitals is unlikely to affect average market shares across the country but may have more impact at the local level.

We compare three approaches to defining hospitals in scope in the markets. The primary definition of hospital markets includes general acute care hospitals as well as specialty hospitals that are likely to compete with general hospitals and in some cases provide more services than general hospitals. This set of hospitals is referred to as the “medium” definition in subsequent tables and analyses in this paper. These hospitals represent about 89% of hospitals short term hospitals in the 50 states and DC each year. We include a narrower (short-term general medical/surgical hospitals only) and broader (adding hospitals for tuberculosis and other respiratory diseases and specialty hospitals for children) market definition. In all three subsets, we exclude hospitals located in US territories and long-term hospitals.<sup>4</sup> In the AHA data, admissions are reported separately for hospital and long-term care units within a hospital, and thus it is possible to exclude long-term unit discharges from calculations of an acute care hospital’s market share or, alternatively, to create a specific HHI measure for long-term services performed at both acute care and long-term hospitals.

**Table 2: Mean HHIs with Varying Hospital Types in Scope for Market**

	Mean HHI, Narrow	Mean HHI, Medium	Mean HHI, Broad
2003	2948.8 (1777.9)	2899.2 (1772.1)	2899.0 (1772.3)
2004	2937.6 (1769.6)	2884.8 (1767.9)	2884.7 (1768.0)
2005	2946.8 (1762.1)	2870.7 (1744.5)	2870.1 (1745.0)

<sup>4</sup> The AHA identifies long-term hospitals as 1) hospitals reporting a separate long-term unit and whose long-term unit admissions are greater than the short-term admissions or 2) a hospital that does not report a separate long-term unit but whose average ratio of inpatient days to admissions is 30 or more.

2006	3006.4 (1794.1)	2924.5 (1775.9)	2924.2 (1776.1)
2007	3049.0 (1818.4)	2974.1 (1795.1)	2973.8 (1795.3)
2008	3079.0 (1800.2)	3005.0 (1782.5)	3004.8 (1782.6)
2009	3130.8 (1835.4)	3061.1 (1821.8)	3060.9 (1822.0)
Note: HHI is unweighted and based on HRR-level Medicare discharges, chain-adjusted to combine market shares of hospitals in the same system and HRR.			

As expected, the mean HHI values for the narrow definition of hospital types in scope for the markets are higher than the medium or broad definitions, suggesting a slightly more concentrated market. There is almost no difference in mean HHI between the medium and broad definitions, indicating tuberculosis, and other respiratory diseases and children’s specialty hospitals do not have sufficient market share to affect the HHI appreciably. The correlation between these two measures was 1.00, while the correlation between the narrow definition and the broad and medium-based measures still very high at 0.996. Statistical tests indicate the HHI based on the narrow definition is not significantly different from the medium or broad approach, and this finding was consistent when other products such as total beds or total admissions were used as the basis for the HHI (to be discussed in greater detail below). In addition, the trends in hospital concentration over time are consistent across the three definitions tested—though it appears the average hospital market has grown slightly more concentrated over time by roughly 100-200 points, in all three approaches the higher HHI in the 2009 is not statistically different from the 2003 HHI.

When the goal of creating the hospital concentration measure is an assessment of market concentration across the range of services hospitals provide, the analytic choice of which definition of the hospital is used does not appear to affect the concentration

measure. The larger, general medical surgical hospitals predominate the market share for products such as Medicare discharges, and thus the addition of smaller specialty hospitals does not impact the measures. However, for more tailored analysis such as an examination of the concentration of cardiology services or pediatric surgery in a market, the hospitals in scope could have a more appreciable impact.

### **Hospital Market Share Measures**

Once the hospital market area and hospitals in scope have been defined, the level of competition in that market can be described through a variety of measures. At a basic level, one might consider the number of hospitals in a market as an indicator of the level of competition, based upon the theory that more firms competing in a market leads to increased competition (Scanlon et al., 2006). This measure has intuitive appeal, is easily obtained, and is understandable for a lay audience; however, it is rarely used in academic literature as a measure of hospital competition. The number of firms in the market assumes that each firm contributes uniformly to the level of competition in the market and thus does not account for the distribution of market share among the firms in the market, potential competitors, barriers to entry, etc. To be fair, many of the measures that express competition as a single number—including the Herfindahl-Hirschman Index (HHI), discussed below—do not fully address the complex nature of competition.

The HHI is commonly used in studies with hospital competition. The Federal Trade Commission-Department of Justice Horizontal Merger Guidelines (“Merger Guidelines”) that were issued in 1992 and updated in 2010 base analyses of competitive effects of mergers on the HHI. If the post-merger HHI in a market exceeds 2,500 and the merger or

acquisition increases the HHI by more than 200 points, the merger or acquisition is presumed likely to create or enhance market power and thus be presumably illegal. (U.S. Department of Justice and the Federal Trade Commission, 2010). The FTC also has referenced the number of “significant competitors” and post-merger market shares in a market.

The HHI is the sum of the squared market shares  $S$  of firms (hospitals)  $i$  in market  $m$ , as depicted in Equation 1 below:

**Equation 1:**

$$HHI_m = \sum_{i=1}^I S_i^2$$

The higher the HHI, the more concentrated the market; a perfect monopoly has an HHI of 10,000. The HHI was first used in the 1940s as a measure of market skewness; in 1976 the HHI was formally linked to the Cournot theory of competition (Cowling & Waterson, 1976), which assumes fixed quantities and homogenous products. In 1984, the U.S. Department of Justice (DOJ) adopted the HHI as a concentration measure for merger reviews. Although it is widely used, the HHI has been criticized for two main shortcomings: it is sensitive to geographic boundaries and products used in the market definition, and as a measure only of concentration it fails to incorporate other important aspects of market power such as barriers to entry (Lijesen, 2004). Gaynor and Town suggest the HHI may be interpreted more as a measure of the potential for competition with some measurement error rather than a measure grounded in economic theory (Gaynor and Town, 2012). The use of the HHI in analyses of the impact of concentration has been criticized as a potentially endogenous measure along the following basic

argument: while prices and quality are generally the outcomes of interest, firms with lower prices or higher quality could attract greater market share such that the outcomes precede the independent variable of interest (the HHI) in the causal pathway. In more recent economic analysis, researchers such Kessler and McClellan (2000) and Gowrisinkaran and Town (2003) have created hospital-specific HHIs, which are generally the weighted zipcode HHIs of the patients using the hospital, to mitigate concern about the potential endogeneity of market share measures and avoid *ex ante* analytic decisions about geopolitical boundaries for the market.

Some analysts have developed models that are related to the HHI, generating pricing power as a function of market share that are appropriate in markets with differentiated products. For example, Antwi and colleagues (2006) use a Logit of Competition Index (LOCI) to model hospital prices. The LOCI ( $\Lambda_j$ ) is a function of the hospitals  $j$  in the market, the number ( $N_t$ ) of consumers of different types  $t$  in the market, the average quantity ( $\bar{q}_t$ ) consumed by each type, and the proportion of each type of consumer ( $s_{tj}$ ) using each hospital in the market.

**Equation 2:**

$$\Lambda_j = \sum_{t=1}^T \frac{N_t \bar{q}_t s_{tj}}{\sum_{t=1}^T N_t \bar{q}_t s_{tj}} (1 - s_{tj})$$

Prices at each hospital are then determined by the LOCI, the hospital's marginal costs, and the marginal utility of income derived from the underlying utility function.



This approach generates prices as a function of market share within a coherent economic framework.

In addition to the HHI, some analyses have used the older four-firm concentration ratio. The concentration ratio is a measure of the total output in an industry produced by a certain (4) number of firms. When the DOJ adopted the HHI in 1984, it justified its selection by stating “Unlike the traditional four-firm concentration ratio, the HHI reflects both the distribution of the market shares of the top four firms and the composition of the market outside the top four firms. It also gives proportionately greater weight to the market shares of the larger firms, which probably accords with their relative importance in any collusive interaction.” (Department of Justice, 1984).

Using the AHA Annual Survey data, we compare an HHI concentration measure to the number of hospitals in the HRR to demonstrate differences in these two approaches. The overall correlation of these two measures was -0.54; a negative correlation is expected because of the inverse relationship of the HHI to competition (i.e., the HHI increases as competition decreases while the number of firms increases as competition increases). The overall strength of the correlation is weak, however, indicating the two measures likely capture different aspects of the market. In the hospital market, the mean number of hospitals in an HRR changes very little from 2003-2009, remaining between 16.3 and 16.7 hospitals on average. The mean HRR HHI appears to display greater variation over time, reflecting both the larger scale of the HHI measure and its potential to demonstrate changes in market share as well as the number of firms.

**Table 3: Mean HRR HHI and # Hospitals, 2003-2009**

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	<b>Mean HRR HHI</b>	<b>Mean HRR # Hospitals</b>
2003	2899.2 (1772.1)	16.3 (14.9)
2004	2884.8 (1767.9)	16.4 (14.9)
2005	2870.7 (1744.5)	16.7 (15.1)
2006	2924.5 (1775.9)	16.6 (15.1)
2007	2974.1 (1795.1)	16.6 (15.3)
2008	3005.0 (1782.5)	16.7 (15.2)
2009	3061.1 (1821.8)	16.6 (15.2)
Note: Both HHI and # hospitals are unweighted and include short-term general acute, surgical, cancer, heart, obstetrics and gynecology, eye, ear, nose and throat, rehabilitation, orthopedic, chronic disease, other specialty, and children’s general hospitals. The HHI is based on HRR-level Medicare discharges, chain-adjusted to combine market shares of hospitals in the same system and HRR.		

Furthermore, different types of hospital “products” can serve as the basis of a hospital’s market share in that market. Depending on the research question an analyst might appropriately measure market share based on staffed hospital beds, admissions, inpatient days, average daily census, volume of a particular procedure such as surgeries or births, medical staff, or outpatient visits. In the revised Horizontal Merger Guidelines, it states “the Agencies measure market shares based on the best available indicator of firms’ future competitive significance in the relevant market. This may depend upon the type of competitive effect being considered, and on the availability of data.” (U.S. Department of Justice and the Federal Trade Commission, 2010). Hospital beds are commonly reported, easy to measure and reflect hospital capacity; occupancy rates may vary across hospitals that would affect true market share, though a hospital’s investment in staffing a bed suggests an expectation that the bed will be filled. Occupancy rates are correlated with hospital size and ownership status, with smaller hospitals and for-profit hospitals reporting lower occupancy rates (Table 4).

**Table 4: Occupancy Rates by Hospital Type, 1975-2009**

	<b>1975</b>	<b>1980</b>	<b>1990</b>	<b>1995</b>	<b>2000</b>	<b>2009</b>
All hospitals	76.7	77.7	69.5	65.7	66.1	67.8
Federal	80.7	80.1	72.9	72.6	68.2	69.1
Nonfederal	76.3	77.4	69.2	65.1	65.9	67.8
Community	75.0	75.6	66.8	62.8	63.9	65.5
Nonprofit	77.5	78.2	69.3	64.5	65.5	57.4
For-profit	65.9	65.2	52.8	51.8	55.9	57.7
State/local Govt	70.4	71.1	65.3	63.7	63.2	65.0
6-24 beds	48.0	46.8	32.3	36.9	31.7	33.6
25-49 beds	56.7	52.8	41.3	42.6	41.3	46.0
50-99 beds	64.7	64.2	53.8	54.1	54.8	55.9
100-199 beds	71.2	71.4	61.5	58.8	60.0	61.3
200-299 beds	77.1	77.4	67.1	63.1	65.0	65.6
300-399 beds	79.7	79.7	70.0	64.8	65.7	67.9
400-499 beds	81.1	81.2	73.5	68.1	69.1	70.1
500 + beds	80.9	82.1	77.3	71.4	72.2	74.0
Source: American Hospital Association Annual Survey of Hospitals. Hospital Statistics, 1976, 1981, 1991–2011 editions. Chicago, IL. (Copyright 1976, 1981, 1991–2011)						

We compare various hospital outputs that could serve as the basis for an HHI, including admissions, staffed beds, total inpatient days and inpatient days by Medicare, Medicaid and private payer, Medicare discharges, Medicaid discharges, total visits, and admissions and inpatient days adjusted to account for a hospital’s outpatient volume. Overall, the correlation among these measures was high, ranging from 0.81 to 0.98 (Table 5), suggesting that the choice of output generally does not have a large impact on conclusions about the level of market. For each of the measures, the change in within-market HHIs was concentrated in a few HRRs as measured by the standard deviation of each HRR’s HHIs from 2003-2009. The median HRR standard deviation ranged from from 130.7 to 295.4 across the measures and the mean ranged from 217.9 to 404.7— (Table 6, bottom row), indicating skewness in the data.

The HHIs based on the two Medicaid volume-related measures were less strongly correlated with the other measures and depict the greatest amount of concentration in

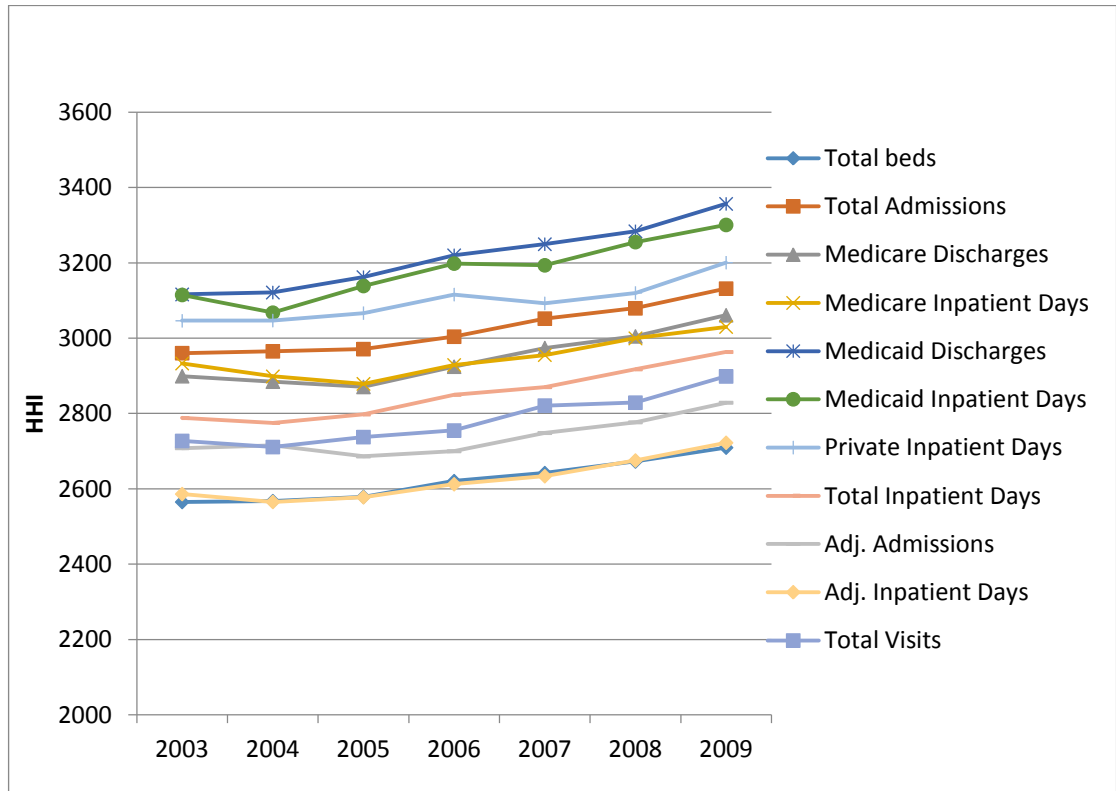
hospital markets, reflecting the concentration of care for low-income and vulnerable populations at selected safety net hospitals. Adjusted inpatient days and total beds show less concentrated markets relative to Medicaid, with Medicaid discharges higher on average by 595.1 for adjusted days and 596.3 for total beds. The Medicaid measures also had the highest within-HRR variation over 2003-2009, while the HHI based on total admissions was more stable. The distinction of the Medicaid-based HHIs suggests these measures are useful in analyses of services for low-income individuals or safety-net institutions but are less generalizable for broader hospital concentration measures.

	Total Staffed Beds	Total Admsns	Mcare Dschgs	Mcare Inptnt Days	Medicaid Discharges	Medicaid Inpatient Days	Private Inpatient Days	Total Inpatient Days	Adj. Admissions	Adj. Patient Days	Total Visits
Total Staffed Beds	1.0000										
Total Admissions	0.9476	1.0000									
Medicare Discharges	0.9499	0.9872	1.0000								
Medicare Inpatient Days	0.9611	0.9689	0.9833	1.0000							
Medicaid Discharges	0.9109	0.9529	0.9323	0.9142	1.0000						
Medicaid Inpatient Days	0.9123	0.8560	0.8465	0.8576	0.8851	1.0000					
Private Inpatient Days	0.9508	0.9286	0.9123	0.9254	0.8787	0.8911	1.0000				
Total Inpatient Days	0.9854	0.9494	0.9480	0.9650	0.9071	0.9222	0.9716	1.0000			
Adjusted Admissions	0.9447	0.9821	0.9762	0.9518	0.9409	0.8538	0.9140	0.9383	1.0000		
Adjusted Patient Days	0.9791	0.9346	0.9380	0.9487	0.8955	0.9214	0.9547	0.9860	0.9456	1.0000	
Total Visits	0.8860	0.8911	0.8919	0.8794	0.8718	0.8123	0.8537	0.8754	0.9165	0.8910	1.0000

**Table 6: Mean HRR HHIs based on Selected Hospital Measures, 2003-2009**

	Total Beds	Total Admsns	Medicare Dschgs	Medicare Inpatient Days	Medicaid Dschgs	Medicaid Inpatient Days	Private Inpatient Days	Total Inpatient Days	Adj. Admissions	Adj. Inpatient Days	Total Visits
2003	2565.2	2960.4	2899.2	2933.1	3116.4	3115.0	3046.4	2788.2	2708.1	2586.3	2727.4
2004	2567.6	2965.4	2884.8	2898.7	3121.4	3067.9	3047.0	2775.1	2715.5	2565.3	2711.2
2005	2578.9	2971.2	2870.7	2878.9	3162.2	3138.8	3066.7	2797.7	2686.2	2577.7	2737.6
2006	2620.7	3004.2	2924.5	2929.0	3220.2	3198.4	3116.0	2849.8	2700.0	2612.3	2755.0
2007	2642.0	3052.1	2974.1	2955.4	3249.7	3193.7	3092.6	2870.3	2748.4	2633.6	2821.2
2008	2672.8	3079.6	3005.0	2999.8	3284	3255.3	3120.3	2917.5	2776.8	2675.5	2829.0
2009	2709.6	3131.8	3061.1	3030	3356.8	3300.9	3200.8	2963.5	2828.8	2722.5	2898.7
Mean of within-HRR HHI Std. Deviations	222.8	217.9	251.6	285.1	335.5	404.7	342.8	241.8	229.8	245.0	303.3

**Figure 2: Mean HRR HHIs based on Selected Hospital Measures, 2003-2009**



## Insurance Market Concentration Measures

In contrast to concentration in hospital markets, there is relatively little empirical research examining methods for describing concentration in insurance markets. Rather, the research has tended to focus on assessing causes and effects of insurance market concentration and used “off the shelf” measures. Scanlon and colleagues assessed commonly used measures of insurance market concentration in a 2006 review (Scanlon, Chernew, Swaminathan, & Lee, 2006). In the 35 studies included in their review, the authors identified 3 primary measures of insurance competition: the HMO HHI, the number of HMOs, and the HMO penetration. The authors suggest most studies of the effects of insurance competition ignore analytic decisions regarding the type of health

plan or insurance products that are included in the market definition (e.g. Medicare and Medicaid HMO enrollment, administrative services only (ASO) enrollment, etc) and instead rely on Interstudy's "off the shelf" measures of the HHI, which combines commercial, Medicare, and Medicaid enrollment, omits ASO enrollment, and treats insurance products from the same firm in a market as separate competitors. The authors do not address the role of different geographic boundaries for health insurance markets, though the Interstudy measures are created for MSAs.

To test whether these implicit or explicit decisions about insurance market definition were important empirically, the authors examined the correlations between HHIs created using various arrangements of market segment (commercial HMO HHI, the Interstudy HMO HHI), different products under common plan ownership, and including ASO enrollment. The authors concluded that these decisions are not likely to be important empirically given the high cross-sectional (range 0.83 to 0.99) and longitudinal (0.69 to 0.97) correlations in the unadjusted and adjusted HHIs. This conclusion is testable; one could estimate models with various measures and assess whether conclusions about the significance and magnitude of the coefficient on insurance concentration are robust. However, the authors do not estimate models with their measures nor provide the full correlation matrices and thus it is difficult to evaluate where correlations fall within the somewhat wide ranges and whether there are any patterns to the correlations. The authors also suggest the need to include other types of products such as PPOs that have grown in enrollment in recent years.



The authors also tested the sensitivity of competition measures to low-enrollment plans and the choice of the competition measure. In the case of low-enrollment plans, the inclusion of these plans would not have a large effect on the HHI or penetration measure but could have a more pronounced effect on the number of HMOs in a market. The cross-sectional correlation in the number of plans was 0.87 when comparing the total number of plans to only those plans with 1,000 or more enrollees. Plan entry and exit from the market is driven by low-enrollment firms, and consequently the authors found more longitudinal variation in the average number of HMOs in an MSA from 1998-2002. The mean HMO HHI and HMO penetration remained more stable over the time period. In assessing sensitivity to the choice of measure, the authors note that the pairwise correlations between the measures is significant but “not high enough to eliminate concern that in some applications, the choice of measure might matter.” The HHI is negatively correlated with competition, and so the authors expected a negative correlation with the HMO penetration and number of HMO measures.

**Table 7: Cross-Sectional and Longitudinal Correlations in HMO Competition Measures (Scanlon, Chernew, Swaminathan, & Lee, 2006)**

Variable Pairs	Range in Cross-sectional Correlation Coefficients (1998-2002)	Correlation Coefficients for Longitudinal Changes in Competition (1998-2002)
HMO, # HMOs	-0.67 ~ -0.71	-0.4827
HHI, HMO Penetration	-0.40 ~ -0.47	-0.1187
# HMOs, HMO Penetration	0.49 ~ 0.60	0.2655

Note: All correlations are different from zero at <0.01 level. HHI uses commercial enrollment and pools market share for affiliated plans within an MSA. The HMO penetration rate includes commercial, Medicare, and Medicaid HMO enrollment. The number of HMOs excludes plans with fewer than 1,000 commercial enrollees. The longitudinal correlations are computed using the different between the 2002 and 1998 values for each measure.

Longitudinal variation in insurance concentration measures is important for statistical models that attempt to control for omitted variables bias through fixed effects. These models rely on variation within markets over time to identify the association between the independent variable and outcome measures. Scanlon and colleagues found that the average market experienced little change through time, though some markets experienced greater change: 41.7% of MSAs experienced a 5-year change in the HMO HHI of more than 1000, 24.6% experienced a 5-year change in HMO penetration of more than 10%, and 33.6% had a change of two or more HMOs. The number of HMOs varied most within markets. The authors also estimated the degree to which variation in the commercial HMO HHI is due to enrollment changes between plans or structural changes resulting from new entrants, exiting firms, or mergers and acquisitions, finding that 35%-39% of the variance in the HHI is due to annual enrollment changes that may reflect endogenous factors such as lower prices or better quality in the plan with enrollment growth while 61%-65% is because of structural changes.

The review of existing measures of health insurance concentration Scanlon and colleagues provide suggests that the measure selected for use in empirical studies could matter depending on whether the analysis requires longitudinal or cross-sectional variation, given the relatively weak correlations between measures. Furthermore, the review highlights the need to control for market characteristics such as population, per capita income, or hospital competition in cross-sectional designs; in longitudinal designs, results may be driven by within-case changes in a few markets and may also reflect endogenous enrollment changes as well structural changes in the market. Finally,

important elements of market competition—such as barriers to entry, selective contracting arrangements, and other environmental aspects of the insurance market—are not included in current measures of insurance market concentration.

One element of competition measures often discussed in the literature on hospital markets is the geographic definition of a “service area”; the review above does not raise issues related to the geographic definition of insurance concentration measures. The Annual American Medical Association report on concentration in the health insurance industry uses MSAs as the geographic market, based on HealthLeaders-Interstudy data (American Medical Association, 2012). The large number of studies included in Scanlon’s review that use the “off the shelf” HealthLeaders HMO concentration measures also use MSAs as the geographic market. The Federal Trade Commission begins its geographic analysis of health insurance mergers by determining whether the two firms sell insurance in the same area. In its case against a potential Aetna merger, the FTC alleged “[t]he relevant geographic markets in which HMO and HMO-POS health plans compete are ... no larger than the local areas within which managed care companies market their respective HMO and HMO-POS plans ...patients seeking medical care generally prefer to receive treatment close to where they work or live, and many employers require managed care companies to offer a network that contains a certain number of health care providers within a specified distance of each employee's home” (United States v. Aetna Inc., 1999). In this case, the relevant geographic markets were the MSAs in and around Houston and Dallas, Texas.

While MSAs have strong intuitive appeal as a geographic market for commercial insurance with their establishment based on economic ties and commuting patterns, published literature has not established whether MSAs do, in fact, reflect the actual sales and enrollment patterns of health plans. To use an analogous term from the hospital literature, there is a lack of widely available “patient flow” data describing the health plan enrollment by zip code or another geographic unit that makes comparable empirical determinations of health insurance markets challenging. MSAs may also not be an appropriate market for other types of insurance, such as Medicaid or Medicare managed care, the Federal Employees Health Benefits Program (FEHBP), coverage purchased through the individual or small-group market, large employers with offices in multiple locations, or the new state-based health insurance marketplaces established through the Affordable Care Act.<sup>5</sup>

While provider locations are generally fixed with a heavy investment of capital resources, health insurance plans can more rapidly change their geographic market by negotiating contracts with providers in a new area and advertising its insurance products to different firms without the same level of capital investment. In addition, the DOJ distinguishes between the definition of monopoly and monopsony markets in health insurance, noting that the “purchasers of the input need not compete in the output market to be included in the relevant market for the purchase of the input” (US Federal Trade Commission and Department of Justice, 2004). For example, the merger of two health

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<sup>5</sup> Medicare Managed Care is marketed at a county level; the regions for Medicaid managed care vary by state but do not cross state lines as do MSAs; FEHBP has both state-specific and nationwide plans; the availability and nature of individual and small-group coverage varies by state; and some larger employers may select one health plan that has partner networks around the country.

plans may pose monopolistic concerns in the market for commercial health insurance among employers, but it may not pose the same degree of monopsonistic concerns in markets with substantial public payer or self-insured presence. The boundaries of the markets in which the health plan advertises and negotiates with providers may be determined independently. Therefore, the appropriate geographic market definition depends on the purpose of the analysis and that definition may change over time.

To conduct our assessment of different approaches to defining insurance market concentration, we use county-level HealthLeaders-Interstudy plan enrollment data for 2003-2009 to develop HHIs that vary along several dimensions. The county-level data provides the flexibility to create concentration measures at the county, state, or MSA level. We assess whether the HHI is sensitive to market segment (Medicare, Medicaid, and commercial insurance), commercial product type (HMOs, PPOs, and POS plans), geography (county, state, and MSA), insurance risk arrangement (self-insured and fully-insured plans), and level of analysis (individual health plan versus managed care organization (MCO)). The data source also includes information that enables the calculation of managed care penetration rates by plan for each MSA for the commercially insured population and the number of plans that are available in each market. The available information from HealthLeaders-Interstudy changed over the study period, with more refinement of insurance categories over time. For example, HMOs, Medicare, and Medicaid enrollment was consistently available from 2003-2009, while PPOs were added in 2005 and consumer-directed health plans were included in 2008. Enrollment was summed by plan type and combinations of plan type: HMO only, PPO only, total

commercial (HMO, PPO, and POS plans), total private (commercial and self-insured HMOs, PPOs, and POS plans) and total lives (HMO, PPO, POS, managed Medicare, and managed Medicaid). Using the HLI data, private market HHIs were created by summing county enrollment to the MSA level for each plan. Appendix A lists the HealthLeaders variables and definitions that were included each year. For all years, plans likely to be rental networks, in which the provider network is negotiated without health plan enrollment information, were excluded.

**Table 8: Mean MSA HHIs and Number of MCOs, 2003-2009**

	Commercial HMOs	Fully Insured PPOs	Total Commercial	Total Private Insurance	Total Lives	Number of MCOs with Commercial Enrollment
2003	3906.8				3461.0	9.8
2004	3609.4				3305.6	11.3
2005	3930.1	3974.0	3014.9	2938.8	2725.5	23.3
2006	3369.1	4040.4	2921.4	2536.4	2295.1	22.3
2007	4169.0	4954.8	3735.9	3121.6	2733.6	14.7
2008	4087.0	4229.4	3400.3	2897.1	2541.2	14.8
2009	4122.3	4077.0	3239.8	2598.6	2195.7	16.5
NOTE: Estimates include micro and non-MSA areas and are weighted by population.						

Allowing commercial HMOs and PPOs to act as competitors, as in the total commercial HHI data above, yields HHIs that are lower than those calculated for the HMO or PPO market separately. All three measures on average remain well above the FTC threshold for a highly concentrated market. Factoring in the self-insured, administrative services only (ASO) plans further reduces the HHI. While these ASO plans may not compete for fully insured business, MCOs may use the self-insured enrollment as additional leverage when negotiating with providers. The addition of

additional types of insurance such as Medicare and Medicaid managed care further reduces the average HHI, bringing the mean HHI within the FTC threshold for a moderately concentrated market rather than a highly concentrated market. When considering the relationship between hospitals and insurers, it is likely more appropriate to include self-insured or Medicare and Medicaid enrollment given the potential for greater insurer leverage, and the inclusion of these product sectors generates a more competitive HHI.

In 2003 and 2004, the number of plans in the MSA measure includes only commercial HMOs, while later years include other types of plans like PPOs, POS plans, and CDHPs. Whereas the number of hospitals in an HRR changed very little over time, the number of MCOs with commercial enrollment was much more variable. This could reflect sensitivity of this measure to plans with very small enrollment as suggested by Scanlon and colleagues (2006) that is less of a factor in the HHI measures. It may also reflect changes in HLI reporting and categorization of plan types rather than true variation over time.

We also created concentration measures for Medicaid Managed Care (MMC) to enhance the analysis of private insurance. The National Summary of State Medicaid Managed Care Programs from CMS supplements the Medicaid enrollment data from HLI. This data source was added to ensure adequate representation of Medicaid-only MCOs in the analysis (Herring & Adams, 2011). The CMS source provides information at the plan level—whether the plan operates statewide or in specific counties, its total enrollment, and the type of plan (PCCM, MCO, prepaid inpatient health plan, or PHIP,

etc). Markets in the Medicaid portion of this analysis are defined at the county level because states often vary the structure of MMC programs by county. Previous research on Medicaid managed care has used a county as the geographic unit ( (Coughlin, Long, & Graves, 2009), (Smith, Cheung, Owens, Wilson, & Simpson, 2007). To match the HLI county-level data, total plan-level enrollment from CMS is apportioned across its service area based on the county’s share of the service area population in poverty.

