

ORGANIZATIONAL FRAGMENTATION AND CARE QUALITY
IN THE US HEALTH CARE SYSTEM

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Abstract

From an organizational perspective, the US health care system is highly fragmented. Critical tasks in the financing and provision of health care are distributed across a variety of distinct, often competing, entities each with its own objectives, obligations and capabilities. The market mechanisms, contractual arrangements, governance structures and information technologies that enable coordination elsewhere in the economy often function poorly in the health care setting. As a result, organizational fragmentation is a serious and persistent impediment to improving health care quality. We illustrate our argument with examples taken from the insurance and the hospital industries, and discuss possible responses to the problems that arise as a consequence of organizational fragmentation.

Introduction

From an organizational perspective, the US health care system is highly fragmented. By this we mean that critical tasks in the financing and provision of health care are distributed across a variety of distinct, often competing, entities each with its own objectives, obligations and capabilities. The market mechanisms, contractual arrangements, governance structures, and information technologies that enable coordination across organizations elsewhere in the economy tend to function poorly in the health care setting. As a result, organizational fragmentation is a serious and persistent impediment to improving health care quality (Shortell, Gillies, Anderson, Erickson, and Mitchell, 1996; Fisher, Staiger, Bynum, and Gottlieb, 2006; Wilensky, Wolter, and Fischer, 2006).

In discussing organizational fragmentation, it is helpful to separate the financing of health care from the provision of care. For the commercial population, i.e., individuals under age 65, the payment for health care services is largely the result of private insurance plans. About sixty three percent obtain health insurance through their employer (Current Population Survey, Annual Social and Economic Supplement, U.S. Census Bureau, 2007). There are more than 1.5 million employer groups in the US who purchase health insurance on behalf of their employees from over 1200 registered insurance companies.¹ Large employers often self-insure, meaning that they bear the risk and hire insurers only to administer plans. Other employers are fully insured; meaning that the insurance company both administers the plan and also holds the risk. Fifty five percent of the workers with employer group coverage are working for employer groups that are completely or partially self funded (The Kaiser Family Foundation and Health Retirement and

¹ A conservative estimate of the employer groups who purchase insurance derived from 2004 firm counts reported by the Census Bureau (see <http://www.census.gov/csd/susb/susb04.htm>) and statistics on firm health benefits in the Employer Health Benefit Annual Survey, 2004.

Educational Trust, 2006). About 540 commercial insurers are registered as Health Maintenance Organizations, and the majority of other insurers also engage in some form of managed care, deciding which physicians to include in the provider network, and actively shaping the relationship between physicians and providers through incentive contracts, direct monitoring and utilization reviews (Waller, 2004). Traditional indemnity policies that offer close to first dollar coverage and leave the patient-physician relationship untouched also persist in the marketplace, although they do not have the dominant position they once had.

A striking feature of the commercial health insurance market is the scarcity of long-term insurance contracts. In the individual and fully insured market segments almost all contracts are one year contracts with the possibility of renewal. The length of contract does not determine the length of the insurance relationship. For employees working for self-insured employers, the insurance relationship essentially lasts as long as the employment relationship. For employees whose employers are fully insured, the duration of relationship is much shorter due to the switching of employer groups across insurers.

For individuals aged 65 and older, insurance is available from a single, government-run insurance program, Medicare, though a large number of Medicare beneficiaries receive coverage through private insurers. Currently, about 18.5 percent of Medicare beneficiaries receive coverage through private Medicare Advantage plans, and another twenty four percent are enrolled in private prescription drug plans known as Part D (The Kaiser Family Foundation, 2007) . In 2002, the majority of Medicare beneficiaries had some form of private coverage to supplement their (traditional) Medicare benefits.² The poor and disabled can also be insured

² Based on the Medicare Current Beneficiary Survey (U.S. Department of Health and Human Services, 2002), 35 percent of Medicare beneficiaries had supplemental coverage through a former or current employer, while another 21 percent obtained individually-purchased Medigap

under Medicaid, a federally mandated means-tested insurance program administered by each state.

On the provider side medical care is delivered both in the hospital (in-patient care) and outside the hospital (out-patient or ambulatory care). There are approximately 19,000 physician practices in the United States (American Medical Association, 2004) and over 5700 hospitals (U.S. Centers for Disease Control and Prevention, 2006). Although there exists large multi-specialty group practices, the majority of physicians work in small single-specialty groups (Wilensky, et al., 2006).

Hospitals come in a wide variety of forms: some are not-for profit while others are for-profit; some hospitals have a research or teaching mission and close associations with research universities and medical schools, others focus on delivering care to particular communities, still others specialize in the treatment of specific diseases or conditions. Within hospitals the course of care is determined largely by the decisions of physicians, but these physicians are usually not employees of the hospital. Some physicians may have “privileges” at more than one hospital and many more split their time and attention between in-patient care and their office based practices (Fisher, et al., 2006). The smooth handing off of patient information within and between hospitals and physician practices is often critical to the delivery of care and from this perspective it is noteworthy that the information infrastructure in medicine is quite Balkanized. The hospital industry is currently making substantial investments in electronic record systems, but these systems often do not communicate smoothly with other hospitals or with physician practices,

plans. It is unclear how these figures have changed over time. In 2006, with the initiation of Medicare Part D, Medigap policies were no longer permitted to include prescription drug coverage.

thus making it difficult to coordinate in-patient and out-patient care.³ The problems of coordinating care are made worse by the fact that individual patients typically receive services from more than one physician and more than one physician practice.

In this paper we make the case that the fragmented organizational structures in our health care system lead to disrupted relationships, poor information flows, and misaligned incentives that combine to degrade care quality in important ways. We illustrate our argument with examples taken from the insurance industry and the hospital industry. In section two, we present evidence of high rates of turnover in the relationship between insurers and their policy holders. This turnover is likely due to search frictions that, we argue, lead to disrupted insurance policy-holder relationships, sub-optimal investments in future health, and high administrative costs. These problems are compounded by fragmented health care information systems that often require health insurers to play a central role as information aggregators.

In section three we shift the discussion from insurance to hospitals. Our discussion of hospitals begins with the observation that these organizations have a fragmented structure because of the special role played by physicians. Physician actions and decisions are central to resource allocation and care processes in the hospital, yet physicians are to a large extent independent of hospital management. The organizational independence and the clinical interdependence of physicians and hospitals inhibit key clinical process improvements. Integrating physicians into process improvement efforts is made difficult by the sociology of the

³ Burt and Hing (2005) report that, during 2001 to 2003, electronic medical records were used in about 30 percent of hospital emergency and outpatient departments, but only 17 percent of physician offices. Similarly, the use of the information technology for ordering prescriptions electronically was substantially lower in physician offices (8 percent) than in hospital emergency departments (40 percent) or outpatient departments (18 percent).

medical profession and also by legal doctrines that have historically supported arms-length physician-hospital relationships.

We conclude the paper by discussing possible responses to the problems raised by organizational fragmentation.

Fragmentation in Insurance

Disrupted Relationships

In the commercial health insurance market, the length of the relationships between an insurer and its policy holders are determined in part by the vagaries of the labor market and in part by the decisions of individual policy holders. Whenever an employee leaves the employer group that purchased a policy on his or her behalf, the insurance relationship is typically severed. Similarly, employees may opt out of their employer's plan if they get more desirable insurance from another family member. For employers offering multiple policies, the insurance relationship may also be severed if an employee switches among the employer's available plans. Given all these possibilities, it may not be surprising to find that a fifth of policy holders cancel their policy in any given year.⁴ It is perhaps more surprising that 38% of this turnover is *not* the result of employee decisions or individual labor market transitions but rather the result of employer groups canceling their policies. High rates of turnover due to employer group cancellations are anomalous because health insurance is a complex multi-attribute product and there are a very large number of possible alternative plans offered in any given market. This complexity makes it hard to solve the shopping problem in the health insurance market without

⁴ Data from the Community Tracking Study for heads of households aged 23-65 averaged over the four waves of the CTS: 1996-97, 1998-99, 2000-01, and 2003. See Cebul, Herschman, Rebitzer, Taylor and Votruba (2007) for details.

incurring costs.⁵ It takes considerable time and effort for employer groups to compare the price and quality of products and it takes considerable time and effort for insurers to generate offers that match the specific needs of clients. The puzzle of high turnover by employer groups is deepened by data suggesting that these turnover rates are considerably higher for fully insured employer groups. This segment of the market, which typically includes smaller employers and employers who are less sophisticated about insurance benefits, is likely to have higher switching costs per employee than self-insured employers.⁶

The high turnover rate among fully-insured employer groups is common knowledge in the health insurance industry. Brokers and insurers with whom we have spoken attribute high rates of employer group cancellations to purchasers searching for—and finding—lower premiums elsewhere in the market. This explanation appears to be widely believed, but it is hard to square with models of competitive insurance markets. In well functioning markets the law of one price should prevail and the opportunity to leave an insurer for a better price ought to be limited, especially in view of the costs of switching plans.

