Defensive response to malpractice pressure in health care settings: A behavioral approach

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ABSTRACT

This article offers an insight into the techniques for analyzing defensive response to malpractice pressure in health care settings, through a behavioral economic approach. It describes and comments recent advances in the game-theoretic literature on the contentious interactions between patients and physicians. We focus on three evolutionary games in which patients can resort to litigation against physicians, and the latter in turn can prevent negligence charges by practicing defensive medicine or by purchasing liability insurance. The aim of this article is to provide clinical and legal practitioners with points for reflection on strategies for making more efficient use of resources by managing conflicts between patients and physicians.

Keywords: Defensive medicine, Malpractice litigation, Liability insurance, Evolutionary game
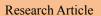
INTRODUCTION

Defensive medicine can be defined as a deviation from sound medical practice motivated by the threat of liability (Kessler and McClellan, 1996). It can lead to deviation from best practice through avoidance behavior and is therefore called negative defensive medicine such that physicians may avoid high-risk patients and/or procedures, or through overtreatment (called positive defensive medicine) such that physicians may charge unnecessary tests and treatments. The motivation to overtreat is to deter patients from filing medical malpractice claims by providing documented evidence that the physician is practicing according to the standard of care.

Defensive medicine is a worldwide issue. In a survey among 824 physicians in high-risk specialities in Pennsylvania, 93% reported practising defensive medicine (Studdert et al., 2005). According to surveys, comparable numbers emerged in Europe (Osti and Steyrer, 2016; Ramella et al., 2015; Garcia-Retamero and Galesic, 2014; Palagiano, 2013), China (He, 2014) and Japan (Hiyama et al., 2006). In the US, evidence from cross-country variations in tort law reveals that states with limited monetary damages have lower odds of diagnostic imaging, thus suggesting a positive relation between malpractice damages and overtreatment (Sloan and Shadle, 2009).

Defensive medicine is expensive. In the US, it costs more than $ 55 billion per year or between 2.4%-10% of total healthcare spending (Mello et al., 2010); in Italy, more than € 10 billion per year or 10.5% of overall expenses of public healthcare system (Palagiano, 2013); in Austria, only for radiology, orthopaedic and trauma surgery, around €420.8 million per year or 1.62% of overall public healthcare expenses (Osti and Steyrer, 2016).

Defensive medicine is also dangerous because it can expose patients to risks of harm from unnecessary or inappropriate procedures. Health issues include, among others, the overutilization of healthcare services (Emanuel and Fuchs, 2008), the excessive use of Caesarean section to deliver babies (Feess, 2012), and the excessive exposure to radiation in diagnosis (Hendee et al., 2010).

The doctor-patient relationship has been analysed, in theoretical literature on defensive medicine, almost exclusively through static or multi-stage models (Ellis and McGuire 1986; Ma 1994; Ma and McGuire 1997; Ellis 1998; Quinn 1998; Gal-Or 1999; Lien et al. 2004; Olbrich 2008; Allard et al. 2009; Feess 2012). A noteworthy exception is the work by Antoci et al. (2016, 2018, 2019), who first model by evolutionary game theory the contentious interaction between patients and physicians.

METHODOLOGY

The game-theoretic approach proposed by Antoci et al. (2016, 2018, and 2019) studies the behavioral choices of physicians and patients, and their dynamics in continuous time, in large populations of agents who repeatedly engage in healing interactions. In each interaction, a physician provides a risky medical treatment to a patient. The treatment can fail with a given probability; if that occurs, the patient suffers damages and can choose whether to sue or not the physician for medical malpractice. If winning the possible litigation, the patient would get compensation from the losing physician; otherwise, the losing patient would pay to the winning physician reparation for legal and reputation losses.

The outcome of the litigation is uncertain and depends on the physician's behavior. Physicians can choose to provide the medical treatment in the sole interest of the patient, to the best of their knowledge and without regard to liability; this strategy amounts to not defending. On the other hand, they can choose instead to protect themselves from liability claims by performing one of the following actions. Physicians may choose to provide superfluous additional effort, which amounts to performing positive defensive medicine (Antoci et al., 2016). They may choose to provide a lower-quality treatment with lower clinical risk, which amounts to performing negative defensive medicine (Antoci et al., 2018). They may also choose to provide the best medical practice (as in the not-defensive strategy) but, at the same time, to protect themselves by purchasing liability insurance (Antoci et al., 2019).

The dynamics of the evolutionary game are represented by a system, whose variables are the ratios of the adopted strategies among the populations of physicians and patients. When the possible strategies of the two populations are, respectively, practicing defensive medicine or not, and being litigious or not, the system is bidimensional (Antoci et al., 2016; 2018). When physicians can also choose the insurance strategy, the dynamics turns out to be represented by a four-dimensional system, whose additional variables are the share of adoption of the insurance strategy and the price of liability insurance (Antoci et al., 2019).

CONCLUSION

Under the assumptions of the models by Antoci et al. (2016, 2018, 2019), the contentious interaction between physicians (choosing whether to practise defensive medicine or not) and patients (choosing whether to be litigious or not) can lead to cyclic behaviours typical of predator–prey models, where litigious patients can be seen as predators and physicians as their preys. Introducing the possibility for physicians of purchasing liability insurance may play either a stabilizing or a destabilizing role in the behavioral choices of both populations, depending on the premium calculation principle. Notably, if the premium corresponds to the actuarially fair value of the liability risk, eventually increased by a low-enough loading charge, all physicians may choose to protect themselves by insurance, and the frequency of defensive medicine may eventually fall to zero (Antoci et al., 2019).

The implications of these results are various. First, the overall underlying dynamics of defensive medicine and malpractice litigation can differ significantly from their irregular (and sometimes misleading) short-term trends. Second, because of the predator-prey relationship, changes in clinical and legal practices can have a counter-intuitive impact on the long-term frequency of defensive and litigious behaviors. Third, liability insurance may effectively deter physicians' defensive behavior but only if the premium is actuarially fair and the loading charge is low enough. This precondition requires the insurance market to be competitive and efficient, thus leaving room for government intervention.

In conclusion, applying evolutionary game theory to the contentious relationship between patients and physicians, can suggest a broad range of policies for pursuing the goal of a fair and efficient health care. We hope that the present article can help to stimulate the design of such strategies, which shall be the goal of further research.

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