The resulting county-level MMC enrollment data from CMS was matched to the HLI Medicaid data, and CMS plans already present in the HLI data were excluded. County-level HHIs were created based on summing the squared market shares (based on enrollment) of MMC plans. The number of MMC plans in each county was also tabulated. These county-level HHIs and plan counts were aggregated to the state level, weighted by the share of a state’s MMC population residing in the county. State-level HHIs were created based on the statewide enrollment of each MCO.

**Table 9: Mean Medicaid HHIs, County vs. State, 2003-2009**

	<b>County-based Medicaid HHI</b>	<b>State-based Medicaid HHI</b>
<b>2003</b>	5998.4 (2841.9)	3352.3 (2566.4)
<b>2004</b>	5933.5 (2905.5)	3476.8 (2555.6)
<b>2005</b>	6447.2 (2936.3)	4035.7 (2906.5)
<b>2006</b>	5557.0 (2788.1)	5674.5 (3774.7)
<b>2007</b>	5067.9 (2311.7)	5377.6 (3575.6)
<b>2008</b>	4911.8 (2316.4)	2793.1 (1982.3)
<b>2009</b>	4610.5 (2104.8)	2753.4 (1835.0)
Note: Medicaid HHIs are unweighted.		

**Table 10: Comparison of Mean Commercial HMO HHIs using States, Counties, and CBSAs as Markets, 2003-2009**



	County		State		CBSA	
	Unweighted	Wtd	Unwtd	Wtd	Unwtd	Wtd
2003	5182.0 (3061.1)	3132.8 (2472.9)	3019.2 (2045.5)	1697.5 (865.4)	5659.8 (2743.5)	2541.8 (1440.7)
2004	5433.1 (2984.4)	3252.3 (2463.4)	2530.6 (1814.8)	1603.1 (67.1)	5858.0 (2615.2)	2694.1 (1356.4)
2005	5029.8 (3103.8)	3470.6 (2481.1)	2946.7 (1429.5)	2292.5 (982.9)	5715.4 (2650.4)	3387.8 (1639.9)
2006	5187.6 (2629.0)	3760.3 (1836.9)	3159.3 (1868.3)	2411.5 (1218.9)	4917.6 (3205.3)	3205.3 (1529.4)
2007	5911.3 (2782.8)	4516.1 (2136.8)	3838.7 (1969.4)	2727.9 (1329.1)	5672.3 (2437.4)	3842.1 (1882.4)
2008	5466.4 (2435.1)	4333.1 (1896.0)	3320.8 (996.0)	2582.6 (1344.3)	5237.4 (2124.4)	3760.5 (1771.5)
2009	5489.8 (2330.1)	4574.4 (1858.4)	3495.6 (1821.9)	2814.6 (1458.1)	5128.3 (2193.4)	4005.0 (1806.9)
Note: CBSAs include MetroSAs, MicroSAs, and rural areas within a state						

On average, HHIs developed with the state as the geographic market appear the most competitive of the three geographic areas examined. Counties appear the most concentrated on average, and CBSAs fall in between the two. Weighting by population does moderate the differences between the approaches some, but the state-based HHIs are still significantly lower than CBSAs or counties. In a criticism of an article by Robinson suggesting that increased insurance consolidation measured at the state level was associated with higher premiums (Robinson J. , 2004), Kopit emphasizes that health insurance markets are very local in nature. He argues, “In a state the size of Rhode Island, the geographic market could be the entire state, but in larger states, such as Pennsylvania, the sale of health insurance products in Pittsburgh does nothing for local

employers in Philadelphia or even Harrisburg.” (Kopit, 2004) Without additional data it is difficult to label any of these as the “right” approach, but it is clear that a state-based insurance market HHI likely overstates the level of competition in the health insurance market. As enrollment grows in new state-based ACA marketplaces, however, the state may become a more appropriate geographic unit because plans may compete more broadly across a state.

Managed Care organizations can report enrollment in multiple products or plans within the same geographic area. For example, in one county in Alabama, the parent MCO Wellpoint, Inc. reported commercial fully insured enrollment in several subsidiary companies, including Anthem BCBS of Colorado, Anthem BCBS of Connecticut, Empire BCBS of New York, Unicare, and BCBS of Georgia. This may reflect mergers or acquisitions of companies, the effect of multisite employers with a health plan covering employees across sites, or some other strategic business decision by the MCO. When horizontal integration occurs that reduces the number of effective competitors, Baker suggests it is increasingly important to account for it in measures of competition (Baker L. , 2001). In 2008 and 2009, HealthLeaders-Interstudy provided enrollment information at both the company and MCO level. The table below provides MSA-level HHIs using total commercial enrollment (including fully insured HMOs, PPOs, and POS plans) with market share defined at the product level compared with MCO-level market share. The HHIs based on aggregated MCO-level data accounting for common plan ownership were on average 380 points higher than the product-level HHI, a statistically significant difference. The overall correlation between the two approaches was 0.93,

indicating that the general trends across MSAs in the measures were similar, even though the MCO-based HHI was higher. These findings suggest it is important to account for common ownership of health plans in concentration measures by using MCO-level enrollment rather than company-level enrollment.

**Table 11: Total Commercial HHIs with and without adjusting for Common MCO ownership, 2008 and 2009**

	Company Level Total Commercial HHI	MCO Level Total Commercial HHI
2008	2905.8 (1595.6)	3233.0 (1463.7)
2009	2812.3 (1347.4)	3154.7 (1263.2)

Note: HHIs are weighted by MSA total population and exclude non-MSA areas. When non-MSA areas are included, the respective weighted HHIs are: 2962.7 (2008 product level), 3289.4 (2008 MCO level), 2856 (2009 product level), and 3202.1 (2009 MCO level).

In summary, measures of insurance concentration have typically taken two forms: the number of competing firms in a market and the HHI. In recent years, data has become more available to include insurance products beyond HMOs in the HHI, which reflects changing enrollment patterns in health insurance. These findings suggest that including these other types of insurance products leads to lower HHIs that are more reflective of current enrollment patterns in the insurance marketplace. The correlations among insurance concentration measures developed using different analytic choices remains moderately strong to strong, though in some cases the HHI using one method may be significantly higher than another. The CBSA-level HHIs were significantly higher than the state-based HHIs, as were HHIs that accounted for common plan ownership by MCOs relative to HHIs that did not account for common ownership. These differences highlight that conclusions about the level of competition in a market can be

affected by analytic choices in the construction of the concentration measure. The relevance of this difference depends on the analytic question. For example, econometric studies using fixed effects methods relying on within-case variation over time may be less sensitive to the absolute value of the HHI than policy decisions regarding enforcement or regulation in which the concentration value is more important.

## **Relative Insurance Market to Hospital Market Concentration**

There are several key features of hospital markets in the United States that play an important role in affecting competitive interactions between hospitals (Gaynor & Town, 2012). The majority of individuals in the US access and pay for hospital care through their health insurance plans, and so choice set of available hospitals will depend on their health insurance plan and price differentials between hospitals are largely not reflected in a patient's out of pocket costs. Individuals generally select health plans before the need for care arises, though individuals with chronic health needs may have some prior knowledge of anticipated provider needs. Finally, hospitals negotiate inclusion in a plan's provider network and the reimbursement rates the plan pays, as well as utilization review and quality monitoring. Health insurers develop premiums based on these reimbursement rates as well as marketing and administrative costs and anticipated profit. Health plans compete for market share based upon these premiums, their provider networks, and plan quality (when known). The issue of insurer-hospital bargaining is important, therefore, in determining how consumers fare in terms of the prices they pay and their experience seeking care in a given market. As discussed below in more detail,

research has found that increased insurance concentration can have a “monopoly busting” effect against higher prices charged in more concentrated hospital markets.

Gaynor and Town outline a simple model of hospital-insurer bargaining that has three main phases: 1) health plans and hospitals bargain to determine the set of hospitals in the plan networks and the per-patient reimbursement 2) patients choose health plans and 3) patients seek care when the need arises and choose a hospital based on need and the plan’s provider network. In the first phase, insurers and hospitals negotiate over the price of inpatient care, aiming to settle on a base price for each admission that is multiplied by a disease weight (analogous to a Diagnostic Related Group, or DRG). Gaynor and Town calculate the Nash bargaining outcome in which each insurer-hospital pair is taken in isolation, though they acknowledge this ignores the effect of negotiations on other insurer-hospital diads. The authors develop agreement and disagreement values for each hospital and insurer. The agreement value for the hospital is the net revenue they receive from an insurer’s patient population obtaining care at the hospital, while the disagreement outcome assumes the hospital receives a fixed net revenue. The agreement value for the insurer is the gross revenue they gain by having the hospital in the network, less expenditures on patient care at the hospital. The authors conclude that the Nash bargaining outcome predicts that a hospital’s price increases with increasing costs, bargaining ability, prices of competing hospitals, and the value that the hospital brings to the insurer’s network.

In the second phase, a patient’s choice in health plans is determined by the insurance premium for the plan, the hospitals in the plan’s provider network, some

unmeasured desirability for the plan, and the error term. In the final stage of the model, patient utility is defined as a function of hospital characteristics such as size, ownership, or service offerings, patient characteristics such as age, sex, race, and diagnosis, the distance to the hospital from the patient's home, and error term.

Researchers have used various approaches to incorporate the relative concentration of health insurance and hospital markets into their analytic models. In an exploration of whether HMOs possess monopsony power in the market for hospital inpatient and ambulatory services, Feldman and Wholey (2001) define health insurance buying power for hospital services as the percentage of inpatient days in the market area purchased by each HMO. Buying power for ambulatory services is measured by the number of ambulatory visits purchased by each HMO per 1,000 active physicians in the market area. Bates and Santerre (2008) define health plan buying power as the MSA-level HHIs for HMOs and PPOs based on enrollment.

This analysis includes a measure of the relative concentration of insurance markets to hospital markets, operationalized by the ratio of insurance to hospital HHIs (see Appendix B for detailed methods). The ratio of insurance HHIs to hospital HHIs suggest that, on average, the insurance markets are more concentrated than hospital markets. Across various formulations of hospital and insurance market HHIs, the mean ratio of insurance concentration to hospital market concentration remained above 1.0 (Table 12).

**Table 12: Mean MSA-level Ratio of Insurance Market HHI to Hospital Market HHI, 2003-2009**

Year	Commercial HMOs		Total Privately Insured	
	Mean	Sd	Mean	Sd
2003	2.3	1.6	-	-
2004	2	1.3	-	-
2005	2.3	1.6	1.7	1.4
2006	1.8	1.4	1.4	1.2
2007	2.3	1.6	1.8	1.3
2008	2.1	1.5	1.5	1.1
2009	2.1	1.6	1.4	1

Note: Hospital HHI based on Medicare discharges for the medium definition of hospitals in scope.

We also categorize areas into four groups based on the joint competitiveness of their insurance and hospital markets: hospital and insurance markets are both competitive, competitive hospital and concentrated insurance market, concentrated hospital and competitive insurance markets, and both markets concentrated. Competitive is defined as an HHI below 2500 following FTC guidelines (Table 13). In this table, the categorization is based on three formulations of insurance HHIs (HMO only, Total Private, and Total Lives) relative to the Medium, Medicare Discharges hospital HHI only. We include commercial HMO HHIs to provide data for 2003 and 2004 and include the total private HHI, which includes the self-insured, to represent the insurance market environment hospitals experience when negotiating with insurers.

The categorization of markets based on the competitiveness of insurance and hospital markets shows that most MSAs have hospital HHIs below 2,500, and it was rare

than hospital HHIs were above this threshold. Insurance HHIs were more evenly split above and below the threshold.

<b>Table 13: Categorization of MSAs based on Competitiveness of Private Insurance and Hospital Markets, 2003-2009</b>			Concentrated Insurance, Competitive Hospital	Competitive Insurance, Concentrated Hospital	Both Concentrated
		Both Competitive			
2003	HMO Commercial	12%	53%	3%	32%
	Total Lives	20%	45%	5%	30%
2004	HMO Commercial	21%	43%	7%	29%
	Total Lives	25%	39%	8%	28%
2005	HMO Commercial	13%	52%	4%	30%
	Total Private	30%	36%	14%	21%
	Total Lives	33%	33%	16%	19%
2006	HMO Commercial	20%	42%	8%	30%
	Total Private	39%	23%	24%	14%
	Total Lives	40%	22%	26%	13%
2007	HMO Commercial	8%	54%	3%	35%
	Total Private	25%	38%	12%	26%
	Total Lives	35%	28%	17%	21%
2008	HMO Commercial	13%	47%	4%	36%
	Total Private	31%	29%	16%	24%
	Total Lives	37%	22%	23%	17%
2009	HMO Commercial	10%	49%	5%	36%
	Total Private	38%	22%	20%	20%
	Total Lives	44%	16%	23%	17%
Notes: Row percents may not sum to 100 due to rounding. Competitive market defined as one with an HHI below 2500. Plan enrollment in PPOs was not available in 2003 and 2004, and so the total private HHI could not be calculated. Total Lives in these two years includes HMO, Medicare, and Medicaid managed care enrollment. Hospital Market HHIs based on the medium definition of markets and use Medicare Hospital Discharges as basis for market share					



## **Looking Toward ACOs: Other Provider Concentration**

### **Measures**

In recent years, there has been a push to organize and pay for health care services in a more integrated fashion. One major example is the establishment of Accountable Care Organizations (ACOs) as part of the ACA. These organizations encourage hospitals, physicians, and other providers to come together to coordinate care across settings to better manage patients, improve quality, and reduce costs. As the provider community becomes more integrated, measures of concentration will need to adapt to this changed environment to reflect more accurately the market structure for health care services.

While the bulk of research assessing concentration in health care services has focused on hospitals, some research on the level of competition among other types of health care providers, such as nursing homes, dialysis centers, and pharmaceuticals, and the impact of competition on associated outcomes has also been conducted. One possible reason for the focus on hospital services is that spending on hospital services accounted for roughly one third (31.4%) of total national health care expenditures in 2011, more than any other service category. However, the efforts by payers and policymakers to look to payment bundling approaches that hold providers across settings accountable for patient care and outcomes has implications for competition in multiple provider markets. Understanding how provider competition is defined in those markets, the extent of the knowledge base on the effects of competition, and where gaps remain could aid efforts in evaluating the competitive effects of new delivery system approaches.

In 1988, Nyman examined the impact of competition in nursing home markets—using the number of empty nursing home beds at the county level to reflect excess demand—on nursing home expenditures per patient (Nyman, 1988). Nyman found that if the average nursing home in an underbedded areas with little competition had been located an area with more available beds, it would spend more money each day per patient in order to compete in that market. More recently, Gruneir and colleagues examined the relationship between long-term care market competition and the odds of having a dementia special care unit, using counties as the definition of a long-term care market and the nursing home’s share of beds as the measure of market share (Gruneir, Lapane, Miller, & Mor, 2007). This article found that the presence of a dementia special care unit in a nursing home was influenced by the behavior of other nursing homes in the market, though the study did not examine the effect of nursing home competition on prices or quality. DeLellis and Oxcan found a positive association between the level of nursing home competition, measured at the county level alternatively using the HHI and the number of home health agencies, and higher efficiency nursing homes (DeLellis & Ozcan, 2013). Thus, for nursing homes we see market structure based on the number of beds, the number of agencies, and the HHI, typically at the county level.

Some work in both research and anti-trust regulation has also been done in the area of dialysis. In the regulatory area, the FTC required Fresenius Medical Care in 2012 to divest 60 dialysis centers in 43 markets around the country in its proposal to acquire rival Liberty Dialysis Holdings, Inc. (Federal Trade Commission, 2012). Cutler, Dafny, and Ody performed an analysis of the impact competition on quality, using dialysis as a case

study. Operationalizing dialysis market concentration as the HHI at Dartmouth's Hospital Service Area (HSA) level, the authors found no significant effects of competition in the dialysis market on outcomes such as mortality rates, dialysis adequacy, and staffing ratios (Cutler, Dafny, & Ody, 2012). In an analysis examining the association between dialysis center for-profit status and hospital days per patient, Lee and colleagues include a measure of dialysis market competition defined as the HHI (with market share based on number of patients) for all facilities within 30 miles of a given facility's zip code (Lee, Chertow, & Zenios, 2010). In dialysis, then, we find the HHI more commonly used with different geographic definitions (HSAs and a fixed radius approach) for the market.

Historically, physicians practiced predominately as solo providers or in small groups. Evidence suggests that the percentage of doctors who are practicing in medium and large-sized groups is growing. In addition, hospitals are increasingly purchasing physician practices and groups in anticipation of the Affordable Care Act and the advent of ACOs (Kocher & Sahni, 2011). Using survey data from the Physician Survey component of the Community Tracking Study, Casalino and colleagues reported that in 2001, 47% of physicians practices in groups of 1-2, down from 54% in 1997 (Casalino, Devers, Lake, Reed, & Stoddard, 2003). The authors also conducted a qualitative study of perceived benefits of and barriers to large group medical practice. The most frequently cited benefit of large medical group practices was to gain leverage with health plans, cited by 81% of the physician group interviewees in the study. A more recent study of all physicians billing Medicare Fee for Service using Medicare claims and provider

enrollment data finds that the percentage of physicians in groups of more than 50 providers rose from 30.9% in 2009 to 35.6% in 2011 (Welch, Stearns, Bindman, & Cuellar, 2013). In an effort to define geographic markets for physician services and assess concentration, Kleiner, Lyons and White use 2009 Medicare patient flow data to create specialty-specific physician markets based on the Elzinga-Hogarty methodology. This study found considerable variation in the size of geographic markets by physician specialty and evidence of concentration in physician markets, particularly for specialists practicing in smaller geographic areas (Kleiner, Lyons, & White, 2012). Berenson and colleagues use California's experience with joint physician-hospital negotiations with insurers as a cautionary tale that integrated care through organizations like ACOs may lead to higher rates for private payers (Berenson, Ginsburg, & Kemper, 2010).

Though little evidence about the positive effects of increased concentration in physician markets, proponents claim that larger groups, particularly multi-specialty groups, can more effectively coordinate care, improve efficiency, and enhance quality (Fisher, Staiger, Bynum, & Gottlieb, 2007). In a study of physician group characteristics and outcomes for Medicare beneficiaries, McWilliams and colleagues did find that larger independent physician groups exhibited lower per beneficiary expenditures and better performance on quality measures, though larger hospital-based groups did not show the same benefits (McWilliams, Chernew, Zaslavsky, Hamed, & Landon, 2013). At the same time, larger medical groups have the potential for increased market power with health plans given lower transactional costs, larger patient panels, and other incumbent advantages such as existing admitting privileges with hospitals (Haas-Wilson & Gaynor,

1998). Dunn and Shapiro linked physician-firm concentration measures based on a fixed travel time HHI to commercial insurance claims and found that physicians in more concentrated markets charge higher service prices (Dunn & Shapiro, 2013). The relevance of this market power will increase as ACOs are implemented and physicians share financial and clinical arrangements with other types of providers (Burke & Rosenbaum, 2010).

Several aspects of ACOs need to be considered when developing measures of ACO market competition. First, in the review of hospital and insurance concentration measures described above, the appropriate design of the concentration measure related directly to particular analytic question about the level or effects of competition. Researchers and policymakers should identify key questions about ACOs and associated effects that account for their distinct nature in the health care delivery system, to spur the development of useful competition measures. This includes both the outcomes for Medicare beneficiaries and commercially insured individuals participating in the ACO as well as spillover effects (positive or negative) in local health care markets. Any effects ACOs have on the local health care delivery system at large may impact evaluations of ACO program effectiveness for Medicare beneficiaries; studies may seek to include several comparison groups including non-ACO individuals within and external to the local health care market. With the analytic question in mind, policymakers should consider whether to create one summary measure of ACO concentration that incorporates service use across sectors or continue to analyze market structure in a more sector-specific way. The review above suggests that disparate approaches to measuring market

structure have thus far been used, with more sophisticated analytic approaches used in areas such as physician concentration. .

In addition, CMS currently has a large role in determining which beneficiaries are assigned to ACO providers as well as the regions in which ACOs are located through its approval process for Pioneer ACOs<sup>6</sup>. The risk structure, population size, and share of savings differ between Pioneer ACOs and ACOS in the Medicare Shared Savings Program, and these differences could affect the outcomes of interest in research studies. Importantly, ACOs are also virtual in nature and span providers delivering a range of services under different payment systems. Creating a single competition measure for ACOs requires determining a common denominator across these varied systems. Also, competition measures and econometric techniques that rely on distance from a fixed point—for example, the fixed or variable radius measures for hospitals or Kessler and McClellan’s prediction-based instrument for hospital market share (Kessler & McClellan, 2000) – are unlikely to be feasible for analyses of ACOs.

The FTC has considered some of these issues in crafting a policy statement published in conjunction with the ACO final rule that provided guidance for a “safety zone” determination for ACOs that were highly unlikely to cause competitive concerns (Federal Trade Commission, 2011). The FTC focused on three areas--physician services, inpatient hospital services, and outpatient services—and used a “primary service area” (PSA) definition for each type of service that includes the zip codes from which the ACO

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<sup>6</sup> Pioneer ACOs are selected competitively by CMS; all applicant ACOs in the Medicare shared savings program that meet program criteria (which may be subject to some bias) are approved to participate in the program.

members draw 75% of users. The PSA for each of the three service areas may be different. To be considered in the “safety zone,” the combined market share of the ACO members should not exceed 30% of the Medicare allowed charges in the previous year (for physicians by specialty), all-payer inpatient discharges or Medicare fee-for-service payments (for inpatient services), and Medicare fee-for-service payments for hospital outpatient and allowed charges for Ambulatory Surgical Centers (for outpatient services). The FTC notes that ACOs outside the safety zone can still be pro-competitive. This approach lends itself to evaluating the effects of ACOs within certain service categories rather than across the spectrum of services the ACO provides.

Some alternative approaches to defining ACO concentration could span all the services an ACO provides. For example, one could base the market share on the number of FTE equivalent Medicare-certified providers affiliated with the ACO. Providers have the option to be exclusive to ACOs or provide care to other individuals outside the ACO. Thus, determining the appropriate weight to give each provider for the share of their practice devoted to the ACO would be challenging and require claims data as well as a datafile with beneficiaries assigned to an ACO to match to claims. Another simple measure akin to the HMO penetration measures in studies described above is an ACO penetration measure that describes the percentage of Medicare beneficiaries and commercially insured enrollees when applicable who are assigned to the ACO. This approach would be simple but would not depict actual utilization, only potential market share based on enrollment. An additional alternative would follow the approach of Zwanziger (Zwanziger, Melnick, & Eyre, 1994) and create ACO-level weighted zip code

measures of the share of Medicare payments and allowed charges flowing to ACO providers. Though this latter approach would require substantial claims data to implement, the common units of money across service types would allow for a range of health sectors to be included. The market would also be defined based on patient flow data rather than an arbitrary geographic unit.

To summarize, while the bulk of research on competition in health care has focused on hospitals and health insurance markets, some research has been conducted on other sectors as well that includes varied approaches to defining market concentration in those sectors. Compared with hospitals and health insurance, there is relatively little empirical research supporting the measures of competition used in this body of literature. As vertical integration and care coordination across provider sectors becomes more common and more important in the financing and delivery of care, supporting the development of competition measures that reflect the unique nature of organizations like ACOs will be valuable in understanding the market-based effects and assessing outcomes related to these initiatives.



# **Impact of Health Insurance and Hospital Market**

## **Concentration**

Understanding the level of competition in hospital and health insurance markets is important because competition theoretically has the potential to affect both price and non-price aspects of health care and consequently consumer welfare. The following literature review assesses whether the theoretical relationship between competition and prices and quality has been detected in empirical studies of the real world.

### **Effects on Prices: Hospitals**

The recent literature (since 2000) on the association between hospital competition and prices has largely found a positive association between more concentrated hospital markets and higher prices. There is some indication this association grew more attenuated in the era of the managed care backlash, when health plans felt pressure to include a wider array of providers in their networks and the bargaining position of hospitals increases vis a vis health plans. Many reduced-form (also referred to as structure-conduct-performance) studies of hospital concentration are based on California, a state which has both a long history of managed care and data that facilitate empirical analyses, though several recent studies have moved to national data sources.

Burgess and colleagues used California inpatient hospital data for 1994-1998 to create hospital network-level weighted average zip code HHIs, finding that hospital system HHI is positively correlated with the average net private revenue per private discharge (Burgess, Carey, & Young, 2005). Zwanziger and Mooney studied the effect

of hospital pricing deregulation in New York state in 1997 and found a positive, significant relationship between the hospital system HHI (based on the weighted zip-code average HHI) and HMO payments per risk-adjusted discharge after the reform (Zwanziger & Mooney, 2005). Another study based on California inpatient data by Melnick and Keeler found the hospital-system level HHI was positively associated with growth in private net revenue per private discharge, and hospitals in large systems were able to grow prices more than comparable small-system hospitals relative to non-system hospitals from 1999 to 2003 (34% vs. 17%) (Melnick & Keeler, 2007). Using data from Florida and California, Dranove and colleagues found that the association between concentration and price increased in the 1990s during the growth of managed care and leveled off during the 2000s during the managed care backlash (Dranove, Lindrooth, White, & Zwanziger, 2008). This study constructed hospital system HHIs based on actual and predicted patient flow data, and employed OLS and IV regression methods to estimate the association between hospital concentration, managed care price shopping sensitivity (measured as a dichotomous version of managed care penetration), and price (measured as the weighted average net revenue per discharge for 10 DRGs). Antwi and colleagues used inpatient data from California to develop county-level HHIs on the average net revenue per discharge. This study found that private pay prices were nearly twice as high in 2006 as in 1999, with the highest growth in monopoly markets. However, the greatest changes in prices were not geographically correlated with the highest changes in hospital concentration (Akosa Antwi, Gaynor, & Vogt, 2009).

In a national study examining the anti-competitive effect of hospital closures on rival hospitals in urban areas, Wu found that hospitals experiencing the closure of a rival located within 5 miles were able to extract greater price growth than other rivals located further away within the same market over 1990-2002 (Wu, 2008). Wu defines price as the average private net revenue per private admission, estimated from CMS Medicare Cost Reports. Wu employs data at a range of market levels to address different methodological concerns. To control for very local hospital concentration changes that may affect treatment and control groups differently, Wu includes the initial HSA-level HHI in the model. However, she uses the HRR to define hospitals within the same market and includes HRR fixed effects, based on the theory that hospital prices are defined by both hospital and health insurance market structure, and health plans would have broader markets for purchasing hospital services. Wu also includes two measures of health plan market structure, the HMO penetration and MSA-level HMO HHI, to control for potential differential effects of insurance market structure on treatment and control groups.

Studies of hospital mergers also provide evidence about the impact of hospital market structure on prices. On the whole, studies of hospital mergers find higher prices at merging hospitals relative to non-merging hospitals, though the magnitude of this effect differs across hospitals and settings. These studies tend to use a difference-in-differences approach, examining the effect of the merger on prices for hospitals involved in the merger relative to the prices or trend in prices for non-merging hospitals. Several studies have used aggregated price data at the state or national level to examine the effect

of mergers on prices, finding a positive association between mergers and prices (Sacher & Vitu, 2001), (Krishnan, 2001). Other studies have used insurance claims as the basis for prices. Capps and Dranove studied the effects of 12 mergers, deriving prices from insurance claims paid for inpatient services in 1997-2001. This study found that nine of the mergers experienced price increases that were greater than the median increase (Capps & Dranove, Hospital consolidation and negotiated PPO prices, 2004). Haas-Wilson and Garmon also use insurer claims from 1997 to 2003 to estimate the effect of two mergers in the Chicago area, finding that one merged hospital had prices about 20% higher than non-merger hospitals (Haas-Wilson & Garmon, 2011). A similar study examined the effect of mergers in the San Francisco area. One challenge with this approach is the tension between selecting proximal control hospitals that experience the same demand and shocks as the merging hospitals and selecting hospitals further away that are unlikely to have their own prices directly affected by the merger but less likely to experience the same external factors. Using an instrumental variables approach to address potential endogeneity of hospitals selecting into mergers, Dafny found that prices at merging hospitals were 40% higher than at non-merging hospitals (Dafny, Estimation and identification of merger effects: An application to hospital mergers., 2009). Thus, in both reduced-form studies and in examinations of hospital mergers, increased hospital concentration is associated with higher prices.

In recent years, economists have turned to nascent methods of structural and semi-structural models to estimate the effect of concentration on prices. The structural approach involves estimating economic primitives according to a specific economic

model that can then be used to predict outcomes. Semi-structural approaches estimate some of the economic primitives but do not impose a specific economic model on the estimation process. As a result, semi-structural approaches are somewhat less susceptible to potential bias from model misspecification in the fully structural approaches. At the same time, the additional flexibility of semi-structural approaches can lead to primitive parameter estimates that could vary with costs, demand, or market structure. An early example of a semi-structural approach is outlined in a study by Capps and colleagues in which the authors estimated a “willingness to pay” parameter that represents the value each hospital brings to a health plan’s provider network (Capps, Dranove, & Satterthwaite, 2003). The willingness to pay value is estimated from patient discharge data as a function of patient demographics, zip code, diagnosis, and the hospital to which the patient was admitted. Capps and colleagues then model the price effect of the merger as a function of the change in willingness to pay or bargaining leverage. In their study, Capps and colleagues found a positive association between willingness to pay and hospital profits. A similar approach is used by Lewis and Pflum, who find that hospital’s willingness to pay is correlated with market power and that hospitals in systems operating in multiple markets have greater bargaining power (Lewis & Pflum, 2011). Ho estimates the parameters of a hospital’s profit function based on consumer preferences about MCO characteristics, including the plan’s provider network, and the health plan’s realized provider network (Ho K. , 2009). This study found that hospitals in systems take a bigger share of the economic surplus as well as hospitals that are attractive to patients. Across a range of methodological approaches, increased concentration in hospital markets is

associated with higher prices. The magnitude of the associated differs, but the basic conclusion is largely consistent across studies.

### **Effects on Prices: Health Insurance**

Turning to health insurance, recent literature has generally found that increased concentration in health insurance markets leads to increased premiums. Studies have spanned various markets for health insurance coverage, including private employer-sponsored coverage, Medicare Advantage (formerly known as Medicare plus Choice), and Medigap, which is a supplemental policy Medicare beneficiaries can purchase to cover cost sharing and benefit gaps in traditional fee-for-service Medicare. In a study of private insurance plans at large employers spanning 1997-2005, Dafny evaluates the bargaining relationship between employers and insurers and postulates that insurers with greater market power will be able to extract more in premiums from more profitable employers as a form of direct price discrimination occurring in an imperfectly competitive market (Dafny, 2010). The findings from this study are consistent with this hypothesis—premiums do rise with employer profitability, and the market power of health plans to capture employer profitability decreases as the number of health plans in the market increases.