The anomaly of high rates of insurance turnover by employer groups can be resolved if we allow for moderate levels of search frictions in the market for health insurance. Not only are there differences across health insurance companies but, as we have already discussed, it is

⁵ Dranove (2000) uses this convenient term to refer to the information failures that make the market for health insurance different from other markets. In addition to the search costs we describe, new policy-holders arrive at insurers without a “paper trail” of their prior medical history. One person with whom we spoke—an individual with years of experience in the health insurance industry—told us that it takes about a year for an insurer to accumulate enough information about a policy holder to identify who might have a chronic condition, even if the individual had been a policy holder sometime in the past.

⁶ Cebul, *et al.* (2007) examined data from a large regional insurance company with annual severance rates about equal to the national average, 21%. For fully-insured employers that account for 41% of the insurers enrollees, annual turnover rates were 30%. Approximately 59% of this turnover was the result of employer group cancellations.

costly and difficult for employer groups to evaluate outside offers. This is the situation that the theory of non-sequential search tries to capture, and the many well-established features of these models are helpful for understanding the market for health insurance.

Search frictions give insurers some degree of market power and as a result equilibrium is characterized by a distribution of prices supported on the low end by marginal cost and the high end by the purchaser's maximum willingness to pay (Burdett and Mortensen, 1998; Mortensen, Mortensen, 2003; Lang and Majumdar, 2004; Montgomery, 1991; Butters, 1977; Manning, 2003).⁷ In a competitive market with identical insurers offering identical products to identical consumers, an insurer who charges premiums 10% above marginal cost will not find any customers. With search frictions, however, there is some probability that the "10% above marginal cost" premium is the best offer the purchaser will receive. In time, a better offer will come along and the employer group will exit the insurer. Thus the regular exit of employer groups from their insurance relationship is quite natural in a search model-provided that search frictions are not too severe.⁸

⁷ It is easy to see why the law of one price fails when there are search frictions. Suppose all insurers offered the same premium, p , equal to average cost, c , so that all insurers earned zero profit. Then a maverick firm could clearly increase profits by charging some discretely higher price (less than or equal to the reservation premium p^R). This high offer would be rejected more frequently than the going price, because any potential client who fielded more than one offer in a period would obviously reject the high offer, but on occasion the contacted client would have no other offers, and a policy would be sold. This strategy would thus produce positive profit for the firm. Similarly, if all insurers charged the same price, p , with $p > c$, a maverick firm could increase profit by undercutting slightly the price charged by competitors, thereby increasing the number of clients while reducing by profit per client by only a trivial amount. In short, equilibrium cannot entail a single price; in equilibrium there must be a *distribution* of prices.

⁸ With very severe frictions, outside offers would be processed so slowly that we would observe very little turnover even though premiums were widely divergent across identical insurance policies. With trivial search frictions, the distribution of premiums collapses towards a single price equal to marginal cost. With very few firms charging above the competitive price, we would also see little mobility.

Cebul *et al.* (2007) use a search model along the lines of Burdett and Mortensen (1998) to produce a rough calculation of the degree of search frictions and the distribution of premiums consistent with observed turnover rates in insurance markets. They estimate that the lowest premium in the market allows the insurer to capture only 6% of the surplus while the insurer offering the average premium captures 25% of the surplus. Frank and Lamiraud (2007) present direct evidence of price dispersion in the Swiss health insurance market. Switzerland requires all residents to purchase health insurance in a marketplace that features a large number of competing insurers.⁹ The government regulates a uniform basic insurance package. Premiums, which are risk adjusted by location, gender and age, can differ between health plans, but within health plans an insurer must offer the same premium for individuals having the same age, gender and region of residence. In addition to this community rating feature, health insurers must accept every applicant for basic insurance, and individuals can switch insurance providers every six months. In spite of competition among insurers and a regulatory structure that reduces many aspects of service quality variation and supports a high degree of product uniformity, the Swiss health insurance market exhibited considerable price dispersion and little evidence of price convergence over a seven year period.¹⁰ The authors attribute these results to the psychological costs of searching through the large variety of different insurance options.¹¹

⁹ In 1997, the median number of insurers in a Canton was 38; the maximum was 74 and the minimum was 34. By 2004, the median had increased to 56 (Frank and Lamiraud, 2007, p. 35).

¹⁰ The average monthly premium differences between the mean and the minimum premium was 32.18 Euros in 1997 and 29.73 Euros in 2004. The differences between the maximum and minimum premiums were 65.36 in 1997 and 88.01 in 2004 (Frank and Lamiraud, 2007, p. 38).

¹¹ Many of the sources of search frictions found in US health insurance markets were removed in the Swiss context. The switching procedure was easy, products were uniform and all premiums were published each year by the government. The primary deterrent to switching in the Swiss context appears to have been psychological—either decision overload, under which the psychological costs of processing information as choice increases overwhelms individual's

Investments in Future Health

A significant fraction of health care dollars go to the care and treatment of chronic conditions such as diabetes, asthma, coronary artery disease, chronic obstructed pulmonary disorders (COPD), and hypertension.¹² The complications associated with these conditions accumulate over time, so early interventions that help individuals manage their disease and slow its progress offer the promise of improving patient care while also reducing medical costs. There is considerable evidence that individuals with chronic diseases are under-treated, and disease management programs have sprung up to help fill this lacuna (Institute Of Medicine Committee On Quality Of Health Care In America, 2001).¹³

To understand the issues with regulating chronic diseases, it is helpful to look at diabetes. According to the National Diabetes Association's fact sheet, 20.8 million people have diabetes and 6.2 million are undiagnosed. Almost twenty one percent of people aged 60 or older have diabetes. Diabetes is said to be the sixth leading cause of death, but this is probably quite conservative as only 35 to 40% of diabetes-related deaths list diabetes as an underlying cause. Adults with diabetes have heart disease death rates two to four times higher than adults without

decision making capacity, or status quo bias. (Strombom, Buchmueller, and Feldstein, 2002, present evidence consistent with some degree of status quo bias in choice of health insurer.) In Switzerland, annual switch rates were considerably lower than in the US—about 3% (Frank and Lamiraud, 2007, p. 8)—but they were not high enough to eliminate price dispersion. Enrollees don't have to combine the carriers for their basic and supplemental coverage, though it appears to reduce the administrative burden to them if they do combine. Dormont, Geoffard and Lamiraud (2007) suggest that the "inertia" in the Swiss market is affected by the presence of supplemental policies. The switching costs might be high for supplemental policies. Insurers may use these supplemental policies as "risk selection" devices.

¹² The Centers for Disease Prevention and Control estimates that the care of patients with chronic diseases accounts for seventy five percent of annual health care expenditures (National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP), 2005).

¹³ We know of no survey data that measures the prevalence of disease management programs over time, although many observers take it as a fact that such programs have increased and frequently involve outsourcing to independent firms (Ellrodt, 1997; Christensen, 2002; and Short, Mays, and Mittler, 2003).

diabetes. Diabetes also accounted for 44% of new cases of kidney failure in 2002. Other complications include nerve damage and limb amputations (National Diabetes Association, 2005).

Beulieu, *et al.* (2007) offer a case study of diabetic disease management at Health Partners as well as an illuminating discussion of the relevant literature. Diabetes is a relatively well understood chronic disease and there is broad agreement that monitoring and controlling blood levels of glycated hemoglobin (HbA1c) and low density lipoprotein (LDL) is key to managing the progression of the disease. The Health Partner program involves educating patients and primary care providers, monitoring to track patient progress and to assess physician performance, and performance-based financial and recognition rewards for providers. Tracking patient progress requires combining information from pharmacies, labs, specialists and primary care providers. Although typical in these respects, the Health Partner program differs from many others in that it is conducted in-house and not contracted out to disease management specialists. Beulieu, *et al.* (2007) estimate that the savings from the disease program yielded a net positive annual return that grew over time. This return was small, however, relative to the social value of the program—a calculation which includes the additional quality adjusted life years for program participants.¹⁴

Disease management programs focus on helping patients manage chronic diseases once they are manifest. The payoff to these programs comes with the slowed progression of the disease in the future. An even more proactive approach would be to identify individuals in the

¹⁴ Beulieu *et al.* (2006) observe that their investigation was hampered by the absence of a true control group for the study, but their estimates are in line with other published estimates. Gertler and Simcoe (2004) examine a program that Fallon Community Partners had outsourced to Lifepartners, a disease management company. They find that diabetics who chose to enroll in the program exhibited better compliance, better health outcomes (including reduced mortality), and lower average costs.

patient population who by virtue of psychological/physiological predisposition are likely to develop serious chronic disease. These health investments, which might include interventions such as bariatric surgery for morbidly obese patients or smoking cessation classes, would presumably have payoffs even further in the future than disease management.

