



City Research Online

City, University of London Institutional Repository

Citation: Stavropoulou, C. (2012). The doctor-patient relationship: A review of the theory and policy implications. In: The LSE Companion to Health Policy. (pp. 314-326). Cheltenham: Edward Elgar Publishing Limited. ISBN 9781781004234

This is the accepted version of the paper.

This version of the publication may differ from the final published version.

Permanent repository link: <http://openaccess.city.ac.uk/4480/>

Link to published version: <http://dx.doi.org/10.4337/9781781004241>

Copyright and reuse: City Research Online aims to make research outputs of City, University of London available to a wider audience. Copyright and Moral Rights remain with the author(s) and/or copyright holders. URLs from City Research Online may be freely distributed and linked to.

City Research Online:

<http://openaccess.city.ac.uk/>

publications@city.ac.uk

Physician-patient relationship: A review of the theory and policy implications.

Key terms: doctor-patient relationship, physician incentives, patient behaviour, physician behaviour, adherence, theory and policy implications.

1. Introduction

The doctor-patient relationship remains the cornerstone of medical practice. At the same time it is one of the most complex interactions in health care, which goes beyond consultation and clinical practice and involves aspects that are developed outside the encounter. On the one side of this relationship stands the doctor, whose diagnosing skills, prescribing patterns and referral decisions determine not only health outcomes but also, and to a great extent, health care costs. On the other side stands the patient, who is increasingly empowered to make decisions that concern his health. In many cases he chooses among a number of physicians, he collects information from sources other than the doctor and finally decides whether to adhere to the medical recommendations. These are all decisions that impact on his health but also on health care utilisation and expenditure.

Health economists and policy makers realise the importance of this relationship on health systems and put great effort in exploring its underline mechanisms. A number of models have been proposed to understand the elements of the physician's utility function (McGuire 2000; Scott 2000) and different payment schemes have been

designed in an effort to change physicians' behaviour. The patient's side has received less attention. In health economics the agency relationship that is often used to describe the doctor-patient interaction implies that the doctor acts on the patient's behalf and therefore the majority of the decisions are taken mainly by the former and less by the latter.

In recent decades, two trends have challenged this state and call for more attention on the patient's side to be given. The first one is the increasing empowerment of the patient's role in decision making (Kaba and Sooriakumaran 2007). Patients may require more information during the consultation and are more actively involved in the choice of treatment. Patients have also increased power in choosing the general practitioner or specialist that treats them, with significant consequences on competition, health utilisation and costs.

The second trend is the increasingly high prevalence of chronic illnesses, which has implication both in terms of prevention but also managed care. The majority of these conditions, including cardiovascular diseases, cancer and diabetes are mostly related to life-style choices. Both in managing these conditions and ensuring that the patient adheres to the medical recommendations and follows a healthier life-style the doctor has a very important role to play.

Understanding the importance of patient's role in medical decision is crucial for health economists and policy makers. In that respect health economics may benefit greatly from behavioural sciences, including medical sociology and psychology that offer elements enabling a better understanding of this interaction.

This chapter reviews the literature on the theory of doctor-patient relationship, considers the recent research trends and discusses the implications this interaction has on health policy and economics.

The rest of the chapter is organised in the following way. Section 2 reviews the theoretical models of the doctor-patient interaction. It begins by exploring the literature of health economics and then reviews models from medical sociology. New insights offered by other fields, such as psychology, are discussed in section 3. Section 4 explores the implications that various aspects of this relationship have on health policy, while section 5 summarises and concludes.

2. Review of theoretical models on doctor-patient relationship

2.1 Health economics; an agency relationship

In health economics the doctor-patient relationship is often perceived as an agency one. The principal-agent model stresses the information asymmetry between the physician

and the patient introduced by Arrow (1963). It states that the doctor acts like an agent maximizing the patient's, i.e. the principal's, utility. The doctor holds more information about the patient's health status and the available treatments. The patient has superior knowledge about how these treatments fit with his lifestyle and has specific beliefs about medication and illness. The patient communicates these preferences to the doctor, who then acts as an agent for the patient.

In the perfect agency model, a specific case of the principal-agent theory, the doctor maximizes the patient's utility as if it were his own.¹ This model has been extensively used in health economics both because of its conceptual simplicity and the lack of any agreed alternative. Yet, this model is not without limitations and criticisms. Empirical evidence has extensively shown that the doctor and the patient bring to the consultation different agendas and that the doctor is very often unable to understand patient needs (Britten et al. 2000). When these needs are not met the outcomes of the consultation are unsatisfactory and patients may non-adhere to the doctor's recommendations. It also seems unrealistic for the perfect agency model to work in practice as the doctor, apart from the patient's needs, has other constraints that need to be taken into consideration, such as administrative constraints, time issues and personal benefits and costs.

