The COMMONWEALTH FUND

THE ROLE OF PRACTITIONER MOTIVATION IN DESIGNING PROVIDER PAYMENT REFORMS AND OTHER INCENTIVES

Irene Papanicolas, London School of Economics and Political Science
Peter C. Smith, Imperial College Business School

Prepared for:
The Commonwealth Fund
2015 INTERNATIONAL SYMPOSIUM ON HEALTH CARE POLICY

Abstract: Health systems spend a large percentage of their funding on the clinical work force, yet there is widespread concern that they are not getting the best from their clinicians. Many systems have therefore introduced reforms, to align clinician behavior with the interests of patients and payers. As well as payment mechanisms, systems have experimented with nonfinancial incentives: professional advancement; earned autonomy; and public reporting of performance. However, these experiments have often been undertaken without a clear understanding of the motivations and constraints operating on clinicians, and so these experiments have been inconsistent. This paper first presents a framework to help policymakers think about clinical behavior when designing reforms. It focuses on seven dimensions relevant to motivation, drawing on principles developed from the general economics literature on utility theory, institutional economics, labor economics, and behavioral economics, as well as insights from other disciplines such as psychology, management, and sociology. The paper then discusses some of the policy levers available to promote efficiency or cost containment, and the extent to which these levers are effective in addressing clinical motivation. Case studies demonstrate the different policies that health systems have used in a wide variety of settings.

INTRODUCTION

Health systems spend a large percentage of their funding on the clinical work force, yet there is widespread concern that they are not getting the best from their clinicians, especially when seeking to align cost containment measures. Many systems have therefore introduced reforms to align clinician behavior and the interests of patients and payers. Besides payment mechanisms, policymakers have experimented with nonfinancial incentives: professional advancement; earned autonomy; and public reporting of performance. However, these experiments are often undertaken without a clear understanding of the motivations of and constraints operating on clinicians, making it difficult to predict the outcomes.

There are numerous examples where incentives designed to motivate provider and practitioner behavior have had different effects from those initially expected. Perhaps one of the most commonly discussed has been the effects of pay-for-performance initiatives, initiatives that explicitly link financial incentives to provider performance. These programs have been widely adopted with the aim of improving quality of care, and by extension, patient outcomes. Yet evidence from evaluations of such initiatives as the USA Premier Hospital Quality Incentive Demonstration (HQID) and the English Advancing Quality program indicates that they have had no significant long-term effect on patient mortality (Jha et al. 2012; Kristensen et al. 2014), despite evidence of favorable effects on short-term process measures (Lindenauer et al. 2007) and short-term mortality in the case of England (Sutton et al. 2012). Understanding why these incentives have not had a greater impact on outcomes is not straightforward, and is likely to be context dependent. However, an important potential reason is that they have either failed to engage practitioners, or have not changed practitioner behavior in the intended way (Smith 2015).

We lack a clear framework for thinking about the competing motivations that may influence how providers react to new policy interventions. In particular, while interventions usually target one aspect of performance, they are introduced into a system with an existing culture and constraints. This makes it difficult to predict the outcome of any one intervention, or to generalize about the transferability of findings across systems.

Variations in individual practitioner characteristics and preferences may also determine the effectiveness of an intervention. A particular individual may respond more sensitively to an incentive than someone else. A voluntary program, such as the fundholding scheme for general practitioners described below, allows us to observe large variations in the willingness and ability of practitioners to adopt new ways of working (Baines and Whynes 1996). A particular type of difference may be the extent to which individuals are intrinsically or extrinsically motivated, which may lead to wide variations in the way they react to an incentive, as described in Julian LeGrand's knights and knaves analogy (Le Grand 1997).

The aim of this paper is to propose a theoretical framework to help policymakers think about clinical behavior when designing reforms. It draws on the general economics literature and behavioral economics, as well as psychology and management, and suggests a more holistic approach to thinking about practitioner incentives. The framework comprises seven elements, and for each we discuss the implications for cost control and efficiency improvement. The paper examines certain policy levers used by policymakers to incentivize clinicians, and reassesses their potential in the light of the proposed framework. This analysis is supplemented with case studies that demonstrate how such policies have operated in a variety of settings.

A FRAMEWORK FOR THINKING ABOUT PRACTITIONER INCENTIVES

While health care practitioners have been the focus of studies on incentives, there is no consensus on what drives their behavior. Within the health economics literature, physicians have been described as utility maximizers, income maximizers, quantity maximizers and profit maximizers (Liu 2003; Liu & Mills 2007). Efforts to model the utility function also recognize the importance of maximizing quality alongside quantity (Newhouse 1970; Pauly 1980) or quality of health care, or both (Chalkley & Malcomson 1998); or maximizing profit alongside patient benefit (Ellis & McGuire 1986; Hellerstein 1998). Similarly, Liu & Mills (2007), drawing on Scott and Shiell (1997) and Ryan (1992) also recognize that doctor's effort and the outcome of the medical contact should be included alongside income in a physician's utility function. Altruism, physician concern about patient benefit, has been considered elsewhere (Galizzi et al. 2015; Godager & Wiesen 2011). As a few components of a physician's utility function, Eastaugh (1992) identifies leisure time, professional status, internal ethics, complexity of case mix, study time to keep up-to-date, and number of support staff under the physician's supervision.

Behavioral economics suggests several decision-making ingredients policymakers can use to think about physician behavior—and what policies may or may not influence that behavior (Chetty 2015; Frank 2004; Loewenstein et al. 2012). Most of the health care–centered literature on behavioral economics has concentrated on patients, and how behavioral economics can be applied to promote healthy living (Lowenstein et al. 2007). However, lessons from behavioral economics can also be applied to physicians in the workplace (Loewenstein et al. 2012), and can shed light (Kamenica 2012) on why incentives work or backfire. For example, individuals may suffer from loss aversion, which may make them more sensitive to penalties than rewards. Other authors (Gneezey et al. 2011) consider how extrinsic incentives may crowd out intrinsic motivations, for example, when a financial incentive is removed.

The health services research literature recognizes the importance of the organizational, cultural, and socioeconomic context in shaping and influencing provider motivation and satisfaction (Buetow 2007; Dussault & Dubois 2003; Franco et al. 2002; LeGrand 1997; Mathauer & Imhoff 2006; RAND 2013). Much of this literature is concerned with the limitations of extrinsic

motivation, and identifying other motivators of performance. RAND corporation focused on physician professional satisfaction (RAND 2013). RAND's mixed methods approach considered system, organizational and individual characteristics; working conditions; and patient outcomes, among other factors. The psychology and business literature also includes a number of relevant studies addressing the factors that motivate individuals and employees (Deci 1975; Fehr & Falk 2002; Herzberg 1993, 2003; Maslow 1954). This literature highlights other powerful motivating factors—the desire for social approval and the desire to work on interesting tasks, for example. Fehr and Falk (2002) point out that in order to truly understand the effect of economic incentives on behavior we must understand how they interact with these other motivations.

