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POLICY APPROACHES TO ADDRESSING GEOGRAPHIC VARIATION IN SPENDING, UTILIZATION, AND HIGH VALUE CARE AND THE IMPLICATIONS OF THOSE APPROACHES

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EXECUTIVE SUMMARY

The US healthcare system is characterized by both productive and allocative inefficiency. In aggregate, healthcare spending could be lowered by nearly a third without adversely affecting health, while access to care and the quality and safety of care need to be raised to improve population health. Over time, growth in total spending is rising by an unsustainable rate in excess of national economic growth.

Overlaying these aggregate attributes of the delivery system are inequitable and inefficient geographical variations in spending, utilization and quality driven by physical and virtual fragmentation of care and perverse incentives in existing payment schemes. Unfortunately, much of the current policy debate focuses on the former aggregate statistics, *not* the latter distributional statistics.

This report surveys the history, present and future of supply-side payment reform (e.g. pay for performance, accountable care organizations, global and bundled payments) and demand-side payment reform (e.g. value-based insurance design and benefit tiering) intended to address those aggregate systemic issues. Analysis of these reforms' potential impact on even the aggregate issues is characterized by uncertainty. Extensive design and implementation issues as well as political motivation issues are likely to curtail the impact of potential payment reforms on the level of aggregate spending; their impact on spending growth in excess of economic growth is not likely to be significant.

Moreover, empirical evidence from other healthcare systems suggests that geographical variations can be *persistent* despite integration of care and payment reform. For example, profound small-area variations in the utilization of tonsillectomies remain in the United Kingdom despite Glover's pioneering realization 70 years ago that it "defies any explanation" and 60 years' of a single payor National Health Service. Another example is the highly regarded Kaiser Permanente system, in which a two-four fold variation exists across Kaiser's geographic areas despite world-class health information technology, salaried physicians, and 50 years' worth of integration and collaborative culture.

Theory and scattered empirical evidence also suggests that both supply-side and demand-side payment reform may *accentuate* existing geographical variations in high-value care. Rewards and penalties inherent in schemes that seek to pay for performance or episodes may increase the current divide between low and high value care areas, as may heterogeneous physician responses. Existing differences in human and financial capital between locations have stymied past attempts to achieve convergence on clinical process measures and may stymie future attempts to resolve variations. Value-based insurance design may well accentuate regressive differences in care occasioned by differences in socio-economic status and preferences for non-medical over medical spending. Finally, the impending increases in the numbers of elderly entitlement program beneficiaries and non-elderly enrollees in safety-net programs will not be affected by payment reforms which act at best on a per capita margin. Those demographic changes will however also stress existing care delivery systems and may *worsen* geographical variations in care.

We recommend that payment reform policies to reducing geographic variation in spending, utilization, and high value healthcare should not focus on targeting specific geographic regions, but instead focus on reducing potential causes of unwarranted geographic variation in healthcare utilization. These policies should replace existing payment approaches with new ones that provide incentives for high value care, establishment of an independent entity that can mandate such changes if necessary, and to provide consumers with incentives to accept more personal responsibility in managing their health care.

1 Value in the U.S. Health Care System

Value in healthcare – or its absence – is an intuitive concept. It is estimated that total healthcare spending could be lowered by around 30% without adversely affecting health (Garber, Goldman, and Jena, 2007). Reducing unnecessary and costly utilization of healthcare in aggregate, and reducing geographical variations in spending, quality, outcomes and care experience are unambiguous aims for the health care delivery system and its stakeholders.

1.1 The foundational concept of value

High value care can be conceptualized broadly as better or similar multi-dimensional, longitudinal health outcomes achieved for a particular medical condition for the same or lower cost expended in doing so (Porter and Teisberg, 2006). In this construct, measuring spending or utilization alone without regard to outcomes is an incomplete measure of value in health care (Porter, 2010), while measuring outcomes without regard to inputs is similarly incomplete. To the extent that the value construct includes the relevant inputs to health and measures the output of health appropriately, these completeness problems are avoided. However, to the degree that this metric does not incorporate important direct inputs to health such as self-care, medication adherence and nutrition, or indirect inputs such as education and income, assessing high value care remains incomplete.

1.2 Value and high-performance health care systems

Conditional on the robustness of such a value metric, the goal of high value care can usefully subsume other generally agreed aims for high performance health care delivery systems. These other goals include higher efficiency (Fuchs and Milstein, 2011; McGinnis, 2010), enhanced quality, and greater access (Weil, 2004). Efficiency is also encompassed through the relation of outcomes to costs (Porter, 2010). Quality of care is directly reflected in the numerator through the quality of the health outcome, as well as in the denominator through the quality of the processes of care. Access to care is mirrored in the numerator through achieved health outcomes measured at sufficiently high levels of analysis such as population health (Kindig et al., 2008).

Unfortunately, while conceptually elegant and an important step, agreement on such a high value care metric is still far from settled. Beyond the completeness of the measures of inputs to health, are concerns about whether this definition of value is focused too closely on an economic or societal perspective as opposed to a number of other possible viewpoints. Expanding the concept of value in health care clearly means different things to different stakeholders (IOM, 2010). One important dimension that captures these different stakeholder perspectives corresponds to the unit of analysis being the individual patient or an aggregation of many individuals, perhaps at the societal level (Kindig et al., 2008). The higher the level of analysis, the more an aggregate economic interpretation of value becomes useful.

Expanding the definition of value from an arithmetic one to a broader societal one can serve to acknowledge the scarcity of society's resources (Persad et al., 2009). There is widespread agreement that overall healthcare spending is growing too fast compared to the economy more broadly. Given the almost universal agreement on the need to 'bend the cost curve' (Antos et al., 2010), an economic perspective of value is also well-aligned with this objective. For nearly half a century, annual increases in aggregate healthcare spending have risen by more than 2% in excess of growth in gross domestic product (Wilensky, 2011).

Metrics of value which are defined without reference to this spending problem seem fundamentally flawed. As currently defined, high-value care is consistent with delivering high value care to all using more resources than the economy as a whole has at its disposal. More realistically, high value care must allow both the limitation of lower value care and the prioritization of higher value care within an overall sustainable allocation of resources to the healthcare sector. Despite the seemingly overwhelming

complexity of resource allocation decisions, individual and small group respondents have been able to generate consensus in experimental settings on such trade-offs (Ginsburg, Goold, and Danis, 2006). The general public also seems willing and motivated to consider comparative effectiveness information to understand such options better (Gerber et al., 2010).

Accompanying this aggregate economic perspective is the ability to understand the equitableness of distributions of individual patient value (Bleichrodt, Doctor and Stolk, 2005). High value care delivered to one subset of society clearly does not imply that other subsets are receiving sufficiently high value care. For example, while repeated renal transplants are deemed to be as cost-effective as other commonly accepted treatments (Hornberger et al., 1997), there remains debate about the perceived fairness of allowing retransplantations while others have yet to receive their primary transplant (Ubel and Loewenstein, 1995).

An economic perspective may also better reflect the skin in the game that individual employees and tax payers have with respect to the funding of national health expenditures (Emanuel and Fuchs, 2008). However, other perspectives on value include those of affected patients, of employers, of providers and of manufactures of devices and pharmaceuticals used in high-value care delivery. Limiting the definition of value to a more personal and individual one can facilitate patient inputs into what is actually valued in terms of outcomes and what options exist.

1.3 Causes & correlates of lower value care: fragmentation, variations and incentives

Despite these difficulties operationalizing the value construct, there is far greater agreement as to causes and correlates of lower value health care. Of these, several are especially relevant to this report and are focused on in increasing order of depth: the fragmentation of care, the resulting geographical variations in care, and the role of existing payment mechanisms.

1.31 Fragmentation of care

There is broad consensus that fragmentation of health care delivery both physically (in terms of the industrial organization of care) and virtually (in terms of information flow and contractual arrangements) stymies the achievement of a high performance health care system (Swensen et al., 2010) and is a fundamental contributor to poor overall system value (Shih et al., 2008).

Fragmentation affects access and quality of care, thus impacting the numerator of the value metric, and increases costs through waste and duplication in the denominator of the measure of value. Moreover, fragmentation facilitates local variations in processes of care, does not support convergence to evidence based care, potentially restricts patients to providers that offer higher cost, lower value interventions, and militates against transparency in the health care sector. Beyond care system fragmentation, other studies have suggested that a more general fragmentation of the value chain of healthcare is present (Burns et al., 2002). Rather than just providers failing to coordinate on care, manufacturers of devices and pharmaceuticals, purchasers, fiscal intermediaries, and providers all fail to coordinate, to share knowledge, to ally themselves to deliver maximum value to health care consumers.

1.32 Geographical variations

The combination of a continuing difficult discussion on how to conceptualize, define and measure value in health care delivery, and the broad consensus that system fragmentation is a chief cause of lower system value has naturally led to extensive research into geographical variations, the observable consequences of such fragmentation. Glover (1938) is credited with the first empirical observation of small area variation, studying tonsillectomies among school children in the United Kingdom and finding "...extreme variations in the operation rate, the extremes often being in adjacent areas". Glover concluded that "In fact it defies any explanation, save that of variations of medical opinion on the indications for operation." Despite more than 70 years of attempts to orient medical opinion in the United Kingdom towards a more conservative

approach to tonsillectomy in a pediatric population, substantial geographical variation remains today (Suleman et al., 2010).

In this country, geographical variation was first commented on in the late 1960s (Lewis, 1969) and then a deep and broad investigation centered in Dartmouth commenced in the early 1970s (Wennberg and Gittelsohn, 1973; Wennberg & Cooper, 1999). The intellectual contribution of the Dartmouth investigations lies in identifying areas of increased spending and higher utilization of care in the absence of measurable differences in outcomes or patient satisfaction (Wennberg & Cooper, 1999; Fisher et al., 2003; Sutherland, Fisher and Skinner, 2009). Both at the individual and political level, such variation in Medicare payments at the county level was perceived as unfair and inequitable, leading to policy reforms to set a floor to Medicare managed care plans (Wilensky, 2003).

However some aspects of the methodology employed by the Dartmouth investigators have continued to be challenged. The retrospective analyses of the treatment histories of decedents can lead to biased conclusions of the value of higher levels of care (Bach et al., 2004; Bach, 2010). In rebuttal, the Dartmouth investigators note that their results are robust to 'looking back' or 'looking forward' analyses (Skinner et al., 2010). However, a different critique points to the importance of unobserved differences in hospitals' thresholds for admission and treatment as likely masking further variation in community health (Huesch, 2010a). Furthermore, concerns have also been raised about the extent to which the observed variations reflect physician preferences and physician and hospital supply-side factors (Anthony et al., 2009), as opposed to patient preferences (Bertko, 2003) or previously unmeasured or poorly measured patient characteristics (Reschovsky et al., 2011).

