New Developments in Physician Agency: the Role of Patient Information[*]

Francesca Barigozzi[†]and Rosella Levaggi[‡]

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Abstract

In economic perspective, the agency relationship between a patient and his physician has dramatically changed in the past years and is still evolving. Great emphasis is now placed on communication issues. The debate on the amount and precision of information on his health status the patient would/should acquire is still open and likewise the definition of the role of the patient's choice in the agency relationship. The debate is not only academic: in fact, it has important policy implications on the reimbursement schemes for physicians and informed consent.

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[†]Department of Economics, University of Bologna, Strada Maggiore 45, 40125 Bologna (Italy). E-mail: barigozz@spbo.unibo.it.

[‡]Department of Economics, University of Brescia, Via S. Faustino, 74b, 25122 Brescia (Italy). E-mail: levaggi@eco.unibs.it.

1 Introduction

The theory that studies patient behaviour and the agency relationship with the patient's physician has undergone several important changes over time.

Firstly, the literature on Health Economics has moved from the old perspective, where the patient was passively accepting doctors' advice and treatment, to an approach characterised by strategic interaction between patient and physician. In the agency relationship the physician's informational advantage makes him able to influence the medical services used by the patient. However, while in the standard agency the physician's activity is (at least partially) characterised by opportunistic behaviours motivated by financial self-interest, in the new perspective the physician is benevolent but cannot commit either to not revealing the truth or to reporting information truthfully to his patient. As will be discussed, this leads to credibility problems. The crucial ingredient of the latter approach is that the patient experiences anticipatory feelings and his fears and hopes are of central concern to health professionals. As a consequence, in the following, we will call it emotional agency[1].

This evolution over time has interesting features and suggests important policy considerations. As will be discussed, two relevant issues are the patient's information on his health condition and the degree of the physician's altruism.

The emotional agency approach is motivated by a growing literature on behavioural medicine (see for example the Cambridge Handbook edited by Baum et al. 1997), showing that one of the consequences of stress and anxiety associated with medical procedures or uncertain health outcomes is that patients often exhibit choices of health information that may seem anomalous. For example, since information can raise anxiety, the patient may prefer not to be informed about health matters. Translated into economic language, a consequence of the patient's fears of bad news about his health conditions is that he may 'rationally' postpone the resolution of uncertainty (deciding to stay ignorant) even though such uncertainty implies taking less efficient actions (see Koszegi 2003).

The aim of this survey is to discuss the role of health information in the different approaches used to analyse patient-physician strategic interaction. In particular, while in the standard agency literature information is beneficial since it can be used by the patient to mitigate the physician's opportunistic behaviour, in the emerging view physicians are completely benevolent and information is detrimental to anxious patients. In this respect and considering patients' empowerment, while the central role of the patient in the agency relationship is not doubted, both the strategic choice of the patient as regards the level of information learning on his health status and the transmission of information from the physician to the patient are open issues.

Taking into account anxiety and anticipatory feelings adds an important new element to the patient-physician relationship and leads to some important policy implications as regards the design of contracts for providing health care, and the nature and contents of informed consent.

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[1] This is the title of a recent paper by Botond Koszegi (see Koszegi 2005).

2 Standard physician agency

The old view

The literature studying the demand for health care had initially assumed that the patient played no role in the decision on the type and the amount of health care to be consumed. At the very beginning, the patient was considered an 'irrational' economic agent since he was not able to translate his perceived need for health improvement into a demand for health care, even when correctly informed. Thus, any decision regarding patient health was delegated to the physician and the patient-doctor relationship was characterised by paternalism (and, more generally, government paternalism represented one of the most important motivations for public provision of health care, see Musgrave 1959).

Subsequently, in what we call the old view of the agency relationship, the physician, being a perfect agent for the patient, chooses exactly the decisions the patient would have taken had he had the same level of information (Feldstein 1970, Phelps 1992). Here, delegation to the physician is indeed optimal and efficient since the latter is completely benevolent, perfectly informed about health matters and takes decisions for the patient only in his best interest. The patient has no reason to search for information, his best option is to go and see his physician and follow the prescribed treatment.

This view was justified on several grounds: in the case of paternalism the patient could not be involved in treatment choice given his inability to process health information and medical matters. In the case of perfect agency, medical ethics make doctors prescribe only appropriate treatments (Shackley and Ryan 1994). What is relevant in the perspective that we adopt here is that, in both situations, patient information is completely useless.