In a related study using the same dataset, Dafny and colleagues estimate the association between health insurance market concentration (based on the HHI) and growth in employers' health premiums, controlling for factors that could affect medical spending or administrative costs (Dafny, Duggan, & Ramanarayanan, 2011). In a traditional OLS regression, the study did not find an association between the HHI and

premium growth. However, after using an instrumental variables approach to address potential endogeneity of the HHI, the association between market concentration and premium growth was stronger. The study also examines the relationship between insurance concentration and provider wages, finding that higher concentration is associated with lower wages for physicians and slightly higher wages for nurses.

An alternative approach used by Dranove and colleagues estimates the ratio of the population necessary to support a given number of HMOs in a market to the population necessary to support one additional HMO (Dranove, Gron, & Mazzeo, 2003). The authors base their model on the theory that a ratio greater than 1 (meaning a greater population is necessary to support the additional firm) indicates decreasing profitability. National and local HMOs may appeal to different purchasers within the market, and Dranove and colleagues estimate the model for all HMOs together as well as various combinations of national and local HMOs. Their findings suggest that national and local HMOs do not compete with one another, but additional HMOs of the same type reduces insurer profitability.

In the Medigap insurance market, plan benefit packages are standardized according to National Association of Insurance Commissioners (NAIC) standards. Despite this standardization, Maestas and colleagues found substantial variation in prices (Maestas, Schroeder, & Goldman, 2009). This study uses a search cost model and found that insurers experience variation in costs, and therefore loading fees, that contributes to the variation in premiums. This price variation was consistent with findings by Sheingold and colleagues, which also documented substantial variation in average

monthly premiums for Medigap plans C and F (Sheingold, Shartzter, & Ly, 2010). Medigap premiums were more strongly associated with average state Medicare spending per beneficiary (reflecting expected medical expenditures), plan size, and policy characteristics such as rating strategy than concentration. However, Medigap monthly premiums were significantly higher with increasing market concentration for Medigap Plan C, accounting for about 15% of Medigap enrollment in 2010. A study by Starc also found substantial price variation in Medigap, a highly concentrated market, and a greater association between market power and prices (Starc, 2010). Using the two-firm concentration ratio as the primary measure of concentration, this study found that a one percent increase in the ratio was associated with a 0.26 percent increase in premiums. Starc models both adverse selection and market power, finding evidence of both and an interesting interrelationship between the two. In order to keep policies attractive to lower risk individuals in an environment of adverse selection, insurers add a smaller market over marginal costs to policies than they normally would under monopoly, reducing the effects.

Lustig also models adverse selection and market power, though he focuses on insurer behavior in the Medicare plus Choice (M+C, now called Medicare Advantage) market (Lustig, 2010). Comparing the social welfare if no adverse selection were present to the welfare observed in the data, Lustig estimates models for markets with increasing numbers of M+C firms. He finds that the welfare loss due to adverse selection increases with increasing numbers of firms. For example, eliminating adverse selection accounts for 17% of the welfare difference in a monopoly but about 35% when there are two firms



and 50% when there are six or more firms. The lack of competition accounts for a greater share of the welfare loss in more concentrated markets. Thus, across several health insurance sectors and various methodological approaches, there is a consistent finding that increased concentration is associated with higher premiums and increased insurer profitability.

A small number of studies have examined the impact of increased health insurance concentration relative to hospital concentration. In one early study, Feldman and Wholey examine HMOs from 1985 to 1997 and the association between one HMO's importance as a purchaser of hospital services (as defined above) on hospital output and price (Feldman & Wholey, 2001). This study finds that increased HMO buying power is associated with lower hospital costs and increased output. Another more recent study by Bates and Santerre includes PPOs and more recent data, using an instrumental variables approach to find evidence that increased insurance concentration is not associated with monopsony power, characterized by a fall in hospital output, and they find some evidence to suggest that metropolitan hospitals offer increased services when health insurance concentration increases (Bates & Santerre, 2008). In another national study with data from 2001-2003, Moriya and colleagues estimated the relationship between the state-level insurance HHI and Health Service Area (HSA) hospital system-level market HHI (based on staffed hospital beds) and transaction price, measured as DRG-adjusted payments per inpatient admission. This study found that increased insurer concentration is negatively associated with hospital prices while increased hospital concentration is not associated with higher prices (Moriya, Vogt, & Gaynor, 2010). All three of these studies

suggest that increased insurance concentration has a countervailing effect on hospital prices.

### **Effects on Quality: Hospitals**

In addition to competing on price, hospitals—particularly in settings with administratively-set prices such as Medicare—may compete on non-price factors including quality. A number of studies have been conducted assessing the impact of competition on quality in Medicare, which may reflect both the theoretical appeal of a regulated-price environment and the greater availability of data allowing for quality measurement. These studies typically adopt a conceptual framework of structure-conduct-performance in keeping with Donabedian’s quality framework (Donabedian, 1965), in which the market and institutional structure affects firm conduct, which in turn affect industry performance

While the research on the effect of hospital competition and price is generally consistent in demonstrating that increased competition lowers hospital prices, the findings from Medicare studies examining the relationship to quality have been more mixed. In some cases, increased competition increases quality and in others quality is unaffected or decreased. For example, Kessler and McClellan (2000), find that increased hospital concentration reduces quality. In one of the earlier studies on this topic, Kessler and McClellan examine risk-adjusted one year AMI mortality, using instruments for the hospital HHI with market shares based on patient zip code distance from the hospital. The probability of 1-year mortality increased by about 4 percent for beneficiaries in the most concentrated hospital markets relative to the least concentrated markets.

In contrast, several studies have found that hospital competition has no effect on quality or even that quality is worse in more competitive hospital markets. Gowrisankaran and Town (2003) study the effects of competition on AMI and pneumonia mortality in Los Angeles County and also use a measure of hospital competition based on patient distance similar to that in Kessler and McClellan. In this case, the researchers develop hospital-specific HHIs for Medicare, HMOs, and other payers and find that mortality is higher for Medicare beneficiaries in more competitive Medicare hospital markets. More recently, Maeda and Lo Sasso examined the relationship between competition (measured as the HRR-level HHI based on the share of heart failure patients at each hospital) and short- and long-term mortality from heart failure (Maeda & Lo Sasso, 2012). This study found no significant association between hospital competition and performance measures or mortality. In an analysis that included hospital competition as well as HMO penetration and competition, Mukamel and colleagues similarly found no association between hospital competition and risk-adjusted mortality (Mukamel, Zwanziger, & Tomaszewski, 2001).

Though the theoretical relationship between competition and quality is less clear in environments where the market determines prices (Gaynor M. , 2006), several studies have been conducted that adopt the SCP model or evaluated the effects of mergers or price deregulation. As with the literature in the Medicare domain, the findings regarding the relationship of competition and quality are inconsistent in the studies based on the private market with some studies concluding that competition has no effect on or decreases quality (Encinosa & Bernard, 2005) (Ho & Hamilton, 2000), (Capps C. , 2005)

or quality increases (Sohn & Rathouz, 2003), (Rogowski, Jain, & Escarce, 2007). However, these studies tend to focus on one or a small number of states. The two exceptions are national studies by Howard (2005) and Abraham and colleagues (2007), both of which find a small increase in quality associated with more competitive markets. Mutter and colleagues (Mutter, Romano, & Wong, 2011) study the effects of mergers in 16 states on 25 patient quality or patient safety indicators, finding heterogeneous effects on quality based on the merger and quality indicator analyzed. While there was a consistent finding regarding the effect of hospital concentration on prices, the review of the studies above suggests that the effect on quality is more heterogeneous and may depend on the quality outcome assessed.

### **Effects on Quality: Health Insurance**

Relatively fewer studies have been conducted on the impact of health insurance concentration or market structure on quality. Building upon their two previous studies examining HMO competition and quality (Scanlon, Swaminathan, Chernew, Bost, & Shevock, 2005), (Scanlon D. , Swaminathan, Chernew, & Lee, 2006) that found no association between insurance competition and quality, Scanlon and colleagues improve upon their methods by using market fixed effects along with plan-level data from the National Committee for Quality Assurance (NCQA) reporting Healthcare Effectiveness Data and Information Set (HEDIS) and Consumer Assessment of Health Plans (CAHPS) measures (Scanlon D. , Swaminathan, Lee, & Chernew, 2008). This study is a reduced-form approach that used Interstudy data to create MSA-level HHIs for the commercially insured HMO population, with enrollment aggregated to the MCO level when applicable,

as well as the number of HMOs in the market. After including MSA-level fixed effects to control for time-invariant unobservable factors that may be associated with quality, this study found that increased HMO competition is not associated with improved quality.

However, another study examining competition in Medicaid managed care (MMC) in three states did find higher rates of inpatient pediatric adverse events with decreased competition (Smith, Cheung, Owens, Wilson, & Simpson, 2007). This study includes a measure of hospital market concentration, defined as the hospital-level weighted average of patient zip code HHIs. The researchers developed an index of MMC concentration based on the county-level HHI as well as the proportion of Medicaid discharges occurring at that hospital. The researchers then dichotomize these indices into dummy variables based on whether the HHI falls above or below 1,800. In the model that includes state and year fixed effects, the odds of a pediatric safety event was about 60% higher in concentrated Medicaid markets relative to competitive markets. After including county-year dummy variables, the MMC concentration was significant only at the 10% level, though the interaction of hospital and MMC market concentration continued to be significant at the 5% level.

In another state-specific study focused on MMC, Millet and colleagues examine beneficiaries living in counties with a choice in MMC plans have higher rates of ambulatory care-sensitive hospital admissions (Millet, Chattopadhyay, & Bindman, 2010). The study found that beneficiaries with a choice in plans had 6.58 ambulatory care-sensitive admissions per 1,000 compared with 6.27 for beneficiaries with no choice

in plans. The authors suggest this “unhealthy effect” of competition largely reflects delayed enrollment in MMC plans associated with plan choice; nearly 95% of beneficiaries with no choice in plans had 12 months of continuous enrollment, compared with 79.2% for beneficiaries with a choice in plans.

In summary, the national studies of the association between health insurance competition and quality suggest there is no statistically significant association between concentration and quality. One state study found higher rates of adverse events with decreased competition, and another state-specific study defining competition as beneficiary choice in MMC plans found a negative association between competition and quality. On the balance, then, it appears that health insurance competition does not have an established, statistically significant association with quality as measured by the studies.

## **Discussion**

Consistent with published findings, the approach in this study found that hospital and health insurance markets (both Medicaid Managed Care and private insurance markets) are concentrated. The average state-level HHI in Medicaid managed care has remained above 3,600 since 2003, MSA-level total commercial HHI has remained above 2,900 since 2005, and the HRR-level hospital HHI has remained above 2,875 since 2003. The findings do not suggest large changes in the relative balance of insurer to hospital market concentration in the previous decade at the national level. In general, there was high correlation among the measures created using different analytic choices regarding market definition. However, some decision points such as the geographic area or

measures based on Medicaid enrollment and discharges stand out as having a greater impact on measured market concentration. Thus, analysts interested in concentration in safety net services would be well-served to use one of the Medicaid-based HHIs, whereas analysts searching for a more general measure of hospital concentration should avoid Medicaid-based measures given the potentially different conclusions about market concentration that may result. As always, the researcher should be careful to use a measure of competition that is appropriate for the analytic question at hand, matching the market definition to the scope of the analytic question and understanding the needs of the intended audience. The best measure for a broad assessment of hospital concentration may be quite different than the ideal measure for a more targeted analysis focusing on the effects of concentration in cataracts surgery on vision outcomes. Similarly, policymakers should understand the implications of tracking concentration or implementing policy to address issues based on a particular measure of concentration, including a familiarity with what the measure does and does not describe in terms of market structure and the strengths and limitations of various measures. The longitudinal trends in these measures was also consistent, and so methods that draw upon longitudinal variation are likely to be as affected by the choice in measure than methods that rely on cross-sectional variation.

While this paper attempts to compare many different approaches to measuring market competition in hospitals and health insurance, data limitations prevented us from empirically comparing every approach discussed or used in the literature. As such, this study cannot determine whether the measured level of market concentration based on those measures is consistent with or different from the measures included in this study.

The review of studies assessing the impact of competition in hospital and insurance markets finds great consistency among the literature addressing hospital competition and price. These studies, using a variety of measures of hospital concentration, find that more concentrated hospital markets are associated with higher prices. The literature was less consistent regarding the impact of hospital competition on quality, with some studies reporting a negative effect of increased concentration on quality and some finding a positive association. This could reflect the more diverse array of outcomes and conditions assessed in quality studies compared with price, which was defined largely as either the net revenue per discharge or inpatient prices from claims data. As suggested by Gaynor (2006), the association between competition and price may be tighter than that for quality, and failure to account for possible confounding variables or sources of bias could consequently have a greater impact on studies with quality as the outcome. The studies of health insurance competition also generally find increased prices associated with increased health insurance concentration; the few studies of health insurance competition and quality have found no significant association between competition and quality. The studies that have carefully examined the relative concentration of health insurance and hospital markets through health plan buying power or leverage have demonstrated a “monopoly busting” relationship such that prices are lower and output higher with increased health plan market power relative to hospitals compared to less concentrated health insurance markets.

The Affordable Care Act seeks to make changes in both health insurance and delivery system that will improve quality of care and reduce costs. As the research



community evaluates the effectiveness of these initiatives, it is important to include an assessment of the effects on market concentration and to gain an improved understanding of the function of new markets such as insurance marketplaces and ACOs. Researchers should explore new measures of concentration for these more integrated markets and pursue evidence to substantiate these measures and also to assess the impact of integrated competition on health outcomes.

# **Paper 2: Health Insurance Competition and Its Impact on Consumer Access and Satisfaction**

## **Abstract**

Increased competition is often discussed as a tool for improving shortcomings in the current US health care system. While research finds that the level of market competition is associated with health care prices, the effect on consumers' access to care and satisfaction is largely unexplored. This study uses measures of competition in health insurance and hospital markets and consumer-reported information from the Medical Expenditure Panel Survey from 2003-2009 to assess the impact of health insurance and hospital competition and the balance of the two on consumer's experiences in Medicaid managed care (MMC) and private insurance. On average, health insurance markets were concentrated during this time—the average Herfindahl Hirschman Index (HHI) at the state level for MMC was 5991 (SD 2703) in 2003 and 4385 (SD 1970) in 2009. The average MSA-level private market HHI was 2842 (1595) in 2005 and 2784 (1509) in 2009. Controlling for individual and market-level characteristics that could influence access to care and consumer satisfaction with their health plan, this study found that the level of competition in a market is largely an insignificant factor in consumers' experiences. However, the number of MCOs was a statistically significant positive predictor of overall health plan satisfaction (0.005,  $p \leq 0.00$ ) as was the ratio of the private HHI to hospital HHI (0.67,  $p < 0.007$ ) after including MSA fixed effects. Privately insured respondents were slightly more likely to have a usual source of care in

MSAs where the relative insurance concentration was higher (OR 1.058, p. 0.068), other factors held constant. An imbalance in the relative concentration of insurance and hospital markets was also associated with delaying or not getting care; privately insured individuals were more likely to delay or not get care in MSAs where the health insurance market was competitive and the hospital market concentrated relative to MSAs competitive in both markets (1.218,  $p < 0.039$ ), with a smaller and less significant effect when the hospital market was competitive and the insurance market concentrated. These results suggest that the effect of increased competition in health care markets on consumers' access to care and health plan satisfaction is moderate at best; while policies to increase competition in health care may be warranted, this study indicates these policies are not likely to have a significant impact on consumers' experiences with their health plan.

## **Introduction**

The health insurance industry has experienced consolidation among insurers—large firms have acquired smaller plans and merged with other large firms (Robinson 2004) (Kirchoff, 2013). The hospital industry has also experienced consolidation in recent years, resulting in increased costs and potential reductions in quality (Vogt, Town, & Williams, 2006). The American Medical Association (AMA) publishes an annual report on concentration in the health insurance industry and concluded the majority of metropolitan markets like Atlanta or Denver are highly concentrated and dominated by one or two insurers. In nearly half (38%) of metropolitan areas, one insurer had a market share of 50% or more (American Medical Association, 2012). The two largest health

insurers (Wellpoint and United) controlled 36% of the commercial market nationwide, or 67 million covered lives.

While a robust body of literature has demonstrated that increased hospital and insurance concentration is associated with higher prices and premiums, (Moriya, Vogt, & Gaynor, 2010; Frakt, 2010) (Gaynor & Town, 2012), there is little information on how competition impacts the consumer in other ways—namely, consumers’ perceptions about health quality and access. This study adds to the body of research by examining the impact of health insurance competition and insurers’ relative bargaining power with hospitals on consumers’ perceptions of quality, focusing on access to care and satisfaction with their health plan. This study examines both the private insurance and the Medicaid markets, providing the opportunity to determine if market concentration has similar effects across these markets.

Though research on insurance competition has largely focused on private HMOs, the share of Americans who receive public coverage through Medicaid managed care (MMC) contracts is significant and growing. In 2008, 71% of Medicaid beneficiaries were enrolled in managed care (Kaiser Family Foundation, 2010). With its very low consumer cost sharing requirements and limited consumer premiums, the Medicaid program provides an opportunity to examine the impact of concentration on consumers’ perceived quality and access while removing the effect of prices on consumer plan choices.

Competition in the health insurance industry remains a key policy issue through the implementation of the Patient Protection and Affordability Act of 2010 (ACA). Millions of individuals are expected to gain Medicaid coverage in 2014, and a large proportion of them will likely enroll in managed care. Further, regulators are charged with determining requirements for plans participating in the health insurance exchange and certifying compliance. In addition, federal and state regulators have some influence over the number of plans participating in the exchange. This study provides information to guide discussion about the appropriate level of competition, particularly as it relates to the impact on consumers.

This study focuses on the impact of market structure on consumer experiences in two different insurance markets, MMC and private group health insurance. Following upon previous work describing the level of competition in MMC and private insurance markets as well as the relationship to hospital market concentration at the local level (Shartzler, 2013), this study seeks to answer the following research questions: what is the impact of health insurance concentration and the relative concentration of insurance and hospital markets on consumers' reported access to care and experience with their health plan?

According to economic theory, price competition in health care is desirable because it can lead to lower costs for consumers, creating broader access to services and products. Non-price competition can lead to improved quality and enhanced innovation (U.S. Department of Justice and Federal Trade Commission, 2004). As markets become more monopolistic, consumer welfare is compromised because the monopolist can charge higher prices and reap more profit than under competitive market dynamics. Health

insurers are both sellers of insurance as well as purchasers of medical services from hospitals, doctors, and other health providers, and so according to theory concentrated insurance markets can raise both monopolistic and monopsonistic concerns. Research has found that insurers in more concentrated markets can extract greater profits from employers and charge higher premiums (Dafny, 2010), (Dafny, Duggan, & Ramanarayanan, 2011).

The hospital industry has also grown more concentrated over time, raising independent concerns about the impact on costs and quality (Vogt, Town, & Williams, 2006). Hospital costs represent about a third of every dollar spent on personal health care in 2009 (Martin, 2011), making the negotiation between insurers and hospitals an important determinant of the overall premium. Looking at the balance of power between insurers and hospitals in this negotiation, concentration in the health insurance market could have the “monopoly busting” effect of eliciting lower prices or higher quality from hospitals. Research has shown that the “monopoly busting” effect exists for prices such that output is higher and prices lower in areas with more concentrated health insurance markets relative to hospital markets, but the research has not examined whether this holds true for quality (Bates & Santerre, 2008; Moriya, Vogt, & Gaynor, 2010).

The association between competition in insurance markets and the impact on the consumer has also largely focused on prices rather than quality. These studies have generally found there to be a positive association between the level of consolidation in the health insurance market and prices, in terms of profit, premiums, and growth in premiums. For example, Dafny and colleagues estimated insurance premiums rose 7

percentage points in a typical market from 1998 to 2006 due to the rise in insurance concentration (Dafny, Duggan, & Ramanarayanan, 2011). In theory, health insurers can maximize profit by increasing revenue through prices or by constraining spending on its costs such as medical claims or plan administration. Quality, like price, could be influenced by market characteristics because quality is also “an endogenous outcome of the competitive process” (Scanlon 2008). In markets where prices are regulated (such as in Medicaid), insurers may compete primarily on quality in order to gain or maintain market share whereas when prices are not determined, insurers could compete both on price and quality (Gaynor, 2006).

Consumers experience the “benefits” of a health plan in several ways—the medical benefits of covered services, cost sharing requirements, the extent and quality of provider networks for covered services, as well as the quality of the health plan’s customer service. Research suggests that an individual’s enrollment choice among available health plans is shaped by both insurance characteristics (premiums, out-of-pocket costs, and extent of covered benefits) and delivery system characteristics (Berki & Ashcraft, 1980). Available plans are generally determined by employers or state Medicaid offices, but some with non-group coverage purchase plans directly in the marketplace. Consumers use multidimensional evaluative criteria of cost, freedom, access, and quality to choose plans (Thomas, 2004). Thus, insurers can modify internal characteristics like premiums, cost-sharing, and customer service (reflecting cost and quality) as well as the restrictiveness, quality, and accessibility of their contracted network. Theoretically, the level of market competition determines the ability of insurers to alter the benefits of

plans; in concentrated markets, insurers could offer higher cost plans with more restrictive networks, lower quality, and reduced access while maintaining market share.

One pioneering study examined the relationship between competition and quality using plan-level outcome and control variables in a fixed effects model (Scanlon, Swaminathan, Lee, & Chernew, 2008). This study assessed a plan's mean HEDIS and CAHPS scores, including the plan's mean CAHPS health plan rating as a function of health plan ownership and other plan and market traits. This analysis found no significant association between quality and health insurance competition. However, another study examining competition in Medicaid managed care in three states found higher rates of pediatric adverse events with decreased competition (Smith, Cheung, Owens, Wilson, & Simpson, 2007). These early studies do not provide a clear consensus about the effect of insurance concentration on quality. In an effort to further explore this relationship, this national study uses a model that includes individual characteristics such as age and health status to control for relevant factors that are correlated with market structure or access and satisfaction and are not included in the plan-level model used by Scanlon and colleagues.

This study features a distinct analysis within the Medicaid program, which provides an opportunity to examine the impact of competition and bargaining power while consumer premiums and cost sharing relatively constant across individuals because both are extremely limited in MMC. In effect, the analysis in Medicaid filters out the role of premiums in the self-reported quality and access measures. Further, this study uses recent, nationally representative data that includes PPOs over several years, enhancing



the generalizability and validity of the research findings beyond previous studies that only include measures of HMO competition. This study also explicitly examines the issue of insurer-hospital bargaining power and its impact on consumer-reported quality and access, whereas previous research in this area has focused on price.

## **Methods**

This study uses a quasi-experimental design to assess the impact of market structure on consumer experiences with health plans, taking advantage of changes in health insurance and hospital market structure over time within areas to identify the impact on the consumer. With multiple years of data, this study employs a longitudinal analysis of cross-sectional data with multivariate statistical regressions.

### **Market Concentration Measures**

This study included individual and market-level variables from several data sources and developed market concentration measures specific to private insurance, Medicaid, and hospitals using the geographic area most appropriate for each. The primary data source for health insurance competition was HealthLeaders-Interstudy (HLI) data. This source contained plan-level enrollment information at the county level for managed Medicaid and Medicare, HMOs, PPOs, and POS plans and reports enrollment separately for self-insured and fully-insured plans, however only HMO, Medicare, and Medicaid enrollment were reported in 2003 and 2004 with other types added in subsequent years. In addition to insurance market HHIs, we calculate managed care penetration rates using the HLI data. We created product-specific HHIs (i.e. PPOs only) as well as market wide analyses (aggregated HMO, PPO, managed Medicare, etc)

by managed care organization (MCO), for each MSA for the commercially insured population. The HLI data is used by the health insurance industry and researchers as a reliable measure of enrollment across plans; 93% of published studies using the HHI to examine the impact of health insurance competition use Interstudy data (Baker, 2001; Scanlon, Chernew, Swaminathan, & Lee, 2006).

The National Summary of State Medicaid Managed Care Programs from CMS supplemented the Medicaid enrollment data from HLI. This data source was added to ensure adequate representation of Medicaid-only MCOs in the analysis (Herring & Adams, 2011). The CMS source provides information at the plan level—whether the plan operates statewide or in specific counties, its total enrollment, and the type of plan (PCCM, MCO, prepaid inpatient health plan, or PHIP, etc). Markets in the Medicaid portion of this analysis were defined at the county level because states often vary the structure of MMC programs by county. Previous research on Medicaid managed care has used a county as the geographic unit (Coughlin, Long, & Graves, 2009), (Smith, Cheung, Owens, Wilson, & Simpson, 2007). To match the HLI county-level data, we apportioned total plan-level enrollment from CMS across its service area based on the county's share of the service area population in poverty.

We matched the resulting county-level MMC enrollment data from CMS to the HLI Medicaid data and removed CMS plans already present in the HLI data. County-level HHIs were created based on summing the squared market shares (based on enrollment in January of each year) of MMC plans. The number of MMC plans in each county was also tabulated. Next, these county-level HHIs and plan counts were

aggregated to the state level, weighted by the share of a state's MMC population residing in the county.

Using the HLI data, private market HHIs were created by summing county-level MCO enrollment to the MSAs level, aggregating plans operated by the same MCO when applicable. For example, we summed enrollment for all of Wellpoint's plans with members living in an area. Enrollment was summed by plan type and combinations of plan type: HMO only, PPO only, total commercial (HMO + PPO), and total lives (HMO, PPO, managed Medicare, and managed Medicaid). We create HHIs for commercial HMOs and total enrollment for 2003-2009, though the total enrollment in 2003 and 2004 does not include commercial PPOs; the HHIs for PPO-only, total commercial, and total private market share were created for 2005-2009 based on HLI reporting. Table 14 summarizes the plan types included in the private market measures each year. For all years, plans likely to be "rental networks" in which a provider network forms independently and is then contracted out to interested parties like smaller insurers were excluded because these products fall outside the traditional insurance-provider negotiating paradigm.

<b>Table 14: HLI Private Plan Enrollments Included in HHI by Year</b>				
	<b>HMO HHI</b>	<b>PPO HHI</b>	<b>Total Commercial HHI</b>	<b>Total Private HHI includes self-insured</b>
2003	Fully-insured Commercial HMO	<i>no separate PPO enrollment reported</i>		
2004	Fully-insured Commercial HMO			
2005	Fully-insured Commercial HMO	Fully-insured Commercial PPO	Fully-insured Commercial PPO + Commercial HMO	Fully-insured Commercial PPO + Commercial HMO + PPO self-insured
2006	Fully-insured Commercial HMO	Fully-insured Commercial PPO	Fully-insured Commercial PPO + Commercial HMO	Fully-insured Commercial PPO + Commercial HMO + PPO self-insured
2007	Fully-insured Commercial HMO	Fully-insured Commercial PPO	Fully-insured Commercial PPO + Commercial HMO	Fully-insured Commercial PPO + Commercial HMO + PPO self-insured
2008	Fully-insured Commercial HMO	Fully-insured Commercial PPO (with CHDP)	Fully-insured Commercial PPO + Commercial HMO + Fully-insured POS + CHDP <sup>2</sup>	Fully-insured Commercial PPO + Commercial HMO + POS fully-insured + PPO self-insured + POS self-insured
2009	Fully-insured Commercial HMO	Fully-insured Commercial PPO	Fully-insured Commercial PPO + Commercial HMO + Fully-insured POS <sup>2</sup>	Fully-insured Commercial PPO + Commercial HMO + POS fully-insured + PPO self-insured + POS self-insured
NOTES				
1 Replaced two hmos with negative enrollment with zero enrollment				
2 CDHP enrollment in January 2008 was allocated to PPO SI and FI based on the FI/SI split from July 2008				

The measure of hospital market concentration was a Hospital Referral Region (HRR)-level HHI, developed using American Hospital Association (AHA) Annual Survey data for 2003-2009. The AHA’s Health Forum administers the annual survey for the purpose of “collecting utilization, financial, and personnel information from each of the nation’s hospitals.”<sup>7</sup> The AHA sends the survey to registered hospitals, which

<sup>7</sup> American Hospital Association Annual Survey Database 2010 Estimation Document, <http://www.ahadata.com/ahadata/html/AHASurvey.html>

comprise 98% of the 6,500 hospitals in the survey universe; non-registered hospitals are identified through state and local hospital associations, the Centers for Medicare and Medicaid Services, and other national organizations and governmental bodies. The overall response rate for the Annual Survey was approximately 85% of the 6,500 hospitals in the survey universe each year. Hospitals report data for their fiscal year, generally a 365-day period, primarily through an online portal. Data was analyzed for the hospital fiscal year as reported in the AHA survey.

Based upon our research assessing various approaches to defining competition in hospital markets, this study included general acute care hospitals as well as specialty hospitals that are likely to compete with general hospitals and in some cases provide more services than general hospitals in their field of specialization (Government Accountability Office, 2003). The hospital types included: surgical; cancer; heart; obstetrics and gynecology; eye, ear, nose and throat; rehabilitation; orthopedic; chronic disease; other specialty; and children's general hospitals. These hospitals represent about 89% of short term hospitals in the 50 states and DC each year. We excluded hospitals located in US territories, long-term hospitals, and hospitals of other service categories like children's specialty hospitals.<sup>8</sup>

We used a "chain-adjusted" Herfindahl-Hirschman Index (HHI) as a measure of market concentration (Robinson J. , 2011). We took into account hospitals that are members of the same health care system within the same geographic area that are likely

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<sup>8</sup> The AHA identifies long-term hospitals as 1) hospitals reporting a separate long-term unit and whose long-term unit admissions are greater than the short-term admissions or 2) a hospital that does not report a separate long-term unit but whose average ratio of inpatient days to admissions is 30 or more.

to negotiate jointly with insurance companies. Hospitals that are members of multi-hospital systems are able to charge higher prices than non-system members, exerting greater bargaining power with insurers (Melnick G. K., 2007). Roughly 55% of hospitals are members of a multi-hospital health care system each year, though these systems may be spread out over multiple geographic markets. A geographic unit (hospital referral regions) determines market boundaries. We imputed Hospital Referral Regions (HRR) for hospitals missing this data in the AHA Database using a zip code-HRR crosswalk from the Dartmouth Atlas.<sup>9</sup>

The number of total Medicare discharges served as the basis for calculating hospital market share in this study. Researchers have also used staffed beds and total discharges to calculate the hospital market Herfindahl-Hirschman Index (Keeler, 1999). Fee-for-service Medicare beneficiaries have the freedom to choose health care providers and hospitals, and so utilization based on Medicare beneficiaries is unrelated to network contracts private insurers negotiate with hospitals and is thus exogenous to private health plan competition. Discharges are preferable to staffed beds and inpatient days, which respectively reflect capacity rather than true utilization and exaggerate the market share of hospitals with sicker patients and longer average stays. While the AHA annual survey does include measures of outpatient hospital utilization, we followed the practice of the Federal Trade Commission in its evaluation of hospital mergers and focused on inpatient acute care.<sup>10</sup> For verification, we created HHIs based upon multiple measures and

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<sup>9</sup> Dartmouth Atlas zip code crosswalks, 2002-2010, <http://www.dartmouthatlas.org/tools/downloads.aspx>

<sup>10</sup> See, for example, Federal Trade Commission administrative complaint “In the Matter of Inova Health System and Prince William Health System”, Docket 9326. <http://www.ftc.gov/os/adjpro/d9326/080509admincomplaint.pdf>

examined the consistency of conclusions about hospital market concentration based on the different iterations of the HHI.