The frequently disrupted relationships between health insurers and their commercial policy holders make it difficult for insurers to finance efficient levels of investments in the future health of their members. In principle, an insurer who invests in disease management in the present could capture the returns on this investment by requiring any future insurers to make transfers back to the original insurer. There are, however, many practical problems to this logic, not least of which is that the identity of the future insurers is not known at the time the investment is made.

If one considers the market equilibrium under perfect competition, however, it may be that insurer incentives should not matter at all for investments in future health. Many of these investments are very much like investments in general human capital: a diabetic who learns to manage her HbA1c is an inexpensive diabetic for all insurers and this fact can be determined by a simple blood test. Thus the incumbent insurer would need to lower premiums to well-controlled diabetics or risk losing them to other insurers. In equilibrium, competition would force premiums to be low enough that the entire surplus created by investments in diabetes control accrues to the individual diabetic (or to the employer group of which she is a member). In this case insurer incentives to invest in diabetes disease management are irrelevant.

In a market characterized by search frictions, however, the incentives of insurers *do* matter (Cebul, et al., 2007). Frictional insurance markets give insurance companies some degree of market power over the employer groups who purchase insurance. This market power allows

insurers to capture a portion of the surplus generated by investments in future health and, in this way, reduce the incentives of employer groups or employees themselves. Sustaining high levels of investment therefore requires insurers to pick up some portion of the total investment burden. In this way search frictions that lead to high rates of turnover in insurance markets also contribute to sub-optimal investments in future health.¹⁵ Consistent with this hypothesis, Herring (2006) finds that in cities with a high degree of employer-induced insurance turnover, there is a reduction in preventative care visits, but no reduction in acute care visits.

The ability of employer groups (or employees) to capture gains from investments in future health is also limited by information asymmetries. If outside insurers cannot identify how many diabetics an employer group has and how well controlled their diabetes is, the fear of adverse selection will dampen outside offers and give incumbent insurers some degree of market power. In this way information asymmetries can be a cause of market frictions in insurance markets.¹⁶ To the extent that disease management programs and other investments in future health attract expensive patients, adverse selection can directly reduce insurer incentives to finance these programs.¹⁷

Our discussion of returns to investments in future health has so far focused on pecuniary savings from disease management programs or, as it is sometimes called, the business case for quality. There is considerable debate, however, whether the savings produced by disease

¹⁵ These results regarding investments and search frictions were first made in the context of human capital investments in labor markets by Acemoglu (1997) and Acemoglu and Pischke (1999). In each of these papers, an investment in fully general human capital is financed, in part, by the employer as a result of labor market frictions.

¹⁶ The relationship between adverse selection and search frictions has been developed by Li (2007) in a labor market context.

¹⁷ Beaulieu, *et al.* (2007) found that both insurance turnover and adverse selection reduced the insurer's returns to investments in diabetes disease management.

management programs are sufficient to offset their costs, primarily because of an absence of randomized prospective trials. Whatever the facts regarding the business case for quality, its focus on the monetary savings from investments in future health is surely far too narrow because it ignores the value created by improvements in the future health and well being of individual policy holders.¹⁸ Insurers could, in principle, capture some of this value in the form of higher premiums if they could count on long-term relationships with employer groups or individual policy holders. Policy holders may not currently know if they are going to become diabetics in need of disease management or if they are going to develop arthritis severe enough to require knee replacements sometime in the future. They might, however, pay more in the present for an insurance policy that credibly promises to deliver these services should they need it in the future.¹⁹

Given the high rate of turnover in insurance markets, long-term relationships between health insurers and policy- holders require long-term contracts. As Diamond (1992) and others have noted, the absence of long-term commercial health insurance contracts is evidence of an

¹⁸ Beulieu, *et al.* (2007) argue that once one includes the additional quality adjusted life years emerging from diabetes disease management, the social returns far exceed the costs of the program and that the cost savings from disease management are only a small fraction of the benefit of the program. Cutler (2004) summarizes a large number of studies comparing the benefits (including the value of extended quality adjusted life years) and costs of a wide range of medical procedures and finds that in most cases, the rate of return is strongly positive. Murphy and Topel (2006) reach similar conclusions using a more aggregated approach and willingness to pay measures of the value of extended life. Unlike other estimates, Murphy and Topel's analysis allows for complementarity in health care investments, i.e., that the value of life extending medical investments is increased by medical expenditures that reduce the hazard of dying.

¹⁹ Estimating the relationship between the quality of a health insurance policy and its premiums is a complex empirical exercise, and it is made more complex by the presence of search frictions. Lang and Majumbar (2004) have shown that the price-quality tradeoff found in frictionless markets may be masked in a market with frictions. Indeed, under quite general assumptions, they demonstrate that the quality price relationship may be positive. Their model is developed in a labor market context. In the insurance context, their results indicate that it would not be surprising to find that high price plans are also poor quality plans.

important market failure in insurance markets. Even the healthiest individuals face the risk that as they age their body may change in ways that put them in jeopardy of developing an expensive medical condition. Insurance against this “reclassification risk” requires multi-year contracts. Economic explanations for the absence of long-term health insurance contracts emphasize the difficulties of persuading policy holders to make credible long-term commitments (Diamond, 1992; Hendel and Lizzeri, 2003; Finkelstein, McGarry, and Sufi, 2005). In the absence of this commitment, policy holders who discover over time that they are low-risk may opt out of the insurance pool, creating adverse selection. In principle this problem can be mitigated by multi-year contracts with front loaded premiums. By shifting cost of the policy towards the beginning of the relationship, insurers can lock-in their policy holders. In practice, however, imperfect credit markets and liquidity constraints may make sufficient front-loading infeasible.²⁰

One hoped-for result of the managed care revolution of the 1990s was an increase in investments in future health. Because of insurance market frictions and the absence of long-term contracts, however, managed care organizations have not been able to capture much of the surplus from disease-prevention programs. Returns on investments in future health depend on the expected duration of the relationship between insurers and their policy holders. In the U.S.’s employer-based commercial insurance market, the expected duration of this relationship is determined in part by the duration of employment relationships. Thus a natural extension of our argument would be that sectors of the labor market with high rates of job turnover should also

²⁰ Hendel and Lizzeri (2003) provide a theoretical model of the failure of long-term contracts and offer evidence that life-insurance contracts (which are by their nature long-term) have front-loaded premiums. Finkelstein, McGarry, and Sufi (2005) document the presence of adverse selection in the market for long-term care insurance. Diamond (1992) argues that long-term contracting is much more difficult to achieve in the health insurance setting because the product is more complex, with many contingencies that are hard to specify in advance, thanks to frequently changing medical technologies, clinical practices, and legal mandates.

have low rates of investment in future health and hence poorer health outcomes than other sectors. This hypothesis was investigated in a recent paper by Fang and Gavazza (2007).²¹ They find that employees in industries with high turnover rates are less likely to be offered health insurance from their employer. Should health insurance be offered, employees in high turnover industries pay higher deductibles and a larger fraction of the insurance premium. As a result, these employees also spend less on health services and receive less preventative care. In retirement, however, employees who had worked in high turnover industries have higher medical expenditures.

In the absence of long-term contracts, the difficulties of obtaining health insurance each year increase with age. Medicare, the government run insurance program for older Americans, helps mitigate this problem by offering insurance to everyone at age 65, but the fragmentation in insurance relationships resulting from the near universal transfer of commercial insurance patients to Medicare also creates incentives for insurers and their members to shift costs of medical expenditures onto the Federal government. An analysis by Card, Dobkin and Maestas (2004) exploits the age related discontinuity of insurance availability and documents both these aspects of Medicare. Consistent with Medicare's role in expanding access to insurance, the authors find that disparities in access to medical care fall for demographic groups that, prior to age 65, were less likely to have insurance. They also find that Medicare increases hospital admissions by 10 percent with most of the action concentrated on non-emergency and elective procedures. Contrary to their results for care access, but consistent with cost-shifting from private insurance onto Medicare, they find that this increase in hospitalization is largest for

²¹ In the framing of their empirical analysis, Fang and Gavazza (2007) ignore the insurance market altogether and focus on the market power employers gain from labor market frictions. From theoretical perspective, suboptimal investments in future health can be the result of either labor or insurance market frictions or both.

groups with *higher* insurance rates prior to turning age 65 (Card, et al., 2004, p. 5). Cost shifting from private to public insurance is also possible after age 65 because of private Medigap insurance. Chandra, Gruber and McKnight (2007) examine the effect of increased co-pays for Calper's Medigap insurance. They find that an increase in co-pays has the effect of reducing both office visits and expenditures on prescriptions, while increasing hospitalizations. Since Medicare pays the lion's share of hospitalization, and 80% of office visits, while Calpers gets to keep the co-pay and 100% of the Rx expenditures, the net effect of higher co-pays is a transfer of spending from Calpers to the Medicare program.