Standard agency

The old view shows a number of drawbacks, the most important being that it does not take into account the physician's market power. In particular, the physician has important informational advantages making opportunistic behaviours possible. His superior knowledge concerns the patient's medical conditions, the available treatments and their possible effects. Moreover, the physician's actions are often not observable by the patient and quality of services received is sometimes not verifiable, even ex-post. Whenever his objective function is not perfectly aligned with that of the patient, the physician can use his informational advantage to provide low effort in order to decrease his disutility costs (Ma and McGuire 1997), or to provide over-treatment in order to increase the remuneration of his work (Evans 1974, Farley 1986, Mooney and Ryan 1993, DeJaegher and Jeger 2000 and 2001, McGuire 2000). The theoretical and empirical literature has extensively studied the latter problem (usually defined as 'demand inducement') which produces an increase in the price and volume of health care and, finally, a decrease in the appropriateness of health care and patients' satisfaction.

A definite test for the theory of demand inducement has never been formulated; nevertheless health economists have definitely recognised that physicians are experts with a specific utility function characterised by some level (not ob-

servable and heterogeneous) of altruism towards patients. In line with standard results in Incentives Theory (see for example Wolinsky 1993), raising competition between health professionals has been indicated as a way to increase both quality of care and physician effort. In Gravelle (1999) and Levaggi and Rochaix (2003) patients' choice of GP makes health professionals compete for patients so that physicians' market power is reduced. Considering health professionals' reimbursement, a standard result is that fee-for-services encourages over-treatment provision, while capitation payments and cost-sharing between physicians and health insurers are appropriate measures to promote cost-containment from the supply side of health systems. In particular, optimal reimbursement schemes that might avoid demand inducement are analysed in McGuire (2000), Scott (2000), Levaggi and Rochaix (2003), Bardey and Lesur (2004). In some papers, both the remuneration system and the access to primary and secondary care are used to provide physicians with the appropriate incentives (Jelovac 2001, Malcomson 2004, Garcia Marinoso and Jelovac 2003).

What is more relevant for the purpose of our survey is the role of patient's health information in the agency relationship. In the last decades people's attitude towards health information has dramatically changed. This phenomenon is the result of several factors, probably the most important being that average health literacy has significantly grown and that people now have easy access to several sources of health information[2]. In the eighties a strand of the literature developed the idea that the patient can obtain health information and use it to decrease, to some extent, the physician's informational advantage. Pauly and Sutterwaithe (1981) empirically analyse the relationship between reputation, patients' information and fees charged by the physicians. In Dranove (1988) patients learn about the physician's past behaviours and are more likely to refuse the physician's recommendation when the physician has the reputation of not being accurate. In other words, physicians' attention to reputation positively affects the price of their services and mitigates the incentives to overprescribe treatment. Rochaix (1989) provides an interesting example of how patient information may affect the agency relationship. In her model, before asking for a physician's advice, the patient looks for information to reduce the uncertainty on the appropriate treatment: the patient evaluates the cost and benefits of searching for information and plays an active role in improving the appropriate use of medical resources. In fact, when he sees the doctor, the patient does not reveal his information to him and accepts the diagnosis and the treatment proposed only if the latter is compatible with the information previously obtained. This obliges the physician to act more in the interest of the patient.[3]

Calcott (1999) and De Jaegher and Jeger (2001) follow a different approach in investigating supply-induced demand. Both models use a cheap talk sig-

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[2] Even if the Internet was still not available in the eighties, the other media were increasingly aware of health-related matters. People also often relied on the information obtained from friends and relatives. See the HSC Household Survey (2001) for a description of the evolution in the use of sources of health information alternative to health professionals.

[3] See Levaggi and Rochaix (2003) for a review of the models which have emphasised the patient's role in the consumption of health care.

nalling game where the physician has incentives to provide the wrong diagnosis to induce the patient to choose the most expensive treatment. Interestingly, De Jaegher and Jeger (2001) show that such a model is appropriate to analyse induced demand when health services take the form of 'credence goods': the patient is unable to observe how treatment contributed to his utility even after consumption. By interpreting induced demand as a problem of strategic communication transmission, this model makes the link among health economics on physician behaviour, the signalling literature and the one on expert services.