This analysis included a measure of the relative concentration of insurance markets to hospital markets, measured by the ratio of insurance to hospital HHIs. In order to have a common geographic unit and capture the insurance environment experienced by hospitals, we apportioned the county-level insurance enrollment data to HRRs using another crosswalk from Dartmouth. We constructed the ratios at the HRR level and then weighted the ratios as well as the hospital HHIs back to states or MSAs using the county-HRR crosswalk to be consistent with other variables in the analysis. Finally, we categorized areas into four groups based on the competitiveness (defined as an HHI < 2500 following FTC guidelines for a highly concentrated market) of their insurance and hospital markets as depicted in Figure 3 below: hospital and insurance markets are both competitive, competitive hospital and concentrated insurance market, concentrated hospital and competitive insurance markets, and both markets concentrated.

**Figure 3: Joint Categorization of Markets based on Insurance and Hospital Concentration**

	Competitive Hospital Market (HHI ≤2500)	Concentrated Hospital Market (HHI >2500)
Competitive Insurance Market	Type 1	Type 3
Concentrated Insurance Market	Type 2	Type 4

**Local Area Characteristics**

For the MMC analysis, the CMS managed care data was used to develop control variables reflecting the MMC environment in each county—indicators for mandatory

MMC enrollment for parents and children, the length in months of plan lock-in, availability of primary care case management (PCCM) as an alternative to enrollment in an MCO, and whether the state operated multiple MMC waivers. Additional market-level control variables for this analysis were drawn from the Area Resource File (ARF), a collection of county-level statistics compiled by the Health Resources and Services Administration (HRSA). The ARF has a range of demographic, health insurance market, and geographic characteristics. Multiple years of the ARF were used to provide control variables through the study period.

The local area characteristics from the ARF included to control for regional factors that could influence access and satisfaction based on the availability of providers and local utilization patterns, are median household income, hospital admissions per 10,000, total doctors per 10,000, total specialists per 10,000, the percentage of hospitals that are for profit, and the number of FQHCs per 100,000 people. We selected these factors based on the Andersen-Aday model of access to care (Aday & Andersen, 1974). We summed the county-level data from the ARF to the state or MSA, weighting by the county population. To control for plan premiums and generosity, we used the MSA average premium for family coverage from the Kaiser/HRET annual survey of employer health benefits in the private market analysis and the state average Medicaid payments per adult in the MMC analysis.

### **Access to Care and Health Plan Satisfaction**

Dependent variables measuring consumers' reported access to care and experience with health plans in both analyses came from the Medical Expenditure Panel



Survey (MEPS) Household Component, which is overseen by the Agency for Healthcare Research and Quality (AHRQ). The MEPS is a nationally-representative household survey of a subsample of households who participate in the National Health Interview Survey. The satisfaction with plans supplement and the access to care supplement are administered in the second and fourth rounds of the MEPS, and question wording is based on the Consumer Assessment of Healthcare Providers and Systems (CAHPS). For public plans, these and other relevant variables are located in the full-year consolidated data file; for private plans, these satisfaction with plans variables are located in the Person Round Plan (PRPL) file each year.

MEPS includes restricted-use geographic identifying variables that indicate the respondent's state and county of residence. The private market and Medicaid files containing independent and control variables were merged to the MEPS by state for MMC and MSA for the private market analysis. In the years 2003-2009, MEPS surveyed about 32,000 individuals on average. MEPS respondents eligible for inclusion in the Medicaid sample were enrolled in Medicaid HMO coverage at the time the supplements were administered in rounds 2 or 4 and did not have private coverage at that time. The private market sample includes all individuals with employer or other group coverage in rounds 2 or 4 who did not have Medigap insurance, were eligible for the satisfaction questions because someone in the household was covered by the plan at the time of the interview, and were a member of the household during the round (for example, not stationed abroad). While the access questions reflect a specific person's experience, the CAHPS questions reflect the family's experience with the health plan covering the

policyholder. To address potential duplicate answers among family members, we created Medicaid and private market subsamples for the CAHPS questions including only the responses from the survey first respondent. Table 15 shows the sample sizes each year.

Year	MMC N	Private Market N
2003	3,168	16,816
2004	3,419	16,481
2005	3,503	16,388
2006	3,645	16,438
2007	3,058	15,161
2008	3,207	15,793
2009	3,928	16,953
<b>Total</b>	<b>23,928</b>	<b>114,030</b>

For the study of Medicaid managed care, the access and quality dimensions included reflect quality requirements for Medicaid MCOs set forth in the Balanced Budget Act of 1997. Through the CMS regulations released in accordance with this act, Medicaid MCOs are required to provide an ongoing source of care for enrollees, to consider the expected utilization of services, to provide timely access to services, and to consider the geographic location and accessibility of providers when developing networks (U.S. Government Accountability Office, 2004). The outcome measures in this analysis address the BBA '97 requirements: whether the respondent has a usual source of care (USOC), the time it takes to reach the USOC, the difficulty of reaching the USOC, delaying or not getting necessary care, and difficulty finding a doctor. Access measures are identical for the private market analysis. These measures are frequently used in

health services research as indicators of access and are among the measures included in AHRQ's annual National Healthcare Quality Report and National Healthcare Disparities Report.

We use the Consumer Assessment of Healthcare Providers and Systems Survey (CAHPS) questions in MEPS as measures of consumers' satisfaction with their health plan. There is a wealth of literature on the validity and measurement properties of CAHPS, much of which is synthesized in a 2005 analysis by Mathematica (Lake, Kvam, & Gold, 2005). In this summary, the authors note that "CAHPS is widely used in the health care industry and is now viewed as the standard for measuring consumers' experiences with health plans, including commercial products, Medicare, and Medicaid." There is some evidence to suggest that Medicaid beneficiaries respond to CAHPS questions differently than commercially insured, using the extreme ends of a scale more frequently (Damiano, Elliott, Tyler, & Hays, 2004). More than 90% of U.S. health plans use CAHPS. CAHPS questions address ease of access to medical care, the need to seek approval for medical treatments and delays in care experienced while waiting for approval, ease of access to understandable plan information and repercussions of poor access, need to complete paperwork and problems filling out paperwork, and an overall rating of the health plan. MEPS includes CAHPS questions in its survey, and a subset of these questions are used along with other commonly used measures of access to care available in the survey.

The outcome measures capture ways in which an insurer might alter the benefits of health insurance based on market structure through spending on medical claims and

plan administration. Delaying or not getting care and higher out of pocket spending on medical care for the privately insured reflect the scope of covered benefits. Insurers may also restrict provider networks to constrain costs; travel time and difficulty with reaching a USOC and problems getting a doctor the respondent likes address this pathway. These measures are commonly used in assessments of access to care (Burns, 2009). Reducing spending on plan administration can affect consumers by increasing the “hassle factor” and is measured by consumers’ reported problems getting help from the plan’s customer service, finding information about the plan, waiting for approval for necessary treatment, and problems completing plan paperwork. Finally, we will use the consumers’ self-reported satisfaction with their health plan as an overall summary measure. While these questions represent different elements, the questions on both medical claims and plan administration point to the larger issue of the individual’s perception of access and quality available through his or her health plan. Taken together, these elements describe the impact of insurance market concentration and bargaining power on the consumer.

### **Statistical Methods**

The study design is a longitudinal analysis of cross-sectional data, employing multivariate statistical regressions. We conducted analyses of dependent variables measuring access to care and satisfaction  $Y_{pmt}$  for person  $p$  with their health plan in market  $m$ . Each model used a measure of insurance market concentration: the insurance market HHI ( $IHHI_{mt}$ ), the number of health plans operating in the market, the relative concentration of the insurance and hospital markets ( $IHHI_{mt}/HHHI_{mt}$ ), or categorized joint hospital-insurance market concentration as described in Figure 3 as key independent

variables. The models also included control variables,  $X_{pmt}$ , for person-level characteristics from the MEPS and time-varying market-level characteristics from the ARF, unobserved time-invariant market fixed effects,  $\lambda_m$ , and year indicators,  $\tau_t$ , given by the following general form:

**Equation 3:** 
$$f(Y_{pmt}) = \alpha + \beta IHHI_{mt} + \gamma X_{pmt} + \lambda_m + \tau_t + \varepsilon_{pmt}$$

It was possible to estimate the MMC models with state fixed effects ( $\lambda_m$ ); small sample size in some MSAs limited the private market analysis to year fixed effects only without local MSA fixed effects.

With the exception of the overall rating of plan satisfaction responses on a 0-10 scale, other outcome measures were collapsed into dichotomous categories for clarity of interpretation and to account for small numbers of responses on some questions. For example, respondents who had tried to get help from a plan's customer service were asked whether they experienced a big problem, a small problem, or no problem getting help. We combine those reporting a small or big problem into one group, testing the robustness of findings in a subsequent analysis that grouped the middle response category differently to determine whether findings were sensitive to this analytic decision. We grouped those CAHPS questions that were asked only of individuals who sought administrative help together, so that we assessed whether the family experienced any administrative problem (big or small) when using the service. The sample for these questions includes those who sought any administrative service from the plan, including

those who: called customer service, looked for plan information, completed plan paperwork, or needed approval for treatment. Logistic regressions were conducted for the dichotomous outcome measures.

Respondents rate their plan on a 0-10 scale and the majority of respondents rate plans very highly. We first estimated standard OLS linear models for market and individual characteristics. Because the plan rating responses were left-skewed and the OLS assumption of normality was in question, we also estimated models with a Heckman selection approach, with the first stage predicting the odds of rating satisfaction at 10 points and the second stage conducting a linear regression for those responses less than 10. To account for the complex sampling design of the MEPS, standard errors were adjusted to allow for the correlation of responses within sampling clusters. The analysis was conducted in STATA version 12 (StataCorp, College Station, TX).

Previous research indicates the importance of accounting for unobserved factors that may be correlated with access to care and quality, and so a fixed effects model at the market (MSA or state) level was the primary methodological approach for the study. Fixed effects models address time-invariant unobserved factors that could influence the outcome. Under fixed effects models, it is assumed that the error term is correlated with the independent variables. Fixed effects models require within-market variation in the independent variable over time for identification and adequate sample size.

We conducted sensitivity analyses to test the parameters of some assumptions or open questions in the research design. For example, the primary model for private insurance assumes competition between HMOs and PPOs within markets. Sensitivity

analyses using the HMO-only HHI and the PPO-only HHI were conducted to explore whether findings are robust under different definitions of the relevant product market. A non-linear relationship between the number of plans in the market and the relevant outcomes was tested by employing a natural cubic spline model, with knots specified at specific intervals. Spline models allow distinct relationships along values of the independent variable, with the function between two points (e.g. 0 to 3 plans in a market, 3 to 6 plans, etc.) determined by a polynomial. We estimated models restricting the sample to MEPS respondents with non-zero medical expenditures. For Medicaid, a sub-analyses on only those states with statewide MMC programs was conducted

In addition, potential bias from endogeneity has been raised by previous researchers. To attempt to address this issue, an instrumental variables (IV) approach was pursued as a sensitivity analysis to determine whether findings from the fixed effects regression hold under IV formulation of the analysis. The instruments for private group insurance concentration were the number of employer firms in the market and the share of firms that have greater than 500 employees. The logic behind these measures is that employers often serve as a “customer” purchasing insurance coverage, and more firms in a market provides greater demand and a change for greater competition as firms make independent insurance purchasing decisions. Also, large firms are more likely to offer health insurance coverage and provide coverage options to employees. The instrument for the Medicaid market concentration was the number of MMC beneficiaries in the state, which has been associated with the number of available plans (Howell, 2012). In the sensitivity analyses, we verified the strength and excludability of these instruments using

accepted techniques (French & Popovici, 2011). This includes regressing the endogenous independent variable on the instrument to determine the strength of the instrument and also regressing the outcome of interest on both the endogenous independent variable and the instrument to determine whether the instrument truly only impacts the outcome through its relation to the endogenous independent variable.

## Results

The Medicaid Managed Care and private insurance markets were concentrated in 2003-2009. The average county-level HHI in Medicaid managed care has remained above 4610 since 2003 (Table 16). In 2003, the average Medicaid beneficiary enrolled in Managed Care had a choice of 6.3 plans. In 2009, the number of plan choices was largely unchanged at 6.4 plans.

	MMC (County)	Commerical HMOs (CBSA)	Commercial PPOs (MSA)	Total Commercial (MSA)
2003	5998.4	3906.8	--	--
2004	5933.5	3609.4	--	--
2005	6447.2	3930.1	3974.0	3014.9
2006	5557.0	3369.1	4040.4	2921.4
2007	5067.9	4169.0	4954.8	3735.9
2008	4911.8	4087.0	4229.4	3400.3
2009	4610.5	4122.3	4077.0	3239.8

Note: CBSA-based measures for private insurance include Micro SAs and rural areas and are weighted by population. The county-based measure for MMC is aggregated to the state level and weighted by the county's share of the state MMC enrollment.

In the private market, the HMO market in general was more concentrated than the PPO market with a mean HHI of 4,122 for HMOs compared with 4,077 for PPOs in



2009. As expected, private market HHIs were lower when including HMOs and PPOs as potential competitors for commercial market share within an MSA than for separate markets (mean HHI 3,240 in 2009). Similarly, including self-insured MCO enrollment further also yielded more competitive markets (mean HHI 2,599 in 2009). No statistically significant time trend was evident in the private market HHIs. The ratio of insurance HHIs to hospital HHIs suggest that, on average, the insurance markets are more concentrated than hospital markets. Across various formulations of hospital and insurance market HHIs, the mean ratio of insurance concentration to hospital market concentration remained above 1.0 (Table 17). The categorization of markets based on the joint competitiveness of insurance and hospital markets shows that most states and MSAs have hospital HHIs below 2,500, and it was rare than hospital HHIs were above this threshold. Insurance HHIs were more evenly split above and below the threshold (Tables 18 and 19).

<b>Table 17: Mean Ratio of Insurance Market HHI to Hospital Market HHI, 2003-2009</b>												
	Commercial HMOs				Total Privately Insured				Medicaid Managed Care			
	Medium, Hospital Beds	Med., Medicare Discharges	Narrow, Hosp. Beds	Nar., Mcare Dschgs	Med., Hosp. Beds	Med. Mcare Dschgs	Nar., Hosp. Beds	Nar., Mcare Dschgs	Med., Hosp. Beds	Med. Mcare Dschgs	Nar., Hosp. Beds	Nar., Mcare Dschgs
2003	2.5	2.3	2.4	2.3	-	-	-	-	1.5	1.6	1.6	1.5
2004	2.2	2	2.1	2	-	-	-	-	1.4	1.6	1.5	1.4
2005	2.4	2.3	2.3	2.2	1.8	1.7	1.7	1.7	1.4	1.5	1.4	1.4
2006	1.9	1.8	1.8	1.8	1.4	1.4	1.4	1.4	1.4	1.5	1.4	1.3
2007	2.5	2.3	2.3	2.2	1.9	1.8	1.8	1.7	1.3	1.5	1.4	1.3
2008	2.2	2.1	2.1	2	1.6	1.5	1.5	1.5	1.3	1.5	1.3	1.3
2009	2.3	2.1	2.2	2.1	1.5	1.4	1.4	1.4	0.7	0.7	0.7	0.7

<b>Table 18: Categorization of States according to Competitiveness of Medicaid Managed Care and Hospital Markets</b>					
		Both Competitive	Concentrated Insurance, Competitive Hospital	Competitive Insurance, Concentrated Hospital	Both Concentrated
2003	Medium Medicare Discharges	34%	47%	8%	11%
	Narrow Medicare Discharges	34%	47%	8%	11%
	Medium, Hospital Beds	39%	50%	3%	8%
	Narrow, Hospital Beds	39%	50%	3%	8%
2004	Medium Medicare Discharges	53%	31%	8%	8%
	Narrow Medicare Discharges	53%	28%	8%	11%
	Medium, Hospital Beds	56%	33%	6%	6%
	Narrow, Hospital Beds	56%	33%	6%	6%
2005	Medium Medicare Discharges	39%	33%	11%	17%
	Narrow Medicare Discharges	39%	33%	11%	17%
	Medium, Hospital Beds	42%	36%	8%	14%
	Narrow, Hospital Beds	42%	33%	8%	17%
2006	Medium Medicare Discharges	46%	46%	3%	5%
	Narrow Medicare Discharges	46%	43%	3%	8%
	Medium, Hospital Beds	46%	46%	3%	5%
	Narrow, Hospital Beds	46%	43%	3%	8%
2007	Medium Medicare Discharges	44%	36%	3%	17%
	Narrow Medicare Discharges	44%	36%	3%	17%
	Medium, Hospital Beds	44%	42%	3%	11%
	Narrow, Hospital Beds	44%	42%	3%	11%
2008	Medium Medicare Discharges	60%	26%	3%	11%
	Narrow Medicare Discharges	60%	26%	3%	11%
	Medium, Hospital Beds	60%	26%	3%	11%
	Narrow, Hospital Beds	60%	26%	3%	11%
2009	Medium Medicare Discharges	71%	21%	6%	3%
	Narrow Medicare Discharges	71%	21%	6%	3%
	Medium, Hospital Beds	71%	21%	6%	3%
	Narrow, Hospital Beds	71%	21%	6%	3%

<b>Table 19: Categorization of MSAs based on Competitiveness of Private Insurance and Hospital Markets</b>					
		Both Competitive	Concentrated. Insurance, Competitive Hospital	Competitive Insurance, Concentrated Hospital	Both Concentrated
2003	HMO Commercial	12%	53%	3%	32%
	Total Private	--	--	--	--
	Total Lives	20%	45%	5%	30%
2004	HMO Commercial	21%	43%	7%	29%
	Total Private	--	--	--	--
	Total Lives	25%	39%	8%	28%
2005	HMO Commercial	13%	52%	4%	30%
	Total Private	30%	36%	14%	21%
	Total Lives	33%	33%	16%	19%
2006	HMO Commercial	20%	42%	8%	30%
	Total Private	39%	23%	24%	14%
	Total Lives	40%	22%	26%	13%
2007	HMO Commercial	8%	54%	3%	35%
	Total Private	25%	38%	12%	26%
	Total Lives	35%	28%	17%	21%
2008	HMO Commercial	13%	47%	4%	36%
	Total Private	31%	29%	16%	24%
	Total Lives	37%	22%	23%	17%
2009	HMO Commercial	10%	49%	5%	36%
	Total Private	38%	22%	20%	20%
	Total Lives	44%	16%	23%	17%
Notes: Row percents may not sum to 100 due to rounding					
Competitive market defined as one with an HHI below 2500.					
Plan enrollment in PPOs was not available in 2003 and 2004, and so the total private HHI could not be calculated. Total Lives in these two years includes HMO, Medicare, and Medicaid managed care enrollment.					
Hospital Market HHIs based on the medium definition of markets and use Medicare Hospital Discharges as basis for market share					

## **Sample Characteristics**

Based upon the sample selection criteria detailed above, Table 20 describes the MEPS sample size and characteristics for the MMC and private market full sample and subsample for the CAHPS questions. Of the 23,928 in the full Medicaid sample and 114,030 in the private group insurance sample, the mean age of the MMC enrollee was 19.2 years (19) and 35.3 (20) years for the privately insured sample. The younger average age among the Medicaid sample reflects the common practice among states of enrolling children eligible through TANF into MMC programs. The private market CAHPS subsample largely resembled the full private market sample across a range of demographic variables, so the findings based on CAHPS are likely generalizable to the broader community of those with private group coverage. The MMC CAHPS subsample of first respondents was older, more likely to be married, more educated, and had a higher mean personal income than the full MMC sample so the results based on CAHPS may better reflect the experiences of adults with Medicaid rather than the whole population enrolled in MMC. Both the full MMC sample and the CAHPS subsample had a greater proportion of women and minorities than the private market sample (57% vs. 51% female, 65% vs. 75% white) and were less well-educated, in worse physical and mental health, and reported lower income. The differences between the privately insured and the MMC samples are consistent with known differences between these populations in terms of age, health status, income, and gender (Kaiser Family Foundation, 2010) The average state Medicaid HHI experienced by the sample was 4,409 and MSA total commercial

HHI (HMO+PPO) was 3,039. Almost all respondents lived in states with mandatory enrollment for TANF adults and children (0.97, se 0.15).

<b>Table 20: Sample Characteristics (All Years)</b>		
	<b>MMC Sample</b>	<b>Private Market Sample</b>
<b>Demographics</b>		
Mean Age	19.2 (19.0)	35.3 (20.0)
% Female	57.0%	51.5%
% Hispanic	46.5%	16.9%
% White only	65.1%	75.7%
% Black only	27.3%	15.0%
% Married	11.0%	49.6%
Mean Family Income	\$25,111	80,771
Mean Years of Education	6.9	10.7 (5.6)
Mean Self-rated Health Status <sup>1</sup>	2.23 (1.10)	2.07 (0.97)
Mean Self-rated Mental Health Status	2.05 (1.04)	1.85 (0.90)
<b>Local Area Characteristics</b>		
Urban/Rural Continuum Code <sup>2</sup>	1.62 (0.61)	1.45 (0.7)
Median Household Income	\$40,525 (18,871)	\$44,121 (20,774)
% For-profit Hospitals	23.6% (17.9)	21.38 (20.69)
Total MDs per 10,000	20.86 (10.55)	21.56 (12.21)
Total Specialists per 10,000	6.64 (5.13)	6.88 (5.69)
Hospital Admissions per 1,000	122.4 (24.8)	120.32 (30.09)
Hospitals per 100,000	1.28 (0.47)	3.98 (4.29)
FQHCs per 100,000	0.86 (0.78)	1.20 (0.54)
<b>Insurance &amp; Hospital Market Environment</b>		
Mean Medicaid HHI	4409 (1752)	
Mean # MMC Plans Available	6.03 (3.97)	
State Hospital HHI (Med, Mcare Dx)	1621 (598)	
Mean Ratio of MMC HHI to Hospital HHI		
Mean HMO HHI		3779 (1889)
Mean PPO HHI		4067 (1287)
Mean Total Commerical HHI		3039 (1287)
Mean # MCOs in MSA		27.4 (15.3)
Mean MSA Hospital HHI (Med, Mcare Dx)		1982 (1074)
Ratio of Total Private to Hospital HHIs		1.16 (1.10)
<b>Access to Care</b>		
No Usual Source of Care other than ER	12.8%	16.2%

Somewhat/Very Difficult to get to USOC	7.7%	33.4%
Takes 30+ Minutes to travel to USOC	10.0%	77.4%
Delayed/Did not get Needed Care	3.6%	3.2%
<b>Experience with Health Plan</b>		
Overall Plan Rating	8.54 (1.88)	7.90 (1.864)
Small/Big Problem Getting a Doctor	10.8%	66.1%
Small/Big Problem with Customer Service	39.1%	35.2%
Small/Big Problem with Paperwork	26.0%	22.9%
Small/Big Problem Getting Information	25.6%	30.6%
Small/Big Problem with Delay Waiting for Approval	43.0%	29.7%
OOP Share of Total Medical Expenditures		26.2% (26.6)
OOP Share of Expenditures on Office Visits		18.5% (25.4)
OOP Share of Prescription Drug Expenditures		29.4% (33.1)
OOP Share of Inpatient Hospital Expenditures		3.0% (3.2)

Notes:

1. Self-rated physical and mental health status was reported on a five-point scale, with a response of “1” indicating excellent health and a “5” indicating poor health.
2. The rural-urban continuum code is reported on a 9-point scale, where 1 an urban county with a population of 1 million or more and 9 is a completely rural county with a population less than 2,500 that is not adjacent to a metro area.

## Access to Care

Most Medicaid Managed Care enrollees reported having a usual source of care—one in eight (0.13, SE 0.33) reported having no usual source of care other than a hospital emergency room. Only 4 percent (0.04, SE 0.18) reported delaying or not getting necessary care. About ten percent of MMC enrollees reported it took 30 minutes or more to reach their usual source of care (0.10, SE 0.30) and 8 percent reported it was somewhat or very difficult to get to their usual source of care (0.08, SE 0.26).

Privately insured respondents also generally reported having a USOC, with 16% reporting no USOC other than an emergency department (0.16, SE 0.37). A similarly low percentage (0.03, SE 0.18) reported delaying or not getting care and taking more than 30 minutes to reach the USOC (0.08, SE 0.27). Only three percent (0.03, SE 0.18) reported it was somewhat or very difficult to get to their USOC.

After including individual demographic characteristics, local health care market characteristics, and state and year fixed effects, the MMC HHI was not significantly associated with delaying or not getting needed health care. Older individuals and Hispanic individuals were less likely to delay or not get health care, while those who reported worse physical and mental health were more likely to delay or not get care, other factors held constant (Table 21). Local health care market supply variables were not significant. The MMC HHI and number of plans were also insignificant in the models for problems getting a doctor with which the family was happy, travel time to the USOC, difficulty getting to a USOC, or having no USOC other than an ER. Older individuals,



unmarried individuals, and those in poor physical health were more likely to report that it took more than 30 minutes to reach their USOC or was difficult to reach their USOC.

<b>Table 21: Regression Results: Medicaid Managed Care Respondents, Delay/Not Get Care Outcome</b>						
Number of strata = 356				Number of obs = 15848		
Number of PSUs = 699				Population size = 87996923		
				F( 62, 282) = 8.09		
				Design df = 343		
				Prob > F = 0.0000		
<b>Delay/Not Get Care</b>	<b>Odds Ratio</b>	<b>Std. Err</b>	<b>t</b>	<b>P&gt; t </b>	<b>95% Conf. Interval</b>	
MMC HHI	.9999715	.0000918	-0.31	0.756	.999791	1.000152
Sex	.7824232	.0877187	-2.19	0.029	.6275875	.9754594
Hispanic	.4340175	.077989	-4.65	0.000	.3047982	.6180194
Age	.9901091	.0037102	-2.65	0.008	.9828383	.9974337
Unmarried	.9594437	.1310394	-0.30	0.762	.7334187	1.255125
Education	1.128818	.023829	5.74	0.000	1.082909	1.176674
Personal Income	.9999973	5.87e-06	-0.46	0.642	.9999857	1.000009
Race/Ethnicity	.8797301	.0697092	-1.62	0.107	.7527694	1.028104
Physical Health	1.639233	.1157753	7.00	0.000	1.426624	1.883528
Mental Health	1.187329	.0648598	3.14	0.002	1.06637	1.322008
PCCM Indicator	1.384049	.5094953	0.88	0.378	.6709618	2.854991
Months of MMC Lock-in	.9453448	.038456	-1.38	0.168	.8726525	1.024092
Mixed Waiver Ind.	1.124102	.3747841	0.35	0.726	.5834503	2.165747
Mandatory MMC Ind.	2.113497	2.137235	0.74	0.460	.2891954	15.44584
Urban/Rural Cont. Cd	.5136066	.2458401	-1.39	0.165	.2003348	1.316754
Median HH Income (state)	.9999862	.0000374	-0.37	0.713	.9999126	1.00006
MDs per 10,000	1.005387	.0469218	0.12	0.908	.9172051	1.102046
Specialists per 10,000	1.031022	.0387907	0.81	0.417	.9574795	1.110214
Hospitals per 100,000	1.54237	1.029491	0.65	0.517	.414975	5.732645
Admissions per 1,000	.8460296	.9372031	-0.15	0.880	.0957446	7.475787
For-profit Hospital %	.0556017	.1243395	-1.29	0.197	.0006837	4.521994
Year						
2004	.9183695	.1963355	-0.40	0.691	.603111	1.39842
2005	.9644787	.3007246	-0.12	0.908	.5223338	1.78089
2006	1.592482	.7345977	1.01	0.314	.6427357	3.945632
2007	1.087683	.4471744	0.20	0.838	.4845204	2.4417
2008	.9579946	.4385026	-0.09	0.925	.3893706	2.357019
2009	.7922905	1.593713	-0.12	0.908	.0151568	41.41536

*Note: Coefficients for state fixed effects not shown.*

In most cases, the ratio of MMC market concentration to hospital concentration was not significant in the models for access to care. One exception is respondents' reports of it being somewhat or very difficult to get to their USOC--a higher relative MMC market concentration was associated with about a six percent increase in the odds of having difficulty getting to the USOC (OR 1.056,  $p < 0.024$ ) after including state and year fixed effects (Table 22). A higher relative MMC concentration was associated with lower odds of reporting no usual source of care other than an ER, so in this case more concentrated MMC markets relative to hospital markets were protective (OR 0.971,  $p < 0.04$ ) (Table 23). Both these findings are statistically significant but small in magnitude.