Building on this body of work, we suggest a framework for thinking about practitioner incentives. We attempt to include the elements identified above, but also to incorporate other drivers that we believe influence provider behavior. We believe that, in summary, the literature suggests that the following factors are likely to be amongst the most important influences on practitioner behavior and satisfaction:

- payment: income, pension, and other material rewards;
- freedom/autonomy: ability to practice in line with professional preferences;
- working conditions: including working hours, unsociable hours, physical environment;
- reputation/prestige: professional standing;
- opportunities for knowledge development: professional development and pride;
- regret/risk: freedom from threats to livelihood, income, and professional status;
- altruism: satisfaction derived from the well-being of others, most notably patients.

Another issue is how these influences affect clinical behavior, either singly or in combination. Previous work in the management literature (Herzberg 1993, 2003) suggests that the factors that lead to job *dis*satisfaction are different from the factors involved in producing job satisfaction. This distinction is made by Newhouse (1970) in relation to practitioner payment. He called it the target income hypothesis. As outlined by Liu and Mills (2007), each individual practitioner has income expectations, possibly formed with reference to what similar practitioners are earning. If the professional's income falls below that target, his or her actions will be predominantly driven by income. Once that target is achieved, other considerations having to do with satisfaction become more important. This holds many implications for the design of policy, and how practitioners might respond to financial incentives.

It is likely that other factors that influence practitioner behavior also exhibit some sort of threshold effect, as outlined by Herzberg (1993, 2003). Working conditions (i.e., flexibility of working hours or amount of working hours), or even autonomy may follow such a pattern. In contrast, some factors (such as recognition or responsibility) may be pure motivators that work by making the job more rewarding and producing more satisfaction, once the minimum thresholds of pay and working conditions have been satisfied.

THE ELEMENTS OF THE FRAMEWORK

This section expands on each of the elements identified above, using case studies to illustrate approaches that have influenced specific elements of provider motivation.

1. Payment

Of all the elements identified in the framework, practitioner payment has been most commonly investigated and utilized. It is now well established that the way practitioners are paid strongly influences their behavior (Dudley et al. 1998; Conrad & Christianson 2004). In our framework, and in line with the target income hypothesis proposed by Newhouse (1970), payment should be viewed as a constraint rather than a motivator. The framework assumes there is some baseline pay that ensures practitioners are satisfied. Above this baseline, how physicians are paid can vary to influence different aspects of performance, such as the volume or type of services provided.

Table 1 illustrates the likely impact of different physician reimbursement methods on health system objectives, relative to an economically efficient (but probably unattainable) level of performance. A fixed salary controls expenses and leads to few interventions, but at the expense of other objectives, unless complementary policies such as performance measurement are implemented, too. Reimbursement according to costs incurred (fee-for-service) is likely to encourage activity, but may be bad for expenditure control and efficiency. Prospective reimbursement, per unit of activity, is likely to promote efficiency for each patient treated, but may encourage inappropriately high levels of treatment, and therefore has an ambiguous implication for expenditure control. These predictions are generalizations, and will vary according to specifics, but they illustrate the trade-offs between different modes of provider payment. Some blend of payment mechanisms is likely to be optimal, although of course identifying specifics is highly problematic.

Table 1: Impact of physician reimbursement on health system objectives

	Method of Reimbursement		
Objective	Fixed salary	According to costs incurred	According to activity
Increase activity	-- (+?)	++	+
Expenditure control	++	--	- (+?)
Improve quality	-	+	-
Improve equity of access	--	+	-
Improve efficiency	-	--	+

Loosely speaking, these rudimentary payment mechanisms balance the practitioner's income and what we might call leisure. An important recent development has been adding to reimbursement schemes an element of pay that is conditional on performance, and usually performance is measured by quality of care delivered (Cashin et al. 2014). Although most such "pay for performance" (P4P) schemes have been targeted at provider organizations rather than individual practitioners or partnerships, there are some important exceptions. Among the most important of these is the UK Quality and Outcomes Framework for general practitioners (GPs) (Doran et al. 2011). Such P4P schemes are linked with other elements of practitioner motivation discussed below, such as reputation and professional development.

Note that Table 1 treats cost containment and efficiency as distinct concepts, even though there may be times when one can lead to the other. Of all the policy levers described in this paper, payment is the most directly targeted at either of these concepts. However, the implication of the general predictions in Table 1 is that their consequences for other aspects of practitioner utility and health system performance should be scrutinized, both before implementation and as part of any evaluation.

2. Freedom/Autonomy

To improve accountability, cost control, and quality improvement, health systems have introduced such new management tools as clinical guidelines, report cards, audits, regulation, and inspection. Many of these have resulted in significant improvements, but they have also led to reductions in the medical autonomy of health care professionals, particularly if they did not help to develop the regulatory instruments. Reports from many countries have documented the increasing pressures these changes in practice have placed on physicians, and their impact on physician satisfaction as well as on patient outcomes and safety (Dunn et al. 2007; Edwards et al. 2002; Janus et al. 2008; Taitz et al. 2011).

A number of research studies have noted the link between physician autonomy and professional satisfaction (Edwards et al. 2002; Jackson Healthcare 2013; RAND 2013), with some qualitative studies suggesting that declines in autonomy can be more important influences on practitioner satisfaction than payment. Where evidence-based medicine and clinical guidelines play an increasingly important role, balancing quality assurance, cost control, transparency, and accountability with professional freedom and autonomy becomes a delicate task, especially where evidence is sparse or patient needs are heterogeneous. The fundamental tension is between the "industrial" model of standardization and the traditional professional model of autonomy and innovation (Swensen et al. 2010).

Moreover, when tools such as guidelines or performance metrics, which could be motivators of behavior, are attached to financial incentives they may have adverse effects. As outlined by Gneezy et al. (2011), monetary incentives may have an indirect psychological effect that makes the incentivized behavior less attractive, and risks crowding out the incentivized behavior. Attaching incentives to benchmarking or reputational indicators may signal that managers do not trust physicians' intrinsic motivation and can lower the motivating effect of benchmarking alone.

Box 1 outlines a GP fundholding case study of hospital use in the UK. The relevant policy sought to introduce financial incentives that balanced cost control, efficiency, and professional autonomy. Autonomy was an important element of this policy in two respects: participation was voluntary, and how to control expenses was left to individual practices. This is likely to have played an important part in its apparent success. This finding is consistent with RAND's findings that physician autonomy motivates physicians in the United States. According to RAND,

> Greater physician autonomy and greater control over the pace and content of clinical work were both associated with better professional satisfaction. For some physicians, having a leadership or management role within the practice was a key way of achieving autonomy. However, practice ownership was not for everyone: Some physicians reported little taste for the business side of medicine, deriving satisfaction from

> employed positions that allowed them to focus more exclusively on clinical care. (RAND 2013, p. 49)

The link between professional autonomy and cost containment is not straightforward. On the one hand, practitioner budgets may be one way to contain cost. There also is an argument—especially in publicly funded health systems—that the Hippocratic principle is antipathetic to cost control, and so professional autonomy must be balanced by policies such as clinical guidelines, which seek to promote cost-effective treatment. The policy challenge is to secure an optimal balance.