Other authors have focused on the flow of information from the physician to the patient and on the role played by the latter in the final decision concerning treatment options. Gafni et al. (1998) and (1999) suggest that the patient has to receive from the physician all the information necessary to make appropriate decisions about his treatment. This provides better results in terms of health outcome and cost containment (Stewart 1995; Stewart et al. 2000; Britten 2004). A more involved patient, in fact, feels that his physician cares for his health, complies more easily with prescriptions and increases the probability of a positive outcome.

However the real interaction between patient and physician appears richer and more complex than the above- mentioned literature has shown. In particular, in the strategical interaction between patient and physician, is information always beneficial to patients? How can the process of patient information learning be described? Does the communication between physician and patient raise credibility issues?

3 Emotional agency

The most recent literature focuses on patient attitude to information and on communication. This new view introduces a crucial element: health information is associated with anticipatory and emotional feelings neglected so far. In particular, the usual conjecture that more information is always preferred to less might not be valid in this context, at least not for all patients. In particular, a personal attitude towards health information exists, which depends on the ability to manage anxiety, i.e. the natural fear of receiving bad news. As Behavioural Medicine has shown, anxiety can lead to apparently anomalous behaviours in information gathering: anxious patients may avoid going to see their doctor or obtaining easily available information about their health. This can be explained considering that actions are affected by anticipatory feelings and that choices are often aimed at lowering our level of anxiety.

The Psychological Expected Utility model proposed by Caplin and Leahy (2001) extends expected utility theory in order to explain how anticipatory feelings influence decision makers[4]. According to such a framework, the standard model of choice under uncertainty must be enriched by adding beliefs to the description of consequences, in order to capture anticipatory feelings such as

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[4]In particular the authors provide an example from portfolio theory to illustrate the potential impact of anticipation on investment decisions and asset prices.

anxiety or hopefulness. Utility depends not only on physical utility but also on the anticipation of such physical utility. Thus, people perceive an emotional utility which is directly affected by beliefs about future outcomes. Since people derive utility directly from their beliefs, they must consider how the information they gather will affect those beliefs. This implies that information choices are also motivated by anticipatory feelings.

In the case of patients and health information the problem of anxiety related to future health outcomes is particularly relevant. It has been observed that attitude towards information is not uniform: some patients prefer to learn their health conditions, even if this means receiving bad news (early resolvers) while others, the more anxious, prefer to stay ignorant (late resolvers).[5] Kozsegi (2003) shows that, if the patient is sufficiently anxious (i.e. information-averse), the choice of staying ignorant can be optimal even though it implies damage deriving from inefficient actions. In other words, since information-averse patients dislike bad news more than they like good news, they might choose to get a treatment based on their priors about future health rather than one based on the observation of their true health status.[6]

Some recent studies[7] show that physicians express difficulty in revealing sensitive information to their patients. In particular, doctors take their patients' emotions into account and, more importantly, their recommendations and communication are affected (and even 'distorted') in response to them. In this respect, feelings add an important dimension of complexity to the doctor-patient interaction; two recent papers, Caplin and Leahy (2004) and Kozsegi (2005), investigate this issue.

Caplin and Leahy (2004) analyse a show-and-tell game where the patient, who is facing an impending operation, has private information on his type: he can be either an early or a late resolver patient. When the patient is an early resolver he is characterised by preference for early resolution of uncertainty concerning his operation; when he is a late resolver he prefers late resolution of uncertainty. The patient decides whether to reveal his type to the physician or not. The physician observes what type of operation the patient needs: the operation can be characterised either by low or high risk. When the operation is low risk the preferred outcome α is more likely than the worst one β, whereas when the operation is high risk the opposite holds. Once the message has been received by the patient (who can show or not show his type), the physician must decide whether to tell the patient which operation he needs. The physician is entirely empathetic, that is he derives utility only from his beliefs in the patient's welfare. Both patient and physician can certifiably communicate their private information.[8]

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[5] See Roth and Cohen (1986).

[6] In the same vein, Barigozzi and Levaggi (2005) show that anxiety can explain the search for health information on the Internet, a far less informative channel than a visit to a physician or a medical test. The intuition is that *partial* information learning allows late resolver patients to trade-off the anxiety cost of information with the benefits in terms of more accurate actions.