<b>Table 22: Regression Results: Difficult to Get to USOC and the Ratio of the MMC HHI to Hospital Market HHI</b>						
Number of strata = 356			Number of obs = 15848			
Number of PSUs = 699			Population size = 87996923			
			Design df = 343			
			F( 67, 277) = 6.89			
			Prob > F = 0.0000			
Difficult to Reach USOC	Odds Ratio	Std. Err	t	P> t	95% Conf. Interval	
Ratio of MMC HHI to Hospital HHI	1.055579	.0251052	2.27	0.024	1.007337	1.106132
Sex	.9606267	.0767665	-0.50	0.616	.8209028	1.124133
Hispanic	1.047087	.1390259	0.35	0.729	.806427	1.359566
Black	1.0597	.1360005	0.45	0.652	.8232924	1.363992
American Indian/AK Native	.9942321	.2827213	-0.02	0.984	.5683054	1.739377
Asian	.8096984	.2656471	-0.64	0.520	.4246889	1.543745
Native Hawaiian/Pacific Islander	.7677725	.2699137	-0.75	0.453	.3845292	1.532977
MultiRacial	.7664283	.2113042	-0.96	0.335	.4456197	1.318192
Age	1.011772	.0027755	4.27	0.000	1.006327	1.017245
Unmarried	1.431989	.1943392	2.65	0.009	1.096507	1.870112
Education	.9753265	.0107708	-2.26	0.024	.9543698	.9967434
Personal Income	.9999893	6.46e-06	-1.66	0.099	.9999766	1.000002

Physical Health	1.377568	.0741694	5.95	0.000	1.239143	1.531457
Mental Health	1.122543	.0548332	2.37	0.019	1.019711	1.235746
PCCM Indicator	.9950787	.2982746	-0.02	0.987	.5518315	1.794355
Months of MMC Lock-in	1.014679	.0267812	0.55	0.581	.9633471	1.068747
Mixed Waiver Ind.	.83942	.2135631	-0.69	0.492	.5089228	1.384544
Mandatory MMC Ind.	.6059758	.5646454	-0.54	0.591	.0969396	3.787995
Urban/Rural Cont. Cd	.7520694	.3679498	-0.58	0.561	.2872983	1.968714
Median HH Income (state)	.9999896	.0000302	-0.34	0.732	.9999302	1.000049
MDs per 10,000	.9680821	.0461764	-0.68	0.497	.8813879	1.063304
Specialists per 10,000	1.021774	.0372506	0.59	0.555	.951071	1.097733
Hospitals per 100,000	.816	.665337	-0.25	0.803	.1641321	4.05683
Admissions per 1,000	1.239533	1.40732	0.19	0.850	.1328657	11.56386
For-profit Hospital %	26.35361	57.01593	1.51	0.131	.3738932	1857.516
Avg Mcaid Payment for Adult	1.000248	.0001894	1.31	0.191	.9998759	1.000621
Year						
2004	1.053791	.2023198	0.27	0.785	.7223563	1.537295
2005	1.086096	.2809043	0.32	0.750	.6530355	1.806341
2006	1.344149	.6623761	0.60	0.549	.5099211	3.543169
2007	1.00218	.3781647	0.01	0.995	.4771054	2.105122
2008	.5500656	.2597278	-1.27	0.206	.2173073	1.39237
2009	.272952	.4270348	-0.83	0.407	.0125794	5.922583
constant	.083511	.2143105	-0.97	0.334	.0005365	12.9981
<i>Note: Coefficients for state fixed effects not shown.</i>						

<b>Table 23: Regression Results: No USOC Other than an ER and the Ratio of MMC HHI to Hospital Market HHI</b>						
Number of strata = 356			Number of obs = 15879			
Number of PSUs = 700			Population size = 88155944			
			Design df = 344			
			F( 68, 277) = 21.47			
			Prob > F = 0.0000			
No USOC Other than an ER	Odds Ratio	Std. Err	t	P> t	95% Conf. Interval	
Ratio of MMC HHI to Hospital HHI	.9608008	.0199594	-1.92	0.055	.9223342	1.000872
Sex	1.167779	.0841843	2.15	0.032	1.013402	1.345674
Hispanic	1.231353	.143526	1.79	0.075	.9790766	1.548634
Black	.9371513	.1172561	-0.52	0.604	.7327091	1.198637
American Indian/AK Native	1.315533	.3551728	1.02	0.310	.7735346	2.237299
Asian	1.161524	.2964993	0.59	0.558	.7030352	1.91902
Native Hawaiian/	.6846783	.3657677	-0.71	0.479	.2394163	1.958031

Pacific Islander						
MultiRacial	1.139395	.2604887	0.57	0.569	.7267503	1.786336
Age	.9845547	.0031131	-4.92	0.000	.9784506	.990697
Unmarried	.7668748	.0974241	-2.09	0.037	.5973182	.9845624
Education	1.135622	.0133551	10.81	0.000	1.109655	1.162196
Personal Income	1.00001	4.13e-06	2.45	0.015	1.000002	1.000018
Physical Health	.8442097	.0412639	-3.46	0.001	.7668278	.9294004
Mental Health	1.080965	.0525831	1.60	0.110	.9823341	1.189499
PCCM Indicator	1.408904	.3447358	1.40	0.162	.8707044	2.279774
Months of MMC Lock-in	.9813043	.0302879	-0.61	0.541	.9235037	1.042723
Mixed Waiver Ind.	.8176978	.1530377	-1.08	0.283	.5658772	1.181581
Mandatory MMC Ind.	.4434328	.3568079	-1.01	0.313	.0910942	2.158563
Urban/Rural Cont. Cd	1.06128	.4541119	0.14	0.890	.4574282	2.462279
Median HH Income (state)	1.000012	.0000233	0.53	0.593	.9999666	1.000058
MDs per 10,000	.979021	.0351813	-0.59	0.556	.9122123	1.050723
Specialists per 10,000	9632378	.0337699	-1.07	0.286	.8990547	1.032003
Hospitals per 100,000	.6242724	.4602883	-0.64	0.523	.1464032	2.661936
Admissions per 1,000	1.132133	1.314537	0.11	0.915	.1153624	11.11042
For-profit Hospital %	.5039636	.9635858	-0.36	0.720	.0117258	21.65984
Avg Mcaid Payment for Adult	1.000222	.0001524	1.45	0.147	.9999219	1.000521
Year						
2004	.6196279	.1056918	-2.81	0.005	.4430231	.8666337
2005	.5995685	.1179956	-2.60	0.010	.4071273	.8829731
2006	.3975842	.1704535	-2.15	0.032	.1710846	.9239476
2007	.5999773	.1870776	-1.64	0.102	.3249275	1.107856
2008	.5632315	.2131803	-1.52	0.130	.2675308	1.185769
2009	.4590349	.6444924	-0.55	0.580	.0290085	7.263835
constant	.1087643	.226563	-1.07	0.288	.0018077	6.544163
<i>Note: Coefficients for state fixed effects not shown.</i>						

For the privately insured, the association between the total commercial HHI and access measures was largely insignificant in the unadjusted model and the full models including year fixed effects. The HMO HHI was not associated with the odds of delaying or not getting care or reported problems getting a doctor; it was associated with statistically significant but very slight increased odds of having no usual source of care

other than an ER (1.000035,  $p < 0.012$ ) (Table 24). The total commercial insurance HHI which includes HMOs and PPOs as competitors was not significantly associated with any access outcomes. The number of MCOs present in an MSA was associated with a lower odds of delaying or not getting necessary care (OR 0.9880363,  $p < 0.00$ , Table 25) but higher odds of reported problems finding a doctor (1.007665,  $p < 0.046$ ) (Table 26) and higher odds of taking 30 or more minutes to get to a USOC (1.015799,  $p < 0.001$ ) (Table 27). As the insurance HHI increased relative to the hospital market HHI, respondents reported higher odds of delaying or not getting care (1.056,  $p < 0.049$ , Table 28).

<b>Table 24: No Usual Source of Care Other than an ER and the HMO HHI</b>						
Number of strata = 367		Number of obs = 95639				
Number of PSUs = 812		Population size = 1073533081				F(
		Design df = 445				28,418 = 69.73
		28,418 = 69.73				Prob > F =
		0.0000				0.0000
No USOC Other than an ER	Odds Ratio	Std. Err	t	P> t	95% Conf. Interval	
HMO HHI	1.000035	.000014	2.53	0.012	1.000008	1.000063
Sex	1.690895	.043639	20.35	0.000	1.607269	1.778871
Hispanic	1.761159	.0866436	11.50	0.000	1.59885	1.939944
Black	1.489694	.0735976	8.07	0.000	1.351852	1.641591
American Indian/AK Native	.7414104	.1600752	-1.39	0.167	.48504	1.133286
Asian	1.600129	.1020448	7.37	0.000	1.411638	1.813788
Native Hawaiian/Pacific Islander	1.391841	.4399296	1.05	0.296	.7478427	2.590413
MultiRacial	1.0207	.1305844	0.16	0.873	.7937826	1.312485
Age	.9769627	.0012253	-18.58	0.000	.9745577	.9793737
Unmarried	1.222894	.0458758	5.36	0.000	1.135978	1.316461
Education	1.157314	.0052282	32.34	0.000	1.147085	1.167635
Personal Income	.9999996	4.45e-07	-1.00	0.316	.9999987	1
Physical Health	.894464	.0173319	-5.76	0.000	.8610418	.9291835
Mental Health	1.034424	.0205066	1.71	0.088	.9948976	1.075522
Urban/Rural Cont. Cd	.9613705	.0443377	-0.85	0.393	.8780655	1.052579
Median HH Income (state)	.9999982	3.76e-06	-0.47	0.639	.9999908	1.000006
MDs per 10,000	.9892346	.0049928	-2.14	0.033	.9794708	.9990958
Specialists per 10,000	.9999073	.0109896	-0.01	0.993	.9785408	1.02174

Hospitals per 100,000	1.025093	.0674745	0.38	0.707	.900704	1.166661
Admissions per 1,000	1.00199	.0010805	1.84	0.066	.9998688	1.004116
For-profit Hospital %	1.009725	.0011706	8.35	0.000	1.007427	1.012029
Avg. Family Premium	.9999623	.0000299	-1.26	0.209	.9999034	1.000021
Year						
2004	1.107382	.066204	1.71	0.089	.9846231	1.245445
2005	1.100861	.0870211	1.22	0.225	.9424602	1.285884
2006	1.138704	.1891244	0.78	0.435	.821583	1.57823
2007	1.206143	.1256038	1.80	0.073	.9829145	1.480069
2008	1.266118	.14921	2.00	0.046	1.004357	1.596102
2009	.8086783	.1366176	-1.26	0.209	.580206	1.127118
constant	.0584057	.023546	-7.05	0.000	.0264461	.1289879

<b>Table 25: Delaying/Not Getting Care and the Number of Commercial MCOs</b>						
Number of strata = 367			Number of obs = 84512			
Number of PSUs = 809			Population size = 971112541			
			Design df = 442			
			F( 28, 415) = 29.99			
			Prob > F = 0.0000			
Delaying/Not Getting Needed Care	Odds Ratio	Std. Err	t	P> t	95% Conf. Interval	
Number of MCOs	.9880258	.0032699	-3.64	0.000	.9816201	.9944732
Sex	.7921498	.0381835	-4.83	0.000	.720551	.8708631
Hispanic	.7439206	.0678476	-3.24	0.001	.6218441	.8899625
Black	.7046297	.0537916	-4.59	0.000	.6064592	.8186915
American Indian/AK Native	1.647901	.4080831	2.02	0.044	1.01289	2.681019
Asian	.5269772	.0661838	-5.10	0.000	.411713	.674511
Native Hawaiian/ Pacific Islander	.3927448	.1745386	-2.10	0.036	.1639803	.9406526
MultiRacial	1.30642	.1939051	1.80	0.072	.9758804	1.748917
Age	.9946886	.0016266	-3.26	0.001	.991497	.9978905
Unmarried	1.567619	.0970259	7.26	0.000	1.388071	1.770392
Education	1.071713	.0084391	8.80	0.000	1.055255	1.088428
Personal Income	.9999985	8.51e-07	-1.71	0.087	.9999969	1
Physical Health	1.663769	.0540795	15.66	0.000	1.560808	1.773522
Mental Health	1.191167	.0375701	5.55	0.000	1.119571	1.267342
Urban/Rural Cont. Cd	.8547975	.0447042	-3.00	0.003	.7713028	.9473307
Median HH Income (state)	.9999953	5.46e-06	-0.85	0.393	.9999846	1.000006
MDs per 10,000	1.006532	.006745	0.97	0.332	.9933632	1.019876
Specialists per 10,000	.9867165	.0151447	-0.87	0.384	.9573964	1.016934
Hospitals per 100,000	1.026407	.0748117	0.36	0.721	.8894215	1.18449
Admissions per 1,000	.9950845	.0016447	-2.98	0.003	.9918573	.9983221
For-profit Hospital %	.9993577	.0016369	-0.39	0.695	.9961457	1.00258
Avg. Family Premium	.9999263	.0000368	-2.00	0.046	.999854	.9999986
Year						
2004	1.143418	.0919754	1.67	0.096	.9762194	1.339254

2005	1.62003	.2060858	3.79	0.000	1.261663	2.080189
2006	1.800573	.3945676	2.68	0.008	1.170499	2.769813
2007	1.386059	.1930126	2.34	0.019	1.054203	1.822382
2008	1.504944	.2088274	2.95	0.003	1.145731	1.976779
2009	1.298489	.4385103	0.77	0.440	.6686381	2.521652
constant	.0265634	.0124735	-7.73	0.000	.0105556	.0668475

<b>Table 26: Problems Finding a Doctor and the Number of Commerical MCOs</b>						
Number of strata = 367			Number of obs = 96607			
Number of PSUs = 812			Population size = 1084542765			
			Design df = 445			
			F( 28, 418)= 9.02			
			Prob > F = 0.0000			
Any Problem Finding a Doctor	Odds Ratio	Std. Err	t	P> t	95% Conf. Interval	
Number of MCOs	1.007665	.0038388	2.00	0.046	1.000149	1.015238
Sex	.8784267	.0239001	-4.76	0.000	.8326893	.9266763
Hispanic	.7932743	.0645104	-2.85	0.005	.676104	.9307504
Black	.7800298	.061307	-3.16	0.002	.668387	.9103206
American Indian/AK Native	.8183927	.2673542	-0.61	0.540	.4306567	1.555222
Asian	1.335847	.1263067	3.06	0.002	1.109314	1.60864
Native Hawaiian/ Pacific Islander	.6275887	.2187581	-1.34	0.182	.3163467	1.24505
MultiRacial	1.352455	.189958	2.15	0.032	1.026223	1.782394
Age	.990703	.0015783	-5.86	0.000	.9876061	.9938097
Unmarried	.9194523	.0417529	-1.85	0.065	.8409501	1.005283
Education	.9988071	.0061534	-0.19	0.846	.9867867	1.010974
Personal Income	1.000002	6.17e-07	2.88	0.004	1.000001	1.000003
Physical Health	1.134887	.0271848	5.28	0.000	1.082699	1.189591
Mental Health	1.159878	.0273785	6.28	0.000	1.1073	1.214953
Urban/Rural Cont. Cd	1.104539	.0627205	1.75	0.081	.9879027	1.234945
Median HH Income (state)	1.000006	5.92e-06	0.95	0.342	.999994	1.000017
MDs per 10,000	.9943017	.0075465	-0.75	0.452	.9795805	1.009244
Specialists per 10,000	.9917904	.0146298	-0.56	0.577	.963451	1.020963
Hospitals per 100,000	.7461223	.0591727	-3.69	0.000	.6384395	.8719675
Admissions per 1,000	.998805	.0017093	-0.70	0.485	.9954513	1.00217
For-profit Hospital %	1.005396	.0017317	3.12	0.002	1.001998	1.008805
Avg. Family Premium	.999963	.0000458	-0.81	0.420	.9998731	1.000053
Year						
2004	.8440432	.0689815	-2.07	0.039	.7188005	.9911079
2005	.6392903	.0869172	-3.29	0.001	.4893888	.8351071
2006	.5966733	.1454712	-2.12	0.035	.3695256	.9634491
2007	.6968066	.1082851	-2.32	0.021	.5134204	.9456956
2008	.5665252	.0978219	-3.29	0.001	.403498	.795421
2009	.692124	.2407656	-1.06	0.291	.3493601	1.37118
constant	.132735	.073032	-3.67	0.000	.0450163	.3913826

<b>Table 27: Takes 30+ Minutes to Reach USOC and the Number of MCOs</b>						
Number of strata = 367 Number of PSUs = 812			Number of obs = 96607 Population size = 1084542765 Design df = 445 F( 28, 418) = 5.78 Prob > F = 0.0000			
Takes 30+ Minutes to Reach USOC	Odds Ratio	Std. Err	t	P> t	95% Conf. Interval	
Number of MCOs	1.015799	.0036494	4.36	0.000	1.008652	1.022997
Sex	.9209201	.0280814	-2.70	0.007	.8673525	.9777961
Hispanic	.9772804	.0770098	-0.29	0.771	.8370695	1.140977
Black	1.229436	.0941898	2.70	0.007	1.057586	1.429211
American Indian/AK Native	1.801885	.503905	2.11	0.036	1.040006	3.121896
Asian	.9557426	.0967934	-0.45	0.655	.7832491	1.166224
Native Hawaiian/ Pacific Islander	.6740545	.2305707	-1.15	0.249	.3441394	1.320248
MultiRacial	1.026279	.194284	0.14	0.891	.707434	1.488831
Age	1.004564	.0014554	3.14	0.002	1.001708	1.007428
Unmarried	1.018276	.0491628	0.38	0.708	.9260987	1.119629
Education	.9760603	.0048537	-4.87	0.000	.9665678	.985646
Personal Income	1.000001	6.37e-07	1.44	0.150	.9999997	1.000002
Physical Health	1.120416	.0273625	4.66	0.000	1.067911	1.175503
Mental Health	1.000115	.0272784	0.00	0.997	.947916	1.055188
Urban/Rural Cont. Cd	.9462383	.0743882	-0.70	0.482	.8107765	1.104333
Median HH Income (state)	.9999935	5.73e-06	-1.13	0.258	.9999823	1.000005
MDs per 10,000	.9911617	.0079719	-1.10	0.270	.9756176	1.006954
Specialists per 10,000	1.020232	.0140248	1.46	0.146	.9930385	1.048171
Hospitals per 100,000	.9883163	.0929425	-0.12	0.901	.8215416	1.188947
Admissions per 1,000	1.000051	.0016625	0.03	0.976	.9967889	1.003324
For-profit Hospital %	.9992022	.0018093	-0.44	0.660	.9956527	1.002764
Avg. Family Premium	.9999609	.0000421	-0.93	0.353	.9998782	1.000044
Year						
2004	.9745759	.0801214	-0.31	0.754	.8291751	1.145474
2005	.6538731	.0971476	-2.86	0.004	.4882963	.8755955
2006	.8291473	.1620079	-0.96	0.338	.5647562	1.217313
2007	.8397702	.115186	-1.27	0.204	.6413396	1.099595
2008	.6863044	.1159221	-2.23	0.026	.4924365	.9564965
2009	.5062066	.1926863	-1.79	0.074	.2395722	1.069595
constant	.1336544	.0672541	-4.00	0.000	.0497159	.3593115



<b>Table 28: Delaying or Not Getting Care, Ratio of Insurance HHI to Hospital Market HHI</b>						
Number of strata = 367 Number of PSUs = 812			Number of obs = 96618 Population size = 1084729746 Design df = 445 F( 28, 418) = 32.84 Prob > F = 0.0000			
Delayed/Did Not Get Care	Odds Ratio	Std. Err	t	P> t	95% Conf. Interval	
Ratio of Total Private Insurance HHI to Hospital HHI	1.056465	.029354	1.98	0.049	1.000322	1.115759
Sex	.7559948	.0355341	-5.95	0.000	.6892878	.8291576
Hispanic	.6745354	.0630478	-4.21	0.000	.5613416	.8105547
Black	.6476118	.0475038	-5.92	0.000	.5606694	.7480362
American Indian/AK Native	1.569111	.381016	1.86	0.064	.9736407	2.528765
Asian	.4967408	.0603586	-5.76	0.000	.3912181	.630726
Native Hawaiian/ Pacific Islander	.3553676	.1580846	-2.33	0.020	.1482483	.8518555
MultiRacial	1.237512	.1793743	1.47	0.142	.9307511	1.645377
Age	.9955274	.0015836	-2.82	0.005	.99242	.9986446
Unmarried	1.566805	.0948464	7.42	0.000	1.391064	1.764749
Education	1.069015	.0082268	8.67	0.000	1.052969	1.085306
Personal Income	.9999986	8.44e-07	-1.69	0.092	.9999969	1
Physical Health	1.69045	.0551748	16.08	0.000	1.585419	1.802439
Mental Health	1.189447	.0382379	5.40	0.000	1.116623	1.267021
Urban/Rural Cont. Cd	.908429	.0483677	-1.80	0.072	.8181759	1.008638
Median HH Income (state)	.999993	5.78e-06	-1.22	0.224	.9999816	1.000004
MDs per 10,000	1.009468	.0070171	1.36	0.176	.9957709	1.023353
Specialists per 10,000	.977884	.0146153	-1.50	0.135	.9495782	1.007034
Hospitals per 100,000	1.071084	.0784813	0.94	0.349	.9274355	1.236983
Admissions per 1,000	.9937652	.0016054	-3.87	0.000	.990615	.9969255
For-profit Hospital %	.9991762	.0016724	-0.49	0.623	.9958948	1.002468
Avg. Family Premium	.9999063	.0000371	-2.53	0.012	.9998335	.9999792
Year						
2004	1.088735	.0829655	1.12	0.265	.9373047	1.264631
2005	1.063611	.1151477	0.57	0.569	.8597648	1.315789
2006	1.147903	.2340075	0.68	0.499	.7689692	1.713568
2007	1.176386	.1762796	1.08	0.279	.8762959	1.579243
2008	1.147281	.1635243	0.96	0.336	.866993	1.518183
2009	.8621475	.2964771	-0.43	.666	0.438602	1.6947
constant	.0314275	.0158758	-6.85	0.000	.0116452	.0848152

A statistically significant effect on delaying or not getting care was also evident in the joint categorization of the two markets. When the market concentration was imbalanced, respondents were more likely to report delaying or not getting care relative

to consumers where both markets were competitive. The effect was most pronounced for respondents living in areas with a competitive insurance and concentrated hospital market (1.218,  $p < 0.039$ ) (Table 29), with a smaller and less significant effect for respondents living in a concentrated insurance and competitive hospital market (1.160,  $p < 0.062$ ). However, respondents living in markets where both insurance and hospital markets were concentrated were not significantly more likely to report delaying care relative to those in jointly competitive markets. Interestingly, those in jointly concentrated markets were less likely to report it took 30 or more minutes to reach a USOC than those in jointly competitive markets (0.776,  $p < 0.043$ ) (Table 30) while there was no significant effect for imbalanced markets. Respondents in areas with a competitive insurance and concentrated hospital market were significantly more likely to report having no USOC other than an ER (1.172,  $p < 0.005$ ) (Table 31) than those in jointly competitive markets, with no significant effect for the other two categories.

**Table 29: Delaying or Not Getting Care and the Joint Categorization of Total Private Insurance and Hospital Markets**

Number of strata = 367		Number of obs = 96618				
Number of PSUs = 812		Population size = 1084729746				
		Design df = 445				
		F( 30, 416) = 31.48				
		Prob > F = 0.0000				
Delayed/Did Not Get Care	Odds Ratio	Std. Err	t	P> t	95% Conf. Interval	
Both Markets Competitive (ref)						
Conc. Insurance, Comp Hosp	1.160146	.0920736	1.87	0.062	.9925993	1.355975
Comp. Insurance, Conc. Hosp	1.217801	.1158001	2.07	0.039	1.010218	1.468038
Both Markets Concentrated	1.00659	.1150977	0.06	0.954	.8040021	1.260225
Sex	.7567295	.0354862	-5.94	0.000	.6901053	.8297858
Hispanic	.6820553	.0637287	-4.10	0.000	.5676356	.8195388
Black	.6534832	.0478961	-5.80	0.000	.5658179	.7547309
American Indian/AK Native	1.559461	.3831194	1.81	0.071	.9622455	2.527337
Asian	.502222	.0610033	-5.67	0.000	.3955678	.6376325
Native Hawaiian/ Pacific Islander	.3560123	.1587465	-2.32	0.021	.14821	.85517
MultiRacial	1.242849	.1805688	1.50	0.135	.9341432	1.653574
Age	.9955222	.0015923	-2.81	0.005	.9923977	.9986565
Unmarried	1.567191	.0948623	7.42	0.000	1.391419	1.765167
Education	1.068928	.0082191	8.67	0.000	1.052897	1.085204
Personal Income	.9999986	8.47e-07	-1.61	0.108	.999997	1
Physical Health	1.689756	.0552017	16.06	0.000	1.584677	1.801803
Mental Health	1.189411	.0381111	5.41	0.000	1.116821	1.26672
Urban/Rural Cont. Cd	.8902873	.0484919	-2.13	0.033	.7999093	.9908767
Median HH Income (state)	.9999915	5.62e-06	-1.51	0.133	.9999805	1.000003
MDs per 10,000	1.011518	.0070804	1.64	0.103	.9976984	1.02553
Specialists per 10,000	.9792244	.0143226	-1.44	0.152	.9514769	1.007781
Hospitals per 100,000	1.075402	.0795533	0.98	0.326	.9298885	1.243685
Admissions per 1,000	.9932527	.0015854	-4.24	0.000	.9901417	.9963734
For-profit Hospital %	.9994447	.0016737	-0.33	0.740	.9961608	1.002739
Avg. Family Premium	.9999003	.000037	-2.69	0.007	.9998276	.9999731
Year						
2004	1.090758	.0834344	1.14	0.257	.9385133	1.267699
2005	1.150128	.1195997	1.35	0.179	.9375403	1.41092
2006	1.257972	.2465894	1.17	0.242	.8557802	1.849182
2007	1.298682	.1888917	1.80	0.073	.9757956	1.728409
2008	1.282721	.1798325	1.78	0.076	.9738039	1.689634
2009	.9485597	.3143991	-0.16	0.873	.494499	1.81955
constant	.0343077	.0170637	-6.78	0.000	.0129084	.0911823

**Table 30: Time to USOC and Joint Categorization of Total Private Insurance and Hospital Markets**

Number of strata = 367		Number of obs = 96618				
Number of PSUs = 812		Population size = 1084729746				
		Design df = 445				
		F( 30, 416) = 4.27				
		Prob > F = 0.0000				
Takes 30+ Minutes to Reach USOC	Odds Ratio	Std. Err	t	P> t	95% Conf. Interval	
Both Markets Competitive (ref)						
Conc. Insurance, Comp Hosp	.9452672	.0739537	-0.72	0.472	.8105476	1.102378
Comp. Insurance, Conc. Hosp	.9354227	.0876571	-0.71	0.477	.7780823	1.12458
Both Markets Concentrated	.7760043	.0971927	-2.02	0.043	.6066838	.9925806
Sex	.9212667	.0279821	-2.70	0.007	.8678825	.9779347
Hispanic	1.003969	.0789385	0.05	0.960	.8602226	1.171736
Black	1.244217	.0936707	2.90	0.004	1.073096	1.442625
American Indian/AK Native	1.772166	.4904269	2.07	0.039	1.02873	3.052862
Asian	.9599309	.0971083	-0.40	0.686	.7868576	1.171073
Native Hawaiian/ Pacific Islander	.6452799	.2219621	-1.27	0.203	.3282124	1.268648
MultiRacial	1.008732	.1910468	0.05	0.963	.6952234	1.463615
Age	1.004406	.001458	3.03	0.003	1.001545	1.007276
Unmarried	1.015404	.0489408	0.32	0.751	.9236355	1.116291
Education	.975931	.0048068	-4.95	0.000	.9665298	.9854236
Personal Income	1.000001	6.36e-07	1.47	0.143	.9999997	1.000002
Physical Health	1.121882	.027219	4.74	0.000	1.069643	1.176672
Mental Health	.9990872	.027066	-0.03	0.973	.9472854	1.053722
Urban/Rural Cont. Cd	.8875219	.0651339	-1.63	0.105	.7683168	1.025222
Median HH Income (state)	.9999959	5.63e-06	-0.74	0.462	.9999848	1.000007
MDs per 10,000	.9869314	.0078571	-1.65	0.099	.9716099	1.002494
Specialists per 10,000	1.026103	.0146559	1.80	0.072	.9976997	1.055314
Hospitals per 100,000	.9124827	.0838426	-1.00	0.319	.7617273	1.093075
Admissions per 1,000	1.001842	.0015138	1.22	0.224	.9988718	1.004822
For-profit Hospital %	.9989609	.0017918	-0.58	0.562	.9954457	1.002489
Avg. Family Premium	1.000012	.0000411	0.30	0.765	.9999316	1.000093
Year						
2004	.9783235	.0805546	-0.27	0.790	.8321544	1.150167
2005	1.007393	.1132407	0.07	0.948	.8077086	1.256444
2006	1.24532	.2279967	1.20	0.231	.8689916	1.784622
2007	.9270338	.1322574	-0.53	0.596	.7003672	1.227059
2008	.8549058	.1427425	-0.94	0.348	.6157532	1.186943
2009	.662266	.2408621	-1.13	0.258	.3240495	1.353485
constant	.0916955	.0470204	4.66	-0.00	.0334712	.2512028

<b>Table 31: No USOC Other than an ER and Joint Categorization of Insurance and Hospital Markets</b>						
Number of strata = 367 Number of PSUs = 812			Number of obs = 96618 Population size = 1084729746 Design df = 445 F( 30, 416) = 66.31 Prob > F = 0.0000			
No USOC Other than an ER	Odds Ratio	Std. Err	t	P> t	95% Conf. Interval	
Both Markets Competitive (ref)						
Conc. Insurance, Comp Hosp	.9233021	.0546333	-1.35	0.178	.8219389	1.037166
Comp. Insurance, Conc. Hosp	1.171723	.0650786	2.85	0.005	1.050557	1.306864
Both Markets Concentrated	.9093333	.0750604	-1.15	0.250	.7731602	1.06949
Sex	1.688547	.0441419	20.04	0.000	1.603985	1.777566
Hispanic	1.729661	.0847225	11.19	0.000	1.570919	1.904445
Black	1.482312	.0728799	8.01	0.000	1.345783	1.632692
American Indian/AK Native	.7336106	.1591749	-1.43	0.154	.4789307	1.123721
Asian	1.600762	.1011895	7.44	0.000	1.413751	1.812512
Native Hawaiian/ Pacific Islander	1.391644	.4429666	1.04	0.300	.744471	2.601407
MultiRacial	1.030773	.1315011	0.24	0.812	.802185	1.324498
Age	.9769145	.0012396	-18.41	0.000	.9744814	.9793537
Unmarried	1.217145	.0461059	5.19	0.000	1.129823	1.311216
Education	1.157229	.0052977	31.90	0.000	1.146864	1.167687
Personal Income	.9999996	4.47e-07	-1.00	0.318	.9999987	1
Physical Health	.8921091	.0172832	-5.89	0.000	.8587807	.9267309
Mental Health	1.033883	.0202902	1.70	0.090	.9947654	1.074538
Urban/Rural Cont. Cd	.9832494	.0422617	-0.39	0.694	.9036033	1.069916
Median HH Income (state)	.9999972	3.63e-06	-0.78	0.434	.99999	1.000004
MDs per 10,000	.991889	.005304	-1.52	0.128	.9815196	1.002368
Specialists per 10,000	.9935284	.0105554	-0.61	0.541	.9729989	1.014491
Hospitals per 100,000	1.045639	.0664591	0.70	0.483	.9228543	1.184759
Admissions per 1,000	1.001897	.0010637	1.78	0.075	.9998083	1.003989
For-profit Hospital %	1.009294	.0011645	8.02	0.000	1.007008	1.011586
Avg. Family Premium	.9999618	.0000297	-1.29	0.199	.999903	1.00002
Year						
2004	1.094525	.0636646	1.55	0.121	.9762909	1.227078
2005	1.179233	.0935582	2.08	0.038	1.008981	1.378214
2006	1.089674	.1663219	0.56	0.574	.8072709	1.470868
2007	1.318188	.1354049	2.69	0.007	1.077217	1.613065
2008	1.364958	.1571088	2.70	0.007	1.088623	1.711438
2009	.8230591	.1412567	-1.13	0.257	.5874163	1.15323
constant	.066105	.0263947	-6.80	0.000	.0301603	.1448881

## **Experience with Health Plan**

Looking at the overall, unadjusted experiences with health plans reported by Medicaid managed care enrollees, the mean plan rating (on a scale of 0-10) was 8.5 (1.8). While the prevalence of administrative problems among the total sample was low, administrative problems among those who used administrative services like calling customer service or needing approval for treatment were more common. Forty percent of those who sought help from customer service or needed approval for a treatment experienced a problem getting needed help (0.39, SE 0.48 and -0.43, SE 0.50 respectively). One in four of those who sought plan information or completed plan paperwork experienced a problem (0.26, SE 0.44 and 0.26, SE 0.44).