¹ Gafni et al. (1998) argue that an alternative to the perfect agency relationship would be for the doctors to pass the information to the patients, who now being perfectly informed and knowing their own preferences can choose what is the best option for them. This makes the model conceptually identical to the informed model of decision making (described below) and as Gafni et al. (1998) argue it seems to be "superior to the model of the physician being a perfect agent in terms of feasibility of implementation". However, in health economics the agent is clearly the doctor and the principal is the patient, and as such it will be considered in this chapter.

Departing from the perfect-agency model, there is an extensive literature on how physicians can act beyond maximising the patient's utility function only. The doctor wants to improve the patient's health but still has other aspects that he needs to consider. Scott (2000) reviews the model of general practitioner's (GP) behaviour and notes that there is no single common utility function used, but different studies use different arguments in the doctor's utility. The income-leisure framework is common to many models, while workload is another element. The altruistic element is also often found in the models mentioned in the review (Scott 2000). Some models incorporate this by including patient's utility or welfare in the GP's utility function, while others include patient's economic well being and the interests of society as arguments in his utility (Blomqvist 1991).

To put it in other words, economic models allow doctors' behaviour to be driven not only by altruistic elements but also other aspects such as workload, income, reputation and other non-altruistic factors. Le Grand (2006) describes these two different aspects of doctor behaviour as knightly and knavish and argues that it is perfectly possible that an individual has altruistic motivations for some of his activities and self-interested ones for others. In addition, he has argued that it is not only financial considerations, such as income, that drive self interested behaviour. Doctors want not only to improve their economic status but also maintain a certain lifestyle, have respectful working relationships with their colleagues and the ability to make clinical decisions without too much interference. That said, a doctor's inability to be entirely empathetic to the patient

is not only driven by individualistic elements but also by organisational constraints, such as time pressure and long lists.

The review by McGuire (2000) of the theory and empirical research on physicians' motivation presents three ways a physician can influence the quantity of medical care the patient can buy: non-retradability, which allows quantity setting, choice of non-contractible input and the supply-induced demand. In the first model, doctors influence the quantity of medical care, based on the feature of non-retradability that underlines it. The model assumes complete information about the benefits of medical care, i.e. there is no asymmetric information between the two parties. It implies that profit-maximizing physicians do not allow patients to choose the utility-maximizing quantity given the price the patient pays.

Apart from the quantity, doctors can also influence the quality of care, or effort. This is a key input into health, which, even though observed by patients, may be impossible to verify. This is the second mechanism of physician behaviour as suggested by McGuire (2000). By influencing the quality of care doctors can control patient demand. The input is observable by the patient, it affects his choice of medical treatment but cannot be paid upon by a payer.

Both these mechanisms are based on the assumption of complete information. Yet, information asymmetry is a key element of the medical practice that influences their

interaction (Arrow 1963). When patients believe doctors have superior knowledge to them, doctors may be able to persuade patients to demand more or less care. This third mechanism for quantity determination proposed by McGuire (2000) captures the meaning of "physician-induced demand" as it is used in the literature. The notion of physician-induced demand has been used widely in the doctor-patient literature and it has been used to explain why doctors lead the patient to consume more than if they had perfect information (Evans 1974). The model focuses on the supply-side of medical care and explains how doctors make patients consume more or less than if they had perfect information about their treatment.

2.2 Medical Sociology; theory and empirical evidence

In medical sociology three main theoretical models have been developed to describe the doctor-patient relationship with regard to decision making. These are paternalism, shared and informed decision making model (Charles et al. 1999).

Paternalism

This is the traditional model of the doctor-patient relationship, in which the doctor, as the expert, diagnoses the patient and decides on the appropriate treatment. In this model the patient has a passive role and no active involvement in the decision-making process. Coulter (2002) avoids the term 'paternalistic' and calls this model 'professional choice', arguing that it may be appropriate under some circumstances for the doctor to make decisions without the patient being actively involved. This passive

role of the patient in paternalism makes the model similar to that of perfect-agency in health economics.

Shared decision model

This model was developed by Charles et al. (1997), who argue that there should be four specific characteristics for shared decision making to be effective:

1. Both the physician and patient are, to some extent, involved in the treatment decision-making process.
2. Both parts share information.
3. Both take steps to participate in the decision-making process by expressing treatment preferences.
4. A treatment decision is made and both the physician and the patient agree on the treatment to be adopted.