[7] See Ptacek and Eberhardt (1996), Christakis (1999) and the last section in Kozsegi (2004).

[8] Since the payoffs in the show-and-tell game depend on beliefs about other players' strate-

The patient experiences utility in two periods, both occurring after the play of the show-and-tell game. In the first period, before the operation takes place, since the patient anticipates the operation, he experiences feelings of anxiety which depend on the information that he has (possibly) received from the doctor. The second period corresponds to the operation itself and utility is the same for the early and the late resolver patient (with $U_2(\alpha) \geq U_2(\beta) = 0$): both calculate expected utility using posterior beliefs. Assuming that the patient's prior concerning the low-risk operation is $1/2$, and letting p_1 denote the posterior probability that the patient attaches to the low-risk operation, a late resolver patient's whole utility is:

$$V^L(p_1) = ap_1 - b\left(p_1 - \frac{1}{2}\right)^2 + p_1 U_2(\alpha)$$

while an early resolver patient has preferences:

$$V^E(p_1) = ap_1 + b\left(p_1 - \frac{1}{2}\right)^2 + p_1 U_2(\alpha)$$

The first two terms in the utility functions describe anticipatory utility. ap_1 ($a \geq 0$) represents pessimistic beliefs lowering the level of anticipatory utility. The parameter b reflects the impact of pure uncertainty on anxiety. Note that the late resolver's utility is convex whereas the early resolver's one is concave in p_1. Thus information learning, leading to more precise expectations about future outcomes ($p_1 \neq 1/2$), makes a late resolver patient worse off, at least when news is sufficiently bad.

The physician is perfectly empathetic and observes the true probability of the operation type. Letting p_d be the true probability that the operation is low risk, when facing a late resolver patient, the doctor's preferences are:

$$V_d^L(p_1|p_d) = ap_1 - b\left(p_1 - \frac{1}{2}\right)^2 + p_d U_2(\alpha) \tag{1}$$

Thus, the physician evaluates the patient's anticipatory utility (the first two terms in 1) exactly as the patient does, but he evaluates the patient's expected physical utility using the true probability p_d, while the patient uses beliefs p_1.

The physician would act in the patient's best interest only if he could discriminate among patients. To early resolvers, he would offer the truth about the operation. To those that are information-averse, he would say nothing. This ideal solution, however, clashes with the fact that, if the news to be released to a late resolver is good, keeping this piece of information away from him reduces the patient's utility (this is a consequence of the term ap_1 in the utility functions). The benevolent physician would have to inform the patient in this case. The patient anticipates that the physician would transmit only good news, with the result that, when the doctor does not reveal anything, his behaviour

gies, the authors apply the psychological game model of Geanakoplos *et al.* (1989).

is interpreted as bad news. This is called the 'no news is bad news' effect. To avoid this credibility problem, the physician will always inform the patient: in equilibrium the doctor reveals all the information to both patient types.

Caplin and Leahy (2004) present a theory of communication with emotionally relevant certifiable information and no choice of action. Kozsegi (2005) extends the previous setting to a situation where the patient's information has decision-making value: the patient's choice of treatment is taken into account. In particular, firstly the doctor privately (and probabilistically) observes a diagnosis which affects the optimal treatment. Secondly, the physician sends a message to the patient, who chooses one of two treatments.[9] The physician is completely benevolent and the patient's utility depends both on future health outcomes and anticipatory feeling. The author analyses both the model where the doctor can certifiably convey the diagnosis to the patient (as in Caplin and Leahy 2004), and the model where information is not verifiable.[10]

Patient utility is adapted from Caplin and Leahy (2001, 2004) such that cheap talk communication is allowed and an action is taken by the patient. In particular, if we consider again the two possible states of nature α and β and the posterior belief p_1, the first period emotional utility takes the form:

$$u\left(p_1 h\left(\alpha, t\right) + (1 - p_1) h\left(\beta, t\right)\right)$$

where $u\left(\cdot\right)$ is a von Neumann-Morgenstern utility function and t is the action (treatment). As before, when the patient is a late resolver $u\left(\cdot\right)$ is concave in p_1 and, *given a certain action t*, the patient prefers to stay ignorant. The opposite holds when the patient is an early resolver. When $u\left(\cdot\right)$ is linear, the patient is neutral with respect to information. The function $h(\cdot, \cdot)$ represents second period utility which is affected both by the state of nature realised in the first period and by the action t taken in the first period as well. Note that here $a = 0$.