Information Flows

The fragmented relationships between insurers and their policy holders create less than optimal incentives to invest in disease management programs and other initiatives that require expenditures in the present to improve health in the future. From this perspective it is puzzling to observe that the great bulk of investments in disease management are undertaken by insurers. Insurers after all, have no great expertise in the delivery of health care—a fact underscored by the frequency with which they simply contract out disease management to third party providers (Beaulieu, et al., 2007). The reasons for this odd arrangement have to do with the central role that insurers play in the flow of information needed to coordinate care (Gertler and Simcoe, 2004).

The purpose of disease management (and more proactive population management) programs is to intervene *before* hospitalization is required. Should patients become hospitalized, however, these programs aim to prevent re-hospitalization. Achieving these goals requires the coordinated action of primary care physicians and specialists in both in-patient and out-patient settings. Pham, Schrag, O'Malley, Wu and Bach (2007) provides some evidence on the scale of

coordination required. They studied Medicare patients whose physicians were included in the Community Tracking Study physician survey. They report that the median number of physicians seen by patients with diabetes is eight and the median number of distinct medical practices involved in treatment is five. The analogous numbers for coronary artery disease are ten physicians and six practices. Coordination problems are further exacerbated by the fact that the amount of care is fairly spread out across physicians and that the physician providing the most care is not constant from one year to the next (Pham, et al., 2007).

Unfortunately the information infrastructure in health care does not allow for the seamless flow of information from hospitals to physician offices and between physician practices. A major reason for this is the fragmented nature of the health care delivery system and the consequent absence of well accepted standards for sharing information.²² The IT revolution has been slow coming to hospitals and only in recent years have large expenditures in electronic medical systems begun. Burt and Hing (2005) estimate that in 2001-2003 only about 30 percent of hospital emergency and out-patient departments used electronic medical records (EMRs). Physician practices are even more dependent on paper-based medical records, with 17 percent of physicians' offices reporting use of EMRs in 2001-2003. Where physicians' offices have moved to electronic records, these systems often do not interface neatly with hospital systems.²³

²² As President Bush's information technology advisor committee concluded, "Unlike the nationalized health systems of many countries, however, the U.S. health care system is deliberately composed of private, independent hospitals, ambulatory care and long term care facilities, and private individual and group provider practices. While this arrangement has stimulated competition, maximized consumer choice, and provided ongoing incentives to excel and to innovate, the free market system does not inherently generate practical mechanisms for sharing information critical to patient care" (President's Information Technology Advisory Committee, 2004, p. 7)

²³ "To be effective, CDSS [clinical decision support systems] diagnostic systems require detailed, patient-specific clinical information (history, physical results, medications, laboratory test results), which in most health care settings resides in a variety of paper and automated datasets

As a result of this fractured IT infrastructure, insurers have a central role to play as information aggregators. All visits and procedures that require billing end up being coded into the vast records of the insurer. If the billing information is sufficiently timely and accurate, and if it can be integrated with pharmacy and laboratory information, it is possible to assemble a virtual electronic medical record that spans across in-patient and out-patient settings and also across the offices of providers, even those that still keep records entirely on paper. This information could be used to implement disease management programs and to otherwise enhance the use of evidence based protocols.

Javitt , Rebitzer and Reisman (forthcoming) report the results of a randomized trial of an claims-based decision support system that aggregates out-patient and in-patient information and sends messages to physicians when errors or deviations from protocols are discovered. They find that this system significantly reduced resource utilization, especially for the most expensive patients. There is also some evidence that the intervention increased the rate at which identified issues are resolved. Chernew, Rosen and Fendrick (2007) report promising results from an attempt to use this same claims based system to implement value based insurance design, i.e., to adjust out-of pocket expenditures for services whose benefits are likely to be especially beneficial to specific patients with chronic conditions.

The preceding studies hint at the potential upside of using claims records to promote coordination and the use of evidence based protocols, but insurance records have some inherent

that cannot easily be integrated. Past efforts to develop automated medical record systems have not been very successful because of the lack of common standards for coding data, the absence of a data network connecting the many health care organizations and clinicians involved in patient care, and a number of other factors” (Institute Of Medicine Committee On Quality Of Health Care In America, 2001, p. 154). The problem of coordination is made worse by less than optimal incentives. Hospitals that invest in coordinating IT systems with physicians lose the value of that investment if physicians bring their patients to another hospital (Casalino and Robinson, 2003).

limitations as a source of clinical information. The claims data typically arrives slowly and contains far less clinical detail than one would find in true electronic medical records. The disrupted relationships within the insurance industry further limit the utility of insurance records. When an employee leaves an insurer no further information is collected about them. Similarly, when an employee joins a new insurance company, information collection begins de novo, even if the individual had previously been an insurance company member. One insurance industry veteran with whom we spoke said it takes about a year for an insurance company to collect enough information about a patient to even know if they are eligible for a disease management program.

These problems would be mitigated, but not fully resolved, by a system of personal medical records that are the property of the individual. WebMD, one of the leading personal medical record companies, works with employers and insurers to feed billing information, as well as pharmacy and lab data into each individual's record. This information belongs to the individuals and stays with them should they leave their current job or should the employer sever connections with WebMD. Unfortunately if an individual's next job does not have a contract with WebMD, the flow of information from the insurer stops. Individuals can continue to add their own information to their personal medical record on their own, but it seems clear that the realizing the full potential of personal medical records is made more difficult by fragmented insurance relationships.

Administrative Costs

In his 1992 presidential address to the Econometric Society, Peter Diamond proposed a wide-ranging reform of the structure of US health insurance markets. In his discussion he observed, "The administration of health insurance is expensive, and not adequately approached

by a model of ideal insurance with no loading, i.e., with premiums equal to expected benefits” (Diamond, Diamond, 1992, p. 1234). This theme continues to play an important role in discussions of reform in the US health care system. In a recent and widely discussed analysis, Woolhandler, Campbell and Himmelstein (2003) calculated that the United States spends \$1,059 per capita on the administration of its health care system, which amounts to 31 percent of total health care expenditures. Canada, in contrast, spends \$307 per capita on health care, which is 16.7% of its total health care expenditures (Woolhandler, et al., 2003, p. 768). Insurers contribute in a direct way to this differential; insurance overhead is \$259 per capita in the U.S., versus \$47 in Canada (Woolhandler, et al., 2003, Table 1) and much of this difference is due to the relatively heavy reliance in the U.S. on private insurers, whose underwriting, billing and marketing activities account for the bulk of overhead costs.²⁴ If the complexity of insurance contracts and billing procedures cause hospitals, physicians and employers to build bureaucracies to negotiate relationships with insurers, then the indirect effects of private insurance on administrative costs may be a good deal larger than the direct effects. Woolhandler, *et al.* (2003) find that hospitals in the U.S. spend \$315 per capita on administration, compared with \$103 in Canada. Similarly, the administrative costs of practitioners are \$324 per capita in the U.S., versus \$107 in Canada, while employers spend \$57 per capita in the U.S., compared to \$8 in Canada. As the authors put it, “A system with multiple insurers is also intrinsically costlier than a single-payer system. For insurers it means multiple duplicative claims-processing facilities and smaller insured groups, both of which increase overhead. ... Fragmentation also raises costs for providers who must deal with multiple insurance products—at least 755 in Seattle alone—

²⁴ Kahn, *et al.* (2005), in a study of California insurers, between 1996 and 2000, estimate that billing and insurance related administrative costs account for 8.4% of premiums for commercial insurance, 9.4% of premiums for Medicaid, and 3.8% of premiums for Medicare.

forcing them to determine applicants' eligibility and to keep track of the various copayments, referral networks, and approval requirements" (Woolhandler, et al., 2003, p. 773). A logical extension of these observations is that a move to a Canadian style single payer system would vastly reduce administrative expenses for insurers, hospitals, physicians and employers.

Presumably these savings could help finance some of the additional costs of Canadian style no-cost-sharing universal-coverage health insurance. A recent Commonwealth Fund report (Davis, Schoen, Guterman, Shih, Schoenbaum, and Weinbaum, 2007) uses administrative costs to make a similar point, but with a different international benchmark. If administrative expenditures in the US were scaled back to match what Germany and Switzerland pay for administration, the savings would be \$32 to \$46 billion a year (Davis, et al., 2007, p. 4). Germany and Switzerland have mixed private and public health insurance systems, so the implication is that substantial savings are possible even if we retain the mixed private and public US system.