In this framework, both the patient and the doctor are active members in the decision making process. Evidence on whether this works in practice, has not favoured the model. A study by Stevenson et al. (2000) of 62 consultations in Britain along with interviews with patients and general practitioners revealed that there is little evidence that patients and doctors both participate in the consultation in the way described in the model. The study concluded that even the first two of the four components that are

necessary for the shared decision making to be upheld, i.e. for both parts to be involved and exchange information, were not present in the consultations which were studied.

Informed decision making model

The informed decision making model is often presented together with the shared decision making model (Britten 2004) as both indicate a reaction to the model of paternalism. However, Charles et al. (1999) argue that the two models have essential differences which are mainly concerned with the information exchange. In the shared decision model the flow of information is two-sided as both the patient and the doctor exchange information, the latter mainly on the medical level and the former more on the personal level, such as experience and preferences.

In the informed decision making model the information is mainly one-sided, with the doctor supplying the information to the patient, regarding medical aspects. Also, in the shared decision model the final decision is a common agreement between the two parties while in the informed model it is the patient who decides.

Towards a holistic theoretical framework

The models of doctor-patient interaction described above focus on a specific aspect of this relationship, that is the decision making process. This is without doubt very important especially with regard to understanding non-adherence and it also helps to

narrow down the complexity of the issue. However, it does not offer a holistic perspective of the relationship and therefore it is not sufficient to understand the problem as a whole.

In a review of the literature of the doctor-patient relationship, Ong et al. (1995) proposed a theoretical framework that relates background, process and outcome variables and allows for clear hypotheses regarding these relations. The suggested theoretical framework relates background variables, such as cultural characteristics, to the actual communication during the consultation, to both short-term patient outcomes, such as satisfaction, and long-term outcomes such as health status and psychiatric morbidity.

Regardless of the flaws in the framework by Ong et al. (1995), it does provide a systematic and holistic perspective to the doctor-patient relationship and facilitates the understanding of how this relationship impacts on the patient's decision to adhere.

3. New Directions from Psychology and Economics

The argument that physician's behaviour cannot be explained purely on rational grounds is not new. Arrow (1963) discusses the importance of trust in the doctor-patient relationship. Indeed, a number of emotions that evolve during the consultation have

been acknowledged by health economists but have been ignored in their theoretical models of the relationship. In addition, empirical evidence shows that contrary to what the neoclassical approach would predict physicians do not always maximize income (Newhouse 1970; Fuchs 1978). Significant progress to explain some of these empirical puzzles has been made by the lately increasing field of behavioural economics. This field, that combines economics and psychology, has resulted in models that offer useful insights into the mechanisms that explain the doctor-patient interaction.

Indeed, Frank (2007) argues there is no area in health economics that “relies on a vocabulary that is more closely linked to the work of behavioural economics than research on physician behaviour” (Frank 2007, p. 197). In this section we take Frank’s argument one step further. We advocate that behavioural economics is a promising field that allows a better understanding of the mechanisms that underline not only the doctor’s but also the patient’s decisions and ultimately will provide a better exploration of the doctor-patient interaction. The rest of this section presents a number of areas where psychology has offered a better insight of the doctor-patient interaction.

Emotional agents

An attempt to explore some of the dynamics of the doctor-patient relationship is based on the Psychological Expected Utility theory (henceforth PEU theory) introduced by Caplin and Leahy (2001). The theory is an extension of the expected utility theory of von Neumann-Morgenstern to situations in which agents experience feelings of anticipation regarding future states. It allows for the individual’s utility function to

depend not only on physical outcomes but also on *beliefs* about future physical outcomes.

The PEU theory has been used to explain how anxiety may lead patients to avoid visiting the doctor (Köszegi 2003). Köszegi (2004) has also proposed a model describing the doctor-patient relationship where the doctor makes choices of actions taking into consideration the patient's emotions. The model identifies a number of complications in the doctor-patient interaction that are attributed to anxiety, such as the paradox of emotional patients getting less useful information, which is the opposite of what the neoclassical approach would predict.

Caplin and Leahy (2004) have also applied the PEU theory in a model describing doctor-patient interaction but in a way different to the one presented by Köszegi. They explore the optimal procedure for supplying information to a patient who experiences anticipatory emotions regarding a future health status, after he has sent a signal regarding his emotional status. Finally in previous work we have shown, using the PEU, that different information preferences individuals have may explain why patients do not adhere to the recommendation when the doctor fails to pass on the right information (Stavropoulou and Glycopantis 2009).