In the full model, the MMC HHI was not significantly associated with respondent reports of any administrative problems with their plan. Respondents in worse physical health status (1.27,  $p < 0.001$ ) or mental health status (1.22,  $p < 0.01$ ) were more likely to report having administrative problems while African American and Hispanic respondents were less likely to report administrative problems, other factors held constant (Table 32). The number of MMC plans available, expressed in linear terms as well as non-linear through a natural cubic spline, did not significantly affect the odds of reported administrative problems. The ratio of the MMC HHI to hospital market HHI as well as the joint categorization of MMC and hospital markets were also not significantly associated with the odds of reported administrative problems.

<b>Table 32: Administrative Problems and the MMC HHI</b>						
Number of strata = 309			Number of obs = 2000			
Number of PSUs = 512			Population size = 13727132			
			Design df = 203			
			F( 67, 137) = 12.54			
			Prob > F = 0.0000			
Any Administrative Problem	Odds Ratio	Std. Err	t	P> t	95% Conf. Interval	
MMC HHI	.9998816	.0000931	-1.27	0.205	.999698	1.000065
Sex	1.400761	.2621855	1.80	0.073	.9684699	2.026012
Hispanic	.646833	.1176006	-2.40	0.017	.4519676	.9257146
Black	.6743318	.1111498	-2.39	0.018	.4872243	.9332937
American Indian/AK Native	1.202046	.5631895	0.39	0.695	.4772208	3.027769
Asian	.8664441	.3384122	-0.37	0.714	.4011324	1.871515
Native Hawaiian/ Pacific Islander	.2189954	.3138892	-1.06	0.291	.0129741	3.696506
MultiRacial	1.058416	.4021319	0.15	0.881	.5003959	2.238718
Age	.990854	.0055657	-1.64	0.103	.9799405	1.001889
Unmarried	1.034038	.1842007	0.19	0.851	.7277738	1.469186
Education	1.033691	.023408	1.46	0.145	.9885523	1.080891
Personal Income	1.000009	8.02e-06	1.14	0.257	.9999933	1.000025
Physical Health	1.274606	.0928659	3.33	0.001	1.104045	1.471517
Mental Health	1.219797	.0937799	2.58	0.010	1.048222	1.419455
PCCM Indicator	9950234	.3997797	-0.01	0.990	.4505958	2.19725
Months of MMC Lock-in	.9777769	.043419	-0.51	0.613	.8958076	1.067247
Mixed Waiver Ind.	.7410103	.2628058	-0.85	0.399	.3682372	1.491148
Mandatory MMC Ind.	.4274179	.4542912	-0.80	0.425	.0525663	3.475349
Urban/Rural Cont. Cd	.8043082	.5146178	-0.34	0.734	.2277901	2.839947
Median HH Income (state)	1.000018	.0000421	0.42	0.673	.9999348	1.000101
MDs per 10,000	1.00462	.0596774	0.08	0.938	.8935827	1.129455
Specialists per 10,000	1.001153	.0484091	0.02	0.981	.9101127	1.1013
Hospitals per 100,000	.4067165	.4531377	-0.81	0.420	.0452115	3.658763
Admissions per 1,000	.5105272	.9893116	-0.35	0.729	.0111853	23.30183
For-profit Hospital %	1.639507	4.605819	0.18	0.860	.0064434	417.1675
Avg Mcaid Payment for Adult	1.000654	.0002776	2.35	0.019	1.000106	1.001201
Year						
2004	.6931412	.1994743	-1.27	0.204	.3929987	1.22251
2005	.6037588	.2111647	-1.44	0.151	.3029494	1.203252
2006	.6376939	.4332128	-0.66	0.509	.1670654	2.434098
2007	.485386	.2424448	-1.45	0.149	.1812891	1.299579
2008	.5109518	.314801	-1.09	0.277	.1516364	1.721696
2009	1.487131	3.323109	0.18	0.859	.0181496	121.8519
constant	7.822907	31.36353	0.51	0.608	.0028858	21206.33

*Note: Coefficients for state fixed effects not shown.*

In the unadjusted regressions for the Medicaid market concentration on overall plan satisfaction, increases in the MMC HHI were positively associated with higher satisfaction ratings, though the coefficient was small—a 1,000 unit increase in the HHI was associated with an increase in the plan rating of 0.04 points. In the Heckman selection model with state fixed effects and individual and local control variables, the MMC HHI was significantly associated with higher plan ratings conditional on a plan rating less than 10; the coefficient again remained small (0.0001,  $p < 0.026$ ) and the findings were no longer significant when year fixed effects were included in the model. The number of available MMC plans (both linear and non-linear) was not associated with reported overall satisfaction with plans, nor were the ratio of MMC to hospital market HHIs or the joint categorization of MMC and hospital markets.

On the private market side, the mean health plan rating overall was 7.9 (1.9), slightly lower than the average rating among MMC enrollees. About one in three respondents who sought plan information, help from customer service, or needed approval for treatment experienced a problem doing so (0.31 SE 0.46; 0.35 SE 0.47; and 0.30 SE 0.45 respectively).

Looking at the association between commercial market concentration and consumer experiences, market concentration measures were not significantly associated with overall satisfaction in the Heckman selection model with year fixed effects. In models without year fixed effects, the ratio of the total private insurance HHI to hospital HHI was significantly and positively associated with plan satisfaction (0.03,  $p \leq 0.047$ ), such that a higher concentration of insurance markets relative to hospital markets was



associated with higher reported satisfaction with plans. This effect does not persist when year fixed effects are included, so temporal factors that affect all respondents equally may explain part of this association.

<b>Table 33: Administrative Problems and the HMO HHI</b>						
Number of strata = 364 Number of PSUs = 780			Number of obs = 35470 Population size = 425027554 Design df = 416 F( 28, 389) = 10.11 Prob > F = 0.0000			
Any Administrative Problem	Odds Ratio	Std. Err	t	P> t	95% Conf. Interval	
HMO HHI	1.000032	.0000119	2.70	0.007	1.000009	1.000055
Sex	1.02177	.0224219	0.98	0.327	.9786326	1.066809
Hispanic	.6574007	.0463162	-5.95	0.000	.5723809	.7550492
Black	.6055445	.0407661	-7.45	0.000	.5304871	.6912216
American Indian/AK Native	1.254661	.4020328	0.71	0.479	.6683116	2.355451
Asian	.9132808	.0864772	-0.96	0.339	.7581762	1.100116
Native Hawaiian/ Pacific Islander	.6891169	.2302149	-1.11	0.266	.3573553	1.328879
MultiRacial	1.245177	.1532099	1.78	0.075	.9776684	1.585882
Age	.9918519	.0014358	-5.65	0.000	.9890336	.9946783
Unmarried	.9075974	.0393685	-2.24	0.026	.8334188	.9883783
Education	1.006565	.0048758	1.35	0.177	.9970266	1.016195
Personal Income	.9999999	4.93e-07	-0.20	0.839	.9999989	1.000001
Physical Health	1.067797	.0227515	3.08	0.002	1.023999	1.113469
Mental Health	1.177781	.0270525	7.12	0.000	1.125787	1.232177
Urban/Rural Cont. Cd	.9946846	.0435963	-0.12	0.903	.912576	1.084181
Median HH Income (state)	1.000003	4.75e-06	0.57	0.567	.9999934	1.000012
MDs per 10,000	.9923219	.0064274	-1.19	0.235	.9797679	1.005037
Specialists per 10,000	1.007466	.0128511	0.58	0.560	.9825185	1.033046
Hospitals per 100,000	.9525142	.0491607	-0.94	0.346	.86062	1.054221
Admissions per 1,000	1.000191	.0013072	0.15	0.884	.9976249	1.002764
For-profit Hospital %	1.002654	.0012693	2.09	0.037	1.000162	1.005152
Avg. Family Premium	1.000065	.0000339	1.93	0.054	.9999988	1.000132
Year						
2004	1.006135	.081921	0.08	0.940	.8573298	1.180768
2005	.9880665	.089811	-0.13	0.895	.8263992	1.181361
2006	.9049964	.1575428	-0.57	0.567	.6427415	1.274258
2007	.8578983	.0918749	-1.43	0.153	.6950436	1.058911
2008	.6598333	.0790452	-3.47	0.001	.5213944	.83503
2009	.8360652	.2294333	-0.65	0.514	.4874965	1.433867
constant	.2242818	.085422	-3.92	0.000	.1060845	.4741723

A higher HMO concentration was associated with statistically higher odds of reported administrative problems, though the magnitude of the coefficient was negligible (OR 1.000,  $p \leq 0.007$ ) (Table 33). The total commercial concentration (including both HMOs and PPOs) was not significantly associated with administrative problems. In the nonlinear formulation applying a restricted cubic spline to the number of available MCOs, there was a significantly lower odds of administrative problems with each additional available plan between 5 and 15 plans (0.98,  $p < 0.05$ ) (Table 34); when more than 15 plans were available, changes in the number of plans were no longer significantly associated with the odds of reported administrative problems. The ratio of insurance to hospital HHIs and the joint categorization of private insurance and hospital markets were not significantly associated with the odds of administrative problems.

**Table 34: Restricted Cubic Spline: Number of Commercial Plans and Reported Administrative problems, Private Market**

Number of strata = 364 Number of PSUs = 780		Number of obs = 35839 Population size = 429260236 Design df = 416 F( 30, 387) = 9.42 Prob > F = 0.0000				
Any Administrative Problem	Odds Ratio	Std. Err	t	P> t	95% Conf. Interval	
5-15 Plans	.9782429	.0109421	-1.97	0.050	.956969	.9999898
15-25 Plans	1.07665	.0511958	1.55	0.121	.980575	1.182138
25-45 Plans	.8464464	.0958083	-1.47	0.142	.6775975	1.05737
Sex	1.021811	.0223227	0.99	0.324	.9788608	1.066646
Hispanic	.6557299	.0459223	-6.03	0.000	.5713988	.7525071
Black	.6039762	.0402903	-7.56	0.000	.529751	.6886013
American Indian/AK Native	1.244444	.3946438	0.69	0.491	.6671922	2.321133
Asian	.9178179	.0862271	-0.91	0.362	.7630527	1.103973
Native Hawaiian/ Pacific Islander	.6922243	.2289439	-1.11	0.267	.3613282	1.326147
MultiRacial	1.25156	.1522937	1.84	0.066	.9853095	1.589757
Age	.9917642	.0014185	-5.78	0.000	.9889797	.9945565
Unmarried	.9035542	.0388811	-2.36	0.019	.8302695	.9833075
Education	1.006357	.0048174	1.32	0.186	.996932	1.015871
Personal Income	.9999999	4.87e-07	-0.20	0.842	.9999989	1.000001
Physical Health	1.066998	.0223543	3.10	0.002	1.023949	1.111856
Mental Health	1.178777	.0269155	7.20	0.000	1.127039	1.232889
Urban/Rural Cont. Cd	.9972721	.0445919	-0.06	0.951	.9133603	1.088893
Median HH Income (state)	1.000003	4.76e-06	0.60	0.548	.9999935	1.000012
MDs per 10,000	.9930621	.0059961	-1.15	0.250	.9813453	1.004919
Specialists per 10,000	1.004806	.0126228	0.38	0.703	.9802971	1.029927
Hospitals per 100,000	.9435132	.0497351	-1.10	0.271	.8506442	1.046521
Admissions per 1,000	1.000361	.0013678	0.26	0.792	.9976759	1.003053
For-profit Hospital %	1.002505	.0012629	1.99	0.048	1.000025	1.004991
Avg. Family Premium	1.000079	.0000337	2.34	0.020	1.000013	1.000145
Year						
2004	1.008758	.0830946	0.11	0.916	.8579582	1.186063
2005	1.090838	.1558001	0.61	0.543	.8238193	1.444405
2006	.9628596	.1976487	-0.18	0.854	.6431686	1.441455
2007	.9220362	.1076016	-0.70	0.487	.7330319	1.159773
2008	.7145181	.1028189	-2.34	0.020	.5384783	.9481089
2009	.9041911	.2640739	-0.34	0.730	.5092568	1.605401
constant	.2700152	.1024842	-3.45	0.001	.1280479	.5693826

## **Out of Pocket Expenditures in Private Insurance**

For the private insurance models, we assessed the share of expenditures paid for out of pocket (OOP) by respondents, both total and for specific services. Overall, privately insured respondents paid 26.2% of their total health care expenditures out of pocket. This percentage varied by service, ranging from a low of 0.3% on average for inpatient expenditures to 29.7% for prescription drug expenditures.

Increases in the total commercial insurance HHI (both PPOs and HMOs) was associated with a slight but statistically significant increase in the OOP share for office visits such that a 1000 unit increase in the HHI increased the OOP share by 0.0029 percentage points, other factors held constant. There was also a significant association between the commercial HHI and prescription drug expenditures—a 1,000 unit increase in the HHI was associated with a 0.0039 percentage point increase in the OOP share. There was no statistically significant association between the total commercial HHI and other services, nor the HMO HHI and the OOP share for any service category.

The number of MCOs was not significantly associated with the OOP share for total expenditures or any of the service categories. When modeled as a natural spline, there does appear to be a statistically significant and nonlinear association between the number of plans and the OOP share. For example, the effect of an additional plan in the MSA on the OOP share for total expenditures between 5 and 15 plans is negative and not statistically significant (-0.0016,  $p < 0.065$ ), then positive and significant between 15 and 25 plans (0.0076,  $p < 0.022$ ), and then negative again between 25 and 45 plans (-0.017,

$p < 0.026$ ). A similar pattern was found in the models for the OOP share of expenditures on office visits as well as prescription drugs.

The ratio of insurance to hospital HHI was significantly associated with the OOP share for inpatient expenditures such that an increase in the insurance concentration relative to the hospital concentration was associated with a lower OOP share for consumers ( $-0.0003$ ,  $p < 0.028$ ). The ratio was not significantly associated with the OOP share for other services, including emergency room expenditures or hospital outpatient expenditures. In the joint categorization, respondents in areas with a competitive insurance and concentrated hospital market had a significantly higher OOP share for total expenditures relative to consumers in a jointly competitive market ( $0.011$ ,  $p < 0.017$ ), while the association was insignificant for the other two categories. A similar pattern was found for the OOP share for expenditures on emergency room services, though for inpatient services jointly concentrated markets were associated with a higher OOP share ( $0.001$ ,  $p < 0.047$ ) while the imbalanced markets were not significantly different from jointly competitive markets.

### **Alternative Specifications**

We estimated alternative specifications of the regression model to determine whether findings were robust. In addition to estimating models with different formulations of health insurance market structure as described above, as a sensitivity analysis we also restricted the models to only those respondents with positive medical expenditures. In general, the conclusions from these models were consistent with models estimated on the full sample. In some cases the significance of independent variables slipped beyond the

95% confidence threshold, but largely the non-effect of market structure persisted in models estimated on the sample with positive health expenditures.

In the instrumental variables approaches we tested, the private market instruments—the number of firms and the percentage of firms that had more than 500 employees—were significantly associated with the HMO HHI and the total commercial HHI. The instruments were not strong for the PPO HHI, the total private HHI (including the self-insured), the total lives HHI (including managed Medicare and Medicaid), or the number of MCOs in the MSA. The findings from the instrumental variables approach should therefore be interpreted with caution, though the general finding of a non-effect of market structure on consumer experiences persisted in the IV models. In one of the models, the instruments were found to have a slight but statistically significant effect on respondent reports of having no USOC other than an ER. However, the instrument failed the overidentification test by virtue of having an independent effect on the outcome even after the total commercial HHI was included in the model.

The MMC instrument—the total number of Medicaid enrollees in the state--was significantly associated with a lower Medicaid HHI and higher number of plans after controlling for other variables in the model. The coefficient was small, making the instrument relatively weak. The finding of no significant effect of market structure on consumer experiences was robust the MMC IV models tested.

## **Discussion**

Findings from this analysis suggest that health insurance market structure does have an effect on access to care and a negligible effect on consumers' experiences with their health plan. Of the domains of consumer experience examined, the travel time to the USOC as well as difficulty reaching the USOC seem to be most affected by market structure, though the coefficients were still quite small with generally less than a ten percent change in odds. This suggests that plan provider networks may be modified based on market conditions in both the insurance and hospital markets. These findings are consistent with previous published literature finding little to no significant effect of health insurance competition on quality. Instead, individual factors such as age, income, marital status, and self-reported physical and mental health status have a larger bearing on consumers' reported access to care and experience with their health plans.

Consumers often reported problems with the administrative side of health plans, with over a quarter having problems getting help from customer service, waiting for approval, completing paperwork, and finding information about the plan. However, the prevalence of these problems does not appear to be affected by market structure in either MMC or the private group markets. The health plan practices that lead to administrative challenges for consumers—for example, difficult customer service representatives and dense, technical plan information and procedures—are difficult to evaluate at the time consumers or health benefits managers make plan purchasing decisions because these functions are often ignored until needed in the care-seeking process. Plans may focus on price as a key determinant of enrollment decisions rather than quality as a marketing tool.

Alternatively, some other unmeasured factor, perhaps limited health literacy or language accessibility issues, may explain the high prevalence of reported problems among those who seek administrative help. Similarly, overall plan satisfaction was not significantly affected by market structure. While specific domains of the consumer experience may be affected by market structure, consumers do not appear to bring these experiences to bear when assigning an overall rating to their experience with their health plan.

One motivation for this study was to compare the relationship between market structure and consumer experiences in two different settings, Medicaid managed care and private insurance. MMC enrollees do not pay monthly premiums for their coverage, so the beneficiary's plan selection is not based on price. One might surmise, then, that plans would compete more directly on quality in this setting than in an environment like private insurance in which premiums are very salient to consumers. Despite these theoretical differences, the general finding of little to no effect of market structure on consumer experiences holds in both MMC and private insurance.

Insurers in both MMC and private insurance submit CAHPS responses to the NCQA and state Medicaid agencies as part of performance monitoring. Health insurance companies seem to be particularly active in promoting access and quality for preventive services such as immunizations and managing chronic diseases by coordinating with providers and communicating with enrollees through informational flyers and prompts. These efforts tend to be targeted to a few conditions such as obesity and diabetes.

These findings suggest that, while there is some association between health insurance competition and consumers' reported access and satisfaction with their health



plan on some measures, the overall effect is small if it is at all statistically significant. Consumers are not significantly more satisfied with their health plan in more competitive health insurance markets. In times of tight budgets and tough choices, policymakers will likely look to other outcomes besides consumers' access and satisfaction to make policy decisions about health plan market regulation.

## **Limitations**

A strength of this paper is that it builds evidence in a relatively nascent area of inquiry - the relationship of health insurance competition to access to care and quality. This proposed study uses individual-level data with a full set of controls rather than an insurer's aggregated CAHPS score, which may not fully adjust for individual-level factors that are associated with satisfaction and access to care. These characteristics may also be associated with health plan quality, which would bias the results of previous studies. In addition, this proposal includes more recent data than previous studies (by approximately ten years); in an era when health insurance market dynamics have shifted dramatically over the past decade, this newer data provides high policy relevance. This study will include insurance products such as PPOs that have been omitted from previous studies.

Another strength of this proposal is the joint analysis of health insurance competition for the privately insured and Medicaid population. In the Medicaid program, prices are regulated so insurers compete more on quality for enrollees. Therefore, economic theory suggests the effects of competition on quality may be cleaner than in the private market where price plays an important role to consumers and theory is less

specified. In both markets, there largely was no statistically significant effect of health insurance market structure on access to care or consumers' experience with their health plan.

From a statistical perspective, a limitation of the paper is the low prevalence of access problems among the analytic sample. The low prevalence effectively decreases the statistical power of the analysis, making it more difficult to detect significant differences. The general lack of an association was also evident in the analysis of other, more common outcomes, which lends credence to the findings for the less common access problems.

One limitation of this paper relates to the mediation of insurance markets by employers and the state. In commercial health insurance in the US, employers generally determine the health insurance coverage options an individual can select. In the Medicaid program, states solicit bids from insurers and determine which and how many contracts to award. Enrollment is a true measure of competition only in a market where individuals make direct purchasing decisions; enrollment numbers in ESI is an artifact of employer size and how many plans are offered, and Medicaid Beneficiary enrollment based upon the state's decision to select a given number plans may not truly reflect the MMC market structure. In ESI, employers' decisions in the aggregate and the resulting employee enrollment are arguably a decent proxy for the individual market; employers in competitive markets could theoretically choose from lower cost or higher quality plans into which their workers would then enroll. These plans are competing for contracts with employers, and thus the benefits of these plans would reflect the competitive nature of the

insurance and hospital markets. The extension to Medicaid, where a state and its MMC contract decisions are “the only game in town” could be more problematic in using enrollment as a measure of competition.

An additional limitation of this paper is the use of the HHI as the predominant measure of market concentration. While this measure is commonly used both in regulatory practice and published literature, it has documented shortcomings and does not capture important aspects of the level of competition in markets such as barriers to entry. To the extent the HHI is an incomplete measure of market competition, these results could be biased toward the null.

# **Paper 3: Are Consumers Who Have a Choice in Health Plans More Satisfied?**

## **Abstract**

This study examines whether individuals who have a choice in health plans at their current job report having a better experience with their health plan, better access to care, or a lower out-of-pocket percentage of their medical expenditures. We use data from the Medical Expenditure Panel Survey from 2003-2009 as well as data from the Area Resource File. Our sample includes respondents with private group coverage (N=114,030). In this sample, 25.6% of individuals were offered a choice in plans at their current main job. Our empirical model adjusted for individual and local market factors associated with relevant outcomes and included state fixed effects. We find that individuals with a choice in plans have a very small, but statistically significantly higher overall satisfaction, rating their plans 0.08 points higher on a ten point scale. Among those who used a plan's administrative services like calling customer service, filling out plan paperwork, getting approval for treatment, or finding plan information, those with a choice in plans were less likely to report having any problem when using that service (OR 0.91,  $p < 0.017$ ). On most measures of access to care, those with a choice in plans reported equal access to those without a choice, though those with a choice were less likely to have no usual source of care other than an ER. On the other hand, those with a choice reported higher odds of not getting or delaying care relative to those without a choice in plans (OR 1.21,  $p < 0.003$ ). People with a choice in plans have a lower OOP

percentage for total medical expenditures than those without a choice; however, there was no significant difference for office visit or prescription drug expenditures. These findings are consistent with the theory that individuals with a choice in plans can better maximize their utility than those without a choice in plans, though the overall effect was small.

## **Background**

Over the past several decades, the percentage of employers offering their workers a choice in health plans has increased. For example, the percentage of private sector firms that offer more than one health plan option to its employees has doubled in the last 15 years: in 1996, about 21.5% of firms offered two or more options, rising to 42.6% in 2012, though some employees who work for a firm that offers multiple options may be ineligible for coverage or limited to one plan due to part-time status or other eligibility restrictions (Agency for Healthcare Research and Quality (AHRQ) 2013). However, recent evidence suggests this trend may be slowing; in 2013, a Towers Watson survey of companies with 1,000 or more employees with the National Business Group on Health found that nearly 15% of companies offered only a high-deductible plan with a savings account, up from 7.6% in 2010. At the same time, the establishment of new state-based and federally-facilitated health care marketplaces under the Affordable Care Act (ACA) will create a new venue for purchasing health coverage that offers multiple options for those seeking coverage.

In light of these changes in the health care system, this study examines whether individuals who are offered a choice in health plans report higher satisfaction with their

health care plan, better access to care, or lower out-of-pocket spending than those without a choice in plans. Previous research found that the overall level of market competition, expressed as an HHI, is not generally associated with access, consumer experience, and the OOP percentage of health spending (Shartzler 2013) (Scanlon D. , Swaminathan, Lee, & Chernew, 2008). This study examines whether competition at the individual level—expressed as whether an individual has a choice between health plans—is more strongly associated with consumer experience with their health plan, access to care, or the out-of-pocket (OOP) percentage of health spending.

Several previous studies have examined whether having a choice in health plans affects satisfaction. In an early study of the impact of managed care choice based on a 1994 survey of 3,000 nonelderly adults in Boston, Los Angeles, and Miami, Davis and colleagues found that managed care enrollees without a choice in plans were twice as likely to rate their plan as fair or poor compared to individuals with a choice between managed care and FFS (Davis, et al. 1995). Using data from 1994 and 1995 telephone surveys of about 1,000 adult enrollees in Dallas, Houston, Atlanta, and Washington, D.C., Ullman and colleagues found that individuals with a choice in health plans were more satisfied than those without a choice, regardless of whether the individual selected a Health Maintenance Organization (HMO) or Fee-for-Service (FFS) coverage (Ullman, et al. 1997). In logistic regressions examining the association between choice and a dichotomous satisfaction measure, plan choice and health status were significantly related to satisfaction while other demographic variables were not. Schone and Cooper examined the 1996 Medical Expenditure Panel Survey (MEPS) and found that 41% of all

workers had a choice in plans from their own employer, rising to 55% when other sources of insurance such as a spouse were included (Schone and Cooper 2011). In multivariate regressions controlling for individual characteristics, this study found that plan choice was associated with an increase in the likelihood of feeling that the family's health needs were being met; the coefficient for having a usual source of care positive but was not significant at the 5% confidence level. The authors noted wide geographic variation in plan choice, with individuals in rural areas more likely to have only one plan option. Our methodology attempts to overcome some of these geographic differences by using restricted MEPS data with geographic identifying information to include local area fixed effects to control for time-invariant unobservable characteristics at the state level, including urban and rural differences in availability of plan choice.

Taken together, these studies suggest that health plan choice is positively associated with consumer satisfaction. In the years since the data for these studies were collected, the health insurance marketplace has changed. The managed care "backlash" has ushered in an era of less restrictive managed care products, so those individuals without a choice in health plans may exhibit higher baseline satisfaction levels. If the reference satisfaction levels have risen among those without a choice, we could observe a smaller marginal effect of plan choice on satisfaction. In addition, the percentage of employers offering more than one plan option has increased appreciably, and so the demographic profile of individuals with a choice in plans may have shifted. This study expands upon these previous studies by using multiple years of data from MEPS that

reflects a more current health insurance environment, geographic information to control for local area characteristics, and a range of outcome measures salient to consumers .

This study focuses on the ways in which having a choice in health plans affects individual experiences with health plans and access to care; we do not assess the net effects on an employer of offering more than one plans, such as adverse selection or the effects on total health insurance premiums. Research on the aggregate employer effects have generally found that reductions in premiums through plan competition are counterbalanced by losses due to adverse selection (Cutler and Reber 1998) or a switch from family to single coverage and less generous benefits ( (M. K. Bundorf 2003). In a setting with workers of varied risk, employers may establish varied contribution amounts to stabilize the risk pools for multiple plan options and minimize the effects of adverse selection (Cutler and Reber 1998), (Pauly and Herring 2000).

### **Conceptual Model**

This study uses a conceptual framework of utility maximization which postulates that people will choose plans that best meet their anticipated needs, such as minimizing premiums, lowering out-of-pocket (OOP) payments, choosing plans that include providers they might need, having coverage for needed services, and other factors that could matter to them. Those individuals without a choice in plans do not have the opportunity to maximize utility, and so we expect their realized utility to be lower. In this study, we conceptualize utility in several dimensions: consumer experience with their plan, including overall satisfaction and the presence of administrative problems; access to care, reflecting an individual's ability to access the providers he or she needs in a timely



fashion; and the percentage of spending on select medical services that is paid out of pocket, based on the theory that a higher OOP percentage reflects more spending on out-of-network providers or for services the plan does not cover.

The utility maximization framework is commonly used in the literature on consumers' choice of health plans (Scanlon, Chernew, and Lave 1997). In a more recent review, Kolstad and Chernew (2009) also adopt a utility maximization model from neoclassical economics, in part because much of the literature regarding quality and consumer choice of health plans is based on the empirical expression of this model. In this utility maximization model, rational consumers are presumed to determine their best option given the information available to them. Consumers base their enrollment choice on the attributes of each plan option, including price and quality. Individuals understand the various attributes of health plan options (premiums, out-of-pocket cost sharing, provider networks, etc) and how they value those attributes. This study applies the framework of utility maximization while being mindful that the choices available to an individual are generally determined a sponsor (primarily employers) who select one or more candidate health plans from the open market and determine the employees' financial contribution for each health plan (Enthoven 1993).

### **Previous Literature**

Much of the literature on consumers' choice of health plans focuses on factors that determine which health plan a consumer selects. Scanlon and colleagues (1997) separate these factors into primary factors—those that are related directly to the plan, such as price, quality, provider networks, and benefits—as well as secondary factors

related to the characteristics of the individuals choosing the health plans such as health status and risk preference, characteristics of the environment, and other variables that may influence the weight placed on plan attributes in the selection process. This line of inquiry requires ample information about the plan options available to consumers that often exceeds what is available in national datasets and surveys, and so these studies focus on large employer group or natural experiments on a smaller scale, such as a city or university. While this limits the generalizability of the research, these studies are very useful in identifying factors that should be included in models addressing health plan choice.

Early research on consumer choice of health plans focused on price and found consistently that price is significantly and negatively related to the probability of enrolling in a health plan (Buchmuller and Feldstein 1996), (Long, Sette and Wrightson 1988) (Short and Taylor 1989) (Welch 1986) (McGuire 1981) (Marquis and Long, Worker demand for health insurance in the non-group market 1995) (Feldman, et al. 1989). Studies define price in varied ways, including the total premium cost, the employee share of the premium, or the plan's loading fee, which represents the cost of the plan above the actuarially fair value.