Box 1: UK General Practitioner Budgets

Without countervailing incentives, primary care physicians may seek inappropriately to shift some of the burden of looking after their patients onto secondary care. This tendency for general practitioners (GPs) to encourage overuse of specialists can be reversed by asking practices to manage capitation budgets, from which they purchase specialist care and other services. Budget responsibility may give doctors an incentive to scrutinize the need for specialists more critically. They may then delay or refuse some specialist referrals, or treat some patients in a less costly primary care setting.

The strength of incentives under budget responsibility depends heavily on the stringency of budget constraints, and how much of any surplus stays with the practice. Between 1991 and 1998, the English NHS experimented with a scheme known as GP fundholding, under which GPs could elect to assume responsibility for a budget that covered routine nonemergency hospital treatments and pharmaceutical spending. Experiments of a similar design have been attempted elsewhere (Thorlby et al. 2011). The budgets for fundholders were quite soft, in the sense that GPs' income was not directly at risk, and surpluses had to be spent on some aspect of patient services. Deficits had few concrete adverse implications for many practices, and were often guaranteed by the paying health authority (Audit Commission 1996).

Dusheiko et al. (2006) studied hospital use by English practices before 1998 and after, when fundholding was abolished. They estimated that fundholders made 4.9 percent less use of the relevant nonemergency hospital treatments than their nonfundholding counterparts, a difference that quickly disappeared after abolition of fundholding. A crucial question, however, is whether the reduction in utilization had any adverse impact on patients' health, an issue that researchers have been unable definitively to address. Furthermore, the Audit Commission expressed some concern that the scheme favored more affluent areas, therefore potentially exacerbating health inequalities. More generally, to be fully effective, any system of budget responsibility requires that health outcomes and inequalities are monitored to ensure that expenditure control is not at the expense of population health.

It is noteworthy that more recent attempts in England to implement Practice Based Commissioning since 2005 have been largely ineffective (Goodwin et al. 2008). One of the reasons has been that in many localities the budgets given to general practices have been notional, with no meaningful consequences of overspending or underspending. Furthermore, participation in Practice Based Commissioning has been compulsory. In contrast, fundholding was a voluntary initiative, with the proportion of practices participating steadily increasing over the seven years it was in force, so that by 1998 over 50 percent of patients were cared for by a fundholding practice. This may be an indication that one of the strengths of fundholding was that it respected practice autonomy, and

allowed different styles of practitioner to adopt the regime best suited to their preferences.

3. Working Conditions

Our framework, in line with Herzberg's model, incorporates a dimension that we refer to as working conditions. The number of hours worked, their regularity and timing, the intensity and mix of workload, the physical environment, and the geographical area of practice can all be working conditions. These are likely to be what Herzberg refers to as hygiene factors, which limit or constrain employment rather than acting as motivators. Therefore, working conditions deteriorating below a certain target is likely to cause dissatisfaction and unrest. RAND (2013) found that physicians value having control over their work hours and schedules and are dissatisfied when work schedules are overly rigid and they do not control patient scheduling. Related sources of dissatisfaction were the limited amount of time that physicians have to build relationships and to provide continuous care, and the growing amount of time taken up by administrative work (Dugdale et al. 2001). In general, physicians report dissatisfaction when they are required to perform work that other staff could perform—especially when they sense that tasks are being dictated to them (RAND 2013).

Many health systems are grappling with a shortage of physicians, either in remote or disadvantaged regions, during unsociable hours, and or in unfashionable specialties. This section presents two case studies that examine these problems: in Box 2, a survey by the OECD (OECD 2014), and in Table 2, the Commonwealth Fund survey of after-hours care arrangements (Commonwealth Fund 2012).

Box 2 describes policy levers that have been used in OECD countries to influence physician choice of location. As the OECD notes, the choice of practice location may be influenced by the overall attractiveness as a place to live and work, but may also be influenced by factors already discussed (such as local income, hours, prestige, and difficulty of working conditions). Indeed, Box 2 shows that health systems have implemented policies that draw on each of these elements to influence physician choice of practice location.

Box 2: Policy Levers to Influence Physician Choice of Practice Location

1. Medical Education (Australia, Canada, Japan, United States, Scotland). Favoring students committed to work in underserved areas, or recruiting students for medical education who have a rural background.

2. Regulation (Germany, Denmark). Regulation can be anchored in entry to clinical training, e.g., in the form of

return-of-service agreements conditional on the choice of specialty. Location choice can also be legislated, through implicit or explicit regulation of location when physicians set up their first practice.

3. Financial Incentives (wage and nonwage) (Germany, Denmark, Canada). Monetary incentives are both wage related (including subsidies for setting up practices, or one-off payments aimed at retaining and attracting doctors during their career or when they are close to retirement) and nonwage related (such as income guarantees, debt relief, or bonus payments at different points of the career of a physician practicing in an underserved area).

4. Service Delivery Reorientation (Germany, Demark, Scotland). To make service in otherwise unattractive areas less burdensome by improving working conditions and the life and job satisfaction of physicians practicing there. Policies may incentivize the take-up of new processes of service delivery, or the use of new types of health service providers to provide an adequate level of access with fewer physicians. This may mean using telemedicine or shifting health service away from physicians.

Source: OECD (2014)

An issue that is receiving increased attention across health systems relates to how to organize and provide quality care outside office hours, while keeping costs low. Grol et al. (2006) note that physicians' workloads are growing with nonurgent demands, the increased complexity of health care problems, and the shortage of physicians in some countries. Telephone triage and large primary care centers are being tried to lower costs and lighten physicians' workloads. Table 2 outlines national situations in after-hours care. This is not only important for efficiency and cost containment, but it ensures physicians do not lose control over their work hours and flexibility, which are crucial to their satisfaction (Huibers et al. 2009; RAND 2013). Little is known about what constitutes an optimal model for out-of-hours care (Grol et al. 2006), nor the impact that these changing arrangements have on physician motivation.