Deeper concerns, presently unresolved, center on the extent to which differences in cost across areas are also correlated with differences in outcomes, and to what extent the quotient of delivered value then differs across those areas. For example, utilization of end-of-life surgery has been to vary significantly and substantially nationally (Kwok et al., 2011) yet aggressive surgical treatment style has been shown to be associated with improved post-operative mortality (Silber et al., 2010). Inpatient medical spending exhibits similar concerns. Higher hospital spending was associated with improved survival in some studies (Romley et al., 2011; Kaestner and Silber, 2010) and prospective analyses show that some types of more intensive medical care have demonstrable outcome improvements (Ong et al., 2009; Barnato et al., 2010). Recent work using plausibly exogenous treatment assignment based on visitors to Florida has also shown that those receiving care in high-spending care appear to have significantly better survival (Doyle, 2011); similarly in Pennsylvania, reimbursements are higher and long-term outcomes following stent procedures are better among Medicare Advantage subscribers than among comparable enrollees in traditional Medicare despite appropriate controls and tests of selection biases (Huesch, 2011).

More generally, while geographical variations in health care spending are a serious symptom of lower value health care, their practical ability to predict examples of high value care and low value care is unfortunately limited by a lack of persistence in spending variations. For example, high spending areas are not systematically high growth areas: across the nation's 306 Hospital Referral Regions, the correlation between two consecutive recent 7 year periods' spending was modestly negative (Chernew et al., 2010). This may well imply that policy changes that succeed in reducing spending in one area may have little effect in the longer term on spending growth in that area. Nevertheless, it is important to reflect on the budgetary implications of geographical variations in expenditures. To the extent to which 'excess' payments in high-spending areas can be shown to be absolutely or relatively unnecessary, such Medicare payments can be used to provide for increased coverage of impending additions to the number of total beneficiaries (Wilensky, 2003).

1.33 Payment incentives

Accompanying fragmentation of care as a cause of lower value, and to a large extent also a direct cause of that lack of integration and collaboration, are the extant payment mechanisms in the health care delivery system. Most simply put, most current payment mechanisms pay for unit service productivity rather than outcome productivity (Garber and Skinner, 2008). While earlier research firmly anchored physician incentives within the context of a profession (Arrow, 1963), later studies suggested that physician fee for service financial incentives may lead to higher volumes (Shroeder, 1978), most recently re-confirmed in the imaging practices of cardiologists (Shah et al., 2011).

The effect of fee for service payment incentives contributes to overutilization and thus keeping the cost curve bent upwards. Along with changes in the tax treatment of employer sponsored insurance, changing provider payments towards capitation or fees per episode of care are deemed to be the most plausible reforms to bend the cost curve down (Ginsburg 2009). Additional to costs, less obvious adverse effects are the incentives against collaboration (since incomes shared are incomes lost), the incentives against evidence based standards of care (since ambiguous clinical rationales can be supplanted by unambiguous financial rationales), and the incentives against considering patient preferences for care.

1.4 Resolving fragmentation

Turning to the physical fragmentation and imperfect collaboration among providers and entities within the health care value chain, interventions have been designed to address organizational structure (e.g. primary care gate keepers). When physicians are collocated and practice in shared organizational and physical settings within hospitals the common organizational structure may lead to higher value care (Meltzer, 2009). Other organizational differences exist: among primary care physicians, compared to those from larger organizational settings, solo primary care practitioners have more 'aggressive' treatment plans (Landon et al., 2001) and their patients do worse (Ketcham et al., 2007).

Physical fragmentation may also be associated with economically rational reduction in information sharing for commercial reasons (Huesch, 2011). Whether this is due to competition for patients or for reputation, or to preserve first mover advantages in the adoption of new medical technology, or more simply organizational barriers and the development of different group cultures is not currently well known. Integrating patient care physically may improve the technical efficiency of the delivery system with respect to the current state of the medical technology frontier. This may well be a transitory improvement in costs, since even very technically efficient delivery systems may not be allocatively efficient enough to slow the systemic progression up an expensive innovation frontier (Chernew et al., 2010).

The study of virtual fragmentation and imperfect information sharing among providers and other stakeholders in the healthcare system has led to interventions aimed at improving information flow (Valente & Davis, 1999; Majumdar et al., 2002; Nicholson, 2003; Majumdar et al., 2004; Jippes et al., 2010; Meltzer et al., 2010). Such interventions are predicated on the relatively high rates of inappropriate use of some interventions that has been reported (Winslow et al., 1988), even though rates of inappropriate use have not consistently been shown to vary across geographical areas (Chassin et al., 1987). Given the potential for confounding of peer effects with common contextual effects and correlated effects, and selection effects, identifying the success of peer group interventions has been fraught with great difficulty (Lyons, 2011), although 'top down' policies in which payors or senior physicians mandate changes in physician practice have been more successful (Oshiro et al., 2009; Clark et al., 2010).

It is important to note that even world class integrated delivery systems such as Kaiser Permanente have geographical variations in care across their different campuses, hospitals and areas of service in California, albeit less so than among the surrounding communities' Medicare patients. That is, despite having higher hospice rates, and 25-30% lower inpatient care use than surrounding communities, there was still a two-four fold variation across Kaiser's geographic areas (Stiefel, Feigenbaum, and

Fisher, 2008). Since Kaiser is often held up as a template for providing high quality, low variance healthcare, these results are troubling. Moreover, in addition to excellent physical integration and collaboration among Kaiser physicians, there are only low-powered incentives driving care among their salaried physicians. Finally world-class evidence based medicine is delivered in a very advanced health information technology-enabled environment. Such considerations suggest that physician heterogeneity and patient heterogeneities in underlying health and preferences may conspire to drive residual geographical variation, especially as Kaiser's within-variation appears correlated with geographical variation in the surrounding communities (Stiefel et al., 2008).

1.5 Reforming payment mechanisms

Finally, extensive efforts are on-going in restructuring the existing fee for service payment mechanisms both alone and in conjunction with interventions targeting either virtual and/or physical fragmentation. These interventions have taken place in both the public and private sector (IOM, 2008; Medicare Payment Advisory Commission, 2006), but the federal entitlement programs have taken the lead. Notable initiatives discussed further in subsequent sections include the Centers for Medicare and Medicaid Services (CMS) Hospital Quality Alliance: Improving Care Through Innovation and the associated website tool, Hospital Compare, the CMS Physician Quality Reporting Initiative (PQRI) Home Health Agencies (HHA) collection and reporting of Outcome and Assessment Information Set (OASIS) data. Other reporting tools and incentive programs have included pay for performance for hospitals and physicians; Physician and hospital Resource Use (PHRU) workgroup; hospital acquired conditions (HACs) and Present on Admission (POA) indicator reporting and payment adjustment, and hospital and physician value based purchasing (VBP) etc. (CMS, 2009c, 2010b, 2011b; Darves, 2007). The next sections build on a host of such historical efforts made within Medicare to address lower value.

2 Payment Reform Models Targeting the Supply of Health Care

Before addressing some of the incentive changes, notably among reimbursements, and payment policy reforms, it is helpful to summarize the rationale for focusing on physician incentives as opposed to the incentives of other provider participants in the health care sector. Anecdotally, while physicians only account directly for 20% of healthcare expenditures, their decisions and orders impact more than 80% of all system costs. Physician supply of healthcare is sensitive to reimbursement changes; studies of the relationship between Medicare fees and services provided by physicians demonstrate a positive relationship (Hadley and Reschovsky, 2006), so that higher fees result in more services provided, although the elasticity of this relationship is variable across different types of services (Hadley et al., 2009-2010).

Reimbursements can be conceived of as having several separate elements, which separately form policy levers and together affect physician behavior and income. The first is the timing basis of reimbursement: purely prospective, purely retrospective or some blend of the two. The next is the unit basis of reimbursement: is reimbursement based on services using a fee schedule which rewards resource-based relative values of services, or based on patients, or on areas, or on time taken, or on some blend of these units. Another element is constituted by the level of prices paid on whichever unit of reimbursement is applicable, and whenever the timing basis is applicable. A further element is the productivity of the physician or provider, which subsumes the operational capacity, the financial capacity, the demand-side of the market. In combination these elements of reimbursement deliver an aggregate level of income to providers and physicians, and an aggregate level of outcomes to patients at some aggregate measures of quality.

2.1 Payment interventions designed to guide behavior of clinicians in defined ways

Pressure to enforce defined, desirable clinician behavior has come from multiple stakeholders in the system (IOM, 2001; Medicare Payment Advisory Commission, 2006; IOM, 2008) and led to parallel efforts to create clinician performance measures, to disseminate physician performance reports, and to pay for physician conformance with data generation or quality achievement.

2.11 Overview, rationale and pilot programs

Clinical performance measures have rapidly expanded in scope and detail (AHRQ, 2011), and multiple national organizations provide benchmarks for quality measures (Drozda et al., 2008). Starting in the late 1980s, an increasing amount of research pointed to shortcomings in the quality of care delivery and lack of conformance to an evidence base (Pham and Ginsburg, 2007). For example, the National Quality Forum currently endorses 743 standards (NQF, 2011). Public report cards administered by health insurance plans are similarly available nationwide, with for example the National Committee for Quality Assurance listing 136 national plans reporting some measure of physician or hospital-specific performance (NCQA, 2011).

Federal initiatives to augment private sector and non-governmental organizations in physician data reporting have included the Centers for Medicare and Medicaid Services (CMS) Hospital Quality Alliance: Improving Care Through Innovation and the associated website tool, Hospital Compare. As with all such programs, data and methodology issues are to be expected, but the perfect must not be allowed to be the enemy of the good. For example, the HospitalCompare website, while containing a sophisticated risk adjustment method that controls for clustering of patient outcomes within multiple hierarchical levels, nevertheless contains controversial elements such as a tendency to force estimates of smaller lower volume hospitals to the overall grand mean (Silber et al., 2010).

Initially, CMS paid for reporting alone, and the Hospital Inpatient Quality Reporting program reduced by 2% points any increases in reimbursements for hospitals not reporting adequately or not in a

timely fashion (CMS, 2011). Other performance data harvesting by CMS included CMS Physician Quality Reporting Initiative (PQRI), Home Health Agencies (HHA) collection and reporting of Outcome and Assessment Information Set (OASIS) data (CMS, 2011). Over time performance measurement and performance reporting naturally extended to paying for desired performance.