When making a plan selection, consumers likely focus on prices that are most meaningful to them like premiums and cost sharing provisions. Barringer and Mitchell analyzed data from a large manufacturing firm in which employees were offered four health insurance options and found that employees moving away from traditional FFS preferred a higher premium plan with lower cost-sharing requirements than a lower-

premium, lower coverage option (Barringer and Mitchell 1994). Admittedly, many of these studies are old and the health insurance market has shifted from HMOs and FFS plans to one with more product options such as PPOs and consumer-directed health plans, but these findings have persisted in more recent studies with diverse plan options (Marquis, Buntin, et al. 2007), (Parente, Feldman and Christianson 2004). Naessens and colleagues use a 2004 natural experiment at the Mayo Clinic in Rochester to assess the interaction between health status, premium, and copayments in health plan choice. This study found that overall 62% of employees chose a high-premium, low cost-sharing plan option over a plan with a lower premium and higher cost-sharing and that older individuals, those with higher previous-year health expenditures, and those with more comorbidities were more likely to enroll in the high premium option (Naessens, et al. 2008). Thus, consumers make tradeoffs between the “price” of the premium and the “price” of care at the point of service determined by plan cost-sharing requirements, and an individual’s expected health expenditures is an important mediator of this tradeoff.

A number of more recent studies have examined the role of plan quality in consumers’ health plan selections, summarized in a review by Kolstad and Chernew (2009). While information on premiums and copayment requirements may be relatively straightforward for most consumers to understand, a plan’s quality is multidimensional, often includes many different measures, and may be more difficult for consumers to comprehend. To help convey plan quality information to employers making plan decisions for their workforce as well as consumers, the National Committee for Quality Assurance (NCQA) developed the Healthcare Effectiveness Data and Information Set

(HEDIS). This effort focuses on several broad areas of plan performance: process-oriented quality of care, access to care, and member satisfaction. HEDIS uses data collected from medical and administrative records as well as consumer information collected through the Consumer Assessment of Healthcare Providers and Systems (CAHPS) survey. Many empirical studies use a plan's HEDIS and CAHPS score as the measure of the plan's quality, and this is often the type of information provided to consumers in studies of the effect of providing quality information about plans to consumers.

A number of studies have found a positive and statistically significant response to quality after report card information is released. Wedig and Tai-Seale (2002) examined the effects of report cards on federal employees in 1995 and 1996 and found that plan rating significantly influenced employees' enrollment. These findings are consistent with Beaulieu's study of Harvard University employees (Beaulieu 2002); Scanlon and colleagues found that General Motors employees were responsive to overall quality indices, but not specific quality measures (D. Scanlon, et al. 2002). Quality information is relevant to the employers who determine the health plan choices available to their workforce as well, as evidenced in a study by Chernew and colleagues that found employers were more likely to offer insurance plans with higher absolute and relative HEDIS and CAHPS scores (Chernew, Gowrisankaran, McLaughlin, & Gibson, 2004). In addition, several studies demonstrate that consumers choose higher quality plans even when formal information is not provided, perhaps on the basis of informal plan reputation such as office chatter about which of the employers' plans is best. For example, Dafny

and Dranove found that Medicare HMO enrollees tended to switch into higher quality plans even without report cards (Dafny and Dranove 2005). Jin and Sorenson (2006) estimate the association between both published and unpublished plan quality information on enrollment decisions and find that both types of quality information are positively and significantly associated with enrollment. In general, the impact of quality on plan choice was concentrated on a small number of enrollees in these studies and fewer than 10% of enrollees switched plans.

Consumers also view the breadth of the provider network as an important aspect of plan quality (Beaulieu 2002), (Feldman, et al. 1989). Bundorf conceptualizes the breadth of the provider network as one component of plan generosity. She found that employers were responsive to employees' preferences for plan generosity in the health plans they selected for their workforce, though the effect was small (M. Bundorf 2002). In a survey of privately insured nonelderly adults in Los Angeles, Harris found that individuals were willing to trade higher quality for increased restrictions on the provider network, but the differences in quality needed to be large in order to sway consumers (Harris 2002).

The new contribution of this study is to examine whether individuals who have a choice in health plans report higher satisfaction report better experiences with the plan, better access to care, or lower out-of-pocket expenditures than those individuals who do not have a choice in plans. Based on the research, we presume individuals with a choice will seek to minimize premiums and out of pocket payments and maximize quality and the network of providers they might need, making some tradeoffs among plan elements

based on preferences and individual characteristics. Privately insured individuals who do not have a choice in plans do not have the same opportunity to express those preferences in a plan selection, so we expect their satisfaction and access to be lower with higher out-of-pocket spending because they cannot select their preferred panel of in-network providers. This study will inform employers establishing benefit packages for their workforce, particularly those considering offering two or more health plans or only one health plan option, whether employees report greater satisfaction under one of the two scenarios. It also has implications for those serving as “sponsors” of insurance markets such as the health insurance marketplaces established under the Affordable Care Act, Medicare Advantage, Medicaid managed care, etc., in terms of the importance of providing a choice in plans to an individual. As the marketplaces are implemented and the participation of insurers remains in flux for several years, policymakers may enact or regulate changes that make it easier for people to have and exercise a choice in health plans. In addition, while most Medicare Advantage and Medicaid managed care enrollees do have a choice in health plans, MMC beneficiaries living in rural areas may not have a choice in plans.

## **Methods**

### **Data**

This study uses data from the Medical Expenditure Panel Survey (MEPS) from 2003 to 2009 to estimate the association between having a choice in health plans and self-reported satisfaction with their health plan. The MEPS Household Component (HC) is a survey of the US non-institutionalized population conducted by the Agency for

Healthcare Research and Quality each year that collects information on demographic characteristics, health conditions, health status, use of medical services, charges and source of payments, access to care, satisfaction with care, health insurance coverage, income, and employment. MEPS has a panel design in which each panel is interviewed five times (“rounds”) over the course of two years, allowing for some full calendar-year estimates that combine two panels as well as longitudinal analysis that examine changes within the panel over two years. Some question sets, including the “Satisfaction with Plans” and “Access to Care” sets, are only asked in certain rounds. In each year since 2003, MEPS interviewed approximately 12,000 families representing more than 30,000 individuals.

In addition to MEPS, this study includes local market characteristics from the Area Resource File and market competition measures based on data from HealthLeaders-Interstudy, the Centers for Medicare and Medicaid Services (CMS), and the American Hospital Association. The Area Resource File is a collection of data from more than 50 sources published annually by the Health Resources and Services Agency (HRSA). It provides county-level statistics on the supply of health care facilities, health professionals, health care utilization and expenditures, and population demographics and economic characteristics. The American Hospital Association Annual Survey database includes survey responses and AHA membership information on organizational structure, facility and service lines, inpatient and outpatient utilization, expenses, physician arrangements, staffing, corporate and purchasing affiliations, teaching status, and geographic indicators for about 6,500 hospitals each year. This study uses

HealthLeaders-Interstudy data providing plan by county-level managed care enrollment information for HMOs, PPOs, managed Medicare, and managed Medicaid plans for 2003-2009.

## **Measures**

MEPS includes a question asking whether the individual has a choice of health plans at his or her current main job. This question serves as the independent variable of interest in this study. This question is asked in each round of the MEPS, and the survey instrument includes a “determined in previous round” response category for rounds 4/2 and 5/3 along with responses of individuals newly eligible to answer the question in that round. To address this, we create a variable measuring whether the respondent ever reporting having a choice in health plans at their current main job across the various rounds of the survey.

The questions in the MEPS “Satisfaction with Plans” section, which serve as the primary outcome measures in this study (Table 1), are based on the Consumer Assessment of Health Plans questions developed at ARHQ with researcher support. There is a wealth of literature on the validity and measurement properties of CAHPS, much of which is synthesized in a 2005 analysis by Mathematica (Lake, Kvam and Gold 2005). More than 90% of U.S. health plans use CAHPS, which as mentioned serve as an important part of health plan report cards created by NCQA alongside HEDIS measures. CAHPS questions address ease of access to medical care, the need to seek approval for medical treatments and delays in care experienced while waiting for approval, ease of access to understandable plan information and repercussions of poor access, need to



complete paperwork and problems filling out paperwork, and an overall rating of the health plan. Some of the CAHPS questions ask whether the family experienced a big, small, or no problem using an administrative health plan service; however these questions are asked only of a subset of MEPS respondents conditional on seeking or using a particular service. For example, only those who called their health plan's customer service are asked whether they had a problem getting help from customer service. To address the small sample size for these conditional questions, we combine responses into one summary measure of having any administrative problem, conditional on needing administrative help like calling customer service, looking for plan information, needing approval for treatment, or completing (Table 35). MEPS data also document the respondent's out of pocket (OOP) share of total expenditures for certain medical services including inpatient, outpatient, office visits, emergency room services, prescription drugs, and total medical expenditures. While total out of pocket spending on selected services represents both price and quantity, the respondent's OOP share of expenditures is more a reflection of health plan generosity and removes quantity from the measure.

Certain services such as inpatient hospitalizations have low OOP cost-sharing requirements and are less prevalent in the population, and thus there are many null values in the dataset with little variation around the small OOP mean percentages that are observed. More routine and less expensive services such as office visits and prescriptions show wider variation around the mean and are observed for more respondents, and so these two variables along with the OOP share of total medical expenditures serve as outcome measures demonstrating whether individuals with a choice in health plans report

a lower OOP share of expenditures than individuals who do not have a choice.

<b>Table 35: Outcomes Measures for Choice in Plans Analysis</b>		
	Variable Format & Response Categories	
Any Administrative Problem: <i>(any of below)</i>	Dichotomous	
Getting help from customer service	Not a problem	A small problem; a big problem
Finding information on the plan	Not a problem	A small problem; a big problem
Waiting for approval for a treatment	Not a problem	A small problem; a big problem
Problem with plan paperwork	Not a problem	A small problem; a big problem
Any problem getting a personal doctor	Not a problem	A small problem; a big problem
Overall plan rating	Linear (0-10)	
Difficult to reach USOC	Not at all difficult; a little difficult	Somewhat difficult; very difficult
Delayed/did not get health care	Dichotomous	
Delayed getting necessary health care	No	Yes
Unable to get necessary health care	No	Yes
No USOC other than an ER	Dichotomous	
Has USOC	Has USOC	No USOC
USOC type of place	Hospital clinic; non-hospital place	Hospital ER
Takes 30+ minutes to reach USOC	Dichotomous <15 minutes; 15-30 minutes	Takes 31-60 minutes, 61-90, 91-120, more than 120 minutes
OOP % of Office Visit expenditures	Linear (0-1)	
OOP % of Prescription expenditures	Linear (0-1)	
OOP % of total medical expenditures	Linear (0-1)	

In addition, individuals--particularly for those with chronic health needs—may choose between health plans on the basis of its provider network. To assess whether those with a choice in health plans experience a more optimal provider network than individuals without a choice, we assess measures of access to care including whether the respondent has a usual source of care, whether they delayed or did not get care, the time

it took to get to their usual source of care, and whether the respondent had trouble getting a personal doctor.

### **Statistical Model**

The study design is a longitudinal analysis of cross-sectional data, employing multivariate statistical regressions. We conducted analyses of dependent variables measuring access to care, health plan satisfaction, or OOP expenditures  $Y_{pmt}$  for person  $p$  with their health plan in market  $m$ . We use a reduced-form model that expresses an individual's reported experience with her health plan and access to care  $Y_{pmt}$  as a function of having a choice in health plans  $C_{mt}$ , individual demographic and characteristics and time-varying local market factors  $X_{pmt}$ , state fixed effects  $\lambda_m$ , and an error term as expressed in general form in Equation 1. The functional form of the equation (for example, logistic or linear multivariate regression) depends on the outcome of interest.

#### **Equation 4:**

$$f(Y_{pmt}) = \alpha + \beta C_{mt} + \gamma X_{pmt} + \lambda_m + \varepsilon_{pmt}$$

Our model controls for individual and local market characteristics that are associated with satisfaction with health plans and access to care (Morales, et al. 2001) (Zaslavsky, et al. 2001) (Lurie, et al. 2003) (AHRQ 2012). Individual-level characteristics in our model include age (in years), gender, marital status (married vs. others), total personal income (in dollars), education (in years), race/ethnicity (indicators for African American, Hispanic, American Indian/Alaska Native, Native Hawaiian/Pacific Islander, and multiracial), and self-reported physical and mental health

status (5-point Likert scales with 1=excellent health and 5=poor health). When possible, we retained the linear expression of MEPS variables such as age and income in the statistical model and used categorical variables when linear was not feasible. The local market variables included as controls in the model are MSA-level rural/urban status, median household income, total physicians per 10,000 individuals, total specialists per 10,000 individuals, the number of hospitals per 100,000, the number of hospital admissions per 100,000, the percentage of hospitals that are for-profit, and the average total family health insurance premium. For all variables except the family premium, we created MSA-level weighted averages of county statistics, with the county population as the weight. We use restricted-access MEPS data with geographic identifying information and thus can include state fixed effects to account for time-invariant unobserved characteristics that may influence access to care and patient satisfaction, such as cultural attitudes toward health plans and state insurance regulations or provider licensing policies that could affect access, OOP expenditures, or consumer experience with the plan.

### **Sample**

We include in our analytic sample individuals with employer, union, or other group private insurance coverage who were eligible for the Satisfaction with Plans questions and did not have Medigap insurance. Respondents were eligible for the Satisfaction with Plans questions if someone in the reporting unit was covered by the plan on the date of the interview and the insurance was hospital/physician or Medicare supplemental coverage. We exclude individuals who were out of scope for the entire reference period (for example, those who were living in an institution). Table 36 shows

sample statistics (for all years) by whether the respondent had a choice in their health plan as well as sample sizes by year.

<b>Table 36: Unweighted MEPS Sample Characteristics</b>			
	<b>Privately Insured with a Choice in Plans at Current Main Job</b>	<b>Privately Insured without a choice in plans</b>	<b>Total</b>
N	27,605	86,425	114,030
% Female	52.9	51.7	51.4
% Married	65.1	44.6	49.6
% With More than HS Degree	67.4	34.3	42.9
% Hispanic	14.4	17.6	27.0
% Black	16.4	14.3	12.3
% American Indian/Alaska Native	0.6	0.7	0.7
% Asian	6.5	6.0	6.3
% Native Hawaiian/Pacific Islander	0.6	0.4	0.4
% Multiracial	1.5	2.2	1.9
% in Excellent or Very Good Physical Health	65.7	68.2	67.6
% in Excellent or Very Good Mental Health	75.1	75.6	75.5
Mean age	42.7	32.9	35.3
Mean personal income	\$51,638	\$21,963	\$29,148
Mean Rural/Urban Continuum Code	1.41	1.47	1.45
Mean Local Median Household Income	\$44,688	\$43,929	\$44,121
Mean MDs per 10,000	21.7	21.5	21.6
Mean Specialists per 10,000	6.9	6.9	6.9
Hospitals per 100,000	1.2	1.2	1.2
Mean Hospital Admissions per 1,000	118.3	121.0	120.3
Mean % For-profit hospitals	21.0	21.5	21.4
Mean MSA total family premium	\$11,292	\$11,215	\$11,235
<b>Sample Size by Year</b>			
2003	3,851	12,965	16,816
2004	3,839	12,642	16,481
2005	3,795	12,593	16,388

2006	4,001	12,437	16,438
2007	3,856	11,305	15,161
2008	4,040	11,753	15,793
2009	4,223	12,730	16,953

## Results

In the MEPS sample, 26% of respondents had a choice in health plans at their current main job and 74% did not have a choice. Those who had a choice tended to be older, married, more educated, and have a higher average personal income. The health status and local area characteristics was similar across the two groups. The proportion of respondents with a choice in plans remained consistent over 2003-2009.

### Global Plan Rating

Overall, privately insured respondents reported being satisfied with their health plan, giving it a 7.86 on average on a scale of 1-10. The average ratings were similar for those with and without a choice in health plans (mean rating of 7.86 for both). In the full linear model examining the relationship between having a choice in health plans and global satisfaction, we find a positive association between having a choice in health plans and rating a plan higher (Table 3). All other things equal, those with a choice in plans rated their health plan 0.08 points higher on a ten point scale. Other significant factors associated with a higher plan rating include age and Hispanic ethnicity, while worse physical and mental health status was associated with lower plan ratings. Each additional year in age was associated with a slightly higher rating (0.0037), and Hispanics rated their plans 0.2 points higher on average than non-Hispanics other factors held constant. These findings are consistent with the published literature (Kolstad and Chernew 2009).

<b>Table 37: Linear Regression Results for Global Plan Rating as a function of Having a Choice in Plans</b>						
Plan Rating	Coefficient	Linearized Std. Error.	t	P> t	95% Conf. Interval	
Had a Choice in Plans	0.0831	0.0237	3.51	0	0.0366	0.1296
Male	0.0013	0.0140	0.09	0.928	-0.0263	0.0289
Age	0.0037	0.0008	4.47	0	0.0021	0.0053
Not married	-0.0260	0.0234	-1.11	0.267	-0.0720	0.0200
Years of education	-0.0051	0.0036	-1.42	0.156	-0.0121	0.0019
Total personal income	0.0000	0.0000	1.42	0.157	0.0000	0.0000
Hispanic Ethnicity	0.2140	0.0427	5.01	0	0.1300	0.2980
Black	0.0539	0.0396	1.36	0.174	-0.0239	0.1317
Asian	-0.0258	0.0511	-0.5	0.614	-0.1261	0.0746
Other	0.0994	0.0757	1.31	0.19	-0.0494	0.2481
Health Status	-0.0919	0.0147	-6.26	0	-0.1208	-0.0631
Mental Health Status	-0.1072	0.0151	-7.11	0	-0.1368	-0.0775
<b>MSA-level Market Characteristics</b>						
Rural-urban Continuum code	-0.0722	0.0269	-2.68	0.008	-0.1251	-0.0192
Median HH Income	0.0000	0.0000	0.49	0.626	0.0000	0.0000
Total MDs per 10,000	-0.0003	0.0033	-0.09	0.928	-0.0068	0.0062
Total Specialists per 10,000	0.0004	0.0031	0.14	0.886	-0.0056	0.0065
Hospitals per 100,000	0.0300	0.0471	0.64	0.524	-0.0626	0.1227
Hospital Admissions per 1,000	0.0007	0.0009	0.8	0.425	-0.0011	0.0025
For-profit hospital %	-0.0001	0.0011	-0.07	0.946	-0.0023	0.0022
Total premium for single coverage	0.0002	0.0000	5.05	0	0.0001	0.0002
_cons	6.9643	0.2084	33.41	0.000	6.5547	7.3740
Note: State fixed effects not shown.						

To address potential skewness in the data with most respondents rating his or her health plan highly, we estimated a two-part model that estimated the probability a respondent rated the plan a “10” based on demographic characteristics and then estimated the association between choice and global ratings, conditional on rating the plan less than 10. We also estimated the association with a Heckman model (Heckman 1979). Both models are similar in their two-part structure: the first “selection” stage uses a probit

model to predict the odds of selection based on covariates, in this case the odds of rating the plan a “10”. The second phase uses OLS linear regression to model the outcome based on another set of covariates for those observations in the set, in this case those rating their plan less than 10. The two part model assumes there is no correlation between the error terms of the two stages (Breen 1996). In both specifications, the findings regarding the significance and magnitude of the coefficient on plan choice were robust—in the two part model, the coefficient was 0.0939 ( $p < 0.01$ ) and it was 0.0972 ( $p < 0.01$ ) in the Heckman specification.

### **Experience with Plan**

Among those who sought administrative services from their health plan such as needing approval for treatment, seeking information on how the plan works, calling customer service or the plan administration, or filling out paperwork for the plan, about a third (34.7%) reported having any administrative problem when seeking the service. This percentage was not statistically different for those who had a choice in plans (33.5%) and those who did not have a choice (35.2%). In the full logistic regression model, individuals with a choice in health plans were less likely to report an administrative problem such as problems finding plan information, getting help from customer service, or waiting for approvals, than those without a choice (Table 38). Those in worse health, particularly those in worse mental health (OR 1.18,  $p < 0.01$ ), were more likely to report an administrative problem. Older individuals, unmarried individuals, Hispanics (relative to non-Hispanics), and Blacks (relative to whites) were less likely to report an administrative problem. Previous research found that Hispanics tend give a higher



proportion of “10”s than non-Hispanics and caution that some of the differences in plan ratings may stem from different response styles rather than a superior experience with their health plan (Weech-Maldonado, et al. 2008).

Any Administrative Problem	Odds Ratio	Std. Err.	t	P> t	[95% Conf.	Interval]
Had a Choice in Plans	0.9190	0.0323	-2.4	0.017	0.8577	0.9848
Male	1.0165	0.0219	0.76	0.447	0.9744	1.0605
Age	0.9919	0.0014	-5.81	0	0.9891	0.9946
Not married	0.9181	0.0391	-2.01	0.045	0.8443	0.9982
Years of education	1.0084	0.0046	1.83	0.068	0.9994	1.0176
Total personal income	1.0000	0.0000	0.42	0.677	1.0000	1.0000
Hispanic Ethnicity	0.6676	0.0490	-5.5	0	0.5778	0.7713
Black	0.6105	0.0422	-7.14	0	0.5329	0.6994
Asian	0.9417	0.0911	-0.62	0.535	0.7786	1.1389
Other	1.0826	0.1247	0.69	0.491	0.8633	1.3577
Health Status	1.0704	0.0225	3.23	0.001	1.0270	1.1156
Mental Health Status	1.1758	0.0271	7.03	0	1.1237	1.2302
MSA-level Market Characteristics						
Rural-urban Continuum code	0.9933	0.0459	-0.15	0.884	0.9071	1.0877
Median HH Income	1.0000	0.0000	-0.48	0.633	1.0000	1.0000
Total MDs per 10,000	0.9965	0.0049	-0.73	0.466	0.9870	1.0060
Total Specialists per 10,000	1.0038	0.0055	0.7	0.485	0.9931	1.0146
Hospitals per 100,000	0.9318	0.0602	-1.09	0.275	0.8206	1.0581
Hospital Admissions per 1,000	1.0002	0.0016	0.12	0.906	0.9970	1.0034
For-profit hospital %	1.0020	0.0019	1.07	0.285	0.9983	1.0058
Total premium for single coverage	1.0000	0.0001	-0.76	0.449	0.9998	1.0001
cons	0.7531	0.2641	-0.81	0.419	0.3780	1.5005

Note: Among those who needed administrative services. State fixed effects not shown.

### **Access to Care**

In the MEPS privately insured sample, 3.4% of respondents reported delaying or not getting needed health care, including 4.3% of those with a choice in plans and 3.2% of those without a choice. In the full logistic regression model, individuals with a choice

in health plans had a higher odds of delaying or not getting care (Table 39). This finding is contrary to our overarching hypothesis that those with a choice in plans will report better outcomes, but is consistent with at least one previous study in the Medicaid population which found a lower proportion of MediCal beneficiaries with twelve months of continuous coverage in counties with a choice in plans compared to beneficiaries without a choice and higher rates of ambulatory care sensitive hospitalizations among beneficiaries with a choice in plans (Millett, Chattopadhyay and Bindman 2010).

Delayed or Did Not Get Care	Odds Ratio	Linearized Std. Err.	t	P> t	[95% Conf. Interval]	
Had a Choice in Plans	1.2057	0.0749	3.01	0.003	1.0671 1.3622	
Male	0.7600	0.0361	-5.77	0	0.6922 0.8344	
Age	0.9957	0.0016	-2.72	0.007	0.9927 0.9988	
Not married	1.5583	0.0946	7.31	0	1.3832 1.7557	
Years of education	1.0654	0.0081	8.35	0	1.0496 1.0814	
Total personal income	1.0000	0.0000	-2.54	0.011	1.0000 1.0000	
Hispanic Ethnicity	0.6808	0.0677	-3.87	0	0.5600 0.8277	
Black	0.6064	0.0462	-6.56	0	0.5221 0.7044	
Asian	0.4951	0.0640	-5.44	0	0.3841 0.6382	
Other	1.0473	0.1371	0.35	0.724	0.8097 1.3547	
Health Status	1.6889	0.0558	15.85	0	1.5827 1.8023	
Mental Health Status	1.1921	0.0375	5.58	0	1.1205 1.2682	
<b>MSA-level Market Characteristics</b>						
Rural-urban Continuum code	0.9426	0.0528	-1.05	0.292	0.8443 1.0524	
Median HH Income	1.0000	0.0000	-0.35	0.728	1.0000 1.0000	
Total MDs per 10,000	1.0076	0.0056	1.37	0.171	0.9967 1.0187	
Total Specialists per 10,000	0.9761	0.0061	-3.87	0	0.9641 0.9881	
Hospitals per 100,000	1.0703	0.0950	0.77	0.445	0.8989 1.2744	
Hospital Admissions per 1,000	0.9981	0.0018	-1.06	0.291	0.9946 1.0016	
For-profit hospital %	0.9957	0.0026	-1.66	0.097	0.9907 1.0008	
Total premium for single coverage	0.9998	0.0001	-1.95	0.051	0.9997 1.0000	
_cons	0.0037	-0.0018	11.69	0	0.0015 0.0096	
Note: State effects not shown.						

About one in six respondents (15.6%) reporting having no USOC other than an emergency room. Individuals with a choice in health plans were less likely to report having no USOC other than an ER (OR 0.878,  $p < 0.01$ , Table 40). On average, 6.7% of respondents reported any problem finding a doctor with whom they were happy. Individuals with a choice in health plans were not statistically significantly more likely to report a problem finding a doctor (1.066,  $p < 0.145$ ) than individuals without a choice. There was no statistically significant difference between those with and without a choice in health plans in the odds of it taking thirty or more minutes to reach the respondent's USOC (0.991,  $p < 0.849$ ), nor was there a statistically significant difference in the odds of reporting it was somewhat or very difficult to reach the respondent's USOC (0.995,  $p < 0.448$ ).

<b>Table 40: Logistic Regression Results for Having No USOC other than an ER</b>						
No USOC Other than an ER	Odds Ratio	Linearized Std. Err.	t	P> t	[95% Conf. Interval]	
Had a Choice in Plans	0.8778	0.0310	-3.7	0	0.8190	0.9408
Male	1.6975	0.0446	20.14	0	1.6121	1.7875
Age	0.9768	0.0013	-18.23	0	0.9744	0.9793
Not married	1.2395	0.0466	5.72	0	1.1513	1.3345
Years of education	1.1620	0.0052	33.26	0	1.1517	1.1723
Total personal income	1.0000	0.0000	0.02	0.983	1.0000	1.0000
Hispanic Ethnicity	1.8180	0.0995	10.92	0	1.6326	2.0244
Black	1.4330	0.0716	7.2	0	1.2990	1.5807
Asian	1.6828	0.1096	7.99	0	1.4806	1.9127
Other	1.1181	0.1356	0.92	0.358	0.8810	1.4189
Health Status	0.8910	0.0173	-5.93	0	0.8575	0.9257
Mental Health Status	1.0393	0.0203	1.97	0.049	1.0002	1.0801
MSA-level Market Characteristics						
Rural-urban Continuum code	0.9657	0.0426	-0.79	0.43	0.8855	1.0532
Median HH Income	1.0000	0.0000	3.08	0.002	1.0000	1.0000
Total MDs per 10,000	0.9875	0.0042	-2.95	0.003	0.9792	0.9958
Total Specialists per 10,000	1.0072	0.0037	1.96	0.051	1.0000	1.0144
Hospitals per 100,000	1.0830	0.0846	1.02	0.308	0.9289	1.2626
Hospital Admissions per 1,000	1.0034	0.0012	2.71	0.007	1.0009	1.0058
For-profit hospital %	1.0006	0.0015	0.4	0.686	0.9976	1.0037
Total premium for single coverage	1.0000	0.0000	0.98	0.33	1.0000	1.0001
_cons						
Note: state effects not shown						

To explore why the results for delaying or not getting care appear incongruent with the rest of the access to care results suggesting those with a choice had equal or better access to care than those without a choice, we assessed the follow-up questions in the MEPS survey that question why the respondent delayed or did not get care. The most commonly cited reason for not getting care was cost (12.5%, Table 41), while the most

common reason for delaying care was “other” (37.2%), with a similar percentage citing cost as a reason (13.6%).

	Did not get care	Delayed Care
Could not afford care	12.5%	13.6%
Insurance company would not approve/cover/pay	6.1%	8.1%
Doctor refused family insurance plan	0.3%	0.8%
Problems getting to doctor’s office	0.9%	3.2%
Different language	0.1%	0.0%
Could not get time off work	0.8%	3.8%
Don’t know where to get care	0.6%	1.6%
Was refused services	3.8%	2.5%
Could not get child care	0.0%	0.0%
Did not have time or took too long	2.4%	11.0%
Other	6.8%	37.2%
Inapplicable/DK/not ascertained	65.8%	18.2%

### **Out of Pocket Expenditures**

On average, about a quarter (27.3%) of total medical expenditures incurred by privately insured individuals was paid for out-of-pocket, including the statistically similar 27.2% for those with a choice in health plans and 27.4% for those without a choice. The average OOP percentage was 19.7% for office visits and 30.3% for prescription drugs. In comparison, respondents contributed 1.5% on average for ER expenditures and 0.3% out of pocket on inpatient hospital expenditures; the percentages were 13.7% for respondents with an ER visit and 5.3% for those with an inpatient hospital stay. After controlling for individual and local market factors and state fixed effects, having a choice in health plans was associated with a lower OOP percentage for total medical expenditures (Table 42).

There was not a statistically significant difference in the percentage of spending on office visits paid out-of-pocket by respondents (-0.0029,  $p < 0.313$ ). Those in worse physical health had a slightly lower OOP for total medical expenditures, perhaps related to increased utilization of services with lower cost-sharing or alternatively meeting deductible requirements of their plan. Those in worse mental health did report a higher OOP percentage for total medical expenditures, possibly reflecting limitations on coverage for mental health services. The percentage of expenditures on prescription drugs paid out-of-pocket was also not statistically different between those with and without a choice in health plans.