To the extent that administrative functions would absorb fewer resources if the US health care system were organized differently, it is possible to view some portion of administrative expenses as wasteful.²⁵ From an economic perspective, however, this view of administrative costs in health care is not satisfying. The problem is the difficulty of determining exactly which activities should be counted as administrative costs (Kahn, et al., 2005; Aaron, 2003). This ambiguity creates obvious problems for making meaningful international comparisons. Importantly, a failure to understand the tasks involved in administration makes it difficult to identify which administrative costs arise from necessary activities that would persist under any alternative health care system, and which are due to a failure of insurance markets or to a failure

²⁵ Similar claims are sometimes made about administrative expenses in the context of public schools or tax-exempt salaries (cites).

of the health system's administrative structure.²⁶ The distinction between the failure of markets and the failure of administrative structure is especially important in the context of health care reform. The administrative structure of a country's health care systems evolves out of its history, culture, politics, and institutions and is typically supported by groups with powerful interests in maintaining the status quo. Consequently, the administrative structure of health care systems are very resistant to change (Aaron, 2003). Market failures, in contrast, can be easier to ameliorate, provided that the causes of these failures are properly understood. From this perspective it is quite important to know if the high administrative costs in the U.S. health care system are the result of the absence of a single payer administrative structure or of some easier-to-reform aspect of the workings of health insurance markets.

There is good reason to suspect that high administrative costs are partly the result of market failures in the insurance market, specifically the presence of search frictions. The marketing expenditures frequently cited in discussions of administrative overhead are themselves evidence that information does not flow easily and instantaneously through the insurance market.

Search frictions also contribute to high administrative costs because they make the processing of claims quite complex. To see this, consider the process by which insurers pay claims. Before a commercial health insurer can begin paying claims it must know that a particular plan member who received medical services is covered under a policy and it must know what the terms of that policy are. Keeping track of the details of a policy is a complex administrative task. The insurer needs to know: What is the co-pay or deductible associated with the service at the time of service? Is the service covered under the insurance policy? Was

²⁶ Aaron (2003) also criticizes the methods that Woolhandler, *et al.* (2003) use for their estimates. His alternative approach yields smaller—but still substantial—differences in administrative costs between Canada and the U.S.

pre-approval required and was it obtained? Was the physician or provider part of the insurer's approved network at the time of service and what rate of payment is specified in the contract with the provider? Answering these questions for each claim obviously absorbs time and energy, and the amount of time and energy required increases as the number and variety of products grow. As Woolhandler, *et al.* (2003) mention, Seattle has 757 distinct health insurance products. Our own interviews with executives in the insurance industry suggest that this number is not atypical and may in fact be conservative.²⁷ It seems natural then that an economic analysis of high administrative costs should consider why competition produces so many distinct health insurance products.

If health insurance markets were competitive, and if all insurers and buyers in the market were identical, we would expect to observe a single insurance premium corresponding to a single insurance policy, with terms tailored to optimally meet the needs of buyers (all of whom attain the same level of utility). A proliferation of product variety would occur only if there were differing resources and preferences of heterogeneous purchasers. Things are different in markets with search frictions. Even if all insurers and purchasers are homogeneous, the equilibrium is characterized by a *distribution* of utilities, reflecting differing degrees of luck in acquiring insurance. At each point on the distribution, insurers offer an insurance policy with distinctive terms differing premiums; fortunate employer groups find a good insurance policy at a low price, while unfortunate ones find that their best offer entails a mediocre policy at a high price. The resulting proliferation of policies and premiums might well be utility maximizing for consumers in the narrow sense that there will be no profitable re-arrangement of premiums and policy terms

²⁷ One manager we interviewed—the chief information officer of an insurance company, with years of experience processing claims—estimated that his claims center handled thousands of distinct insurance products. For national insurers, some of the proliferation of products is due to the fact that insurance mandates differ across states.

that will make buyers at that point on the utility distribution better off. This is not, however, the same as saying that the wide range of insurance products is socially desirable. Indeed, a reduction in search frictions will both reduce the number of policies and improve the welfare of consumers. In the case where purchasers have heterogeneous preferences and search frictions are fixed, it is possible to improve overall utility by restricting the variety of products on the market.²⁸

If we are right that search frictions contribute in an important way to marketing costs, as well as the proliferation of products and hence to high administrative costs in insurance, the attention of policy makers wishing to reduce administrative waste might be better focused on efforts to reduce search frictions rather than efforts to more fundamentally reform the administrative structure of the insurance industry.²⁹ We return to these issues in the final section of the paper.

²⁸ A clear explanation of the effect of search frictions on market variety comes from an analysis of non-wage job characteristics by Lang and Majumbar (2004). They demonstrate that when there are homogenous workers and firms, equilibrium generally entails a distribution of worker utilities, with each point on this distribution involving a distinct combination of wage and non-wage job attributes. In their set-up it is straightforward to show that as search frictions fall, the variety of jobs fall and worker utility increases. The authors then show that when workers are heterogeneous, extra-market restrictions on the variety of jobs can improve welfare. Substituting “insurance premiums” for “wages,” and “insurance policy attributes” for “non-wage attributes,” we see that the same results hold in the insurance context. Clearly, the number of non-premium attributes of an insurance policy is large (i.e., there is massive variation in co-pays, deductibles, physicians in the network, drugs in the formulary, etc.). Consequently search frictions might lead to a great proliferation of insurance products—much greater than would prevail in the absence of frictions.

²⁹ Some economists have pointed to adverse selection, rather than search frictions, as the market failure leading to the proliferation of policies as well as their complexity (Diamond, 1992). Clever insurers might indeed want to design policies so as to deter bad risks, but it is hard to see how this fine tuning could account for the *very* large number of health insurance products offered by insurers. In any event, at a theoretical level the distinction between models of adverse selection and search friction may be more apparent than real. Li (2007) presents a model of non-sequential search where the search frictions are entirely the result of adverse selection.

Hospitals: Fragmented Governance and Care Quality

Hospitals have a fragmented organizational structure because of the special role played by physicians. Physician actions and decisions are central to resource allocation and care processes in the hospital, yet physicians are to a large extent independent of hospital management. Doctors are rarely employed by hospitals and they rarely have an ownership stake in them. The doctor-patient relationship and the doctor's medical practice are usually separate and legally distinct from the rest of the hospital. Reimbursements made for inpatient care are made separately to physicians and hospitals. As Harris put it in his seminal article on the internal organization of hospitals, "The net result is one organization split into two disjoint pieces, each with its own objectives, managers, pricing strategy and constraints" (Harris, 1977 , p. 468).³⁰

From the hospital's perspective, the organizational form described by Harris was workable in an environment where private insurers and the government passively reimbursed providers for services they chose to offer (Casalino and Robinson, 2003). Things changed, however, with the introduction of Medicare's prospective pay system and the eclipse of traditional indemnity insurers by managed care organizations. In this new environment, hospitals were forced to be increasingly concerned with the efficiency of their processes.

The organizational independence and the clinical interdependence of physicians and hospitals can act as a drag on clinical process improvements. Consider, for example, the process of sterilizing surgical instruments as described in a recent case study of the Stanford Hospital and

³⁰ Our view of the role of physicians is related to but distinct from the "physician control models" of hospital behavior (Pauly and Redisch, 1973). These models assume physicians control the allocation of resources within a hospital, and do so to maximize their incomes. Maximizing physician income has implications for hospital staffing levels, investments in technology and the pricing of hospital services that complement physician services. Our discussion also gives physicians a central role but focuses on something different—the difficulty of coordinating activities required to improve quality care when physicians are independent contractors.

Clinics (Zenios, Surman, and Pernas-Giz, 2004).³¹ Sterilization is not a trivial process. Approximately 50,000 instruments flowed through Stanford Hospital's operating rooms in 2004. Each instrument needs to be sterilized, processed and delivered to the correct room at the correct time. Without proper instruments, the surgery might be delayed or rescheduled. Efficient use of operating rooms is quite important for obvious clinical reasons and also because surgery generated about a third of the hospital's revenues. Surgeons received a salary as well as a fee for each surgery. As is typically the case, surgeons at Stanford Hospital were not hospital employees. Rather they were members of Stanford Medical School faculty and they were free to practice at another facility should they choose to do so. If a surgeon chose to perform surgeries elsewhere, Stanford Hospital would lose that surgeon's expertise, patients, and revenues.

The process of providing instruments to operating rooms was in principle quite simple, but in practice it left open many possibilities for error and dysfunctional behaviors. A preference card listed all the supplies needed for a surgery and these were loaded onto a cart by technicians. Errors occurred if there were mistakes in filling out the preference card. Even if the card was correct, technicians sometimes picked incorrect instruments because the bins in which the instruments sat were incorrectly labeled. Mistakes also occurred if reassembly of instruments after sterilization was not done correctly, and the sterilization technicians – who were hourly employees hired with only a few weeks of on-the-job training – did not know how to spot these problems. The location of instruments in the hospital was supposed to be tracked by manual scanners, but employees frequently failed to scan, so the location of instruments was often unknown. Emergencies and poor coordination meant that instruments were often needed

³¹ We chose this study to illustrate the important role physicians play in process improvements in hospitals. The case, and our summary of it, is not intended to demonstrate either effective or ineffective handling of an administrative situation.

immediately after use, making the preferred (six hour long) sterilization process impossible and forcing the use of less desirable flash sterilization with steam. Surgeons were frustrated with late or unusable instruments. They relied on the OR nurses for instrumentation and had no direct contact with the sterilization process or technicians. Nurses were harshly blamed by surgeons for instrumentation failures, but nurses who delivered clean instruments on time achieved “star status” among surgeons. Errors in the provision of instruments led to some individual to take actions that made the system perform less efficiently. To avoid stressful and time-consuming searches for missing items, some OR staff shared instruments between surgical suites and some nurses kept critical instruments in their personal locker. Some surgeons also took instruments with them when they left the hospital.