Table 2: After-hours care arrangements in different countries

Country	After-Hours Care Provider(s)	Fee/Bonus
Canada	• Physician-led (mainly privately owned) walk-in clinics • Emergency rooms • Free 24-hour telephone service	Traditionally, primary care physicians were not required to provide after-hours care, although many of the government-enabled group practice arrangements have requirements or financial incentives for providing after-hours care to registered patients. For example, in Ontario, many primary care physicians receive a 20 percent premium for after-hours provision of specific services.
Denmark	• Responsibility of the regions—mostly done by agreement with GPs • First line of contact is regional phone service with GP (or nurse in Copenhagen) followed by a referral, or no referral, to hospital • Home visits for immobile patients	Voluntary with a higher rate of payment after-hours than for normal care.
France	• Delivered by emergency departments of public hospitals or contracted private hospitals • Emergency telephone line	Hourly rate
Japan	• Delivered by hospital outpatient departments, some regular clinics, and after-hours care clinics. • There is a national after-hours pediatric medical advice telephone service.	Top-up fees are paid to hospitals and clinics but there is no formal requirement for clinics to provide these services.
The Netherlands	• After-hours primary care is organized at the municipal level in general practitioner "posts"—centralized services, typically run by a nearby hospital, that provide primary care between 5 p.m. and 8 a.m. • Emergency care is provided by GPs, emergency departments, and trauma centers, and is covered under statutory insurance.	Doctors are compensated per hourly rates for after-hours care, and must provide at least 50 hours of after-hours care annually to maintain their registration as general practitioner.
Sweden	• Primary care practices in proximity to each other (normally three to five practices) collaborate regarding after-hours arrangements. • There are seven university hospitals and about 50 county council hospitals that provide full emergency services 24 hours a day. • There is a national emergency phone line (inclusive of ambulance service).	There is no special arrangement for payment to providers of after-hours care.

Source: Commonwealth Fund (2014)

It is difficult to generalize about the link between working conditions and cost containment. However, improving working conditions may be a cost-effective way of avoiding using expensive temporary staff, or falling back on high-cost facilities for routine treatment. Poor working conditions may also produce inefficient or low-quality care, for example, by leading to high levels of staff absenteeism and turnover.

4. Reputation/Prestige

A central feature of Maslow's theory of human motivation (1943) is that all people have a need or desire for self-esteem and the esteem or respect of others: what may be called a desire for reputation, prestige, recognition, attention, importance, or appreciation. Herzberg (2003) also notes that, once an employee's basic needs, such as income, are met, certain motivating factors come into play, of which the most important are achievement, recognition, and responsibility.

Reputation and prestige take many forms in the health care professions. These include the prestige associated with certain specialties or working in certain regions. Indeed, general practice and certain nursing specialties (such as care of older people versus general hospital care) are associated with lower prestige and are less commonly selected by graduates (Abrahamsen et al. 2014; OECD 2014).

In addition, individual prestige suggests that physicians might be motivated by their standing within their chosen specialty, a reputational effect that may emerge through public reporting of their comparative performance. With public reporting, providers may be motivated to improve their performance to protect their reputations and the demand for their services (Berwick 2003; Hibbard et al. 2005). This idea has motivated public reporting in the United States, and more recently in the UK and the Netherlands. Although there is ample evidence that such schemes do affect professional behavior, there is little direct research on how physicians actually make practice improvements in response to public reporting. Furthermore, report cards are an external stimulus, and there is little evidence whether they compromise the intrinsic motivation of practitioners.

The example in Box 3 describes how public reporting touches on a number of aspects of physician motivation, of which three important ones are professionalism, reputation, and commercial success. Physicians might respond to reporting by challenging its fundamental propriety, challenging the specific metrics, questioning the quality of the data, changing the mix of patients or treatments, and improving quality. Their response is likely to be influenced by the design of the public reporting incentive itself, particularly whether physicians believe that the reported performance correctly reflects factors within their control and the extent to which they are involved in the choice and interpretation of the metrics selected.

Most policies addressing prestige and reputation are aimed at professionals and their patients, so are aimed at clinical quality. They do not usually directly address cost containment or efficiency, although some aspects of reported inefficiency (such as delays, repeated tests, and inappropriate care) are likely to be of concern to patients.

Box 3: Public Reporting of Physicians' Performance

There is growing experience of publicly reporting physicians' performance (Shekelle 2010). The United States has led the way, starting in 1990 with the famous scheme that reported surgeons' risk-adjusted mortality rates after coronary artery bypass surgery in New York. Other examples that have been researched include *Consumer Assessment of Healthcare Providers and Systems (*CAHPS), QualityCounts, California Hospital Outcomes Project, Cleveland Health Quality Choice, Pennsylvania Health Care Cost Containment Council, and Healthcare Effectiveness Data and Information Set (HEDIS). Similar schemes can now be found in many health systems, including England and Sweden.

Analysis of the impact of report cards is complicated because they are rarely subject to randomized trials. Instead, researchers must take advantage of natural experiments, which can usually offer only an imperfect insight, and which necessitate careful analysis before drawing conclusions. Typically, research finds that the aspect of performance reflected in the reports does indeed improve, relative to performance in control groups. The prime effect is through a process known as the "change" pathway, described by Berwick (2003). Health care professionals change because of a desire for professional improvement, a desire to maintain personal and organizational reputation, and a desire to retain and enhance income.

However, researchers have also found unintended consequences, which may bring into question the effectiveness of the schemes. For example, Dranove et al. (2003) used patient-level analysis to examine the impact of public reporting in New York and Pennsylvania compared to other U.S. states. They discovered, by using a cohort of Medicare patients admitted with acute myocardial infarction and Medicare data from 1987 to 1994, and adjusting for patient characteristics, that compared to other U.S. states, in New York and Pennsylvania:

- reported mortality (risk adjusted) improved;
- reporting of risk factors increased;
- fewer high-risk patients were accepted;
- more low-risk patients were accepted.

They concluded that—as implemented—the early version of the schemes led to no significant benefits to low-risk patients; substantial increases in mortality in high-risk patients; and increased Medicare expenditure.

The implication is that these particular innovations in public reporting incentivized physicians to change their clinical decision-making. The risk adjustment scheme discouraged surgery on high-risk patients, who could benefit from treatment. This highlights why the apparently arcane practice of risk-adjustment is likely to be fundamental to the success or otherwise of such schemes.

Public reporting has often attracted hostility from physicians, sometimes even legal action. For example, the Massachusetts Medical Society challenged a scheme under which physicians were ranked for cost and quality measures by health plans associated with the Group Insurance Commission.

5. Opportunities for Knowledge Development and Practice Improvement

Related to (but distinct from) prestige and reputation is the desire to improve by investing in professional development, building up professional networks, engaging in research, and influencing health policy and quality improvements. At the health system level, many countries engage in different policies of physician revalidation (Merkur et al. 2008) or quality and safety management programs, to promote continuing improvements in quality of care and to ensure medical safety (Dickinson et al. 2008). While engagement in such activities will be a motivator for many professionals, there is only limited evidence on how best to nurture that motivation and use it to best effect.

Taitz et al. (2011) identify six key drivers of physician engagement in quality and safety activities among providers in top performing U.S. health care organizations: engaged leadership; a physician compact; appropriate compensation; realignment of financial incentives; data and enablers; academic promotion.