Heuristic norms

The complexity of medical decisions has led researchers to propose models of physician behaviour that are based on heuristic norms. Frank and Zeckhauser (2007) argue that physicians do not always tailor their therapeutic treatment to the patients' specific needs but instead they often use "ready-to-wear" treatments, i.e. norms that apply to broad classes of patients. That means they often fail to optimise on a patient-by-patient basis. In some cases, when the associated costs of customised treatment are high, it may be sensible for physicians to use norms. These are described as four types of costs, i.e. communication, cognition, coordination and capability costs.

The empirical evidence of the Frank and Zeckhauser study supports partly this argument, i.e. that norms may be a sensible response to a complex decision making environment, confirming previous studies by Chandra and Staiger (2007) and Sommers et al. (2007). However, the results also show that ready-to-wear treatment may also be based on idiosyncratic individual behaviour of the physicians or severe biases in the application of heuristics. This type of bias in ready-to-wear treatment has been supported by previous studies in depression and primary care (Tai-Seale et al 2007) and can lead to highly suboptimal therapeutic treatments.

Alternatives to profit maximisation

Physicians' behaviour has been a great puzzle for health economists and a number of studies have been conducted to understand its underline mechanisms. Empirical

evidence has shown a clear departure from the competitive model. Indeed, econometric studies by Feldstein (1970), Newhouse (1970), Fuchs and Kramer (1972) observe a positive partial correlation between the number of physicians in the market and physician prices. As it turns out that neither the competitive model nor a monopolistic one have been supported by empirical evidence, a number of alternative explanations have been explored. Feldstein (1970) argues that markets experience persistent excess demand, Simon's (1958) satisficing model has also been explored, while the theory of target income has been proposed as a possible alternative to the competitive model. However, these models have also been criticised. Therefore, there is no commonly acceptable, behavioural model alternative to that of profit maximization (McGuire 2000). This is because of the number of economic but also social and psychological dimensions of the issues considered, that make it difficult for one model to incorporate all aspects.

4. Doctor-patient relationship and policy implications

Having presented the modelling of the doctor-patient relationship we consider in this section its policy implications, focusing on three aspects. First, we consider the impact physicians' incentives have on the actual doctor-patient relationship. Second, we discuss the importance of doctor-patient relationship on satisfaction with health services and choice of physician. Finally, we discuss how this relationship affects patient's decision, in particular non-adherence to recommendations.

Physician's incentives and the doctor-patient relationship

Incentives given to doctors may include financial rewards, payment on the basis of increasing quality of care or even a combination of the two. A number of studies have been conducted to examine the impact of incentives to physician's behaviour and consequently on health outcomes, cost-containment and control of expenditure. These implications have received considerable attention from health economists and are extensively and systematically reviewed in other chapter of the book. In this section, we review in particular the impact these schemes have on the doctor-patient relationship.

A study by Chaix-Couturier et al. (2000) reviewing the related literature shows that financial incentives clearly affect doctors' behaviour in many ways; they may help reduce the use of health care resources, improve compliance with guidelines and achieve health targets. On the other hand, it may have a negative impact on the doctor-patient relationship because as the authors argue, motivating doctors with financial rewards increases the conflict of interests between the doctors and the patients, putting their relationship in danger. They therefore suggest that they may be better used in combination with other incentives in order to be more effective.

The UK system has provided a fruitful environment for discussing incentives and physicians' behaviour through a number of different schemes that have been implemented in the last two decades. Between 1991 and 1998 general practitioners in the UK were given the option to hold budgets for prescribing and elective secondary care. Budgets were calculated on the basis of the services consumed by patients before

the practice had become a fundholder. Practices participating in the scheme were given the autonomy to retain any surplus that they could then use on additional services to patients or to improve facilities in their practices. The scheme generated incentives to the physicians to reduce unnecessary expenditure and benefit from the surplus that they could allocate as they wished.

Indeed, there is evidence that practices participating to this scheme reduced pharmaceutical cost (Goodwin 1998), managed to decrease readmissions relatively to the non-fundholders (Dusheiko, et al. 2006) and reduced waiting times for their patients (Propper, Croxson et al. 2002). Yet administrative and time costs associated with the scheme generated concerns that GPs may divert from patient care and evidence on this issue has been mixed (Howie et al. 1995; Corney 1999). A study by Dusheiko et al (2007) showed that patients in fundholding practices were overall less satisfied than those in non-fundholding ones. In particular, they expressed dissatisfaction with opening hours, GP's knowledge of their medical history, referrals to specialists and GPs concern to keep costs down. However, there was no effect on self-reported health outcomes.