When the physician cannot certifiably communicate the diagnosis $s = \alpha, \beta$, the author shows that essentially the only way to transmit information is through treatment recommendations.[11] Moreover, to make the patient feel better, the physician will distort treatment recommendation towards the treatment that is optimal when the diagnosis is good. Since the patient anticipates the doctor's incentives to provide optimistic information through wrong treatment recommendation, indeed he feels worse. In fact, wrong treatment choice makes expected outcome decrease, and the anticipation of such future low health outcomes increases the patient's anxiety. As Koszegi (2004, page 3) observes: 'Fears have a self-defeating aspect'. Moreover, the greater the importance of emotions in

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[9] The model also allows consideration of the case in which the treatment choice is directly taken by the doctor.

[10] The author uses a different solution concept from Caplin and Leahy's (2004): the concept of 'emotional perfect Bayesian equilibrium', where the standard notion of perfect Bayesian equilibrium is appropriately modified for games with emotions.

[11] In this specific case the model presents some similarities with De Jaegher and Jeger (2001). In fact, in both papers the communication game between the physician and his patient is analysed as a cheap talk model.

the patient's utility, the less useful (because more distorted) the doctor's recommendations are and, therefore, the lower the average physical and anticipatory utility. Thus, the model shows that because of emotions, the doctor and the patient are not able to reach the common objective of maximising the patient's expected utility.

In the model where the doctor can certifiably reveal the diagnosis and without considering treatment options, the author generalises the full disclosure result of Caplin and Leahy (2004): if the probability of observing a diagnosis is less than one, the physician communicates to the patient only good news and pretends not to have the diagnosis when news is bad. When the patient asks another doctor for a second opinion, the second physician discloses more bad news than the first one. This happens because the patient interprets two 'no diagnosis' communications more negatively than just the first one. As a result, the patient learns bad diagnosis more slowly (only after two medical opinions) than good diagnosis. Moreover, as regards patients with heterogeneous attitudes towards information, results show that, with two doctors, late resolver patients receive more information from the first physician than early resolver ones. Introducing the diagnosis in the model with certifiable information, the author shows that a possible equilibrium is the following: the doctor discloses good news and very bad news but not the news in between. The intuition is that, when the diagnosis is very bad, the physician must tell the patient the truth to prevent him from choosing too inaccurate treatment.

To summarise, both models show that, when the patient is characterised by anticipatory feelings and the physician maximizes patient utility, the latter is not able to disclose information in the patient's best interest. The patient anticipates that the physician cares about both his emotions and his physical health, moreover he knows that the doctor is ready to hide (or even distort) information to make him feel better. Thus, credibility problems arise. This is an important conclusion contrasting with the previous literature where patient welfare always improved if the physician was acting in the patient's interest.

In the models with certifiable information the 'no news is bad news' result derives from the physician's inability to commit to the ex ante optimal strategy, i.e. not to provide information to the late resolver type, even when such information is represented by good news. However, as Caplin and Leahy (2004, page 501) observe, the commitment problem could be solved only if the provision of information were left to an effectively neutral 'mechanism designer': "information [must be] kept out of the hands of empathic caregivers". In the same vein, when information is not certifiable, welfare could increase "by decreasing or eliminating the agent's discretion in choosing her recommendation or action" (Kozsegi 2005, page 20). However, even if some professional norms and guidelines could have a partial commitment role, they are unable to control for all the different situations that may characterise the communication stage.

As Kozsegi (2004) shows, in the case of non-verifiable information, the communication problem between the physician and his patient can be mitigated if the patient does not know the general properties of his medical conditions. In

fact, if the patient is 'not educated', he is not able to infer a diagnosis from the doctor's recommendation and his anticipatory feelings are not affected by the treatment proposed by the doctor. However, when health education improves the patient's ability to diagnose himself, the distortion in patient's recommendation decreases as well as the communication problems because the patient's priors are less dispersed. A final interesting observation is that, since early information alleviates later communication problems, disclosure of partial information seems beneficial.[12]

4   Policy implications

According to the standard view, the patient wants to be informed about his health status and treated if ill. The physician should deliver information and treatment using the most cost-effective techniques. The right system of remuneration for health professionals is the one which assures that the physician is provided with good incentives to make a diagnosis and to recommend the appropriate treatment at the lowest cost. In particular, concerning diagnosis provision, only strictly necessary checks and medical tests should be prescribed. As was mentioned in section 2, the level of efficiency in health provision might improve by increasing patient health information from sources other than his physician and by raising competition among health professionals such that patients choose their doctor taking into account his reputation. Thus, health care systems should allow patients to choose the physician and the treatment that best fit the patient's preferences. In turn patients' choice is meaningful only if patients are sufficiently informed both about physicians' quality and medical issues.