Box 4 describes the Swedish quality registries. These are often offered as examples of a physician engagement activity with a sustained and impressive quality improvement track record. Some of the registries have been in place for many decades, and have undergone considerable change. Crucial to their success seems to be that they are driven by the professions, and are not part of an external regulatory or performance management process (Rehnqvist 2002). This professional leadership in turn has promoted a culture in which practitioners seek out peer comparisons, reflect on their own performance, and implement best practice.

Although professional development has traditionally focused on clinical quality, there is no reason why it could not also embrace efficiency. Metrics such as length of hospital stay, unplanned hospital readmissions, or inappropriate place of treatment could be scrutinized as an issue of professional concern. Cost containment could likewise be addressed through metrics such as inappropriate use of branded medicines and departures from clinical guidelines.

Box 4: Swedish Quality Registries

A national quality registry collects individual information about patients, their medical conditions, the type of care they received, and outcomes. Sweden's government-supported national quality registries date back to the 1970s, when the first registry, covering knee arthroplasty, was set up. Currently there are about 100 government-supported registries. Registry participation is voluntary, and they are largely run by medical professionals and primarily used to develop medical treatments and knowledge and stimulate local quality improvement. The Swedish registry system is distinctive in its heavy reliance on professional initiative (Levay & Waks 2009; Rehnqvist 2002).

Data are collected from patients and entered by hospital clerks. Some registries even employ patient-reported outcome measures to follow up with patients (Emilsson et al. 2015). Some registries approach 100 percent inclusion of patients, such as the Swedeheart registry (Larsson et al. 2012). In 2010, the quality registries covered about 41 percent of Swedish inpatient care and 25 percent of total care (Levay 2015).

Many significant improvements in health outcomes are attributed to the national quality registries, which have helped to identify variations in care and best practices in treatment. The hip registry has helped Sweden identify the best implants, and Sweden has lowered its rates of revision (Larsson et al. 2012). The HIV registry pointed to geographical variations in HIV viral control, which was led to widespread improvement efforts, and reductions in variation, over the next two years (Levay 2015).

The registries also have good support among clinicians, who recognize their role in quality improvement (Larsson et al. 2012; Levay 2015). Among Swedish clinical managers, 62 percent found the quality registries are either useful or very useful for conducting quality improvements in their own organizations (Levay 2015). In a user survey of the Swedeheart registry, 87 percent of users reported that it helped them identify areas for improvement, and 93 percent of physicians and 99 percent of nurses who responded agreed that the registry helped improve the quality of health care (Larsson et al. 2012).

The majority of the registries publicly report quality measures at the hospital or regional level, and are used for clinical research (Levay 2015). However, Sweden only began releasing performance reports to the public in the late 1990s in response to demands from journalists. The move was initially unpopular among those managing the registries, as data had been collected under conditions of anonymity and there were concerns that publishing the data would skew the results for providers with difficult cases. Over time, however, there has been a gradual acceptance of the publication of registry data, after external pressures and through a process of collegial discussions, professional deliberations of different measures, and efforts to clarify the information to nonexperts (Levay & Waks 2009).

Although it is generally accepted that the quality registries facilitate quality improvement, neither the extent of improvement nor the mechanisms that translate findings to quality improvements are well understood (Eldh et al. 2014). Some experts suggest that what makes the Swedish registries distinct from other countries is their indirect, soft regulatory control approach, focused on supporting health professionals' own improvement activities (Levay 2015; Rehnqvist 2002). While receiving funding from the state, professionals enjoy the freedom to design and manage registries, yet are also participating in a system of continuous self-monitoring and self-reform that makes them more amenable to external scrutiny (Levay 2015).

6. Risk and Regret

In all aspects of life, individuals tend to a greater or lesser extent to be risk averse. Health care practitioners are no different. Indeed, in their dealings with patients, they often confront situations in which they must make decisions and allocate resources under conditions of great uncertainty, where risk is intrinsic. Professional responses to this inherent risk may have an important implication for system costs and efficiency. At one extreme, public reporting of patient outcomes may inhibit physicians from accepting high-risk patients who could benefit from treatment. At the other extreme, threat of litigation might prompt physicians to order excessive tests and procedures (Rogers 2013). As Mamede and Schmidt (2013) point out, both these biases are related to anticipated regret and avoidance of risk. One might expect, therefore, that doctors working in cultures that emphasize avoidance of shame, peer disapproval, or loss of reputation may be less likely to fall prey to them.

One basic element of a patient's trust is the behavioral norms contained in the Hippocratic Oath. Its principles, valued by doctors to this day, include treating the sick to the best of one's ability and avoiding either undertreatment or overtreatment. Yet this apparently straightforward principle has proved difficult to translate into simple rules of practice, especially in health systems that rely on public financing, and where total resources are limited. Excessive resources devoted to one patient may deny another patient treatment. Even when spending benefits the immediate patient, the resources may be better directed somewhere else. Therefore the nature of health systems or organizations may affect the definition of what constitutes over- or undertreatment.

Box 5 describes three very different approaches to the way health systems deal with reporting and responding to medical errors. Various aspects of trust are important in the context of reporting medical errors, as outlined by Firth-Cozens (2004). For such systems to be effective, professionals must trust that their reports will be used for learning and improvement, and not punitively. They need to be confident that they will not suffer personally through reporting, and that there are mechanisms in place to limit disclosure. Organizational and professional culture influence the extent to which individuals are expected to behave with regards to colleagues or superiors. Finally, professionals need to feel confident that recognizing and reporting an error will improve the outcome for the patient, while managers need to be confident that they have the full unbiased facts to deal with errors appropriately.

Mitigating actual and perceived practitioner risk may therefore be an important element of cost control in some specialties. If implemented with care it may reduce unnecessary treatment while preserving trust in the professional and the quality of outcomes.

Box 5: Medical Injury, Patients' Claims, and Provider Accountability Mechanisms

United States

In the United States a patient who believes that they have been injured has different recourses. One is to report the physician to their medical society or the state licensing board, or even state agencies or accreditors. Hospitals also typically have formal grievance procedures. These can lead to sanctions against a physician, although there will not be financial compensation for the patient (Rice et al. 2013).

In the absence of a satisfactory resolution to a complaint, a lawsuit is often pursued. For this reason, hospitals and physicians take out expensive, and becoming more so, malpractice insurance. In part due to these rising costs, it has become difficult for some physicians to secure this coverage and there are concerns about the fairness of this system and potential adverse consequences, such as defensive medicine (or overtreatment) (Mello et al. 2010).

A physician practicing in the United States faces a high risk of being sued. About 75 percent of physicians in psychiatry (which is a low-risk specialty) face a malpractice claim during their career, while in surgery (high risk) 99 percent will. Most of these suits do not end in an award and so the likelihood of an insurer making a payment is low (Jena et al. 2011). Moreover, most malpractice claims are abandoned before they are settled (Golann 2011).