The findings also provide some evidence on the strength of the doctor–patient agency relationship. It was possible for GPs to benefit financially from fundholding. GPs who place high weight on the welfare of patients relative to their own will only opt to hold a budget if their patients are thereby made better off. Thus, the finding that patients in

fundholding practices were less satisfied than those in non-fundholding practices suggests that the agency relationship is weak.

Another major experiment of incentives and physicians behaviour in the United Kingdom is the implementation of the Quality and Outcomes Framework (QOF) in the UK. The scheme was implemented in April 2004 as part of the new contracts for primary care services in the UK. It is an annual reward programme that awards achievement points for clinical and organizational indicators as well as patient experience and additional services (such as contraceptive services and child health). Its aim is to incentivise the delivery of quality care (Department of Health 2004). It was anticipated that the scheme would improve health outcomes of the conditions under the scheme but on the other hand it generated fears that quality of care for conditions not included would be reduced (Roland 2004).

A recent study by Campbell et al. (2007) gives some interesting results, using data from primary care in the UK before and after the implementation of the QOF. The study found no strong evidence on the impact of the programme on clinical indicators.

Further evidence shows that the vast majority of the general practitioners achieved markedly higher quality than was required to maximise their financial rewards suggesting that they were partially altruistic (Gravelle et al. 2008). Similarly, they also showed that quality delivered to patients was higher in larger practices and in practices with less deprived populations and with a smaller ethnic minority population. This increases considerations for issues of equity in health care.

Doctor-patient relationship, satisfaction with consultation and choice of provider

The quality of the doctor-patient relationship affects to a great degree the overall satisfaction with the consultation and the experience patients have with the health care system. Indeed, a review of 139 studies provided consistent evidence across different settings that this relationship is the most important factor affecting general satisfaction with health care (Crow et al. 2002). This has significant policy implications especially with respect to choice of physicians, an issue which is considered widely in many countries, including the UK.

Exploring more in depth the heart of the consultation, a study using data from the English National Health Service showed that confidence and trust in the doctor are the two most important factors in explaining the variation in overall patient satisfaction more than any other aspects of the general practitioner experience, such as waiting times (Robertson et al. 2008). The authors argue that this may also have implication if the system of choice is extended in England at the general practitioner level in the UK. They suggest that choice would be expected to be driven by the quality of the doctor-patient relationship. In the long-term however, the authors argue that once a good relationship is established it will then be unlikely for the patient to change practice.

Doctor-patient relationship and adherence to recommendations

Adherence to medical recommendations receives increasingly more attention the last decades. Initially, it was perceived as the patient's obedience to the doctor's medical decision and the term 'compliance' was mainly used (Haynes et al. 1979). In that respect, the paternalistic model presented above was related to the concept of compliance. Determinants of non-compliance were considered to be socio-demographic factors, such as older age and low education.

However, research in the area has evolved and evidence suggests an approach to the issue that is less blameful to the patient. This change has also been reflected in the term used, where 'adherence' has been preferred by most researchers and policy makers. In that sense, the informed model is closer to the concept of adherence as it gives an active role to the patient, who being well informed by the doctor, can decide whether to follow the recommendations or not.

The evidence suggests various factors affect a patient's perception of the doctor-patient relationship and consequently adherence. Farber et al. (2003) conducted telephone interviews with parents of asthmatic children in the Medicaid program in the USA and reported that misunderstanding of medication was associated with decreased adherence. The risk of misunderstanding was lower if the patient had seen a specialist. Berman et al. (1997) showed that the physician's gender as well as his/her specialty was associated with non-adherence. Confidence in the physician and the health care system as a whole led to better adherence in the study by Kjellgren et al. (1998) in Sweden. Physicians'

follow-up communication style and client satisfaction were both predictors of better adherence in the US (Bultman and Svarstad 2000).

In a study of 24 countries participating in the European Social Survey, general perceptions that people have about their doctor impacted on their decision to follow prescribed medication (Stavropoulou 2010). Individuals' decision to adhere to recommendations depended significantly on whether they felt they were involved in the decision making process and they were treated as equals by their doctors.

In a qualitative study by Barry et al. (2000) in England doctors and patients were interviewed to examine their level of communication during consultation. Indeed, it was shown that most of the patients' desires were not met during the consultation and this led to poor adherence. Analysis of the same qualitative study by Berman et al. (1997) showed that misunderstandings between patients and doctors have potential or actual adverse consequences, leading to non-adherence.