OOP % of Total Medical Expenditures	Coef.	Linearized Std. Err.	t	P> t	[95% Conf. Interval]	
Had a choice in plans	-0.0195	0.0029	-6.67	0	-0.0252 -0.0137	
Male	-0.0203	0.0023	-8.95	0	-0.0247 -0.0158	
Age	0.0002	0.0001	2.7	0.007	0.0001 0.0004	
Not married	0.0253	0.0028	8.94	0	0.0198 0.0309	
Years of Education	0.0040	0.0003	12.58	0	0.0034 0.0046	
Personal Income	0.0000	0.0000	6.01	0	0.0000 0.0000	
Hispanic Ethnicity	-0.0300	0.0041	-7.28	0	-0.0380 -0.0219	
Black	-0.0573	0.0035	-16.15	0	-0.0643 -0.0503	
Asian	-0.0154	0.0057	-2.68	0.008	-0.0267 -0.0041	
Other race	-0.0380	0.0085	-4.46	0	-0.0548 -0.0213	
Physical health status	-0.0161	0.0014	-11.66	0	-0.0188 -0.0134	
Mental Health Status	0.0048	0.0016	3.06	0.002	0.0017 0.0078	
MSA-level Characteristics						
Rural-urban Continuum code	0.0036	0.0029	1.26	0.209	-0.0021 0.0094	
Median HH Income	0.0000	0.0000	0.17	0.863	0.0000 0.0000	
Total MDs per 10,000	0.0010	0.0003	3.02	0.003	0.0003 0.0016	
Total Specialists per 10,000	-0.0011	0.0003	-3.31	0.001	-0.0017 -0.0004	
Hospitals per 100,000	-0.0018	0.0037	-0.49	0.625	-0.0091 0.0054	
Hospital Admissions per 1,000	-0.0002	0.0001	-2.75	0.006	-0.0004 -0.0001	

For-profit hospital %	0.0003	0.0001	2.31	0.021	0.0000	0.0005
Total premium for single coverage	0.0000	0.0000	-4.37	0	0.0000	0.0000
_cons	0.3314	0.0219	15.11	0	0.2882	0.3745
Note: State effects not shown						

In recent years, surveys have suggested that employers are shifting more premium costs to employees in an effort to control health care spending. If this holds true for plan benefit design and effective OOP spending at the point of service as well, a failure to address these temporal changes in patient cost sharing responsibility could bias our findings. To assess whether plan OOP responsibilities changed over time, we modeled the OOP percentage for total expenditures that included individual demographics, local market characteristics, and year fixed effects. Relative to 2003, all coefficients for years were negative and all except 2006 were statistically significant at the  $p < 0.05$  confidence level. This indicates that the effective percentage of total medical expenditures paid by respondents declined over time, all other things equal.

## Discussion

This analysis demonstrates that in general, having a choice in health plans is associated with slightly higher and statistically significant global satisfaction with the plan; those with a choice in plans rated their plans 0.08 points higher on a ten point scale. Individuals with a choice in plans also were less likely to report administrative problems with the plan, other factors held constant. On most measures of access, having a choice in health plans was associated with equal access as those without a choice. There was no significant difference in the travel time or level of difficulty getting to a USOC, nor was

there a difference in having problems finding a doctor the family liked. Individuals with a choice in plans were significantly less likely than those without a choice to face the access challenge of having no USOC other than an emergency room.

On the other hand, having a choice in plans was associated with higher odds of delaying or not getting care. The most common reason for not getting care cited by privately insured individuals with a choice in plans was cost; 6% of those not getting care cited insurance coverage issues as the reason. The most common reason for delaying care was the catchall category of “other”, which unfortunately provides little insight into the higher odds of delaying care associated with having a choice in plans. Neither insurance coverage issues nor provider network issues (e.g. getting to the provider, being refused services, the provider not taking family insurance) were commonly cited reasons for delaying care. Though puzzling, these findings are consistent with a study of choice in California Medicaid managed care by Millett and colleagues that found lower rates of 12-month continuous enrollment for MMC beneficiaries with a choice in plans and higher rates of hospitalization for ambulatory care sensitive conditions. The authors suggest the phenomenon of having a choice in plans was related to delays in enrollment as people struggled to understand and weigh options (Millett, Chattopadhyay and Bindman 2010). Privately insured individuals in this study may have delayed getting care while they decided on a plan or in the transition period waiting for coverage to take effect when switching plans, neither of which are captured in the response categories for reasons why care was delayed or not obtained. The other access questions largely focus on having a USOC, which could plausibly be less affected by delays in enrolling in the



plan. An alternative explanation for delaying or not getting care is that individuals with a choice in health plans may be more aware of the cost sharing requirements associated with seeking care as a result of the decision-making process. Benedetti and colleagues found that patients changed care-seeking behavior to avoid paying copayments as a result of perceived costs; increased perception on the part of those with a choice could bias results away from the null (Benedetti, et al. 2008).

This study finds a negative association between having a choice in health plans and the percentage of total medical expenditures paid out-of-pocket by the consumer, so consumers without a choice paid a higher OOP share, all other things equal. This finding is consistent with the hypothesis that those with a choice can maximize utility, in this case making plan selections to maximize the financial protection insurance provides. However, there was no statistically significant association between OOP spending on office visits or prescription drugs. This could in part reflect standardization of copayments for office visits and prescription drugs (for example, a standard \$20 copay for an office visit across plans) that does not exist for other types of medical services.

One limitation of this study is the lack of information on plan benefits for both groups, but particularly for those individuals who do have a choice in plans at their current main job. To the extent that plan options offered by an employer have standardized benefit packages, as suggested by Scanlon and colleagues (1997), there may not be a real distinction between the available options the employer offers in terms of covered services, cost sharing, or provider networks. This would tend to bias the results toward the null hypothesis. More robust information on plan benefits would also help

control for differences in plan quality between those who have a choice in plans and those who do not.

Another potential limitation of this study is the assumption that consumers are well-informed about the differences between plan options and are motivated to act on that knowledge. A recent survey in the Netherlands found that consumers view switching health plans as overwhelming, do not understand quality information clearly, and often prefer the decision making to a third party (Lako, Rosenau and Daw 2011). If these findings generalize at least in part to the United States, the results in this study would be biased toward the null. Individuals may have a choice of plans in name, but there may be a strong incumbent advantage as consumers avoid the taxing process of selecting and switching plans.

Published research shows that provider networks are important to individuals when making health plan enrollment decisions. While this paper attempts to address the importance of provider networks by assessing access to care, problems finding a personal doctor, and out of pocket spending, a direct question ascertaining the individual's rating of a health plan's provider network would be preferable. Unfortunately, no such question exists in the MEPS. The closest approximation in this study—whether the respondent experienced any problem finding a personal doctor with whom they were happy—found no significant difference between those with and without a choice in plans.

While these findings suggest a positive association for the individual between having a choice in health plans and the outcomes assessed, the magnitude of the coefficients was relatively small though statistically significant. This suggests that

employers considering offering employees a choice in plans may find individual worker satisfaction rise slightly. However, this study does not assess the net effects of offering more than one plan on premiums, risk selection, or other features of the plans since we do not have data on the entire insured population within a firm. In the wake of rising health costs for employers and individuals, the individual benefits of having a choice in plans may be outweighed by the potential cost savings to the employer associated with moving a workforce into a high-deductible plan or otherwise limiting coverage options. More research into the net effects of offering a choice in plans on consumer-reported experiences and access as well as premiums and risk selection would be beneficial.

In addition, it will be helpful to revisit the issue of choice in plans following the implementation of the ACA when workers have access to more group health insurance options outside of their employer. The burdens and benefits of health plan choice will fall more squarely on consumers and small businesses purchasing coverage in the marketplaces. Several factors differentiate the choices available to individuals in the marketplace from those currently available to the privately insured. The marketplace will provide price, benefits, quality, and other information in standard plain language across plans to those making purchasing decisions. Each marketplace will have at least three qualified health plans from which to choose, including a gold, silver, and bronze plan that differ in terms of cost-sharing. While health insurance issuers must be certified by the state or federal government as a Qualified Health Plan, the choice set in the exchange will not be “sponsored” in the same way that an employer defines the health plan choices available to employees. In addition, many of those purchasing coverage in the exchange

will receive a subsidy to do so, lessening the effect of price on their decision. With effective tools, individuals could continue to maximize utility in this setting. However, it will be important to evaluate how the dynamics of plan choice play out on the ground. This study suggests that consumers with a choice are likely to fare slightly better in terms of access to care and overall experience, though policymakers should watch for warning signs that consumers in the marketplaces are delaying or not getting care as a result of administrative delays in enrollment or increased awareness of out-of-pocket spending.

# Conclusion

## Key Findings

### Paper 1

In the first paper, we discussed various approaches for developing measures of competition in health care markets, focusing on health insurance and hospital markets. Tantamount in the process of developing these measures is identifying the relevant analytic question and purpose of the concentration measure, which will drive some of the analytic choices in measure development. In the case of a targeted measure assessing concentration in specific services like heart surgery, the choices may be clear. For general purpose measures intended to track changes in market structure over time, analysts must consider multiple factors that could influence the level of concentration portrayed by the measure. For example, the choice of a geographic definition for the market, the types of hospitals or insurance products to include, and the basis for the market share calculation can all have a significant impact on the level of concentration depicted by the HHI.

The paper also noted differences in measures that might be implemented in an empirical formulation versus those that are intended to be reported as a number to a wider audience. Those approaches used in a model could be both more precise and complex, with multiple terms and structural parameters to define market competition. Policymakers often prefer simple numbers for reporting or tracking, and measures such as the number of firms or market share do provide simplicity and understandability.

However, these measures also lack meaningful nuances of competition in their attempt to be widely understandable. In all cases, analysts should be clear and explicit about the methods used to develop the concentration measure so that fellow researchers and policymakers understand how the measure was crafted.

Across most of the measures examined in the paper, we found hospital and health insurance markets to be highly concentrated according to the FTC-DOJ merger guidelines, meaning the HHI was greater than 2,500. The mean level of competition in the hospital and health insurance markets did not change significantly from 2003 to 2009, though some markets did experience a greater degree of change. The correlation between measures of concentration was generally high, suggesting that in many cases the analytic decision made would not greatly alter the conclusion one made about the level of concentration in the market. For example, the narrow, medium, and broad definitions of hospitals in scope for the market did not appreciably effect the HHI, nor did the service product used to calculate market share (e.g. beds, Medicare discharges, etc). Some exceptions are noteworthy, however. Hospital HHIs based on Medicaid service use tend to portray a more concentrated market and should be reserved for those interested in competition in safety-net services. The geographic definition of markets (e.g. states versus MSAs) also impacts the reported level of competition.

We assessed differences across one dimension of a measure at a time. For example, we examined whether the medium, narrow, or broad definition of hospitals in scope for the measure affected the HHI and found little effect across these variations. We did not examine whether a CBSA-based broad definition using hospital staffed beds

differed significantly from a HRR-based narrow definition using total discharges. Such a multifaceted comparison may uncover larger differences as small differences in the one-dimensional measures accumulate, though the number of potential comparisons is large. However, our analysis did uncover some approaches where the concentration measure did differ, including the geographic area and measures based on Medicaid enrollment and discharges.

The paper also highlighted trends in the relative concentration of health insurance to hospital market concentration, finding that the average MSA-level market experienced higher concentration in health insurance than hospital services from 2003-2009. The categorization of markets in terms of both hospital and total private health insurance concentration found that each year, about 20-25% of MSAs were concentrated in both markets, about a third of MSAs were concentrated insurance and competitive hospital markets, a smaller percentage (15-20%) were competitive insurance and concentrated hospital MSAs, and about a third were competitive in both.

The review of studies assessing the impact of competition in hospital and insurance markets finds great consistency among the literature addressing hospital competition and price. These studies, using a variety of measures of hospital concentration, find that more concentrated hospital markets are associated with higher prices. The literature was less consistent regarding the impact of hospital competition on quality, with some studies reporting a negative effect of increased concentration on quality and some finding a positive association. This could reflect the more diverse array of outcomes and conditions assessed in quality studies compared with price. As

suggested by Gaynor (2006), the association between competition and price may also be tighter than that for quality, and failure to account for possible confounding variables or sources of bias could consequently have a greater impact on studies with quality as the outcome.

The studies of health insurance competition also generally find increased prices associated with increased health insurance concentration; the few studies of health insurance competition and quality have found no significant association between competition and quality. The studies that have carefully examined the relative concentration of health insurance and hospital markets through health plan buying power or leverage have demonstrated a “monopoly busting” relationship such that prices are lower and output higher with increased health plan market power relative to hospitals compared to less concentrated health insurance markets.

## **Paper 2**

The second paper investigates an area where only a handful of studies have been published. These studies have either been focused on a small number of states or have included only plan-level independent and outcome variables. This paper is a national study that includes individual level data to better control for factors associated with access to care and reported consumer experiences with health plans, such as health status and income. Findings from this analysis suggest that health insurance market structure does have a small but statistically significant association with reported access to care and a negligible effect on consumers’ experiences with their health plan. Of the domains of consumer experience examined, the travel time to the USOC as well as difficulty



reaching the USOC seem to be most affected by market structure, though the coefficients were still quite small. These findings are consistent with previous published literature finding little to no significant effect of health insurance competition on quality. Despite differences in the structure of competition in private insurance and Medicaid, the results were consistent across the two settings. In both sectors, individual factors such as age, income, marital status, and self-reported physical and mental health status have a larger bearing on consumers' reported access to care and experience with their health plans than the level of competition in the market.

Consumers generally rated their health plan favorably, with an average 8.5 rating on a ten point scale among MMC enrollees and a 7.9 among those with private group coverage. Overall plan satisfaction was not significantly affected by market structure. Across various model specifications, the insurance HHI or the relative insurance to hospital concentration was not a statistically significant factor in consumers' overall plan rating.

Consumers who sought out administrative services from their health plan often reported problems with the administrative side of health plans, with over a quarter having problems getting help from customer service, waiting for approval, completing paperwork, and finding information about the plan. However, the prevalence of these problems does not appear to be affected by market structure in either MMC or the private group markets. One possible explanation for the high prevalence of administrative problems and lack of association with market structure is that these aspects of a health plan are largely invisible to a consumer when making enrollment decisions, plans may

focus on price as a key determinant of enrollment decisions rather than quality.

Alternatively, some other unmeasured factor, perhaps limited health literacy or language issues, may explain the high prevalence of reported problems among those who seek administrative help. Similarly,

These findings suggest that, while there is some association between health insurance competition and consumers' reported access and satisfaction with their health plan on some measures, the overall effect is small if it is at all statistically significant. Consumers are not significantly more satisfied with their health plan in more competitive health insurance markets, and so more competition does not necessarily improve access and satisfaction. In times of tight budgets and tough choices, policymakers will likely need to look beyond policies addressing competition to impact consumers' access to care and experience with their health plan.

### **Paper 3**

The third paper investigates the impact of a form competition that is more closely felt by consumers—whether they have a choice in health plans at their job. Most of the research into consumer choice of health plans pertains to factors influencing enrollment decisions. A small number of previous studies assessed the association between plan choice and satisfaction. This analysis builds upon those studies in several ways. First, the analysis uses multiple years of national data which allows for more generalizable findings and the inclusion of geographic fixed effects to control for time invariant regional differences both in the availability of plan choice and in the broader health care environment. The analysis also assesses a greater number of outcomes that capture a

more robust picture of a consumer's experience with their health plan, including administrative problems, overall satisfaction, having and getting to a usual source of care, finding an acceptable doctor, and the share of health expenditures paid out of pocket. Finally, previous analyses occurred in an era when the choice was often between a FFS or HMO option; health plan options have evolved such that PPOs are more common and FFS rarely an option. The more recent data in this analysis reflects a more current and accurate market.

This analysis demonstrates that in general, having a choice in health plans is associated with slightly higher and statistically significant global satisfaction with the plan; those with a choice in plans rated their plans 0.08 points higher on a ten point scale. Individuals with a choice in plans also were less likely to report administrative problems with the plan (OR 0.91,  $p < 0.0117$ ), other factors held constant. On most measures of access, having a choice in health plans was associated with equal access or slightly better access than having no choice. However, having a choice in plans was associated with higher odds of delaying or not getting care (OR 1.21,  $p < 0.003$ ). This may be a result of delayed enrollment associated with transitions in coverage or an increased awareness and subsequent avoidance of cost-sharing requirements associated with the process of selecting a plan. This study finds a negative association between having a choice in health plans and the percentage of total medical expenditures paid out-of-pocket by the consumer, so consumers without a choice paid a higher OOP share by 2 percentage points, all other things equal. However, there was no statistically significant association between OOP spending on office visits or prescription drugs.

One limitation of this study is the lack of information on plan benefits for both groups, but particularly for those individuals who do have a choice in plans at their current main job. To the extent that plan options offered by an employer have standardized benefit packages, as suggested by Scanlon and colleagues (1997), there may not be a real distinction between available options in terms of covered services, cost sharing, or provider networks. This would tend to bias the results toward the null hypothesis. More robust information on plan benefits would also help control for differences in plan quality between those who have a choice in plans and those who do not.

## **Themes**

The results suggest that proximal factors such as age, health status, and race/ethnicity have a larger impact on an individual's reported experience with their health plan and access to care than more distal measures such as provider supply, rural or urban location or, importantly, health insurance market competition. To the average consumer with employer-based coverage, the level of competition in the marketplace is largely unobserved. It is the employer-agent or state Medicaid office who more directly experiences the market and narrows the pool of choices for the individual. An individual may live in a competitive health insurance market, but it may not appear competitive if that person only has one coverage option at work or in MMC. Competition may be felt more closely in the individual market because an individual directly purchases a health plan from the array of choices available. However, many individuals—especially older individuals or those with a pre-existing health condition—could currently have their

choices limited in this market. This analysis focuses on competition and choice in private group coverage and Medicaid managed care, which constitute a much larger share both of enrollment nationally in health coverage as well as the MEPS survey population.

For those who have a choice in health plans from their employer, the market may feel more competitive because they can exercise a choice and because, in fact, the various plan options at the employer are competing with one another for enrollment share. These reasons may explain the small but statistically greater association of having a choice in plans with reported access, health plan experience, and out-of-pocket spending that the overall level of market concentration.

## **Policy Implications**

The findings from these studies suggest that while increasing competition in health care markets may important in reducing prices, the impact on consumers' experience with their health plan and access to care were not significantly affected by these efforts. The common reports of administrative challenges among those who sought administrative services from their plan suggest there is much room for improvement among health plans. Initiatives to standardize plan benefits language as through the marketplaces, simplify plan paperwork and information, and make the administrative process easier to navigate for consumers have the potential to mitigate some of the administrative challenges expressed by consumers in these studies. The impact of these initiatives on consumer experiences, access to care, and the OOP share of medical spending is an area for future research, particularly in light of the efforts underway to make coverage accessible in the health care marketplaces.

In addition, new avenues for competition and plan choice will soon open up in the health insurance marketplaces implemented as part of the Affordable Care Act. The ACA seeks to make changes in both health insurance and delivery system that will improve quality of care and reduce costs. As the research community evaluates the effectiveness of these initiatives, it is important to include an assessment of the effects on market concentration and to gain an improved understanding of the function of new markets such as insurance marketplaces and ACOs. Researchers should continue to develop and test alternative concentration measures that reflect a changing health care delivery and coverage landscape. It will also be useful to revisit the issue of choice in plans following the implementation of the ACA when workers have access to more group health insurance options outside of their employer. Policymakers can monitor access to care, consumer satisfaction, and out-of-pocket spending within the marketplaces through surveys and administrative filings to assess whether policy objectives are being met. In particular, policymakers should watch for reports of delayed or foregone care that could be associated with the process of enrolling in or selecting coverage. The burdens and benefits of health plan choice will fall more squarely on consumers and small businesses purchasing coverage in the marketplaces. With effective tools, individuals could continue to maximize utility in this setting. However, it will be important to evaluate how the dynamics of plan choice play out on the ground. Going forward in this new environment, researchers and analysis should carefully and clearly construct concentration measures, and policymakers should understand that policies addressing

competition and plan choice, though warranted for other reasons, may have only a limited impact on consumer's overall experience with their health plan.

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### Appendices

	HMO HHI	PPO HHI	Total Commercial HHI	Total Private HHI <i>includes self-insured</i>
2003	Fully-insured Commercial HMO	<i>no separate PPO enrollment reported</i>		
2004	Fully-insured Commercial HMO			
2005	Fully-insured Commercial HMO	Fully-insured Commercial PPO	Fully-insured Commercial PPO + Commercial HMO	Fully-insured Commercial PPO + Commercial HMO + PPO self-insured
2006	Fully-insured Commercial HMO	Fully-insured Commercial PPO	Fully-insured Commercial PPO + Commercial HMO	Fully-insured Commercial PPO + Commercial HMO + PPO self-insured
2007	Fully-insured Commercial HMO	Fully-insured Commercial PPO	Fully-insured Commercial PPO + Commercial HMO	Fully-insured Commercial PPO + Commercial HMO + PPO self-insured
2008	Fully-insured Commercial HMO	Fully-insured Commercial PPO (with CHDP)	Fully-insured Commercial PPO + Commercial HMO + Fully-insured POS + CHDP <sup>2</sup>	Fully-insured Commercial PPO + Commercial HMO + POS fully-insured + PPO self-insured + POS self-insured
2009	Fully-insured Commercial HMO	Fully-insured Commercial PPO	Fully-insured Commercial PPO + Commercial HMO + Fully-insured POS <sup>2</sup>	Fully-insured Commercial PPO + Commercial HMO + POS fully-insured + PPO self-insured + POS self-insured
NOTES				
1 Replaced two hmos with negative enrollment with zero enrollment				
2 CDHP enrollment in January 2008 was allocated to PPO SI and FI based on the FI/SI split from July 2008				

### Appendix A: HLI Private Plan Enrollments Included in Insurance HHI by Year





## **Appendix B : Methods for the Relative Concentration of Insurance Markets to Hospital Markets**

The first measure of the relative concentration of insurance markets to hospital markets we use is the ratio of the two HHIs. We base the ratio on a health insurance HHI at the MSA level and the hospital market HHI at the HRR level. In order to create a common geographic unit for analysis, therefore, we must crosswalk the estimates to one another.

To do this, we first apportion the county-level health insurance enrollment information to HRRs using a county to HRR crosswalk obtained from staff at the Dartmouth Center for Outcomes Research. We crosswalk counties rather than MSA enrollment information because crosswalking the smaller geographic unit to HRRs allows for a cleaner and more precise allocation of enrollment. For each HRR, we sum the total private enrollment (including the self-insured plans) and total lives for each health plan to represent the health insurance market structure that hospitals within an HRR experience when negotiating contracts with insurers. From this HRR-level insurance enrollment we create an HRR-level health insurance HHI.

We create HRR-level HHIs using the medium definition of hospitals in scope for the market, which includes general acute care hospitals; surgical; cancer; heart; obstetrics and gynecology; eye, ear, nose and throat; rehabilitation; orthopedic; chronic disease; other specialty; and children's general hospitals. We use the hospital system's total Medicare discharges as the basis for our market share calculation. We exclude long-term care hospitals and hospitals located outside the 50 states and District of Columbia.

The relative insurance to hospital market concentration is defined as ratio of the HRR-level insurance market HHI and HRR-level hospital HHI. Subsequent analyses in this thesis use the relative concentration measure as an independent variable in the model examining the association between this relative concentration and consumers' access to care and experiences with their health plan in private insurance and in Medicaid managed care (MMC). These models are estimated at the MSA level (in the case of private insurance) and state level for MMC. Specifically, we merge the area-level market concentration and provider supply variables to the restricted-use MEPS data by the respondent's encoded state or MSA of residence at the time of the survey. Therefore, the ratio of insurance to hospital market concentration needs to be expressed in the appropriate geographic unit (states or MSAs) rather than at the HRR level.

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- Zwanziger, J., & Mooney, C. (2005). Has Competition Lowered Hospital Prices? *Inquiry*, 42(1), 73-85.
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# Curriculum Vitae

**Adele Shartzter**

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## Experience

**U.S Department of Health and Human Services** **Washington, DC**  
**Office of the Assistant Secretary for Planning and Evaluation**  
*Program Analyst* October 2010-present

- Conduct internal quantitative and qualitative evaluation of health care programs, including assessing alternatives to the sustainable growth rate and the determinants of the supply of Ambulatory Surgical Centers
- Produce factual summaries and briefing information on health care programs at the request of the Assistant Secretary
- Review and comment on proposed regulations and administrative documents
- Assist with the development of regulations guiding healthcare reform implementation

**Johns Hopkins Bloomberg School of Public Health**  
**Baltimore, MD** March  
*Research Assistant*  
2009-present

- Worked on an RWJF-funded project assessing the impact of incremental coverage expansions on uncompensated care spending and the uninsured rate, including development of the analytic file and regression analysis
- Served as a student intern with U.S. DHHS assessing the availability of hospital resources to address the H1N1 influenza pandemic
- Assisted with the interpretation of results from a study of geographic variations in inpatient hospital expenditures

**Henry J. Kaiser Family Foundation**  
**Washington, DC** November 2005-  
*Special Assistant to the Executive Vice President and Executive Director*  
August 2008

- of the Kaiser Commission on Medicaid and the Uninsured (KCMU)*
- Collaborate with Diane Rowland to prepare the content of journal articles, congressional testimony, and presentations
  - Fulfill requests for information from Kaiser Family Foundation Trustees, KCMU Commission members, and other research requests from Dr. Rowland
  - Coordinate the Foundation's initiatives related to the health care system in New Orleans after Katrina
  - Participate in design, analysis, and production of several internal research projects focused on health care in the Gulf Coast region after Katrina
  - Formulate Foundation materials, present findings at briefings, organize site visits, and monitor policy developments related to health care after Katrina

- Provide background information to journalists
- Track health reform initiatives at the state and national level
- Maintain an updated set of Kaiser Family Foundation graphics for presentations and publications
- Coordinate intern recruiting process for policy programs

*Policy Analyst, Kaiser Commission on Medicaid and the Uninsured*  
November 2005

July 2005-

- Tracked policy changes to state Medicaid programs
- Assisted in the writing and editing of publications
- Updated online reference library on Medicaid for [www.kaiserEDU.org](http://www.kaiserEDU.org)
- Worked with outside contractors to research churning on and off health insurance using SIPP

**National Institute for Health Care Management Foundation**  
**Washington, DC**

*Research and Policy Analyst*  
2004-July 2005

October

- Worked collaboratively in the implementation of three federal grants, including writing and editing of publications, conference development, and strategic planning for the grant
- Wrote a CDC-funded report on health plan initiatives to address the obesity epidemic
- Co-authored a background brief for an AHRQ-funded meeting on health information technology
- Produced a HRSA-funded issue brief on children's mental health
- Managed the annual Health Care Journalism Award process
- Oversaw two briefs in an "Expert Voices" series of publications addressing variations in health care quality and obesity
- Participated in intern recruitment, website maintenance, and other administrative duties as necessary
- Found and developed new grant proposals for Foundation research
- Strategized about future projects and research and policy issues of interest to NIHCM Foundation

**Families USA**  
**Washington, DC**

*Research Associate*  
2003-August 2004

September

- Provided research and writing for a published brief on the Health Coverage Tax Credit
- Developed, led, and implemented a 50-state survey on the Medicaid component of fiscal relief in 2003
- Developed a published report on Medicaid's economic impact in states and updated supervisors about state actions regarding Medicaid and SCHIP
- Tracked changes in pharmaceutical prices during the transition to Medicare Part D discount cards
- Coordinated a workshop session on hospital billing practices during annual conference
- Analyzed health-related academic literature and provide summaries to supervisors

**Centers for Disease Control and Prevention**  
**Atlanta, GA**

*Summer Intern, Office of Human Research Protection*  
August 2002

July-

- Led a project to develop an institutional policy on conflicts of interest in public health research
- Analyzed ethical issues regarding human subjects research and attended Institutional Review Board meetings



## Education

2008-2013

**Johns Hopkins Bloomberg School of Public Health** **Baltimore, MD**

*Ph.D. in Health Policy and Management, Health Services Research Track*

Cumulative GPA 3.95

Dissertation: "Health Insurance Competition: Its Impact On Consumers' Access and Satisfaction"

2003- 2005

**George Washington School of Public Health and Health Services** **Washington, DC**

*Masters of Public Health, Concentration in Health Policy*

Cumulative GPA 3.97

Special Project: "Health Savings Accounts: Overview and Policy Recommendations"

1999-2003

**University of Virginia**

**Charlottesville, VA**

*Bachelor of Arts, Echols Interdisciplinary Major in Bioethics*

Cumulative GPA 3.58

## Publications

- D. Rowland and A. Shartzter, "The Statistics and the Backstory," *Journal of Law, Medicine & Ethics*, November/December 2008
- D. Rowland and A. Shartzter, "Existing Federal Programs as Building Blocks for Coverage Expansions," forthcoming in *National Voter Magazine*
- "Health Challenges for the People of New Orleans: The Kaiser Post-Katrina Baseline Survey," Kaiser Family Foundation report #7659, July 2007
- R. Rudowitz, D. Rowland, and A. Shartzter, "Health Care in New Orleans Before and After Hurricane Katrina," *Health Affairs* 25(5): w393-w406, August 2006
- M. Perry, A. Dulio, S. Artiga, A. Shartzter, and D. Rousseau, "Voices of the Storm: Health Challenges of Low-Income Katrina Survivors," Kaiser Family Foundation report # 7538, August 2006
- J. Lee and A. Shartzter, "Health IT and Workflow in Small Physician Practices," NIHCM Foundation report funded by AHRQ, April 2005
- "Health Plans Emerging as Pragmatic Partners in the Fight Against Obesity," NIHCM Foundation report funded by CDC, April 2005

## **Presentations**

- “Hospital and Beneficiary Factors Associated with 30-day All Cause Readmissions,” AcademyHealth Annual Research Meeting, June 23, 2013
- “Medicaid Managed Care: Its Impact on Beneficiary Access and Experiences with Health Plans,” (Poster), AcademyHealth Annual Research Meeting, June 23, 2013
- “Kaiser Family Foundation Research on Health Care in Post-Katrina New Orleans,” for the Government Accountability Office Health Care Team, November 2007, Washington, DC
- “Medicaid, the Uninsured, and Health as a Campaign Issue,” for the International HIV/AIDS Education and Prevention Delegation, November 2007, Washington, DC
- “Health Coverage in the United States,” for the Joel Fleishman Fellows in Public Policy from Duke University, October 2007, Washington, DC
- “Who We Are and How We Work: Health Care in the Aftermath of Katrina,” Kaiser Family Foundation panel, October 2007, Washington, DC
- “Health Care in New Orleans Before and After Hurricane Katrina,” New York University School of Law, February 2007

## **Awards and Honors**

### Johns Hopkins University

- Alvin R. Tarlov and John E. Ware Jr. Doctoral Dissertation Award in Patient Reported Outcomes, 2011
- Sandvold-Hydlle Family Scholarship Recipient, 2011
- AHRQ National Research Service Award (NRSA) Trainee, 2008-2010

### George Washington University

- Department of Health Policy Award for Excellence in a Special Project
- Dean’s Honors
- Accepted to the U.S. Department of Health and Human Services Emerging Leaders Program

### University of Virginia

- Jefferson Scholar (Frank Gardiner Wisner St. Paul’s Scholar)
- Echols Scholar
- Intermediate Honors
- Dean’s List
- Order of Omega
- Phi Eta Sigma

## **Activities and Service**

- Junior League of Washington, 2007-2013
- Students Promoting Healthcare Reform (SPHERE), Vice President for Education, 2009-2010
- Jefferson Scholars Foundation Alumni Advisory Board, 2006-2010
- DC Health Policy Young Professionals, 2006-2007
- UVA Class of 2003 Reunions Planning Committee, 2007-2008
- Jefferson Scholars Foundation, Washington DC/Suburban Maryland Regional Selection Committee Member, 2006-2007
- FBC Alexandria Choir, Alto Section Leader, 2004-2007
- 1869 Society (benefiting the Corcoran Museum of Art), 2006-2007