The new perspective based on the Psychological Expected Utility model adds a new dimension to this picture, namely anxiety about future health status and fear of bad news. When the patient approaches a physician, because of the emotional component of his utility, he wants to be reassured about future health and, when news is bad, he needs time and assistance to cope with his disease: the timing of information disclosure seems particularly important. Only after this emotional process has been completed is the patient ready to be treated. This suggests that physicians provide two extremely different medical services: advice (i.e. the communication of a diagnosis) and treatment. As far as the provision of the diagnosis is concerned, more time than what is strictly necessary to transmit information might be needed to enable the patient to cope with his health problems. Moreover, in this specific phase, defining demand inducement is quite difficult: the patient might emotionally benefit from a medical test that, from a strictly medical point of view, is not necessary. Since the patient's emotions affect his physical health, the policy-maker should not exclusively reason in budgetary terms when designing the optimal payment scheme for physicians, at

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[12]This is in the spirit of Caplin and Eliaz (2003) who argue that the spread of AIDS could be reduced by reducing the anxiety associated with testing for the disease. Thus, the authors suggest making the positive result of the test less informative.

least where advice provision is concerned. In other words, in the 'advice stage', when deciding the optimal amount of medical checks and tests, emotional benefits should be considered together with the standard physical benefits of care. Thus, an appropriate remuneration scheme should induce the doctor to make the highest effort in communication during the diagnosis provision (this implies that a second consultation, when 'emotionally' useful, should be encouraged).[13]

Finally, we saw that the role of the patient's own information and health education is crucial in patient-physician communication. Patient health information is certainly beneficial if obtained before the communication stage (when anxiety is still not an issue) and if it is accurate. This implies that the policy-maker should increase his effort in information campaigns about health matters and that people should be guided in choosing the right high quality sources of information from the huge amount available on the Internet and in the other media.

The new developments in physician agency based on Psychological Expected Utility also enrich the debate onÿ informed consent, both for treatment and for randomised clinical trials. Informed consent means a patient's written consent to a surgical or medical procedure or other course of treatment, given after the physician has told the patient all of the potential benefits, risks and alternatives involved.

The traditional view is that the patient should be fully informed about the treatment offered, the alternatives and whether he is part of a randomised clinical trial (Doyal and Tobias 2001). The need for informed consent has even cast doubts on whether the results of clinical trials where the consent of the patient was not obtained should have been published (see the British Medical Journal of March 1998, entirely devoted to informed consent). The literature has long debated over whether special populations, such as children and the mentally ill, can really be considered to have given informed consent. The new developments in patient attitude towards health information add a new line of debate to this crucial matter. When dealing with an anxious patient, is the role of a benevolent physician to inform him completely or to pass on only the information that is relevant to make him comply with the therapy?

This is an open question to which there does not seem to be an easy answer, also because in many countries doctors are explicitly required to tell the truth: the legal duty of a doctor is to give information about medical interventions and especially about material risks. From a legal perspective, informed consent was defined as *requiring information that a reasonable patient would want*. The physician has to choose his best action by balancing several conflicting needs: encouraging the patient, disclosing information on his real condition and, last

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[13]Notice that one country's cultural background surely affects the way patients' emotions are internalized by physicians. This could explain a part of the great variance in diagnostic tests and treatment prescriptions by physicians in the South and in the North of Europe. Physicians in Mediterranean countries provide, on average, more treatment for illness episode than their colleagues in the North of Europe. When it cannot be explained by differences in monetary incentives for physicians or remuneration schemes, such a behaviour could be motivated by heterogeneity in doctors' attention to patients' anxiety.

but not least, avoiding future legal actions by unsatisfied patients. Unfortunately, in the end, the doctor's best choice might be to reveal to the patients all the available information for legal rather than medical reasons. Even if the practice of 'defensive medicine' has been widely analysed, it would be interesting to investigate its precise role in information disclosure to patients.[14] An interesting empirical result is weak evidence that liability practice induces physicians to spend more time per patient visit. This could imply that liability leads physicians to put more effort into communicating with patients (see Danzon 2000 and references contained). Thus, even if the practice of defensive medicine is not in the best interest of patients[15], it could positively affect anxious patients in the communication stage with their physician.