Jenkins et al. (2003) interviewed both patients and GPs to correlate their expectations and potential non-adherence. They found that patients had high expectations for communication and participation in the consultation and that unnecessary prescribing and problems in communication may lead to poor outcomes in terms of non-adherence.

To sum up, the empirical evidence is vast, it is increasing and it clearly shows the importance of the doctor-patient relationship on patients' decision to adhere to the medical recommendations.

5. Discussion

This chapter has reviewed the theories of doctor-patient relationship and considered some of its policy implications. It identified four main theoretical models. From the field of health economics the relationship is perceived as an agency one, while the medical sociology literature identifies three models; paternalism, shared decision and informed decision model. All models are in agreement in one regard: the complex and multifaceted nature of the doctor-patient relationship. The models acknowledge that there is no single, commonly accepted theory that captures all aspects of this relationship and all are attempting to understand some of its components.

The review of the health economic literature reveals that there has been a great effort in understanding the physician's behaviour and how he responds to different types of incentives. A number of models have been proposed and numerous empirical studies have been conducted. The same effort has not been put on exploring the impact on the patient's side. The realisation that the patient is an empowered individual who is allowed to choose the physicians he wants, can reject his advice and may make life-style choices that lead to decreased health outcomes and increase costs will force health economists to put more attention on the patient characteristics and understand the drivers of their decisions.

In the future, we believe that there will be a research tendency to explore more in depth the patient's role in the decision making model. We also anticipate the need for more interdisciplinary approach on the doctor-patient relationship as it is more commonly accepted that the decisions of the two parties cannot be explained purely on rational grounds. In that respect literature from medical sociology and psychology is useful, as it provides a more holistic picture of the relationship and gives a significant importance on patient's role. The potential of combining economics with psychology, despite its great potential in health economics and policy remains largely unexplored. In this paper we have reviewed areas of the doctor-patient relationship where psychology has enriched economic concepts to better explain behaviours of the two parties. We argue that there is still great potential in this field to explain some of the empirical puzzles that the neoclassical approaches have offered limited understanding.

The impact of the above discussion on policy is also important. Policy schemes have been implemented as a way of changing physicians' behaviour, forcing them to better use of available resources. A number of interesting cases are presented in the UK. The majority of the evidence has shown that indeed physicians respond to incentives given by different schemes. The impact on costs and savings is more tangible and obvious. What is less clear is the impact of these incentives on the doctor-patient relationship and patients' behaviour. There is evidence suggesting that financial schemes may jeopardise the relationship between the two parties as the physician may put emphasis on financial considerations and overlook personal aspects. In the light of new policies, such as the

recent NHS reform that empowers GPs with commissioning roles (Department of Health 2010), it is extremely important to understand how incentives affect not only the physician's behaviour but also the patient's decisions.

Indeed, there is plenty of evidence to suggest that the doctor-patient relationship impacts on patients' decision to follow recommendations. It clearly suggests that any intervention aiming at improving patient's adherence needs to be developed on the basis of a strong doctor-patient relationship. Involvement in the decision making process, provision of adequate information and generally meeting patients' needs have been shown to be effective ways of a better doctor-patient relationship and to lead to improvement of adherence.

To conclude, we call for a more holistic approach to the issue of doctor-patient relationship as it seems that one side, the doctor, has been explored more than the other, the patient. Yet, policy makers and health economists understand that patients are now more empowered and take important decisions as to which doctor to choose or whether to follow his recommendations. Individuals' life-style options have been shown to be a great determinant of chronic conditions, which consequently influence health outcomes and increase health care costs. The role of the doctor on influence patients' decision is vital.

References

Arrow, K. (1963), 'Uncertainty and the welfare economics of medical care', *American Economic Review*, **53**(5), 941-973.

Barry, C.A., C.P. Bradley, N. Britten, F. Stevenson and N. Barber (2000), 'Patients' unvoiced agendas in general practice consultations: qualitative study', *British Medical Journal*, **320**(7244), 1246-50.

Berman, R.S., R.S. Epstein and E. Lydick (1997), 'Risk factors associated with women's compliance with Estrogen Replacement Therapy', *Journal of Women's Health*, **6**(2), 219-226.

Blomqvist, A. (1991), 'The utilisation of health services. Sequences of visits to general practitioners', *Social Science and Medicine*, **16**, 2065-2072.