Paying for physician conformance to quality standards is thought by many to be due to the influential Institute of Medicine report on *Crossing the Quality Chasm* in 2001 which stressed the need for quality in healthcare (Saleh, Hannan, and Racz, 2008). A bipartisan consensus has argued that Medicare should drive these efforts which are seen as a national priority (Berwick et al., 2003). Many smaller, regional schemes exist among private payors and their contractees, and the earliest pioneers include Aetna in 1985 (Leapfrog Group, 2011). The latest data available from 2007 states 129 P4P plans serve primary care practitioners predominantly using HEDIS-type measures, 71 serve specialist physicians comprising chiefly obstetricians, cardiologists, orthopedists, gastroenterologists, endocrinologists and pulmonologists, while 56 measure and incent hospital systems. The two prime sources of measures used to monitor performance in the commercial P4P plans are the NCQA HEDIS measures and internally developed ones. Interestingly, nearly 40% of P4P plans supplement the physician incentives in their P4P plans with consumer incentives – tiering their benefit designs to steer subscribers to providers with better performance (Leapfrog, 2011). An even more targeted payment plan involves specific payments for more coordinated primary care, in particular within a medical home (Friedberg et al., 2009; 2010) which we do not consider further for reasons of scope and space.

Despite the widespread commercial use of P4P plans, evidence of their effectiveness is lacking. In a systematic review of primary care physician P4P programs, scattered, modest results along with serious selection bias concerns were noted (Anthony et al., 2011). Other related reviews of the evidence also point out the narrow evidence base, and the small-scale nature of prior experiments (Christianson, Leatherman, and Sutherland, 2008). Even in studies that succeed, it is not clear whether incentives were the cause, as opposed to other unmeasured causes such as locally different provider norms or attitudes. Uncertainty about the estimates of causal effects of incentive systems is a critical source of concern with the widespread roll-out of P4P: it is possible that these will lead to overpayments without large-scale changes in the behaviour.

Finally, CMS has launched innovative value-based purchasing designed to be budget neutral. This program will be running for hospitals from 2013 and is expected to be phased in for physicians over 2015-2017. For hospitals, value-based purchasing involves the progressive reduction in Medicare payments from 1% in 2013 through 2% in 2017 and beyond, and the redistribution back to hospitals based on composite quality measures. There are 17 clinical quality measures which comprise 70% of the score, and 8 Hospital Consumer Assessment of Healthcare Providers and Systems measures comprising the balance. A large number of additional measures are contemplated, and beginning in Fall 2013, Medicare will also take the spending level of the hospital into account, accounting for 20% of the overall composite score. Hospital acquired conditions and patient errors will fall under the purvey of the value-based purchasing program in Fall, 2012, and aim to incent the reduction of preventable medical harms and reducing avoidable costs incurred in dealing with 'never' events and below-standard quality for other common events. After 2015, hospitals with poorer performance on hospital acquired conditions will face additional reimbursement cuts. For completeness, CMS will link a portion of reimbursements to compliance with the meaningful use of healthcare information technology within a hospital by 2015. A recent review of the evidence that might support quality-based purchasing found that programs that base incentives on measurements of outcomes are technically feasible without undue risk to hospital reputation or financial status, but that significantly more research is required to judge their success at changing quality (Dudley et al., 2004).

However, if the ability to reach performance hurdles is systematically related to location (e.g. urban versus rural) or human capital of medical and non-medical labor, then existing geographical variations may be exacerbated. In this light, a recent large-scale study of 2,705 hospitals found that

hospital performance on clinical process measures was associated with local economic and workforce resources (Blustein, Borden, and Valentine, 2010). Importantly, this was not just a cross-sectional finding, but persisted longitudinally: despite overall increases in performance over the study period, the locationally disadvantaged hospitals continued to lag behind their advantaged peers. Whether these findings would also extend to the CMS value-based purchasing program remain to be seen.

2.12 Factors that facilitate or impede efforts

A common factor that we judge likely to impede efforts to shape physician behavior in defined ways is the debate about how to set targets. While hospital readmission rates, for example, are a legitimate and costly target for public payors to attempt to control, the extent to which readmissions are avoidable remains unclear. The particular target in common use, the 30 day readmission rate is clearly influenced by many factors outside the control of the discharging hospital. Efforts to decrease readmission by increasing the continuity between outpatient and inpatient care have been shown in randomized, controlled studies to reduce readmissions by up to 30% [Naylor et al., 1999; Coleman et al., 2006; Jack et al., 2009]; however, these programs may be much harder to extend to more generalized populations [Voss et al., 2011; Katz, 2011]. Intuitively, a trade-off may exist between costs incurred while an inpatient and while an outpatient [Kosecoff et al., 1990]. In this setting a powerful visual metaphor is that of a balloon which may be squeezed into a different shape, but not compressed.

Many other factors (or their absence) facilitate or impede progress in achieving high value health care using these incentive reforms. These include how the bonuses are distributed, at what levels they are made available, and whether the group practice or hospital allocates or attributes them in a way consistent with individual's costly effort to address quality and other metrics of performance (Brush et al., 2006; Chernew, 2010). For hospitals that lose reimbursements from public payors, a key unanswered question is whether such financial stress is consistent with the requisite investments for improvement. Clearly, a 'death spiral' is theoretically possible in which the hospital falls further and further behind, all to the patients' detriment. More generally, a sound business case for quality must appropriately incent providers to make the necessary infrastructural investments and ongoing expenditures to actually deliver on the outcomes that are incented.

Gaming of incentives, or the subversion of the principal's intent is always a concern. While gaming implies moral hazard on the part of the physicians, a different unintended consequence can follow attempts to root out gaming with ever more sophisticated, nuanced, multi-dimensional goals and incentives. Here, the cognitive difficulty of navigating through such complex difficulties can subvert the physician's focus on what is intended and rationally leave him or her doing much as they were prior to the incentive change (Robinson, 2001). A related shortcoming of physician incentives systems is that many if not most physicians likely already act in the desired manner. Incentives systems tend to overpay many on average to achieve small changes at the margins. None of these unintended consequences will be easy or inexpensive to overcome, and some appear to be intractable consequences of the underlying principal-agent problem with its hidden action and hidden information complexity.

Finally, recent work points out the potential for gaming of incentives to exacerbate geographical variations in healthcare utilization and value. It had been previously known that following the replacement of the average wholesale price reimbursement model for chemotherapy with an average sales price +6% regime that physicians tended to respond by increasing the utilization of chemotherapy (Jacobson et al., 2010). A recent follow-up study shows dramatic geographical variations in this response: in some states chemotherapy utilization for lung cancer increased by as much as 4% points, while in a few states utilization declined. The dispersion of state results was sufficiently extensive to reject the null hypothesis of no geographical variation in care following the policy change (Jacobson, Earle, and Newhouse, 2011). If heterogeneous responses by physicians, practice groups and hospitals also exist within state, then existing geographical variation in utilization of care and spending may change in as yet unknown ways. Whether these changes are second order or first order effects is not well known yet.

2.13 Issues surrounding how to set payments

A number of unresolved issues surround the setting of payments. These span the level, the basis, and the methods. It remains unsettled at the time of writing as to what proportion of a provider's total income ought to be at risk through pay for performance programs. A long-standing concern is that the relative magnitude of many P4P programs is still too low, especially if these are in the low single-digit range, and dwarfed by the incentives of the fee for service regime (Pham and Ginsburg, 2007). An unanswered question is the trade-off between the probability of implementation success and behavioral success. While placing low proportions of provider or hospital income at risk can help to guarantee that the program is accepted by risk averse stakeholders concerned about income, it may simultaneously reduce the chance for meaningful behavioral changes. On the other hand, placing providers seriously at risk for patient outcomes may result in unintended consequences beyond incentivizing providers. For example, as many as 7% of all hospitals had higher-than-expected readmission rates for heart failure, myocardial infarction or pneumonia (Kaiser, 2011). The operating profitability of hospitals smaller than 200 beds is typically in the range -1% to +1%. Such hospitals may therefore have their overall financial survival threatened by readmission penalties which can eventually reach 2% of all Medicare payments.

Apparently successful payment reform may still lead to unintended consequences. The range of such unforeseen effects includes the frank ability of physicians to 'game the system'. For example, we have strong reservations about the ability of risk adjustment to adequately control for patient pre-existing risk. It is conceptually difficult to believe that even the best models of risk will include those unmeasured and (to the analyst) unobserved factors that help physicians understand which patients are likeliest to do well. Indeed, several studies in one trial of interventional cardiology procedures versus open heart bypass surgery confirm that patients in clinical trials whose doctors reject randomization and insist on control or intervention arms systematically do better (The BARI Investigators, 1996) or in some subsets do as well as randomized patients despite a far higher proportion of interventional procedures than the randomized patients (Feit et al., 2000). As Robinson (2001) has systematically explained, physicians are theoretically able to subvert access through this sort of risk-selection, but also to subvert the intentions of the principal by simply changing practices and maximizing financial performance through a different route.

Related problems are triggered by more complex payment setting methods. Recent experience with the readmission rates pay for performance scheme highlights these issues. How shall policymakers define excessive readmission rates? CMS' value-based purchasing sets a minimum score at the national median and a benchmark at the national top decile. These could be set using some exogenous threshold based on consensus or an evidence-base. Alternatively, a distributional threshold may suffice. Here, readmission rates below a certain percentile of the distribution of all hospital readmission rates are considered to have 'immunity' due to their good performance. Above this lower threshold and below an upper threshold is a window in which a 3% penalty on all admissions is triggered. For worse performance still, hospitals face a fixed penalty. Many areas of concern exist with endogenous thresholds in that they are clearly not robust to longitudinal shifts towards milder or harsher regimes. For example, whether the policy is successful or not at changing the mean readmission rate, the distributional threshold ensures that 'punishment' will still occur for a fixed proportion of the number of hospitals in the distribution.

Risk-adjustment of individual hospital's performance is also contentious. CMS' use of the Hospital Compare model has some issues related to how the volume-outcome relationship is controlled for. Research suggests that smaller hospitals appear to benefit from shrinkage of estimates to a grand mean in the CMS mortality model (Silber et al., 2010). As with all forms of risk-adjustments, these concerns must be dealt with to ensure that hospital participants preserve confidence in the payment incentives programs.

Another dimension of how to set payments that remains unsettled is the optimal mixture of incentives to share savings and penalties for not meeting agreed-on costs and quality benchmarks. Consider value-based purchasing, and for example Sentara Obichi, a 168 bed acute hospital in Suffolk

which opened in 2002 and was acquired by Sentara Healthcare in 2006. Despite having all the advantages of Sentara's investments in patient-centered care and health information technology, projected payments under Medicare's value-based purchasing are net negative based on recent historical performance although the state of Virginia as a whole appears to benefit (see figure).