New Zealand

New Zealand has a system of no-fault compensation. Legal statute bars lawsuits for negligence or medical error. Through a crown entity called the Accident Compensation Corporation (ACC), anyone suffering a personal injury (including a medical injury, whether negligent or not) can seek compensation through ACC. The injured patient does not need to prove fault (Bismark & Paterson 2006).

Davis et al. (2003) and Bismark and Paterson (2006) estimate that the rate of patients experiencing a serious preventable adverse event is similar to other countries (Australia, the United States, and the UK). However, other research has found health providers are more willing to assist injured patients, and less likely to practice defensive medicine, in a no-fault environment vs a negligence environment. Doctors are more likely to apologize to injured patients and practice open disclosure in a no-fault environment (Cunningham & Dovey 2006).

Although injured patients are largely barred from suing, they can complain to the Health and Disability Commissioner. The complaint may be escalated to the Health Practitioners' Disciplinary Tribunal, where the doctor may be de-registered. Or, if the patient dies, the case may be investigated in the Coroner's Court.

Denmark

The Danish Act on Patient Safety, which took effect in January 2004 (National Board of Health 2007), obliges health care professionals to report any adverse events they become aware of in connection with patients' treatment or stay in hospitals, and requires hospitals to submit reports of adverse events to the National Board of Health. The Act, however, prevents a health care professional being subjected to disciplinary action as a result of reporting an adverse event. In 2010 the national adverse event reporting system was extended to primary and prehospital care. The system is designed to work from the bottom up, with the majority of the work being performed locally. The rationale is that adverse events should be analyzed and corrected where they occur. This is also thought to have a

positive impact on the development of a safety culture.

A 2007 followup of the Act on Patient Safety found that the number of reports of adverse events increased from 5,740 in 2004 to 15,556 in 2006. The increase was thought to reflect acceptance of the system by health care professionals. Information about adverse events has also been used locally to take preventive actions. A national review of all the changes has not been published, but a few examples were included in a 2009 review of the Act (Danish Society of Patient Safety 2009). These actions included the introduction of a protocol, including marking of the surgical site and a time out, to prevent surgical errors; a protocol to improve suicide risk assessment; a strategy for safer use of infusion pumps (including redistribution of infusion pumps so that only one type of pump is present in each department); and the elimination of different types of lookalike medications.

7. Altruism

Altruism is defined in Chambers dictionary as "the principle of living and acting for the interests of others." It is likely that most health care practitioners enter their profession in order to pursue this principle in relation to patients and their caregivers. Yet, while the concept of altruism features in many of the theoretical frameworks discussed in the health economics literature, often in terms of concern about quality or patient benefit, little empirical work has been able to capture its effect, how to protect it from being crowded out by other policies such as payment, or how indeed to stimulate or nurture it. In today's health care debate, altruism is most commonly referred to in discussions of performance-related pay, and concerns that such prescriptive extrinsic incentives may potentially undermine the intrinsic motivation of providers.

Notwithstanding the lack of concrete study, there appear to be combinations of factors that can either nurture and reinforce, or alternatively compromise and nullify, a professional's intrinsic altruistic motive. There are countless examples of professionals "going the extra mile" for patients, for example, by devoting unpaid time to their care. At the other extreme, the mid-Staffordshire scandal in England demonstrated how parts of an entire organization could be undermined by an adverse organizational culture (Francis 2013).

Case studies and qualitative work from the UK, the United States, and Canada emphasize that a physician compact can balance managerial objectives with physician engagement and involvement (Scott et al. 2012; Taitz et al. 2011; Milliken 2014). A physician compact is an informal agreement between the management of a health care facility and the physicians outlining what physicians are expected to give to the group and what they can expect to get in return. The compact can help to facilitate an open discussion between physicians and management and integrate physician inputs and concerns into practice.

Altruism is likely to play an important role in determining the quality of care, and its absence may be an important reason for inefficiency, escalating costs, and poor quality. An important task for publicly funded systems is expanding the subjects of a practitioner's altruism to the

entire population, so that they understand there is an opportunity cost in overtreating certain patients because it deprives others of cost-effective care.

Creating health care policy requires making assumptions about provider motivation. As extrinsic incentives are used as motivators, it becomes important to ensure that natural altruism is not compromised by policy design. This may require explicitly considering altruism in the design and evaluation of policy instruments, and attention to professional leadership and training in affecting altruistic attitudes.

DISCUSSION

Whatever the system, health care remains what Baumol refers to as a "handicraft" industry, and resources are allocated mainly through the countless treatment decisions of health care professionals and their patients. It is therefore somewhat surprising that we know so little of how those decisions are made, and how different system and organizational structures might affect them. Yet the success of any effort to contain costs and improve efficiency will depend on how the associated policy affects the actions of practitioners and patients.

As doctors make most health care decisions, this paper has concentrated on them. Yet many of the principles also apply to the other health care professions. Cost control and efficiency policies have traditionally focused on practitioner payment. However, this paper has argued that governing costs and efficiency affects other health system objectives, such as service quality, health improvement, and equity. Policymakers need to look well beyond the traditional concerns of payment and working hours when framing their plans. We have discussed other aspects of professional motivation, such as prestige, risk aversion, and practice improvement. These in turn may have important implications for cost containment and efficiency.

In short, policy formulation should examine both the intended and accidental impact on health care professionals. To do so it is necessary to have in mind a clear idea of practitioner motivation, and we have argued that this is likely to have at least seven dimensions: payment; working conditions; prestige; knowledge development; autonomy; risk aversion; and altruism. We have also argued that these motivators may have to be treated in different ways (for example, thinking separately about the factors that make providers *dis*satisfied, and those that are purely motivational). Moreover, the discussion has shown that these factors should often be considered in combination, as they are not necessarily independent. One further complication, not much discussed here, is that the importance of all the factors, and their impact on decision-making, may vary considerably between individuals.

Without question, efforts to control costs and improve efficiency will ultimately rely to a large extent on the decisions made by health care professionals. The conclusion of this brief summary is that more research into the motivation of health care professionals, beyond the traditional

domains of pay and working conditions, is necessary. This is important not only for payment mechanisms, but for other policy instruments that may affect the following sorts of decisions health care professionals have to make:

- types of training and professional education undertaken;
- whether to remain in the work force;
- what type of professional employment to seek;
- the location and working conditions of that employment;
- whether or not to accept certain patients;
- what treatments to offer patients;
- the intensity and setting of care offered.