Britten, N., F.A. Stevenson, C.A. Barry, N. Barber and C.P. Bradley (2000), 'Misunderstandings in prescribing decisions in general practice: qualitative study', *British Medical Journal*, **320**(7233), 484-8.

Britten, Nicky (2004), 'What is concordance?' in Christine Bond (ed), *Concordance: A partnership in medicine-taking*. London, Pharmaceutical Press, pp. 9-28.

Bultman, D.C. and B.L. Svarstad (2000), 'Effects of physician communication style on client medication beliefs and adherence with antidepressant treatment', *Patient Education and Counselling*, **40**(2), 173-85.

Campbell, S., D. Reeves, E. Kontopantelis, E. Middleton, B. Sibbald and M. Roland (2007), 'Quality of Primary Care in England with the Introduction of Pay for Performance', *The New England Journal of Medicine*, **357**(2), 181-190.

Caplin, A. and J. Leahy (2001), 'The Psychological Expected Utility Theory and Anticipatory Feelings' *The Quarterly Journal of Economics*, 116, 55-79.

Caplin, A. and J. Leahy (2004), 'The supply of information by a concerned expert', *The Economic Journal*, **114**, 487-505.

Chaix-Couturier, C., I. Durand-Zaleski, D. Jolly and P. Durieux (2000), 'Effects of financial incentives on medical practice: results from a systematic review of the literature and methodological issues', *International Journal for Quality in Health Care*, **12**, 133-142.

Chandra, A. and D.O. Staiger (2007), 'Productivity Spillovers in Health Care: Evidence from Treatments of Heart Attacks', *Journal of Political Economy*, **115**(1), 103-140.

Charles, C., A. Gafni and T. Whelan (1997), 'Shared decision-making in the medical encounter: what does it mean? (or it takes at least two to tango)', *Social Science and Medicine*, **44**, 681-692.

Charles, C., A. Gafni and T. Whelan (1999), 'Decision making in the physician-patient encounter: revisiting the shared treatment decision-making model', *Social Science and Medicine*, **49**, 651-661.

Corney, R.H. (1999), 'Changes in patient satisfaction and experience in primary and secondary care: the effect of general practice fundholding', *British Journal of General Practice*, **49**, 27-30.

Coulter, Angela (2002), *The Autonomous Patient - Ending paternalism in medical care*, London, UK: Stationary Office (for the Nuffield Trust).

Crow, R., H. Gage, S. Hampson, J. Hart, L. Storey and H. Thomas (2002), 'The measurement of satisfaction with healthcare: implications for practice from a systematic review of the literature' *Health Technology Assessment*, **6**(32), 1-244.

Department of Health (2004), *QOF Guidance*, London, UK: HMSO.

Department of Health (2010), *Equity and Excellence: Liberating the NHS*. Cmd 7881

Dusheiko, M., H. Gravelle, N. Yu and S. Campbell (2007), 'The effect of budgets for gatekeeping physicians on patient satisfaction: evidence from fundholding', *Journal of Health Economics*, **26**(4), 242-62.

Dusheiko, M., H. Gravelle, R. Jacobs and P.C. Smith (2006), 'The effect of financial incentives on gatekeeping doctors: Evidence from a natural experiment', *Journal of Health Economics*, **25**, 449-478.

Evans, Robert G. (1974), 'Supplier-induced demand: some empirical evidence and implications', in Mark Perlman (ed), *The Economics of Health and Medical Care*, New York: John Wiley and Sons, pp. 162–173

Farber, H.J., A.M. Capra, J.A. Finkelstein, P. Lozano, C.P. Quesenberry, N.G. Jensvold, F.W. Chi and T.A. Lieu (2003), 'Misunderstanding of asthma controller medications: association with nonadherence', *Journal of Asthma*, **40**(1), 17-25.

Feldstein, M.S. (1970), 'The rising price of physicians' services', *Review of Economics and Statistics*, **51**, 121-133.

Frank, Richard G. (2007), 'Behavioural Economics and Health Economics', in Peter Diamond and Hannu Vartiainen (eds), *Behavioural Economics and its Applications*, Princeton: Princeton University Press, pp. 195-234.

Frank, R.G. and R. Zeckhauser (2007), 'Custom-Made versus Ready-to-Wear Treatments: Behavioral Propensities in Physicians' Choices', *Journal of Health Economics*, **26**(6), 1101-1127.

Fuchs, V.R. (1978), 'The supply of surgeons and the demand for operations', *Journal of Human Resources*, **13**, 35-55.