In concert with these concerns are the very real risks that providers who are 'doing better' than the upper threshold can 'afford' to let performance deteriorate until it is just better than the threshold. Similarly, those providers who are within the broad window of admission rates that are penalized with an x% penalty on all hospital admission reimbursements each face unique decisions on the cost-benefit tradeoff of responding to the incentives to move to the 'immunity' part of the distribution. For some this will be difficult: the penalty is variable, proportional to total admissions, but the investment necessary to move out of the window may not be proportional to total admission and may have a large fixed cost component. For those close to the worse end of the window, it may be rational to move to the unbounded fixed punishment area above the window, rather than attempting a costly move to the immunity zone.

Figure X: Value-based purchasing impact on a large Virginian not for profit hospital and on the state itself.

Sentara Obici Hospital
Analysis of the Proposed VBP Rule for FFY 2013
Payment Impact Estimate - Linear Payout Function
 Performance Period: April 1, 2009 - March 31, 2010

Sentara Obici Hospital		FFY 2013	FFY 2014	FFY 2015	FFY 2016	FFY 2017
Process Domain Score: 37%		1% Carve-Out	1.25% Carve-Out	1.5% Carve-Out	1.75% Carve-Out	2% Carve-Out
HCAHPS Domain Score: 8%	Dollars Contributed to VBP	\$252,000	\$315,000	\$378,000	\$441,000	\$504,000
Overall VBP Score (70% Process, 30% HCAHPS): 29%	Estimated Payment from VBP Pool	\$168,682	\$210,852	\$253,023	\$295,193	\$337,364
Payment Percentage: 67%	Dollars Left in the VBP Pool for Redistribution	(\$83,318)	(\$104,148)	(\$124,977)	(\$145,807)	(\$166,636)
Virginia		FFY 2013	FFY 2014	FFY 2015	FFY 2016	FFY 2017
Process Domain Score: 53%		1% Carve-Out	1.25% Carve-Out	1.5% Carve-Out	1.75% Carve-Out	2% Carve-Out
HCAHPS Domain Score: 32%	Dollars Contributed to VBP	\$20,614,000	\$25,768,000	\$30,921,000	\$36,075,000	\$41,228,000
Overall VBP Score (70% Process, 30% HCAHPS): 47%	Estimated Payment from VBP Pool	\$22,471,000	\$28,089,000	\$33,707,000	\$39,325,000	\$44,943,000
Payment Percentage: 109%	Net VBP Incentive Payment	\$1,857,000	\$2,321,000	\$2,786,000	\$3,250,000	\$3,715,000

This example is of course not unique: any incentive system that involves thresholds will lead to discontinuities in the marginal decisions by hospital leaders or physicians. Similar policy dilemmas are evident in income support programs that are tied to family income such as Earned Income Tax Credits or food stamps or other entitlement programs. A slightly more distant concern involves the donut hole in Medicare Part D programs. Judicious setting of thresholds may attenuate the perverse incentives close to the thresholds, but equity concerns will remain.

Finally, subtle dilemma concerns the relevant margin on which a hospital is acting. In theory, if a hospital is able to identify the marginal patient as likely to be a readmission, then incremental and perhaps very cost-effective steps could be taken with respect to just that one patient to reduce the likelihood of readmission. However, it is unlikely that this ability exists in any robust way. More likely is that the steps that must be incurred must be incurred across many if not most patients that are admitted for a given chronic condition in a given year. This far larger margin may change the conclusions of the hospital's cost-benefit analysis of steps to reduce readmission. This and the other concerns raised in this subsection imply a serious need to monitor and learn from ongoing policy experiments, and a willingness by policymakers to allow a large variety of experimental situations.

2.2 Payments to provide greater value without specifying steps

The first paradigm change in payments for health care was the move from retrospective per diem to prospective per diagnosis reimbursement for Medicare inpatients in 1983, followed by similar approaches to outpatient hospital spending, home health and skilled nursing care in 1997 (Wilensky, 2004). The second paradigm shift was the in the mid-1990s which saw the zenith of managed care and capitated physician contracts (Chernew, 2010). The evolution of this line leads naturally to global payments, which are most logically implemented in integrated physician-hospital organizations. To address physical and virtual fragmentation in care delivery, Accountable Care Organizations (ACO) are at the forefront of innovation. ACOs are intended to lead to better provider integration and tighter physician-hospital relationships. The impetus is clear: for too long the delivery of care has been a fragmented and uncoordinated cottage industry (Swensen et al., 2010). By allowing hospitals, physicians, plans and providers to commit to joint responsibility for the care of patients, unnecessary duplication and lack of coordination can both be reduced. We take up the organizational and payment innovations separately.

ACOs represent an innovative blend of changes in organizational form, changes in measuring performance and changes in paying for care delivery (Lee et al., 2010). All three changes are inter-related. By measuring and reporting on outcomes, such new organizational forms that integrate hospitals and physicians, consumers and payors are able to better monitor the quality and quantity of care received for the payments made. By paying for integrated care across the set of providers who have responsibility in the diagnosis, treatment, resolution and follow-up of an episode of care, it is hoped that physician and hospital behavior will be oriented towards higher value.

With the recent publication by CMS of the Final Rule (Berwick, 2011), ACOs will share savings that Medicare reaps from higher quality, less costly care delivery. A very close antecedent of the ACO model is the Physician Group Practice Demonstration which ran from 2005-2010. A notable feature of the PGP pilot is the maintaining of fee for service payments, but the sharing by participants in CMS savings above a 2% threshold. The results of the PGP project are an important signal of the ability to implement ACOs more generally: some of the nation's leading physician groups participated in the pilot, but only half were able to achieve the 2% threshold and took as much as three years to reach this (Wilensky, 2011). We continue a survey of the factors that will facilitate or impede ACO implementation efforts in the next subsection.

Between the current fee for service and global payments lies an important possible transition step: gain sharing. Conceptually, gain sharing may take place within a hospital facing capitated revenues either through the DRG model or through pilot payment models involving episodes of care (Wilensky, Wolter,

and Fischer, 2007). In these examples in the early 1990s, hospitals attempted to and succeeded in aligning the interest of their physicians and surgeons with hospital incentives. Unfortunately existing federal law and regulations has made expansion of this transitional strategy all but impossible. If legislative changes were made, we believe that gain sharing could become a 'halfway house' that would build confidence before proceeding to even more accountable care in ACOs and through bundling of payments.

Bundling payments and paying one or a set of complementary service providers per episode of care combines elements of fee for service and capitation, effectively capitating an episode of care from inpatient hospital and physician care, and post-acute care. Such episodic payments are a logical extension of the more limited DRG bundling of services within one inpatient admission (Chernew, 2010). The future use of such payment reforms is likely given their sponsorship through the Affordable Care Act's voluntary pilot program on Payment Bundling. Their promise lies especially in post-acute care: by integrating payments across a set of previously separately reimbursed providers, improved coordination, lower 'sick and quick' discharges, and higher use of lower cost providers for post-acute care (Sood et al., 2011). Some examples of successful bundling of such episodes of care are found in the private sector, where Geisinger has offered guaranteed wrap-around pricing for selected standardized high volume surgical services. We highlight that the absorption of risk and its prudent management by integrated systems may lead to selection bias effects: Geisinger discloses that only 34% of patients insured by its own health plan are eligible for the ProvenCare offering in cardiac bypass graft surgery (Geisinger, 2011).

The use of physician profiling software and tools to reconstruct the set of providers involved in a patient's care has grown increasingly sophisticated and proprietary software abounds. (Thomas and Ward, 2006). Their judicious use depends on this ability to track care, and more importantly on the ability to actually integrate care so that different providers have real incentives and ability to impact what care is provided when and at what level. Initial efforts have been slow to take off in some demonstration projects such as the PROMETHEUS bundled payment experiment (Hussey, Ridgely, and Rosenthal, 2011).

There are sound reasons why procedures, such as elective knee procedures, may have been chosen. They are exemplars of conditions for which within-provider variation in costs (relating to unobservable patient and provider characteristics which are difficult to contract on) is low, whereas across-provider variation in episodic costs is high (Sood et al., 2011). As a result, they are attractive candidates for payors and providers to launch pilot bundling schemes. While we support the intent of these innovations, it is unclear whether such relatively low cost and reasonably short-lived episodes of care will lead significant changes in per capita cost growth.

2.21 Factors that facilitate or impede efforts:

Some design features of ACOs are likely to need reengineering. Some of these, such as the upfront costs, incorporation, tax identification numbers and prudently obtaining legal opinions on anti-trust implications, are likely to be initial teething pains. Others are more serious and persistent. The most important of these is the lack of mandatory rostering or even de minimis incentives for patients to obtain their care within an ACO which has accepted responsibility for them. Related to this is the inconsistency in which ACOs will need to inform patients that they will be included in an ACO even though the hospital will not know this prospectively initially. Separately, the degree to which ACOs will take downside risk will need to be refined with experience.

At the market level, the one-to-one relationship between primary care physician and ACO is in stark contrast to the ability of hospitals and specialist physicians to associate themselves with many ACOs. Similarly, the inability of ACOs to expand their base of associated physicians once implemented appears to need revision to account for system mergers and acquisitions and dynamic reactions to market changes. A fundamental conceptual difficulty remains: how will ACOs achieve aggregate cost reductions without reducing their aggregate income? In particular, how will ACOs square the circle of achieving cost containment in the same way as HMOs did initially in the early 1990s, without constraining

subscriber choices? It would seem that ACOs may reduce cost growth, but will be less likely to reduce the level of costs.

Assuming these issues are successfully dealt with, leadership at and across the organizational level is clearly critical for facilitating broad reform, especially for initiatives that change incentives for multiple stakeholders across organizational barriers. In contrast, even the nation's biggest and most clinically advanced hospital systems including Mayo, Geisinger (a participant in the Physician Group Practice Demonstration with moderate success in reducing costs), Cleveland Clinic, Sentara Healthcare, and Intermountain Health Care rejected recent opportunities to join the accountable care organization pilot program. Their lack of participation, attributed to concerns about risks and expenses outweighing possible shared savings, bodes ill for less well-capitalized, less profitable, smaller and less able to bear financial risk hospitals and provider systems.

Conceptually, changed payment systems that do not specify steps or targets are exposed to several important risks. By delegating or decentralizing the problem, it is possible that provider systems subvert the initiative's focus and intentions. For example, payors or funders may have hoped for and intended change to occur in patient sub-group A, but actually changes occurred in sub-groups A, B and C. Such spillovers may dilute the desired effects in sub-group A, and negatively affect the other two sub-groups since resources were diverted to meet the needs of the first sub-group. Maintenance of provider behavior changes will likely require long-term use of the incentives. Alterations from positive incentives, such as withdrawal of initially generous support, or the switching from incentives for desirable actions towards disincentives against undesirable actions, seem unlikely to maintain provider behavior changes.