It should be clear from the preceding sketch that efficient surgical instrumentation requires coordination among a very heterogeneous group that includes surgeons, nurses, and sterilization technicians.³² This sort of cross-functional coordination is generally accepted as crucial for providing high quality care and implementing effective improvement processes.³³

Indeed, the Institute of Medicine’s comprehensive study of health care quality, Crossing the Quality Chasm (2001), lists the creation of effective work teams as one if its ten rules to redesign and improve care. “In the current system, care is taken to protect professional prerogatives and separate roles. The current system shows too little cooperation and teamwork.

³² Do surgeons’ decisions with respect to instruments take into account process externalities such as sterilization time? What clinical information do sterilization technicians need to have to spot problems before instruments reach the operating room? These basic process questions require the transfer of information and knowledge across functional areas. As the case writers put it, “In addition to challenges posed by SHC’s [Stanford Hospital and Clinics] administrative structure, the OR culture was particularly complex because it was organized into silos. Not surprisingly, anesthesiologist, surgeons, nurses, and supply distribution staff all had a variety of opinions about how the OR would function most efficiently” (Zenios, et al., 2004, p. 9).

³³ The drive to improve processes is not solely the result of pressures to improve care quality. Under Medicare’s prospective pay system, hospitals have financial incentives to reduce length of stay and costly adverse events (Abraham and Weiler, 1994).

Instead, each discipline and type of organization tends to defend its authority at the expense of the total system's function" (Institute Of Medicine Committee On Quality Of Health Care In America, 2001, p. 83).³⁴

The IOM traces the difficulty in forming work teams to the sociology of health care professions which focuses on "role definition, certification and licensure, or doing one's own work as the top priority..." (Institute Of Medicine Committee On Quality Of Health Care In America, 2001, p. 83). These attitudes, which are especially pronounced among physicians, are inculcated in education programs that emphasize individual decision making in their respective disciplines and do not offer much training for work in complex collaborative settings. Audet, Doty, Shamasdin, and Schoenbaum (2005) emphasize the absence of measurement systems as a reason for the slow adoption of quality improvement methods by physicians. They use the 2003 Commonwealth Fund National Survey of Physicians and Quality of Care physician access to quality-of-care data. They find that only a third of physicians receive any data about the quality of care they provide. Similarly only a third report participating in redesign efforts to improve the performance of the system of care in which they practice (Audet, et al., 2005, p. 847, Exhibit 2).³⁵

³⁴ To illustrate this point, the Institute of Medicine report also focuses on surgical tray set-ups: "Suboptimization is seen, for example, in operating rooms that must maintain different surgical tray setups for different doctors performing the same procedure. Each doctor gets what he or she wants, but at the cost of introducing enormous complexity and possible error into the system. In the new system, people will understand the advantage of high levels of cooperation, coordination and standardization to guarantee excellence, continuity and reliability" (Institute Of Medicine Committee On Quality Of Health Care In America, 2001, p. 83). For interesting studies of the effect of team coordination on clinical outcomes see Gittell, 2002 and Gittell, Fairfield, Bierbaum, Head, Jackson, Kelly, Laskin, Lipson, Siliski, Thornhill, and Zuckerman, 2000.

³⁵ Our discussion has focused on the in-patient setting, but fragmentation also plays a role in out-patient care in complex, high-cost cases. Wilensky et. al, argue that the challenge of care management and cost control is "magnified by reimbursement systems that reinforces silos of care rather than system approaches" (Wilensky, et al., 2006 p. 59).

While these sociological and measurement issues may indeed be impediments to effective quality improvement efforts, the problem is made worse by the fragmented governance structure of hospitals. The independent status of physicians makes it difficult for hospitals to craft incentives that achieve the right balance of initiative and cooperation for teams involving physicians. From an organizational design perspective, physicians pose to hospitals the same sort of multi-task problems that independent sales representatives pose for marketing organizations. Physicians, as independent contractors, have high powered incentives for devoting time and attention to their private practice, to other hospitals where they may have admitting privileges, or to research and teaching. In this context, getting high levels of physician cooperation for addressing hospital-specific issues like the sterilization of instruments requires that the hospital offer equally high powered, countervailing incentives—something that is certainly complex and typically impractical because coordination within teams is hard to measure and specify in a contract. Monetary incentives linked to the output of a team have been shown in other settings to be effective motivators (Encinosa, Gaynor, and Rebitzer, 2007; Gaynor, Rebitzer, and Taylor, 2004) but these sorts of incentives are problematic in settings where the income and wealth of team members varies as dramatically as they do in a hospital setting.

In the context of an employment relationship, however, hospitals would not require high-powered countervailing incentives to elicit team cooperation. This is because the hospital could structure the job responsibilities of physicians it employs, and in so doing limit the scope of activities in a physician-employee's job. A surgeon employed full time at a hospital would certainly need compensation sufficient to offset lost income from outside activities, but once this participation constraint is achieved high powered incentives may no longer be required to induce

cooperation. In an environment of low-powered incentives, space is created for more subtle and finely tuned non-pecuniary motivators that sustain high-commitment.³⁶ There is a substantial literature on high commitment human resource systems in which employees work hard in the interests of the employer in exchange for good pay, empowerment, trust, and interesting fulfilling work (Roberts, 2004, p. 175). In place of high powered monetary rewards for individual performance, employers substitute careful screening, socialization, and training in the objectives of the firm, and peer pressure to sustain high levels of motivation.

If the fragmented governance structure of hospitals poses important impediments to process improvements in hospitals, why don't we see alternative governance structures appear that more tightly integrate physicians into the functioning of hospitals? For instance, in many European health care systems (e.g., Austria, Belgium, Denmark, Finland, France, Germany, Great Britain, Italy, the Netherlands, Norway, Spain and Sweden) in-patient care is predominately or entirely overseen by salaried physicians employed by their hospital (European Observatory on Health Systems and Policies, 2004). Part of the answer to this question is that the legal system in the US has historically discouraged the employment of physicians by hospitals. Two long-standing legal doctrines have tilted the evolution of the hospital-physician relationship towards an independent contractor model. These are the corporate practice of medicine doctrine and the doctrine of vicarious liability. We briefly discuss each of these in turn.

The corporate practice of medicine legal doctrine has its roots in state laws that prevent unlicensed entities from providing medical services. These statutes, which the American Medical Association first proposed in 1847, were motivated in part by a desire to protect the

³⁶ The clearest statement on the advantages of employment relationships in eliciting cooperation is in Holmstrom (1999). In a related analysis, Encinosa, Gaynor and Rebitzer (2007) offer empirical evidence on the presence of sociological and economic incentives in medical groups.

public from bad medicine and physicians with “divided loyalties,” and in part by a desire to protect the professional autonomy of medical doctors from encroachments by corporations and hospitals (Huberfeld, 2004; Yessian and Kvall, 1991). The statutes and associated case law vary from state to state. In the past, the doctrine effectively prohibited the employment of physicians by hospitals and other non-physician entities, although the current force of this prohibition is unclear (Robinson, 1999; Huberfeld, 2004). Yessian and Kvell (1991) find that in 1991 only five states clearly prohibited hospitals from employing physicians. These five states (California, Colorado, Iowa, Ohio and Texas) accounted for twenty three percent of all US hospitals. In some other states there is confusion about whether hospitals can employ physicians (Yessian and Kvall, 1991, p. 4).³⁷

The doctrine of vicarious liability comes out of tort law. According to this doctrine, principals are responsible for the consequences of actions taken by employees in the course of carrying out their duties. Thus a hospital that hires physicians as employees creates for itself malpractice liability for their mistakes that it wouldn’t otherwise have to bear.³⁸ From an economic perspective, the equilibrium expected costs of malpractice (and hence incentives to avoid malpractice), are not influenced by who is held liable for malpractice damages.³⁹ What

³⁷ Some exceptions are allowed in these states. In California the prohibition does not apply to public hospitals or to clinics operated by medical schools. Iowa, Colorado and Ohio allow teaching hospitals to employ physicians as residents and interns for purposes of education (Yessian and Kvall, 1991, p. 4).