In aggregate these decisions will have a profound effect on health system performance, and to influence them requires a deep understanding of personal motivation. Economic enquiry has in principle a good deal to offer in this respect. It might include "revealed preference" studies related to empirical analysis of individual professionals' labor supply decisions and more aggregate empirical analysis of labor markets; or "stated preference" studies in which professionals are asked to rank different employment scenarios, or participate in experimental labor market simulations. There are likely to be important contributions from psychology, sociology, management, education, and the clinical disciplines themselves. The role of policymakers is to promote relevant research, through setting tractable research questions, and to make available necessary funding and data resources.

The authors thank Martin Wenzl and Robin Osborn for their guidance.

References

Bente Abrahamsen. Nurses' choice of clinical field in early career. *Journal of Advanced Nursing*, 71(2):304–314, Luty 2015.

Darrin L. Baines, David K. Whynes. Selection bias in GP fundholding. *Health Economics*, 5(2):129–140, 1996.

Donald M. Berwick, Brent James, Molly Joel Coye. Connections between quality measurement and improvement. *Medical Care*, 41(1 Suppl):I30–38, 2003.

Marie Bismark, Edward Dauer, Ron Paterson, David Studdert. Accountability sought by patients following adverse events from medical care: the New Zealand experience. *Canadian Medical Association Journal*, 175(8):889–894, 2006.

Stephen Buetow. What motivates health professionals? Opportunities to gain greater insight from theory. *Journal of Health Services Research & Policy*, 12(3):183–185, 2007.

Cheryl Cashin,Y-Ling Chi, Peter C. Smith, Michael Borowitz and Sarah Thompson (eds) (2014), *Paying for performance in healthcare: implications for health system performance and accountability*, Maidenhead: Open University Press.

Martin Chalkley, James M. Malcomson. Contracting for health services when patient demand does not reflect quality. *Journal of Health Economics*, 17(1):1–19, 1998.

The Commonwealth Fund, *2014 International Profiles of Health Care Systems*. Edited by Elias Mossialos, Martin Wenzl, Robin Osborne and Chloe Anderson. *http://www.commonwealthfund.org/~/media/files/publications/fundreport/2015/jan/1802_mossialos_intl_profiles_2014_v7.pdf?la=en* (last accessed 11/11/15)

Douglas A. Conrad, Jon B. Christianson. Penetrating the "Black Box": Financial Incentives for Enhancing the Quality of Physician Services. *Medical Care Research and Review*, 61(3 suppl):37S–68S, 2004.

Wayne Cunningham, Susan Dovey. Defensive changes in medical practice and the complaints process: a qualitative study of New Zealand doctors. *The New Zealand Medical Journal*, 119(1244):U2283, 2006.

Edward Deci. *Intrinsic Motivation*. Plenum Press, New York, 1st edition, 1975.

Tim Doran, Catherine Fullwood, Hugh Gravelle, David Reeves, Evangelos Kontopantelis, Urara Hiroeh, Martin Roland. Pay-for-Performance Programs in Family Practices in the United Kingdom. *New England Journal of Medicine*, 355(4):375–384, 2006.

R. Adams Dudley, Robert H. Miller, Tamir Y. Korenbrot, Harold S. Luft. The Impact of Financial Incentives on Quality of Health Care. *Milbank Quarterly*, 76(4):649–686, 1998.

Patrick M. Dunn, Bengt B. Arnetz, John F. Christensen, Louis Homer. Meeting the Imperative to Improve Physician Well-being: Assessment of an Innovative Program. *Journal of General Internal Medicine*, 22(11):1544–1552, 2007.

Mark Dusheiko, Hugh Gravelle, Stephen Martin, Nigel Rice, Peter C. Smith. Does better disease management in primary care reduce hospital costs? Evidence from English primary care. *Journal of Health Economics*, 30(5):919–932, 2011.

Gilles Dussault, Carl-Ardy Dubois. Human resources for health policies: a critical component in health policies. *Human Resources for Health*, 1(1):1, 2003.

Steven R. Eastaugh. *Health Economics: Efficiency, Quality, and Equity*. Greenwood Publishing Group, 1992.

Nigel Edwards, Mary Jane Kornacki, Jack Silversin. Unhappy doctors: what are the causes and what can be done? *British Medical Journal*, 324(7341):835–838, 2002.

Ann C. Eldh, Mio Fredriksson, Christina Halford, Lars Wallin, Tobias Dahlstr¨om, Sofie Vengberg, Ulrika Winblad. Facilitators and barriers to applying a national quality registry for quality improvement in stroke care. *BMC Health Services Research*, 14(1):354, 2014.

Randall P. Ellis, Thomas G. McGuire. Provider behavior under prospective reimbursement: Cost sharing and supply. *Journal of Health Economics*, 5(2):129–151, 1986.

L. Emilsson, B. Lindahl, M. K¨oster, M. Lambe, J. F. Ludvigsson. Review of 103 Swedish Healthcare Quality Registries. *Journal of Internal Medicine*, 277(1):94–136, 2015.

Ernst Fehr, Armin Falk. Psychological foundations of incentives. *European Economic Review*, 46(4– 5):687–724, 2002.

J. Firth-Cozens. Organisational trust: the keystone to patient safety. *Quality and Safety in Health Care*, 13(1):56–61, 2004.

Robert Francis, *Report of the Mid Staffordshire NHS Foundation Trust Public Inquiry*, London: The Stationery Office, 2013.

Lynne Miller Franco, Sara Bennett, Ruth Kanfer. Health sector reform and public sector health worker motivation: a conceptual framework. *Social Science & Medicine*, 54(8):1255–1266, 2002.

Mark W. Friedberg, Peggy G. Chen, Kristin R. Van Busum, Frances Aunon, Chau Pham, John Caloyeras, Soeren Mattke, Emma Pitchforth, Denise D. Quigley, Robert H. Brook, F. Jay Crosson, Michael Tutty. Factors Affecting Physician Professional Satisfaction and Their Implications for Patient Care, Health Systems, and Health Policy, 2013.

Matteo M. Galizzi, Timo Tammi, Geir Godager, Ismo Linnosmaa, Daniel Wiesen. *Provider altruism in health economics*, 2015.

Geir Godager, Daniel Wiesen. Profit or patients' health benefit? Exploring the heterogeneity in physician altruism. *Journal of Health Economics*, 32(6):1105–1116, 2013.

Dwight Golann. Dropped Medical Malpractice Claims: Their Surprising Frequency, Apparent Causes, And Potential Remedies. *Health Affairs*, 30(7):1343–1350, 2011.

Nick Goodwin, Chris Naylor, Ruth Robertson, Natasha Curry (2008), *Practice-based commissioning. Reinvigorate, replace or abandon?*, London: King's Fund.

Richard Grol, Paul Giesen, Caro van Uden. After-Hours Care In The United Kingdom, Denmark, And The Netherlands: New Models. *Health Affairs*, 25(6):1733–1737, 2006.