Finally, ACOs seek to decrease the virtual and physical fragmentation of physicians, and simultaneously shift payment mechanisms towards better value care. However such changes in the industrial organization of care delivery may have unforeseen circumstances. Hospitals have reacted quickly by increasing already high employment of specialist physicians in the more lucrative service lines such as cardiology (Kocer and Sahni, 2011), very aware of the possibility of increased market power available under such new organizational structures (Richman and Schulman, 2011). Whether the theoretical reduction in the production costs of healthcare is sufficient to outweigh the theoretical increase in transacted prices of healthcare is an empirical question and it remains unclear to what extent the promise of accountable care organizations will be achieved (Crosson, 2011).

Yet if the formation of ACOs simply leads to larger forms of non-integrated delivery, the quality promise may also not be realized. The combination of employment and less circulation of physicians across different ACOs may impact physician learning. On the one hand, closed practice groups and integrated physician-hospital networks should deliver greater process conformance and larger stocks of knowledge achieved on learning curves support such a 'practice makes perfect' mechanism. Hospitals will rationally invest more in increased training, practice harmonization within the ACO and expensive and proprietary electronic health record systems. On the other hand, process conformance may prevent adjustment of practices to individual patient heterogeneity at any point in time, and adjustment of practices through learning and cross-pollination of process and care innovations over time. It is not yet clear at this early point in the development of ACOs how they might affect learning. It is also not certain whether ACOs will truly become learning organizations that support the practice of medicine.

2.22 Issues surrounding how to set payments

In payment reforms that seek to guide physician behavior through ways that do not directly define the desired outcome, a crucial question becomes how to set payment levels and growth rates. Conceptually, this can be done using two distinct approaches, although the first is currently envisaged under the Affordable Care Act, while the second partial capitation model may be tested and introduced in the future. In the first, payment is retrospective, rewarding areas that generated high value and punishing areas that generated lower value. This approach presumes that some form of fee for service mechanism remains, but reimbursed payments are lower for care that did not meet value or outcome thresholds. In the

second, payment is prospective, involving some form of cost and risk adjusted capitation or global episodic payment and in which higher cost areas are indirectly punished in advance by the relatively lower fixed payment.

In terms of these approaches ability to smooth out geographical variations, both suffer from an empirical observation. High spending areas are not systematically high growth areas: across the nation's 306 Hospital Referral Regions, the correlation between two consecutive recent 7 year periods' spending was modestly negative (Chernew et al., 2010). This reversion to the mean in the absence of systematic policy interventions could confound observations of the apparent short term success of interventions in high cost areas. But more importantly, it may well imply that policy changes that succeed in reducing spending in one area may have little effect in the longer term on spending growth in that area. In the other direction, rewarding providers in past high value care areas for efforts that represent short-term success may overcompensate them undeservedly.

Both prospective and retrospective approaches suffer from additional shortcomings, unfortunately. In the former, setting geographical benchmarks for high or low value remains fraught with conceptual difficulties. Should high and low value be defined with respect to the distribution of value at some national or regional level? Doing so risks a 'no win' situation, where some providers will always be in the lowest decile even if not continually. Should payments be prospectively capitated, bundled across providers or some blend of these? Finally, how should the length of an episode that is being used for as the basis of a bundled payment be calculated. Too short, and the provider faces incentives to underinvest in patient-beneficial activities that nonetheless do not affect short-term readmission (Sood et al., 2011). Too long, and the provider bears too much risk for events that are out of their realm of responsibility and may be more closely linked to the underlying illness or other disease burden. In the next section the additional potential for conflicting objectives brought about by capitation versus fee for service is described.

2.3 Potential for expansion, ability to foster continuous improvement

Several crucial obstacles, often unrecognized, challenge the payment reforms outlined in this section. These span the recognition that value can be identified and measured, the risk aversion of individual providers, the multiple conflicting objectives that physicians face, the unintended consequences associated with all provider incentive systems, and the implicit transfer of wealth from physicians to funders or consumers that successful supply-side reforms must involve.

2.31 Identifying and measuring value

Clearly one of the critical assumptions underpinning this section and the following section's interventions is the ability of policy makers to identify value. In turn, data on comparative and cost effectiveness is a precondition. Consider for example the intuitive notion that preventive care represents higher value care than subsequent treatment. It is well-known that a limited set of chronic diseases such as diabetes, ischemic heart disease, cerebrovascular disease and renal disease account disproportionately for high healthcare expenditures (DeVol, 2007). A number of studies have shown targeted benefits accruing to simulated interventions that would target selected high prevalence cardiovascular disease risk-factors (Goldman et al., 2009), while broader preventive interventions might contribute to bending the cost curve to a small degree in the short to medium term, net of the costs of intervention (Waidmann, Ormond, and Bovbjerg, 2011).

Other studies that examine the spectrum of possible prevention interventions find that while some preventive measures do save money, the vast majority do not (Cohen, Neumann, and Weinstein, 2008). Nonetheless, wide support exists at the government agency level for the Prevention and Public Health Fund's objectives (National Prevention Council, 2011). To resolve the question of which preventive interventions are likely to deliver value over the appropriate time frame, more information on cost and

comparative effectiveness will be necessary. Whether these two types of effectiveness data will be provided by separate organizations (Wilensky, 2008) or by one combined organization (American College of Physicians, 2008) remains unsettled although many argue that the two types of resulting information must be considered together (Brook, 2011).

2.32 Physician risk aversion

We are struck how little attention has been focused on physician's risk aversion. It seems clear that requiring physicians to bear more variation in income will reduce physician utility. The intuitive explanation has usually been that "risk is the potential to lose money, earn less money, or spend more time without additional payment" (Bodenheimer and Grumbach, 1996, p1026). From the perspective of a risk neutral funder, the initially mean preserving nature of many incentive systems are often thought to be a generous concession (to be later reduced). Of course, from the perspective of a risk averter, even a mean-preserving increase in variance involves a decrease in utility and is perceived correctly as equivalent to a certain reduction in income. These considerations are especially important in understanding how risk is best apportioned between funders, fiscal intermediaries, large provider groups, physician practice groups and individual physicians. Any initiatives that allow the additional risk for physicians to be absorbed by other parties will require physicians to pay certain risk premia, or will require the risk neutral funder to pay additional payments.

Moreover, while the previous point is generically true, there are particular negative statistical consequences from payment reform that increase risk for physicians. For example, the delegation of cost responsibility to lower levels of provision (e.g. from state to county, or from plan to provider) necessarily weakly increases the sample variance. By the laws of large numbers, the percentage difference between expected and actual value tends to increase as the number of trials of the random process decreases. From the physician's perspective, large differences in net income may exceed his or her capital and render the business non-viable in an 'unlucky' period. In parallel, the smaller the physical catchment area from which patients are drawn by, the less likely that successive 'trials' are actually independent. Finally, while successive patients may be approximated as identically distributed random variables, this distribution is likely to vary across physicians. Failure to allow 'mixing' of such distributions is likely to make individual physicians' utility differ systematically even under the same payment incentive plan.

We are not yet completely convinced that these serious challenges have an easy solution, and suspect that pay for performance, bundling, and capitation type reforms are likely to have sustained problems due to this fundamental mismatch between a more risk-averse agent and a more risk neutral principal, where ability to bear risk is inverse to ability to determine outcomes.

2.33 Multiple conflicting objectives

Yet another challenge in evaluating payment policy reform's success centers on the conflicting objectives on the part of, for example, physician behavior. Suppose payment policy in one area moves increasingly towards standardization of care and towards a capitation model. The resulting high degree of collaboration and conformance to evidence based care could be shown to be associated with lower cost, increased access and improved or stable individual patient outcomes. Evaluation might be that this policy is thus successful. Unfortunately, if attention were not paid to the objectives of risk acceptance, it might escape observation that a failure to take into account individual patient heterogeneity led some patients to balk at the standardized treatment, or led some referring physicians to dissuade patients from a 'cookie cutter' approach. Other providers of care in this setting might at the same time be less incented to put in the extra effort to understand which patients might truly benefit from a non-standard care approach.

While short term value metrics might not highlight the shortcomings of the new payment policy regime, longer-term health care value could fall short of feasible targets of access and patient satisfaction with care experiences. Similar problems might occur if policy drove too far towards customization of care,

leading to an inability or lack of necessity to collaborate and higher variance in patient costs. The evaluation of payment policy must take into account sub-metrics of high value care that can monitor such divergence and allow mid-course corrections to be made. This summary of the multiple conflicting objectives on the part of just one economic agent in the healthcare sector alludes to the challenges for evaluation of implemented policy.

2.34 Transfers of wealth

Future payment policy reforms must continue to address the inevitable conflicts among different stakeholders. A decrease in healthcare expenditures needs to be frankly conceptualized as a transfer of wealth from providers and hospitals to other parts of the economy, and as a transfer of wealth from device and pharmaceutical manufacturers to other sectors of the economy. Those who lose out under payment policy reform are likely to lose both financially through immediate income reductions and longer term weakened bargaining power, as well as non-financially through lowered societal status and lower political power. Failure to consider and acknowledge this transfer of wealth that must needs accompany successful payment reform is likely to render change extremely difficult if not impossible to achieve.

3 Payment Reform Models Targeting the Demand of Health Care

In the Patient Protection and Affordable Care Act signed last year, aggressive supply-side solutions are envisaged for high and increasing health care costs (Berenson, 2010). Policymakers hope for additional cost savings from re-organizing care delivery using accountable care organizations and by bundling of payments to networks of physicians and hospitals (Bach, 2010). Streamlining the supply of care then incents providers with a share of such cost savings.

Excluded from consideration, unfortunately, are analogous initiatives and incentives for patients on the demand-side. While provider behavior has been successfully targeted to enhance quality, to manage costs and to improve access, initiatives aimed at changing individual consumer behavior have been less successful. This is not for want of knowledge. Lifestyle changes when citizens are healthy, and sensible choices of therapeutics when not, are well-known but under-used interventions (Ornish, 2009). Turning greater attention to patients and consumers promises innovative solutions to control costs while increasing patient choices. Moreover such reform could take place even within the existing third-party payment system that exacerbates consumer insensitivity.

Most importantly, while previous supply-side solutions depend on provider or insurer-driven constraints placed on consumer choice, direct demand-side solutions may not negate or constrain consumer choice in as visible or as unpopular a way (Chernew, Encinosa, and Hirth, 2000). In this section are discussed several important efforts targeting the patient such as value-based insurance redesign and payment incentives to improve health behavior.