³⁸ Abraham and Weiler (1994) discuss the evolution of hospital liability. Until the 1940’s, hospitals were enjoyed almost total “charitable immunity” from tort claims. That doctrine has declined and currently the doctrine of vicarious liability holds so that independent physicians bear the brunt of liability for negligence occurring during hospital care. There are, however, some notable exceptions to this generalization, especially regarding the “apparent authority” of physicians working in emergency rooms and elsewhere where patients would not know that physicians are independent contractors.

³⁹ For example, a shift in liability from independent physicians with hospital privileges to hospitals would simply be compensated for by an offsetting reduction in the compensation of physician

does matter economically is whether the shift in liability from hospitals to independent contractor physicians reduces either the overall economic burden that malpractice litigation and awards place on these parties, or the expected economic gains from taking actions that reduce the chances of bad outcomes. Thus, if physicians are more likely than hospitals to be judgment proof as Arlen and MacLeod (2005a) contend, the use of independent contractors should *ceteris paribus* reduce expected costs of malpractice.⁴⁰ Alternatively it may be that the experience rating of malpractice insurance differs between hospitals and individual physicians. Abraham and Weiler (1994) claim that malpractice suits are so rare for individual physicians that insurers do not experience rate premiums. For hospitals, however, malpractice events are less rare and so it would make sense for insurers to experience rate premiums—and large, self-insured, hospitals are necessarily perfectly experience rated. Given these differences in experience rating practices, the doctrine of vicarious liability might favor the use of independent physicians even though this arrangement makes process improvements more difficult.⁴¹ Process improvements are further complicated by the fact that for the purposes of tort law, employment is defined by supervision and control. Thus a hospital that relies largely on physicians as independent contractors would

employees. Arlen and MacLeod (Arlen and MacLeod, 2003, Arlen and Macleod, 2005a, Arlen and MacLeod, 2005b), make this point in the context of managed care organizations.

⁴⁰ Zeiler, Silver, Black, Hyman, and Sage, (forthcoming) study malpractice payments in Texas from 1990 through 2003. They find that physicians' insurance policy limits act as an effective cap on recovery and that many physicians have policies with much less than the one million dollar limits that had been assumed to be the norm. More than half the claim reports in their sample involved policies with limits of \$100,000, \$200,000 and \$500,000.

⁴¹ Arlen and MacLeod (2005b) present a theoretical analysis of this issue in the context of managed care organizations. Abraham and Weiler (1994) argue that the current system of vicarious liability offers insufficient incentives for hospitals to undertake the systematic process analysis and improvements required to improve patient safety. Outside of health care, Rebitzer (1995) provides empirical evidence that safety problems at petrochemical plants were increased because of employers' attempts to evade vicarious liability through the use of independent contractors. Where plant management followed legal advice to minimize liability by not supervising or training contract employees, accidents increased.

forgo some of the legal advantages of this set-up should it attempt to tightly supervise, train and otherwise put physicians under its administrative control.

Our discussion of the importance of vicarious liability may be incongruous to those with experience with managed care organizations. Traditional indemnity insurance exerted no influence on physician treatment decisions, but it has been largely eclipsed by managed care organizations that simultaneously provided health insurance while also subjecting physicians to utilization review, incentive contracts and other arrangements designed to shape clinical decision making (Gaynor, et al., 2004; Cooper and Rebitzer, 2006). If legal doctrine was a powerful enough force to inhibit the integration of physicians with hospital operations, why did it not also inhibit managed care's attempts to regulate physician practice patterns? Part of the answer to this question is that it is very difficult to recover substantial damages based on the negligent denial of care by managed care organizations. The reason for this is that managed care organizations are covered under a Federal law, the Employee Retirement Security Act (ERISA), that restricts damages to the cost of denied coverage and preempts malpractice suits under state law. This preemption is important because state laws would otherwise allow for the recovery of substantial compensatory damages (Arlen and MacLeod, 2003). ERISA does not preclude malpractice suits under state law for negligent care delivered by physicians employed by managed care organizations. In this case, however, the doctrine of vicarious liability allows managed care organizations to escape liability so long as the physicians are independent contractors (Arlen and MacLeod, 2003).

In summary, for much of the 20th century, legal doctrines and associated case law have created a legal landscape that discouraged hospitals from employing physicians. This landscape is not fixed and seems to be evolving in ways that are likely to weaken and perhaps eliminate the

corporate practice of medicine doctrine. It is also not hard to imagine tort law moving further towards increasing hospital liability for the care of the hospitalized patients from independent physicians. Health care organizations and providers are unlikely, however, to passively wait for legal doctrine to evolve. Economic pressures are causing hospitals and physicians to develop new professional practices and organizational forms that may integrate physicians more tightly into hospital operations and process improvement efforts.

A particularly noteworthy innovation is the growing use of hospitalists. Hospitalists are a new medical specialty in which physicians, often internists, specialize in caring for patients who are in the hospital. The word “hospitalist” was first defined by Wachter in 1996 (Meltzer, 2001). Although there were only a few hundred such specialists in 1996, Wachter estimated that there were 8000 hospitalists in 2004 and he expected to continued rapid growth (Wachter, 2004). Sometimes hospitalists are members of medical groups or managed care organizations, but sometimes they are hospital employees (Robinson, 1999).⁴² Whatever their status, the fact that hospitalists locate their practice at a hospital would seem make it easier for them to make investments in hospital specific human capital and also to participate in process improvement projects. Evidence on the effects of hospitalists has been scarce, and most studies suffer from the non-random assignment of patients to hospitalists (Meltzer, 2001). Meltzer (2001) discusses two studies that approximate a random design in that patients were allocated to a hospitalist or non-hospitalist based on who happened to be on call when the patient arrived. Both studies find that hospitalists modestly reduce length of stay and charges. To the extent that hospitalists offer

⁴² The shortening length of hospital stays and the higher level of complexity of patients in the hospital also spurred demand. With fewer hospitalized patients and those who were in the hospital on average much sicker than in the past, it made sense for office based physicians to hand off responsibility to a physician stationed in and specializing in hospital care (Meltzer, 2001).

opportunities for enhanced coordination and quality improvement, one might expect these gains to grow over time as hospitals and hospitalists gain experience with these new arrangements.

While hospitalists offer the promise of efficient specialization, they also create coordination costs. The conventional physician-patient relationship allows the primary care doctor to coordinate in-patient and out-patient care. In the hospitalist model, however, office-based physicians hand their patients off to hospitalists when patients enter the hospital and this hand-off creates the opportunity for missteps (Meltzer, 2001; Wachter, 2004). Ultimately, the extent of the diffusion of the hospitalist model of in-patient care will depend on the benefits from specialization (including specialization in hospital process improvement) exceeding the heightened coordination costs.⁴³

The hospitalist model makes enhances physician-hospital coordination in the in-patient setting. As our discussion of chronic disease emphasized however, high quality care for serious illnesses often requires coordination of in-patient with out-patient treatments. This sort of coordination might be better facilitated by having hospitals integrate with physician practices. In some cases hospitals have acquired physician practices by purchasing their assets and placing doctors on salary. The motive for these purchases seems largely to be to lock-in profitable referrals (Dranove, 2000, p. 130; Robinson, 1999; Casalino and Robinson, 2003) and also to enhance hospital bargaining power (Budetti, Shortell, Waters, Alexander, Burns, Gillies, and Zuckerman, 2002; Casalino and Robinson, 2003). In other cases, hospitals construct alliances with physicians by forming physician hospital organizations (PHOs) or management service

⁴³ Coordinating care among a variety of physicians may make it difficult to implement low- tech but effective treatments that hinge on monitoring patients. Consistent with this hypothesis, . These differential improvement rates were not due to differences in underlying patient conditions, but may have been due to the more consistent use of aspirin and beta-blockers to treat AMI patients.

organizations (MSOs).⁴⁴ These attempts at vertical integration have generally produced disappointing results, in part because they have done a poor job integrating care processes across providers.⁴⁵ As Burns and Pauly (2002 , p. 134) put it, “The structures that were put in place to integrate hospitals, primary care providers and specialists often failed to fundamentally alter the manner in which physicians practiced medicine and collaborated with other health care professionals (that is, ‘clinical integration’). As a result, integrated structures rarely integrated the actual delivery of patient care.”⁴⁶ In the absence of process integration, PHOs and other integrated health care organizations have experimented with a great variety of clever incentive systems for physicians. These incentive experiments have not met with much success, in part because many aspects of care integration are non-contractible and in part because incentive pay is too crude an instrument to achieve the multiple goals of efficiency in production, appropriate

⁴⁴ A PHO is a joint venture between a hospital and physicians that serves as a single agent for managed care contracting and provides administrative services and utilization review. In a PHO, both the physicians and the hospital retain their identity as separate lines of business. An MSO is a free-standing corporation owned by a hospital or PHO. It provides services to medical practices, it may be the employer of the non-medical staff, and it may help coordinate planning and decision making (Burns, 1995).