Fuchs, Victor R. and Marcia J. Kramer (1972), 'Determinants of expenditure for physician services in the United States, Washington, DC: National Center for Health Services Research.

Goodwin, Nick (1998), 'GP Fundholding', in Julian Le Grand, Nick Mays and Jo-Ann Mulligan (eds), *Learning from the NHS Internal Market: A Review of the Evidence*, London: King's Fund Publishing: 43-68.

Gravelle, H., M. Sutton and A. Ma (2008). 'Doctor behaviour under a pay for performance contract: Further evidence from the quality and outcomes framework', *Centre for Health Economics, University of York CHE Research Paper 34*.

Haynes, Brian R., Wayne D. Taylor and David L. Sackett (eds) (1979), *Compliance in Health Care*, Baltimore: Johns Hopkins University Press.

Howie, J.G.R., D.J. Heaney, M. Maxwell (1995), 'Care of patients with selected health problems in fundholding practices in Scotland in 1990 and 1992: needs, process and outcome', *British Journal of General Practice*, **45**, 121-126.

Jenkins, L., N. Britten, F. Stevenson, N. Barber and C. Bradley (2003), 'Developing and using quantitative instruments for measuring doctor-patient communication about drugs', *Patient Education and Counselling*, **50**(3), 273-8.

Kaba, R. and P. Sooriakumaran (2007), 'The evolution of the doctor-patient relationship', *International Journal of Surgery*, **5**(1), 57-65.

Kjellgren, K.I., S. Svensson, J. Ahlner and R. Säljo (1998), 'Antihypertensive medication in clinical encounters', *International Journal of Cardiology*, **64**(2), 161-9.

Köszegi, B. (2003), 'Health anxiety and patient behavior', *Journal of Health Economics*, **22**, 1073-1084.

Köszegi, B. (2004), 'Emotional Agency: The case of the Doctor-Patient Relationship', *UC Berkeley Mimeo*.

Le Grand, Julian (2006), *Motivation, agency and public policy: of knights & knaves, pawns & queens*. Oxford: Oxford University Press.

McGuire, Thomas G. (2000), 'Physician Agency' in Anthony J. Culyer and Joseph P. Newhouse (eds), *Handbook of Health Economics*, Amsterdam: Elsevier Science, pp. 461-536.

Newhouse, J.P. (1970), 'A model for physician pricing', *Southern Economic Journal*, **37**, 174-183.

Ong, L.M., J.C. de Haes, A.M. Hoos and F.B. Lammes (1995), 'Doctor-patient communication: A review of the literature', *Social Science and Medicine*, **40**(7), 903-18.

Propper, C., B. Croxson and A. Shearer (2002), 'Waiting times for hospital admissions: the impact of GP fundholding', *Journal of Health Economics*, **21**, 227-252.

Robertson, R., A. Dixon and J. Le Grand (2008), 'Patient choice in general practice: the implications of patient satisfaction surveys', *Journal of Health Services Research and Policy*, **13**(2), 67-72.

Ronald, M. (2004), 'Linking physicians' pay to the quality of care--a major experiment in the United kingdom', *New English Journal of Medicine*, **351**(14), 1448-54.

Scott, Anthony (2000), 'Economics of General Practice', in Anthony J. Culyer and Joseph P. Newhouse (eds), *Handbook of Health Economics*. Amsterdam: Elsevier Science, pp. 1175-1200.

Simon, M. (1958), 'Theories of decision making in economics and behaviour science', *American Economic Review*, **49**, 253-283.

Sommers, B.D., C.J. Beard, A.V. D'Amico, D. Dahl, I. Kaplan, J.P. Richie and R.J. Zeckhauser (2007), 'Decision Analysis Using Individual Patient Preferences to Determine Optimal Treatment for Localized Prostate Cancer', *Cancer*, **110**(10), 2210-2217.

Stavropoulou C. (2010) 'Non-adherence to medication and doctor-patient relationship: Evidence from a European survey', *Patient Education and Counselling*. Article in Press.

Stavropoulou C. and Glycopantis D. (2009), 'The doctor-patient relationship under general conditions of uncertainty', *Imperial Business School Discussion Paper Series*, Discussion Paper No 2009/06.

Stevenson, F.A., C.A. Barry, N. Britten, N. Barber and C.P. Bradley (2000), 'Doctor-patient communication about drugs: the evidence for shared decision making', *Social Science and Medicine*, **50**(6), 829-40.

Tai-Seale, M., T.G. McGuire, W. Zhang (2007), 'Time allocation in primary care office visits', *Health Services Research*, **42**(5): 1871-1894.