3.1 Overview, rationale, and pilot programs

In numerous cases, clinical equipoise suggests that a number of different treatments are possible, have similar benefits, and choice of treatment is at least to some extent up to the physician and patient's discretion (Bloom and Fendrick, 1996). In some of these cases, substantial differences in value accrue to different options of treatment rendering shared decision making and disease carve-out programs viable options. Variation in spending can be modelled as variation in preferences for different treatments. To align patient interests with the interests of the payor or funder, the demand for alternative treatment paths can theoretically be affected by calibrating the degree of cost-sharing to the presence or absence of lesser or greater value.

While such cost-sharing has more recently been seen as calibrated cost-sharing from zero to full cost-sharing, an important contribution to the literature noted that it could be optimal to have negative cost-sharing under which patients are paid for certain high value choices (Chernew, Encinosa, and Hirth, 2000). This result relies on the fact that savings from discretion in treatment choice only accrue to payor within the band of treatment alternatives beyond the cheapest treatment plan. Co-payments should thus be zero, and can even be negative, for the cheapest medically satisfactory treatment while increasing with more expensive treatments.

As was noted by Chernew and colleagues (2000), this structure seems at odds with many existing co-insurance designs whose effect is to make coverage free at the margin above a certain high level of expenditures, and more expensive at lower levels where patient discretion is much less. From these early insights, extensive empirical work has continued to explore the optimal structure of such programs (Fendrick et al., 2001; Malkin, Goldman, and Joyce, 2004; Goldman et al., 2004). Many of these programs and experiments and to understand whether the savings from avoidable downstream care outweigh the costs of subsidized upstream care (Fendrick and Chernew, 2006). Some research has already convincingly established the converse that higher out-of-pocket expenses for pharmaceuticals can lead to worse health outcomes (Baicker and Goldman 2011; Goldman, Joyce and Zheng 2007).

3.2 Factors that facilitate or impede efforts.

We believe that it is risky to extrapolate from the success of a small number of circumscribed interventions such as medication copay subsidy, in easily defined and concentrated subsets of patients such as those with ischemic heart disease. We are concerned that unforeseen costs involved in rolling out extensions could dramatically tilt the cost-benefit tradeoff against benefit redesign despite the best of intentions and despite their theoretical efficacy. Early evidence of such counterintuitive outcomes comes, for example, from a change (Goldman et al., 1995) from fee for service to managed care benefits in which the higher administrative costs reduced the value of theoretically effective business policy.

In the context of the concentration of Medicare expenditures within small numbers of multiple chronic illness patients, diffuse subsidy programs seem inadequately motivated. The fat-tail phenomenon in Medicare spending exhibits a very small numbers of beneficiaries accounting for large and disproportionate amounts of spending. For example, the top 5% of Medicare beneficiaries account for 43% of total Medicare expenditures. The top 25% account for as much as 85% of the total spend. In one study, predicted high-cost patients were far more likely to be institutionalized and to have dual Medicare-Medicaid eligibility and more likely to have lower family income and to be African-Americans (Reschovsky et al. 2011). Tailoring programs around these high cost beneficiaries in a sensitive and respectful manner seems the most efficient use of scarce resources in public programs.

While not yet a concern, as such programs become more widespread and more successful, it is possible that untoward effects on geographical and socio-economic variations will worsen. We note that this effect is independent of a net increase in value in aggregate. This distributional concern would be due to the fundamentally regressive effects of value-based insurance designs. In the same way that copayments which are equal across members of a plan are less of a disincentive for wealthier subscribers, so too will those patients who are richer not perceive a presented fixed saving in the same manner as a poorer patient. In consequence, the former will remain more likely to choose the more expensive 'better' treatment than the latter. It remains to be seen whether such possible accentuations of existing socioeconomic gradients would decrease the popularity of such benefit plans. Future redesigns may take such heterogeneous effects into account.

3.3 Issues surrounding how to structure incentives.

Value-based insurance design programs seek to reduce patient cost-sharing for valuable treatments such as medications important for maintenance and prevention of future events. However, it is an unavoidable feature of all broad-based incentive plans that such subsidization occurs on the margin of the entire subscriber base in which adherence is sought, instead of on the margin of less or more adherence. For example, while (a surprisingly small) 36-49% of patients in a recent study of myocardial infarction survivors were already compliant with post-discharge life-saving medications, the subsidy program which reduced copayments to zero was instituted for 100% of the survivors (Choudhry et al., 2011). An unachievable ideal would only subsidize medication co-pays for the 51-64% of nonadherers, but would be unlikely to be implementable, given obvious moral hazard and equity concerns. Nevertheless, current value-based initiatives appear to allow a transfer of wealth from the more compliant to the less compliant to the extent that premiums paid by all subscribers or beneficiaries are also community-rated.

Compliance with guidelines should be encouraged by judicious use of cost-sharing that lowers out of pocket costs, but fine-tuning of the benefit regime seems in order to avoid over-investing and crowding out subscriber's own expenditures. One intriguing option is to vary pharmaceutical subsidies with clinical status (Goldman, Joyce, and Karaca-Mandic, 2006) and in general considering the patient characteristics that might predispose to compliance seems worthwhile (Meeker et al., 2011).

A related question is to what extent patient responsibility, say, among survivors of a recent myocardial infarction can be leveraged. If patients 'understand' that ambulance, emergency department, coronary intensive care and interventional cardiology/cardiac surgery is guaranteed to be available and

relatively affordable in the future, does this realization stymie efforts to enhance medication adherence? More broadly, should value-based incentive programs be coupled with disincentive programs that increase cost-sharing for preventable illness?

If not, should other behavioral techniques be used? An interesting option that exploits loss aversion and other cognitive biases is to have the costs of 'drug licenses' incorporated into subscription premiums. These 'licenses' would guarantee unfettered access to a clinically optimal number of prescriptions over the course of a year (Goldman et al., 2008).

A related question concerns whether incentives should be targeted broadly at maintenance and preventative therapies such as adhering to medication, or narrowly to the cheapest generic medicine within that subset of therapies. If increasing outcomes while lowering costs is the ultimate objective, shouldn't increasing the copayments for branded pharmaceuticals and reducing the copayments for generic medication in the same therapeutic class to zero be a dominant strategy in a static analysis? While out of scope, we acknowledge that in dynamic analysis which appropriately reflects the returns from innovation, there are significant losses in welfare from reductions in future innovation caused by policies that have the effect of limiting pharmaceutical spending and prices (Lakdawalla et al., 2009), and no such losses from policies that subsidize pharmaceutical consumption while preserving manufacturer cash flow (Lakdawalla and Sood, 2009).

3.4 Potential for expansion.

Currently, the legislation sees a range of demonstration projects to test innovative payment approaches, but these are not allowed to include features which seek to change patient benefits or eligibility. The exclusive focus on the supply-side in the USA is understandable given widespread concerns and debate about rationing. But on the demand side, patients have the responsibility to contribute to their own well-being (Brook, 2010). Patients also have the right to determine their care and do value choice. Incorporating demand-side innovations into reform could improve the personal value that patients derive from the resources they consume, and may slow the growth of system health care expenditures.

Consider two hypothetical elderly patients sick with the same serious illness. Physicians agree on a set of possible treatments and the government payer knows the typical costs of treatment. Society concurs that the two patients should have access to the same amount of resources to be spent on their illnesses. Such an apparently fair agreement can paradoxically leave both patients worse off.

The more stoic patient may derive substantially more value from compassionate, less intensive and more inexpensive care. Were she to choose such care, the foregone resources return to government's consolidated revenues. Despite having paid taxes or premiums for a long time, the current system prevents her from *cashing out* even a fraction of the savings that the government realizes. Without such incentives, an endowment effect may lead a patient to seek care beyond what she might prefer (Kahneman, Knetsch, and Thaler, 1991).

The other patient is less resigned to care of typical intensity and prefers apparently futile and very expensive treatment for his illness. But were he to try to receive care from a specialist who did not accept his entitlement voucher, this care would have to be fully paid for using his own resources. Despite having paid premiums or taxes for a lengthy time, he is usually prohibited from *cashing in* even some of the government's entitlement for his preferred choice of care. A small share of that entitlement combined with his own personal resources might allow him an experimental therapy, or a therapy that was not judged to be cost-effective.

Standard economic reasoning also sees constraints on individual choice as inefficient (Mas-Colell, Whinston, and Green, 1995). When patients are not identical, allowing patients to choose from carefully designed menus of choices may lead to higher individual value. From a policy maker's perspective, loosening such constraints might decrease total public healthcare expenditures. This would

be the case as long as cash-out payments were less than expected resource use, and if cash-in contributions helped defray higher resource use.

How might such innovations look in practice? Obvious starting points are common illnesses in which some therapeutic options are expensive and of unclear comparative effectiveness, along the lines of Value Based Insurance Design, but defining medically acceptable treatment down. One example may be in white male patients with stable coronary artery disease. Here, it may be possible to incent a patient financially to cash out, abstain from initial percutaneous coronary intervention, and opt for more or less intensive medical therapy instead. This seems ethical given existing comparative effectiveness findings (Boden et al., 2007), as long as such decisions are made voluntarily by a well-informed patient. It also seems more likely to succeed than disallowing such interventions in particular classes, or requiring a patient to pay a large co-payment to receive the more intensive treatment. However, we suggest that for some informed patients, allowing patients to cash-out their 'voucher' on a treatment that did not suffice to meet the evidence-based guideline for optimal medical therapy may still be optimal in a welfare sense.

Consumers can have too many choices (Rice and Unruh, 2009) and both physicians and patients already find it difficult to discuss complex care trade-offs (Ubel, 2010; Kon, 2010). Yet as a society we value options and seek choices in many areas. The complex relationship between resource use and personal utility offers hope for innovative options in financing and delivery of healthcare. Incenting providers in supply-side solutions such as accountable care organizations, bundling of payments and changes in reimbursements is unlikely to suffice. Incenting patients could help drive resource allocation that is simultaneously respectful of individual preferences and collective resources.

3.5 Ability of demand-side initiatives to foster continuous improvement.

There is substantial disagreement over whether 'pro-government' or 'pro-market' interventions are most likely to reduce overall costs, improve value and smooth out geographical variations in spending and outcomes across the nation. The demand-side initiatives discussed in this section are predominantly 'pro-market' and have the potential to contribute to lowering overall healthcare spending growth. Nonetheless, concern remains that the impact on overall cost growth is bounded above and that the impact may be heterogeneous across socio-economic status gradients.