Jackson Healthcare http://www.jacksonhealthcare.com/physiciantrends2013 (last accessed 29-10-2015)

Judith K. Hellerstein. The Importance of the Physician in the Generic versus Trade-Name Prescription Decision. *The RAND Journal of Economics*, 29(1):108–136, 1998.

Frederick Herzberg. *One More Time: How Do You Motivate Employees?* 2003

Frederick Herzberg, Bernard Mausner, Barbara Bloch Snyderman. *The Motivation to Work. Transaction Publishers*, New Brunswick, N.J., U.S.A, reprint edition, 1993.

Judith H. Hibbard, Jean Stockard, Martin Tusler. Hospital Performance Reports: Impact On Quality, Market Share, And Reputation. *Health Affairs*, 24(4):1150–1160, 2005.

Linda Huibers, Paul Giesen, Michel Wensing, Richard Grol. Out-of-hours care in western countries: assessment of different organizational models. *BMC Health Services Research*, 9(1):1–8, 2009.

Katharina Janus, Volker E. Amelung, Laurence C. Baker, Michael Gaitanides, Friedrich W. Schwartz, Thomas G. Rundall. Job Satisfaction and Motivation among Physicians in Academic Medical Centers: Insights from a Cross-National Study. *Journal of Health Politics, Policy and Law*, 33(6):1133–1167, 2008.

Anupam B. Jena, Seth Seabury, Darius Lakdawalla, Amitabh Chandra. Malpractice Risk According to Physician Specialty. *New England Journal of Medicine*, 365(7):629–636, 2011.

Ashish K. Jha, Karen E. Joynt, E. John Orav, Arnold M. Epstein. The Long-Term Effect of Premier Pay for Performance on Patient Outcomes. *New England Journal of Medicine*, 366(17):1606–1615, 2012.

Emir Kamenica. Behavioral Economics and Psychology of Incentives. *Annual Review of Economics*, 4(1):427–452, 2012.

Søren Rud Kristensen, Rachel Meacock, Alex J. Turner, Ruth Boaden, Ruth McDonald, Martin Roland, Matthew Sutton. Long-Term Effect of Hospital Pay for Performance on Mortality in England. *New England Journal of Medicine*, 371(6):540–548, 2014.

Stefan Larsson, Peter Lawyer, G¨oran Garellick, Bertil Lindahl, Mats Lundstr¨om. Use Of 13 Disease Registries In 5 Countries Demonstrates The Potential To Use Outcome Data To Improve Health Care's Value. *Health Affairs*, 31(1):220–227, 2012.

Julian Le Grand. *Knights, Knaves or Pawns? Human Behavior and Social Policy*. Journal of Social Policy, 26(02):149–169, 1997.

Charlotta Levay, Caroline Waks. Professions and the Pursuit of Transparency in Healthcare: Two Cases of Soft Autonomy. *Organization Studies*, 30(5):509–527, 2009.

Peter K. Lindenauer, Denise Remus, Sheila Roman, Michael B. Rothberg, Evan M. Benjamin, Allen Ma, Dale W. Bratzler. Public Reporting and Pay for Performance in Hospital Quality Improvement. *New England Journal of Medicine*, 356(5):486–496, Luty 2007.

Xingzhu Liu. *Policy Tools for Allocative Efficiency of Health Services*. World Health Organization, 2003.

Xingzhu Liu, Anne Mills. *Doctor's and Patient's Utility Functions.* in Alexander S. Preker, Xingzhu Liu, Edit V. Velenyi. *Public Ends, Private Means*. World Bank Publications, 2007.

George Loewenstein, Kevin G Volpp, David A Asch. Incentives in health: Different prescriptions for physicians and patients. *JAMA*, 307(13):1375–1376, 2012.

Sılvia Mamede, Henk G Schmidt. The twin traps of overtreatment and therapeutic nihilism in clinical practice. *Medical Education*, 48(1):34–43, 2014

Abraham H. Maslow. *A Theory of Human Motivation*. Martino Fine Books, 1954.

Inke Mathauer, Ingo Imhoff. Health worker motivation in Africa: the role of non-financial incentives and human resource management tools. *Human Resources for Health*, 4:24, 2006.

Michelle M. Mello, Amitabh Chandra, Atul A. Gawande, David M. Studdert. National Costs Of The Medical Liability System. *Health Affairs*, 29(9):1569–1577, 2010.

Sherry Merkur, Elias Mossialos, Morgan Long, Martin McKee Physician revalidation in Europe. *Clinical Medicine*, 8(4):371–376, 2008.

Joseph P. Newhouse. A Model of Physician Pricing. *Southern Economic Journal*, 37(2):174–183, 1970.

OECD. *Geographic Variations in Health Care*. Organisation for Economic Co-operation and Development, Paris, 2014.

Maria Olejaz, Annegrate J. Nielsen, Andreas Rudkjobing, Hans O. Birk, Allan Krasnik, Cristina Hernandez-Quevedo. Health Systems in Transition: *Denmark : health system review*. European Observatory on Health Systems and Policies, 2013.

Mark Pauly. *Physicians as Agents*. NBER Chapters, National Bureau of Economic Research, Inc, 1980.

Nina Rehnqvist, *Improving Accountability in a Decentralized System: A Swedish Perspective* in OECD. Measuring Up Improving Health System Performance in OECD Countries: Improving Health System Performance in OECD Countries. OECD Publishing, 2002.

Thomas Rice. Pauline Rosenau Lynn Y. Unrhu, Andrew J. Barnes, Richard B Saltman, Ewout van Ginneken. Health Systems in Transition: *United States of America : health system review*. European Observatory on Health Systems and Policies, 2013.

Wendy A Rogers. Avoiding the trap of overtreatment. *Medical Education*, 48(1):12–14, 2014.

Anthony Scott, Alan Shiell. Do fee descriptors influence treatment choices in general practice? A multilevel discrete choice model. *Journal of Health Economics*, 16(3):323–342, 1997.

Paul G. Shekelle (2010), "Public performance reporting on quality information", in Peter C. Smith,, Elias Mossialos, Irene Papanicolas and Sheila Leatherman. (eds), *Performance measurement for health system improvement: experiences, challenges and prospects*, Cambridge: Cambridge University Press.

Peter C. Smith. Performance management: the clinician's tale. *Health Economics, Policy and Law*, 10(03):357–360, 2015.

Matt Sutton, Silviya Nikolova, Ruth Boaden, Helen Lester, Ruth McDonald, Martin Roland. Re- duced Mortality with Hospital Pay for Performance in England. *New England Journal of Medicine*, 367(19):1821–1828, 2012.

Stephen J. Swensen *et al* Cottage Industry to Postindustrial Care — The Revolution in Health Care Delivery, *New England Journal of Medicine*, 362:e12, 2010.

Jonathan M. Taitz, Thomas H. Lee, Thomas D. Sequist. A framework for engaging physicians in quality and safety. *BMJ Quality & Safety*, 2011.