⁴⁵ Robinson (1999, p. 192) argues that the scope for vertical integration between hospitals and physicians is quite limited “... very few PHOs can aspire to owning sufficient practices to fill their beds solely with the patients from their physician employees. Even the largest integrated organizations, such as Kaiser, find it advantageous where possible to contract for the use of independent facilities or, conversely, to allow nonaffiliated physicians to use the system hospitals. Most PHOs, even prominent examples such as St. Jude in Orange County and Montefiore in New York are only partially dependent on employed physicians for their admissions. Partial vertical integration also cuts the other way, since the medical groups owned by hospital systems often find it desirable to admit some of their patients to nonsystem institutions for reasons of patient preferences and geographical convenience.” The difficulties of vertical integration seem to have become apparent in the market place as well. The fraction of hospitals with PHOs and MSOs peaked in 1996 and has been declining since (Burns and Pauly, 2002).

⁴⁶ Robinson (1999) observes that the greatest benefits for coordination would be between hospitals and specialists whose practice largely takes place in hospitals, but many PHOs were purchasing primary care physician practices.

utilization and referrals, and delivery of high quality care (Dranove, 2000, p. 135; Robinson, 1999).⁴⁷

Conclusion: Responses To Fragmentation

We have argued that the organizational fragmentation of our health care system has wide-ranging and often adverse effects on care quality. We have also argued that fragmentation is not the result of a single process. It has its roots in important market forces (and failures), legal doctrine, government policy and the state of information technology. Just as there is no single cause, there is no single cure for problems resulting from fragmentation. Some improvements may result from changed government policy, but a good deal will depend on the development of improved organizational practices, legal doctrine and informational technology.

Our analysis of fragmentation in insurance relationships suggested that the disrupted insurer-policy holder relationships are likely to lead to insufficient investments in future health such as disease management programs for chronic diseases. Our analysis of fragmented hospital governance emphasized the difficulty of implementing important process improvements. In principle policy makers could address any short-fall in investments in future health by mandating that insurers deliver the under-provided programs. Indeed, twenty seven states currently mandate coverage for diabetes self-management and education programs, though disease management mandates for other conditions remain rare (Bunce, Wieske, and Vlasta Prikazsky,

⁴⁷ Beulieu and Barro (2003) offer a case study of one hospital system's attempt to introduce appropriate incentives into physician practices they purchased. They make the point that increasing incentive pay for physicians causes low performers to leave the practices purchased by the hospital. Presumably these exiting physicians are less likely to refer patients to the hospital than the stayers.

2007).⁴⁸ Similarly, policy makers could create powerful incentives for process improvement simply by making pay contingent on quality outcomes. Medicare will be adopting just this approach when it introduces a policy in fiscal year 2009 that refuses additional payments to hospitals for preventable inpatient complications, errors, injuries, and infections that could have reasonably been prevented by good quality assurance processes (Kurtzman, 2007).

Mandates are powerful tools for influencing insurers and providers, but neither is likely to achieve fully satisfactory results. Insurance mandates that are not compatible with the incentives inherent in short insurer-policy holder relationships may lead to insufficient investments and perfunctory programs that in extreme cases may become wasteful sham efforts. Being very specific about the content of mandated programs may help reduce the scope of evasion, but specificity may itself be problematic in an environment where clinical best-practice is rapidly evolving.

Pay-for-performance creates implementation problems analogous to mandates. In clinical settings, performance measures are often imperfect and complete risk adjustment is typically not feasible. Linking high-powered incentives to these performance measures creates distorted incentives that can lead to “cream skimming” and other undesirable provider behaviors (Dranove, Kessler, McClellan, and Satterthwaite, 2003). A second but equally important issue with pay-for-performance is that in a fragmented health care system it is often unclear just whom to hold responsible for outcomes and therefore who should receive the payments. As we noted in section two above, the care for Medicare patients is typically distributed across a number of providers and physician practices. Pham, *et al.* (2007) used Medicare’s claims data, and common algorithms, in an effort to identify physicians primarily responsible for the care of

⁴⁸ California also mandates coverage for pediatric asthma self-management and education.

patients. They were, more often than not, unable to identify a physician primarily responsible for care.⁴⁹ The inability to identify an individual provider to hold responsible for care introduces an important source of waste and potential distortion into pay-for-performance systems. An intriguing alternative approach put forward by Fischer, et al., (2006) is to create “accountable care organizations” that are composed of hospitals and the physicians who treat or admit patients there. Linking pay to the performance of these artificial entities would make it easier to create incentives for improving the many clinical processes that span in-patient and out-patient care delivery systems. By holding a large network of organizations accountable, the accountable care organization approach also has the benefit of ensuring a large enough sample size to yield meaningful performance measures across diverse aspects of care. This approach, however, also faces a number of legal and political barriers to implementation. Introducing gain-sharing among participants in accountable care organizations will require modification of Federal laws.⁵⁰ In addition free-riding issues will likely make it difficult to provide high-powered incentives across a large group of heterogenous and loosely affiliated provider organizations (Gaynor, et al., 2004; Encinosa, et al., 2007). We have seen that low-powered pay for performance incentives can be powerful when employers implement high-performance human resource systems, but

⁴⁹ Pham, *et al.* (2007) were interested in the ability of Medicare to “assign” a primary physician to a particular patient for the purpose of implementing pay for performance incentive systems. For this purpose they used different algorithms that “assigned” physicians to patients on the basis of which physician billed for the greatest number of evaluation and management visits (with no procedures performed). They find that “assigned” physicians accounted for 33% of all physician visits for diabetics. Between the years 2000 to 2002 the identity of the “assigned” physician changed at least once for 46% of the patients in their sample.

⁵⁰ The relevant laws are the Social Security Act Civil Monetary Penalties (CMP) law, Federal anti-kickback statues, and Stark laws. The CMP prohibits hospitals from making a payment to a physician as an inducement to limit services to Medicare or Medicaid patients under the physician’s care. The anti-kickback statute prohibits payments to reward referrals of patients participating in federal health care programs. The Stark laws prevent physicians from referring Medicare and Medicaid patients for health services from entities in which physicians have a financial relationship (Wilensky, et al., 2006) .

inducing physicians to form employment-like relationships with “accountable care organizations” is unlikely to be easier than employing them in hospitals.

If mandates and pay-for-performance cannot adequately ameliorate the undesirable consequences of fragmentation, then it might make sense to consider actions that reduce the causes of fragmentation itself. In insurance markets, we have argued that fragmentation is fundamentally the result of search frictions. The distortions created by these frictions are largely due to the fact that some insurers can profit by selling policies at high premiums. Employer groups accept these high premiums, because the product is sufficiently complex and the flow of information about alternatives is sufficiently poor, that the high offer is better than the available alternatives—at least for a time. The economic theory of search suggests that one way to reduce frictions would be to have a simple, competitively priced and highly marketed default insurance policy that employers could use to compare with other offers received. This simple innovation may go far towards reducing distortions created by search frictions in health insurance markets.

Our analysis of fragmentation in hospital care emphasized the legal barriers towards integrating physicians tightly with the process of care and with quality improvement initiatives in hospitals. The legal system itself seems to be moving towards removing one of these obstacles—the corporate practice of medical doctrine. In our view, little would be lost and potentially much gained if courts and legislatures took action to accelerate this process. A good deal more might be gained if the rule of vicarious liability for malpractice would be replaced by an enterprise liability rule in which hospital liability for malpractice would not depend on whether the physician delivering care in the hospital were an independent contractor or employee. The hospitalist approach to in-patient care might also be a step forward in integrating

physicians into hospital care improvement initiatives. If studies find that this is indeed the case, regulators should find ways to further promote this new specialty.

The final aspect of organizational fragmentation in our analysis is the Balkanized information technology infrastructure in the health care system. Powerful new information technology systems can facilitate the flow of information across disparate providers and perhaps move away from reliance on insurers as information aggregators. Large scale investments in these systems are now underway, but the full potential of information technology will likely require the adoption of a set of common technical (and linguistic) standards and much further investment. Electronic patient record systems that allow the seamless flow of information between hospitals and physician offices will eventually be a powerful tool for standardizing treatment protocols and also for providing the data needed to refine and improve these protocols. In this sense, information technology will allow health care to more closely resemble other industries where continuous experimenting with standardized products and services are an important driver of efficiency gains. In health care, however, the drive to standardize will need to be tempered by the realization that even with the best technology, providers will continue to have more information about the conditions and desires of their patients than can be included in protocols (Ramanujam and Rousseau, 2006).

Electronic patient medical systems are aimed largely at providers. Information technology will also enable integration of information on the patient side through the development of portable patient health records. **These portable records, when combined with decision support tools, may help patients and their families better coordinate their own care across the many providers and health care organizations they must navigate. Many challenging care decisions, however, must be made when individuals are sick, anxious, financially taxed and**

otherwise not in the best shape to make complex decisions. This fact is likely to constrain the degree to which integration by patients can be an effective response to the organizational fragmentation of the US health care system.

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