5   Conclusions

The role of the patient in building health care demand has always been a very controversial point in the health economics literature. This results from the need to reconcile different aspects related to the patient's information on his health conditions and on treatment options. Health information makes the patient aware of his conditions and allows him to mitigate the physician's opportunistic behaviours. However, when the patient fears bad health outcomes, information produces anxiety and must be provided carefully. As the new literature based on emotional agency shows, strategic interaction between patient and physician makes communication difficult. Even a completely benevolent physician is not able to reveal information in a way which is not detrimental to 'late resolver' patients. Possible undesirable outcomes are too much information disclosure and the provision of inaccurate treatments. Health education can alleviate the communications problems, provided it is provided before the illness episode; in fact, when patient's priors about his health condition are less dispersed, the physician has less incentives to reassure patients through treatment recommendations that are not completely appropriate.

The next step in investigating communication issues in physician agency could be to reintroduce in the framework some personal interests of the doctor. Liability and the physician's financial interests would certainly make the setting more realistic. We expect a non-benevolent physician to be able to strategically use the patient's fears and anxiety to influence the patient's consumption of care even further.

References

[1] Bardey and Lesur (2004), Régulation optimale du système de santé dans un contexte de demande induite et de risque moral ex post, *mimeo*.

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[14] 'Defensive medicine' was defined as the whole liability-induced changes in practice that would not be desired by an informed patient.

[15] In fact, it not only raises the cost of health care on the whole, but it can limit access to quality care, and even cause physical harm (for example because of excessive imaging studies).

[2] Barigozzi, F. and R. Levaggi (2005) A Rationale for Searching (Imprecise) Health Information, *mimeo.*

[3] Baum, A., Newman, S., Weinman, J., West, R. and mcManus, C. (eds.) (1997). Cambridge *Handbook of Psychology, Health, and Medicine*, Cambridge: Cambridge University Press.

[4] Britten, N. (2004), Patients' expectations of consultations. Patients pressure may be stronger in the doctor's mind than in the patient's, *BMJ*, 328:416-7.

[5] Calcott, P. (1999), Demand inducement as cheap talk, *Health Economics* 8, 721-733.

[6] Caplin, A. and K. Eliaz (2003), AIDS and Psychology: A Mechanism-Design Approach, *RAND Journal of Economics*, 34 , 631-646.

[7] Caplin, A. and J. Leahy (2001), Psychological Expected Utility Theory and Anticipatory Feelings, *Quarterly Journal of Economics*, 2001, 55-80.

[8] Caplin, A. and J. Leahy (2004), The Supply of Information by a Concerned Expert, *Economic Journal*, 114 , 487-505.

[9] Christakis, Nicholas (1999), *Death Foretold: Prophecy and Prognosis in Medical Care.* Chicago and London: The University of Chicago Press, second edition.

[10] Evans, R. G. (1974) Supplier- induced demand: some empirical evidences» in Perlman, M. (ed.), *The economics of Health and Medical Care*, New York, John Wiley.

[11] Danzon, P. (2000), Liability for Medical Malpractice, in *Handbook of Health Economics* Vol. 1, eds. J. Newhouse and A. Culyer. Elsevier.

[12] DeJaegher, K, Jegers M., (2000), A Model of Physician Behaviour with Demand Inducement, *Journal of Health Economics*, 19:231-258.

[13] DeJaegher, K, Jegers M., (2001), The Physician-Patient relationship as a game of strategic information transmission , *Health Economics*, 10:651-668.

[14] Doyal, S. and J.S. Tobias (eds), (2001) *Informed Consent in Medical Research*, BMJ Books, London.

[15] Dranove, D. (1988), Demand inducement an the physician-patient relationship, *Economic Inquiry*, vol.24, 282-298.