Consumers are limited in their cognitive ability to make 'appropriate' healthcare decisions, and are further limited by inadequate information on the value of choices. As a result, demand-side initiatives may struggle to foster continuous improvement. Once the relatively easy decisions (e.g. the value of coronary revascularization in middle aged White men with stable coronary artery disease, the value of early spinal imaging for low back pain) have been presented and taken, incrementally harder and more controversial decisions will remain. The less prevalent the underlying disease, the lower the incidence of symptoms or signs, so the less algorithmic support is likely to exist or be justified for guiding value-based insurance design.

Innovative tiered products (Chernew, Rosen, and Fendrick, 2007) are acknowledged by their creators to still be in their infancy (Chernew et al., 2010) and we remain concerned about such demand-side strategies' long-term success. On the other hand, those who favor 'pro-market' reforms see them as gentler, decentralized implementations than the alternatives of bureaucratic, top-down mandates to reduce spending and enhance outcomes and thus value (Wilensky, 2011).

4 Challenges in Evaluating Payment Reform Models

A number of serious challenges to evaluating payment reforms that seek to address geographical variations include the overall nature of the problem, its interdependencies, and the risk of unintended effects. Other challenges discussed include the difficulty of measuring the attributes of a high-performing healthcare system, the equifinality dilemma, the dynamic nature of reactions to policy changes and the economic interconnections between system participants.

4.1 Nature of the problem

The objective of payment policy reform is both incremental and systemic. It is unambiguously to reduce, attenuate and if possible eliminate the physician and hospital incentives that are closely associated with the following specific characteristics of the state of the healthcare system. These include: significant variation in, and generally overconsumption of health care resources, fragmented and uncoordinated care, substantial variation in the health status achieved by residents in different geographical areas (Fisher, 2003), and excessive and varying adoption of medical technology of uncertain incremental value.

Several aspects of this problem make it a matter of public and not private concern. Foremost among these is the extent to which the federal and state governments fund more than half of national health expenditures places primary responsibility on public policy makers to drive centralized action, as opposed to allowing private or decentralized action (Orszag and Ellis, 2007). As a regulator, payor and small-scale provider of health care, the federal government is well-placed to launch initiatives and obtain the critical mass of interest and successful implementation necessary for related changes in decentralized governments and within private industry.

It is additionally a matter for public concern, given the extent to which potential solutions affect large numbers of private corporations, public institutions, and private individuals in ways that can affect equity and ethics. The government may be able to balance adjustment costs among the different parties in the system and attenuate the net losses sustained by some participants. Finally, the federal government already has responsibility for existing large-scale informational, technological, regulatory and legal infrastructure which will be critical for the implementation of policy solutions.

The main intended changes in behavior that policy reform seeks to induce, incent or procure are a lower intensity of health care utilization and lower medical price growth so that a lower relative base of healthcare spending is ultimately achieved through slower growth in periodic health care expenditures (Fisher, Bynum, Skinner, 2009; Antos et al., 2010; Ginsburg and White, 2011). Such payment policy reform is also intended to simultaneously increase or maintain existing quality and access to healthcare. A secondary aim is a flatter distribution of health care expenditures across the population by age, area of residence and type of disease burden, and across phases of care from prevention through intervention and resolution.

It is neither desired nor intended that changes in utilization towards higher value are achieved by substantially less effective care. While some examples care have been shown to be almost as good while being substantially cheaper (Nelson et al., 2009), for example percutaneous coronary interventions instead of bypass surgery in multi-vessel disease, these opportunities remain a rarity in today's system. Similarly, policy must not lower or otherwise inhibit access to care declines among minorities, vulnerable subsets of societies or those with lower socio-economic status (Beal, 2011). Finally, other undesirable changes of payment policy reform include a reduction in physician incentives to be productive, or reduced willingness to accept the riskier of patients (Robinson, 2001).

4.2 Measurement problems

While well-designed and theoretically efficacious payment policy reforms can be implemented, our ability to monitor the success of such initiatives is often limited by available data. This measurement problem is

a generic problem with evaluation of health policy (Huesch, Ostbye, and Ong, 2011). Stipulate success as an upward trend in the value of delivered healthcare, where we intend the value metric conceptualized and defined by Porter (2010). Recall that this metric is most simply a quotient of high quality, high access, delivered health outcomes and the costs of doing so. Despite the simplicity of such metrics, data may be generally insufficient or selectively insufficient. Under the former constraint, a lack of agreement or lack of short-run outcomes data may prevent sufficient data on the numerator of outcomes (Huesch, 2009). Similarly, an inability to define access (by whom, to what service, at what level and frequency?) would also stymie calculation of the numerator.

Generally insufficient data in the denominator of the value metric on costs is a related problem (Ross, 2004). Historically, very few if any large scale healthcare providers have in place a sufficiently robust activity based costing methodology to understand the true average costs incurred during the provision of discrete procedures and services within a particular service line (Chan, 1993).

A recent survey of hospital chief financial officers fails to show progress in this critical area. Less than 75% were aware of the activity based costing method, and less than 5% had adopted it. Indeed, only 52% of surveyed hospitals used any cost accounting method at all (Emmet and Forget, 2005). Of especial note is the tendency to allocate fixed costs in ways that have only a very coarse relationship to the service's actual responsibility for such fixed costs such as shared infrastructure. Even more fundamentally, when decisions based on value are made, they should involve decisions based on marginal quantities, not average quantities. Given most health care providers' inability to understand even average costs, it is difficult to imagine that they would be able to quantify true marginal costs. Clearly, the question of whether high value care is being delivered is very sensitive to decisions on 'costing' such care.

Evaluating whether care was in fact high value could therefore be a challenge. More insidiously, incorrect costing could lead to some types of care delivered by a provider as being incorrectly classified as 'lower value' and other types of care as 'higher value'. If inappropriate decisions on referrals or payments are based on such flawed value metrics, then the resulting misallocations of patients to providers could potentially reduce value.

Turning from generally insufficient to selectively insufficient data constraints, it is possible that those aspects of value that are easily measured get measured, and conversely those that are not fail to get considered appropriately. For example, payment policy reform that leads to increased patient responsibility for care (e.g. the decision to seek care, or increased management of their own care in the outpatient environment, or increased out of pocket contributions) may shift costs to a setting in which they are far harder to take into account. Such cost shifting may paradoxically lead to inefficient allocation of resources at the patient level, rendering 'total value' lower.

In related fashion, hospital performance on delivering value could be misconstrued if complete data on local disease burdens is selectively unavailable. Failure to fully risk adjust outcomes would then lead to biased conclusions on which site is delivering high value care. However, higher utilization at one site may also be due to a lower threshold for admission (Wennberg et al., 1989) driven for example by higher per capita supply of specialists and hospital beds (Dartmouth Atlas, 2008). Information on such admission thresholds would be unlikely to be generally available.

As a result, in hospitals with lower thresholds, slack capacity allows doctors to work 'down an appropriateness curve' in their decisions. Once the very sick patients have been admitted, such hospitals may then admit in-patients in better general health with an expected good response to treatment. Such selection implies in-patients are more likely to do well and consume fewer resources on average. In a different hospital a higher threshold for admission leads to the opposite phenomenon. Selection now makes it more likely that those patients that are admitted tend to do poorly and consume more costly care.

As a result, the first hospital appears to deliver higher value care than the other hospital. Note that whether prospective data (Ong et al., 2009) is used or retrospective data (Bach, 2010), similar

quantification of value results. 'Looking forward' the seemingly high value hospital has lower costs and better outcomes after an index admission, because of better selection of in-patients. 'Looking back' it also has lower end-of-life spending for all local decedents, because proportionately more decedents did not consume hospital-based intensive care. Such biased calculations of value are likely, given the inability to control for existing supply, for demand.

It has been suggested that population measures of care are sufficiently high levels of analysis and could circumvent measurement problems (Kindig et al., 2008). Unfortunately, simply considering the average non-hospitalized patient cannot correct for such biased measures of hospital performance (Huesch, 2010). Suppose the catchment areas of both of these hospitals were identical as to underlying health status and incident diagnoses, and that the hospitals sorted patients based on risk.

Each time the hospital with the lower admission threshold admits an additional patient it draws the sickest individual from the pool of non-hospitalized patients in its catchment area. This inpatient is now the least sick among the hospitalized. In consequence, the in-patient average improves. Paradoxically, the withdrawal of the relatively sickest individual also improves average sickness among the *non*-hospitalized (Wennberg et al., 1989). This phenomenon is closely related to the 'Will Rogers' phenomenon first observed in the context of cancer care (Feinstein, Sosin and Wells, 1985). To the extent that the value construct includes all the relevant inputs to health and measures the output of health appropriately, these completeness problems are avoided. Clearly however, to the degree that this metric does not correctly capture outcomes and costs incurred in producing such outcomes, assessing high value care remains incomplete.

4.3 Equifinality versus path dependence

A subtle problem with evaluating policy reform that leads to higher value care is that there are theoretically multiple paths to achieving such value. Consider for example the many ways to affect the denominator, or to bend the cost curve down. This can be conveniently summarized through performing a DuPont style ratio disaggregation of aggregate healthcare expenditures (Fuchs, 1996). Costs are the product of three terms: the quantity of supplied services, the ratio of resources consumed and services generated, and the price paid to the owners of the resources used during the provision of the services. Reducing costs implies a net reduction in one or more of these three terms. Arithmetically, proceeding along any of these three different routes by reducing one of the terms is equally capable of reaching a lower total health care expenditure. However, each path has different implications and ramifications.

For example, reducing costs by reducing the quantity of services supplied has an indeterminate effect on value since some of the services may be high value, and others might be lower value. Value would only improve if marginally less valuable or not valuable services are reduced, assuming that no additional demand for other services is generated. Absent agreement or data on cost and comparative effectiveness and the extent of foregone treatments, it is not clear that value has improved. Evaluating policy success based just on reduced provision of unnecessary services might therefore fail to capture the compensatory increases in other nominally valuable and necessary services.

Similar challenges face attempts to improve productivity or reduce the return to the owners of the resources used in delivering care. In either of these two routes, the overall impact on value must take into account potential feedback effects. There might be positive feedback effects through lower provision of services, or more likely compensatory negative feedback effects through induced demand and higher provision of services (Jacobson, Earle, and Newhouse, 2011), or increased resource-intensity on the same quantity of services. Only if productivity and number of services stayed constant, or fell and rose respectively less than the price of unit resources would value improve. Clearly, evaluating payment policy reform that sought to reduce costs by acting on one driver of costs, must measure the other drivers of costs as well.

4.4 Dynamic reactions and counteractions

Even with a robust value metric in which these measurement problems are resolved, there remain profoundly difficult dynamic problems with assessing the impact of payment policy reform. This category includes dynamic behavior across different economic agents, in contrast to the discussion of equifinality above which predominantly relates to dynamic behavioral changes within one class of economic agents.

These difficulties center on the interconnectedness of economic agents in the healthcare sector. Consider, for example, accountable care organizations that seek to decrease the virtual and physical fragmentation of physicians, and simultaneously shift payment mechanisms towards better value care. Hospitals have reacted quickly by increasing already high employment of specialist physicians in the more lucrative service lines such as cardiology (Kocer and Sahni, 2011), very aware of the possibility of increased market power available under such new organizational structures (Richman and Schulman, 2011). Whether the theoretical reduction in the production costs of healthcare is sufficient to outweigh the theoretical increase in transacted prices of healthcare is an empirical question and it remains unclear to what extent the promise of accountable care organizations will be achieved (Crosson, 2011).

A particularly cogent example represents the ability of hospitals and providers to exert market power against private payors while experiencing slow-downs in government entitlement program reimbursements (Wu, 2010). This possibility has long been recognized (Ginsburg and Sloan, 1984; Dranove, 1988), as has the exact nature of a rational hospital decision-maker's options (Ginsburg, 2003) given hospital pricing power in markets in general (Melnick and Keeler, 2007) and in private markets in particular (Philipson et al., 2010).

Faced with the inability to influence revenue from patients insured through social safety net programs, hospitals in concentrated markets charge higher prices to private payor-insured patients. Hospitals then use this higher revenue, to build out higher cost structures, and that declining Medicare margins is a sequel of this 'unnaturally' high average cost structure. In this view, lowering Medicare reimbursements further could have the salutary effects of incenting more reasonable cost structures and thus lead to lower costs or slower cost growth (Stensland, Gaumer and Miller, 2010).

Another view sees cost-shifting within a reasonable cost structure as the only option to cover high fixed costs: in most markets, hospitals must charge privately-insured patients more because otherwise average contribution margins are insufficient to cover fixed costs. Exploiting the differences in options across concentrated and competitive provider markets, recent evidence suggests that both mechanisms are in operation in hospitals, and that the precise mix of price-raising and cost-shifting that is observed is a function of the degree of hospital market concentration (Robinson, 2011). The import of dynamic changes such as this within inter-connected insurance and provider markets is that policies that might seek to lower Medicare reimbursement might have undesirable impacts in highly competitive markets, and could lead to discrete reductions in access to important care for social safety-net programs.

5 The Future of Payment Policy

In this concluding section we provide overall recommendations regarding payment policy approaches to act on the problem of geographical variations in healthcare.

5.1 Overall goal setting

We believe a substantial lack of clarity still surrounds the value concept as outlined previously in the first and penultimate sections. In Porter's conceptualization of value, better outcomes at the same cost might yield the same arithmetic 'value' as even better outcomes at higher cost, or the same and better outcomes at lower cost. The arithmetic equivalence of these very different scenarios troubles us. All are ostensibly paths to higher value in the US healthcare system. However, each of these scenarios represents a different healthcare system trajectory. The first represents a quality enhancement path in which the cost curve is flattened while outcomes, access and care experiences improve. The second path corresponds to an innovation and investment expansion path. This path clearly does not bend the cost curve down. Indeed, given the existing high valuations implicitly placed on incremental quality adjusted life years gained from an intervention, the cost curve could be bent up dramatically.

The goal of reducing geographic variation in spending, utilization, and high value healthcare should be consistent with the third path of the same or better outcomes at lower cost. However, while it is clear these geographic variations exist, current knowledge regarding the relative contributions of potential causes for these variations remains limited (Bernstein, Reschovsky and Chapin, 2011). Current approaches are limited with regards to separating out potentially warranted variation, such as from underlying health status beyond disease prevalence from administrative claims data, from unwarranted variation, such as from use of expensive treatments with unclear or low effectiveness. Variability over time in geographic variations further complicates targeting specific geographic areas. As a result, we recommend that geographic variations in healthcare should not be addressed directly by policies that reduce payments to geographic areas that have higher-than-expected spending or utilization. Instead, potential causes of unwarranted geographic variation should be the focus of policies to address geographic variation; if effective, remaining geographic variation in healthcare would be due to potentially warranted causes. We provide three general recommendations regarding payment policy approaches to address unwarranted causes of geographic variation in healthcare utilization, which underlie geographic variations in spending and high value.

5.2 Recommendations for payment policy reform

We believe that payment policy reform must lead to payments for delivering healthcare being connected to value as specified by the third path (Antos et al., 2010); we recommend that:

Recommendation 1:

Existing volume and service productivity incentives that providers currently face must be replaced with incentives for high value outcomes for both government entitlement programs and to a lesser extent for commercial payors

We believe that the prevailing fee for service payment approaches and their attendant incentives need to be replaced. However, we decline to recommend or prioritize any one of the many potential supply-side reform policies discussed earlier in this report. We believe that the complexity and magnitude of the problem may hinder adequate centralized control and command. Instead, we believe that decentralized solutions are more likely to be able to survive the political process which renders 'grand bargains' elusive. Seeking permission and guidance from the government has not been the traditional path (Wilensky, 2003), and may not be the optimal path (Wilensky, 2011); we believe it likely to be too

slow and curtail implementation efforts. Of course, by putting our trust in state-level and private market solutions, we do not absolve the federal government of responsibility. The hard political goals and targets of real declines in healthcare spending must be fought for and held to at the central level. Given the unquestioned importance of managing Medicare spending and the importance of data on cost and comparative effectiveness in the elderly, we also advocate for a more mandated and less voluntary approach to service utilization growth:

Recommendation 2:

A clearer and more powerful Independent Payment Advisory Board or an equivalent entity must be created with the power to inform, guide, limit and, if necessary, mandate more rational and less geographically variable care utilization at the provider level

Coupled with an explicit commitment to the use of cost effectiveness data, and with the power to highlight standards of care whose satisfaction is a prerequisite for payment, such an institution would be a national change agent in driving payment policy reform (Antos et al., 2010). The logic of government controlled utilization seems inescapable for government reimbursed provider services. While individual specialties have proposed their own “top 5” lists of unnecessary services (Kale et al., 2011) and developed appropriate utilization criteria (Shah et al., 2011), progress on this across the medical field has been scattered and not matched in scale or success to total spending incurred and prescribed by practitioners.

In particular, we recommend payment policy reforms that explicitly target reimbursements for medical technology-enabled care. The importance of medical technology-driven diffusion in driving overall healthcare expenditures has long been noted (Newhouse, 1993; McClellan and Noguchi, 1998; Chernew et al., 1998; Cutler et al., 1998). Government estimates suggest that as much as 50% of the total growth in health care spending is driven by new technology or existing technology in new uses (CBO, 2008).

An important recent example is high-technology care for prostate cancer care: the use of less technology advanced treatments (in particular, radiotherapeutic) could save up to several billions per year without demonstrable clinical impact on outcomes and side effects (Perlroth, Goldman, and Garber, 2010). A recent topical example illustrates the problem for advanced medical imaging. Taking advantage of the safe harbour provision of the Stark II laws that permit such in office ancillary use, almost one in five physician practices controls equipment for advanced imaging (Reschovsky, Cassil, and Pham, 2010). This problem is especially germane to cardiologists, whose payments for advanced imaging has tripled in the last decade (Hollenbeck and Nallamotheu, 2011).

While gray areas abound, and despite on-going efforts by physician specialty societies to control apparent overutilization, we recommend leaving less room for physician discretion regarding medical technology-enabled care. Utilization growth can be checked and limited to the appropriate utilization criteria established by umbrella specialty groups as a first step. As a base of comparative effectiveness and cost effectiveness data is gathered, further refining of and limitation of high value care can be guided and mandated as necessary. Beyond utilization controls at the provider level, we recommend ancillary policy changes at the level of regulators and standards-setting institutions. Recent research suggests that the primary driver of the excess growth in per Medicare beneficiary costs is higher utilization driven by the rapid diffusion of new and expensive medical technology (Chernew, 2011).

To approach this problem directly we envisage a gradual path to the mandatory incorporation of cost effectiveness into regulatory device and pharmaceutical approval processes, coupled with risk-based pricing, payment for results and enforced post-marketing approval safety, effectiveness and cost effectiveness studies. We believe revisions to existing legislation are also warranted, such as off-label prescribing rights that allow physicians to prescribe any approved medication for any use and use any approved device for any use they like. Clearly, Stark II has been problematic given the facilitation of the development of physicians financials self-interest and conflicts of interest, and also needs robust revision. We do not develop these ancillary recommendations in this report for scope reasons.

As targets for sustainable growth rates are politically painful and have had a limited track record of success in recent years, we also follow a consensus view (Antos et al., 2010) and also believe that accountability must extend to fiscal intermediaries and end-users. In particular, we recommend that:

Recommendation 3:

Consumers must have parallel incentives to accept more personal responsibility in managing their health insurance purchases and their consumption of health care.

The illustrative example of geographic variation even within the Kaiser Permanente system suggests that payment reforms and organizational restructuring for healthcare suppliers is likely not sufficient to address all concerns regarding geographic variation in healthcare. The key elements of such accountability span creative voucher and premium support programs for entitlement programs, excise taxes on 'Cadillac' plans, reform of Medicare fee for service design features, reform of MediGap design features, and increased tiering and rebates to allow consumers to perceive and distinguish value. However, we remain convinced that supply-side payment reform, sponsored research on cost and comparative effectiveness, clinical guidelines and regulations are tools that governments can use to shape care faster than consumer-driven or fiscal-intermediary-driven initiatives (Rawlins, 2009). Since the high-cost Medicare beneficiaries are remarkably concentrated in the Pareto-like distribution of per capita expenditures (Reschovsky et al., 2011), it is clear that more targeted initiatives are more likely to change individual cost generation.

5.3 Looking forward

For the last several decades, flawed incentives among suppliers and consumers of healthcare have led to an increasing disconnect between payments and value and widespread geographical variations in spending, outcomes and value. Failed institutions have further conspired to leave a health system that is clearly caught in a 'perfect storm' of overutilization (Emanuel and Fuchs, 2008), with dramatically high, rising and unsustainable healthcare expenditures. We believe that comprehensive payment policy reform is the leading solution to address this problem, and that the political and policy-making consensus will allow recommendations for current and future initiatives described in this report to be implemented. Since failure is not an option (Crosson, 2011), and since we see similar emergent policy activity to contain national indebtedness and deficit spending in general, we remain confident that comprehensive payment policy reform will be implemented and will lead to sustainable, more equitable and higher value healthcare delivery.

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