[16] Farley, P.J. (1986) Theories of price and quantity of physician services, *Journal of Health Economics,* 315-333

[17] Feldstein, M. (1970) The rising prices of physicians services, *Review of Economics and Statistics*, 52,121-133

[18] Gafni A, C. Charles, T. Wheland (1998), The physician-patient encounter: the physician as a perfect agent for the patient versus the informed treatment decision, *Social Science and Medicine*, 47(3):347-54.

[19] Gafni A, C. Charles, T. Wheland (1999), Decision making in the physician-patient encounter: revisiting the shared treatment decision-making model, *Social Science and Medicine*, 49, 651-61.

[20] Garcia Marinoso B. and I. Jelovac, (2003), GPs' payment contracts and their referral practice, *Journal of Health Economics*, 22, 617-635.

[21] Geanakoplos, J., Pearce D. and Stacchetti E. (1989), Psychological game and sequential rationality, *Games and Economics Behavior* (1), 60-79.

[22] Gravelle H., (1999), Capitation Contracts: Access and Quality, *Journal of Health Economics*, 18(3), 315-340.

[23] HSC Household Survey (2001), available at web site of the Center for Studying Health System Change: www.hschange.org

[24] Jelovac I., (2001), Physicians' Payment Contracts, Treatment Decisions and Diagnosis Accuracy, *Health Economics* 10 (1), 9-25.

[25] Kozsegi, B. (2003) Health Anxiety and Patient Behavior, *Journal of Health Economics*, 22 , 1073-1084.

[26] Kozsegi, B. (2004) Emotional Agency: the case of the doctor-patient relationship, *mimeo*, http://emlab.berkeley.edu/users/botond/doctors.pdf.

[27] Kozsegi, B. (2005) Emotional Agency, *Quarterly Journal of Economics*, forthcoming.

[28] Levaggi, R. and L. Rochaix (2003) Optimal Payment Schemes for Physicians, *Portuguese Economic Review*, 2: 87-107.

[29] Ma A., and McGuire, T.,(1997), Optimal Health Insurance and Provider Payment, *The American Economic Review* 87 (4), 685-704.

[30] Malcomson J., (2004) Health Service Gatekeepers, *Rand Journal of Economics*, 35(2) 401-21

[31] McGuire, T.,(2000) Physician Agency, *Handbook of Health Economics*, volume 1, chapter 9, A.J. Culyer and P.J. Newhouse (eds.), Elsevier Science, 461-536.

[32] Mooney, G. and Ryan, M. (1993) Agency in Health Care: Getting beyond First Principles, *Journal of Health Economics*, 12 (2), pp. 125-35

[33] Musgrave, R. A. (1959). *The Theory of Public Finance*. New York: McGraw-Hill.

[34] Pauly, MV and M.A.Satterthwaite (1981), The pricing of primary care physician services: a test for the role of consumer's information, *Bell Journal of Economics*, vol. 12, pp. 488-506.

[35] Phelps, C.E. (1992) Diffusion of information in medical care, *Journal of Economic Perspectives*, 6(3), pp. 23-42

[36] Ptacek, J. T. and Tara L. Eberhardt (1996), Breaking bad news: A review of the literature. *The Journal of the American Medical Association*, 276(6): 496–502.

[37] Rochaix L. (1989), Information Asymmetry and Search in the Market for Physicians' Services, *Journal of Health Economics*, 8, 53-84.

[38] Roth, S. and L. Cohen (1986), Approach, avoidance, and Coping with Stress, *American Pshychologist* (41), 813-9.

[39] Shackley, P. and Ryan, M. (1994) What is the role of the consumer in health care?, *Journal of Social Policy*, 23, 517-541

[40] Scott A., (2000),The Economics of General Practice, In A. J. Culyer and J. P. Newouse, (eds.), *Handbook of Health Economics*, vol. 1B, Elsevier Science, Amsterdam, Chapter 22, pp. 1175-1200.

[41] Stewart MA (1995), Effective physician-patient communication and health outcomes: a review, *Canadian Medical Association Journal*, 152(9),1423-33

[42] Stewart, MA et al. (2000), The impact of patient-centered care on outcomes, *Journal of Family Practice*, 49(9), 796-804.

[43] Wolinsky, A. (1993), Competition in a Market for Informed Expert Services, *RAND Journal of Economics,* 24, 380-398.